



APPENDIX 10-A

Geotechnical Report



Geotechnical Report (Rev. 1)

AES – Somerset Solar Project



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1 Introduction

ANS Geo, Inc. is pleased to provide this Geotechnical Report (Report) to AES to summarize the results of our geotechnical field investigation in support of the proposed Somerset Solar Energy Generation project located in Somerset, New York. To guide the design and construction of the proposed solar facility, ANS Geo developed and implemented a geotechnical investigation program which encompassed a desktop study of local geologic conditions, soil borings, field electrical resistivity testing, pile load testing, laboratory thermal resistivity and corrosion testing, California Bearing Ratio (CBR) and laboratory soil material testing.

ANS Geo notes that this document includes updates from a second mobilization (November 2021) which included additional explorations at the revised substation location (soil boring and electrical resistivity test) and the existing “mound” location south of the central railroad loop (soil boring).

2 Methodology

2.1 Soil Borings

ANS Geo retained Earth Dimensions, Inc., (EDI) of Elma, New York to advance 42 soil borings (B-01 through B-39, B-M1, and B-SS-1 through B-SS-2) completed at select locations across the project site between March 15 and 23, 2021 and again on November 4, 2021. The soil boring locations are depicted in the Investigation Location Plan, provided as **Attachment A**.

The 39 array-area soil borings were advanced to approximately 20 feet below ground surface (BGS) or until practical refusal, whichever was encountered first. The substation borings (B-SS-1 & B-SS-2) were advanced until practical refusal which was encountered at approximately 28.5 feet and 25.9 feet BGS, respectively. A CME-550x ATV-mounted drill rig was used to collect soil samples using the Standard Penetration Test (SPT) Method through hollow-stem augers in accordance with ASTM Standard D1586. Soil samples were generally collected continuously within the upper 10 feet in each boring, then in five-foot intervals thereafter to the termination depth. In one location (B-29), rock coring was conducted in accordance with ASTM D2113 to confirm the presence, type, and quality of bedrock. Soil borings, proposed by ANS Geo and confirmed by AES review, were located at relatively evenly spread locations throughout the project’s array area(s). All soil borings were overseen and logged by an ANS Geo representative under the direction of a Professional Engineer licensed in the State of New York. Typed soil boring logs are presented as **Attachment B**.

At select soil boring locations, auger cuttings were collected from near-surface soils with the purpose of obtaining bulk soil samples for laboratory California Bearing Ratio (CBR), thermal resistivity testing (TRT), and corrosivity testing. Upon completion, each borehole was backfilled to its existing grade with soil cuttings.

2.2 Electrical Resistivity Testing

As part of our field investigation program, ANS Geo performed field Electrical Resistivity Tomography (ERT) testing on May 10 and 11, 2021 and again on November 4, 2021. Testing was conducted at seven (7) locations within the proposed array area(s) and two (2) locations within the proposed substation areas. In-situ soil resistivity measurements were obtained by utilizing the Wenner 4-Pin Method in accordance with ASTM G57 and IEEE Standard 80. Two (2) mutually perpendicular traverses were collected at each array area location utilizing “a”-spacings of 2, 5, 10, 25, and 50 feet, “a”-spacings of 2, 5, 10, 25, 50, and 100 feet at the first substation area location, and “a”-spacings of 1, 2, 3, 5, 10, 25, 50, 75, 100, 150, and 188 feet at the second substation area location. Test results are presented as **Attachment C**.

2.3 Pile Load Testing

2.3.1 Test Pile Installation

As part of our scope of work, ANS Geo conducted pile load testing at 38 accessible locations across the proposed solar array area(s) between April 7 and 25, 2021. Each test location included a pair of test piles, totaling 76 piles tested for both uplift and lateral capacities. At each test location, W6x9x15 steel sections (“piles”) were installed to varying depths between 6.8 and 11 feet BGS through the overburden via direct push to significant resistance, then driven to their targeted depths using a GAYK HRE 4000 Pile Driver. Per-pile installation rates varied up to 12.3 seconds per foot, with an average of approximately 6.2 seconds per foot. The installation and load testing program was overseen and logged by an ANS Geo geotechnical representative under the direction of a Professional Engineer licensed in the State of New York.

2.3.2 Uplift Load Testing

Once driven to the targeted embedment depth, an uplift load test was performed on each test pile in accordance with the ASTM D3689 (uplift) test method. The tension load was generally applied through hydraulic load cell attached to a rigid tripod reaction frame. Uplift loads were generally applied in one-minute, 1,000-pound increments up to 10,000 pounds, where feasible. Once achieved, the load was then unloaded to measure residual deflection. After the tension was fully released, the piles were reloaded up to a maximum uplift load of roughly 10,000 pounds or one-inch of deflection. ANS Geo notes that several uplift tests were limited in the maximum force applied, not due to excessive pile movement, but rather the reaction points settling into the soft surrounding ground surface.

2.3.3 Lateral Load Testing

A lateral load test was also performed at each test location, following each uplift load test, in accordance with ASTM D3966 (lateral) test method. Horizontal loads were applied at approximately three (3) feet above grade on each pile with the pulling force a hydraulic load cell. Test loads were applied cyclically in one-minute, 500-pound increments up to 4,000 pounds, where feasible. Once achieved, the load was immediately released and reloaded up to a targeted maximum deflection of approximately one-inch, if not already achieved.

The location of each pile load test is depicted in the Investigation Location Plan, provided as **Attachment A**. Results of the pile load testing program are summarized within **Section 5**.

3 Geology and Subsurface Conditions

ANS Geo conducted a brief, desktop review of surficial and bedrock geology maps and reports made available by the New York State Geological Survey (NYSGS) and the New York State Education Department (NYSED) prior to conducting our field investigation. The available mapping indicates that the native surficial soils are predominantly classified as “lacustrine silt and clay” which are described as laminated, calcareous, silts and clays. A small portion (approximately 5 percent) of the project resides within soils classified as “till moraine” which are described as variable textured material. Bedrock geological mapping indicates the project site is underlain entirely by the Queenston formation which predominantly consists of shale, sandstone, and siltstone bedrock.

ANS Geo additionally reviewed overburden soil information made available by the USDA's Natural Resources Conservation Service (NRCS). The NRCS classifies the upper six (6) feet of soil primarily as material of the Callamer silt loam, Niagara silt loam, and Rhinebeck silt loam units. The full NRCS soil report is provided as **Attachment G**.

ANS Geo has provided the generalized subsurface conditions within Table 1 below based upon the observations made during our geotechnical investigation for the solar project. ANS Geo notes that this profile

is highly generalized and that soil boring logs, been provided as **Attachment B**, should be reviewed for location-specific subsurface conditions.

Table 1 – Generalized Subsurface Profile

Avg. Depth (ft)	Material	Avg. Consistency	Description
0' – 0.5'	Topsoil	-	Two (2) to 10 inches of topsoil existed at surface across most of the project area.
0.5' – 4'	Clay / Silt	Medium stiff	Clays and silts of low to medium plasticity were generally encountered underlying the topsoil layer. This material frequently included some sand content and exhibited average pocket penetrometer values of 1.5 tons per square foot.
4' – 10'+	Glacial Till	Dense	Heterogeneous soils, typical of glacial till geology, were encountered throughout several of the boring locations. This layer generally includes varying proportions of gravels, sands, clays, and silts. It should also be noted that cobbles and boulders are typical of glacial till geology which regularly render drilling refusal.

The mapped soil formations identified within our desktop study are consistent with the findings of our field investigations. ANS Geo notes that weathered rock material was encountered within 10 feet of grade within one of the soil boring locations (B-31).

3.1 Groundwater

Water was encountered within a small portion (20 percent) of the soil boring locations between three (3) and 20 feet below grade at the time of our investigation program. It is our opinion, however, that these water levels likely represent perched water conditions rather than static groundwater.

4 Results

4.1 Soil Index Testing

Representative soil samples were collected during our investigation and submitted to ANS's accredited materials testing laboratory. A summary of the index laboratory test results is provided within Table 2. As-received laboratory test results are included within **Attachment D**.

Table 2 – Soil Index Testing Summary

Sieve Analysis Samples							
Boring ID	Sample ID	Depth (feet)	% Gravel	% Sand	% Fines		% Moisture
					% Silt	% Clay	
B-06	S-3	4 – 6	0.0	21.9	42.3	35.8	17.4
B-21	S-4	6 – 8	0.0	26.0	33.0	41.0	14.7
B-24	S-7	18 – 20	3.0	27.7	30.3	39.0	2.0
B-26	S-4	6 – 8	31.5	23.6	18.1	26.8	8.5
B-M1	S-6	13-15	0.0	17.6	82.4		19.6
B-SS-1	S-1	0 – 2	8.6	12.6	40.3	38.5	15.6
Atterberg Samples							
Boring ID	Sample ID	Depth (feet)	Liquid Limit	Plastic Limit	Plasticity Index	% Moisture	USCS Symbol
B-01	S-2	2 – 4	28.1	19.5	8.6	21.1	CL
B-03	S-1	0 – 2	29.8	20.4	9.4	24.1	CL
B-05	S-3	4 – 6	27.8	19.2	8.6	16.4	CL
B-07	S-5	8 – 10	28.0	20.4	7.6	12.1	CL
B-10	S-4	6 – 8	30.3	20.6	9.7	24.5	CL
B-12	S-4	6 – 8	29.2	19.7	9.5	23.1	CL
B-14	S-5	8 – 10	30.0	20.9	9.1	20.2	CL
B-15	S-5	8 – 10	28.6	20.6	8.0	11.2	CL
B-18	S-6	13 – 15	29.6	20.0	9.6	18.9	CL
B-19	S-2	2 – 4	30.7	20.7	10.0	19.4	CL
B-20	S-1	0 – 2	31.2	20.0	11.2	21.1	CL
B-23	S-4	6 – 8	32.6	20.5	12.1	34.2	CL
B-27	S-6	13 – 15	29.2	19.9	9.3	35.4	CL
B-29	S-2	2 – 4	30.2	20.4	9.8	19.2	CL
B-33	S-2	2 – 4	30.3	19.7	10.6	24.4	CL
B-34	S-6	13 – 15	30.7	19.7	11.0	33.6	CL
B-37	S-5	8 – 10	33.3	20.0	13.3	26.6	CL
B-38	S-1	0 – 2	29.6	19.9	9.7	19.2	CL
B-SS2	S-3	4-6	25.2	18.4	6.8	22.1	CL-ML

4.2 Thermal Resistivity Testing

ANS Geo collected bulk samples from four (4) locations throughout the project area for laboratory testing of Thermal Resistivity. Soils were collected in a five-gallon bucket and delivered to ANS Consultants' accredited laboratory for testing. The soil was compacted to 85 percent of its Standard Proctor Density in accordance with ASTM D698, and Thermal Resistivity Testing was conducted in accordance with IEEE Standard 442-2017. Results of the thermal testing are summarized within Table 3. Complete, as-received results have been provided within **Attachment D**.

Table 3 – Thermal Resistivity Testing Summary

Location ID	Material Type	Thermal Resistivity Values at Various Moisture Contents					Received Moisture Content (%)	Re-Molded Dry Density (lb/ft ³)
		% water	% water	% water	% water	% water		
		(°C-cm/W)	(°C-cm/W)	(°C-cm/W)	(°C-cm/W)	(°C-cm/W)		
B-06 (3'-5')	Clay	0	4	8	12	16.6	25	91.4
		665	271	118	88	79		
B-20 (3'-5')	Clay	0	3.5	7	10.5	14.9	21.2	89.3
		753	298	115	83	74		
B-29 (3'-5')	Clay	0	3.5	7	10.5	14.8	21.3	94.2
		698	283	116	86	77		
B-SS2 (3'-5')	Silt	0	3	5.9	8.9	11.8	19.2	97.6
		363	219	115	72	59		

4.3 Corrosivity Testing

ANS Geo collected soil samples at five (5) locations for corrosivity testing. The results of the testing, completed by ANS Consultants, have been summarized within Table 4a and are detailed within **Attachment D**.

Table 4a – Corrosivity Testing Summary – Soil

Location ID	pH	Sulfate (mg/kg)	Chloride (mg/kg)	Soil Box (Calc. Resistivity) (Ω/cm)	Redox Potential (mV)
B-03 (2'-3')	7.12	18	40	7,000	115
B-12 (2'-3')	6.88	6	20	7,000	109
B-27 (2'-3')	7.76	3	25	6,500	111
B-35 (2'-3')	7.38	12	45	8,500	120
B-SS2 (2'-3')	8.23	39	45	3,000	108

Given the project area's close proximity to Lake Ontario, ANS Geo additionally collected groundwater samples from four (4) existing site monitoring wells for corrosivity testing. The results of the testing, completed by Alpha Analytical, are summarized within Table 4b and are detailed within **Attachment D**.

Table 4b – Corrosivity Testing Summary - Groundwater

Well ID	Acidity (mg CaCO ₃ /L)	Alkalinity (mg CaCO ₃ /L)	Sulfide (mg/l)	Redox Potential (mV)	Chloride (mg/l)	Sulfate (mg/l)
SA9122D	11	22.1	ND	-16	9,960	2,070
SA9132S	ND	420	ND	84	41.0	860
SO8305	ND	244	ND	40	315	874
SO8823	ND	542	ND	100	15.4	171

ND = Not Detected

4.4 California Bearing Ratio

ANS Geo collected an additional sample at three (3) locations from one (1) to three (3) feet below grade for testing of California Bearing Ratio (CBR) in accordance with ASTM D1883 at approximately 90 percent of its Standard Proctor Density (ASTM D698). Bulk samples were collected at varying depth intervals to provide representative data based on material type observed. The results of the testing, completed by ANS Consultants, have been summarized within Table 5 and are detailed within **Attachment D**.

Table 5 – California Bearing Ratio Summary

Location ID	CBR Ratio (%)
B-04	0.7
B-18	1.4
B-31	0.7

5 Pile Load Testing Results

Table 6 presents the summarized results of the pile load testing program at each test location. Complete Load Testing Logs are provided as **Attachment E** and should be referenced for detailed information.

Table 6 – Pile Load Testing Summary

Load Test ID	Embedment Depth (ft.)	Avg. Pile Installation Rate (sec/ft)	Approx. Uplift Load at 1-inch Deflection (lbs)	Approx. Lateral Load at 1-inch Deflection (lbs)
PT-01A	10.6	6.1	> 10,000	4,100
PT-01B	10.5	6.8	> 10,000	4,100
PT-02A	9.5	11.5	> 10,000	4,000
PT-02B	9.1	11.8	> 10,000	3,800
PT-03A	8	4.7	> 10,000	3,200
PT-03B	7.8	6.6	> 10,100	3,300
PT-04A	9	11.6	> 8,800	4,200
PT-04B	9	10.6	> 9,000	4,300
PT-05A	7	5.2	> 10,000	4,200
PT-05B	7	5.3	> 10,000	4,500
PT-06A	9	4.0	> 9,900	3,600
PT-06B	9	6.6	> 10,800	3,600
PT-07A	10	6.1	> 13,000	4,800
PT-07B	10	5.5	> 13,000	4,900
PT-08A	8	5.7	> 10,800	4,800
PT-08B	8.2	5.0	> 10,800	4,900
PT-09A	7	7.4	> 11,000	4,100
PT-09B	7	5.6	> 11,000	4,100
PT-10A	9	7.7	> 10,000	4,600
PT-10B	9	9.6	> 9,500	4,600
PT-11A	10	11.7	> 10,800	3,600
PT-11B	10	6.6	> 10,000	3,400
PT-12A	9	9.0	> 10,000	4,300
PT-12B	9	5.3	> 11,500	4,600
PT-13A	8	5.3	> 10,000	3,600
PT-13B	8	5.7	> 11,800	3,700
PT-14A	10.7	10.0	> 13,000	4,300
PT-14B	10.7	9.4	> 13,000	4,200
PT-15A	7	4.9	> 10,000	3,800
PT-15B	7	5.1	> 8,900	3,600
PT-16A	9	5.4	> 13,000	5,900
PT-16B	9	4.6	> 13,000	6,000
PT-17A	7.1	7.3	> 10,000	4,500
PT-17B	7	6.9	> 10,000	4,500
PT-18A	8	3.9	> 10,000	4,400
PT-18B	8	5.3	> 8,000	4,700
PT-19A	10	5.6	> 10,000	4,100
PT-19B	10	4.3	> 10,000	4,200
PT-20A	10	7.8	> 10,000	3,700
PT-20B	10	7.0	> 9,300	3,700
PT-21A	9	12.3	> 11,000	3,700
PT-21B	9	7.1	> 8,000	3,800
PT-22A	7	3.7	> 13,000	4,000
PT-22B	7	3.0	> 13,000	3,800

Table 6 (cont.) – Pile Load Testing Summary

Load Test ID	Embedment Depth (ft.)	Avg. Pile Installation Rate (sec/ft)	Approx. Uplift Load at 1-inch Deflection (lbs)	Approx. Lateral Load at 1-inch Deflection (lbs)
PT-23A	10	5.8	> 10,600	4,000
PT-23B	10	5.2	> 10,200	4,000
PT-24A	10.7	5.8	> 11,200	4,200
PT-24B	10.3	6.1	> 11,200	4,200
PT-25A	6.8	6.6	7,200	3,600
PT-25B	7	5.7	> 10,100	3,700
PT-26A	9	2.8	9,500	3,600
PT-26B	9	3.7	9,800	3,500
PT-27A	10	2.1	> 8,800	4,100
PT-27B	10	1.7	> 10,200	4,300
PT-28A	7	5.1	> 10,000	3,700
PT-28B	7	3.5	9,000	3,800
PT-29A	8	6.9	6,000	3,800
PT-29B	8	4.2	9,500	3,800
PT-30A	9	6.1	> 10,000	3,700
PT-30B	9	6.0	> 8,800	3,400
PT-31A	7	3.5	7,100	3,300
PT-31B	7	3.9	> 10,000	3,600
PT-32A	11	8.3	> 10,000	3,600
PT-32B	10.4	5.2	> 5,000	3,400
PT-33A	7	4.6	> 10,000	3,800
PT-33B	7	3.0	> 10,000	3,700
PT-34A	9	9.7	> 9,700	4,200
PT-34B	9	9.0	> 10,000	4,000
PT-35A	10	3.7	> 8,500	3,500
PT-35B	10	3.6	> 9,100	3,700
PT-36A	8	2.9	> 10,000	4,300
PT-36B	8	3.6	> 10,000	4,400
PT-38A	10.6	6.4	> 10,000	4,000
PT-38B	10.2	5.6	> 10,000	3,900
PT-SSA	8	8.2	> 12,500	4,800
PT-SSB	8	8.9	> 12,500	4,800

6 Seismic Site Classification

Based on the observations recorded within our subsurface investigation program and utilizing the N-Value method as prescribed in Chapter 20 of ASCE 7-16, Site Class D can be assumed as the average condition across the project site.

The seismic ground motion values for this this were obtained from the USGS Seismic Hazard Maps, referenced in ASCE 7-16 Standard and provided as **Attachment F**, and are as follows:

- 0.2 second spectral response acceleration, $S_s = 0.167$ g
- 1 second spectral response acceleration, $S_1 = 0.046$ g
- Maximum spectral acceleration for short periods, $S_{MS} = 0.267$ g
- Maximum spectral acceleration for a 1-second period, $S_{M1} = 0.111$ g
- 5% damped design spectral acceleration at short periods, $S_{DS} = 0.178$ g
- 5% damped design spectral acceleration at 1-second period, $S_{D1} = 0.074$ g

6.1 Preliminary Seismic Evaluation

The designated seismic site class is anticipated based on results from our investigation program and using select areas of the site which have been investigated by ANS Geo. Seismic support data is provided as **Attachment F**. Based on our observation of subsurface conditions, estimated Site Class ratings, and review of USGS's 2018 National Seismic Hazard Map, ANS Geo concludes that there is a low risk of significant seismic activity which may impact the proposed solar facility.

7 Foundation Considerations

ANS Geo anticipates that, as typical with solar farm construction, embedded posts, such as W6x9 H-piles, will be used to support the proposed solar panels. Conventional shallow foundations such as sonotubes, spread footings, or similar systems may also be utilized for equipment pads and associated support structures.

7.1 Corrosion Considerations

Given limited testing results measuring the soil and groundwater's measured acidity, sulfate and chloride concentrations, resistivity, and redox potential summarized in **Section 4.3** (Tables 4a and 4b), in consideration with the soil and moisture conditions observed, the in-situ soil conditions are anticipated to be "moderately" corrosive to embedded steel piles. Typically, a zinc coating of 1.7 oz/ft² (3 mil, or approximately 75 micrometers) is the minimum thickness for Grade 75 steel (W6x9) as specified by ASTM A123. As such, we expect that such piles would generally maintain an approximate lifespan of at least 20 to 30 years.

In addition, the average chloride concentration obtained from soil and groundwater testing across all discrete samples (with the exception of Well SA 9122D which should be considered individually) is roughly 70 parts-per-million (ppm, or mg/kg). The concentration of chloride ions affects the corrosion rate of embedded steel¹. Based on empirical studies performed, the relationship between corrosion rate and chloride concentrations can be estimated as:

$$CR = 16.28 * \ln(CL) - 83.8$$

¹ J. B. Decker, K.M. Rollins, J.C. Ellsworth, "Corrosion Rate Evaluation and Prediction for Piles Based on Long-Term Field Performance", American Society of Civil Engineers Journal of Geotechnical and Geoenvironmental Engineering, 134(4), pp. 341-351 (2008)

Where CR is defined as the “corrosion rate” of steel (in micrometers per year), and CL is the chloride concentration in parts-per-million. Using the equation above, and considering an average chloride concentration of 70 ppm, the corrosion rate is nearly zero across the planned service life of the facility, with the exception of the northeastern area in the vicinity of Well SA9122D. Given the well’s proximity to Lake Ontario, groundwater within this area of the site may be brackish and a particularly higher corrosion risk to steel foundation posts and concrete foundations (as observed within the sampling results). ANS Geo recommends that additional soil corrosivity testing be completed at the northernmost panel locations to confirm these findings as additional coating and/or sacrificial steel thickness may be warranted.

7.2 Frost & Adfreeze Considerations

Given the location of the project and soils encountered, the potential for frost heave against post foundations should be considered. Fine-grained soils, or granular soils with greater than 10 percent fine-grained content are frost-susceptible due to the inability of entrapped moisture from infiltrating or evaporating prior to freezing. Trapped moisture will begin to create ice lenses, which will grip the steel posts or embedded structures, followed by ice-jacking due to frost heave. The phenomenon is more commonly referred to as “adfreeze stress”, which can be considered as an external, upward force applied to the post. The magnitude of the upward force will depend on the depth of the frost zone, the interface bond stress between embedded structure/material and the surrounding area, and the surface area of the structure/material in contact with this bond stress.

Several methods exist to evaluate frost susceptibility of soils, including determination of fine-grained content of near-surface soils, evaluation of air freezing index, and local, empirical correlations such as the Atlas of Soil Freezing Depth Extremes for the Northeastern United States.

The first evaluation is to determine frost susceptibility of the site soils. The earliest method was developed by Arthur Casagrande that uses percentage of fine fraction less than 0.02 mm by weight, in which silts and very fine sands are considered to have medium to very high frost susceptibility. The method was further expanded by the US Army Corps of Engineers (1965) into a widely-used classification system which categorizes soils into frost groups F1 through F4. Classification is made in order of increasing frost-susceptibility (ie. worse soils are F4), and loss of strength during thaw. Based on the predominant, near-surface soil type at the site (silts and clays), the site can be classified as frost group F4.

Frost penetration depth may be calculated in multiple ways, including local, County, or State building code frost depths, the US Army Corps of Engineers method using the modified Berggren Equation, and empirical data.

Within Niagara County, New York, frost depth is mapped to exist at approximately 54 inches (4.5 feet) below grade. However, we recognize that fluctuations in air temperature, snow cover and insulation, and historic freezing indices have shown empirical correlations of shallower frost depth. Based on the Atlas of Soil Freezing Depth Extremes for the Northeastern United States, for a return period of 25 years, the maximum depth of freezing under sod is approximately 30 inches.

Using the modified Berggren Equation, frost penetration depth can also be calculated as follows:

$$X = \lambda \sqrt{\frac{48 k_f n F}{L_s}}$$

Where each variable is defined as follows:

- X = depth of frost penetration [m]
- λ = dimensionless coefficient based on dry density and water content
- n = dimensionless conversion factor from air index to surface freezing index
- k_f = thermal conductivity of frozen soil [BTU/ft-hr-°F]
- F = air freezing index [°F-days]
- L_s = volumetric latent heat of soil [BTU/ft³]

Using this relationship, it is recognized that frost penetration depth is directly proportional to the square root of thermal conductivity of the frozen soil and surface freezing index, and inversely proportional to the square root of volumetric latent heat of the soil. The thermal conductivity of frozen soil is a function of soil type (ie. fine-grained or coarse-grained), moisture content, and dry density. The following assumptions are made to calculate frost depth at this site:

1. Mean annual air temperature (MAAT) of 48.4°F from the 1981 – 2020 Climate Normals data taken from the National Oceanic and Atmospheric Administration (NOAA)
2. The average annual number of frost days assumed was 119 days
3. An air freezing index of 1,037 °F-days for a 25-year return period using NOAA data (Buffalo)
4. The ratio of surface index to air index (n) of 0.7 for bare soil without any overlying soil or ice
5. A dry density of 100 lb/ft³ for fine-grained, near-surface soils
6. An average water content of 25% based on laboratory results for samples within the frost zone

Using the assumptions above, and input into the modified Berggren Equation, the calculated frost penetration depth for a 25-year return period is approximately 32 inches.

Based on our evaluation, since conditions may exist where snow cover is not present during low temperature extremes, and using a calculated depth of frost penetration, ANS Geo recommends that all structural foundations be founded at 32 inches (2.7 feet) below grade or deeper, for a 25-year design life, to ensure adequate protection from frost conditions which may jeopardize the integrity of subgrade soils and associated substructure.

As predominantly silty and/or clayey soils were observed near grade, ANS Geo recommends that an unfactored adfreeze (uplift) stress of 1,500 pounds per square foot (10.4 psi) be considered within the 32-inch frost penetration depth of posts for panel foundation sizing and design.

7.3 Soil Shrink & Swell Potential

Shrinkage and swelling of soils refer to the volumetric change (decrease and increase) exhibited in primarily fine-grained soils due to a change in moisture conditions. The extent of shrinking and swelling is largely influenced by the type and amount of clay present in the native near-surface soils. Higher-risk soils generally include fine-grained material with a high clay content, greater than 50 percent by weight, and liquid limits of 50 percent or higher (fat clays). Based on our observed soil conditions and results of laboratory testing, it is our professional opinion that the native on-site soils exhibit a low to negligible shrink and/or swell potential in the event of significant moisture fluctuation.

7.4 Recommended Soil Parameters for Pile Design

Based on our interpretation of the subsurface conditions observed within our investigation programs and results of pile load testing, ANS Geo recommends that the soil parameters, as depicted within Table 7, be considered for foundation post design purposes.

Table 7 – Recommended LPILE Soil Parameters

Depth	Material	Effective Unit Weight	Internal Friction Angle	Cohesion	Soil Modulus (k)	Soil Strain (E ₅₀)	Allowable Bearing Capacity	Allowable Side Resistance
0' – 0.5'	Topsoil <i>(Soft Clay [Matlock])</i>	100 lb/ft ³	---	300 lb/ft ²	---	0.020	---	---
0.5' – 2.7'	Clay / Silt <i>(Mod Stiff Clay w/o Free Water)</i>	110 lb/ft ³	---	1,200 lb/ft ²	100 lb/in ³	0.010	500 lb/ft ²	---
2.7' – 4'	Clay / Silt <i>(Mod Stiff Clay w/o Free Water)</i>	110 lb/ft ³	---	1,200 lb/ft ²	100 lb/in ³	0.010	1,500 lb/ft ²	500 lb/ft ²
4' – 7'	Glacial Till <i>(Sand [Reese])</i>	120 lb/ft ³	37°	---	200 lb/in ³	---	2,500 lb/ft ²	350 lb/ft ²
7' – 10'+	Glacial Till <i>(Sand [Reese])</i>	125 lb/ft ³	38°	---	250 lb/in ³	---	3,500 lb/ft ²	450 lb/ft ²

Note: *Italicized material types represent our recommended LPILE soil models.*

ANS Geo recommends that allowable side resistance within the upper 2.7 feet be neglected due to frost impact, and adfreeze stresses, as noted in Section 7.2, be considered. Pile load testing results and subsurface observations were evaluated by ANS Geo using LPILE software to provide these refined soil parameters. ANS Geo notes that the soil parameters depicted within Table 7 represent values calibrated to curve-fit our lateral load test data; these parameters (effective unit weight and internal friction angle) should not be relied upon for other site foundation designs. It is our recommendation that verification load testing and detailed structural calculations be performed prior to construction to confirm these recommendations.

8 Construction Recommendations

8.1 Excavation

Depending on proposed foundation configurations, degree of earthwork, and depth of utilities, some excavations may extend deeper than four feet below grade. Excavations deeper than four feet should be shored or sloped and benched, in accordance with OSHA regulations, to ensure safe working conditions within the excavations. For benching purposes, overburden soils may be considered as “Type B” material and should be sloped no steeper than 1H:1V (horizontal to vertical). All OSHA soil classifications should be field-determined by the contractor’s “competent person” prior to excavation. Any proposed shoring systems should be designed by the contractor’s “competent person”, be certified by a Professional Engineer licensed in the State of New York, and should be submitted to the engineer for review. As typical of till geology, the contractor should anticipate occasional cobbles or boulders within excavations and earthwork activities.

8.2 Dewatering

ANS Geo observed perched water as shallow as three (3) feet below grade at the time of our investigation program. Although this does not represent static groundwater levels, the contractor should be prepared to manage groundwater, perched water, and/or infiltrated stormwater as needed using localized pump-and-sump or similar techniques to allow for concrete foundation construction in-the-dry. Water discharge should be managed in compliance with applicable state and local regulations. The contractor should be sure to grade the surface as necessary to divert stormwater away from open excavation to the extent possible.

8.3 Subgrade Preparation

Prior to the installation of shallow concrete foundations, ANS Geo recommends overexcavating the subgrade by at least six (6) inches, lining the exposed material with a geotextile separation fabric, and bringing the subgrade back up to the design foundation elevation with compacted structural fill as specified within Table 8. Native material beneath the separation fabric should be inspected for unsatisfactory conditions such as standing water, frozen soil, organics, protruding cobbles or boulders, or deleterious materials. Should any unsatisfactory conditions exist within the native subgrade, the excavation should be undercut an additional six inches (12 total inches beneath proposed foundation depth) prior to placement of the geotextile separation fabric.

Table 8 – Recommended Gradation of Structural Fill

Sieve Size	Percent Passing
3-inch	100
1 ½-inch	60 – 100
No. 4	30 – 60
No. 200	0 – 10

Structural fill material should be placed in loose lifts not exceeding eight (8) inches in height and be compacted to at least 95 percent of its Modified Proctor Density in accordance with ASTM D1557.

8.4 Backfilling and Re-use of Native Soils

ANS Geo notes that native fine-grained soils (silts and clays) on site will likely be difficult to handle, place, and compact without proper moisture conditioning and protection. ANS Geo recommends the following measures be considered to reduce the adverse impacts of moisture-sensitive soils:

- Positive measure should be implemented and maintained to intercept and direct surface water away from moisture-sensitive subgrade surfaces.
- Subgrade surfaces should be sloped and, as appropriate, seal-rolled to facilitate proper drainage. Surfaces should be properly prepared in anticipation of inclement weather. Moisture should not be allowed to collect on subgrade surfaces.
- To the extent practical, the limits of exposed subgrade soils should be minimized.
- Construction traffic should be limited to properly constructed haul roads.
- Disturbed soils should be removed and replaced with compacted controlled fill material.
- In place moisture contents should be maintained with two percent wet/dry of the optimum moisture content as determined by the Modified Proctor Test (ASTM D1557).

These soils may be re-used across the project area for fill in landscaped areas; however, it should not be used under or above foundations or load-bearing structures where typically imported structural fill is used. Native material used as backfill for cable trenches should be handled and placed at a moisture content at or above its optimum value to ensure representative thermal properties are maintained.

In areas around and above installed foundations, large utilities, and other buried site features, ANS Geo recommends importing a clean granular material with less than 15 percent fine-grained content for use as general backfill. General backfill material should be screened of any cobbles, boulders, and any particles larger than 3 inches in diameter, and should not be used beneath any load-bearing structures. General backfill should be placed in loose lift thicknesses not exceeding 12 inches and be compacted to at least 95 percent of its Modified Proctor Density (ASTM D1557). Soil used as backfill should not be handled when frozen and should be free of excessive moisture, organics, and deleterious material.

In fill areas beneath foundations, access roads, and load-bearing structures, ANS Geo recommends structural fill as described in **Section 8.3** and Table 8.

8.4.1 Re-use of Existing “Mound” Soils

As part of our second phase of investigations at the project site, completed in November 2021, ANS Geo advanced a soil boring at/near the top of the existing soil “mound” situated south of the existing central railroad “loop” at the project site, bounded to the south by Lake Road. This soil boring is identified as “B-M1” and is depicted in the Investigation Location plan, provided as **Attachment A**. The purpose of this additional data point was to identify the composition of the mounded material, as well as assess its suitability as re-use across the project site during construction.

Upon recovery of the soil material, this “mound” was visually classified as maintaining predominately silt and clay material within the upper (approximately) 35 feet, underlain by dense sand and likely bedrock around 45 feet below grade. The upper fine-grained soil horizon was observed to be largely consistent in composition and include no debris or deleterious material. Furthermore, laboratory testing on a discrete sample within this layer confirmed an organic matter content of approximately 3.3 percent. Productive agricultural soils typically contain 3 to 6 percent organic composition. Based on our findings, it is our professional opinion that the observed upper soils (within 35 feet of grade) would be suitable for use as topsoil material across the project site. It should be noted that this recommendation is based on a single soil boring advanced within this “mound” and may not be representative of the entire area. Additional inspection and testing of these soils during construction is recommended.

8.5 Access Roads

ANS Geo understands that unpaved, stone access roads will be required during construction to facilitate access for construction vehicles and heavy equipment deliveries (ie. transformers). Post-construction, permanent access roads will be required to enter and exit the project site as well as provide access to the equipment pad locations for routine maintenance.

ANS Geo has performed a preliminary evaluation of the required, final access road thickness considering infrequent emergency access for firefighting vehicles, as well as occasional light vehicular traffic such as utility pickup truck or similar maintenance vehicle. Assuming a two-inch allowable rut depth, ANS Geo recommends access roads be constructed to include at least 12 inches of compacted crushed stone as specified below:

Table 8 – Recommended Gradation of Crushed Stone

Sieve Size	Percent Passing
1 ½-inch	100
¾-inch	55 – 90
No. 4	25 – 50
No. 50	5 – 20
No. 200	3 – 10

Our preliminary road evaluation for a post-construction access road assumed the following:

- *Allowable rut depth:* 2-inches
- *Vehicle(s) considered:* Standard aerial ladder firefighting rig and light-duty pick-up truck
- *Frequency of passes:* 20 passes per day (light-duty pick-up vehicle)
- *Service life:* 25 years
- *Number of axles:* 3
- *Axle load:* 54,000 lb (maximum rear GAWR, for firefighting rig)
- *Subgrade Soil:* Very stiff, proof-rolled silty clay
- *Assumed CBR:* 2% (considering proof-rolling with at least three passes of loaded tandem)

If a biaxial geogrid is placed atop the proof-rolled and prepared subgrade, access road thickness may be reduced by two inches. A biaxial geogrid such as Tensar BX1200 or equal is recommended.

Prior to permanent roadway construction, the subgrade should be stripped of vegetation and topsoil, and be proof-rolled with at least three (3) roundtrip passes of a smooth-drum roller with a minimum operating weight of eight (8) tons. The prepared subgrade should be confirmed to maintain a minimum CBR value of 2. If required, additional stabilization may be obtained through chemical treatment of the subgrade including introduction of lime or cement. Crushed stone should be placed in loose lifts not exceeding eight (8) inches in height and be compacted to at least 95 percent of its Modified Proctor Density (ASTM D1557).

Temporary construction roads may also be left in place as permanent access roads, where appropriate. These re-purposed roadways should be back-bladed post-construction and graded to an even, level surface with maximum permissible longitudinal and cross slopes in accordance with the site's civil design criteria.

As part of the project construction, the contractor should be prepared to design, construct, and maintain access roadways for the duration of site activities. During construction, the delivery and movement of heavier loads such as transformers, inverters, delivery of steel and concrete, and transportation of modules is expected. It should be understood that these loads and vehicles are larger than what has been considered in the preliminary access road design evaluation, which is focused on post-construction condition including infrequent fire-fighting rigs and routine light-duty trucks and maintenance vehicles. The contractor should complete an independent access road evaluation considering the construction-phase loading and the contractors means and methods. It is possible that the construction-phase access road may require a thicker, temporary access road, the use of geogrid, and/or considerations for routine maintenance of the access roads after heavier traffic. The contractor will be required to maintain serviceable access roads throughout construction and at turn-over of the facility, including backfill ruts, back-blading and re-compacting soft and rutted areas, re-shaping roads to promote drainage and safe passage of traffic, and other improvements.

8.6 Pile Drivability

ANS Geo anticipates that, as typical with solar farm construction, solar panels will be supported by steel H-Piles (wide-flanged sections) driven to approximately 10 to 12 feet below grade. It is ANS Geo's professional opinion that the parameters provided in **Section 7.3** may be used to preliminarily size the proposed piles, however, we recommend verification load testing prior to construction using final design loads, the intended pile profile, and the planned pile depth. These steel piles are typically installed via direct-push, vibration, and/or percussive hammer methods.

Based on our observations within our limited investigation program, we anticipate that occasional refusals (cobbles and/or boulders) may be encountered at the foundation post locations within the anticipated embedment depths, however, we expect this frequency to be approximately 10 to 20 percent of pile locations, or less. It should be noted that this is a high-level estimate based on a limited number of test pile installations across the site.

ANS Geo recommends that the contractor be prepared to pre-drill at proposed post locations to clear obstructions, as needed. We recommend that, if required, pre-drilled holes be completed to a diameter slightly smaller than the diagonal dimension of the proposed pile section to ensure a tight fit once the pile is driven to its targeted depth. For example, a six (6)-inch diameter hole may be drilled and utilized for W6x9 section (approx. 7.1-inch diagonal measurement). The contractor should be aware, however, that heavier sections (ie. W6x12 or W6x15) may have limiting "bending" capacity in its flanges, and therefore require a hole of a slightly larger proportion.

9 Limitations

ANS Geo notes that the findings and recommendations presented within this Geotechnical Report are based on our investigation program conducted in March through May 2021 and our engineering judgment. Should the scope of the project or proposed site layout change, ANS Geo should be given the opportunity to review the applicability of the collected information and modify our recommendations, as needed.

We sincerely appreciate the opportunity to support this project, and please feel free to contact us should you have any questions regarding the findings of this Report.

Attachments

Attachment A – Location Plans

Attachment B – Soil Boring Logs

Attachment C – Electrical Resistivity Testing Results

Attachment D – Laboratory Results

Attachment E – Pile Load Testing Logs

Attachment F – Seismic Support Data

Attachment G – NRCS Soil Report

Attachment A

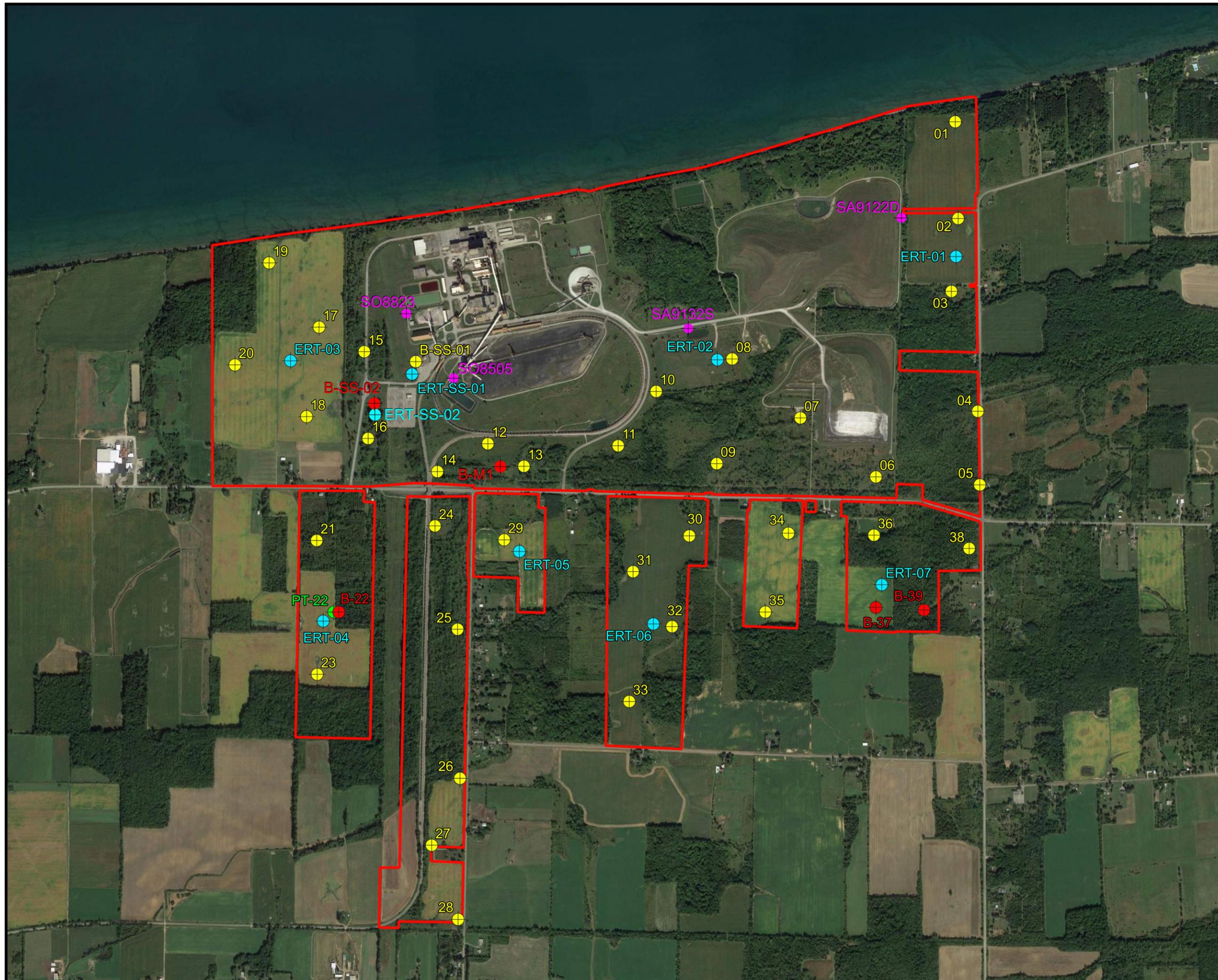
Location Plan

Client:



INVESTIGATION LOCATION PLAN

**AES
SOMERSET SOLAR PROJECT
SOMERSET, NEW YORK**



Legend

- Site Boundaries
- Soil Boring and Pile Test Location
- Soil Boring Only
- Pile Test Only
- Electrical Resistivity Location
- Monitoring Well Sample Location

0 1,500 3,000 ft



**Absolute Scale: 1 inch = 1,500 feet
Scale at 11" x 17" AS SHOWN**

Attachment B

Soil Boring Logs



Soil Boring Log

B-01

Client: AES	Drilling Firm: EDI	Coordinates: 43.364365 N, -78.576699 E
Project: Somerset Solar Project	Drill Crew: Phil / Jason	Horiz. Datum: NAD 83
Location: Somerset, New York	Boring Start: 3/22/2021	Elevation: Grade
Inspector: Matt Laub	Boring End: 3/22/2021	Vert. Datum: N/A

Rig Model: CME-550X	Sampler Type: Split Spoon	Casing Type: HSA
Rig Type: ATV	Sampler Length: 24 inches	Casing Length: 5 feet
Drill Method: Hollow Stem Auger	Sampler I.D.: 1.375 inches	Casing I.D.: 2 inches
Hammer Type: Automatic	Hammer Wt.: 140 pounds	Hammer Wt.: 140 pounds
Drilling Fluid: None	Hammer Fall: 30 inches	Hammer Fall: 30 feet

Depth (ft)	Sample No.	Rec. (in)	Blows per 6"	N-Value	USCS Symbol	Graphic Log	Visual Classification	Toughness	Plasticity	PP (tsf)	TV (tsf)	N-Value 10 20 30 40	Drilling & Strata Notes
						6" - TOPSOIL							
	S-1	14	1 2 4 3	6	ML	[ML Symbol]	Medium stiff, brown Sandy SILT, little coarse to fine Gravel, moist (ML)	L	M				
	S-2	22	2 4 5 6	9	CL	[CL Symbol]	Stiff, brown to greenish brown Sandy CLAY, little Silt, moist (CL)	L	L	0.5	0.05		Oxidized material present
5	S-3	20	6 12 12 10	24	SM	[SM Symbol]	Medium dense, green Silty medium to fine SAND, moist (SM)						Oxidized material present
	S-4	23	13 37 42 57	> 50	GM	[GM Symbol]	Very dense, reddish brown Sandy coarse to fine GRAVEL, little Silt, moist to dry (GM)						Glacial till
	S-5	20	10 38 35 41	> 50		[GM Symbol]	Very dense, gray to reddish brown Sandy coarse to fine GRAVEL, little Silt, dry (GM)						Glacial till
10													
	S-6	10	20 50/6	> 50		[GM Symbol]	Very dense, reddish brown Silty coarse to fine GRAVEL, little coarse to fine Sand, dry (GM)						Heavy auger grinding from 11 to 18 feet BGS Glacial till
15													
	S-7	1	50/4	> 50		[GM Symbol]	Very dense, reddish brown Silty coarse to fine GRAVEL, little coarse to fine Sand, dry (GM) End of boring at 18.3 feet BGS Borehole backfilled with cuttings						Glacial till
20													

In-Borehole Water Levels				General Notes	
Date / Time	Casing Tip (ft)	Bot. of Hole (ft)	Water Lvl (ft)		
				▼ = Water Level (if observed) BGS = Below Ground Surface	
				Toughness: Low (L), Medium (M), High (H) Plasticity: Non-Plastic (NP), Low (L), Medium (M), High (H) PP = Pocket Penetrometer, measured in tons per square ft. TV = Torvane (Shear Vane), measured in tons per square ft.	



Soil Boring Log

B-02

Client: AES	Drilling Firm: EDI	Coordinates: 43.3603 N, -78.576516 E
Project: Somerset Solar Project	Drill Crew: Phil / Brian	Horiz. Datum: NAD 83
Location: Somerset, New York	Boring Start: 3/23/2021	Elevation: Grade
Inspector: Matt Laub	Boring End: 3/23/2021	Vert. Datum: N/A

Rig Model: CME-550X	Sampler Type: Split Spoon	Casing Type: HSA
Rig Type: ATV	Sampler Length: 24 inches	Casing Length: 5 feet
Drill Method: Hollow Stem Auger	Sampler I.D.: 1.375 inches	Casing I.D.: 2 inches
Hammer Type: Automatic	Hammer Wt.: 140 pounds	Hammer Wt.: 140 pounds
Drilling Fluid: None	Hammer Fall: 30 inches	Hammer Fall: 30 feet

Depth (ft)	Sample No.	Rec. (in)	Blows per 6"	N-Value	USCS Symbol	Graphic Log	Visual Classification	Toughness	Plasticity	PP (tsf)	TV (tsf)	N-Value				Drilling & Strata Notes
												10	20	30	40	
	S-1	12	WH 2 2 5	4	CL		4" - TOPSOIL Medium stiff, brown CLAY, trace Silt, moist (CL)	M	M	1.5	0.1					
	S-2	22	5 11 14 21	25	SM		Medium dense, brown Silty coarse to fine SAND, little coarse to fine Gravel, moist (SM)									
5	S-3	24	7 17 26 30	43	GM		Dense, brown Sandy coarse to fine GRAVEL, little Silt, moist (GM)									
	S-4	3	41 49 50/5	> 50			Very dense, gray coarse to fine GRAVEL, little Silt, dry (GM)									
	S-5	22	17 25 36 45	> 50			Very dense, reddish brown coarse to fine GRAVEL, some Silt, little coarse to fine Sand, trace Clay, dry (GM)									Glacial till
10																
	S-6	20	8 16 12 13	28	GC		Medium dense, reddish brown to brown Clayey coarse to fine GRAVEL, little coarse to fine Sand, dry (GC)									Transition layer from glacial till to Clay
15																
	S-7		6 5 4 12	9	CL		Stiff, gray Gravelly CLAY, moist (CL)	L	M	0.25	0.2					
20							End of boring at 20 feet BGS Borehole backfilled with cuttings									

In-Borehole Water Levels				General Notes	
Date / Time	Casing Tip (ft)	Bot. of Hole (ft)	Water Lvl (ft)		
				▼ = Water Level (if observed) BGS = Below Ground Surface	
				Toughness: Low (L), Medium (M), High (H) Plasticity: Non-Plastic (NP), Low (L), Medium (M), High (H) PP = Pocket Penetrometer, measured in tons per square ft. TV = Torvane (Shear Vane), measured in tons per square ft.	



Soil Boring Log

B-03

Client: AES	Drilling Firm: EDI	Coordinates: 43.357246 N, -78.576907 E
Project: Somerset Solar Project	Drill Crew: Phil / Brian	Horiz. Datum: NAD 83
Location: Somerset, New York	Boring Start: 3/23/2021	Elevation: Grade
Inspector: Matt Laub	Boring End: 3/23/2021	Vert. Datum: N/A

Rig Model: CME-550X	Sampler Type: Split Spoon	Casing Type: HSA
Rig Type: ATV	Sampler Length: 24 inches	Casing Length: 5 feet
Drill Method: Hollow Stem Auger	Sampler I.D.: 1.375 inches	Casing I.D.: 2 inches
Hammer Type: Automatic	Hammer Wt.: 140 pounds	Hammer Wt.: 140 pounds
Drilling Fluid: None	Hammer Fall: 30 inches	Hammer Fall: 30 feet

Depth (ft)	Sample No.	Rec. (in)	Blows per 6"	N-Value	USCS Symbol	Graphic Log	Visual Classification	Toughness	Plasticity	PP (tsf)	TV (tsf)	N-Value 10 20 30 40	Drilling & Strata Notes
	S-1	14	WH 1 3 4	4	CL		5" - TOPSOIL Medium stiff, yellowish brown CLAY, little Silt, moist (CL)	L	M	1.25	0.45		5 inches of topsoil
	S-2	12	1 6 7 9	13	SC		Medium dense, green Clayey medium to fine SAND, moist (SC)						
5	S-3	18	4 8 17 19	25	CL		Very stiff, brown Sandy CLAY, trace coarse to fine Gravel, moist (CL)	L	M	> 4.50	0.475		
	S-4	18	9 12 16 20	28		Very stiff, brown Gravelly CLAY, moist (CL)	M	M	2.25	0.65			
	S-5	20	6 19 10 7	29	CL		Very stiff, gray CLAY, little medium to fine Sand, trace coarse to fine Gravel, moist (CL)	L	M	1.5	0.35		
10	S-6	8	21 50/3	> 50		Hard, yellow to reddish brown CLAY, little medium to fine Sand, trace coarse to fine Gravel, moist to dry (CL)	M	M	1.25	0.45			
15													
	S-7		22 50/4	> 50	GP		Very dense, gray coarse to fine GRAVEL, dry (GP)						Heavy auger grinding from 14 to 18 feet BGS Shale rock fragments Water observed at 17 feet BGS
20							End of boring at 18.8 feet BGS Borehole backfilled with cuttings						

In-Borehole Water Levels				General Notes	
Date / Time	Casing Tip (ft)	Bot. of Hole (ft)	Water Lvl (ft)		
3/23/2021	18		17	▼ = Water Level (if observed) BGS = Below Ground Surface	
				Toughness: Low (L), Medium (M), High (H) Plasticity: Non-Plastic (NP), Low (L), Medium (M), High (H) PP = Pocket Penetrometer, measured in tons per square ft. TV = Torvane (Shear Vane), measured in tons per square ft.	

Client: AES Project: Somerset Solar Project Location: Somerset, New York Inspector: Matt Laub	Drilling Firm: EDI Drill Crew: Phil / Brian Boring Start: 3/23/2021 Boring End: 3/23/2021	Coordinates: 43.352216 N, -78.575396 E Horiz. Datum: NAD 83 Elevation: Grade Vert. Datum: N/A
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Rig Model: CME-550X Rig Type: ATV Drill Method: Hollow Stem Auger Hammer Type: Automatic Drilling Fluid: None	Sampler Type: Split Spoon Sampler Length: 24 inches Sampler I.D.: 1.375 inches Hammer Wt.: 140 pounds Hammer Fall: 30 inches	Casing Type: HSA Casing Length: 5 feet Casing I.D.: 2 inches Hammer Wt.: 140 pounds Hammer Fall: 30 feet
--	---	---

Depth (ft)	Sample No.	Rec. (in)	Blows per 6"	N-Value	USCS Symbol	Graphic Log	Visual Classification	Toughness	Plasticity	PP (tsf)	TV (tsf)	N-Value				Drilling & Strata Notes	
												10	20	30	40		
							5" - TOPSOIL										
	S-1	14	WH 2 5 7	7	CL		Medium stiff, brown Silty CLAY, moist (CL)	M	M	2	0.525						
	S-2	22	4 8 15 17	23			Very stiff, brown to gray CLAY, little Silt, wet to moist (CL)	M	M	> 4.5	0.45						
5	S-3	24	4 11 16 21	27			Very stiff, brown to gray CLAY, little Silt, dry (CL)	M	M	4	0.55						
	S-4	20	6 10 16 19	26			Very stiff, brown Sandy CLAY, dry (CL)	M	M	> 4.5	0.55						
	S-5	24	4 11 27 30	38			Hard, gray Sandy CLAY, dry (CL)	L	M	> 4.5	0.3						
	S-6	14	16 22 50/4	> 50	GM		Very dense, reddish brown coarse to fine GRAVEL, little Silt, little medium to Sand, trace Clay, moist (GM)									Auger grinding from 11 to 14.6 feet BGS Auger refusal at 14.6 feet BGS glacial till	
							End of boring at 14.6 feet BGS Borehole backfilled with cuttings										

In-Borehole Water Levels				General Notes	
Date / Time	Casing Tip (ft)	Bot. of Hole (ft)	Water Lvl (ft)		
3/23/2021	14.6		12.2	▼ = Water Level (if observed) BGS = Below Ground Surface Toughness: Low (L), Medium (M), High (H) Plasticity: Non-Plastic (NP), Low (L), Medium (M), High (H) PP = Pocket Penetrometer, measured in tons per square ft. TV = Torvane (Shear Vane), measured in tons per square ft.	
3/23/2021	14.6		14		



Soil Boring Log

B-05

Client: AES	Drilling Firm: EDI	Coordinates: 43.349141 N, -78.575289 E
Project: Somerset Solar Project	Drill Crew: Phil / Brian	Horiz. Datum: NAD 83
Location: Somerset, New York	Boring Start: 3/23/2021	Elevation: Grade
Inspector: Matt Laub	Boring End: 3/23/2021	Vert. Datum: N/A

Rig Model: CME-550X Rig Type: ATV Drill Method: Hollow Stem Auger Hammer Type: Automatic Drilling Fluid: None	Sampler Type: Split Spoon Sampler Length: 24 inches Sampler I.D.: 1.375 inches Hammer Wt.: 140 pounds Hammer Fall: 30 inches	Casing Type: HSA Casing Length: 5 feet Casing I.D.: 2 inches Hammer Wt.: 140 pounds Hammer Fall: 30 feet
--	---	---

Depth (ft)	Sample No.	Rec. (in)	Blows per 6"	N-Value	USCS Symbol	Graphic Log	Visual Classification	Toughness	Plasticity	PP (tsf)	TV (tsf)	N-Value 10 20 30 40	Drilling & Strata Notes
							5" - TOPSOIL						
	S-1	16	WH 1 3 2	4	SM		Very loose, brown Silty coarse to fine SAND, trace coarse to fine Gravel, moist (SM)						
	S-2	20	2 3 6 6	9	CL		Stiff, brown to gray CLAY, trace coarse to fine Gravel, moist (CL)	L	M	3.25	0.4		
5	S-3	24	4 8 17 16	25	CL		Very stiff, brown CLAY, little medium to fine Sand, trace Silt, moist (CL)	L	M	> 4.5	0.4		
	S-4	24	7 20 22 23	42	ML		Hard, brown SILT, trace medium to fine Sand, trace Clay, dry (ML)	L	M	> 4.5	0.5		
	S-5	24	6 18 16 17	34	ML		Hard, brown to gray SILT, trace medium to fine Sand, trace Clay, trace coarse to fine Gravel, dry (ML)	M	M	> 4.5	0.475		
10													
	S-6	24	6 8 11 19	19	SM		Medium dense, brown Silty coarse to fine SAND, moist (SM)						
15													
	S-7	16	15 26 50/5	> 50	GM		Very dense, reddish brown to gray Silty coarse to fine GRAVEL, trace medium to fine Sand, moist (GM)						
20							End of boring at 19.4 feet BGS Borehole backfilled with cuttings						

Auger grinding from 16.5 to 18 feet BGS

In-Borehole Water Levels				General Notes	
Date / Time	Casing Tip (ft)	Bot. of Hole (ft)	Water Lvl (ft)		
				▼ = Water Level (if observed) BGS = Below Ground Surface	
				Toughness: Low (L), Medium (M), High (H) Plasticity: Non-Plastic (NP), Low (L), Medium (M), High (H) PP = Pocket Penetrometer, measured in tons per square ft. TV = Torvane (Shear Vane), measured in tons per square ft.	

Client: AES	Drilling Firm: EDI	Coordinates: 43.349468 N, -78.581278 E
Project: Somerset Solar Project	Drill Crew: Phil / Jason	Horiz. Datum: NAD 83
Location: Somerset, New York	Boring Start: 3/15/2021	Elevation: Grade
Inspector: Matt Laub	Boring End: 3/15/2021	Vert. Datum: N/A

Rig Model: CME-550X	Sampler Type: Split Spoon	Casing Type: HSA
Rig Type: ATV	Sampler Length: 24 inches	Casing Length: 5 feet
Drill Method: Hollow Stem Auger	Sampler I.D.: 1.375 inches	Casing I.D.: 2 inches
Hammer Type: Automatic	Hammer Wt.: 140 pounds	Hammer Wt.: 140 pounds
Drilling Fluid: None	Hammer Fall: 30 inches	Hammer Fall: 30 feet

Depth (ft)	Sample No.	Rec. (in)	Blows per 6"	N-Value	USCS Symbol	Graphic Log	Visual Classification	Toughness	Plasticity	PP (tsf)	TV (tsf)	N-Value				Drilling & Strata Notes
												10	20	30	40	
5	S-1	12	2 2 3 2	5	CL		Medium stiff, brown CLAY, trace medium to fine Sand, trace Silt, moist (CL)	L	M							
	S-2	16	3 3 6 11	9	CL		Stiff, brown Sandy CLAY, trace fine Gravel, trace Silt, moist (CL)	L	M							
5	S-3	20	5 6 8 13	14	ML		Stiff, brown Clayey SILT, some fine Sand, moist (ML)									
	S-4	22	17 17 19 27	36	SM		Dense, brown medium to fine SAND, little Silt, moist (SM)									
10	S-5	24	13 20 26 30	46	SP		Dense, brown medium to fine SAND, trace Silt, moist (SP)									
	S-6	16	7 20 21 28	41	CL		Gray CLAY, little fine Sand, little Silt, moist (CL)	M	M							
15					SC		Reddish brown medium to fine SAND, some Clay, little fine Gravel, moist (SC)									
20	S-7	1	50/4	> 50			Very dense, reddish brown coarse to fine SAND, some Clay, trace coarse to fine Gravel, trace Silt, moist (SC) End of boring at 18.3 feet BGS Borehole backfilled with cuttings									

In-Borehole Water Levels				General Notes	
Date / Time	Casing Tip (ft)	Bot. of Hole (ft)	Water Lvl (ft)		
				▼ = Water Level (if observed) BGS = Below Ground Surface	
				Toughness: Low (L), Medium (M), High (H) Plasticity: Non-Plastic (NP), Low (L), Medium (M), High (H) PP = Pocket Penetrometer, measured in tons per square ft. TV = Torvane (Shear Vane), measured in tons per square ft.	

Client: AES Project: Somerset Solar Project Location: Somerset, New York Inspector: Matt Laub	Drilling Firm: EDI Drill Crew: Phil / Jason Boring Start: 3/15/2021 Boring End: 3/15/2021	Coordinates: 43.351942 N, -78.585629 E Horiz. Datum: NAD 83 Elevation: Grade Vert. Datum: N/A
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Rig Model: CME-550X Rig Type: ATV Drill Method: Hollow Stem Auger Hammer Type: Automatic Drilling Fluid: None	Sampler Type: Split Spoon Sampler Length: 24 inches Sampler I.D.: 1.375 inches Hammer Wt.: 140 pounds Hammer Fall: 30 inches	Casing Type: HSA Casing Length: 5 feet Casing I.D.: 2 inches Hammer Wt.: 140 pounds Hammer Fall: 30 feet
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Depth (ft)	Sample No.	Rec. (in)	Blows per 6"	N-Value	USCS Symbol	Graphic Log	Visual Classification	Toughness	Plasticity	PP (tsf)	TV (tsf)	N-Value				Drilling & Strata Notes
												10	20	30	40	
							4" - TOPSOIL									
	S-1	12	5 4 4 7	8	CL		Stiff, brownish yellow CLAY, some fine Sand, little coarse to fine Gravel, trace Silt, moist (CL)	H	M							
	S-2	18	4 11 7 9	18	SC		Medium dense, light brown to reddish brown medium to fine SAND, some Clay, trace coarse to fine Gravel, moist (SC)									
5	S-3	24	4 6 7 7	13	CH		Stiff, light brown CLAY, little Silt, trace Sand (CH)	H	H							
	S-4	12	12 22 22 41	44	SC		Light brown CLAY, little fine Gravel, little Sand, trace Silt, moist (CH)									Glacial till
	S-5	16	8 17 25 26	42	CL		Reddish brown coarse to fine SAND, little coarse to fine Gravel, little Clay, trace Silt, moist (SC)									Light auger grinding from 8 to 10.5 feet BGS
10																
	S-6	20	21 28 44 40	> 50	SC		Hard, light brown Sandy CLAY, trace coarse to fine Gravel, trace Silt, moist (CL)									Heavy auger grinding from 11 to 15.5 feet BGS
15																
	S-7	8	10 80 50/3	> 50	SP		Very dense, reddish brown Clayey fine SAND, little coarse to fine Gravel, trace Silt, moist (SC)									
							Reddish brown Clayey fine SAND, trace Silt, moist (SC)									
							Gray Gravelly SAND, trace Clay, dry (SP)									
20							End of boring at 19.6 feet BGS Borehole backfilled with cuttings									

In-Borehole Water Levels				General Notes	
Date / Time	Casing Tip (ft)	Bot. of Hole (ft)	Water Lvl (ft)		
				▼ = Water Level (if observed) BGS = Below Ground Surface	
				Toughness: Low (L), Medium (M), High (H) Plasticity: Non-Plastic (NP), Low (L), Medium (M), High (H) PP = Pocket Penetrometer, measured in tons per square ft. TV = Torvane (Shear Vane), measured in tons per square ft.	



Soil Boring Log

B-08

Client: AES	Drilling Firm: EDI	Coordinates: 43.354415 N, -78.589578 E
Project: Somerset Solar Project	Drill Crew: Phil / Jason	Horiz. Datum: NAD 83
Location: Somerset, New York	Boring Start: 3/15/2021	Elevation: Grade
Inspector: Matt Laub	Boring End: 3/15/2021	Vert. Datum: N/A

Rig Model: CME-550X	Sampler Type: Split Spoon	Casing Type: HSA
Rig Type: ATV	Sampler Length: 24 inches	Casing Length: 5 feet
Drill Method: Hollow Stem Auger	Sampler I.D.: 1.375 inches	Casing I.D.: 2 inches
Hammer Type: Automatic	Hammer Wt.: 140 pounds	Hammer Wt.: 140 pounds
Drilling Fluid: None	Hammer Fall: 30 inches	Hammer Fall: 30 feet

Depth (ft)	Sample No.	Rec. (in)	Blows per 6"	N-Value	USCS Symbol	Graphic Log	Visual Classification	Toughness	Plasticity	PP (tsf)	TV (tsf)	N-Value 10 20 30 40	Drilling & Strata Notes
							2" - TOPSOIL						
	S-1	12	1 3 3 6	6	ML		Medium stiff, brown SILT, some medium to fine Sand, moist (ML)	L	M				
	S-2	24	7 6 11 10	17	ML		Very stiff, brown Sandy SILT, moist (ML)	L	M				
5	S-3	24	6 6 9 10	15	ML		Very stiff, brown Sandy SILT, moist (ML)						
	S-4	20	7 5 6 9	11	CL		Stiff, brown Sandy CLAY, moist (CL)						
10	S-5	16	7 10 10 15	20	ML		Very stiff, brown SILT, little medium to fine Sand, moist (ML)	L	M				
	S-6	18	3 7 5 7	12	CL		Stiff, grayish green CLAY, little medium to fine Sand, trace Silt, moist (CL)	L	M				
15													
	S-7	24	4 2 2 3	4	CL		Medium stiff, gray CLAY, trace Silt, wet (CL)	L	M				
20							End of boring at 20 feet BGS Borehole backfilled with cuttings						

In-Borehole Water Levels				General Notes	
Date / Time	Casing Tip (ft)	Bot. of Hole (ft)	Water Lvl (ft)		
				▼ = Water Level (if observed) BGS = Below Ground Surface	
				Toughness: Low (L), Medium (M), High (H) Plasticity: Non-Plastic (NP), Low (L), Medium (M), High (H) PP = Pocket Penetrometer, measured in tons per square ft. TV = Torvane (Shear Vane), measured in tons per square ft.	



Soil Boring Log

B-09

Client: AES	Drilling Firm: EDI	Coordinates: 43.350017 N, -78.590457 E
Project: Somerset Solar Project	Drill Crew: Phil / Jason	Horiz. Datum: NAD 83
Location: Somerset, New York	Boring Start: 3/15/2021	Elevation: Grade
Inspector: Matt Laub	Boring End: 3/15/2021	Vert. Datum: N/A

Rig Model: CME-550X Rig Type: ATV Drill Method: Hollow Stem Auger Hammer Type: Automatic Drilling Fluid: None	Sampler Type: Split Spoon Sampler Length: 24 inches Sampler I.D.: 1.375 inches Hammer Wt.: 140 pounds Hammer Fall: 30 inches	Casing Type: HSA Casing Length: 5 feet Casing I.D.: 2 inches Hammer Wt.: 140 pounds Hammer Fall: 30 feet
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Depth (ft)	Sample No.	Rec. (in)	Blows per 6"	N-Value	USCS Symbol	Graphic Log	Visual Classification	Toughness	Plasticity	PP (tsf)	TV (tsf)	N-Value 10 20 30 40	Drilling & Strata Notes
							4" - TOPSOIL						
	S-1	14	WH 2 3 7	5	CL		Medium stiff, brown Silty CLAY, little fine Sand, moist (CL)	L	M			0.15	
	S-2	24	3 6 9 12	15			Very stiff, gray to brown CLAY, little fine Sand, trace Silt, moist (CL)	M	H			0.25	
5	S-3	24	6 10 12 17	22			Very stiff, brown Silty CLAY, trace fine Sand, trace fine Gravel, moist (CL)	M	H			0.3	5
	S-4	24	11 14 13 15	27	SC		Medium dense, brown fine SAND, some Clay, trace fine Gravel, moist (SC)						
	S-5	18	3 5 9 13	14			Medium dense, brown medium to fine SAND, some Clay, moist (SC)						
10													
	S-6	24	14 14 13 13	27			Medium dense, brown Clayey medium to fine SAND, trace Silt, moist (SC)						
15													
	S-7	18	7 14 18 21	32			Dense, brown medium to fine SAND, some Clay, some coarse to fine Gravel, moist (SC)						
20							End of boring at 20 feet BGS Borehole backfilled with cuttings						

In-Borehole Water Levels				General Notes	
Date / Time	Casing Tip (ft)	Bot. of Hole (ft)	Water Lvl (ft)		
				▼ = Water Level (if observed) BGS = Below Ground Surface	
				Toughness: Low (L), Medium (M), High (H) Plasticity: Non-Plastic (NP), Low (L), Medium (M), High (H) PP = Pocket Penetrometer, measured in tons per square ft. TV = Torvane (Shear Vane), measured in tons per square ft.	

Client: AES	Drilling Firm: EDI	Coordinates: 43.353046 N, -78.593969 E
Project: Somerset Solar Project	Drill Crew: Phil / Jason	Horiz. Datum: NAD 83
Location: Somerset, New York	Boring Start: 3/16/2021	Elevation: Grade
Inspector: Matt Laub	Boring End: 3/16/2021	Vert. Datum: N/A

Rig Model: CME-550X	Sampler Type: Split Spoon	Casing Type: HSA
Rig Type: ATV	Sampler Length: 24 inches	Casing Length: 5 feet
Drill Method: Hollow Stem Auger	Sampler I.D.: 1.375 inches	Casing I.D.: 2 inches
Hammer Type: Automatic	Hammer Wt.: 140 pounds	Hammer Wt.: 140 pounds
Drilling Fluid: None	Hammer Fall: 30 inches	Hammer Fall: 30 feet

Depth (ft)	Sample No.	Rec. (in)	Blows per 6"	N-Value	USCS Symbol	Graphic Log	Visual Classification	Toughness	Plasticity	PP (tsf)	TV (tsf)	N-Value				Drilling & Strata Notes
												10	20	30	40	
							2" - TOPSOIL Stiff, brown CLAY, little Silt, moist (CL)	H	M	2.75	0.125					
	S-1	18	WH 3 6 8	9	CL		Very stiff, brown CLAY, little medium to fine Sand, trace Silt, moist (CL)	M	M	> 4.5	0.65					
	S-2	24	3 9 12 11	21	CL		Very stiff, brown CLAY, little coarse to fine Sand, trace Silt, moist (CL)	M	M	> 4.5	0.45					
5	S-3	24	4 11 12 10	23	CL		Brown CLAY, little medium to fine Sand, moist (CL)	M	M	3	0.35					
	S-4	10	12 38 20 12	> 50	SC		Green Clayey SAND, moist (SC)									
	S-5	24	4 4 5 4	9	CL		Stiff, gray Sandy CLAY, trace Gravel, moist (CL)									
10																
	S-6	4	7 20 25 26	45	SM		Dense, reddish brown Silty coarse to fine SAND, some fine Gravel, dry (SM)									Auger grinding from 12 to 13 feet BGS Glacial till
15																
	S-7	1	50/4	> 50	GP		Very dense, gray coarse Gravel, dry (GP)									Auger grinding from 17.5 to 18 feet BGS
20							End of boring at 18.3 feet BGS Borehole backfilled with cuttings									

In-Borehole Water Levels				General Notes	
Date / Time	Casing Tip (ft)	Bot. of Hole (ft)	Water Lvl (ft)		
				▼ = Water Level (if observed) BGS = Below Ground Surface	
				Toughness: Low (L), Medium (M), High (H) Plasticity: Non-Plastic (NP), Low (L), Medium (M), High (H) PP = Pocket Penetrometer, measured in tons per square ft. TV = Torvane (Shear Vane), measured in tons per square ft.	



Soil Boring Log

B-11

Client: AES	Drilling Firm: EDI	Coordinates: 43.350778 N, -78.59616 E
Project: Somerset Solar Project	Drill Crew: Phil / Jason	Horiz. Datum: NAD 83
Location: Somerset, New York	Boring Start: 3/16/2021	Elevation: Grade
Inspector: Matt Laub	Boring End: 3/16/2021	Vert. Datum: N/A

Rig Model: CME-550X	Sampler Type: Split Spoon	Casing Type: HSA
Rig Type: ATV	Sampler Length: 24 inches	Casing Length: 5 feet
Drill Method: Hollow Stem Auger	Sampler I.D.: 1.375 inches	Casing I.D.: 2 inches
Hammer Type: Automatic	Hammer Wt.: 140 pounds	Hammer Wt.: 140 pounds
Drilling Fluid: None	Hammer Fall: 30 inches	Hammer Fall: 30 feet

Depth (ft)	Sample No.	Rec. (in)	Blows per 6"	N-Value	USCS Symbol	Graphic Log	Visual Classification	Toughness	Plasticity	PP (tsf)	TV (tsf)	N-Value				Drilling & Strata Notes
												10	20	30	40	
	S-1	10	WH 1 2 5	3	ML		3" - TOPSOIL Soft, brown SILT, little medium to fine Sand, trace Clay, moist (ML)	L	M	3.25	0.5					
	S-2	20	4 9 13 22	22	CL		Very stiff, brown Sandy CLAY, trace Silt, moist (CL)	M	M	4.25						
5	S-3	24	13 17 23 19	40	SC		Dense, brown medium to fine SAND, some Clay, moist (SC)									
	S-4	24	21 34 47 46	> 50	SM		Very dense, brown Silty medium to fine SAND, moist (SM)									
	S-5	22	8 26 31 26	> 50			Very dense, brown Silty medium to fine SAND, trace Clay, moist (SM)									
10																
	S-6	24	6 33 56 43	> 50	SP		Very dense, gray medium to fine SAND, little fine Gravel, little Clay, moist (SP)									
15																
	S-7	22	29 57 45 45	> 50			Very dense, gray Gravelly coarse to fine SAND, trace Clay, dry (SP)									
20							End of boring at 20 feet BGS Borehole backfilled with cuttings									

In-Borehole Water Levels				General Notes	
Date / Time	Casing Tip (ft)	Bot. of Hole (ft)	Water Lvl (ft)		
				▼ = Water Level (if observed) BGS = Below Ground Surface	
				Toughness: Low (L), Medium (M), High (H) Plasticity: Non-Plastic (NP), Low (L), Medium (M), High (H) PP = Pocket Penetrometer, measured in tons per square ft. TV = Torvane (Shear Vane), measured in tons per square ft.	



Soil Boring Log

B-12

Client: AES	Drilling Firm: EDI	Coordinates: 43.350868 N, -78.603699 E
Project: Somerset Solar Project	Drill Crew: Phil / Jason	Horiz. Datum: NAD 83
Location: Somerset, New York	Boring Start: 3/16/2021	Elevation: Grade
Inspector: Matt Laub	Boring End: 3/16/2021	Vert. Datum: N/A

Rig Model: CME-550X	Sampler Type: Split Spoon	Casing Type: HSA
Rig Type: ATV	Sampler Length: 24 inches	Casing Length: 5 feet
Drill Method: Hollow Stem Auger	Sampler I.D.: 1.375 inches	Casing I.D.: 2 inches
Hammer Type: Automatic	Hammer Wt.: 140 pounds	Hammer Wt.: 140 pounds
Drilling Fluid: None	Hammer Fall: 30 inches	Hammer Fall: 30 feet

Depth (ft)	Sample No.	Rec. (in)	Blows per 6"	N-Value	USCS Symbol	Graphic Log	Visual Classification	Toughness	Plasticity	PP (tsf)	TV (tsf)	N-Value				Drilling & Strata Notes
												10	20	30	40	
5	S-1	12	WH 3 10 17	13	SC		Medium dense, brown Clayey medium to fine SAND, trace Silt, moist (SC)	M	M	2.75	0.375					
	S-2	24	10 10 8 9	18			Medium dense, brown Clayey medium to fine SAND, little Silt, moist (SC)									
	S-3	20	3 5 5 6	10			Medium dense, brown Clayey medium to fine SAND, little Silt, moist (SC)									
	S-4	22	5 6 6 7	12	CL	Stiff, brown CLAY, little medium to fine Sand, trace Silt, moist (CL)										
10	S-5	24	4 12 14 14	26	SC		Medium dense, brown Clayey SAND, trace Silt, moist (SC)									
	S-6	16	7 18 22 25	40			Dense, reddish brown to gray coarse to fine SAND, some Clay, little Silt, moist (SC)									
15	S-7	12	13 40 22 18	> 50			Very dense, reddish brown to gray Clayey medium to fine SAND, some Silt, some Gravel, moist (SC)									
20	End of boring at 20 feet BGS Borehole backfilled with cuttings															

In-Borehole Water Levels				General Notes	
Date / Time	Casing Tip (ft)	Bot. of Hole (ft)	Water Lvl (ft)		
				▼ = Water Level (if observed) BGS = Below Ground Surface	
				Toughness: Low (L), Medium (M), High (H) Plasticity: Non-Plastic (NP), Low (L), Medium (M), High (H) PP = Pocket Penetrometer, measured in tons per square ft. TV = Torvane (Shear Vane), measured in tons per square ft.	

Client: AES	Drilling Firm: EDI	Coordinates: 43.349916 N, -78.601619 E
Project: Somerset Solar Project	Drill Crew: Phil / Jason	Horiz. Datum: NAD 83
Location: Somerset, New York	Boring Start: 3/15/2021	Elevation: Grade
Inspector: Matt Laub	Boring End: 3/15/2021	Vert. Datum: N/A

Rig Model: CME-550X	Sampler Type: Split Spoon	Casing Type: HSA
Rig Type: ATV	Sampler Length: 24 inches	Casing Length: 5 feet
Drill Method: Hollow Stem Auger	Sampler I.D.: 1.375 inches	Casing I.D.: 2 inches
Hammer Type: Automatic	Hammer Wt.: 140 pounds	Hammer Wt.: 140 pounds
Drilling Fluid: None	Hammer Fall: 30 inches	Hammer Fall: 30 feet

Depth (ft)	Sample No.	Rec. (in)	Blows per 6"	N-Value	USCS Symbol	Graphic Log	Visual Classification	Toughness	Plasticity	PP (tsf)	TV (tsf)	N-Value				Drilling & Strata Notes	
												10	20	30	40		
5	S-1	5	WH WH 2 5		CL		Soft, brown CLAY, little Sand, little Silt, trace fine Gravel, moist (CL)	L	M								
	S-2	10	4 3 6 9	9				Stiff, brown to gray CLAY, trace medium to fine Sand, moist (CL)	M	M							
	S-3	14	5 8 8 10	16				Very stiff, brown to yellow Silty CLAY, trace medium to fine Sand, moist (CL)	M	M							
	S-4	22	8 16 19 11	35				Hard, brown to yellow Silty CLAY, trace medium to fine Sand, moist (CL)	M	M							
	S-5	24	5 4 3 2	7				Medium stiff, reddish brown CLAY, trace coarse to fine Gravel, wet (CL)	L	M							
15	S-6	18	13 17 20 19	37	SP		Dense green to reddish brown medium to fine SAND, little coarse to fine Gravel, trace Silt, wet (SP)										
	S-7	2	50/3	> 50				Weathered rock fragments									
20	End of boring at 18.3 feet BGS Borehole backfilled with cuttings																

In-Borehole Water Levels				General Notes	
Date / Time	Casing Tip (ft)	Bot. of Hole (ft)	Water Lvl (ft)		
				▼ = Water Level (if observed) BGS = Below Ground Surface	
				Toughness: Low (L), Medium (M), High (H) Plasticity: Non-Plastic (NP), Low (L), Medium (M), High (H) PP = Pocket Penetrometer, measured in tons per square ft. TV = Torvane (Shear Vane), measured in tons per square ft.	

Client: AES	Drilling Firm: EDI	Coordinates: 43.349695 N, -78.606597 E
Project: Somerset Solar Project	Drill Crew: Phil / Jason	Horiz. Datum: NAD 83
Location: Somerset, New York	Boring Start: 3/15/2021	Elevation: Grade
Inspector: Matt Laub	Boring End: 3/15/2021	Vert. Datum: N/A

Rig Model: CME-550X	Sampler Type: Split Spoon	Casing Type: HSA
Rig Type: ATV	Sampler Length: 24 inches	Casing Length: 5 feet
Drill Method: Hollow Stem Auger	Sampler I.D.: 1.375 inches	Casing I.D.: 2 inches
Hammer Type: Automatic	Hammer Wt.: 140 pounds	Hammer Wt.: 140 pounds
Drilling Fluid: None	Hammer Fall: 30 inches	Hammer Fall: 30 feet

Depth (ft)	Sample No.	Rec. (in)	Blows per 6"	N-Value	USCS Symbol	Graphic Log	Visual Classification	Toughness	Plasticity	PP (tsf)	TV (tsf)	N-Value 10 20 30 40	Drilling & Strata Notes		
						6" - TOPSOIL							6 inches of topsoil		
5	S-1	10	1 1 2 14	3	CL		Soft, brown Silty CLAY, trace medium to fine Sand, moist (CL)	L	M						
	S-2	14	5 10 12 11	22			Very stiff, brown Silty CLAY, trace medium to fine Sand, moist (CL)	L	M						
	S-3	24	7 10 14 12	24			Very stiff, brown Silty CLAY, little medium to fine Sand, moist (CL)	M	M					5	
	S-4	24	8 9 10 12	19			Very stiff, reddish brown CLAY, little medium to fine Sand, trace fine Gravel, trace Silt, moist (CL)	M	M						
10	S-5	24	7 8 10 23	18			Very stiff, yellowish brown CLAY, little Silt, little medium to fine Sand, moist (CL)	M	M					10	
	S-6	10	4 3 12 24	15			Brown to gray CLAY, little Silt, little medium to fine Sand, moist (CL)								Weathered rock in spoon
15															
	S-7	6	15 37 23 31	> 50			Weathered rock material recovered, wet						Weathered rock material recovered		
20							End of boring at 20 feet BGS Borehole backfilled with cuttings								

In-Borehole Water Levels				General Notes	
Date / Time	Casing Tip (ft)	Bot. of Hole (ft)	Water Lvl (ft)		
3/15/2021	18		8.8	▼ = Water Level (if observed) BGS = Below Ground Surface Toughness: Low (L), Medium (M), High (H) Plasticity: Non-Plastic (NP), Low (L), Medium (M), High (H) PP = Pocket Penetrometer, measured in tons per square ft. TV = Torvane (Shear Vane), measured in tons per square ft.	
3/15/2021	18		19		



Soil Boring Log

B-15

Client: AES	Drilling Firm: EDI	Coordinates: 43.354708 N, -78.610828 E
Project: Somerset Solar Project	Drill Crew: Phil / Jason	Horiz. Datum: NAD 83
Location: Somerset, New York	Boring Start: 3/16/2021	Elevation: Grade
Inspector: Matt Laub	Boring End: 3/16/2021	Vert. Datum: N/A

Rig Model: CME-550X	Sampler Type: Split Spoon	Casing Type: HSA
Rig Type: ATV	Sampler Length: 24 inches	Casing Length: 5 feet
Drill Method: Hollow Stem Auger	Sampler I.D.: 1.375 inches	Casing I.D.: 2 inches
Hammer Type: Automatic	Hammer Wt.: 140 pounds	Hammer Wt.: 140 pounds
Drilling Fluid: None	Hammer Fall: 30 inches	Hammer Fall: 30 feet

Depth (ft)	Sample No.	Rec. (in)	Blows per 6"	N-Value	USCS Symbol	Graphic Log	Visual Classification	Toughness	Plasticity	PP (tsf)	TV (tsf)	N-Value				Drilling & Strata Notes
												10	20	30	40	
	S-1	18	1 2 4 5	6	SC		3" - TOPSOIL Loose, brown Clayey medium to fine SAND, trace Silt, moist (SC)									
	S-2	24	2 6 12 11	18	SM		Medium dense, green Silty medium to fine SAND, moist to wet (SM)									
5	S-3	24	5 12 26 23	38	SC		Dense, green to brown Clayey medium to fine SAND, little coarse to fine Gravel, moist (SC)									
	S-4	6	21 25 23 26	48	SC		Dense, green to reddish brown medium to fine SAND, little Clay, trace coarse to fine Gravel, moist (SC)									Auger grinding from 6 to 7.5 feet BGS
10	S-5	8	7 37 50/1	> 50	CL		Hard, brown Sandy CLAY, little coarse to fine Gravel, trace Silt, moist (CL)	L	M	> 4.5	0.45					
	S-6	20	11 45 23 21	> 50	SP		Very dense, gray Gravelly coarse to fine SAND, trace Silt, dry (SP)									Auger grinding from 10 to 12 feet BGS
15	S-7	10	8 32 19 12	> 50	SP		Very dense, gray Gravelly coarse to fine SAND, moist (SP)									Auger grinding from 16 to 18 feet BGS
20	End of boring at 20 feet BGS Borehole backfilled with cuttings															

In-Borehole Water Levels				General Notes	
Date / Time	Casing Tip (ft)	Bot. of Hole (ft)	Water Lvl (ft)		
				▼ = Water Level (if observed) BGS = Below Ground Surface	
				Toughness: Low (L), Medium (M), High (H) Plasticity: Non-Plastic (NP), Low (L), Medium (M), High (H) PP = Pocket Penetrometer, measured in tons per square ft. TV = Torvane (Shear Vane), measured in tons per square ft.	

Client: AES	Drilling Firm: EDI	Coordinates: 43.35108 N, -78.610621 E
Project: Somerset Solar Project	Drill Crew: Phil / Jason	Horiz. Datum: NAD 83
Location: Somerset, New York	Boring Start: 3/17/2021	Elevation: Grade
Inspector: Matt Laub	Boring End: 3/17/2021	Vert. Datum: N/A

Rig Model: CME-550X	Sampler Type: Split Spoon	Casing Type: HSA
Rig Type: ATV	Sampler Length: 24 inches	Casing Length: 5 feet
Drill Method: Hollow Stem Auger	Sampler I.D.: 1.375 inches	Casing I.D.: 2 inches
Hammer Type: Automatic	Hammer Wt.: 140 pounds	Hammer Wt.: 140 pounds
Drilling Fluid: None	Hammer Fall: 30 inches	Hammer Fall: 30 feet

Depth (ft)	Sample No.	Rec. (in)	Blows per 6"	N-Value	USCS Symbol	Graphic Log	Visual Classification	Toughness	Plasticity	PP (tsf)	TV (tsf)	N-Value				Drilling & Strata Notes	
												10	20	30	40		
							6" - TOPSOIL										
	S-1	10	1 3 8	4	ML		Medium stiff, brown SILT, some medium to fine Sand, moist (ML)	M	M	4.25	0.4						
	S-2	12	5 8 10 15	18			Very stiff, brown SILT, some medium to fine Sand, moist (ML)	M	M	2	0.4						
5	S-3	16	7 9 5 7	14			Stiff, brown to black SILT, some medium to fine Sand, moist (ML)			2	0.3						Organic material recovered, looks to be burnt wood
	S-4	20	7 5 9 12	14			Stiff, brown Sandy SILT, trace Clay, wet to moist (ML)			1.5	0.25						
10	S-5	22	6 10 12 16	22	SC		Medium dense, brown Clayey medium to fine Sand, little Silt, moist (SC)										
	S-6	22	6 13 21 19	34			Dense, brown to gray medium to fine SAND, little Clay, trace Silt, moist (SC)										
15	S-7		6 25 23 30	48	SM		Dense, reddish brown Silty, SAND, little Clay, little coarse to fine Gravel, dry (SM)										
20							End of boring at 20 feet BGS Borehole backfilled with cuttings										Auger grinding from 16 to 17.5 feet BGS Glacial till

In-Borehole Water Levels				General Notes	
Date / Time	Casing Tip (ft)	Bot. of Hole (ft)	Water Lvl (ft)		
				▼ = Water Level (if observed) BGS = Below Ground Surface	
				Toughness: Low (L), Medium (M), High (H) Plasticity: Non-Plastic (NP), Low (L), Medium (M), High (H) PP = Pocket Penetrometer, measured in tons per square ft. TV = Torvane (Shear Vane), measured in tons per square ft.	

Client: AES	Drilling Firm: EDI	Coordinates: 43.355757 N, -78.613453 E
Project: Somerset Solar Project	Drill Crew: Phil / Jason	Horiz. Datum: NAD 83
Location: Somerset, New York	Boring Start: 3/17/2021	Elevation: Grade
Inspector: Matt Laub	Boring End: 3/17/2021	Vert. Datum: N/A

Rig Model: CME-550X	Sampler Type: Split Spoon	Casing Type: HSA
Rig Type: ATV	Sampler Length: 24 inches	Casing Length: 5 feet
Drill Method: Hollow Stem Auger	Sampler I.D.: 1.375 inches	Casing I.D.: 2 inches
Hammer Type: Automatic	Hammer Wt.: 140 pounds	Hammer Wt.: 140 pounds
Drilling Fluid: None	Hammer Fall: 30 inches	Hammer Fall: 30 feet

Depth (ft)	Sample No.	Rec. (in)	Blows per 6"	N-Value	USCS Symbol	Graphic Log	Visual Classification	Toughness	Plasticity	PP (tsf)	TV (tsf)	N-Value				Drilling & Strata Notes
												10	20	30	40	
							4" - TOPSOIL									
	S-1	12	3 2 4 3	6	SP		Loose, brown Gravelly coarse to fine SAND, little Silt, moist (SP)									
	S-2	16	5 7 10 17	17	SP		Medium dense, brown Gravelly coarse to fine SAND, little Silt, trace Clay, moist to wet (SP)									Auger grinding from 3 to 4 feet BGS
5	S-3	16	2 23 26 26	49	SP		Dense, brown medium to fine SAND, little coarse to fine Gravel, trace Clay, dry (SP)									
	S-4	16	19 53 50/4	> 50	SP		Very dense, brown Gravelly coarse to fine SAND, dry (SP)									Heavy auger grinding from 6 to 17.5 feet BGS
	S-5	3	50/6	> 50	GP		Very dense, gray coarse to fine GRAVEL, trace medium to fine Sand, dry (GP)									Soil cuttings were Gravel, limestone
10					GP											
	S-6	1	14 15 16 23	31	GP		Dense, gray Coarse GRAVEL, dry (GP)									Limestone
15					GP											
	S-7	20	12 11 10 15	21	SC		Medium dense, gray Clayey medium to fine SAND, little Gravel, moist (SC)									
20							End of boring at 20 feet BGS Borehole backfilled with cuttings									

In-Borehole Water Levels				General Notes	
Date / Time	Casing Tip (ft)	Bot. of Hole (ft)	Water Lvl (ft)		
				▼ = Water Level (if observed) BGS = Below Ground Surface	
				Toughness: Low (L), Medium (M), High (H) Plasticity: Non-Plastic (NP), Low (L), Medium (M), High (H) PP = Pocket Penetrometer, measured in tons per square ft. TV = Torvane (Shear Vane), measured in tons per square ft.	

Client: AES Project: Somerset Solar Project Location: Somerset, New York Inspector: Matt Laub	Drilling Firm: EDI Drill Crew: Phil / Jason Boring Start: 3/17/2021 Boring End: 3/17/2021	Coordinates: 43.352009 N, -78.61416 E Horiz. Datum: NAD 83 Elevation: Grade Vert. Datum: N/A
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Rig Model: CME-550X Rig Type: ATV Drill Method: Hollow Stem Auger Hammer Type: Automatic Drilling Fluid: None	Sampler Type: Split Spoon Sampler Length: 24 inches Sampler I.D.: 1.375 inches Hammer Wt.: 140 pounds Hammer Fall: 30 inches	Casing Type: HSA Casing Length: 5 feet Casing I.D.: 2 inches Hammer Wt.: 140 pounds Hammer Fall: 30 feet
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Depth (ft)	Sample No.	Rec. (in)	Blows per 6"	N-Value	USCS Symbol	Graphic Log	Visual Classification	Toughness	Plasticity	PP (tsf)	TV (tsf)	N-Value 10 20 30 40	Drilling & Strata Notes
							4" - TOPSOIL						
	S-1	18	1 3 5	4	ML		Medium stiff, brown Sandy SILT, trace fine Gravel, moist (ML)	L	M	2	0.35		
	S-2	22	3 4 6 10	10	SM		Medium dense, brown Silty medium to fine SAND, trace Clay, moist (SM)						
5	S-3	20	12 14 14 10	28	SM		Medium dense, brown Silty medium to fine SAND, trace Clay, moist (SM)					5	
	S-4	16	5 6 6 8	12	CL		Stiff, brown to gray CLAY, little medium to fine Sand, moist (CL)	L	M	3.25	0.35		
	S-5	24	3 6 10 12	16	CL		Very stiff, gray CLAY, some medium to fine Sand, moist (CL)	M	M	3	0.2		10
15	S-6	24	3 3 3 8	6	CL		Medium stiff, gray CLAY, some medium to fine Sand, moist (CL)	M	M	1	0.175		15
	S-7	2	4 4 7 18	11	GP		Medium dense, gray to reddish brown Sandy coarse to fine GRAVEL, little Clay, trace Silt, moist (GP)						20
20							End of boring at 20 feet BGS Borehole backfilled with cuttings						

In-Borehole Water Levels				General Notes	
Date / Time	Casing Tip (ft)	Bot. of Hole (ft)	Water Lvl (ft)		
				▼ = Water Level (if observed) BGS = Below Ground Surface	
				Toughness: Low (L), Medium (M), High (H) Plasticity: Non-Plastic (NP), Low (L), Medium (M), High (H) PP = Pocket Penetrometer, measured in tons per square ft. TV = Torvane (Shear Vane), measured in tons per square ft.	



Soil Boring Log

B-19

Client: AES Project: Somerset Solar Project Location: Somerset, New York Inspector: Matt Laub	Drilling Firm: EDI Drill Crew: Phil / Jason Boring Start: 3/17/2021 Boring End: 3/17/2021	Coordinates: 43.358434 N, -78.616321 E Horiz. Datum: NAD 83 Elevation: Grade Vert. Datum: N/A
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Rig Model: CME-550X Rig Type: ATV Drill Method: Hollow Stem Auger Hammer Type: Automatic Drilling Fluid: None	Sampler Type: Split Spoon Sampler Length: 24 inches Sampler I.D.: 1.375 inches Hammer Wt.: 140 pounds Hammer Fall: 30 inches	Casing Type: HSA Casing Length: 5 feet Casing I.D.: 2 inches Hammer Wt.: 140 pounds Hammer Fall: 30 feet
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Depth (ft)	Sample No.	Rec. (in)	Blows per 6"	N-Value	USCS Symbol	Graphic Log	Visual Classification	Toughness	Plasticity	PP (tsf)	TV (tsf)	N-Value				Drilling & Strata Notes
												10	20	30	40	
	S-1	16	1 3 5	4	ML		4" - TOPSOIL Medium stiff, brown Sandy SILT, moist (ML)	L	M	2.5	3.5					
	S-2	24	3 6 8 10	14	CL		Stiff, green to gray CLAY, trace Silt, moist (CL)	H	M	> 4.5	5.5					
5	S-3	24	17 17 13 22	30	SC		Dense, green Clayey SAND, trace Silt, moist (SC)							5		
	S-4	22	11 20 21 23	41	ML		Hard, green to gray Sandy SILT, trace coarse to fine Gravel, moist (ML)	L	M	1.5	2					
10	S-5	22	4 18 30 26	48	SP		Dense, green to gray coarse to fine SAND, trace Silt, trace coarse to fine Gravel, moist (Sp)							10		
	S-6	20	6 14 16 17	30	CL		Hard, gray CLAY, little coarse to fine Gravel, trace Silt, moist (CL)	M	M	3.5	5.5			15		Heavy auger grinding from 10 to 12.5 feet BGS
	S-7	18	20 44 60 50/4	104	SM		Very dense, Silty coarse to fine SAND, little coarse to fine Gravel, trace Clay, dry (SM)							>>		Auger grinding from 15.5 to 17 feet BGS Glacial till
20	End of boring at 19.6 feet BGS Borehole backfilled with cuttings															

In-Borehole Water Levels				General Notes	
Date / Time	Casing Tip (ft)	Bot. of Hole (ft)	Water Lvl (ft)		
				▼ = Water Level (if observed) BGS = Below Ground Surface	
				Toughness: Low (L), Medium (M), High (H) Plasticity: Non-Plastic (NP), Low (L), Medium (M), High (H) PP = Pocket Penetrometer, measured in tons per square ft. TV = Torvane (Shear Vane), measured in tons per square ft.	



Soil Boring Log

B-20

Client: AES	Drilling Firm: EDI	Coordinates: 43.354158 N, -78.618303 E
Project: Somerset Solar Project	Drill Crew: Phil / Jason	Horiz. Datum: NAD 83
Location: Somerset, New York	Boring Start: 3/17/2021	Elevation: Grade
Inspector: Matt Laub	Boring End: 3/17/2021	Vert. Datum: N/A

Rig Model: CME-550X	Sampler Type: Split Spoon	Casing Type: HSA
Rig Type: ATV	Sampler Length: 24 inches	Casing Length: 5 feet
Drill Method: Hollow Stem Auger	Sampler I.D.: 1.375 inches	Casing I.D.: 2 inches
Hammer Type: Automatic	Hammer Wt.: 140 pounds	Hammer Wt.: 140 pounds
Drilling Fluid: None	Hammer Fall: 30 inches	Hammer Fall: 30 feet

Depth (ft)	Sample No.	Rec. (in)	Blows per 6"	N-Value	USCS Symbol	Graphic Log	Visual Classification	Toughness	Plasticity	PP (tsf)	TV (tsf)	N-Value				Drilling & Strata Notes
												10	20	30	40	
							2" - TOPSOIL									
	S-1	18	1 3 4 5	7	CL		Medium stiff, brown Silty CLAY, little medium to fine Sand, moist (CL)	L	M	2	0.1					
	S-2	24	4 3 5 5	8	CL		Stiff, brown Sandy CLAY, trace Silt, moist (CL)	L	M	1.5	0.35					
5	S-3	20	4 4 4 4	8	SC		Loose, brown coarse to fine SAND, little Clay, trace fine Gravel, moist (SC)									
	S-4	22	8 12 19 26	31	CL		Hard, brown Sandy CLAY, moist (CL)	M	M	3.75	0.15					
	S-5	20	15 31 32 40	> 50	SP		Very dense, brown coarse to fine SAND, trace Silt, moist to wet (SP)									
	S-6	20	11 9 11 16	20	ML		Very stiff, gray Sandy SILT, moist (ML)	M	M	3.5	0.25					
	S-7	22	5 3 4 4	7	ML		Medium stiff, gray Sandy SILT, little coarse to fine Gravel, wet (ML)	L	H	1	0.25					
							End of boring at 20 feet BGS Borehole backfilled with cuttings									

In-Borehole Water Levels				General Notes	
Date / Time	Casing Tip (ft)	Bot. of Hole (ft)	Water Lvl (ft)		
				▼ = Water Level (if observed) BGS = Below Ground Surface	
				Toughness: Low (L), Medium (M), High (H) Plasticity: Non-Plastic (NP), Low (L), Medium (M), High (H) PP = Pocket Penetrometer, measured in tons per square ft. TV = Torvane (Shear Vane), measured in tons per square ft.	

Client: AES	Drilling Firm: EDI	Coordinates: 43.346817 N, -78.613543 E
Project: Somerset Solar Project	Drill Crew: Phil / Jason	Horiz. Datum: NAD 83
Location: Somerset, New York	Boring Start: 3/18/2021	Elevation: Grade
Inspector: Matt Laub	Boring End: 3/18/2021	Vert. Datum: N/A

Rig Model: CME-550X	Sampler Type: Split Spoon	Casing Type: HSA
Rig Type: ATV	Sampler Length: 24 inches	Casing Length: 5 feet
Drill Method: Hollow Stem Auger	Sampler I.D.: 1.375 inches	Casing I.D.: 2 inches
Hammer Type: Automatic	Hammer Wt.: 140 pounds	Hammer Wt.: 140 pounds
Drilling Fluid: None	Hammer Fall: 30 inches	Hammer Fall: 30 feet

Depth (ft)	Sample No.	Rec. (in)	Blows per 6"	N-Value	USCS Symbol	Graphic Log	Visual Classification	Toughness	Plasticity	PP (tsf)	TV (tsf)	N-Value 10 20 30 40	Drilling & Strata Notes	
							6" - TOPSOIL							
	S-1	18	1 2 3 4	5	SC		Loose, brown coarse to fine SAND, little Clay, moist (SC)							
	S-2	20	2 2 3 3	5			Loose, brown coarse to fine SAND, little Clay, moist (SC)							
5	S-3	22	11 19 25 25	44	CL		Dense, brown medium to fine SAND, little Clay, trace Silt, moist to dry (SC)							
	S-4	18	15 31 36 18	67			Hard, brown Silty CLAY, some fine Sand, moist (CL)							
	S-5	12	1 10 14 10	24			Very stiff, gray CLAY, little medium to fine Sand, dry (CL)							
10					CL		Very stiff, gray Sandy CLAY, dry (CL)							
	S-6	24	4 7 8 6	15										
15					GC									
	S-7		15 40 66 50/2	106			Dense, gray Clayey coarse to fine GRAVEL, little medium to fine Sand, moist (GC)							
20							End of boring at 19.7 feet BGS Borehole backfilled with cuttings							

In-Borehole Water Levels				General Notes	
Date / Time	Casing Tip (ft)	Bot. of Hole (ft)	Water Lvl (ft)		
				▼ = Water Level (if observed) BGS = Below Ground Surface	
				Toughness: Low (L), Medium (M), High (H) Plasticity: Non-Plastic (NP), Low (L), Medium (M), High (H) PP = Pocket Penetrometer, measured in tons per square ft. TV = Torvane (Shear Vane), measured in tons per square ft.	

Client: AES	Drilling Firm: EDI	Coordinates: 43.343799 N, -78.612293 E
Project: Somerset Solar Project	Drill Crew: Phil / Jason	Horiz. Datum: NAD 83
Location: Somerset, New York	Boring Start: 3/18/2021	Elevation: Grade
Inspector: Matt Laub	Boring End: 3/18/2021	Vert. Datum: N/A

Rig Model: CME-550X	Sampler Type: Split Spoon	Casing Type: HSA
Rig Type: ATV	Sampler Length: 24 inches	Casing Length: 5 feet
Drill Method: Hollow Stem Auger	Sampler I.D.: 1.375 inches	Casing I.D.: 2 inches
Hammer Type: Automatic	Hammer Wt.: 140 pounds	Hammer Wt.: 140 pounds
Drilling Fluid: None	Hammer Fall: 30 inches	Hammer Fall: 30 feet

Depth (ft)	Sample No.	Rec. (in)	Blows per 6"	N-Value	USCS Symbol	Graphic Log	Visual Classification	Toughness	Plasticity	PP (tsf)	TV (tsf)	N-Value				Drilling & Strata Notes
												10	20	30	40	
							10" - TOPSOIL									
	S-1	16	1 1 5 4	6	SP		Loose, brown coarse to fine SAND, trace Silt, moist (SP)									
	S-2	20	5 3 3 2	6	SM		Loose, brown to black coarse to fine SAND, little Silt, wet (SM)									
5	S-3	22	8 10 18 8	28	SM		Medium dense, brown coarse to fine SAND, little Silt, trace Clay, moist (SM)									
	S-4	20	5 5 6 6	11	CL		Stiff, gray CLAY, trace medium to fine Sand, moist to wet (CL)	M	H	2.75	0.3					
	S-5	24	4 3 8 6	11	CL		Stiff, gray CLAY, trace medium to fine Sand, moist (CL)	M	M	2.25	0.45					
10																
	S-6	18	31 51 49 24	> 50	GP		Very dense, reddish brown to gray Sandy coarse to fine GRAVEL, trace Silt, dry (GP)									Heavy auger grinding from 10.5 to 17 feet BGS Glacial till
15																
	S-7		16 50/5				Very dense, reddish brown Sandy coarse to fine GRAVEL, trace Silt, dry (GP)									Glacial till
20							End of boring at 18.9 feet BGS Borehole backfilled with cuttings									

In-Borehole Water Levels				General Notes	
Date / Time	Casing Tip (ft)	Bot. of Hole (ft)	Water Lvl (ft)		
				▼ = Water Level (if observed) BGS = Below Ground Surface	
				Toughness: Low (L), Medium (M), High (H) Plasticity: Non-Plastic (NP), Low (L), Medium (M), High (H) PP = Pocket Penetrometer, measured in tons per square ft. TV = Torvane (Shear Vane), measured in tons per square ft.	

Client: AES Project: Somerset Solar Project Location: Somerset, New York Inspector: Matt Laub	Drilling Firm: EDI Drill Crew: Phil / Jason Boring Start: 3/17/2021 Boring End: 3/17/2021	Coordinates: 43.341196 N, -78.613566 E Horiz. Datum: NAD 83 Elevation: Grade Vert. Datum: N/A
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Rig Model: CME-550X Rig Type: ATV Drill Method: Hollow Stem Auger Hammer Type: Automatic Drilling Fluid: None	Sampler Type: Split Spoon Sampler Length: 24 inches Sampler I.D.: 1.375 inches Hammer Wt.: 140 pounds Hammer Fall: 30 inches	Casing Type: HSA Casing Length: 5 feet Casing I.D.: 2 inches Hammer Wt.: 140 pounds Hammer Fall: 30 feet
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Depth (ft)	Sample No.	Rec. (in)	Blows per 6"	N-Value	USCS Symbol	Graphic Log	Visual Classification	Toughness	Plasticity	PP (tsf)	TV (tsf)	N-Value				Drilling & Strata Notes
												10	20	30	40	
							3" - TOPSOIL									
	S-1	18	4 3 4	7	SM		Loose, brown Gravelly coarse to fine SAND, little Silt, moist (SM)									
	S-2	22	4 9 13 15	22	SP		Medium dense, brown medium to fine SAND, trace Silt, moist to wet (SP)									
5	S-3	20	9 14 12 8	26	ML		Very stiff, brown Sandy SILT, little Clay, moist to wet (ML)	L	M	2.25	0.375					
	S-4	24	5 3 3 4	6	CL		Medium stiff, gray CLAY, moist to wet (CL)	L	M	0.5	0.2					
	S-5	24	1 1 2 4	3			Soft, gray CLAY, moist to wet (CL)	L	M	0.75	0.05					
	S-6	18	14 29 21 19	50	SP		Very dense, reddish brown Gravelly medium to fine SAND, little Silt, trace Clay, moist (SP)									Heavy auger grinding from 11.5 to 18 feet BGS glacial till
	S-7		50/4	> 50	GP		Very dense, reddish brown Sandy coarse to fine GRAVEL, little Silt, trace Clay, moist (GP) End of boring at 18.3 feet BGS Borehole backfilled with cuttings									Glacial till

In-Borehole Water Levels				General Notes	
Date / Time	Casing Tip (ft)	Bot. of Hole (ft)	Water Lvl (ft)		
				▼ = Water Level (if observed) BGS = Below Ground Surface	
				Toughness: Low (L), Medium (M), High (H) Plasticity: Non-Plastic (NP), Low (L), Medium (M), High (H) PP = Pocket Penetrometer, measured in tons per square ft. TV = Torvane (Shear Vane), measured in tons per square ft.	

Client: AES	Drilling Firm: EDI	Coordinates: 43.347428 N, -78.606744 E
Project: Somerset Solar Project	Drill Crew: Phil / Jason	Horiz. Datum: NAD 83
Location: Somerset, New York	Boring Start: 3/19/2021	Elevation: Grade
Inspector: Matt Laub	Boring End: 3/19/2021	Vert. Datum: N/A

Rig Model: CME-550X	Sampler Type: Split Spoon	Casing Type: HSA
Rig Type: ATV	Sampler Length: 24 inches	Casing Length: 5 feet
Drill Method: Hollow Stem Auger	Sampler I.D.: 1.375 inches	Casing I.D.: 2 inches
Hammer Type: Automatic	Hammer Wt.: 140 pounds	Hammer Wt.: 140 pounds
Drilling Fluid: None	Hammer Fall: 30 inches	Hammer Fall: 30 feet

Depth (ft)	Sample No.	Rec. (in)	Blows per 6"	N-Value	USCS Symbol	Graphic Log	Visual Classification	Toughness	Plasticity	PP (tsf)	TV (tsf)	N-Value				Drilling & Strata Notes
												10	20	30	40	
							5" - TOPSOIL									
	S-1	16	1 2 5 7	7	ML		Medium stiff, brown Sandy SILT, trace coarse to fine Gravel, moist (ML)	L	M	1.5	0.3					
	S-2	22	2 4 4 4	8	ML		Stiff, brown Sandy SILT, little Clay, moist (ML)	L	M	3.25	0.175					
5	S-3	22	7 9 6 7	15	ML		Very stiff, brown Sandy SILT, little Clay, moist (ML)			1.5	0.2			5		
	S-4	20	3 6 12 16	18	CL		Very stiff, gray to green CLAY, little medium to fine Sand, moist (CL)	M	M	3	0.2					
10	S-5	22	5 10 18 20	28	CL		Very stiff, gray to green CLAY, trace Silt, dry (CL)	M	M	> 4.5	0.2			10		
	S-6	20	14 16 35 24	> 50	ML		Hard, gray to brown Clayey SILT, trace coarse Sand, moist (ML)	L	M	3.5	0.375			15		
	S-7	20	7 12 17 25	29	CL		Very stiff, gray to reddish brown Silty CLAY, some coarse to fine Sand, trace fine Gravel, moist to dry (CL)							20		
20	End of boring at 20 feet BGS Borehole backfilled with cuttings															

In-Borehole Water Levels				General Notes	
Date / Time	Casing Tip (ft)	Bot. of Hole (ft)	Water Lvl (ft)		
				▼ = Water Level (if observed) BGS = Below Ground Surface	
				Toughness: Low (L), Medium (M), High (H) Plasticity: Non-Plastic (NP), Low (L), Medium (M), High (H) PP = Pocket Penetrometer, measured in tons per square ft. TV = Torvane (Shear Vane), measured in tons per square ft.	

Client: AES	Drilling Firm: EDI	Coordinates: 43.336843 N, -78.605293 E
Project: Somerset Solar Project	Drill Crew: Phil / Jason	Horiz. Datum: NAD 83
Location: Somerset, New York	Boring Start: 3/18/2021	Elevation: Grade
Inspector: Matt Laub	Boring End: 3/18/2021	Vert. Datum: N/A

Rig Model: CME-550X	Sampler Type: Split Spoon	Casing Type: HSA
Rig Type: ATV	Sampler Length: 24 inches	Casing Length: 5 feet
Drill Method: Hollow Stem Auger	Sampler I.D.: 1.375 inches	Casing I.D.: 2 inches
Hammer Type: Automatic	Hammer Wt.: 140 pounds	Hammer Wt.: 140 pounds
Drilling Fluid: None	Hammer Fall: 30 inches	Hammer Fall: 30 feet

Depth (ft)	Sample No.	Rec. (in)	Blows per 6"	N-Value	USCS Symbol	Graphic Log	Visual Classification	Toughness	Plasticity	PP (tsf)	TV (tsf)	N-Value 10 20 30 40	Drilling & Strata Notes
							6" - TOPSOIL						
	S-1	16	WH 2 4 4	6	SC		Loose, brown medium to fine SAND, little Clay, trace fine Gravel, moist (SC)						
	S-2	16	2 3 2 3	5	SP		Loose, brown to black Gravelly coarse to fine SAND, trace Clay, moist to wet (SP)						Water encountered at 3 feet BGS
5	S-3	18	2 2 3 3	5	SP		Loose, brown to black coarse to fine SAND, trace Clay, moist to wet (SP)						
	S-4	18	6 44 43 38	> 50	GC		Very dense, reddish brown coarse to fine GRAVEL, some coarse to fine Sand, some Clay, little Silt, wet (GC)						Glacial till
	S-5	14	9 28 20 21	48	SC		Dense, reddish brown Gravelly coarse to fine SAND, little Clay, wet (SC)						Glacial till
10													
	S-6	3	50/5	> 50	SC		Very dense, reddish brown Gravelly coarse to fine SAND, little Clay, moist (SC)						Auger grinding from 10 to 18 feet BGS Glacial till
15													
	S-7		50/3	> 50	GP		Very dense, reddish brown coarse to fine GRAVEL, trace Silt, trace fine Sand, trace Clay, wet (GP) End of boring at 18.3 feet BGS Borehole backfilled with cuttings						Glacial till
20													

In-Borehole Water Levels				General Notes	
Date / Time	Casing Tip (ft)	Bot. of Hole (ft)	Water Lvl (ft)		
3/18/2021	18.3		3	▼ = Water Level (if observed) BGS = Below Ground Surface	
				Toughness: Low (L), Medium (M), High (H) Plasticity: Non-Plastic (NP), Low (L), Medium (M), High (H) PP = Pocket Penetrometer, measured in tons per square ft. TV = Torvane (Shear Vane), measured in tons per square ft.	

Client: AES	Drilling Firm: EDI	Coordinates: 43.334032 N, -78.606934 E
Project: Somerset Solar Project	Drill Crew: Phil / Jason	Horiz. Datum: NAD 83
Location: Somerset, New York	Boring Start: 3/18/2021	Elevation: Grade
Inspector: Matt Laub	Boring End: 3/18/2021	Vert. Datum: N/A

Rig Model: CME-550X	Sampler Type: Split Spoon	Casing Type: HSA
Rig Type: ATV	Sampler Length: 24 inches	Casing Length: 5 feet
Drill Method: Hollow Stem Auger	Sampler I.D.: 1.375 inches	Casing I.D.: 2 inches
Hammer Type: Automatic	Hammer Wt.: 140 pounds	Hammer Wt.: 140 pounds
Drilling Fluid: None	Hammer Fall: 30 inches	Hammer Fall: 30 feet

Depth (ft)	Sample No.	Rec. (in)	Blows per 6"	N-Value	USCS Symbol	Graphic Log	Visual Classification	Toughness	Plasticity	PP (tsf)	TV (tsf)	N-Value 10 20 30 40	Drilling & Strata Notes
							4" - TOPSOIL						
	S-1	22	1 4 4 6	8	SP		Loose, brown medium to fine SAND, trace coarse to fine Gravel, trace Silt, moist (SP)						
	S-2	22	4 5 5 5	10	SP		Medium dense, brown medium to fine SAND, trace Clay, trace Silt, moist (SP)						
5	S-3	18	2 7 9 12	16	SP		Medium dense, brown medium to fine SAND, trace Clay, trace Silt, moist (SP)						
	S-4	14	4 7 5 11	12	GP		Medium dense, brown to gray Sandy coarse to fine GRAVEL, trace Silt, wet (GP)						
10	S-5	20	6 3 5 5	8	CL		Stiff, gray CLAY, little medium to fine Sand, moist (CL)	L	M	1	0.25		
	S-6	24	2 1 1 1	2	CL		Soft, gray CLAY, trace medium to fine Sand, wet (CL)	L	M	0.25	0.2		
15													
	S-7	12	7 29 50/5	> 50	SC		Very dense, brown to reddish brown coarse to fine SAND, little Clay, trace coarse to fine Gravel, trace Silt, moist to wet (SC)						Auger grinding from 16 to 17 feet BGS
20							End of boring at 19.4 feet BGS Borehole backfilled with cuttings						

In-Borehole Water Levels				General Notes	
Date / Time	Casing Tip (ft)	Bot. of Hole (ft)	Water Lvl (ft)		
3/18/2021	18		10.5	▼ = Water Level (if observed) BGS = Below Ground Surface	
				Toughness: Low (L), Medium (M), High (H) Plasticity: Non-Plastic (NP), Low (L), Medium (M), High (H) PP = Pocket Penetrometer, measured in tons per square ft. TV = Torvane (Shear Vane), measured in tons per square ft.	

Client: AES	Drilling Firm: EDI	Coordinates: 43.330929 N, -78.605417 E
Project: Somerset Solar Project	Drill Crew: Phil / Jason	Horiz. Datum: NAD 83
Location: Somerset, New York	Boring Start: 3/18/2021	Elevation: Grade
Inspector: Matt Laub	Boring End: 3/18/2021	Vert. Datum: N/A

Rig Model: CME-550X	Sampler Type: Split Spoon	Casing Type: HSA
Rig Type: ATV	Sampler Length: 24 inches	Casing Length: 5 feet
Drill Method: Hollow Stem Auger	Sampler I.D.: 1.375 inches	Casing I.D.: 2 inches
Hammer Type: Automatic	Hammer Wt.: 140 pounds	Hammer Wt.: 140 pounds
Drilling Fluid: None	Hammer Fall: 30 inches	Hammer Fall: 30 feet

Depth (ft)	Sample No.	Rec. (in)	Blows per 6"	N-Value	USCS Symbol	Graphic Log	Visual Classification	Toughness	Plasticity	PP (tsf)	TV (tsf)	N-Value				Drilling & Strata Notes
												10	20	30	40	
	S-1	14	1 3 4 9	7	ML		Medium stiff, brown Sandy SILT, little coarse to fine Gravel, moist (ML)	L	M	2.75	0.25					
	S-2	14	10 18 19 30	37	GP		Dense, brown reddish brown, Sandy coarse to fine GRAVEL, little Silt, dry (GP)									
5	S-3	18	8 24 28 23	> 50	SP		Very dense, reddish brown Gravelly medium to fine SAND, little Silt, moist (SP)									Auger grinding from 4 to 18 feet BGS
	S-4	20	15 21 22 44	43	SP		Dense, reddish brown Gravelly coarse to fine SAND, little Silt, dry (SP)									Glacial till
	S-5	14	21 59 50/5	> 50	GP		Very dense, reddish brown Sandy coarse to fine GRAVEL, little Silt, dry (GP)									Glacial till
10																
	S-6	22	19 27 24 28	> 50	GC		Very dense, reddish brown Clayey coarse to fine GRAVEL, little coarse to fine Sand, trace Silt, dry (GC)									Glacial till
15																
	S-7		22 28 35 40	> 50			Very dense, reddish brown to gray Sandy coarse to fine GRAVEL, little Clay, trace Silt, dry to wet (GC)									Glacial till
20							End of boring at 20 feet BGS Borehole backfilled with cuttings									

In-Borehole Water Levels				General Notes	
Date / Time	Casing Tip (ft)	Bot. of Hole (ft)	Water Lvl (ft)		
				▼ = Water Level (if observed) BGS = Below Ground Surface	
				Toughness: Low (L), Medium (M), High (H) Plasticity: Non-Plastic (NP), Low (L), Medium (M), High (H) PP = Pocket Penetrometer, measured in tons per square ft. TV = Torvane (Shear Vane), measured in tons per square ft.	



Core Boring Log

B-29

Client: AES	Drilling Firm: EDI	Coordinates: 43.346827 N, -78.602745 E
Project: Somerset Solar Project	Drill Crew: Phil / Jason	Horiz. Datum: NAD 83
Location: Somerset, New York	Boring Start: 3/18/2021	Elevation: Grade
Inspector: Matt Laub	Boring End: 3/18/2021	Vert. Datum: N/A

Rig Model: CME-550X	Casing Type: HSA	Core Barrel Type:	Core Bit Type:
Rig Type: ATV	Casing Length: 5 feet	Core Barrel Length: 5 feet	Core Bit Length:
Drill Method: Hollow Stem Auger	Casing I.D.: 2 inches	Core Barrel I.D.:	Core Bit I.D.:

Depth (ft)	Avg Core Rate (min/ft)	Run No.	Recovery (in. / %)	RQD (in. / %)	Hardness	Weathering	Graphic Log	Visual Classification	Depth (ft.)	Discontinuities						Drilling & Strata Notes
										Type	Dip Angle	Roughness	Weathering	Aperture	Infilling	
11.6	untimed						▼	Sandstone, brown, medium grained, slightly weathered, extremely weak, close spaced discontinuities	11.6	J	0	P,R	DS	O		
12.4	untimed								12.4	J	0	P,R	FR	T		
13.6	untimed	R-1	60 100%	38 63%	R0	SL			13.6	J	15	P,R	FR	O		
15	untimed															
15.5	untimed							End of boring at 15.5 feet BGS. Borehole backfilled with soil cuttings and bentonite holeplug.								
20																
25																
30																

In-Borehole Water Levels				General Notes	
Date / Time	Casing Tip (ft)	Bot. of Hole (ft)	Water Lvl (ft)	▼ = Water Level (if observed)	BGS = Below Ground Surface
3/18/2021	10.5		10.5		

Client: AES	Drilling Firm: EDI	Coordinates: 43.346986 N, -78.592067 E
Project: Somerset Solar Project	Drill Crew: Phil / Jason	Horiz. Datum: NAD 83
Location: Somerset, New York	Boring Start: 3/19/2021	Elevation: Grade
Inspector: Matt Laub	Boring End: 3/19/2021	Vert. Datum: N/A

Rig Model: CME-550X	Sampler Type: Split Spoon	Casing Type: HSA
Rig Type: ATV	Sampler Length: 24 inches	Casing Length: 5 feet
Drill Method: Hollow Stem Auger	Sampler I.D.: 1.375 inches	Casing I.D.: 2 inches
Hammer Type: Automatic	Hammer Wt.: 140 pounds	Hammer Wt.: 140 pounds
Drilling Fluid: None	Hammer Fall: 30 inches	Hammer Fall: 30 feet

Depth (ft)	Sample No.	Rec. (in)	Blows per 6"	N-Value	USCS Symbol	Graphic Log	Visual Classification	Toughness	Plasticity	PP (tsf)	TV (tsf)	N-Value				Drilling & Strata Notes
												10	20	30	40	
							5" - TOPSOIL									
	S-1	20	2 2 3 4	5	ML		Medium stiff, brown SILT, little medium to fine Sand, moist (ML)	L	M	1.25	0.25					
	S-2	24	6 7 14 18	21	CL		Very stiff, brown CLAY, trace coarse to fine Gravel, dry (CL)	L	M	3.75	0.35					
5	S-3	18	7 13 17 10	30	ML		Hard, brown Sandy SILT, little Clay, dry (ML)	L	M	3	0.35					
	S-4	22	7 7 5 11	12	CL		Stiff, brown to gray CLAY, trace Silt, moist (CL)	M	M	> 4.50	0.375					
	S-5	24	5 6 4 4	10	CL		Stiff, brown to gray CLAY, moist to wet (CL)	L	L	0.25	0.15					
10																
	S-6	23	10 23 22 46	45	ML		Hard, brown to reddish brown Sandy SILT, little coarse to fine GRAVEL, moist to dry (ML)	L	M	> 4.5	0.35					
15																
	S-7	1	50/4	> 50	GP		Very dense, gray to reddish brown coarse GRAVEL, dry (GP) End of boring at 18.4 feet BGS Borehole backfilled with cuttings									
20																

Light to heavy auger grinding from 10.5 to 18 feet BGS

In-Borehole Water Levels				General Notes	
Date / Time	Casing Tip (ft)	Bot. of Hole (ft)	Water Lvl (ft)		
				▼ = Water Level (if observed) BGS = Below Ground Surface	
				Toughness: Low (L), Medium (M), High (H) Plasticity: Non-Plastic (NP), Low (L), Medium (M), High (H) PP = Pocket Penetrometer, measured in tons per square ft. TV = Torvane (Shear Vane), measured in tons per square ft.	

Client: AES	Drilling Firm: EDI	Coordinates: 43.345488 N, -78.595301 E
Project: Somerset Solar Project	Drill Crew: Phil / Jason	Horiz. Datum: NAD 83
Location: Somerset, New York	Boring Start: 3/19/2021	Elevation: Grade
Inspector: Matt Laub	Boring End: 3/19/2021	Vert. Datum: N/A

Rig Model: CME-550X	Sampler Type: Split Spoon	Casing Type: HSA
Rig Type: ATV	Sampler Length: 24 inches	Casing Length: 5 feet
Drill Method: Hollow Stem Auger	Sampler I.D.: 1.375 inches	Casing I.D.: 2 inches
Hammer Type: Automatic	Hammer Wt.: 140 pounds	Hammer Wt.: 140 pounds
Drilling Fluid: None	Hammer Fall: 30 inches	Hammer Fall: 30 feet

Depth (ft)	Sample No.	Rec. (in)	Blows per 6"	N-Value	USCS Symbol	Graphic Log	Visual Classification	Toughness	Plasticity	PP (tsf)	TV (tsf)	N-Value				Drilling & Strata Notes	
												10	20	30	40		
5	S-1	10	3 3 3 5	6	CL		Medium stiff, brown, Sandy CLAY, moist (CL)	L	M	3	0.225						Auger grinding from 4.5 to 10.7 feet BGS
	S-2	20	5 7 8 16	15			Very stiff, brown, Sandy CLAY, trace coarse to fine Gravel, moist (CL)	L	M	1.25	0.225						
	S-3	20	12 15 15 16	30	SM	Dense, brown, Gravelly coarse to fine SAND, little Silt, moist (SM)					5						
	S-4	20	9 12 70 85	> 50		Weathered ROCK material					>>						
	S-5	6	13 55 50/3	> 50		Weathered ROCK material					>>						
10	End of boring at 10.7 feet BGS Borehole backfilled with cuttings																
15	Auger refusal at 10.7 feet BGS																
20	Auger refusal at 10.7 feet BGS																

In-Borehole Water Levels				General Notes	
Date / Time	Casing Tip (ft)	Bot. of Hole (ft)	Water Lvl (ft)		
				▼ = Water Level (if observed) BGS = Below Ground Surface	
				Toughness: Low (L), Medium (M), High (H) Plasticity: Non-Plastic (NP), Low (L), Medium (M), High (H) PP = Pocket Penetrometer, measured in tons per square ft. TV = Torvane (Shear Vane), measured in tons per square ft.	

Client: AES Project: Somerset Solar Project Location: Somerset, New York Inspector: Matt Laub	Drilling Firm: EDI Drill Crew: Phil / Jason Boring Start: 3/19/2021 Boring End: 3/19/2021	Coordinates: 43.343187 N, -78.593056 E Horiz. Datum: NAD 83 Elevation: Grade Vert. Datum: N/A
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Rig Model: CME-550X Rig Type: ATV Drill Method: Hollow Stem Auger Hammer Type: Automatic Drilling Fluid: None	Sampler Type: Split Spoon Sampler Length: 24 inches Sampler I.D.: 1.375 inches Hammer Wt.: 140 pounds Hammer Fall: 30 inches	Casing Type: HSA Casing Length: 5 feet Casing I.D.: 2 inches Hammer Wt.: 140 pounds Hammer Fall: 30 feet
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Depth (ft)	Sample No.	Rec. (in)	Blows per 6"	N-Value	USCS Symbol	Graphic Log	Visual Classification	Toughness	Plasticity	PP (tsf)	TV (tsf)	N-Value				Drilling & Strata Notes
												10	20	30	40	
	S-1	14	2 2 5 5	7	CL		4" - TOPSOIL Medium stiff, brown Silty CLAY, moist (CL)	M	M	2.25	0.45					
	S-2	8	4 2 5 6	7	CL		Medium stiff, brown Silty CLAY, little coarse to fine Gravel, moist (CL)	L	M	1.5	0.3					
5	S-3	2	3 3 3 5	6	ML		Medium stiff, brown Clayey SILT, trace fine Sand, moist to wet (ML)	M	M							
	S-4	24	3 34 10 15	44	CL		Stiff, brown Sandy CLAY, trace coarse to fine Gravel, moist (CL)	L	M	2	0.275					
	S-5	12	6 21 17 10	38	CL		Gray CLAY, trace Silt, moist (CL)	L	M	0.75	0.45					
10					GM		Reddish brown Silty GRAVEL, little medium to fine Sand, dry (GM)									
					GP		Very dense, gray coarse GRAVEL, dry (GP)									
15	S-6	3	50/3													Auger grinding from 10 to 14.8 feet BGS
							End of boring at 14.8 feet BGS Borehole backfilled with cuttings									Auger refusal at 14.8 feet BGS

In-Borehole Water Levels				General Notes	
Date / Time	Casing Tip (ft)	Bot. of Hole (ft)	Water Lvl (ft)		
				▼ = Water Level (if observed) BGS = Below Ground Surface	
				Toughness: Low (L), Medium (M), High (H) Plasticity: Non-Plastic (NP), Low (L), Medium (M), High (H) PP = Pocket Penetrometer, measured in tons per square ft. TV = Torvane (Shear Vane), measured in tons per square ft.	

Client: AES	Drilling Firm: EDI	Coordinates: 43.340066 N, -78.595529 E
Project: Somerset Solar Project	Drill Crew: Phil / Jason	Horiz. Datum: NAD 83
Location: Somerset, New York	Boring Start: 3/19/2021	Elevation: Grade
Inspector: Matt Laub	Boring End: 3/19/2021	Vert. Datum: N/A

Rig Model: CME-550X	Sampler Type: Split Spoon	Casing Type: HSA
Rig Type: ATV	Sampler Length: 24 inches	Casing Length: 5 feet
Drill Method: Hollow Stem Auger	Sampler I.D.: 1.375 inches	Casing I.D.: 2 inches
Hammer Type: Automatic	Hammer Wt.: 140 pounds	Hammer Wt.: 140 pounds
Drilling Fluid: None	Hammer Fall: 30 inches	Hammer Fall: 30 feet

Depth (ft)	Sample No.	Rec. (in)	Blows per 6"	N-Value	USCS Symbol	Graphic Log	Visual Classification	Toughness	Plasticity	PP (tsf)	TV (tsf)	N-Value				Drilling & Strata Notes
												10	20	30	40	
	S-1	10	2 3 3 5	6	ML		Medium stiff, brown Sandy SILT, little Clay, moist (ML)	L	M	1.25	0.25					
	S-2	14	2 5 5 7	10	CL		Stiff, brown Silty CLAY, trace fine Sand, moist (CL)	L	M	2.75	0.4					
5	S-3	16	4 4 4 5	8	SM		Loose, brown Silty medium to fine SAND, moist (SM)									Organic material recovered
	S-4	14	7 7 12 25	19			Medium dense, brown Silty coarse to fine SAND, little coarse to fine Gravel, dry (SM)									
	S-5	22	16 31 45 52	> 50			Very dense, reddish brown Silty coarse to fine SAND, little coarse to fine Gravel, trace Clay, dry (SM)									Glacial till
10																
	S-6	2	50/2	> 50	GM		Very dense, reddish brown coarse to fine GRAVEL, little Silt, dry (GM)									Auger grinding from 10-18 feet BGS Limestone fragments
15																
	S-7		50/4	> 50			Very dense, reddish brown Silty coarse to fine GRAVEL, dry (GM) End of boring at 18.3 feet BGS Borehole backfilled with cuttings									
20																

In-Borehole Water Levels				General Notes	
Date / Time	Casing Tip (ft)	Bot. of Hole (ft)	Water Lvl (ft)		
				▼ = Water Level (if observed) BGS = Below Ground Surface	
				Toughness: Low (L), Medium (M), High (H) Plasticity: Non-Plastic (NP), Low (L), Medium (M), High (H) PP = Pocket Penetrometer, measured in tons per square ft. TV = Torvane (Shear Vane), measured in tons per square ft.	

Client: AES	Drilling Firm: EDI	Coordinates: 43.34712 N, -78.586322 E
Project: Somerset Solar Project	Drill Crew: Phil / Jason	Horiz. Datum: NAD 83
Location: Somerset, New York	Boring Start: 3/22/2021	Elevation: Grade
Inspector: Matt Laub	Boring End: 3/22/2021	Vert. Datum: N/A

Rig Model: CME-550X	Sampler Type: Split Spoon	Casing Type: HSA
Rig Type: ATV	Sampler Length: 24 inches	Casing Length: 5 feet
Drill Method: Hollow Stem Auger	Sampler I.D.: 1.375 inches	Casing I.D.: 2 inches
Hammer Type: Automatic	Hammer Wt.: 140 pounds	Hammer Wt.: 140 pounds
Drilling Fluid: None	Hammer Fall: 30 inches	Hammer Fall: 30 feet

Depth (ft)	Sample No.	Rec. (in)	Blows per 6"	N-Value	USCS Symbol	Graphic Log	Visual Classification	Toughness	Plasticity	PP (tsf)	TV (tsf)	N-Value 10 20 30 40	Drilling & Strata Notes
			3 4 5 6	9	CL		2" - TOPSOIL Stiff, gray to brown Silty CLAY, trace medium to fine Sand, moist (CL)	M	M	3	0.45		
	S-2	24	10 10 13 14	23	ML		Very stiff, brown SILT, little coarse to fine Sand, trace Clay, moist (ML)	L	M	2.5	0.3		
5	S-3	18	11 17 18 20	35	ML		Hard, green to brown Sandy SILT, trace Clay, moist (ML)	L	L	1.25	0.15		Oxidation discoloration
	S-4	18	12 12 19 25	31	SM		Dense, brown Silty medium to fine SAND, dry (SM)						
	S-5	14	3 21 28 45	49	SM		Dense, brown Silty medium to fine SAND, moist to dry (SM)						
10													
	S-6	12	9 8 5 5	13	CL		Stiff, gray CLAY, moist (CL)	L	M	0.25	0.1		
15													
	S-7	16	13 12 28 23	40	GC		Dense, gray to reddish brown coarse to fine GRAVEL, little Clay, little Silt, trace medium to fine Sand, dry (GC)						
20							End of boring at 20 feet BGS Borehole backfilled with cuttings						

In-Borehole Water Levels				General Notes	
Date / Time	Casing Tip (ft)	Bot. of Hole (ft)	Water Lvl (ft)		
3/22/2021	18		8	▼ = Water Level (if observed) BGS = Below Ground Surface Toughness: Low (L), Medium (M), High (H) Plasticity: Non-Plastic (NP), Low (L), Medium (M), High (H) PP = Pocket Penetrometer, measured in tons per square ft. TV = Torvane (Shear Vane), measured in tons per square ft.	
3/22/2021	18		20		

Client: AES Project: Somerset Solar Project Location: Somerset, New York Inspector: Matt Laub	Drilling Firm: EDI Drill Crew: Phil / Jason Boring Start: 3/22/2021 Boring End: 3/22/2021	Coordinates: 43.343807 N, -78.587658 E Horiz. Datum: NAD 83 Elevation: Grade Vert. Datum: N/A
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Rig Model: CME-550X Rig Type: ATV Drill Method: Hollow Stem Auger Hammer Type: Automatic Drilling Fluid: None	Sampler Type: Split Spoon Sampler Length: 24 inches Sampler I.D.: 1.375 inches Hammer Wt.: 140 pounds Hammer Fall: 30 inches	Casing Type: HSA Casing Length: 5 feet Casing I.D.: 2 inches Hammer Wt.: 140 pounds Hammer Fall: 30 feet
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Depth (ft)	Sample No.	Rec. (in)	Blows per 6"	N-Value	USCS Symbol	Graphic Log	Visual Classification	Toughness	Plasticity	PP (tsf)	TV (tsf)	N-Value 10 20 30 40	Drilling & Strata Notes
							2" - TOPSOIL						
	S-1	16	1 2 4 6	6	ML		Medium stiff, brown SILT, trace medium to fine Sand, moist (ML)	L	M	3.75	0.275		
	S-2	14	1 3 3 7	6	ML		Medium stiff, brown SILT, little Clay, trace coarse to fine Gravel, moist (ML)	L	M	2	0.125		
5	S-3	16	4 9 9 10	18	CL		Very stiff, green to gray CLAY, little Silt, trace medium to fine Sand, moist (CL)	L	M	1.25	0.325		
	S-4	16	4 4 5 22	9	CL		Stiff, green to brown Silty CLAY, moist (CL)	L	M	1.75	0.375		
	S-5	16	6 32 31 41	> 50	GM		Very dense, reddish brown Silty coarse to fine GRAVEL, little coarse to fine Sand, dry (GM)						Glacial till
10													
	S-6	2	50/5	> 50	GP		Very dense, reddish brown coarse to fine GRAVEL, little coarse to fine Sand, trace Silt, dry (GP)						Heavy to light auger grinding from 12.5 to 17 feet BGS
15													
	S-7	1	50/4	> 50			Very dense, reddish brown coarse to fine GRAVEL, trace Silt, wet (GP) End of boring at 18.3 feet BGS Borehole backfilled with cuttings						Water encountered at 18 feet BGS
20													

In-Borehole Water Levels				General Notes	
Date / Time	Casing Tip (ft)	Bot. of Hole (ft)	Water Lvl (ft)		
3/22/2021	18		8	▼ = Water Level (if observed) BGS = Below Ground Surface Toughness: Low (L), Medium (M), High (H) Plasticity: Non-Plastic (NP), Low (L), Medium (M), High (H) PP = Pocket Penetrometer, measured in tons per square ft. TV = Torvane (Shear Vane), measured in tons per square ft.	
3/22/2021	18		18		

Client: AES	Drilling Firm: EDI	Coordinates: 43.347036 N, -78.581398 E
Project: Somerset Solar Project	Drill Crew: Phil / Jason	Horiz. Datum: NAD 83
Location: Somerset, New York	Boring Start: 3/22/2021	Elevation: Grade
Inspector: Matt Laub	Boring End: 3/22/2021	Vert. Datum: N/A

Rig Model: CME-550X	Sampler Type: Split Spoon	Casing Type: HSA
Rig Type: ATV	Sampler Length: 24 inches	Casing Length: 5 feet
Drill Method: Hollow Stem Auger	Sampler I.D.: 1.375 inches	Casing I.D.: 2 inches
Hammer Type: Automatic	Hammer Wt.: 140 pounds	Hammer Wt.: 140 pounds
Drilling Fluid: None	Hammer Fall: 30 inches	Hammer Fall: 30 feet

Depth (ft)	Sample No.	Rec. (in)	Blows per 6"	N-Value	USCS Symbol	Graphic Log	Visual Classification	Toughness	Plasticity	PP (tsf)	TV (tsf)	N-Value 10 20 30 40	Drilling & Strata Notes	
	S-1	14	WH 1 2 4	3	ML		3" - TOPSOIL Stiff, brown SILT, trace medium to fine Sand, moist (ML)	L	L	1.25	0.125			3 inches of topsoil
	S-2	20	7 9 12 14	21			Very stiff, brown SILT, trace fine Sand, trace Clay, moist (ML)							
5	S-3	18	11 14 15 13	29			Very stiff, brown Sandy SILT, moist (ML)	L	M	2.5	0.4		5	
	S-4	14	7 8 6 5	14	CL		Stiff, brown to gray CLAY, some Silt, trace fine Sand, moist (CL)	L	M	0.75	0.3			
	S-5	18	3 3 3 4	6			Medium stiff, gray CLAY, moist (CL)							
10	S-6	10	3 8 5 2	13			Stiff, gray Sandy CLAY, trace Silt, moist to wet (CL)	L	M	1.5	1.5		15	
	S-7		9 7 18 50/3	25			Weathered rock material						Weathered rock material recovered	
20							End of boring at 19.8 feet BGS Borehole backfilled with cuttings							

In-Borehole Water Levels				General Notes	
Date / Time	Casing Tip (ft)	Bot. of Hole (ft)	Water Lvl (ft)		
				▼ = Water Level (if observed) BGS = Below Ground Surface	
				Toughness: Low (L), Medium (M), High (H) Plasticity: Non-Plastic (NP), Low (L), Medium (M), High (H) PP = Pocket Penetrometer, measured in tons per square ft. TV = Torvane (Shear Vane), measured in tons per square ft.	

Client: AES	Drilling Firm: EDI	Coordinates: 43.344003 N, -78.581289 E
Project: Somerset Solar Project	Drill Crew: Phil / Jason	Horiz. Datum: NAD 83
Location: Somerset, New York	Boring Start: 3/22/2021	Elevation: Grade
Inspector: Matt Laub	Boring End: 3/22/2021	Vert. Datum: N/A

Rig Model: CME-550X	Sampler Type: Split Spoon	Casing Type: HSA
Rig Type: ATV	Sampler Length: 24 inches	Casing Length: 5 feet
Drill Method: Hollow Stem Auger	Sampler I.D.: 1.375 inches	Casing I.D.: 2 inches
Hammer Type: Automatic	Hammer Wt.: 140 pounds	Hammer Wt.: 140 pounds
Drilling Fluid: None	Hammer Fall: 30 inches	Hammer Fall: 30 feet

Depth (ft)	Sample No.	Rec. (in)	Blows per 6"	N-Value	USCS Symbol	Graphic Log	Visual Classification	Toughness	Plasticity	PP (tsf)	TV (tsf)	N-Value				Drilling & Strata Notes
												10	20	30	40	
							3" - TOPSOIL									
	S-1	24	1 2 2 4	4	SM		Very loose, brown coarse to fine SAND, little Silt, moist (SM)									
	S-2	22	4 5 13 18	18	SM		Medium dense, brown Silty medium to fine SAND, moist (SM)									
5	S-3	22	9 12 19 19	31	ML		Hard, brown Sandy SILT, dry (ML)	L	M	2.5	0.2					
	S-4	24	7 5 7 8	12	CL		Stiff, brown to gray Silty CLAY, moist (CL)	M	M	1.25	0.375					
	S-5	14	2 5 6 6	11	CL		Stiff, gray CLAY, trace Silt, trace fine Sand, moist (CL)			1.5	0.25					
10																
	S-6	21	4 13 13 14	26	SM		Medium dense, reddish brown coarse to fine SAND, some Silt, little coarse to fine Gravel, trace Clay, moist (CL)									Auger grinding from 10 to 18 feet BGS Glacial till
15																
	S-7	3	50/3	> 50	GM		Very dense, gray to reddish brown Silty coarse to fine GRAVEL, little Clay, moist (GM) End of boring at 18.3 feet BGS Borehole backfilled with cuttings									Glacial till
20																

In-Borehole Water Levels				General Notes	
Date / Time	Casing Tip (ft)	Bot. of Hole (ft)	Water Lvl (ft)		
				▼ = Water Level (if observed) BGS = Below Ground Surface	
				Toughness: Low (L), Medium (M), High (H) Plasticity: Non-Plastic (NP), Low (L), Medium (M), High (H) PP = Pocket Penetrometer, measured in tons per square ft. TV = Torvane (Shear Vane), measured in tons per square ft.	

Client: AES	Drilling Firm: EDI	Coordinates: 43.346457 N, -78.575894 E
Project: Somerset Solar Project	Drill Crew: Phil / Jason	Horiz. Datum: NAD 83
Location: Somerset, New York	Boring Start: 3/22/2021	Elevation: Grade
Inspector: Matt Laub	Boring End: 3/22/2021	Vert. Datum: N/A

Rig Model: CME-550X	Sampler Type: Split Spoon	Casing Type: HSA
Rig Type: ATV	Sampler Length: 24 inches	Casing Length: 5 feet
Drill Method: Hollow Stem Auger	Sampler I.D.: 1.375 inches	Casing I.D.: 2 inches
Hammer Type: Automatic	Hammer Wt.: 140 pounds	Hammer Wt.: 140 pounds
Drilling Fluid: None	Hammer Fall: 30 inches	Hammer Fall: 30 feet

Depth (ft)	Sample No.	Rec. (in)	Blows per 6"	N-Value	USCS Symbol	Graphic Log	Visual Classification	Toughness	Plasticity	PP (tsf)	TV (tsf)	N-Value				Drilling & Strata Notes
												10	20	30	40	
	S-1	12	WH 2 2 5	4	CL		4" - TOPSOIL Medium stiff, brown to gray Silty CLAY, little medium to fine Sand, moist (CL)	L	M	1.5	0.275					
	S-2	10	3 5 8 8	13	SP		Medium dense, brown coarse to fine SAND, trace Silt, moist (SP)									
5	S-3	20	6 6 9 10	15	SP		Medium dense, brown coarse to fine SAND, trace Silt, moist (SP)									
	S-4	20	15 27 27 31	> 50	ML		Hard, brown SILT, little medium to fine Sand, dry (ML)	L	M	2	0.25					Water encountered at 6.5 feet BGS
10	S-5	20	11 24 21 23	45	ML		Hard, brown SILT, little medium to fine Sand, dry (ML)	L	M	1.75	0.275					
	S-6	24	9 22 30 25	> 50	SM		Very dense, brown Silty medium to fine SAND, moist to dry (SM)									
15	S-7	18	8 10 16 16	26	GM		Medium dense, reddish brown Silty coarse to fine GRAVEL, little medium to fine Sand, trace Clay, wet to moist (GM)									Glacial till
20	End of boring at 20 feet BGS Borehole backfilled with cuttings															

In-Borehole Water Levels				General Notes	
Date / Time	Casing Tip (ft)	Bot. of Hole (ft)	Water Lvl (ft)		
				▼ = Water Level (if observed) BGS = Below Ground Surface	
				Toughness: Low (L), Medium (M), High (H) Plasticity: Non-Plastic (NP), Low (L), Medium (M), High (H) PP = Pocket Penetrometer, measured in tons per square ft. TV = Torvane (Shear Vane), measured in tons per square ft.	

Client: AES Project: Somerset Solar Project Location: Somerset, New York Inspector: Matt Laub	Drilling Firm: EDI Drill Crew: Phil / Jason Boring Start: 3/22/2021 Boring End: 3/22/2021	Coordinates: 43.343876 N, -78.578499 E Horiz. Datum: NAD 83 Elevation: Grade Vert. Datum: N/A
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Rig Model: CME-550X Rig Type: ATV Drill Method: Hollow Stem Auger Hammer Type: Automatic Drilling Fluid: None	Sampler Type: Split Spoon Sampler Length: 24 inches Sampler I.D.: 1.375 inches Hammer Wt.: 140 pounds Hammer Fall: 30 inches	Casing Type: HSA Casing Length: 5 feet Casing I.D.: 2 inches Hammer Wt.: 140 pounds Hammer Fall: 30 feet
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Depth (ft)	Sample No.	Rec. (in)	Blows per 6"	N-Value	USCS Symbol	Graphic Log	Visual Classification	Toughness	Plasticity	PP (tsf)	TV (tsf)	N-Value 10 20 30 40	Drilling & Strata Notes
							5" - TOPSOIL						
	S-1	16	WH 3 3 5	6	ML		Medium stiff, brown Sandy SILT, trace Clay, trace coarse to fine Gravel, moist (ML)	L	M	0.75	0.225		
	S-2	20	6 14 16 21	30			Hard, brown Sandy SILT, trace fine Gravel, moist (ML)	L	M	0.75	0.15		
5	S-3	18	8 19 20 18	39	SM		Dense, brown Silty coarse to fine SAND, trace coarse to fine Gravel, moist (SM)						Auger grinding from 4 to 17 feet BGS
	S-4	22	10 16 24 30	40	GM		Dense, reddish brown Silty coarse to fine GRAVEL, little coarse to fine Sand, trace Clay, moist (GM)						Glacial till
	S-5	14	18 24 34 50/5	> 50			Very dense, reddish brown Sandy coarse to fine GRAVEL, little Silt, moist (GM)						
10													
	S-6	8	44 50/4	> 50			Weathered SHALE rock material						
15													
							End of boring at 17 feet BGS Borehole backfilled with cuttings						Auger refusal at 17 feet BGS
20													

In-Borehole Water Levels				General Notes	
Date / Time	Casing Tip (ft)	Bot. of Hole (ft)	Water Lvl (ft)		
				▼ = Water Level (if observed) BGS = Below Ground Surface	
				Toughness: Low (L), Medium (M), High (H) Plasticity: Non-Plastic (NP), Low (L), Medium (M), High (H) PP = Pocket Penetrometer, measured in tons per square ft. TV = Torvane (Shear Vane), measured in tons per square ft.	



Soil Boring Log

B-M1

Client: AES	Drilling Firm: Earth Dimensions, Inc.	Coordinates: ,
Project: Somerset Solar	Drill Crew: Phil Bence / Wayne Farris	Horiz. Datum: NAD83
Location: Somerset, NY	Boring Start: 11/4/2021	Elevation: Grade
Inspector: Nick Walker	Boring End: 11/4/2021	Vert. Datum: N/A

Rig Model: CME 550x	Sampler Type: Split Spoon	Casing Type: HSA
Rig Type: ATV	Sampler Length: 24 inches	Casing Length: 5 feet
Drill Method: Hollow Stem Auger	Sampler I.D.: 1.375 inches	Casing I.D.: 2 inches
Hammer Type: Safety	Hammer Wt.: 140 pounds	Hammer Wt.: N/A
Drilling Fluid: None	Hammer Fall: 30 inches	Hammer Fall: N/A

Depth (ft)	Sample No.	Rec. (ft)	Blows per 6"	N-Value	USCS Symbol	Graphic Log	Visual Classification	Toughness	Plasticity	PP (tsf)	TV (tsf)	N-Value				Drilling & Strata Notes		
												10	20	30	40			
							4" - Topsoil											
	S-1	14	3 8 8 10	16	ML		Very stiff, dark brown Clayey SILT, trace coarse Gravel, dry (ML)	L	M	4.5	0.25							
	S-2	24	10 9 9 12	18			Very stiff, dark brown Clayey SILT, dry (ML)	L	M	4.0	0.2							
5	S-3	24	6 7 10 14	17			Very stiff, dark brown Clayey SILT, dry (ML)	L	M	4.5	0.3							
	S-4	24	6 7 8 11	15			Stiff, blackish gray Clayey SILT, dry (ML)	L	M	4.5	0.45							
	S-5	24	5 6 8 8	14			Stiff, black Clayey SILT, dry (ML)	L	M	3.5	0.25							
10																		
	S-6	24	5 6 8 9	14			Stiff, black Clayey SILT, dry (ML)	L	M	3.5	0.3							
15																		
	S-7	23	3 4 5 6	9	Stiff, dark gray Clayey SILT, trace fine Gravel, dry (ML)	L	M	4.0	0.4									
20																		
	S-8	20	5 8 10 10	18	Very stiff, dark gray Clayey SILT, trace fine Gravel, dry (ML)	L	M	4.5	0.4									

In-Borehole Water Levels				General Notes	
Date / Time	Casing Tip (ft)	Bot. of Hole (ft)	Water Lvl (ft)		
				▼ = Water Level (if observed) BGS = Below Ground Surface	
				Toughness: Low (L), Medium (M), High (H) Plasticity: Non-Plastic (NP), Low (L), Medium (M), High (H) PP = Pocket Penetrometer, measured in tons per square ft. TV = Torvane (Shear Vane), measured in tons per square ft.	



Soil Boring Log

B-M1
(Continued)

Client: AES	Drilling Firm: Earth Dimensions, Inc.	Coordinates: ,
Project: Somerset Solar	Drill Crew: Phil Bence / Wayne Farris	Horiz. Datum: NAD83
Location: Somerset, NY	Boring Start: 11/4/2021	Elevation: Grade
Inspector: Nick Walker	Boring End: 11/4/2021	Vert. Datum: N/A

Depth (ft)	Sample No.	Rec. (in)	Blows per 6"	N-Value	USCS Symbol	Graphic Log	Visual Classification	Toughness	Plasticity	PP (tsf)	TV (tsf)	N-Value				Drilling & Strata Notes
												10	20	30	40	
30	S-9	22	3 5 7 12	12	CL		Stiff, grayish brown Silty CLAY, some coarse to fine Sand, moist (CL)	M	M	4.0	0.85					
35	S-10	24	2 6 6 7	12	CL		Stiff, brown Silty CLAY, little coarse to fine Sand, moist (CL)	M	H	2.5	0.65					
40	S-11	12	13 18 22 23	40	SC		Dense, reddish brown Clayey coarse to fine SAND, little fine Gravel, moist (SC)	-	NP	-	-					
45	S-12	12	19 40 50/1"	> 50	SC		Very dense, reddish brown Gravelly coarse to fine SAND, little Clay, little Silt, moist (SC)	-	NP	-	-				>>	
44.5	End of boring at 44.5 feet BGS Borehole backfilled with cuttings							Auger refusal at 44.5' BGS								

In-Borehole Water Levels				General Notes	
Date / Time	Casing Tip (ft)	Bot. of Hole (ft)	Water Lvl (ft)		
				▼ = Water Level (if observed) BGS = Below Ground Surface	
				Toughness: Low (L), Medium (M), High (H) Plasticity: Non-Plastic (NP), Low (L), Medium (M), High (H) PP = Pocket Penetrometer, measured in tons per square ft. TV = Torvane (Shear Vane), measured in tons per square ft.	



Soil Boring Log

B-SS-1

Client: AES	Drilling Firm: EDI	Coordinates: 43.354314 N, -78.607859 E
Project: Somerset Solar Project	Drill Crew: Phil / Jason	Horiz. Datum: NAD 83
Location: Somerset, New York	Boring Start: 3/16/2021	Elevation: Grade
Inspector: Matt Laub	Boring End: 3/16/2021	Vert. Datum: N/A

Rig Model: CME-550X	Sampler Type: Split Spoon	Casing Type: HSA
Rig Type: ATV	Sampler Length: 24 inches	Casing Length: 5 feet
Drill Method: Hollow Stem Auger	Sampler I.D.: 1.375 inches	Casing I.D.: 2 inches
Hammer Type: Automatic	Hammer Wt.: 140 pounds	Hammer Wt.: 140 pounds
Drilling Fluid: None	Hammer Fall: 30 inches	Hammer Fall: 30 feet

Depth (ft)	Sample No.	Rec. (in)	Blows per 6"	N-Value	USCS Symbol	Graphic Log	Visual Classification	Toughness	Plasticity	PP (tsf)	TV (tsf)	N-Value				Drilling & Strata Notes
												10	20	30	40	
	S-1	18	1 2 10 6	12	SM		4" - TOPSOIL Stiff, brown to green Clayey SILT, little coarse to fine Sand, trace coarse to fine Gravel, moist (ML)									
	S-2	24	7 7 13 15	20	CL		Very stiff, gray Sandy CLAY, moist (CL)	M	M	> 4.50	2.25					
5	S-3	20	6 5 8 10	13	CL		Stiff, black to green Sandy CLAY, moist (CL)	M	M	3.25	0.275					
	S-4	24	8 10 12 22	22	CL		Very stiff, greenish brown Sandy CLAY, moist (CL)	M	M	2.75	0.45					
10	S-5	24	13 23 19 16	42	SC		Dense, green Clayey coarse to fine SAND, moist (SC)									
	S-6	12	5 4 3 4	7	CL		Medium stiff, gray CLAY, little coarse to fine Gravel, trace Sand, moist (CL)	L	M	0.5	0.2					Auger grinding from 11 to 11.5 feet BGS
	S-7	2	19 22 18 21	40	SP		Dense, gray Gravelly medium to fine SAND, dry (SP)									Rock fragment in tip of spoon
20	S-8	24	WH 1 1 2	2	CL		Soft, gray Sandy CLAY, little coarse to fine Gravel, moist (CL)	L	H	0.25	0.2					

In-Borehole Water Levels				General Notes	
Date / Time	Casing Tip (ft)	Bot. of Hole (ft)	Water Lvl (ft)		
				▼ = Water Level (if observed) BGS = Below Ground Surface	
				Toughness: Low (L), Medium (M), High (H) Plasticity: Non-Plastic (NP), Low (L), Medium (M), High (H) PP = Pocket Penetrometer, measured in tons per square ft. TV = Torvane (Shear Vane), measured in tons per square ft.	



Soil Boring Log

B-SS-1
(Continued)

Client: AES	Drilling Firm: EDI	Coordinates: 43.354314 N, -78.607859 E
Project: Somerset Solar Project	Drill Crew: Phil / Jason	Horiz. Datum: NAD 83
Location: Somerset, New York	Boring Start: 3/16/2021	Elevation: Grade
Inspector: Matt Laub	Boring End: 3/16/2021	Vert. Datum: N/A

Depth (ft)	Sample No.	Rec. (in)	Blows per 6"	N-Value	USCS Symbol	Graphic Log	Visual Classification	Toughness	Plasticity	PP (tsf)	TV (tsf)	N-Value				Drilling & Strata Notes
												10	20	30	40	
30	S-9	3	50/5	> 50	GP		Very dense, gray coarse to fine GRAVEL, medium to fine Sand, moist (GP) End of boring at 28.5 feet BGS Borehole backfilled with cuttings						Limestone fragments			
35																
40																
45																
50																

In-Borehole Water Levels				General Notes	
Date / Time	Casing Tip (ft)	Bot. of Hole (ft)	Water Lvl (ft)		
				▼ = Water Level (if observed) BGS = Below Ground Surface Toughness: Low (L), Medium (M), High (H) Plasticity: Non-Plastic (NP), Low (L), Medium (M), High (H) PP = Pocket Penetrometer, measured in tons per square ft. TV = Torvane (Shear Vane), measured in tons per square ft.	



Soil Boring Log

B-SS2

Client: AES	Drilling Firm: Earth Dimensions, Inc.	Coordinates: ,
Project: Somerset Solar	Drill Crew: Phil Bence / Wayne Farris	Horiz. Datum: NAD83
Location: Somerset, NY	Boring Start: 11/4/2021	Elevation: Grade
Inspector: Nick Walker	Boring End: 11/4/2021	Vert. Datum: N/A

Rig Model: CME 550x	Sampler Type: Split Spoon	Casing Type: HSA
Rig Type: ATV	Sampler Length: 24 inches	Casing Length: 5 feet
Drill Method: Hollow Stem Auger	Sampler I.D.: 1.375 inches	Casing I.D.: 2 inches
Hammer Type: Safety	Hammer Wt.: 140 pounds	Hammer Wt.: N/A
Drilling Fluid: None	Hammer Fall: 30 inches	Hammer Fall: N/A

Depth (ft)	Sample No.	Rec. (ft)	Blows per 6"	N-Value	USCS Symbol	Graphic Log	Visual Classification	Toughness	Plasticity	PP (tsf)	TV (tsf)	N-Value				Drilling & Strata Notes
												10	20	30	40	
5	S-1	18	2 2 7 8	9	ML		Stiff, dark brown SILT, some Clay, trace fine Sand, dry (ML)	L	L	3.5	0.35					
	S-2	24	7 13 17 17	30			Very stiff, brown SILT, some Clay, trace fine Sand, dry (ML)	L	L	4.5	0.45					
	S-3	24	7 7 8 17	15			Stiff, brown Sandy SILT, some Clay, dry (ML)	L	L	3.5	0.3					
	S-4	24	10 10 17 19	27			Very stiff, brown Sandy SILT, trace Clay, dry (ML)	L	L	4	0.35					
10	S-5	24	7 7 6 8	13	CH		Top 13" - brown Sandy SILT, trace Clay, dry (ML)	L	L	4.5	0.35					
							Bottom 11" - gray Silty CLAY, moist (CH)	L	H	1	0.4					Till material beginning at 9' BGS
	S-6	14	5 7 12 16	19			Very stiff, gray Silty CLAY, trace fine Sand, moist (CH)	M	H	4	0.2					
15																
20	S-7	16	2 2 2 3	4	SM		Soft, gray Silty CLAY, trace coarse to fine Gravel, moist (CH)	L	H	1.5	0.2					
	S-8	18	4 9 12 10	21			Medium dense, reddish brown Silty coarse to fine SAND, some fine Gravel, wet (SM)	NP		-	-					Auger chatter at 22' BGS

In-Borehole Water Levels				General Notes	
Date / Time	Casing Tip (ft)	Bot. of Hole (ft)	Water Lvl (ft)		
11/4/2021 1:20:00 PM		25.9	17	▼ = Water Level (if observed) BGS = Below Ground Surface Toughness: Low (L), Medium (M), High (H) Plasticity: Non-Plastic (NP), Low (L), Medium (M), High (H) PP = Pocket Penetrometer, measured in tons per square ft. TV = Torvane (Shear Vane), measured in tons per square ft.	
11/4/2021 1:00:00 PM		22	20		



Soil Boring Log

B-SS2
(Continued)

Client: AES	Drilling Firm: Earth Dimensions, Inc.	Coordinates: ,
Project: Somerset Solar	Drill Crew: Phil Bence / Wayne Farris	Horiz. Datum: NAD83
Location: Somerset, NY	Boring Start: 11/4/2021	Elevation: Grade
Inspector: Nick Walker	Boring End: 11/4/2021	Vert. Datum: N/A

Depth (ft)	Sample No.	Rec. (in)	Blows per 6"	N-Value	USCS Symbol	Graphic Log	Visual Classification	Toughness	Plasticity	PP (tsf)	TV (tsf)	N-Value				Drilling & Strata Notes
												10	20	30	40	
30						[Symbol]	End of boring at 25.9 feet BGS Borehole backfilled with cuttings									30
35																35
40																40
45																45
50																50

In-Borehole Water Levels				General Notes	
Date / Time	Casing Tip (ft)	Bot. of Hole (ft)	Water Lvl (ft)		
11/4/2021 1:20:00 PM		25.9	17	▼ = Water Level (if observed) BGS = Below Ground Surface Toughness: Low (L), Medium (M), High (H) Plasticity: Non-Plastic (NP), Low (L), Medium (M), High (H) PP = Pocket Penetrometer, measured in tons per square ft. TV = Torvane (Shear Vane), measured in tons per square ft.	
11/4/2021 1:00:00 PM		22	20		

Attachment C

Electrical Resistivity Testing Results



Soil Resistivity Results

Client:	AES	Date:	5/10/2021 - 5/11/2021
Project Name:	Somerset Solar Project	Weather:	Sunny
Project Location:	Somerset, New York	Temperature:	50°F
Equipment:	AGI MiniSting		
Test Method:	Wenner 4 Electrode Array		

Array	Data	Array spacing (ft)						
		2	5	10	25	50	100	
ERT-SS1	N-S	Measured Resistance (Ω)	14.82	4.157	1.879	0.7436	0.3028	0.07
		Apparent Resistivity (Ω-m)	56.75	39.81	36.00	35.60	29.00	13.32
	E-W	Measured Resistance (Ω)	13.68	4.37	1.681	0.7034	0.3966	0.09
		Apparent Resistivity (Ω-m)	52.40	41.85	32.19	33.68	37.98	17.49
ERT-01	N-S	Measured Resistance (Ω)	18.4	7.487	3.947	1.576	0.6464	-
		Apparent Resistivity (Ω-m)	70.47	71.69	75.59	75.47	61.90	-
	E-W	Measured Resistance (Ω)	17.27	7.145	4.161	1.582	0.6344	-
		Apparent Resistivity (Ω-m)	66.14	68.43	79.67	75.74	60.75	-
ERT-02	N-S	Measured Resistance (Ω)	7.655	3.586	1.886	0.8251	0.5202	-
		Apparent Resistivity (Ω-m)	29.32	34.32	36.12	39.50	49.80	-
	E-W	Measured Resistance (Ω)	7.293	3.656	1.798	0.835	0.5257	-
		Apparent Resistivity (Ω-m)	27.93	35.02	34.44	39.99	50.32	-
ERT-03	N-S	Measured Resistance (Ω)	13.59	6.371	3.971	1.76	0.7963	-
		Apparent Resistivity (Ω-m)	15.87	18.60	23.18	25.69	23.24	-
	E-W	Measured Resistance (Ω)	13.51	7.208	3.935	1.757	0.7893	-
		Apparent Resistivity (Ω-m)	51.76	69.01	75.35	84.12	75.59	-
ERT-04	N-S	Measured Resistance (Ω)	47.78	7.941	3.044	1.498	0.8585	-
		Apparent Resistivity (Ω-m)	183.00	76.05	58.31	71.72	82.20	-
	E-W	Measured Resistance (Ω)	40.98	8.294	2.832	1.559	0.8877	-
		Apparent Resistivity (Ω-m)	156.94	79.43	54.25	74.65	85.01	-
ERT-05	N-S	Measured Resistance (Ω)	12.23	3.968	2.447	1.153	0.484	-
		Apparent Resistivity (Ω-m)	46.82	38.01	46.85	55.20	45.99	-
	E-W	Measured Resistance (Ω)	12.2	3.493	2.479	1.146	0.5139	-
		Apparent Resistivity (Ω-m)	46.73	33.44	47.49	54.86	49.19	-
ERT-06	N-S	Measured Resistance (Ω)	9.721	3.736	2.373	1.241	0.5674	-
		Apparent Resistivity (Ω-m)	37.25	35.78	45.45	59.44	54.32	-
	E-W	Measured Resistance (Ω)	7.387	3.655	2.425	1.296	0.5748	-
		Apparent Resistivity (Ω-m)	28.29	34.99	46.45	62.06	55.05	-
ERT-07	N-S	Measured Resistance (Ω)	10.15	2.543	1.91	1.005	0.5269	-
		Apparent Resistivity (Ω-m)	38.89	24.35	36.58	48.10	50.44	-
	E-W	Measured Resistance (Ω)	11.23	4.493	2.105	0.8871	0.5061	-
		Apparent Resistivity (Ω-m)	43.01	43.01	40.33	42.46	48.46	-
		Site Average (Ω)	22.17	5.86	2.81	1.25	0.59	0.08
		Site Average (Ω-m)	84.91	56.09	53.79	59.62	56.50	15.40



Soil Resistivity Results

Client:	AES	Date:	11/4/2021
Project Name:	Somerset Solar	Weather:	Overcast
Project Location:	Somerset, New York	Temperature:	50°F
Equipment:	AGI MiniSting		
Test Method:	Wenner 4 Electrode Array		

Array	Data	Array spacing (ft)											
		1	2	3	5	10	25	50	75	100	150	188	
ERT-SS-2	N-S	Measured Resistance (Ω)	41.89	23.27	15	9.421	4.113	1.192	0.5243	0.3119	0.2051	0.1053	0.06466
		Apparent Resistivity (Ω -m)	80.22	89.12	86.17	90.22	78.76	57.06	50.20	44.81	39.29	30.24	23.28
	E-W	Measured Resistance (Ω)	48.6	21.87	16.05	10.47	5.338	1.125	0.5409	0.3165	0.2159	-	-
		Apparent Resistivity (Ω -m)	93.09	83.79	92.23	100.25	102.23	53.86	51.79	45.48	41.36	-	-
		Site Average (Ω)	45.25	22.57	15.53	9.95	4.73	1.16	0.53	0.31	0.21	0.11	0.06
		Site Average (Ω -m)	86.65	86.46	89.20	95.23	90.50	55.46	50.99	45.14	40.33	30.24	23.28

Note: East-West electrode spacings limited to 100 feet due to site obstructions (fencelines, trees, roadways, etc.)

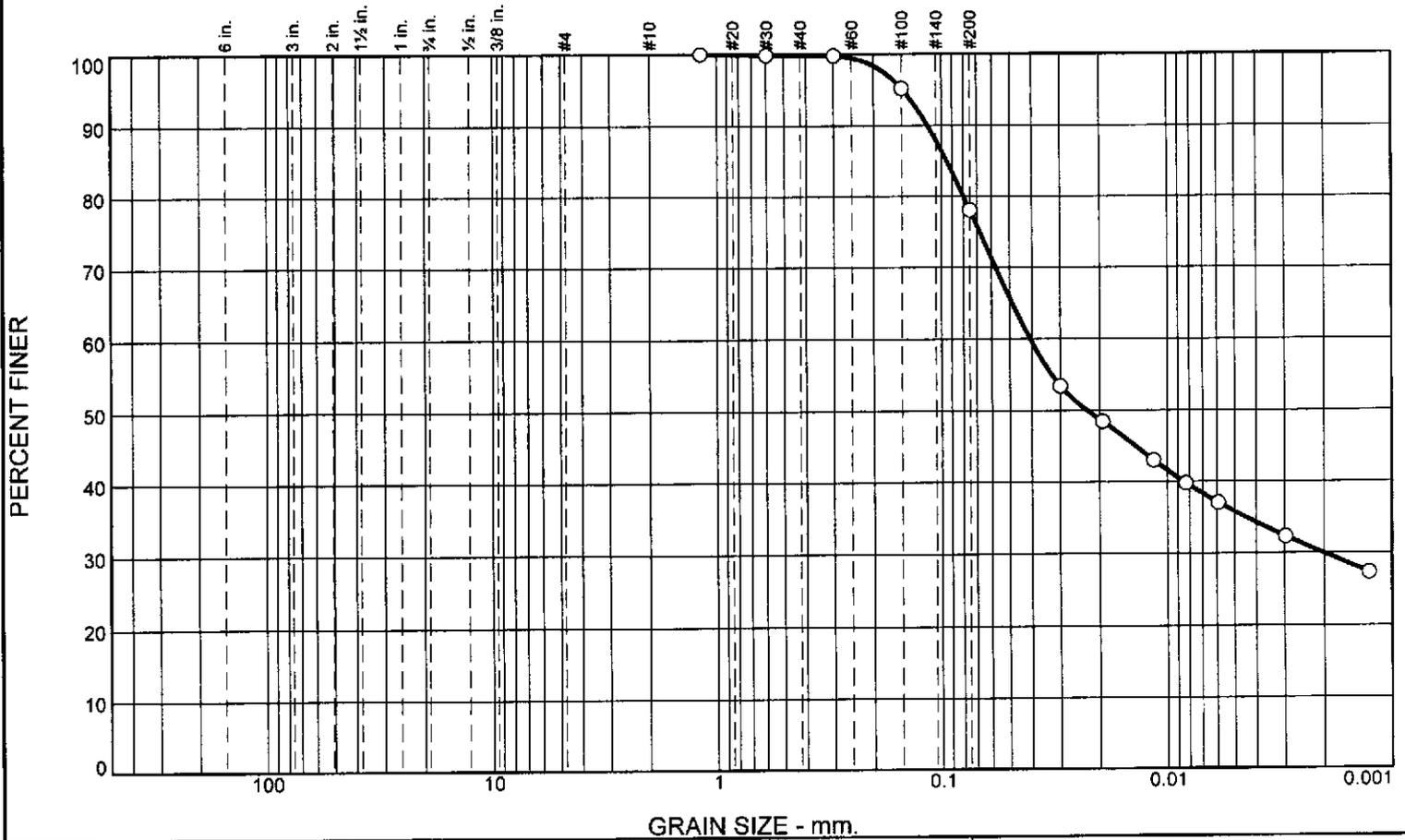
Attachment D

Laboratory Results

SIEVE ANALYSIS

RESULTS

Particle Size Distribution Report As per ASTM D-422



GRAIN SIZE - mm.

% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.2	21.7	42.3	35.8

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#16	100.0		
#30	99.8		
#50	99.7		
#100	95.2		
#200	78.1		

* (no specification provided)

Material Description

silt with sand. Clay loam

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₉₀= 0.1154 D₈₅= 0.0950 D₆₀= 0.0408
 D₅₀= 0.0228 D₃₀= 0.0020 D₁₅=
 D₁₀= C_u= C_c=

Classification

USCS= ML AASHTO= A-4(0)

Remarks

In-Situ %MC=17.4
 F.M.=0.05

Location: B-06, S-3
 Sample Number: S-25

Depth: 4'-6'

Date:

ANS CONSULTANTS, INC.

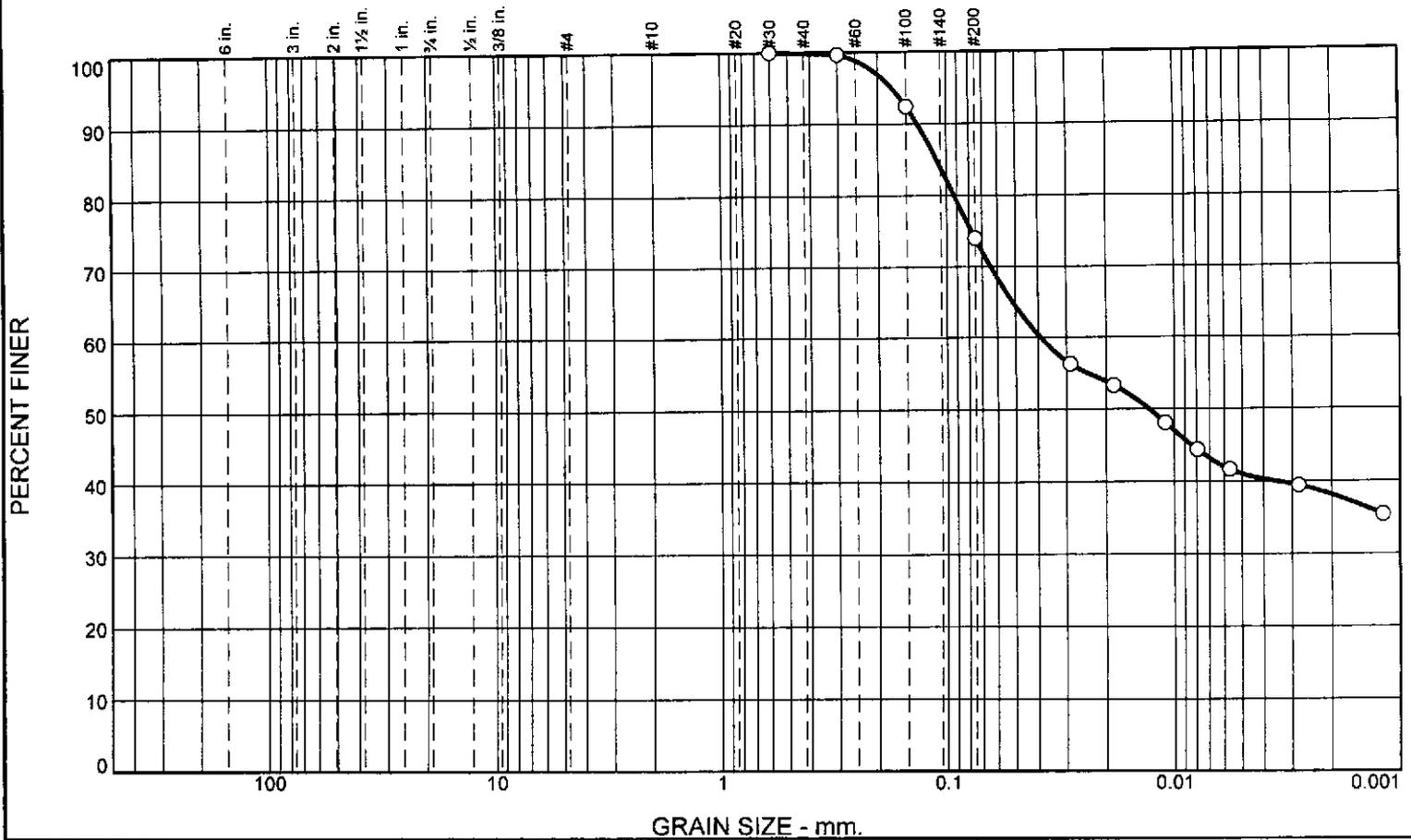
Client: ANS GEO, Inc.
 Project: AES- Somerset Solar, Somerset, NY

South Plainfield, New Jersey

Project No: AOV-5632

Figure 25 F 1

Particle Size Distribution Report As per ASTM D-422



GRAIN SIZE - mm.

% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.2	25.8	33.0	41.0

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#30	100.0		
#50	99.7		
#100	92.4		
#200	74.0		

* (no specification provided)

Material Description

silt with sand. Clay loam.

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₉₀= 0.1343 D₈₅= 0.1106 D₆₀= 0.0391
 D₅₀= 0.0130 D₃₀= D₁₅=
 D₁₀= C_u= C_c=

Classification

USCS= ML AASHTO= A-4(0)

Remarks

In-Situ %MC=14.7
 F.M.=0.08

Location: B-21, S-4
 Sample Number: S-8

Depth: 6'-8'

Date:

ANS CONSULTANTS, INC.

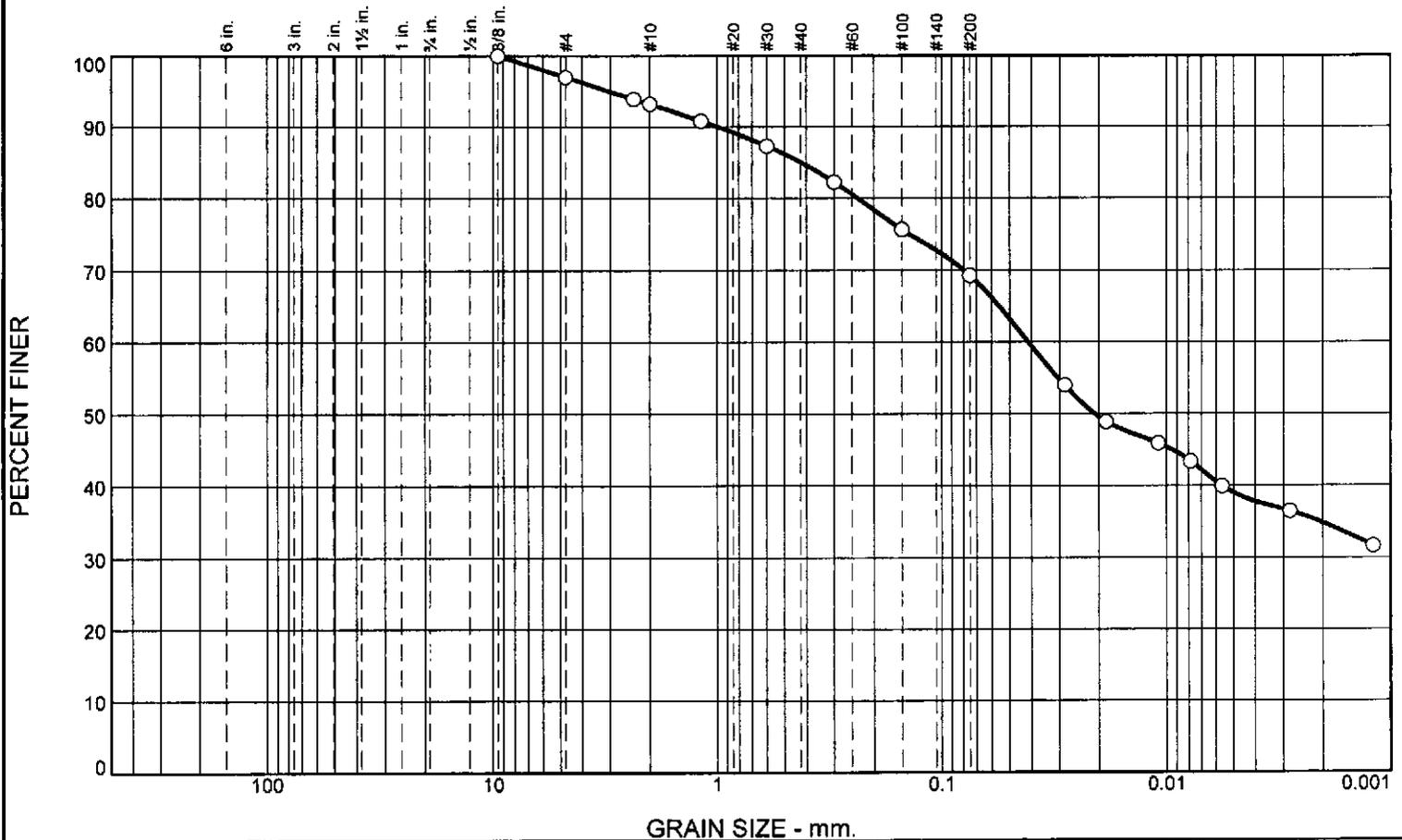
Client: ANS GEO, Inc.
 Project: AES- Somerset Solar, Somerset, NY

South Plainfield, New Jersey

Project No: AOV-5632

Figure 8 F 1

Particle Size Distribution Report As per ASTM D-422



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	3.0	3.8	8.2	15.7	30.3	39.0

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/8	100.0		
#4	97.0		
#8	93.9		
#10	93.2		
#16	90.8		
#30	87.3		
#50	82.2		
#100	75.7		
#200	69.3		

Material Description

sandy silt. Clay loam

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₉₀= 1.0052 D₈₅= 0.4236 D₆₀= 0.0414
 D₅₀= 0.0210 D₃₀= D₁₅=
 D₁₀= C_u= C_c=

Classification

USCS= ML AASHTO= A-4(0)

Remarks

In-Situ %MC=2.0
 F.M.=0.73

* (no specification provided)

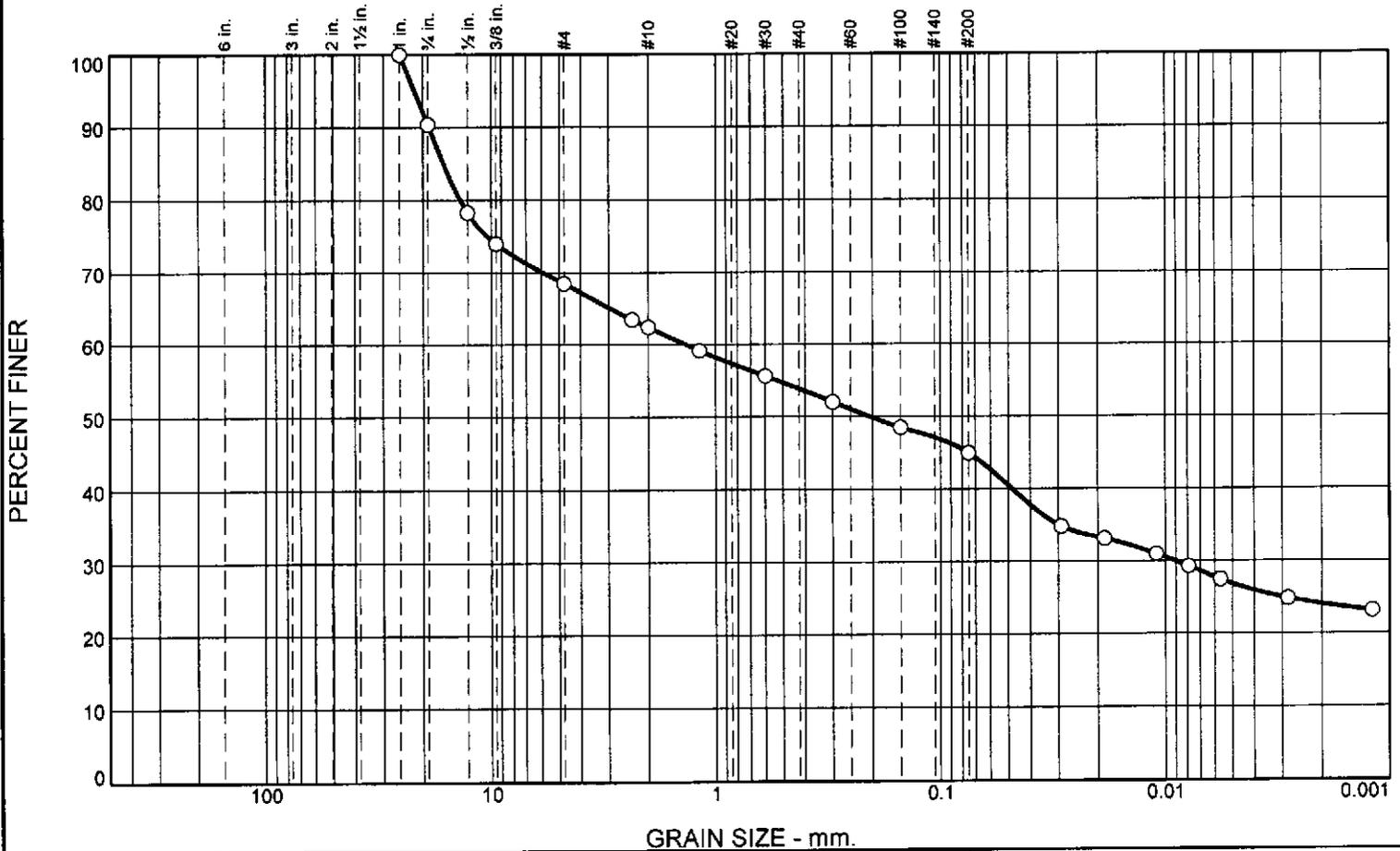
Location: B-24, S-7
 Sample Number: S-33

Depth: 18'-20'

Date:

ANS CONSULTANTS, INC.	Client: ANS GEO, Inc.
South Plainfield, New Jersey	Project: AES- Somerset Solar, Somerset, NY
Project No: AOV-5632	Figure 33 F 1

Particle Size Distribution Report As per ASTM D-422



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	9.7	21.8	6.1	8.6	8.9	18.1	26.8

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1	100.0		
3/4	90.3		
1/2	78.3		
3/8	74.1		
#4	68.5		
#8	63.4		
#10	62.4		
#16	59.1		
#30	55.5		
#50	52.0		
#100	48.4		
#200	44.9		

* (no specification provided)

Material Description

silty gravel with sand. Clay loam

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₉₀= 18.8569 D₈₅= 16.2168 D₆₀= 1.3673
D₅₀= 0.2079 D₃₀= 0.0090 D₁₅=
D₁₀= C_u= C_c=

Classification

USCS= GM AASHTO= A-4(0)

Remarks

In-Situ %MC=8.5
F.M.=2.89

Location: B-26, S-4
Sample Number: S-2

Depth: 6'-8'

Date:

ANS CONSULTANTS, INC.

Client: ANS GEO, Inc.

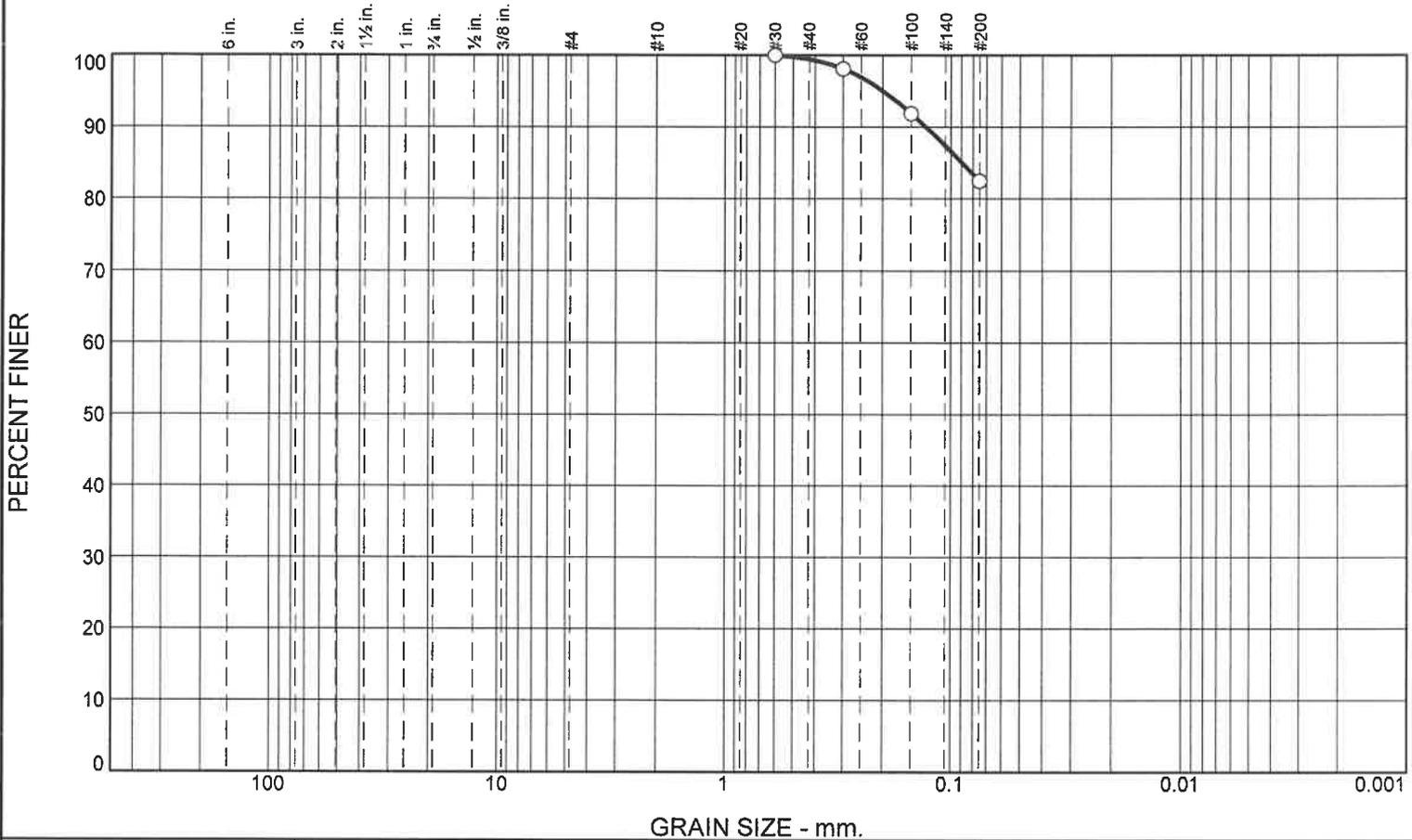
Project: AES- Somerset Solar, Somerset, NY

South Plainfield, New Jersey

Project No: AOV-5632

Figure 2 F 1

Particle Size Distribution Report As per ASTM D-422



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.6	17.0	82.4	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#30	100.0		
#50	98.1		
#100	91.9		
#200	82.4		

* (no specification provided)

Material Description

silt with sand

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₉₀= 0.1292 D₈₅= 0.0896 D₆₀=
D₅₀= D₃₀= D₁₅=
D₁₀= C_u= C_c=

Classification

USCS= ML AASHTO= A-4(0)

Remarks

Inb-Situ %MC=19.6 Organic Content=3.3%
F.M.=0.10

Location: B-M1, S-6
Sample Number: S-36

Depth: 13'-15'

Date:

ANS CONSULTANTS, INC.

Client: ANS GEO, Inc.

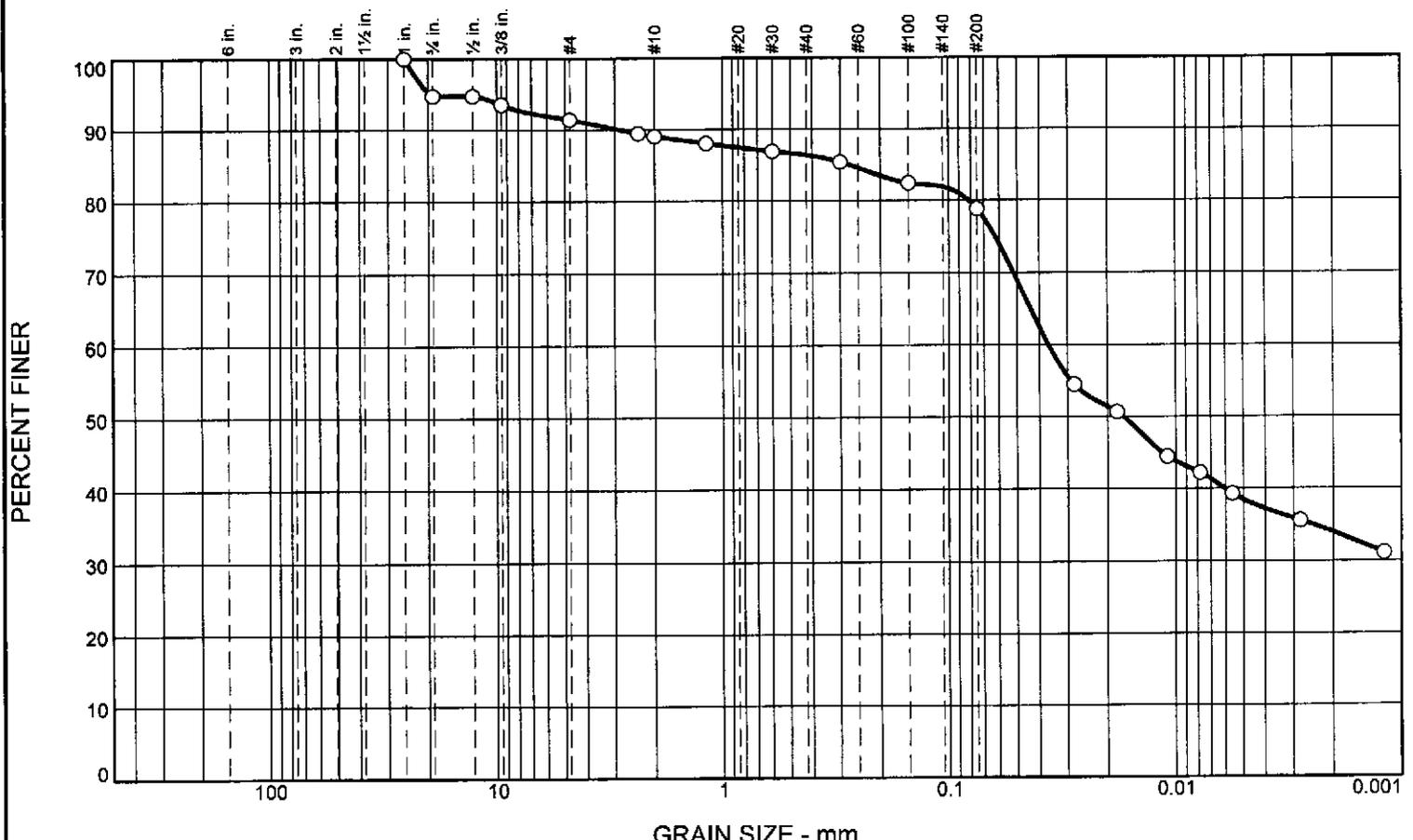
Project: AES- Somerset Solar, Somerset, NY

South Plainfield, New Jersey

Project No: AOV-5632

Figure 36 F 1

Particle Size Distribution Report As per ASTM D-422



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	5.3	3.3	2.4	2.7	7.5	40.3	38.5

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1	100.0		
3/4	94.7		
1/2	94.7		
3/8	93.5		
#4	91.4		
#8	89.4		
#10	89.0		
#16	88.0		
#30	86.9		
#50	85.3		
#100	82.4		
#200	78.8		

Material Description

silt with sand. Clay loam.

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D₉₀= 2.8991 D₈₅= 0.2769 D₆₀= 0.0366
D₅₀= 0.0171 D₃₀= D₁₅=
D₁₀= C_u= C_c=

Classification

USCS= ML AASHTO= A-4(0)

Remarks

In-Situ %MC=15.6
F.M.=0.88

* (no specification provided)

Location: B-SS-1, S-1
Sample Number: S-28

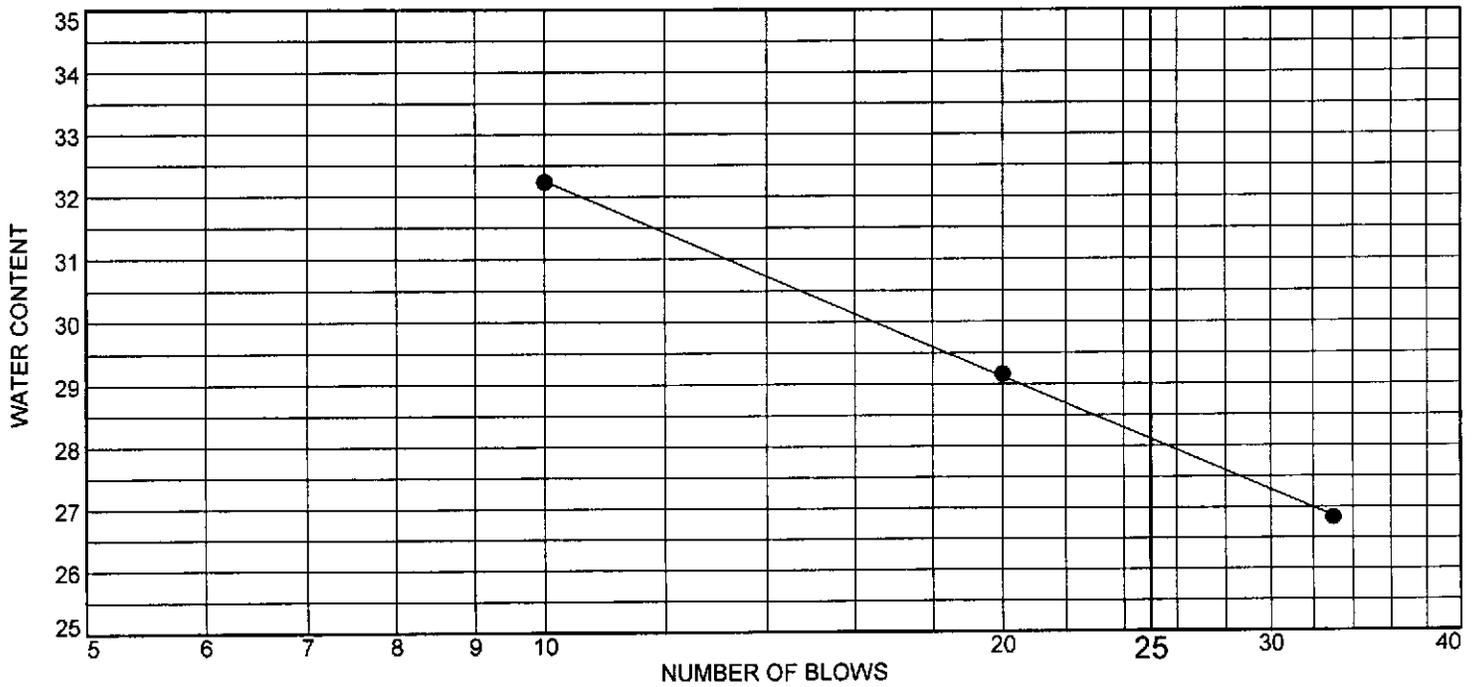
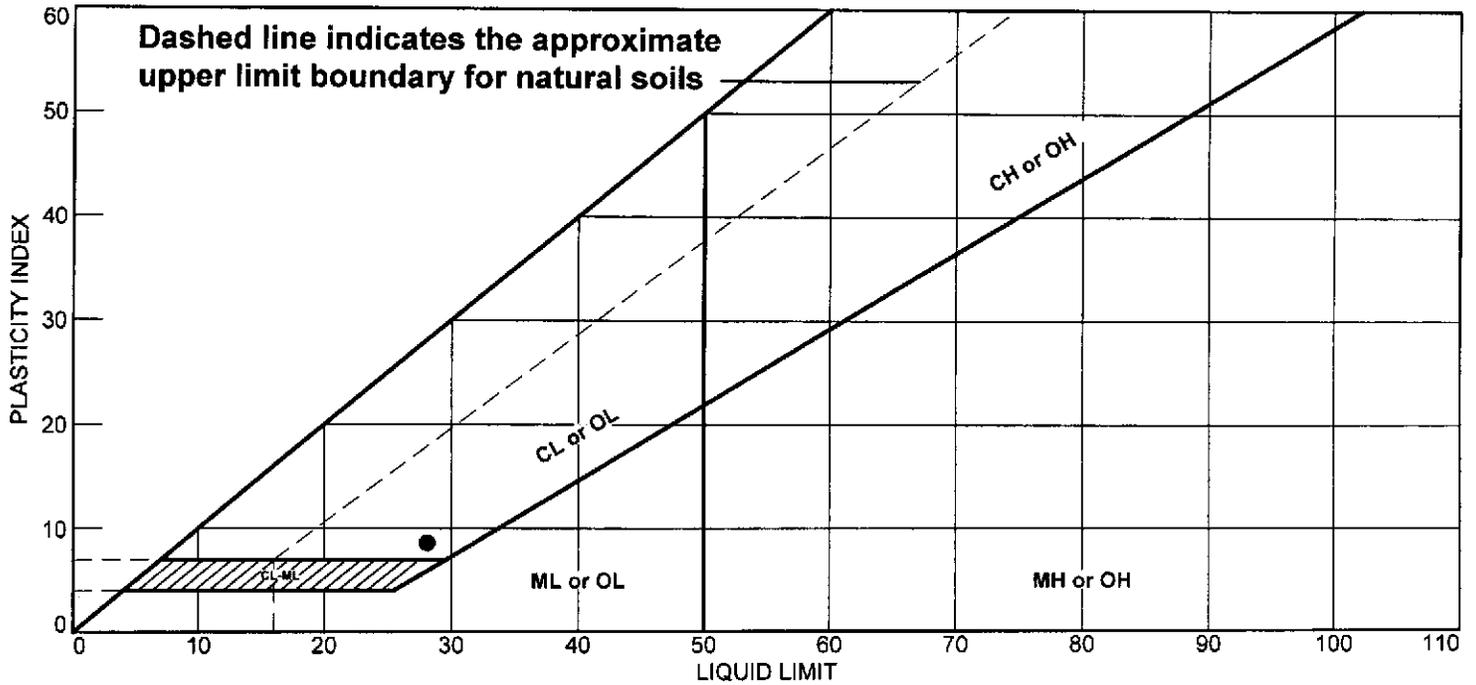
Depth: 0'-2'

Date:

ATTERBERG LIMITS

RESULTS

LIQUID AND PLASTIC LIMITS TEST REPORT



MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	28.1	19.5	8.6			

Project No. AOV-5632 **Client:** ANS GEO, Inc.

Project: AES- Somerset Solar, Somerset, NY

Location: B-01, S-2

Sample Number: S-24

Depth: 2'-4'

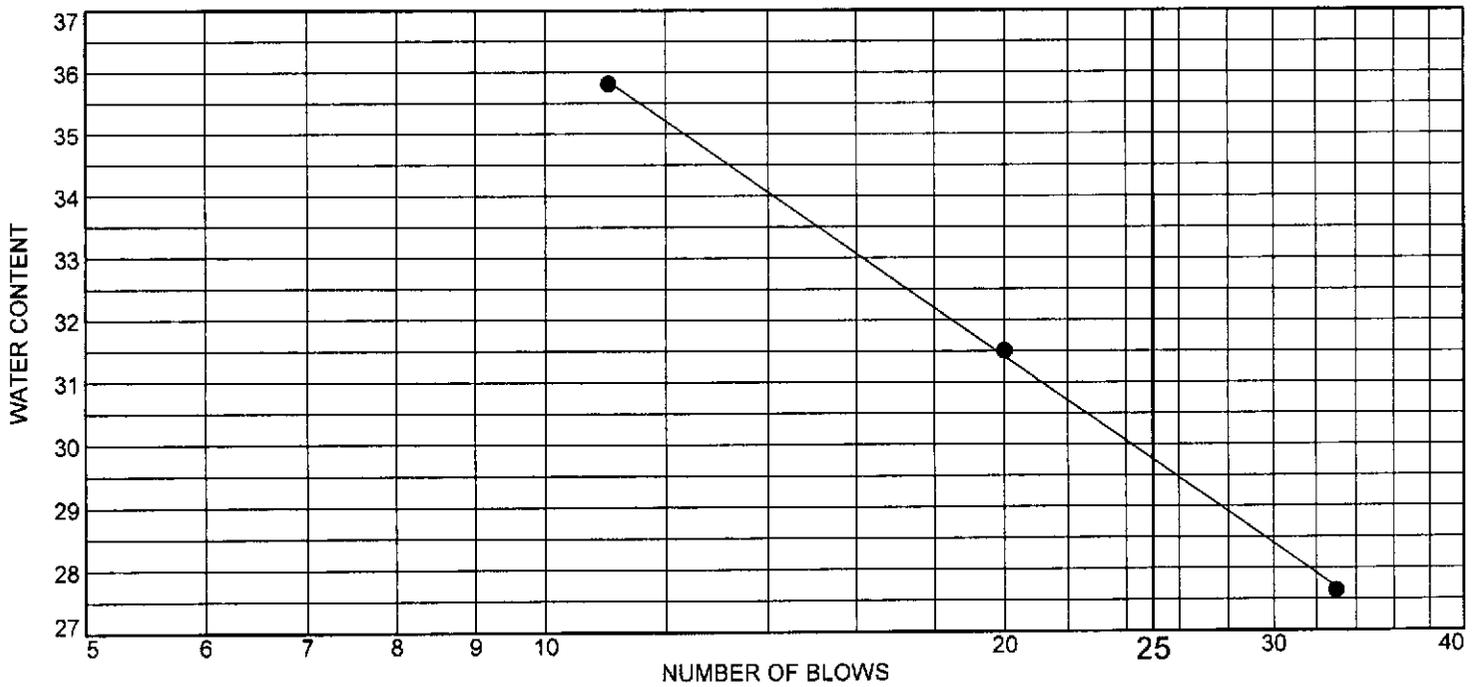
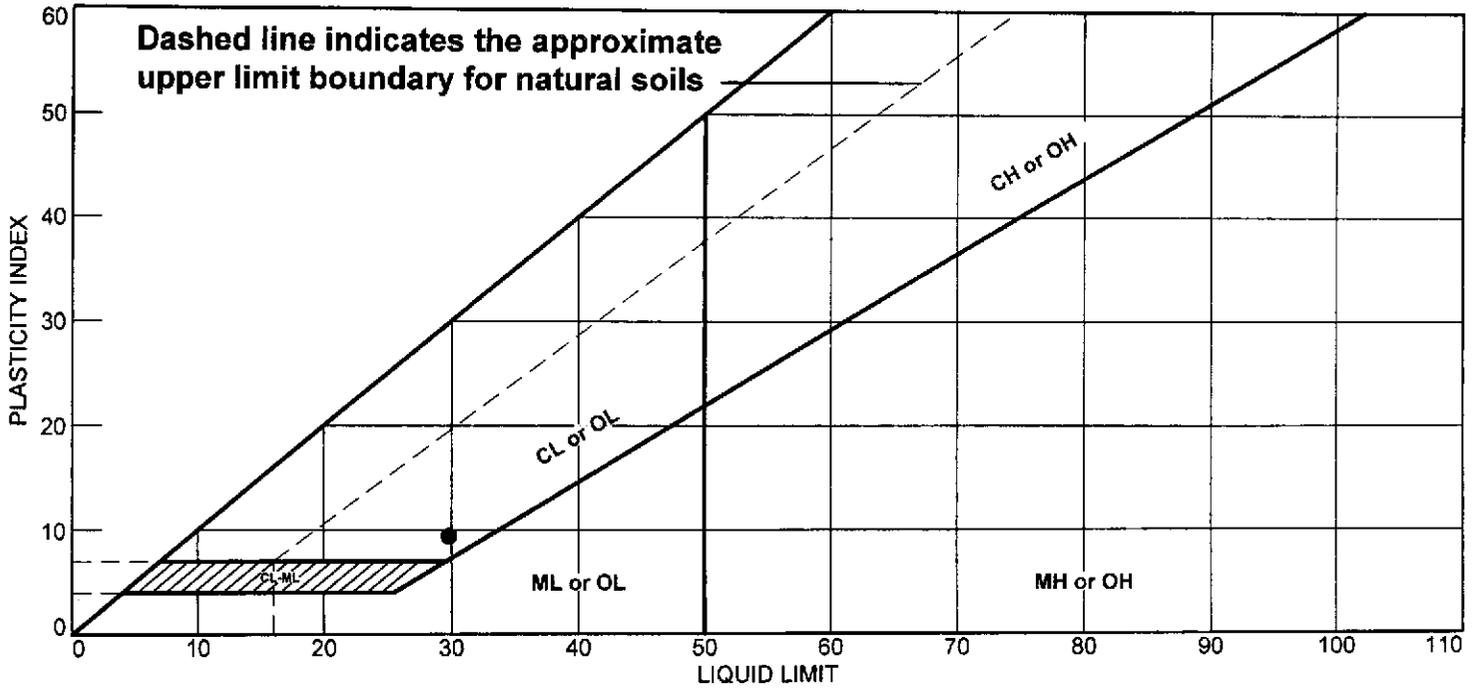
ANS CONSULTANTS, INC.

South Plainfield, New Jersey

Remarks:

● In-Situ %MC=21.1

LIQUID AND PLASTIC LIMITS TEST REPORT



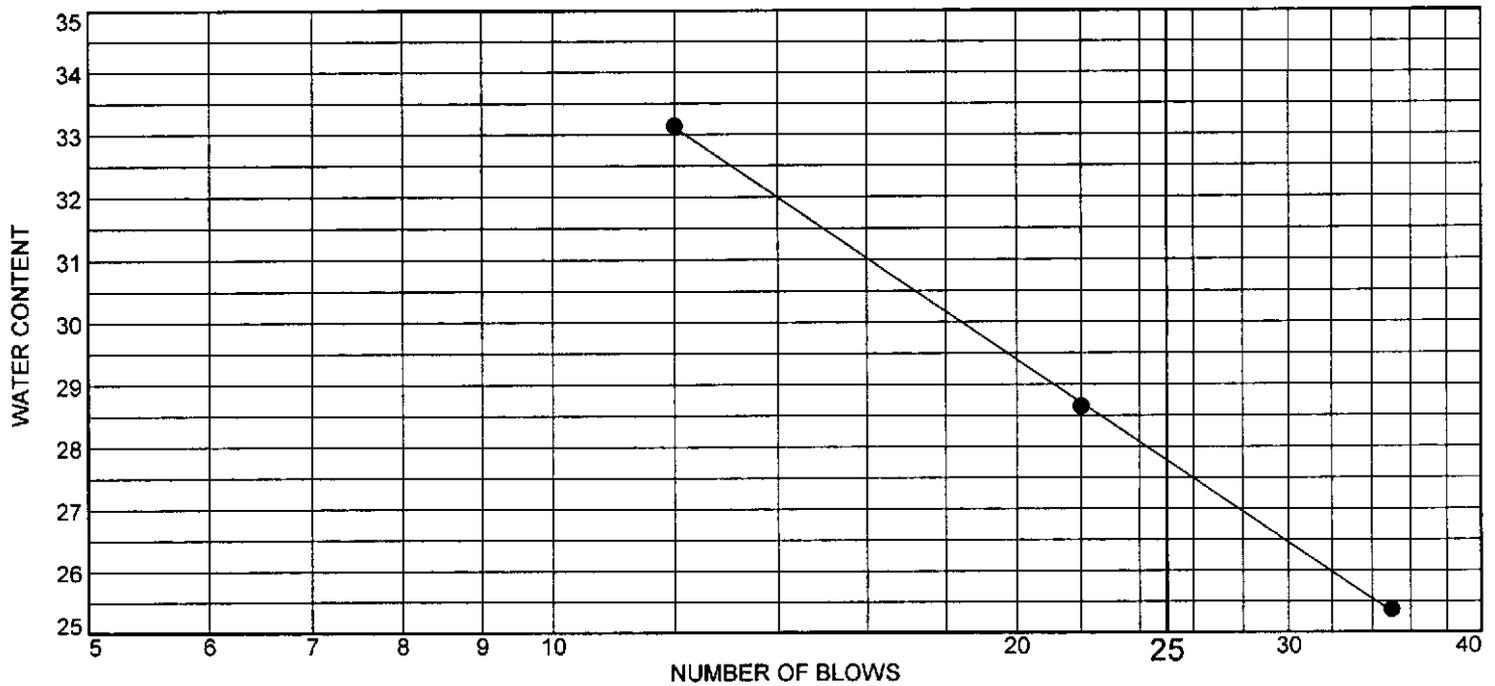
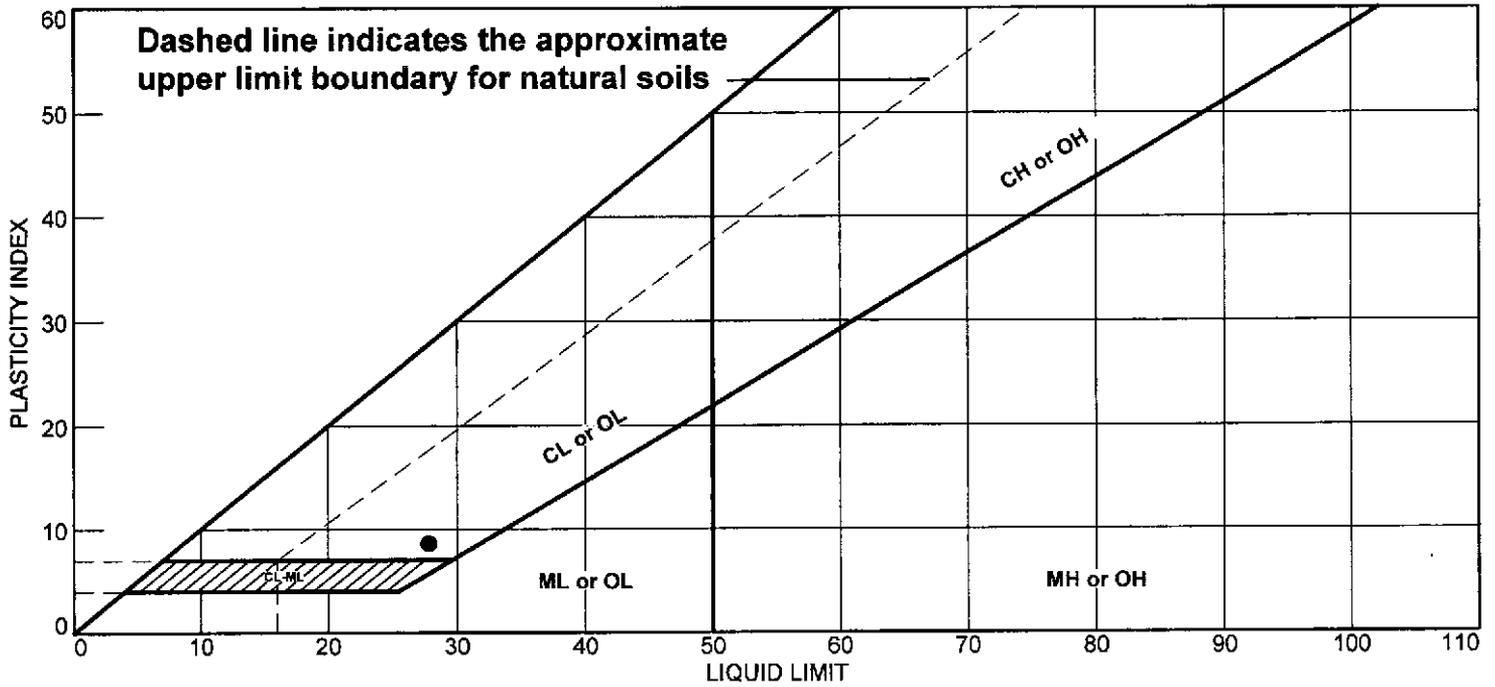
MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	29.8	20.4	9.4			

Project No. AOV-5632 **Client:** ANS GEO, Inc.
Project: AES- Somerset Solar, Somerset, NY
Location: B-03, S-1
Sample Number: S-9 **Depth:** 1'-2'
ANS CONSULTANTS, INC.
 South Plainfield, New Jersey

Remarks:
 ● In-Situ %MC=24.1

Figure 9 F 3

LIQUID AND PLASTIC LIMITS TEST REPORT



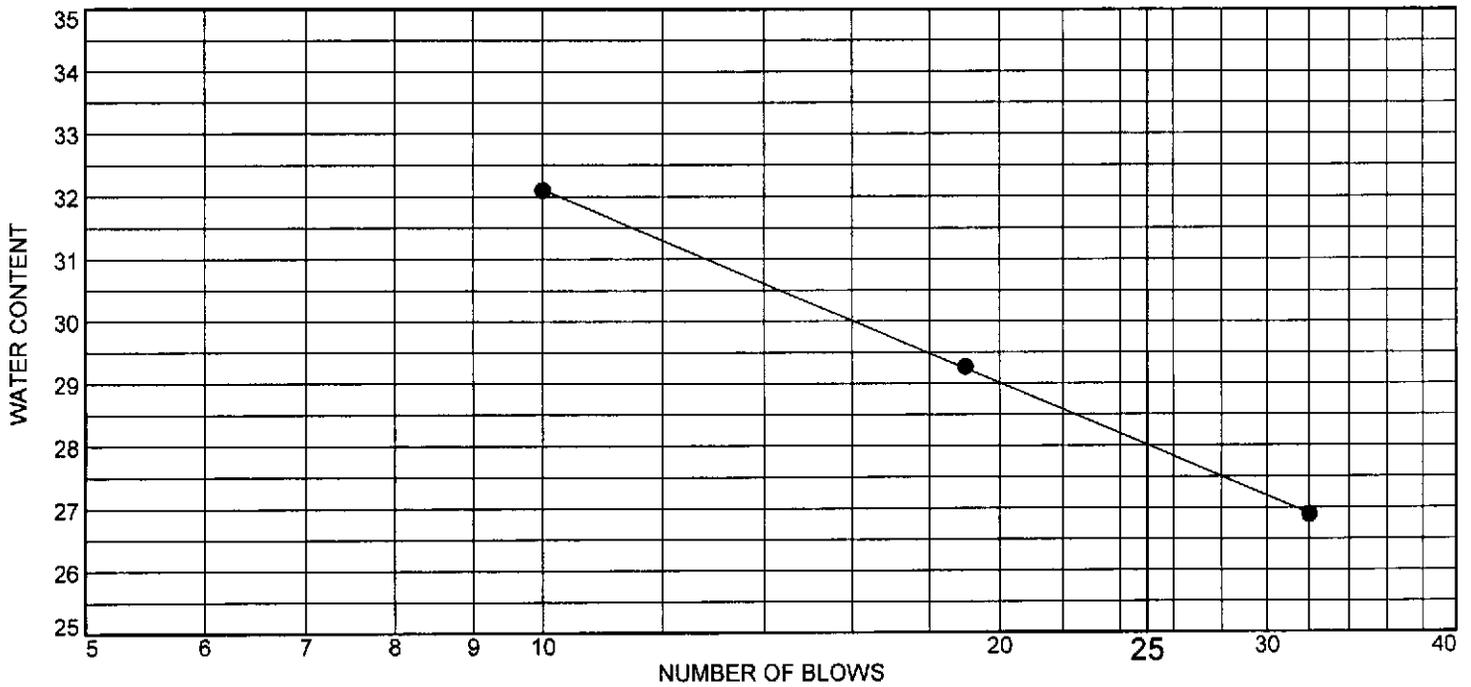
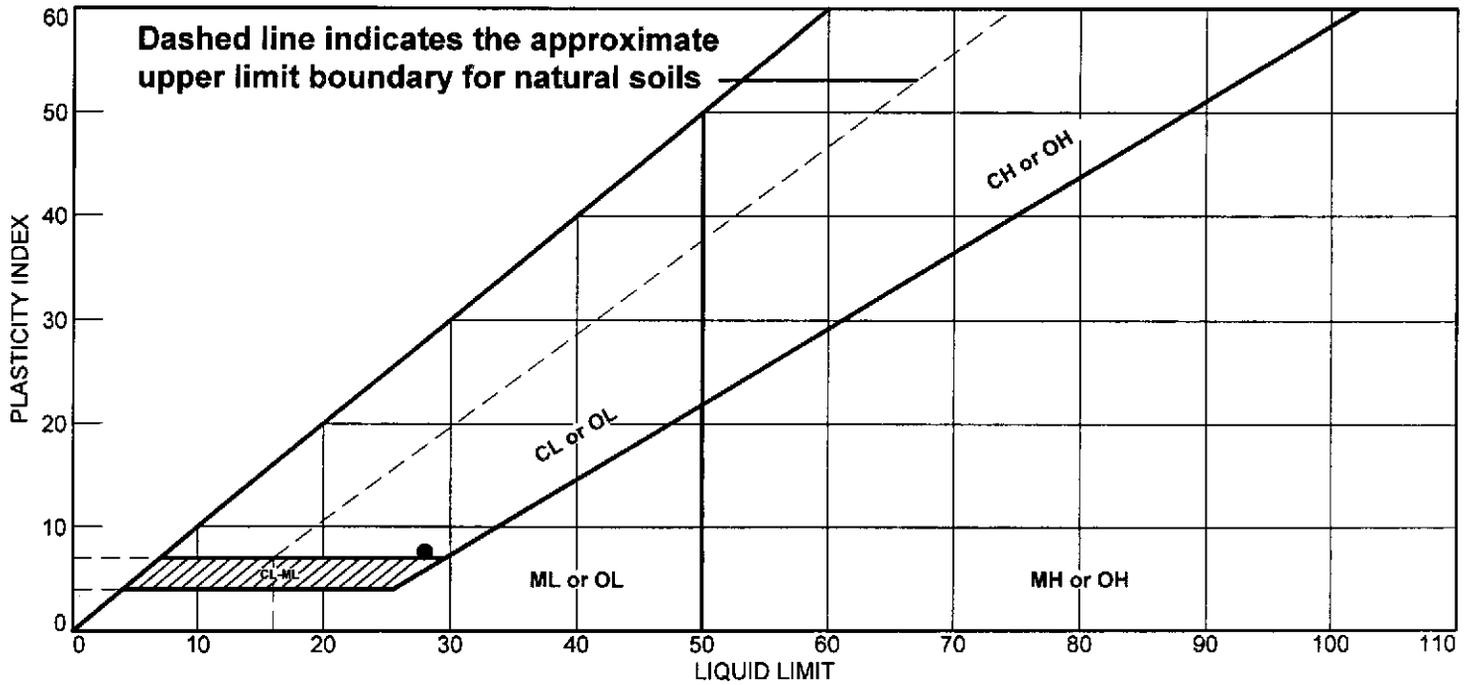
MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	27.8	19.2	8.6			

Project No. AOV-5632 **Client:** ANS GEO, Inc.
Project: AES- Somerset Solar, Somerset, NY
Location: B-05, S-3
Sample Number: S-1 **Depth:** 4'-6'
ANS CONSULTANTS, INC.
South Plainfield, New Jersey

Remarks:
● In-Situ %MC=16.4

Figure 1 F 3

LIQUID AND PLASTIC LIMITS TEST REPORT



MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	28.0	20.4	7.6			

Project No. AOV-5632 **Client:** ANS GEO, Inc.

Project: AES- Somerset Solar, Somerset, NY

Location: B-07, S-5

Sample Number: S-26

Depth: 8'-10'

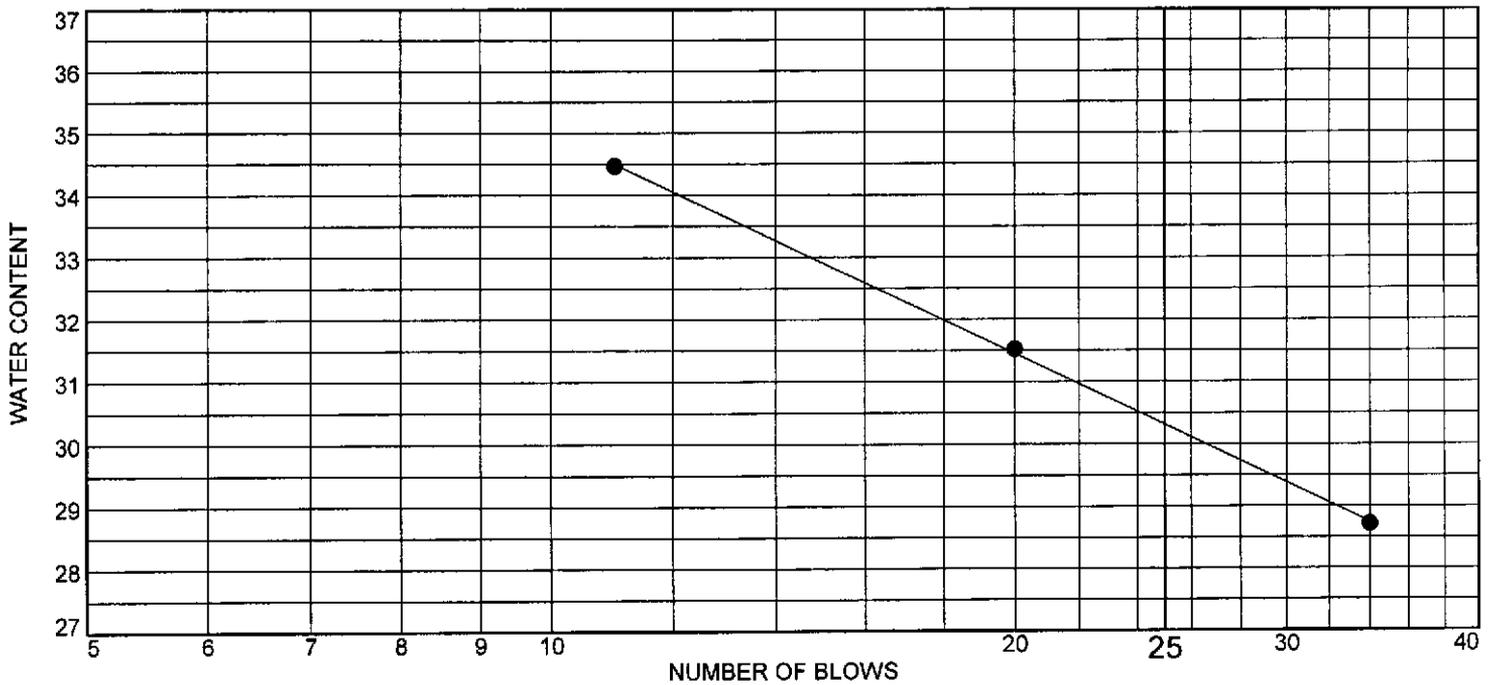
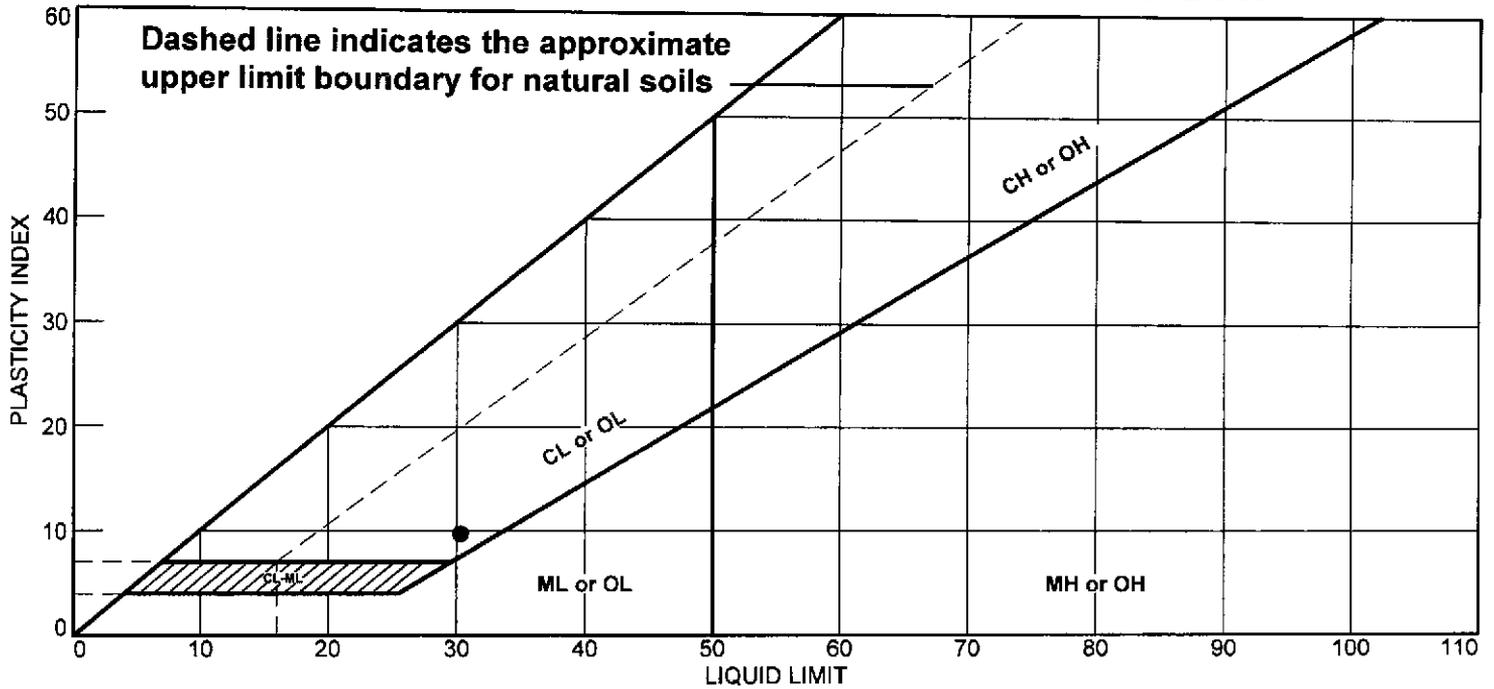
ANS CONSULTANTS, INC.

South Plainfield, New Jersey

Remarks:

● In-Situ %MC=12.1

LIQUID AND PLASTIC LIMITS TEST REPORT



MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	30.3	20.6	9.7			

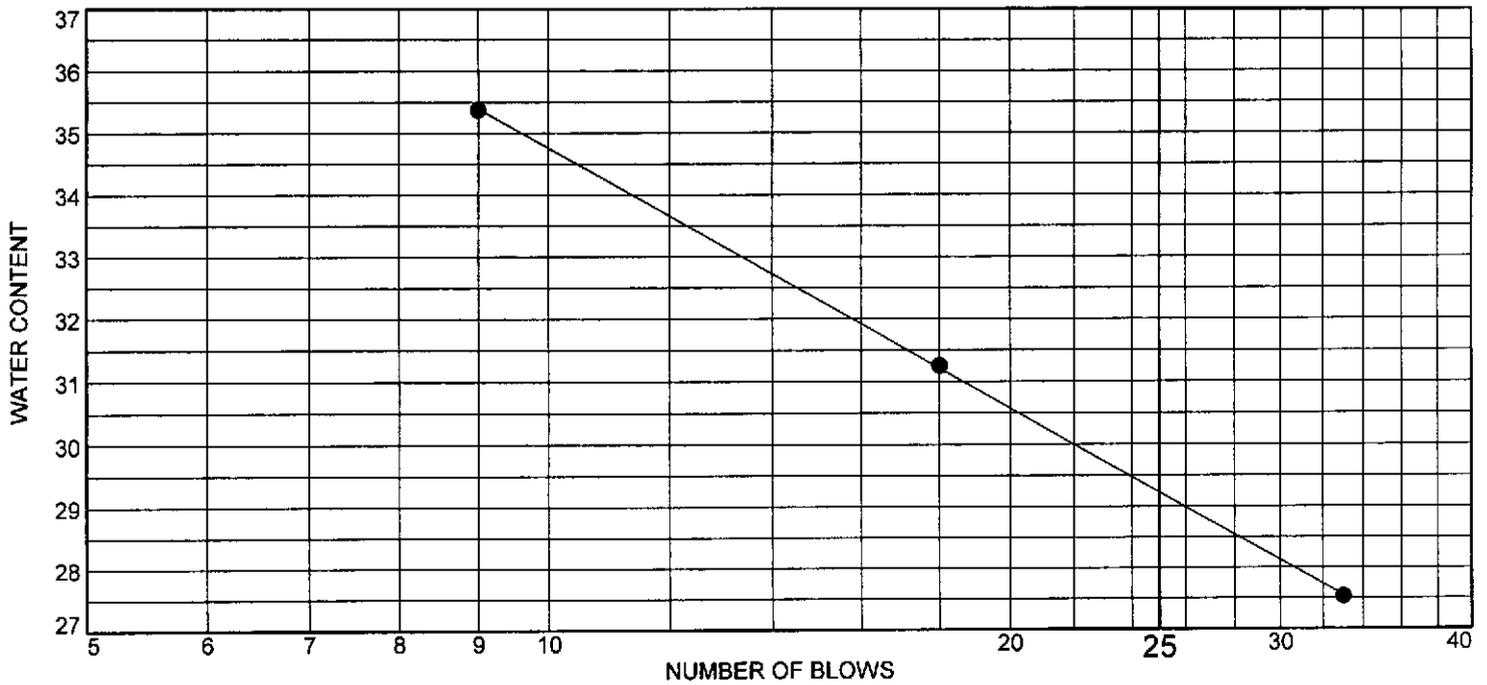
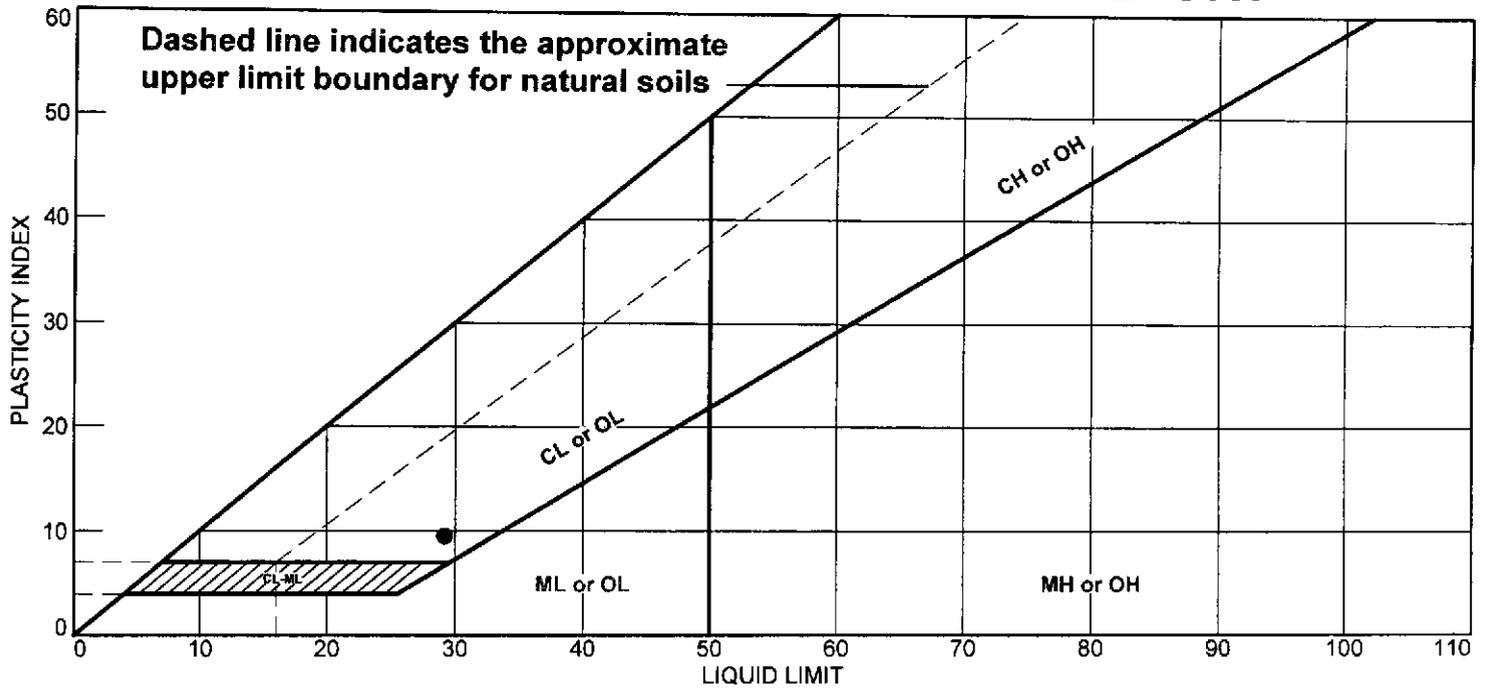
Project No. AOV-5632 **Client:** ANS GEO, Inc.
Project: AES- Somerset Solar, Somerset, NY
Location: B-10, S-4
Sample Number: S-10 **Depth:** 6'-8'

ANS CONSULTANTS, INC.
South Plainfield, New Jersey

Remarks:
● In-Situ %MC=24.5

Figure 10 F 3

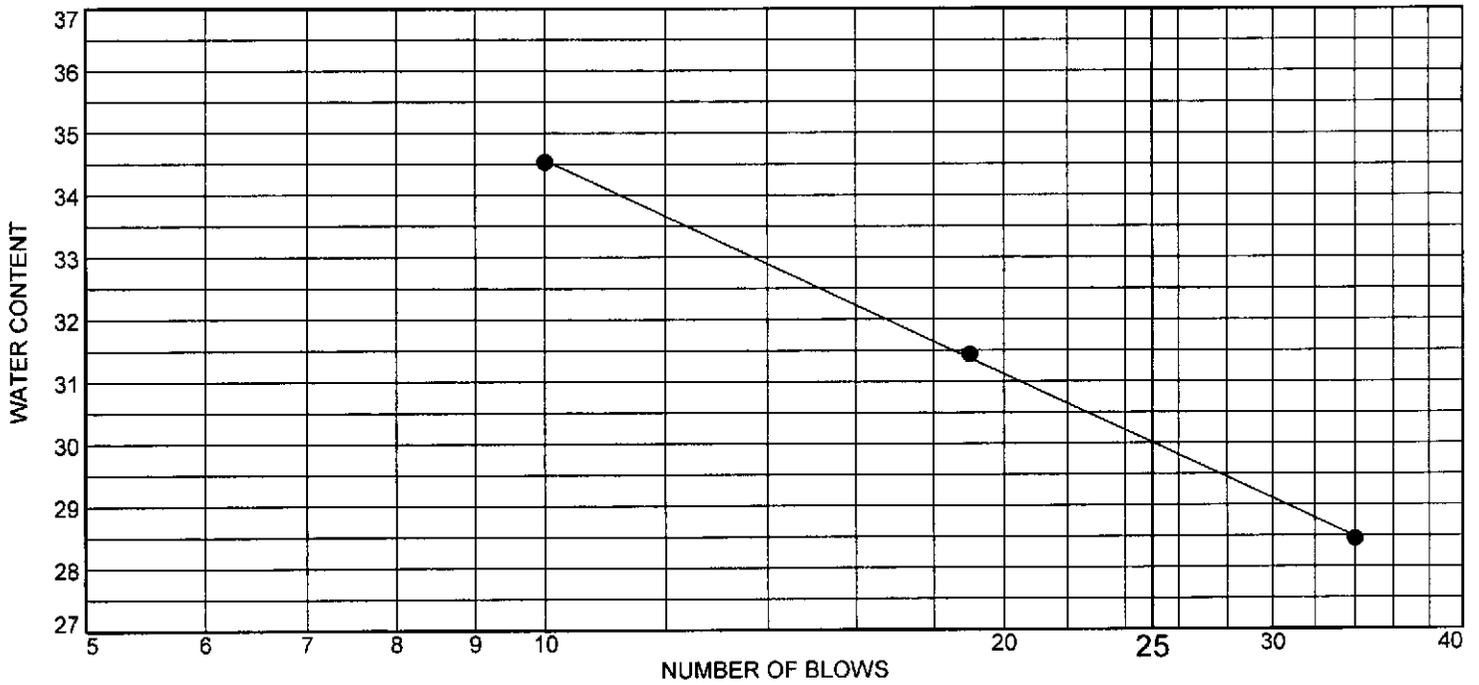
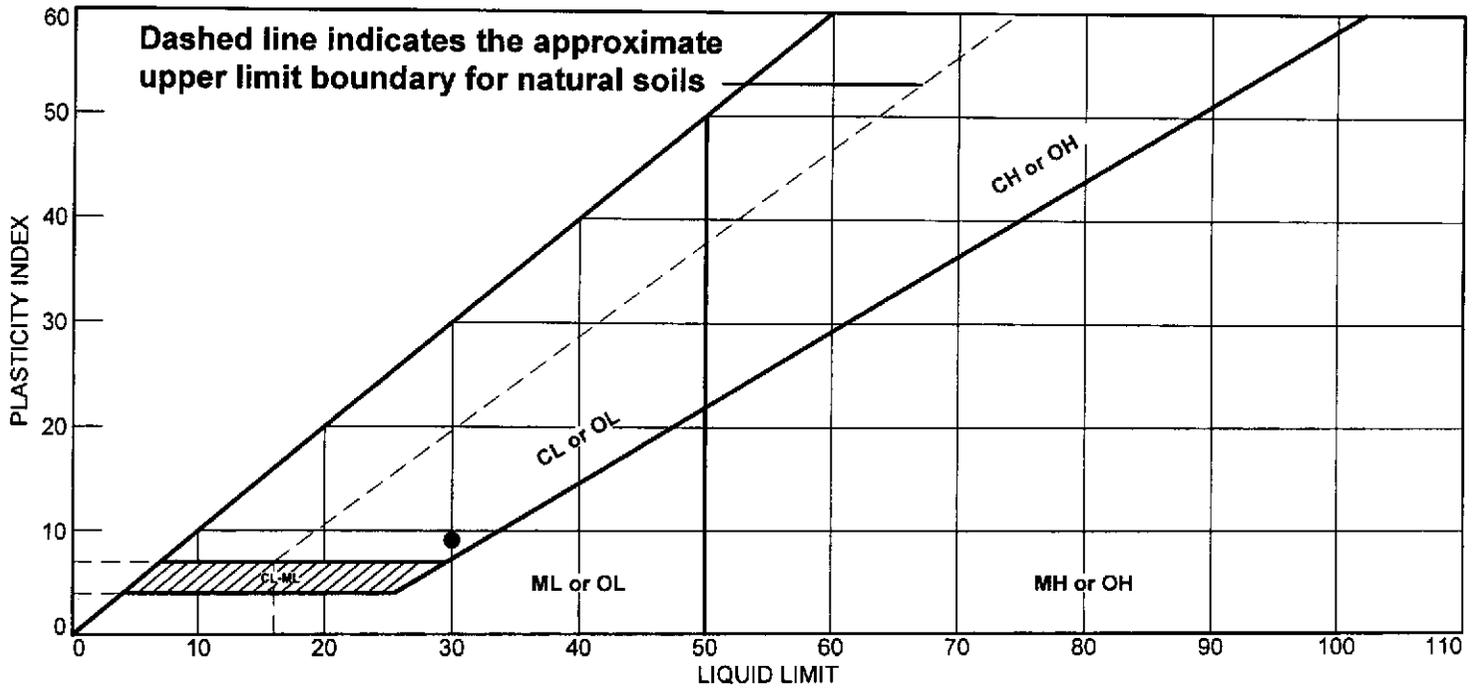
LIQUID AND PLASTIC LIMITS TEST REPORT



MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	29.2	19.7	9.5			

<p>Project No. AOV-5632 Client: ANS GEO, Inc.</p> <p>Project: AES- Somerset Solar, Somerset, NY</p> <p>Location: B-12, S-4 Sample Number: S-11 Depth: 6'-8'</p> <p style="text-align: center;">ANS CONSULTANTS, INC.</p> <p style="text-align: center;">South Plainfield, New Jersey</p>	<p>Remarks:</p> <p>● In-Situ %MC=23.1</p>
---	--

LIQUID AND PLASTIC LIMITS TEST REPORT



MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	30.0	20.9	9.1			

Project No. AOV-5632 **Client:** ANS GEO, Inc.

Project: AES- Somerset Solar, Somerset, NY

Location: B-14, S-5

Sample Number: S-13

Depth: 8'-10'

ANS CONSULTANTS, INC.

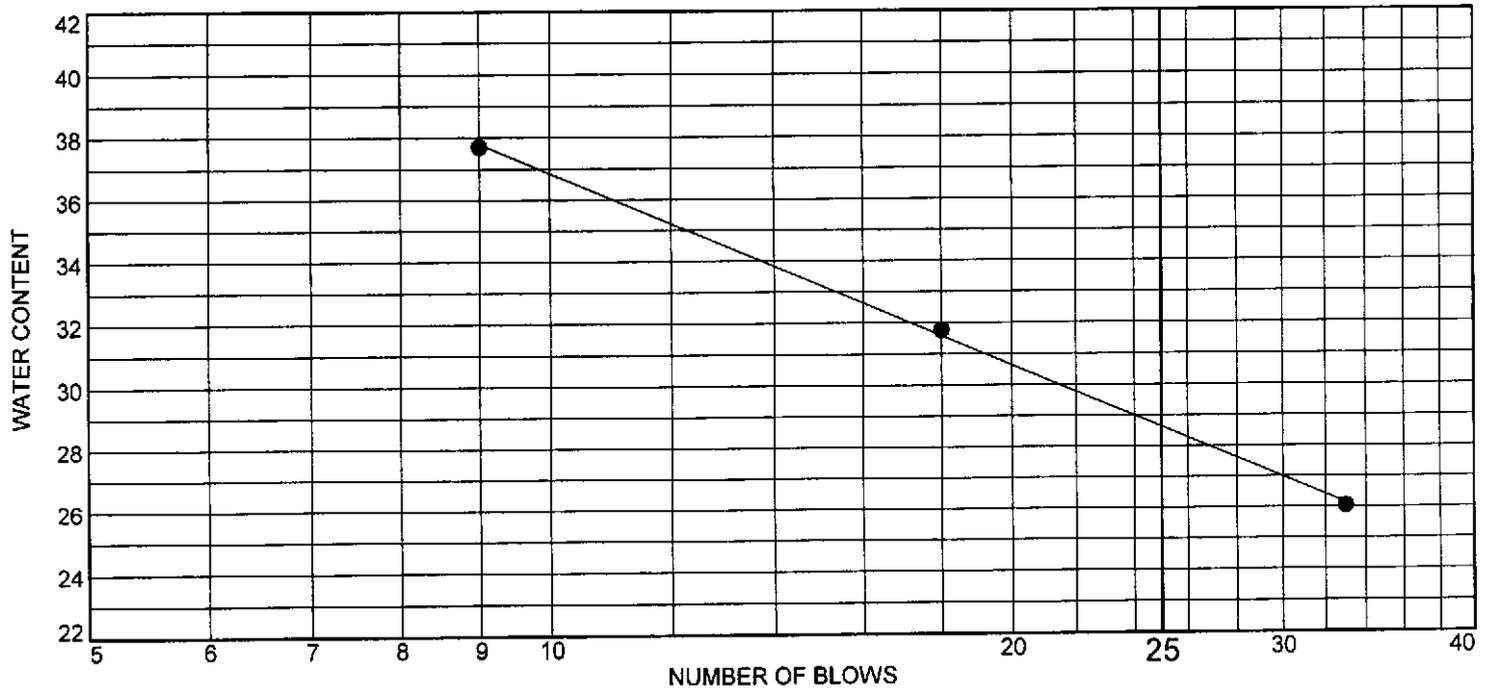
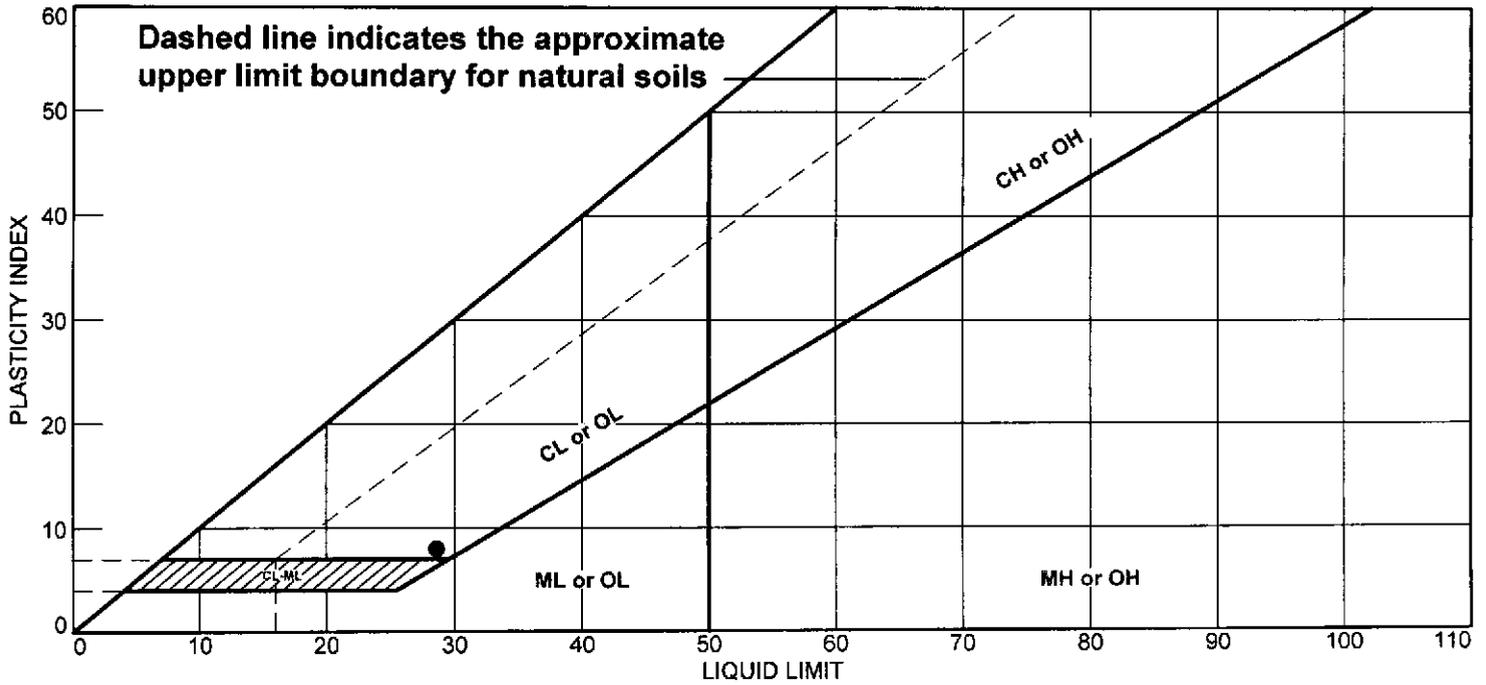
South Plainfield, New Jersey

Remarks:

● In-Situ %MC=20.2

Figure 13 F 3

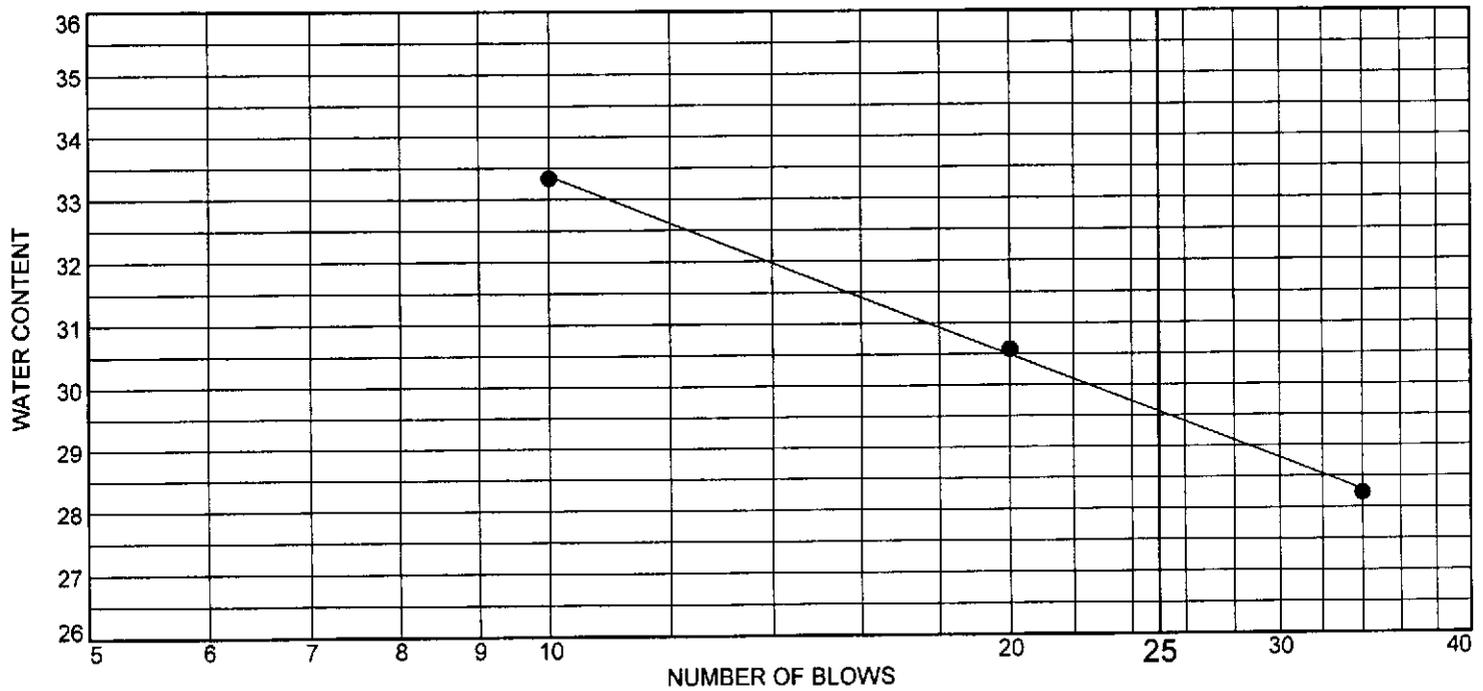
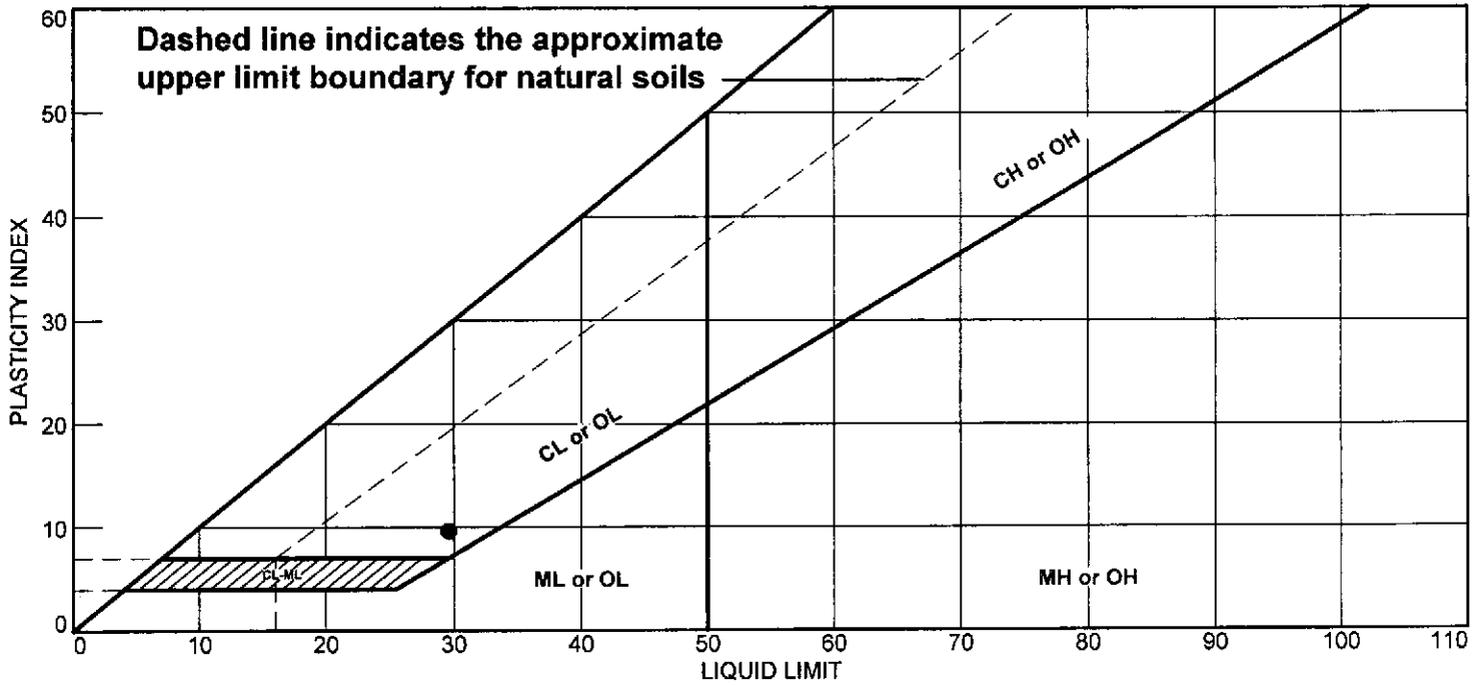
LIQUID AND PLASTIC LIMITS TEST REPORT



MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	28.6	20.6	8.0			

<p>Project No. AOV-5632 Client: ANS GEO, Inc.</p> <p>Project: AES- Somerset Solar, Somerset, NY</p> <p>Location: B-15, S-5 Depth: 8'-10'</p> <p>Sample Number: S-29</p> <p style="text-align: center;">ANS CONSULTANTS, INC.</p> <p style="text-align: center;">South Plainfield, New Jersey</p>	<p>Remarks:</p> <p>● In-Situ %MC=11.2</p>
---	--

LIQUID AND PLASTIC LIMITS TEST REPORT



MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	29.6	20.0	9.6			

Project No. AOV-5632 **Client:** ANS GEO, Inc.

Project: AES- Somerset Solar, Somerset, NY

Location: B-18, S-6

Sample Number: S-30

Depth: 13'-15'

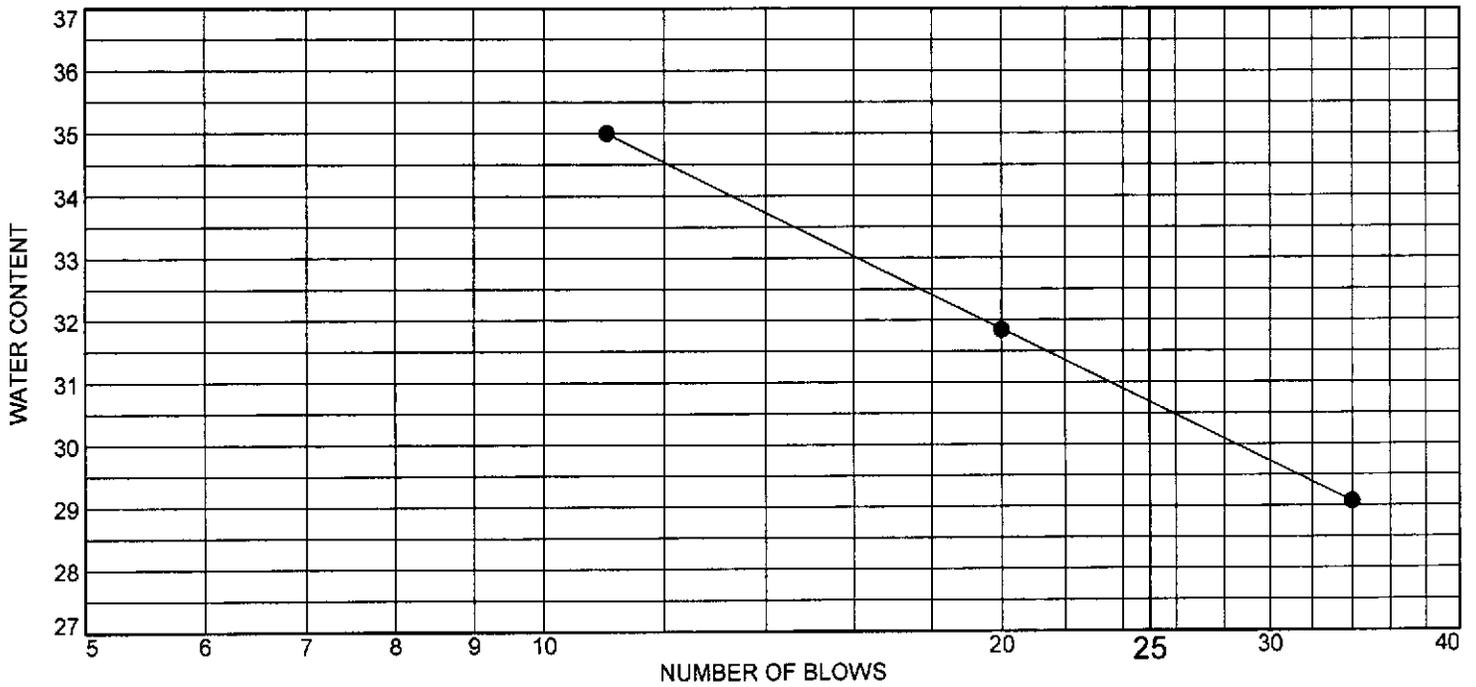
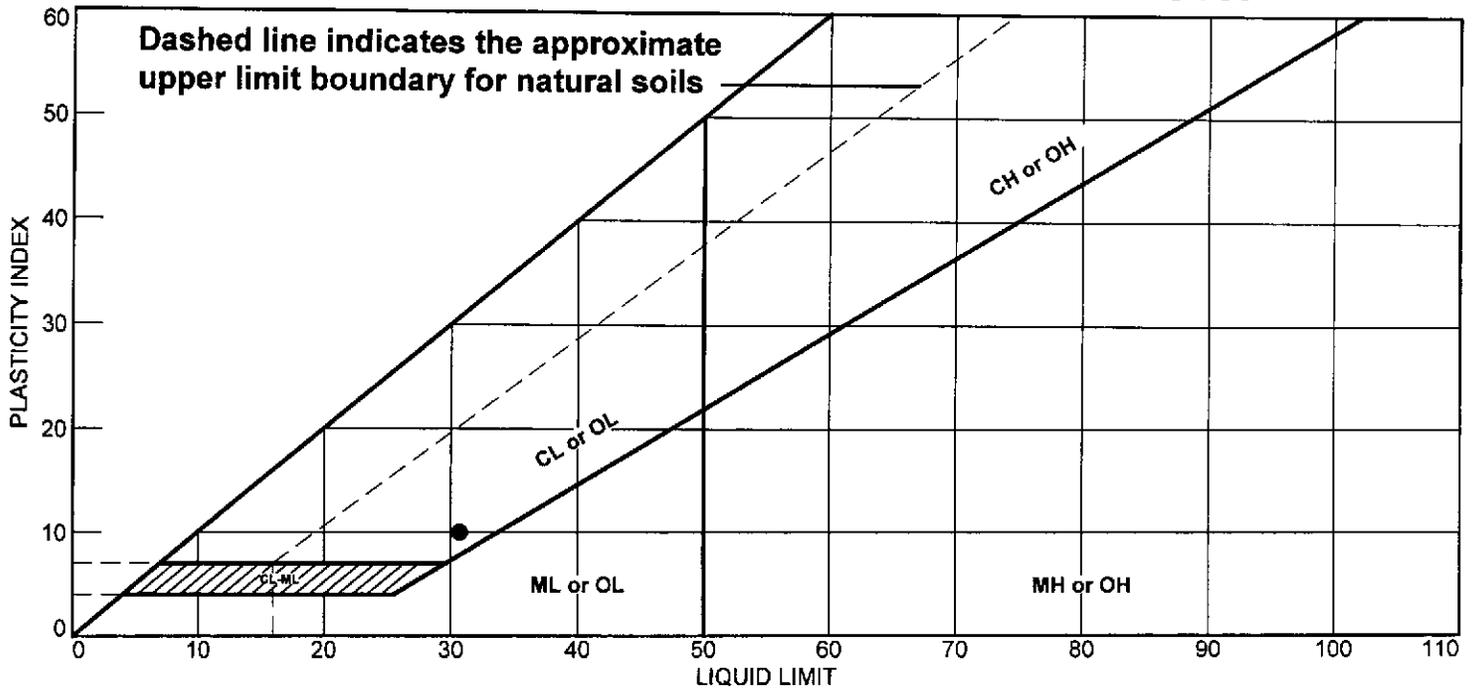
ANS CONSULTANTS, INC.

South Plainfield, New Jersey

Remarks:

● In-Situ %MC=18.9

LIQUID AND PLASTIC LIMITS TEST REPORT



MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	30.7	20.7	10.0			

Project No. AOV-5632 **Client:** ANS GEO, Inc.

Project: AES- Somerset Solar, Somerset, NY

Location: B-19, S-2

Sample Number: S-27

Depth: 2'-4'

ANS CONSULTANTS, INC.

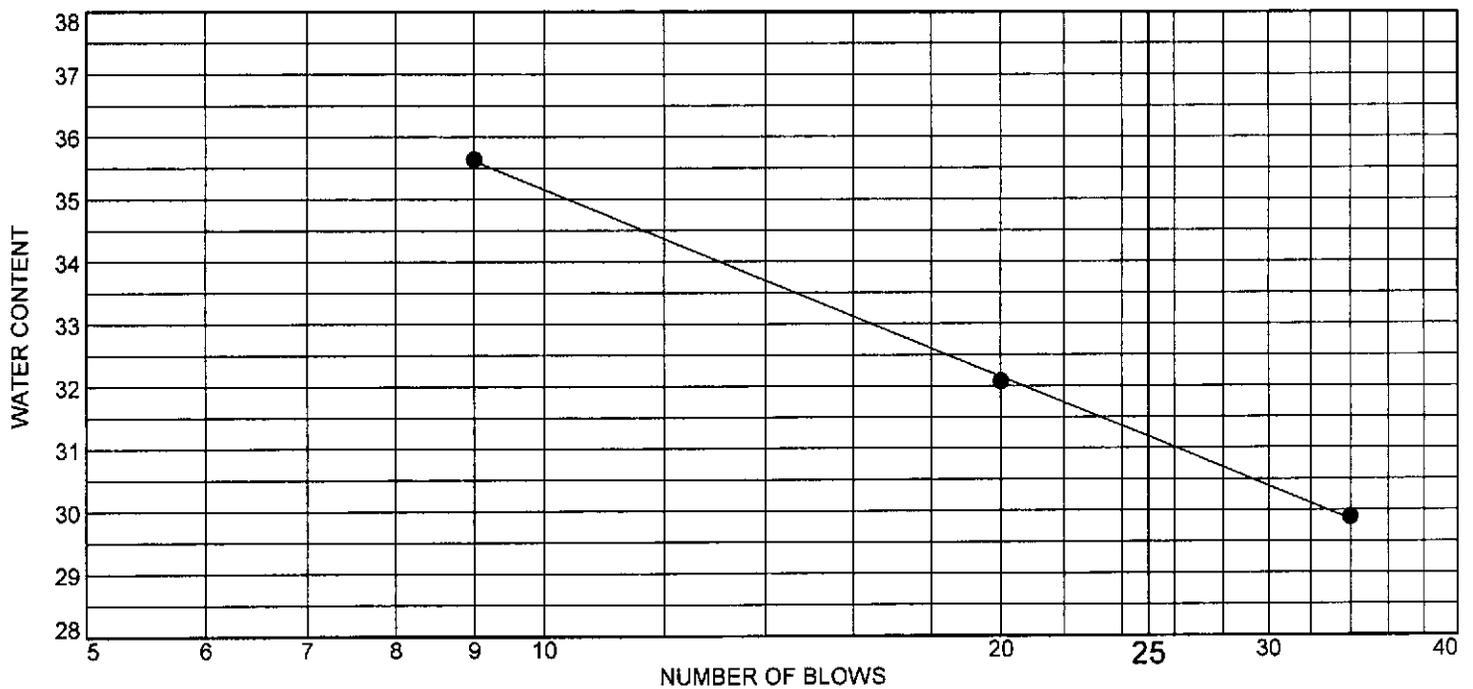
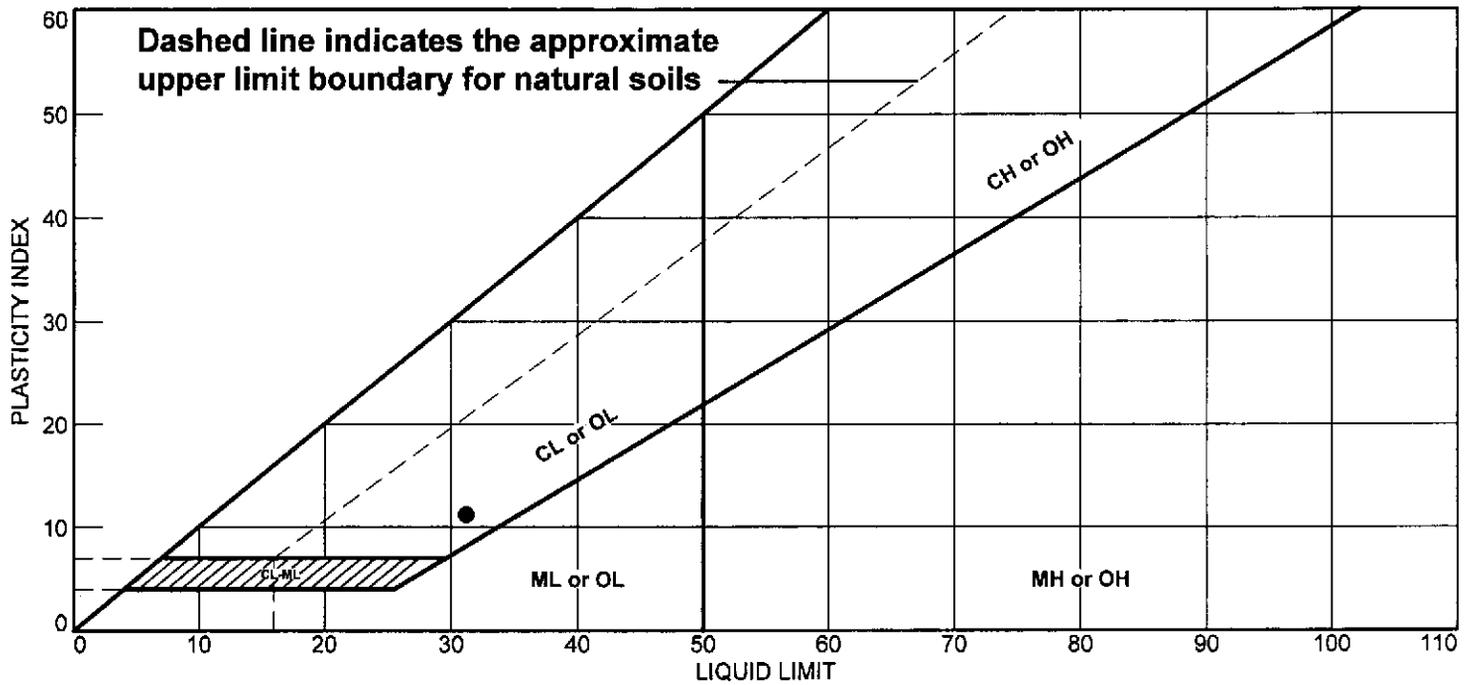
South Plainfield, New Jersey

Remarks:

● In-Situ %MC=19.4

Figure 27 F 3

LIQUID AND PLASTIC LIMITS TEST REPORT



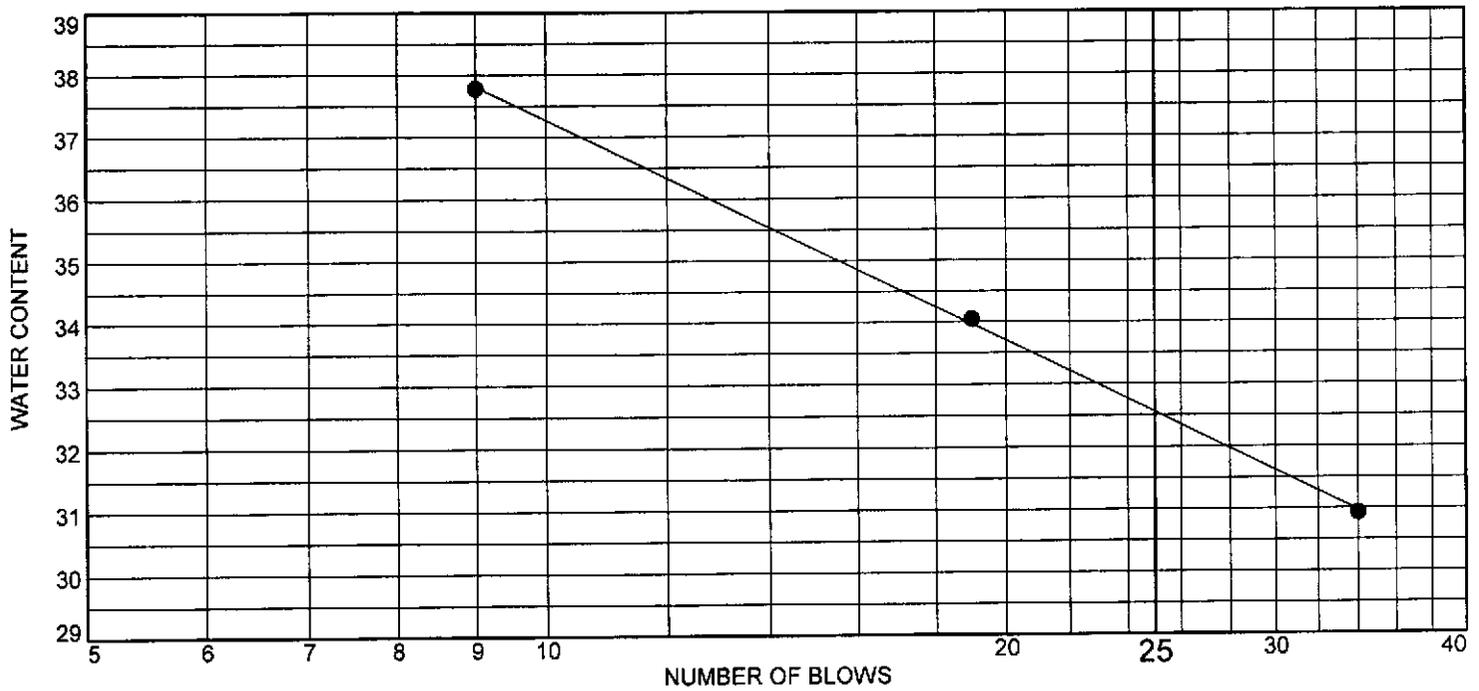
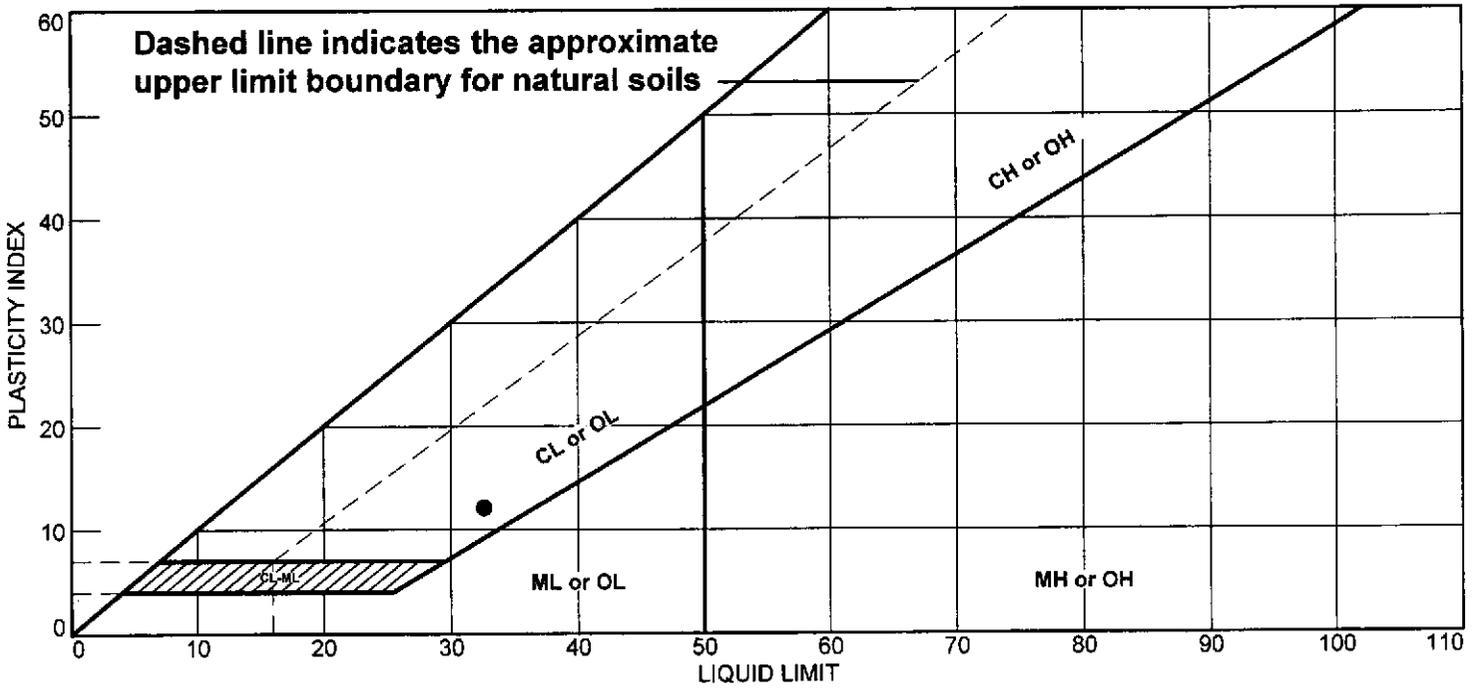
MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	31.2	20.0	11.2			

Project No. AOV-5632 **Client:** ANS GEO, Inc.
Project: AES- Somerset Solar, Somerset, NY
Location: B-20, S-1 **Depth:** 1'-2'
Sample Number: S-31
ANS CONSULTANTS, INC.
South Plainfield, New Jersey

Remarks:
 ● In-Situ %MC=21.1

Figure 31 F 3

LIQUID AND PLASTIC LIMITS TEST REPORT



MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	32.6	20.5	12.1			

Project No. AOV-5632 **Client:** ANS GEO, Inc.

Project: AES- Somerset Solar, Somerset, NY

Location: B-23, S-4
Sample Number: S-32

Depth: 6'-8'

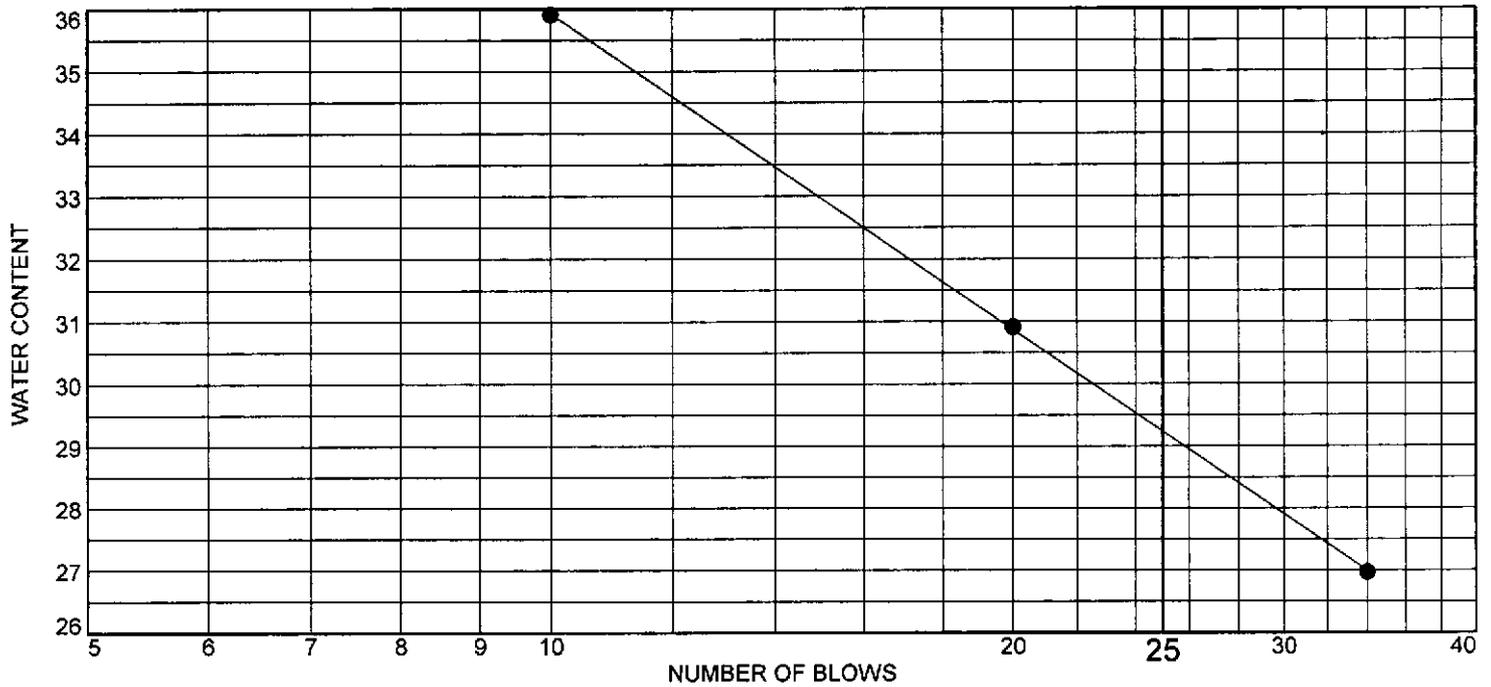
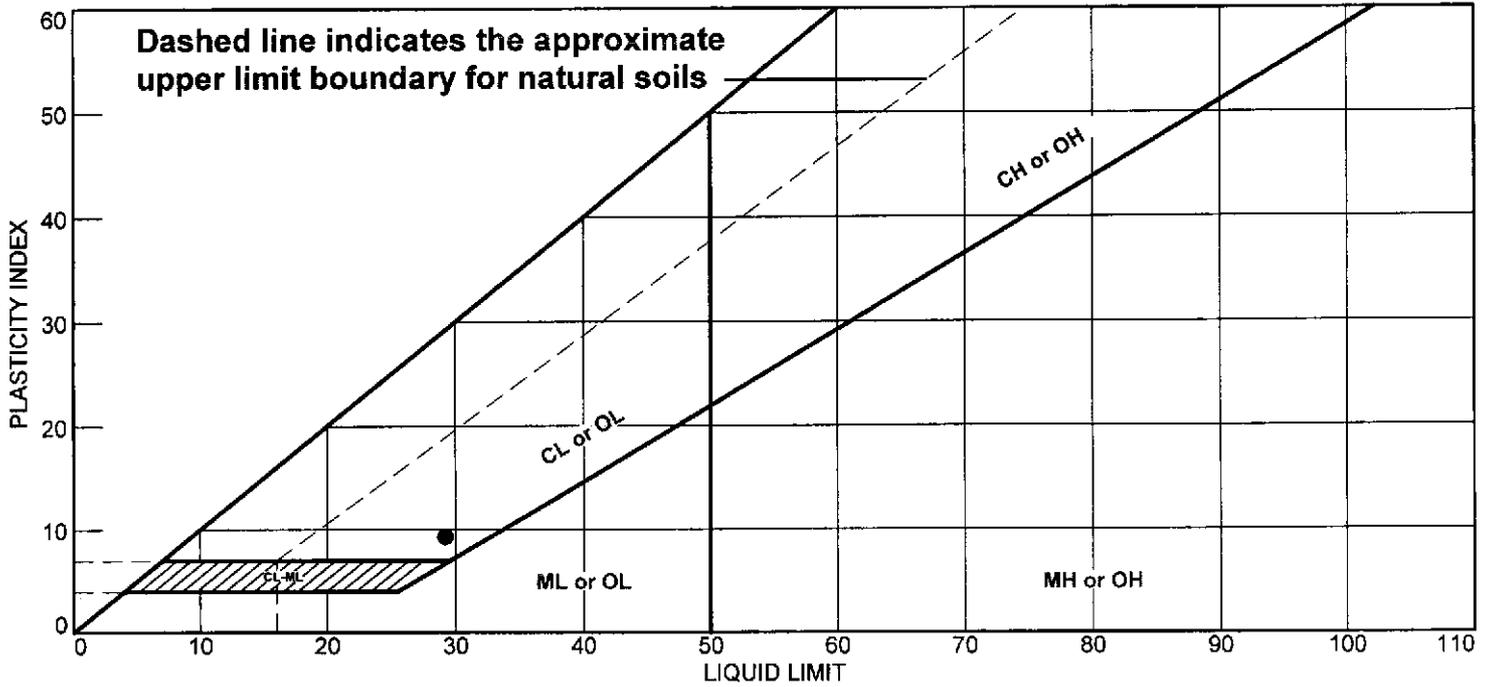
ANS CONSULTANTS, INC.

South Plainfield, New Jersey

Remarks:

● In-Situ %MC=34.2

LIQUID AND PLASTIC LIMITS TEST REPORT



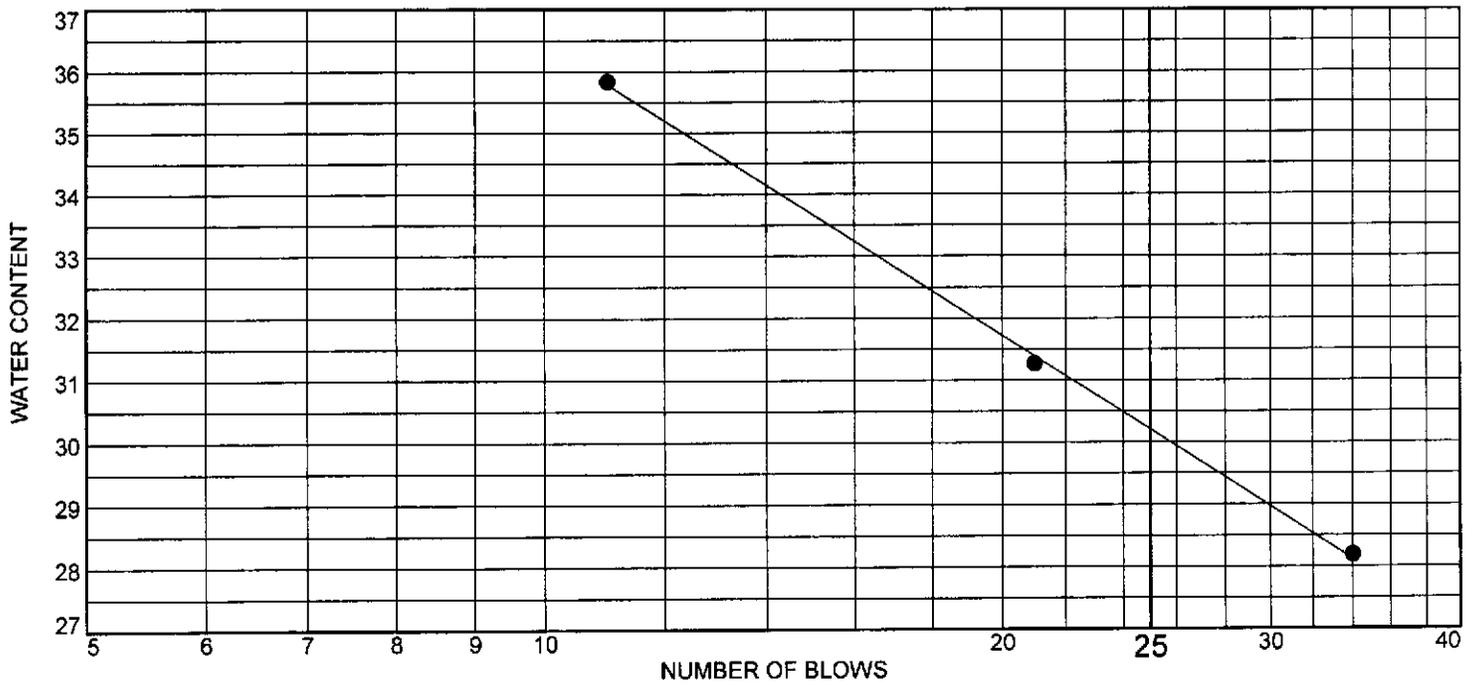
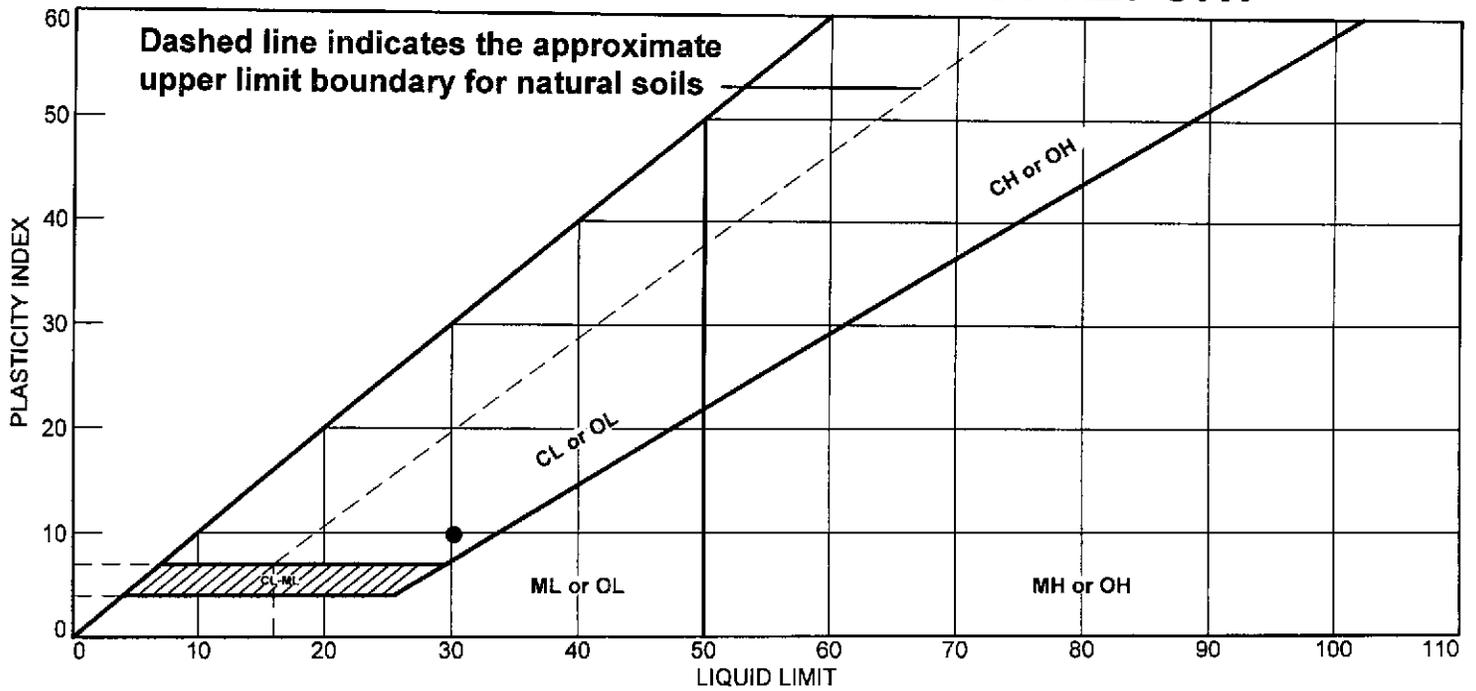
MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	29.2	19.9	9.3			

Project No. AOV-5632 **Client:** ANS GEO, Inc.
Project: AES- Somerset Solar, Somerset, NY
Location: B-27, S-6
Sample Number: S-3 **Depth:** 13'-15'
ANS CONSULTANTS, INC.
South Plainfield, New Jersey

Remarks:
● In-Situ %MC=35.4

Figure 3 F 3

LIQUID AND PLASTIC LIMITS TEST REPORT



MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	30.2	20.4	9.8			

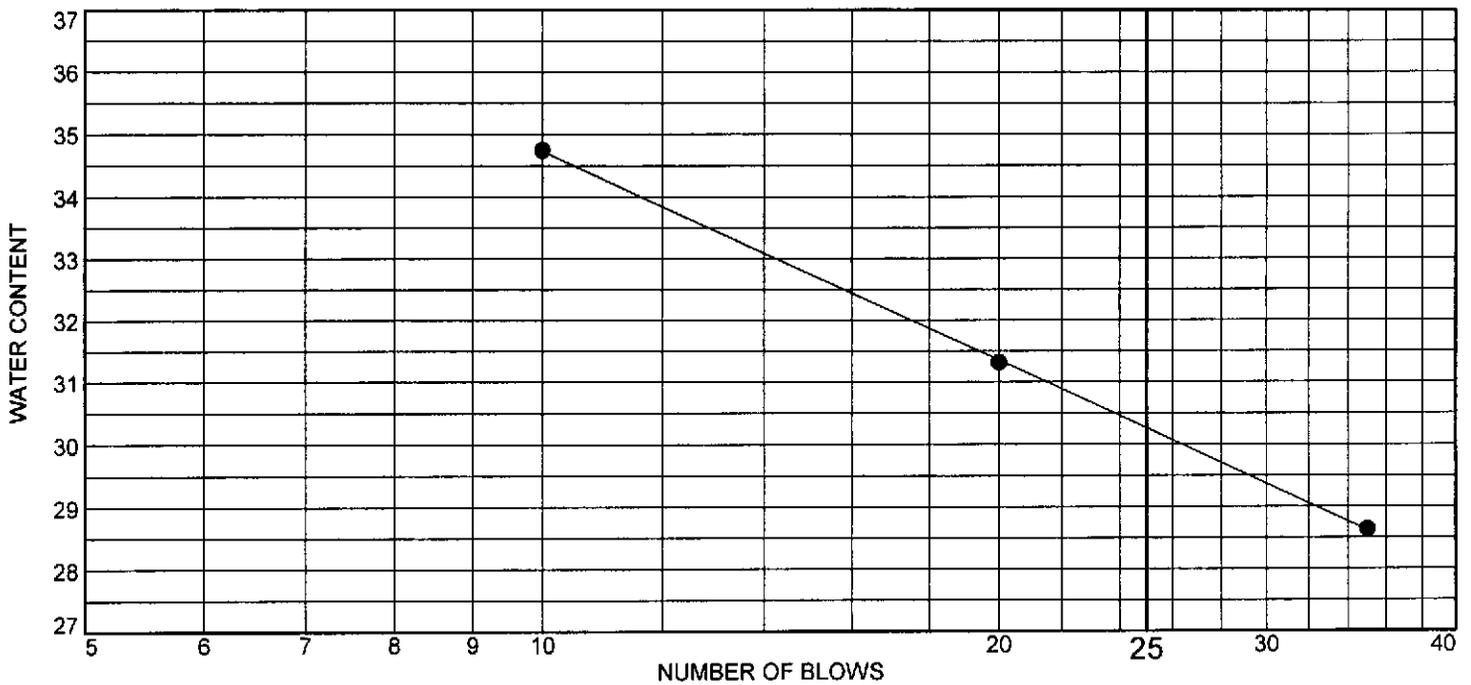
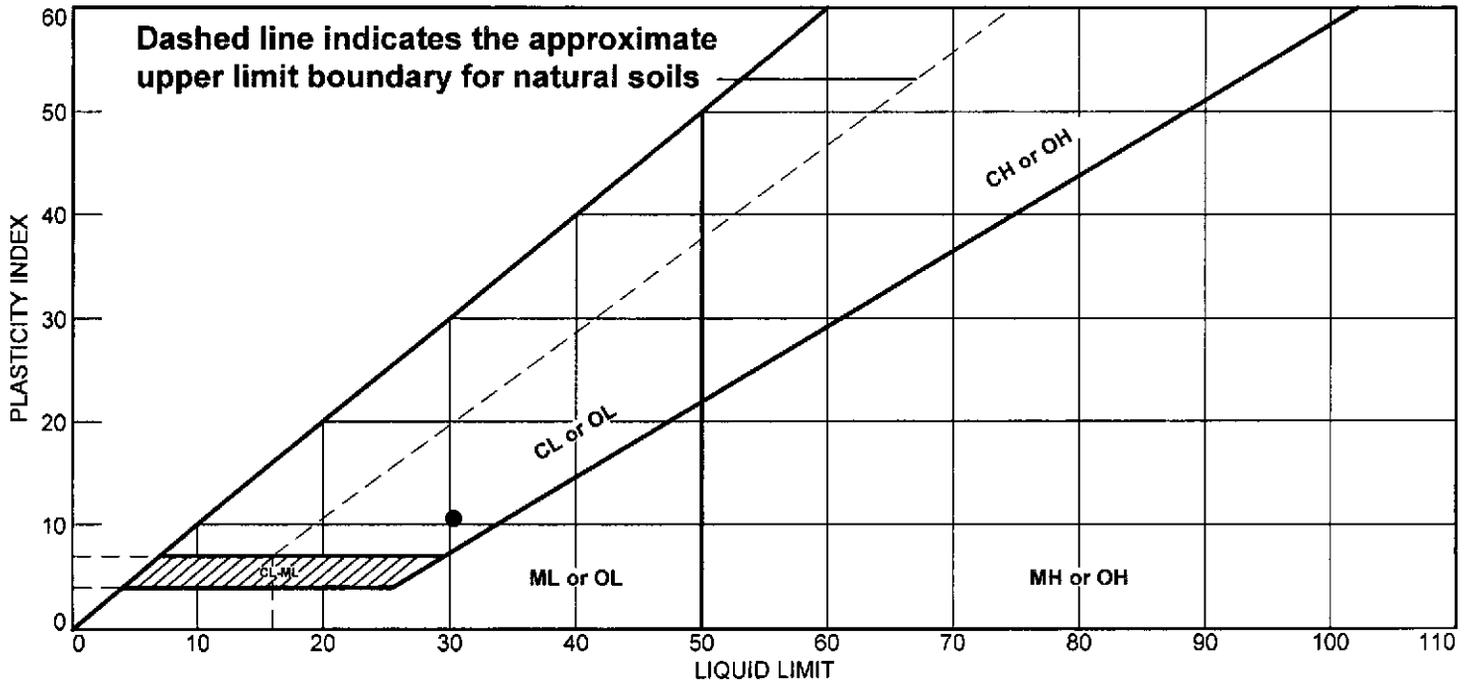
Project No. AOV-5632 **Client:** ANS GEO, Inc.
Project: AES- Somerset Solar, Somerset, NY
Location: B-29, S-2 **Depth:** 2'-4'
Sample Number: S-7

ANS CONSULTANTS, INC.
 South Plainfield, New Jersey

Remarks:
 ● In-Situ %MC=19.2

Figure 7 F 3

LIQUID AND PLASTIC LIMITS TEST REPORT



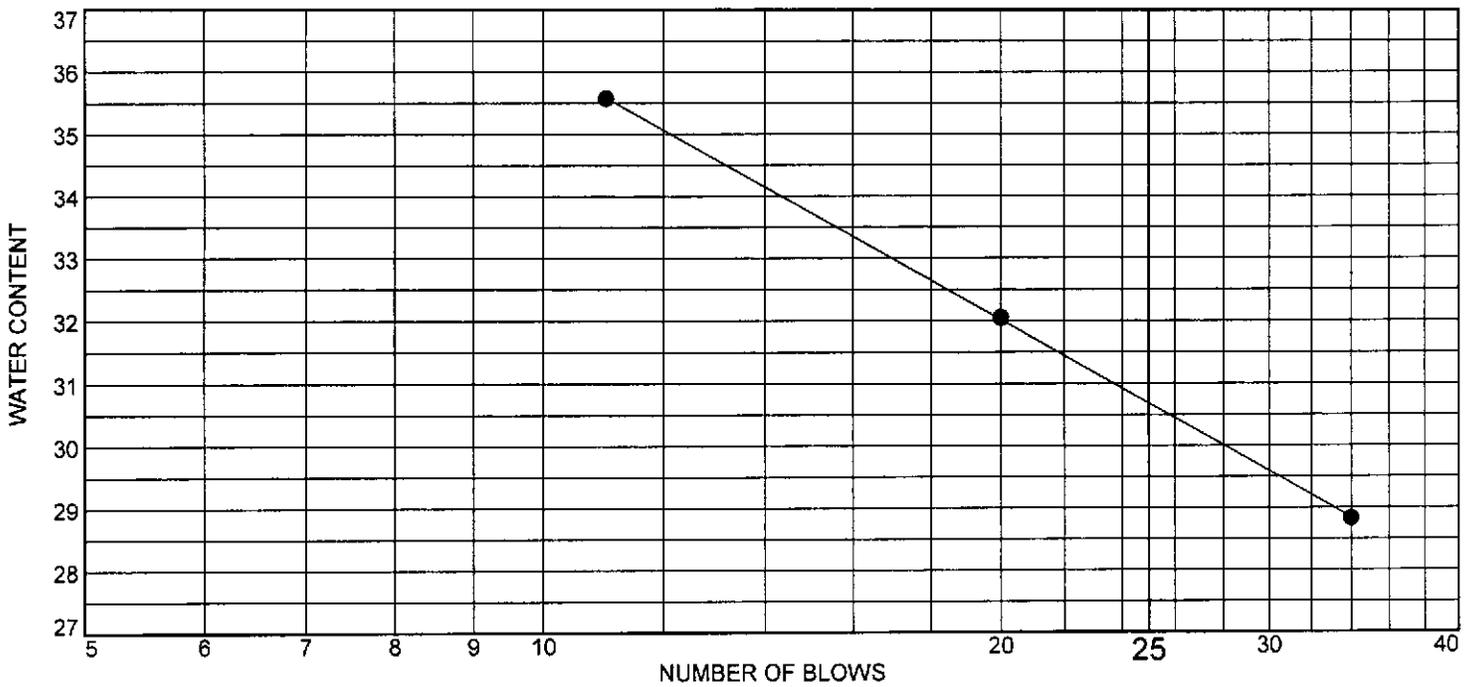
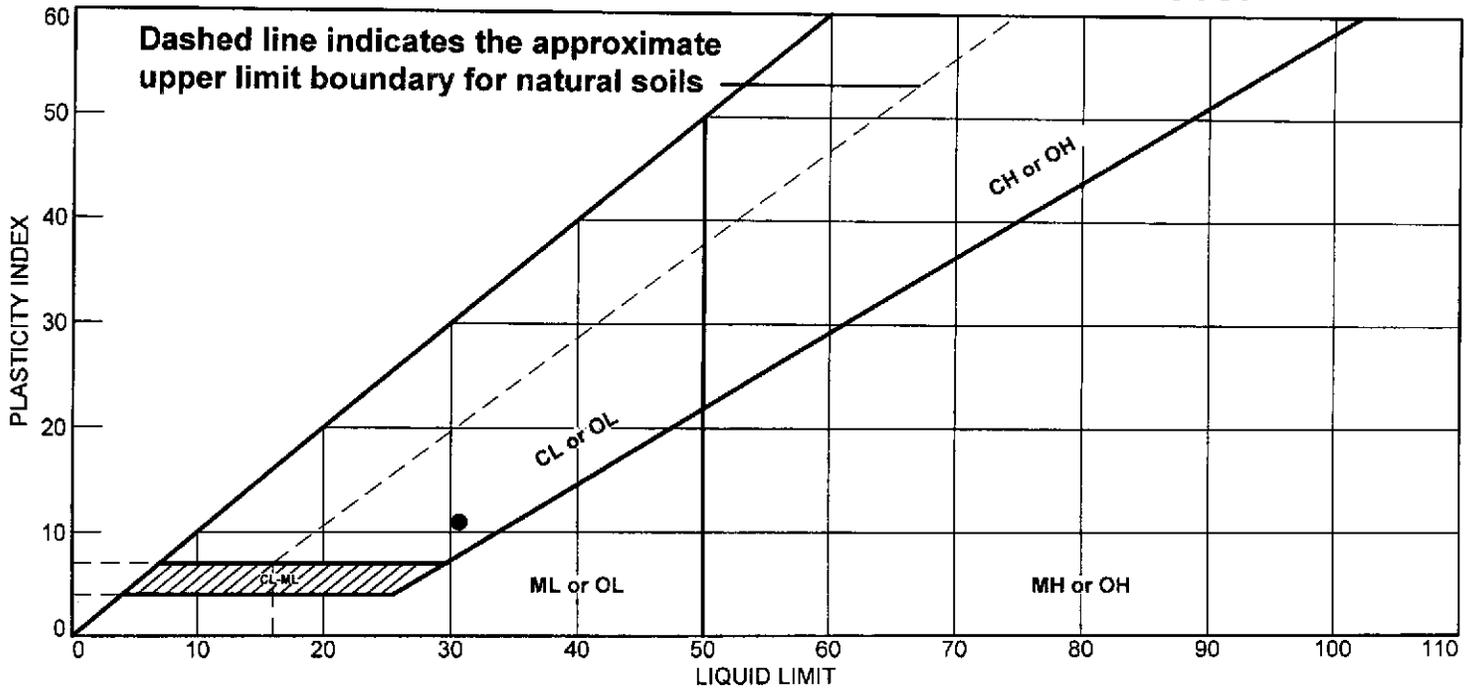
MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	30.3	19.7	10.6			

Project No. AOV-5632 **Client:** ANS GEO, Inc.
Project: AES- Somerset Solar, Somerset, NY
Location: B-33, S-2 **Depth:** 2'-4'
Sample Number: S-4
ANS CONSULTANTS, INC.
South Plainfield, New Jersey

Remarks:
 ● In-Situ %MC=24.4

Figure 4 F 3

LIQUID AND PLASTIC LIMITS TEST REPORT



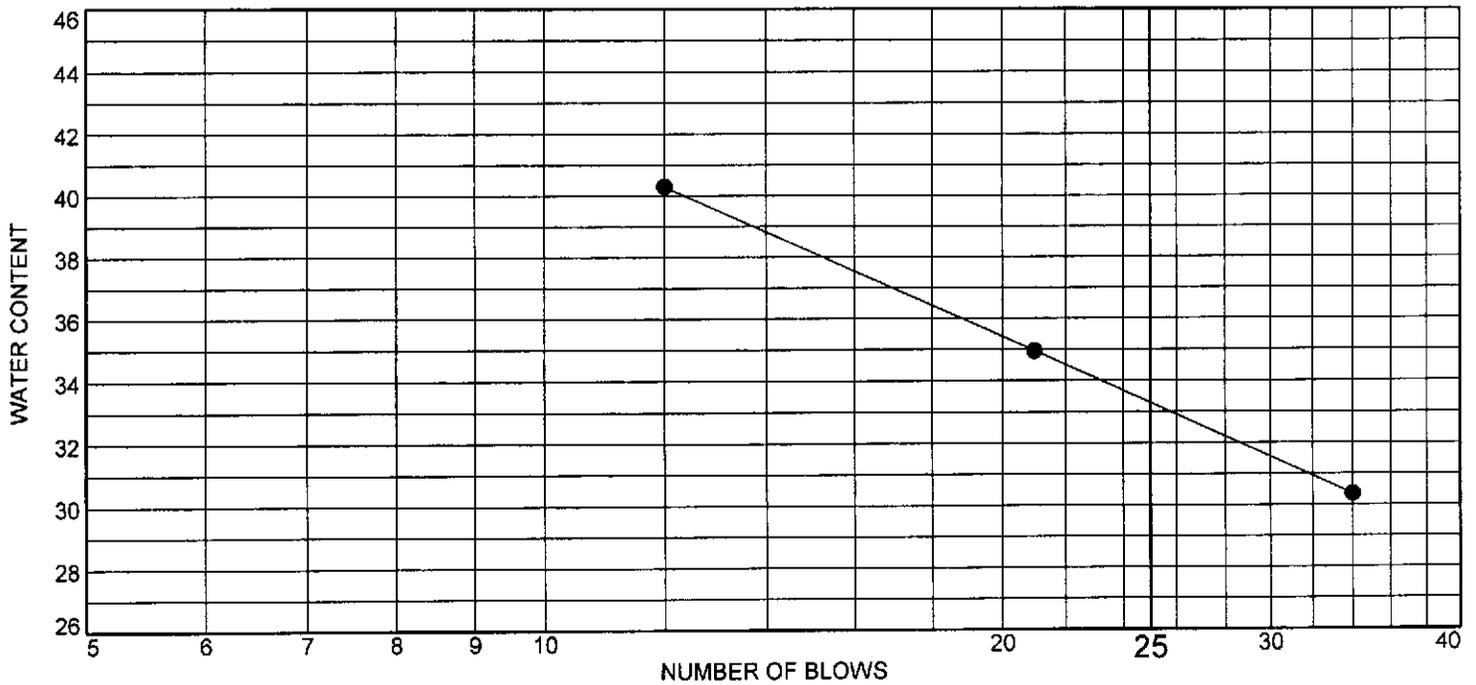
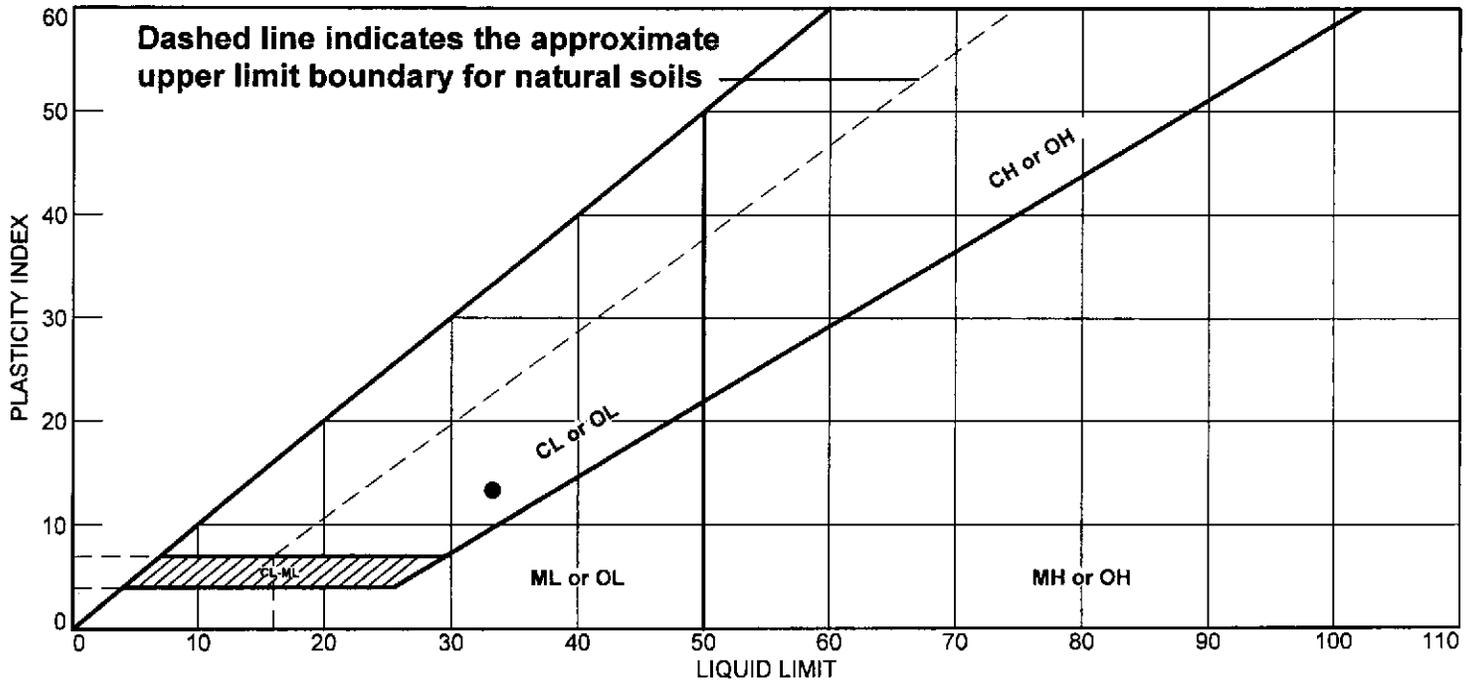
MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	30.7	19.7	11.0			

Project No. AOV-5632 **Client:** ANS GEO, Inc.
Project: AES- Somerset Solar, Somerset, NY
Location: B-34, S-6
Sample Number: S-12 **Depth:** 13'-15'
ANS CONSULTANTS, INC.
South Plainfield, New Jersey

Remarks:
● In-Situ %MC=33.6

Figure 12 F 3

LIQUID AND PLASTIC LIMITS TEST REPORT



MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	33.3	20.0	13.3			

Project No. AOV-5632 **Client:** ANS GEO, Inc.

Project: AES- Somerset Solar, Somerset, NY

Location: B-37, S-5

Sample Number: S-5

Depth: 8'-10'

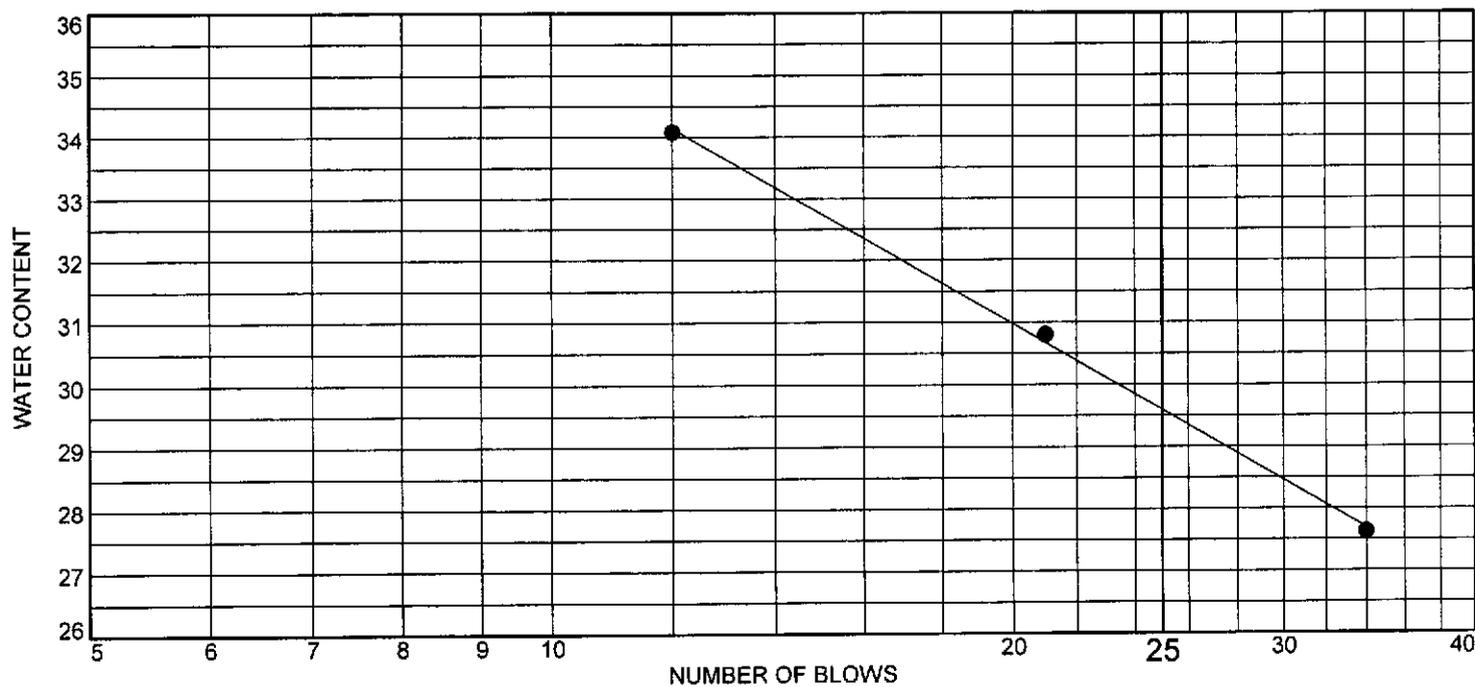
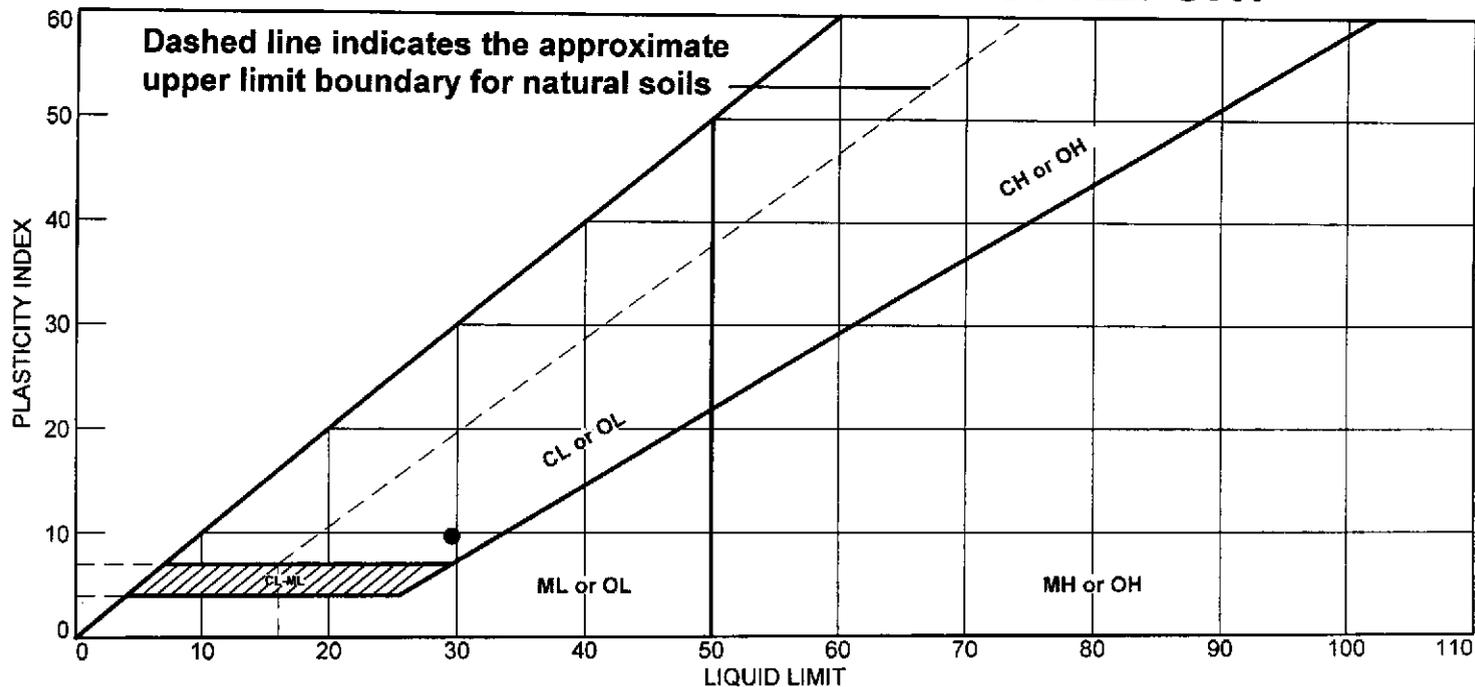
ANS CONSULTANTS, INC.

South Plainfield, New Jersey

Remarks:

● In-Situ %MC=26.6

LIQUID AND PLASTIC LIMITS TEST REPORT



MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	29.6	19.9	9.7			

Project No. AOV-5632 **Client:** ANS GEO, Inc.

Project: AES- Somerset Solar, Somerset, NY

Location: B-38, S-1

Sample Number: S-6

Depth: 1'-2'

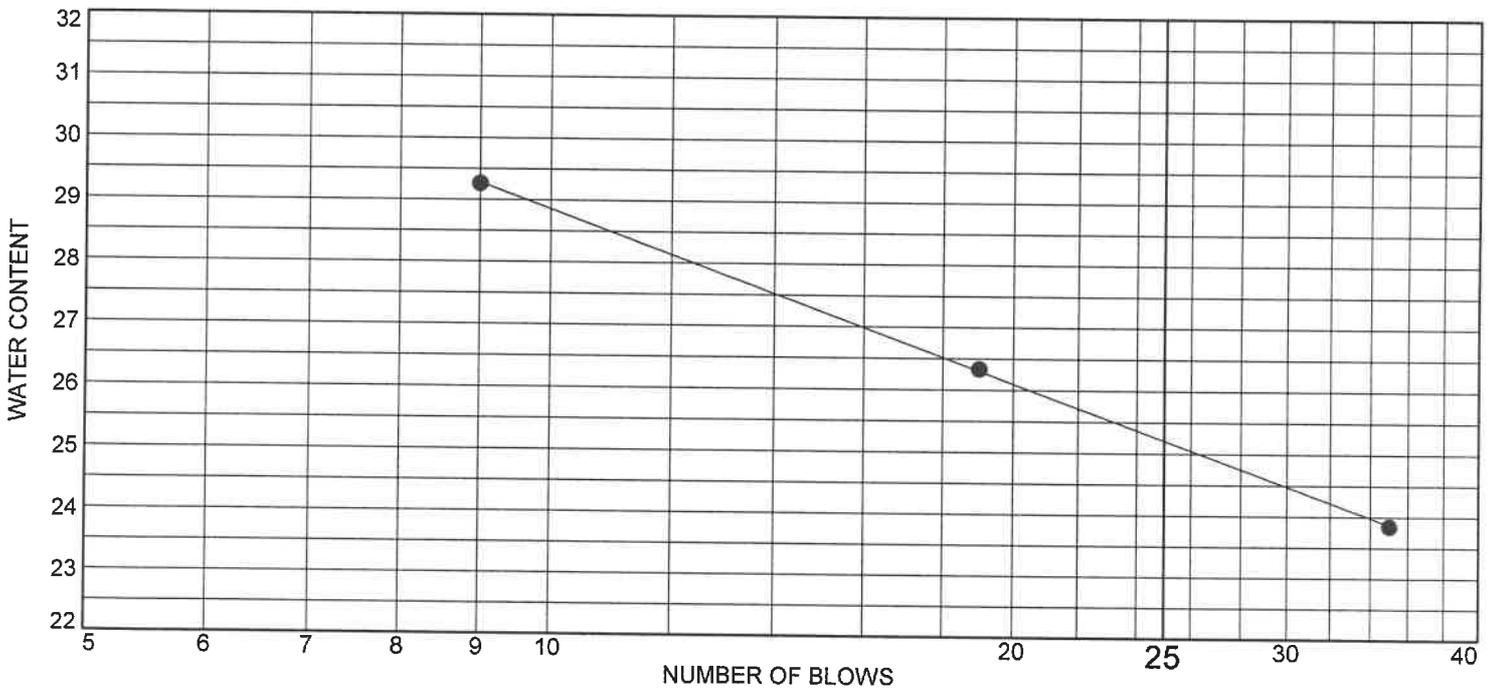
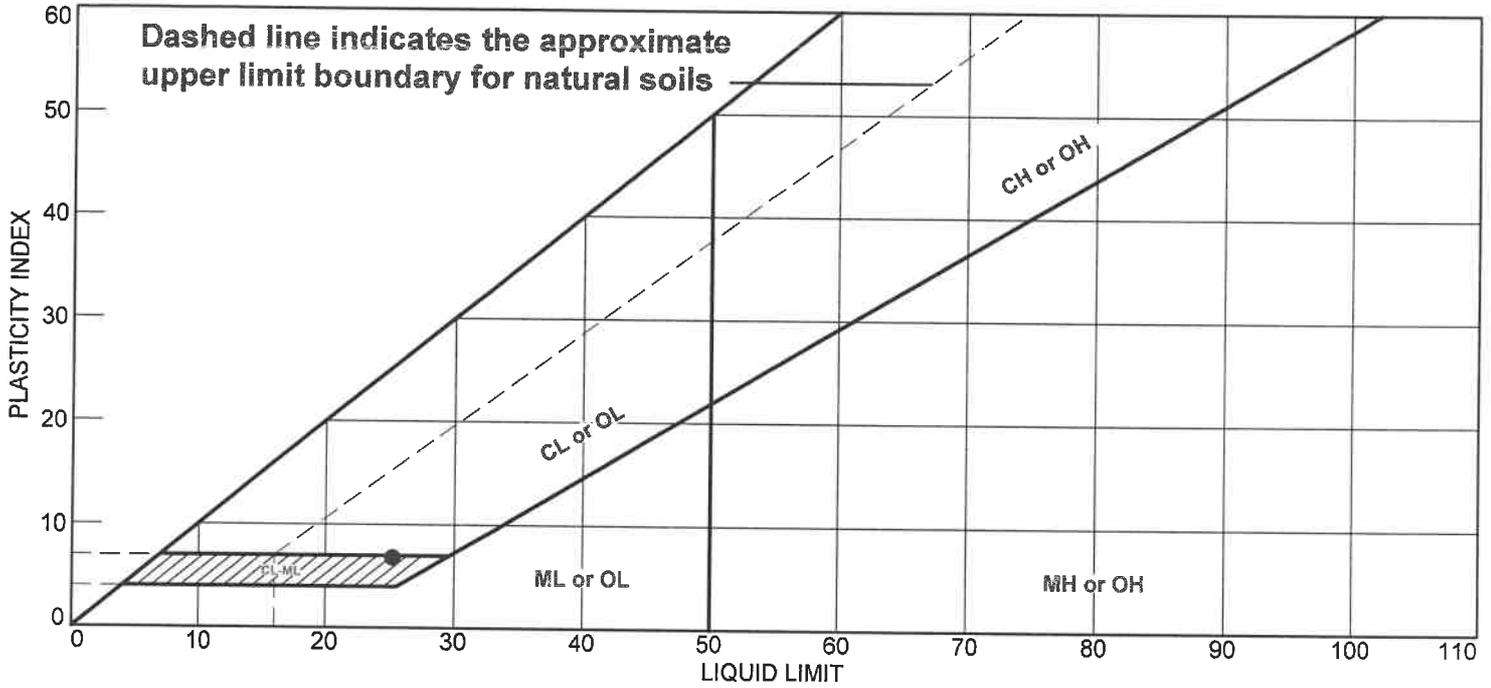
ANS CONSULTANTS, INC.

South Plainfield, New Jersey

Remarks:

● In-Situ %MC=19.2

LIQUID AND PLASTIC LIMITS TEST REPORT



MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	25.2	18.4	6.8			

Project No. AOV-5632 **Client:** ANS GEO, Inc.

Project: AES- Somerset Solar, Somerset, NY

Location: B-SS2, S-3

Sample Number: S-37 **Depth:** 4'-6'

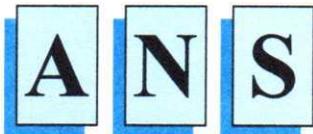
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South Plainfield, New Jersey

Remarks:

● In-Situ %MC=22.1

THERMAL RESISTIVITY
RESULTS



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THERMAL CONDUCTIVITY OF SOIL & SOFT ROCK
BY THERMAL NEEDLE PROBE -IEEE 442

CLIENT: ANS Geo, Inc.
 4405 South Clinton Avenue, Suite#A
 South Plainfield, NJ 07080

DATE: 04/05/2021

Kind Attn: Dr. Vatsal A. Shah. PE. Ph. D, D.GE

FILE NO: AOV-5632

PROJECT: AES – Somerset Solar
 Somerset, NY

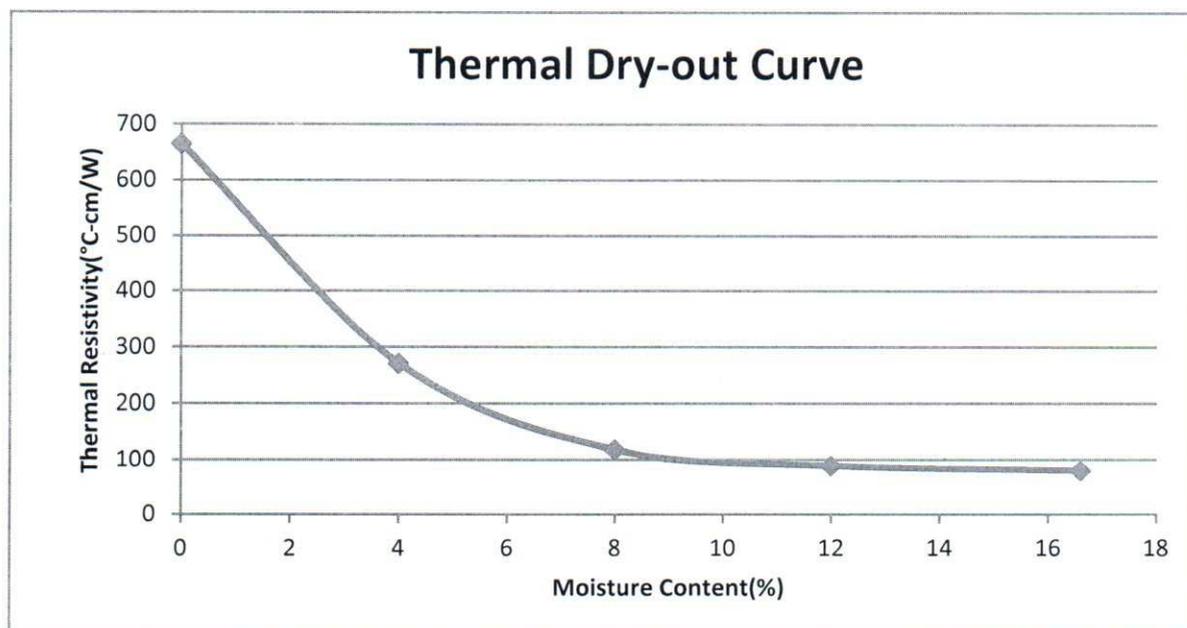
REPORT NO: S-14

Test Data- Sample No. S-1 (B-06, Ther., 3'- 5')

Standard Proctor Value: 107.5
 Remolded Dry Density: 91.375(85%)

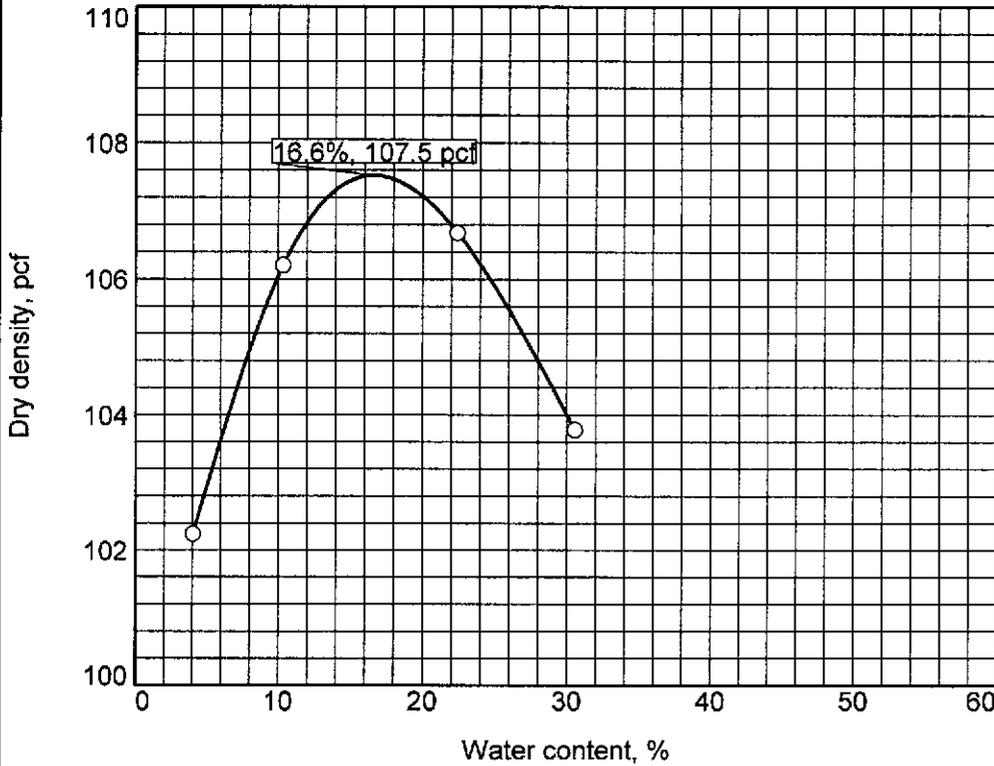
Optimum Moisture Content: 16.6%
 In-Situ Moisture Content: 25.0 %

Moisture Content (%)	Initial Soil Temperature (°C)	Thermal Resistivity (°C-cm/W)
0	26.5	665
4	26.3	271
8	26.2	118
12	26.1	88
16.6	26	79



COMPACTION TEST REPORT

Curve No.
S-14



Test Specification:
ASTM D 698-12 Method B Standard

Preparation Method _____
Hammer Wt. _____ 5.5 lb.
Hammer Drop _____ 12 in.
Number of Layers _____ three
Blows per Layer _____ 25
Mold Size _____ 0.03333 cu. ft.

Test Performed on Material
Passing _____ 3/8 in. **Sieve** _____

NM _____ **LL** _____ **PI** _____

Sp.G. (ASTM D 854) _____

%>3/8 in. _____ **%<No.200** _____

USCS _____ **AASHTO** _____

Date Sampled _____

Date Tested _____

Tested By _____

TESTING DATA

	1	2	3	4	5	6
WM + WS	12.97	13.33	13.78	13.94		
WM	9.43	9.43	9.43	9.43		
WW + T #1	693.5	570.8	721.7	828.5		
WD + T #1	666.6	517.3	589.6	634.6		
TARE #1	0.0	0.0	0.0	0.0		
WW + T #2						
WD + T #2						
TARE #2						
MOISTURE	4.0	10.3	22.4	30.6		
DRY DENSITY	102.2	106.2	106.7	103.8		

TEST RESULTS

Maximum dry density = 107.5 pcf
 Optimum moisture = 16.6 %

Project No. AOV-5632 **Client:** ANS GEO, Inc.

Project: AES- Somerset Solar, Somerset, NY

○ **Location:** B-06, Ther. **Depth:** 3'-5' **Sample Number:** S-14

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South Plainfield, New Jersey

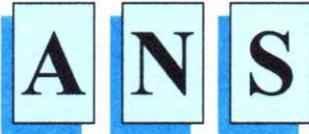
Material Description

Remarks:

Checked by:

Title:

Figure 14 F 2



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THERMAL CONDUCTIVITY OF SOIL & SOFT ROCK
BY THERMAL NEEDLE PROBE -IEEE 442

CLIENT: ANS Geo, Inc.
 4405 South Clinton Avenue, Suite#A
 South Plainfield, NJ 07080

DATE: 04/05/2021

Kind Attn: Dr. Vatsal A. Shah. PE. Ph. D, D.GE

FILE NO: AOV-5632

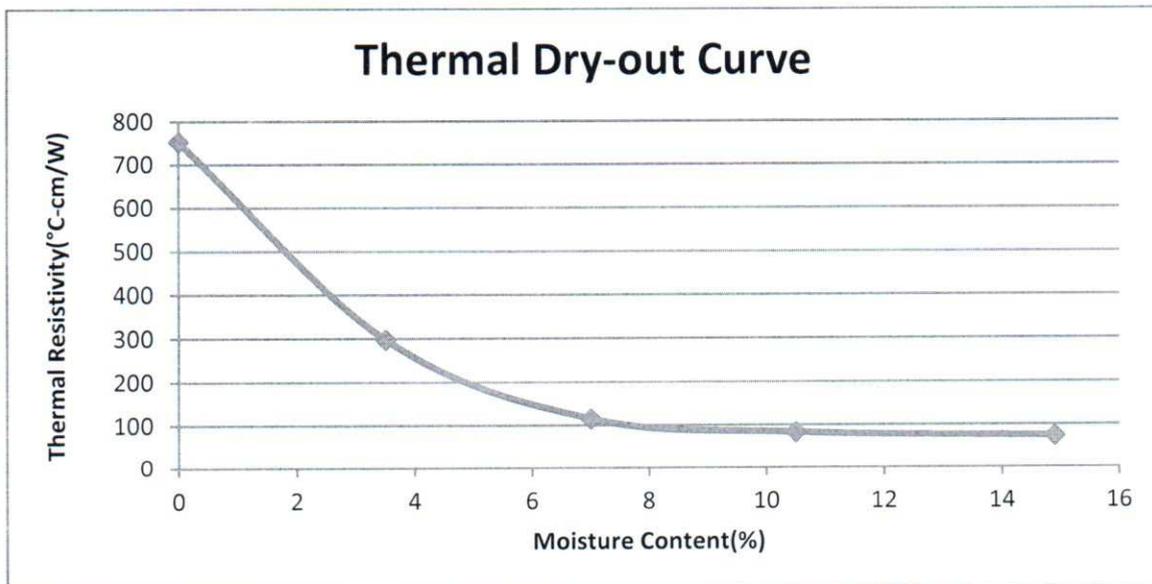
PROJECT: AES – Somerset Solar
 Somerset, NY

REPORT NO: S-15

Test Data- Sample No. S-2 (B-20, Ther., 3'- 5')

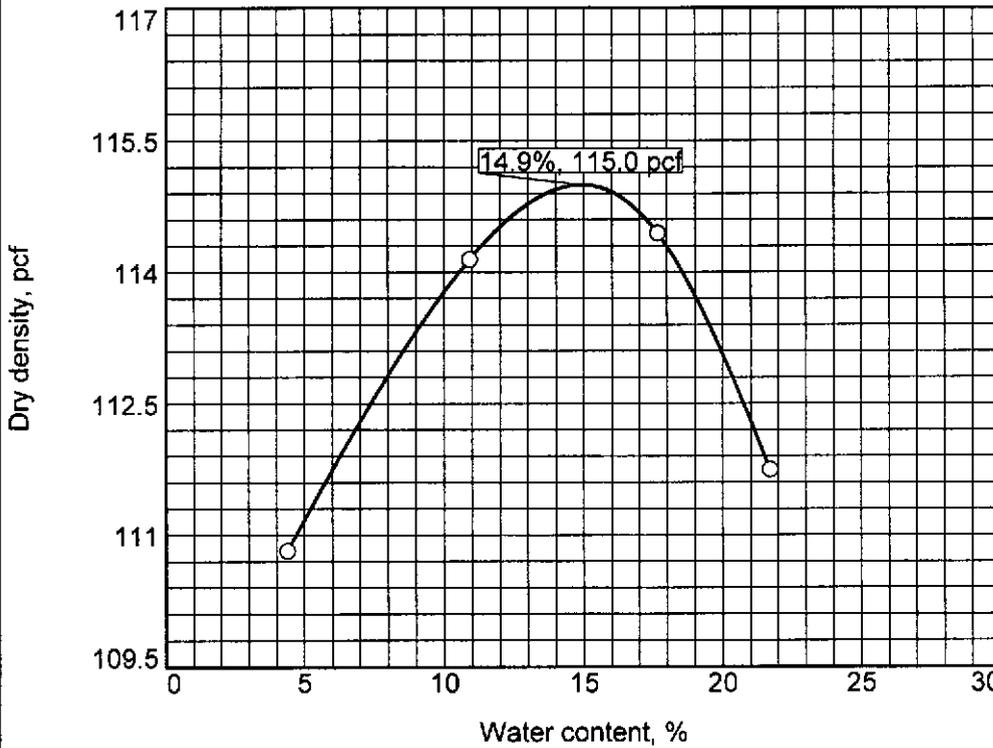
Standard Proctor Value: 105.0 Optimum Moisture Content: 14.9%
 Remolded Dry Density: 89.25(85%) In-Situ Moisture Content: 21.2 %

Moisture Content (%)	Initial Soil Temperature (°C)	Thermal Resistivity (°C-cm/W)
0	25.6	753
3.5	25.2	298
7	25	115
10.5	24.9	83
14.9	24.8	74



COMPACTION TEST REPORT

Curve No.
S-15



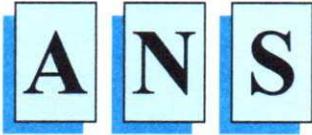
Test Specification:
ASTM D 698-12 Method B Standard

Preparation Method _____
Hammer Wt. 5.5 lb.
Hammer Drop 12 in.
Number of Layers three
Blows per Layer 25
Mold Size 0.03333 cu. ft.
Test Performed on Material
Passing 3/8 in. **Sieve** _____
NM _____ **LL** _____ **PI** _____
Sp.G. (ASTM D 854) _____
%>3/8 in. _____ **%<No.200** _____
USCS _____ **AASHTO** _____
Date Sampled _____
Date Tested _____
Tested By _____

TESTING DATA

	1	2	3	4	5	6
WM + WS	13.28	13.65	13.91	13.96		
WM	9.43	9.43	9.43	9.43		
WW + T #1	551.6	814.2	790.3	777.0		
WD + T #1	528.4	734.1	671.7	638.4		
TARE #1	0.0	0.0	0.0	0.0		
WW + T #2						
WD + T #2						
TARE #2						
MOISTURE	4.4	10.9	17.7	21.7		
DRY DENSITY	110.8	114.1	114.4	111.7		

TEST RESULTS	Material Description
Maximum dry density = 115.0 pcf Optimum moisture = 14.9 %	Remarks: Checked by: Title:
Project No. AOV-5632 Client: ANS GEO, Inc. Project: AES- Somerset Solar, Somerset, NY	
Location: B-20, Ther. Depth: 3'-5' Sample Number: S-15 <b style="text-align: center;">ANS CONSULTANTS, INC. <b style="text-align: center;">South Plainfield, New Jersey	
Figure 15 F 2	



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THERMAL CONDUCTIVITY OF SOIL & SOFT ROCK
BY THERMAL NEEDLE PROBE -IEEE 442

CLIENT: ANS Geo, Inc.
 4405 South Clinton Avenue, Suite#A
 South Plainfield, NJ 07080

DATE: 04/05/2021

Kind Attn: Dr. Vatsal A. Shah. PE. Ph. D, D.GE

FILE NO: AOV-5632

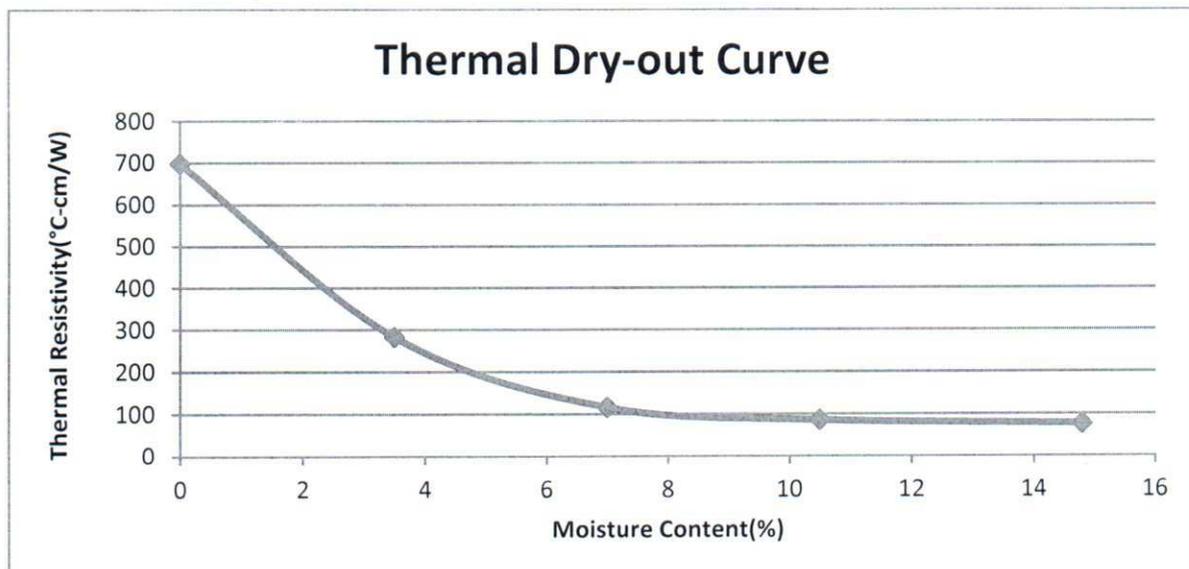
PROJECT: AES – Somerset Solar
 Somerset, NY

REPORT NO: S-16

Test Data- Sample No. S-3 (B-29, Ther., 3'- 5')

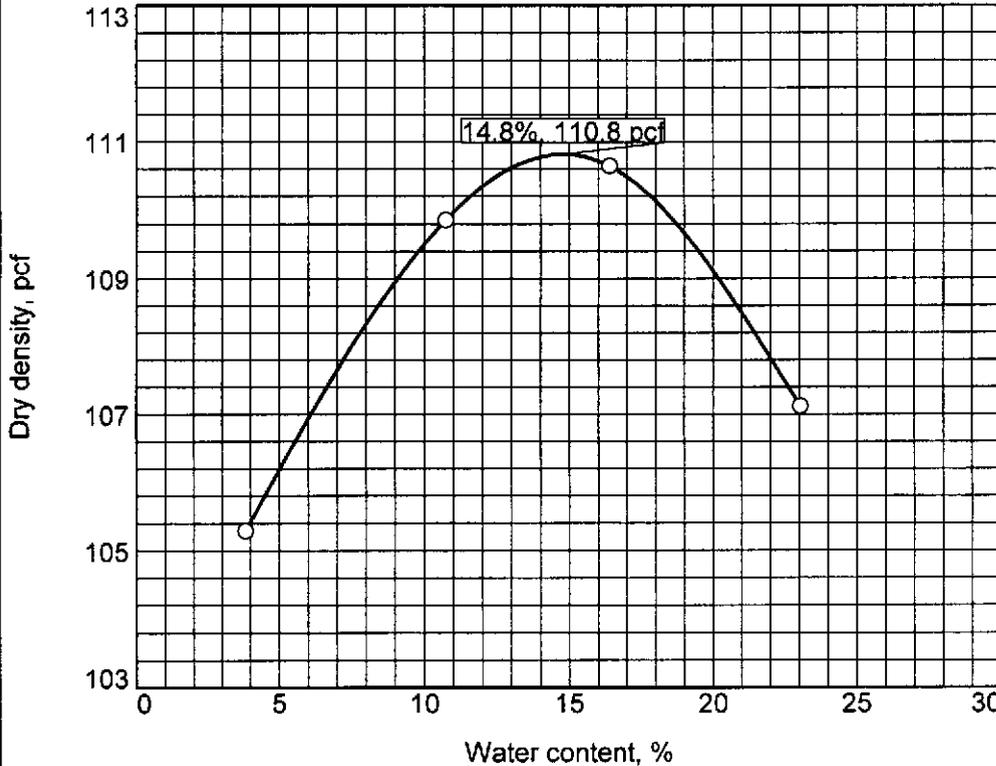
Standard Proctor Value: 110.8 Optimum Moisture Content: 14.8%
 Remolded Dry Density: 94.18(85%) In-Situ Moisture Content: 21.34%

Moisture Content (%)	Initial Soil Temperature (°C)	Thermal Resistivity (°C-cm/W)
0	26.4	698
3.5	26.1	283
7	25.9	116
10.5	25.8	86
14.8	25.7	77



COMPACTION TEST REPORT

Curve No.
S-16



Test Specification:
ASTM D 698-12 Method B Standard

Preparation Method _____
Hammer Wt. _____ 5.5 lb.
Hammer Drop _____ 12 in.
Number of Layers _____ three
Blows per Layer _____ 25
Mold Size _____ 0.03333 cu. ft.

Test Performed on Material
Passing _____ 3/8 in. **Sieve** _____

NM _____ **LL** _____ **PI** _____
Sp.G. (ASTM D 854) _____
%>3/8 in. _____ **%<No.200** _____
USCS _____ **AASHTO** _____

Date Sampled _____

Date Tested _____

Tested By _____

TESTING DATA

	1	2	3	4	5	6
WM + WS	13.07	13.48	13.72	13.82		
WM	9.43	9.43	9.43	9.43		
WW + T #1	815.4	743.8	657.6	757.6		
WD + T #1	785.4	671.7	565.0	615.8		
TARE #1	0.0	0.0	0.0	0.0		
WW + T #2						
WD + T #2						
TARE #2						
MOISTURE	3.8	10.7	16.4	23.0		
DRY DENSITY	105.3	109.9	110.6	107.1		

TEST RESULTS

Maximum dry density = 110.8 pcf

Optimum moisture = 14.8 %

Project No. AOV-5632 **Client:** ANS GEO, Inc.

Project: AES- Somerset Solar, Somerset, NY

○ **Location:** B-29, Ther **Depth:** 3'-5' **Sample Number:** S-16

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South Plainfield, New Jersey

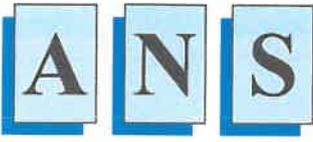
Material Description

Remarks:

Checked by:

Title:

Figure 16 F 2



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THERMAL CONDUCTIVITY OF SOIL & SOFT ROCK
BY THERMAL NEEDLE PROBE –ASTM D5334

CLIENT: ANS Geo, Inc.
 4405 South Clinton Avenue, Suite#A
 South Plainfield, NJ 07080

DATE: 11/13/2021

Kind Attn: Dr. Vatsal A. Shah. PE. Ph. D, D.GE

FILE NO: AOV - 5632

PROJECT: AES-Somerset Solar
 Somerset, NY

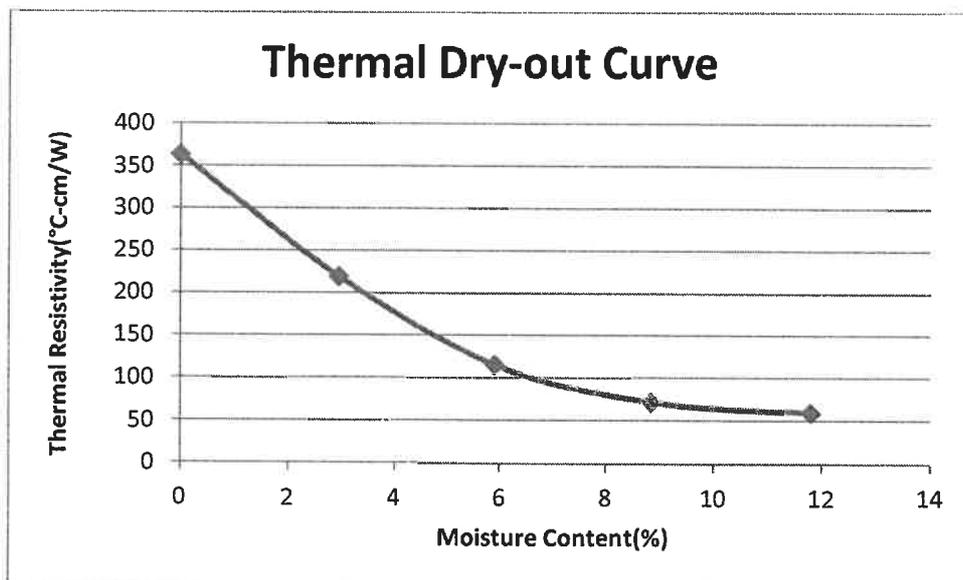
REPORT NO: S – 34

Test Data- Sample No. S – 34 (B-SS2, G-1, 3'- 5')

Standard Proctor Value: 114.8
 Remolded Dry Density: 97.58(85%)

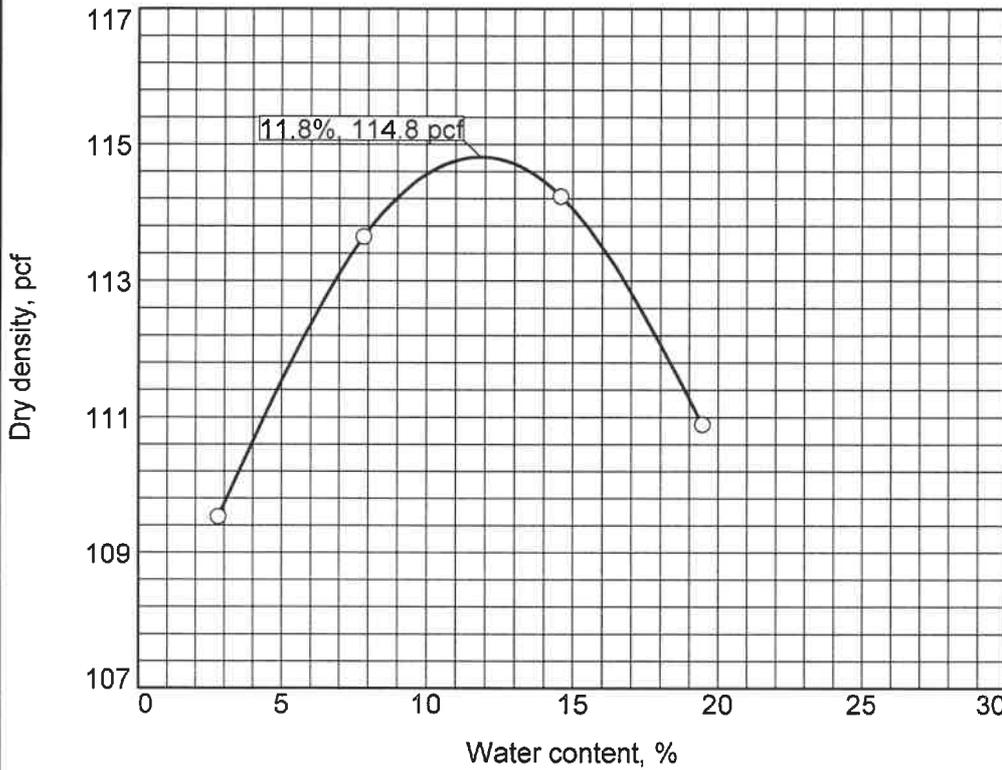
Optimum Moisture Content: 20.7%
 In-Situ Moisture Content: 19.2%

Moisture Content (%)	Initial Soil Temperature (°C)	Thermal Resistivity (°C-cm/W)
0	30.2	363
3	28.8	219
5.9	25.4	115
8.9	24.8	72
11.8	24.2	59



COMPACTION TEST REPORT

Curve No.
S-34



Test Specification:
ASTM D 698-12 Method A Standard

Preparation Method _____
Hammer Wt. _____ 5.5 lb.
Hammer Drop _____ 12 in.
Number of Layers _____ three
Blows per Layer _____ 25
Mold Size _____ 0.03333 cu. ft.

Test Performed on Material
Passing _____ #4 _____ Sieve

NM _____ **LL** _____ **PI** _____
Sp.G. (ASTM D 854) _____
%>#4 _____ **%<No.200** _____
USCS _____ **AASHTO** _____

Date Sampled _____
Date Tested _____
Tested By _____

TESTING DATA

	1	2	3	4	5	6
WM + WS	13.18	13.51	13.79	13.84		
WM	9.43	9.43	9.43	9.43		
WW + T #1	692.2	638.9	842.8	756.4		
WD + T #1	673.4	592.4	735.5	633.2		
TARE #1	0.0	0.0	0.0	0.0		
WW + T #2						
WD + T #2						
TARE #2						
MOISTURE	2.8	7.8	14.6	19.5		
DRY DENSITY	109.5	113.6	114.2	110.9		

TEST RESULTS

Maximum dry density = 114.8 pcf
 Optimum moisture = 11.8 %

Project No. AOV-5632 **Client:** ANS GEO, Inc.
Project: AES- Somerset Solar, Somerset, NY

○ **Location:** BSS-2, G-1 **Depth:** 3'-5' **Sample Number:** S-34

ANS CONSULTANTS, INC.

South Plainfield, New Jersey

Material Description

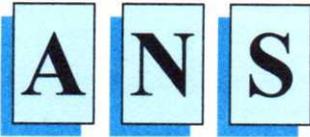
Remarks:

Checked by:
Title:

Figure 34 F 2

CORROSIVITY SUITE

RESULTS



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CERTIFICATE OF TEST - CORROSION ANALYSIS

CLIENT: ANS Geo, Inc.
 4405 South Clinton Avenue
 South Plainfield, NJ 07080

DATE: 04/05/2021

FILE NO: AOV-5632

Kind Attn: Dr. Vatsal A. Shah. PE. Ph. D, D.GE

PROJECT: AES - Somerset Solar
 Somerset, NY

REPORT NO: S-20 to S-23

- TEST PERFORMED:**
- 1) Standard Test Method for Water Soluble Sulfate in Soil AS PER ASTM C-1580
 - 2) Standard Test Method for measuring pH of Soil for use in Corrosion Testing AS PER ASTM G51-18
 - 3) Standard Test Method for Measurement of Oxidation-Reduction Potential (ORP) of Soil AS PER ASTM G-200
 - 4) Standard Method for Test for Determining Water Soluble Chloride Ion AS PER AASHTO T-291
 - 5) Standard Test Method for Measuring Soil Resistivity using two-Electrode AS PER ASTM G187-18

Sample No.	Sample ID	Sulfate (mg/Kg)	pH	ORP (mV)	Chloride (mg/Kg)	Resistivity (Ohm-cm)
S-20	B-03, Corr., 2'-3'	18	7.12	+115	40	7,000
S-21	B-35, Corr., 2'-3'	12	7.38	+120	45	8,500
S-22	B-27, Corr., 2'-3'	3	7.76	+111	25	6,500
S-23	B-12, Corr., 2'-3'	6	6.88	+109	20	7,000



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CERTIFICATE OF TEST - CORROSION ANALYSIS

CLIENT: ANS Geo, Inc.
 4405 South Clinton Avenue
 South Plainfield, NJ 07080

DATE: 11/15/2021
FILE NO: AOV – 5632

Kind Attn: Dr. Vatsal A. Shah. PE. Ph. D, D.GE

PROJECT: AES - Somerset Solar
 Somerset, NY

REPORT NO: S – 35

- TEST PERFORMED:**
- 1) Standard Test Method for Water Soluble Sulfate in Soil AS PER ASTM C-1580
 - 2) Standard Test Method for measuring pH of Soil for use in Corrosion Testing AS PER ASTM G51-18
 - 3) Standard Test Method for Measurement of Oxidation-Reduction Potential (ORP) of Soil AS PER ASTM G-200
 - 4) Standard Method for Test for Determining Water Soluble Chloride Ion AS PER AASHTO T-291
 - 5) Standard Test Method for Measuring Soil Resistivity using two-Electrode AS PER ASTM G187-18

Sample No.	Sample ID	Sulfate (mg/Kg)	pH	ORP (mV)	Chloride (mg/Kg)	Resistivity (Ohm-cm)
S-34	B-SS2, G-1., 2'-3'	39	8.23	+108	45	3,000

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GROUNDWATER SAMPLING RESULTS

ANALYTICAL REPORT

Lab Number:	L2124373
Client:	ANS Deo Inc. 4475 South Clinton Avenue South Plainfield, NJ 07080
ATTN:	Eric Pauli
Phone:	(908) 754-8800
Project Name:	SOMERSET
Project Number:	SOMERSET
Report Date:	05/20/21

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Certifications & Approvals: MA (M-MA086), NH NELAP (2064), CT (PH-0574), IL (200077), ME (MA00086), MD (348), NJ (MA935), NY (11148), NC (25700/666), PA (68-03671), RI (LAO00065), TX (T104704476), VT (VT-0935), VA (460195), USDA (Permit #P330-17-00196).

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Project Name: SOMERSET
Project Number: SOMERSET

Lab Number: L2124373
Report Date: 05/20/21

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L2124373-01	SA 9122D A-E	WATER	SOMERSET, NY	05/11/21 08:30	05/11/21
L2124373-02	SA 9132S A-E	WATER	SOMERSET, NY	05/11/21 09:00	05/11/21
L2124373-03	SO 8305 A-E	WATER	SOMERSET, NY	05/11/21 09:30	05/11/21
L2124373-04	SO 8823 A-E	WATER	SOMERSET, NY	05/11/21 10:00	05/11/21

Project Name: SOMERSET
Project Number: SOMERSET

Lab Number: L2124373
Report Date: 05/20/21

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively.

When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances, the specific failure is not narrated but noted in the associated QC Outlier Summary Report, located directly after the Case Narrative. QC information is also incorporated in the Data Usability Assessment table (Format 11) of our Data Merger tool, where it can be reviewed in conjunction with the sample result, associated regulatory criteria and any associated data usability implications.

Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

HOLD POLICY - For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Alpha Project Manager and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Project Management at 800-624-9220 with any questions.

Project Name: SOMERSET
Project Number: SOMERSET

Lab Number: L2124373
Report Date: 05/20/21

Case Narrative (continued)

Report Submission

All non-detect (ND) or estimated concentrations (J-qualified) have been quantitated to the limit noted in the MDL column.

Sample Receipt

L2124373-01: Headspace was noted in the sample containers submitted for Acidity-CaCO₃ eq. - SM 2310.

Acidity

L2124373-02 and -04: The sample has an elevated detection limit due to the dilution required by the sample matrix.

Oxidation/Reduction Potential

The WG1497651-2 Laboratory Duplicate RPD for oxidation/reduction potential (36%), performed on L2124373-01, is outside the acceptance criteria. The elevated RPD has been attributed to the non-homogeneous nature of the native sample.

Anions by Ion Chromatography

The WG1500092-3 MS recoveries for chloride (69%) and sulfate (0%), performed on L2124373-03, do not apply because the sample concentrations are greater than four times the spike amount added.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature:

 Caitlin Walukevich

Title: Technical Director/Representative

Date: 05/20/21

INORGANICS & MISCELLANEOUS

Project Name: SOMERSET
Project Number: SOMERSET

Lab Number: L2124373
Report Date: 05/20/21

SAMPLE RESULTS

Lab ID: L2124373-01
Client ID: SA 9122D A-E
Sample Location: SOMERSET, NY

Date Collected: 05/11/21 08:30
Date Received: 05/11/21
Field Prep: Not Specified

Sample Depth:
Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Acidity	11.		mg CaCO3/L	2.0	NA	1	-	05/20/21 15:45	121,2310B	JT
Alkalinity, Total	22.1		mg CaCO3/L	2.00	NA	1	-	05/18/21 11:19	121,2320B	JB
Sulfide	ND		mg/l	0.10	0.10	1	05/17/21 13:10	05/17/21 20:20	1,9030B	EN
Oxidation/Reduction Potential	-16		mv	-	NA	1	-	05/12/21 07:50	12,1498	KP
Anions by Ion Chromatography - Westborough Lab										
Chloride	9960		mg/l	250	42.0	500	-	05/18/21 00:26	44,300.0	SH
Sulfate	2070		mg/l	500	227.	500	-	05/18/21 00:26	44,300.0	SH



Project Name: SOMERSET
Project Number: SOMERSET

Lab Number: L2124373
Report Date: 05/20/21

SAMPLE RESULTS

Lab ID: L2124373-02
Client ID: SA 9132S A-E
Sample Location: SOMERSET, NY

Date Collected: 05/11/21 09:00
Date Received: 05/11/21
Field Prep: Not Specified

Sample Depth:
Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Acidity	ND		mg CaCO3/L	4.0	NA	2	-	05/20/21 15:45	121,2310B	JT
Alkalinity, Total	420.		mg CaCO3/L	2.00	NA	1	-	05/18/21 11:19	121,2320B	JB
Sulfide	ND		mg/l	0.10	0.10	1	05/17/21 13:10	05/17/21 20:21	1,9030B	EN
Oxidation/Reduction Potential	84		mv	-	NA	1	-	05/12/21 07:50	12,1498	KP
Anions by Ion Chromatography - Westborough Lab										
Chloride	41.0		mg/l	12.5	2.10	25	-	05/18/21 00:38	44,300.0	SH
Sulfate	860.		mg/l	25.0	11.4	25	-	05/18/21 00:38	44,300.0	SH



Project Name: SOMERSET
Project Number: SOMERSET

Lab Number: L2124373
Report Date: 05/20/21

SAMPLE RESULTS

Lab ID: L2124373-03
Client ID: SO 8305 A-E
Sample Location: SOMERSET, NY

Date Collected: 05/11/21 09:30
Date Received: 05/11/21
Field Prep: Not Specified

Sample Depth:
Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Acidity	ND		mg CaCO3/L	2.0	NA	1	-	05/20/21 15:45	121,2310B	JT
Alkalinity, Total	244.		mg CaCO3/L	2.00	NA	1	-	05/18/21 11:19	121,2320B	JB
Sulfide	ND		mg/l	0.10	0.10	1	05/17/21 13:10	05/17/21 20:21	1,9030B	EN
Oxidation/Reduction Potential	40		mv	-	NA	1	-	05/12/21 07:50	12,1498	KP
Anions by Ion Chromatography - Westborough Lab										
Chloride	315.		mg/l	5.00	0.839	10	-	05/18/21 00:14	44,300.0	SH
Sulfate	874.		mg/l	10.0	4.54	10	-	05/18/21 00:14	44,300.0	SH



Project Name: SOMERSET
Project Number: SOMERSET

Lab Number: L2124373
Report Date: 05/20/21

SAMPLE RESULTS

Lab ID: L2124373-04
Client ID: SO 8823 A-E
Sample Location: SOMERSET, NY

Date Collected: 05/11/21 10:00
Date Received: 05/11/21
Field Prep: Not Specified

Sample Depth:
Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Acidity	ND		mg CaCO3/L	4.0	NA	2	-	05/20/21 15:45	121,2310B	JT
Alkalinity, Total	542.		mg CaCO3/L	2.00	NA	1	-	05/18/21 11:19	121,2320B	JB
Sulfide	ND		mg/l	0.10	0.10	1	05/17/21 13:10	05/17/21 20:21	1,9030B	EN
Oxidation/Reduction Potential	100		mv	-	NA	1	-	05/12/21 07:50	12,1498	KP
Anions by Ion Chromatography - Westborough Lab										
Chloride	15.4		mg/l	5.00	0.839	10	-	05/18/21 00:51	44,300.0	SH
Sulfate	171.		mg/l	10.0	4.54	10	-	05/18/21 00:51	44,300.0	SH



Project Name: SOMERSET

Lab Number: L2124373

Project Number: SOMERSET

Report Date: 05/20/21

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab for sample(s): 01-04 Batch: WG1499904-1										
Sulfide	ND		mg/l	0.10	0.10	1	05/17/21 13:10	05/17/21 20:19	1,9030B	EN
Anions by Ion Chromatography - Westborough Lab for sample(s): 01-04 Batch: WG1500092-1										
Chloride	0.288	J	mg/l	0.500	0.083	1	-	05/17/21 17:07	44,300.0	SH
Sulfate	ND		mg/l	1.00	0.454	1	-	05/17/21 17:07	44,300.0	SH
General Chemistry - Westborough Lab for sample(s): 01-04 Batch: WG1500266-1										
Alkalinity, Total	ND		mg CaCO3/L	2.00	NA	1	-	05/18/21 11:19	121,2320B	JB
General Chemistry - Westborough Lab for sample(s): 01-04 Batch: WG1501725-1										
Acidity	ND		mg CaCO3/L	2.0	NA	1	-	05/20/21 15:45	121,2310B	JT

Lab Control Sample Analysis

Batch Quality Control

Project Name: SOMERSET

Project Number: SOMERSET

Lab Number: L2124373

Report Date: 05/20/21

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-04 Batch: WG1497651-1								
Oxidation/Reduction Potential	100		-		90-110	-		20
General Chemistry - Westborough Lab Associated sample(s): 01-04 Batch: WG1499904-2								
Sulfide	88		-		75-125	-		
Anions by Ion Chromatography - Westborough Lab Associated sample(s): 01-04 Batch: WG1500092-2								
Chloride	96		-		90-110	-		
Sulfate	94		-		90-110	-		
General Chemistry - Westborough Lab Associated sample(s): 01-04 Batch: WG1500266-2								
Alkalinity, Total	102		-		90-110	-		10
General Chemistry - Westborough Lab Associated sample(s): 01-04 Batch: WG1501725-2								
Acidity	102		-		80-120	-		

Matrix Spike Analysis Batch Quality Control

Project Name: SOMERSET
Project Number: SOMERSET

Lab Number: L2124373
Report Date: 05/20/21

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-04 QC Batch ID: WG1499904-4 QC Sample: L2124516-03 Client ID: MS Sample												
Sulfide	ND	0.48	ND	0	Q	-	-		70-130	-		20
Anions by Ion Chromatography - Westborough Lab Associated sample(s): 01-04 QC Batch ID: WG1500092-3 QC Sample: L2124373-03 Client ID: SO 8305 A-E												
Chloride	315.	40	342	69	Q	-	-		90-110	-		18
Sulfate	874.	80	791	0	Q	-	-		90-110	-		20
General Chemistry - Westborough Lab Associated sample(s): 01-04 QC Batch ID: WG1500266-4 QC Sample: L2123831-01 Client ID: MS Sample												
Alkalinity, Total	55.2	100	158	103		-	-		86-116	-		10

Lab Duplicate Analysis

Batch Quality Control

Project Name: SOMERSET
Project Number: SOMERSET

Lab Number: L2124373
Report Date: 05/20/21

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-04 QC Batch ID: WG1497651-2 QC Sample: L2124373-01 Client ID: SA 9122D A-E						
Oxidation/Reduction Potential	-16	-23	mv	36	Q	20
General Chemistry - Westborough Lab Associated sample(s): 01-04 QC Batch ID: WG1499904-3 QC Sample: L2124516-01 Client ID: DUP Sample						
Sulfide	ND	ND	mg/l	NC		20
Anions by Ion Chromatography - Westborough Lab Associated sample(s): 01-04 QC Batch ID: WG1500092-4 QC Sample: L2124373-03 Client ID: SO 8305 A-E						
Chloride	315.	315	mg/l	0		18
Sulfate	874.	875	mg/l	0		20
General Chemistry - Westborough Lab Associated sample(s): 01-04 QC Batch ID: WG1500266-3 QC Sample: L2123831-01 Client ID: DUP Sample						
Alkalinity, Total	55.2	54.0	mg CaCO3/L	2		10
General Chemistry - Westborough Lab Associated sample(s): 01-04 QC Batch ID: WG1501725-3 QC Sample: L2124373-01 Client ID: SA 9122D A-E						
Acidity	11.	12	mg CaCO3/L	9		20

Project Name: SOMERSET**Lab Number:** L2124373**Project Number:** SOMERSET**Report Date:** 05/20/21**Sample Receipt and Container Information**

Were project specific reporting limits specified?

YES

Cooler Information

Cooler	Custody Seal
A	Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2124373-01A	Plastic 250ml unpreserved/No Headspace	A	NA		3.9	Y	Absent		ALK-T-2320(14)
L2124373-01B	Plastic 250ml unpres/No Hdspace/Acidity	A	NA		3.9	Y	Absent		ACID-2310(14)
L2124373-01C	Plastic 250ml unpreserved	A	7	7	3.9	Y	Absent		SO4-300(28),ORP(1),CL-300(28)
L2124373-01D	Plastic 250ml Zn Acetate/NaOH preserved	A	>9	>9	3.9	Y	Absent		SULFIDE-9030(7)
L2124373-01E	Plastic 250ml Zn Acetate/NaOH preserved	A	>9	>9	3.9	Y	Absent		SULFIDE-9030(7)
L2124373-02A	Plastic 250ml unpreserved/No Headspace	A	NA		3.9	Y	Absent		ALK-T-2320(14)
L2124373-02B	Plastic 250ml unpres/No Hdspace/Acidity	A	NA		3.9	Y	Absent		ACID-2310(14)
L2124373-02C	Plastic 250ml unpreserved	A	7	7	3.9	Y	Absent		SO4-300(28),CL-300(28),ORP(1)
L2124373-02D	Plastic 250ml Zn Acetate/NaOH preserved	A	>9	>9	3.9	Y	Absent		SULFIDE-9030(7)
L2124373-02E	Plastic 250ml Zn Acetate/NaOH preserved	A	>9	>9	3.9	Y	Absent		SULFIDE-9030(7)
L2124373-03A	Plastic 250ml unpreserved/No Headspace	A	NA		3.9	Y	Absent		ALK-T-2320(14)
L2124373-03B	Plastic 250ml unpres/No Hdspace/Acidity	A	NA		3.9	Y	Absent		ACID-2310(14)
L2124373-03C	Plastic 250ml unpreserved	A	7	7	3.9	Y	Absent		SO4-300(28),CL-300(28),ORP(1)
L2124373-03D	Plastic 250ml Zn Acetate/NaOH preserved	A	>9	>9	3.9	Y	Absent		SULFIDE-9030(7)
L2124373-03E	Plastic 250ml Zn Acetate/NaOH preserved	A	>9	>9	3.9	Y	Absent		SULFIDE-9030(7)
L2124373-04A	Plastic 250ml unpreserved/No Headspace	A	NA		3.9	Y	Absent		ALK-T-2320(14)
L2124373-04B	Plastic 250ml unpres/No Hdspace/Acidity	A	NA		3.9	Y	Absent		ACID-2310(14)
L2124373-04C	Plastic 250ml unpreserved	A	7	7	3.9	Y	Absent		SO4-300(28),ORP(1),CL-300(28)
L2124373-04D	Plastic 250ml Zn Acetate/NaOH preserved	A	>9	>9	3.9	Y	Absent		SULFIDE-9030(7)
L2124373-04E	Plastic 250ml Zn Acetate/NaOH preserved	A	>9	>9	3.9	Y	Absent		SULFIDE-9030(7)

Project Name: SOMERSET
Project Number: SOMERSET

Lab Number: L2124373
Report Date: 05/20/21

GLOSSARY

Acronyms

DL	- Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the limit of quantitation (LOQ). The DL includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
EDL	- Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).
EMPC	- Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.
EPA	- Environmental Protection Agency.
LCS	- Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LCSD	- Laboratory Control Sample Duplicate: Refer to LCS.
LFB	- Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LOD	- Limit of Detection: This value represents the level to which a target analyte can reliably be detected for a specific analyte in a specific matrix by a specific method. The LOD includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
LOQ	- Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.) Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
MDL	- Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
MS	- Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available. For Method 332.0, the spike recovery is calculated using the native concentration, including estimated values.
MSD	- Matrix Spike Sample Duplicate: Refer to MS.
NA	- Not Applicable.
NC	- Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
NDPA/DPA	- N-Nitrosodiphenylamine/Diphenylamine.
NI	- Not Ignitable.
NP	- Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.
NR	- No Results: Term is utilized when 'No Target Compounds Requested' is reported for the analysis of Volatile or Semivolatile Organic TIC only requests.
RL	- Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
RPD	- Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.
SRM	- Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.
STLP	- Semi-dynamic Tank Leaching Procedure per EPA Method 1315.
TEF	- Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.
TEQ	- Toxic Equivalent: The measure of a sample's toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.
TIC	- Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Report Format: DU Report with 'J' Qualifiers



Project Name: SOMERSET
Project Number: SOMERSET

Lab Number: L2124373
Report Date: 05/20/21

Footnotes

- 1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Difference: With respect to Total Oxidizable Precursor (TOP) Assay analysis, the difference is defined as the Post-Treatment value minus the Pre-Treatment value.

Final pH: As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

Frozen Date/Time: With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

Initial pH: As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

PAH Total: With respect to Alkylated PAH analyses, the 'PAHs, Total' result is defined as the summation of results for all or a subset of the following compounds: Naphthalene, C1-C4 Naphthalenes, 2-Methylnaphthalene, 1-Methylnaphthalene, Biphenyl, Acenaphthylene, Acenaphthene, Fluorene, C1-C3 Fluorenes, Phenanthrene, C1-C4 Phenanthrenes/Anthracenes, Anthracene, Fluoranthene, Pyrene, C1-C4 Fluoranthenes/Pyrenes, Benz(a)anthracene, Chrysene, C1-C4 Chrysenes, Benzo(b)fluoranthene, Benzo(j)+(k)fluoranthene, Benzo(e)pyrene, Benzo(a)pyrene, Perylene, Indeno(1,2,3-cd)pyrene, Dibenz(ah)+(ac)anthracene, Benzo(g,h,i)perylene. If a 'Total' result is requested, the results of its individual components will also be reported.

PFAS Total: With respect to PFAS analyses, the 'PFAS, Total (5)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA and PFOS. In addition, the 'PFAS, Total (6)' result is defined as the summation of results at or above the RL for: PFHpA, PFHxS, PFOA, PFNA, PFDA and PFOS. (Note: 'PFAS, Total (6)' is applicable to MassDEP DW compliance analysis only.). If a 'Total' result is requested, the results of its individual components will also be reported.

The target compound Chlordane (CAS No. 57-74-9) is reported for GC ECD analyses. Per EPA, this compound "refers to a mixture of chlordane isomers, other chlorinated hydrocarbons and numerous other components." (Reference: USEPA Toxicological Review of Chlordane, In Support of Summary Information on the Integrated Risk Information System (IRIS), December 1997.)

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Data Qualifiers

- A** - Spectra identified as "Aldol Condensates" are byproducts of the extraction/concentration procedures when acetone is introduced in the process.
- B** - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).
- C** - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.
- D** - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.
- E** - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
- F** - The ratio of quantifier ion response to qualifier ion response falls outside of the laboratory criteria. Results are considered to be an estimated maximum concentration.
- G** - The concentration may be biased high due to matrix interferences (i.e. co-elution) with non-target compound(s). The result should be considered estimated.
- H** - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.
- I** - The lower value for the two columns has been reported due to obvious interference.
- J** - Estimated value. The Target analyte concentration is below the quantitation limit (RL), but above the Method Detection Limit (MDL) or Estimated Detection Limit (EDL) for SPME-related analyses. This represents an estimated concentration for Tentatively Identified Compounds (TICs).
- M** - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.
- ND** - Not detected at the method detection limit (MDL) for the sample, or estimated detection limit (EDL) for SPME-related analyses.

Report Format: DU Report with 'J' Qualifiers



Project Name: SOMERSET
Project Number: SOMERSET

Lab Number: L2124373
Report Date: 05/20/21

Data Qualifiers

- NJ** - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.
- P** - The RPD between the results for the two columns exceeds the method-specified criteria.
- Q** - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)
- R** - Analytical results are from sample re-analysis.
- RE** - Analytical results are from sample re-extraction.
- S** - Analytical results are from modified screening analysis.

Report Format: DU Report with 'J' Qualifiers



Project Name: SOMERSET
Project Number: SOMERSET

Lab Number: L2124373
Report Date: 05/20/21

REFERENCES

- 1 Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. EPA SW-846. Third Edition. Updates I - VI, 2018.
- 12 Annual Book of ASTM Standards. (American Society for Testing and Materials) ASTM International.
- 44 Methods for the Determination of Inorganic Substances in Environmental Samples, EPA/600/R-93/100, August 1993.
- 121 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WEF. Standard Methods Online.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.



Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility

EPA 624/624.1: m/p-xylene, o-xylene, Naphthalene

EPA 625/625.1: alpha-Terpineol

EPA 8260C/8260D: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.

EPA 8270D/8270E: NPW: Dimethylnaphthalene, 1,4-Diphenylhydrazine, alpha-Terpineol; SCM: Dimethylnaphthalene, 1,4-Diphenylhydrazine.

SM4500: NPW: Amenable Cyanide; SCM: Total Phosphorus, TKN, NO₂, NO₃.

Mansfield Facility

SM 2540D: TSS

EPA 8082A: NPW: PCB: 1, 5, 31, 87,101, 110, 141, 151, 153, 180, 183, 187.

EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene,

3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.

Biological Tissue Matrix: EPA 3050B

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:

Drinking Water

EPA 300.0: Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2:** Nitrate-N, Nitrite-N; **SM4500NO3-F:** Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE,**

EPA 180.1, SM2130B, SM4500CI-D, SM2320B, SM2540C, SM4500H-B, SM4500NO2-B

EPA 332: Perchlorate; **EPA 524.2:** THMs and VOCs; **EPA 504.1:** EDB, DBCP.

Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT, SM9222D.**

Non-Potable Water

SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH: Ammonia-N and Kjeldahl-N, **EPA 350.1:**

Ammonia-N, **LCHAT 10-107-06-1-B:** Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2:** Nitrate-N, **SM4500P-E, SM4500P-B, E, SM4500SO4-E,**

SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D, EPA 300: Chloride, Sulfate, Nitrate.

EPA 624.1: Volatile Halocarbons & Aromatics,

EPA 608.3: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II,

Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs

EPA 625.1: SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045:** PCB-Oil.

Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603, SM9222D.**

Mansfield Facility:

Drinking Water

EPA 200.7: Al, Ba, Cd, Cr, Cu, Fe, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1 Hg.**

EPA 522, EPA 537.1.

Non-Potable Water

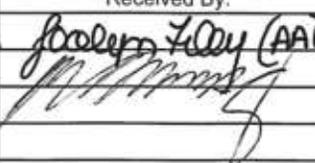
EPA 200.7: Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.

EPA 200.8: Al, Sb, As, Be, Cd, Cr, Cu, Fe, Pb, Mn, Ni, K, Se, Ag, Na, TL, Zn.

EPA 245.1 Hg.

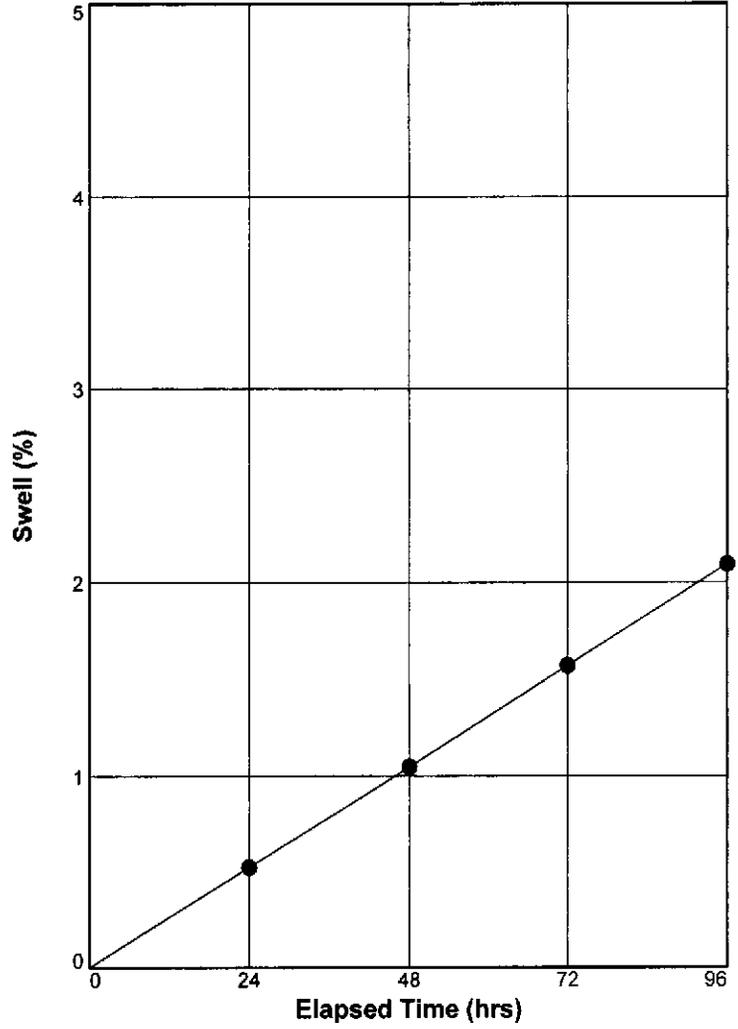
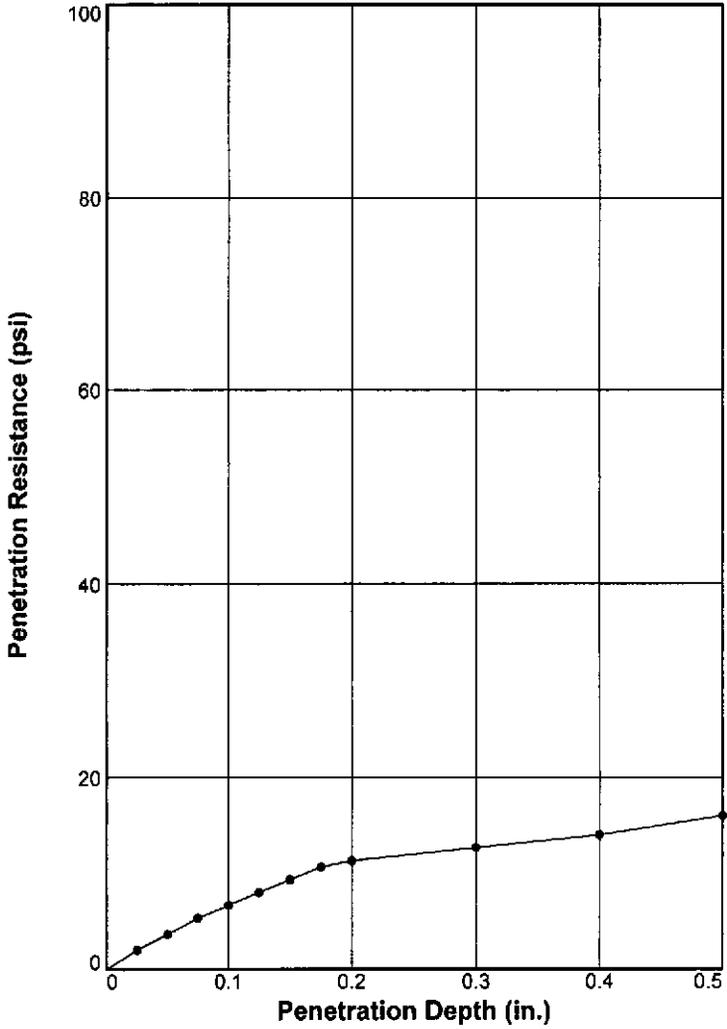
SM2340B

For a complete listing of analytes and methods, please contact your Alpha Project Manager.

	NEW YORK CHAIN OF CUSTODY	Service Centers Mahwah, NJ 07430: 35 Whitney Rd, Suite 5 Albany, NY 12205: 14 Walker Way Tonawanda, NY 14150: 275 Cooper Ave, Suite 105	Page of	Date Rec'd in Lab 5/12/21	ALPHA Job # 02124373						
	Westborough, MA 01581 8 Walkup Dr. TEL: 508-898-9220 FAX: 508-898-9193	Mansfield, MA 02048 320 Forbes Blvd TEL: 508-822-9300 FAX: 508-822-3288									
Project Information Project Name: <u>Somerset</u> Project Location: <u>Somerset, NY</u>		Deliverables <input type="checkbox"/> ASP-A <input type="checkbox"/> ASP-B <input type="checkbox"/> EQulS (1 File) <input type="checkbox"/> EQulS (4 File) <input type="checkbox"/> Other		Billing Information <input checked="" type="checkbox"/> Same as Client Info PO #							
Client Information Client: <u>ANS Geo</u> Address: <u>4475 S. Clinton Ave</u> <u>South Plainfield, NJ 07080</u> Phone: <u>908 754 8800</u> Fax: Email: <u>Eric.Pauli@ansgeo.com</u>		Project # (Use Project name as Project #) <input checked="" type="checkbox"/>		Regulatory Requirement <input checked="" type="checkbox"/> NY TOGS <input type="checkbox"/> NY Part 375 <input type="checkbox"/> AWQ Standards <input type="checkbox"/> NY CP-51 <input type="checkbox"/> NY Restricted Use <input type="checkbox"/> Other <input type="checkbox"/> NY Unrestricted Use <input type="checkbox"/> NYC Sewer Discharge							
Project Manager: <u>Eric Pauli</u> ALPHAQuote #: Turn-Around Time Standard <input type="checkbox"/> Due Date: Rush (only if pre approved) <input type="checkbox"/> # of Days:		Disposal Site Information Please identify below location of applicable disposal facilities. Disposal Facility: <input type="checkbox"/> NJ <input type="checkbox"/> NY <input type="checkbox"/> Other:									
These samples have been previously analyzed by Alpha <input type="checkbox"/>		ANALYSIS		Sample Filtration <input type="checkbox"/> Done <input type="checkbox"/> Lab to do <input type="checkbox"/> Preservation <input type="checkbox"/> Lab to do (Please Specify below)							
Other project specific requirements/comments:		Acidity Alkalinity Chloride Oxidation/Reduction potential Sulfate Sulfide		Total Bottles							
Please specify Metals or TAL.											
ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date Time	Sample Matrix	Sampler's Initials							
<u>243730</u>	<u>SA 9122D a-e</u>	<u>5/11/21 8:30</u>		<u>NW</u>	<u>X</u>	<u>X</u>	<u>X</u>	<u>X</u>	<u>X</u>	<u>X</u>	
<u>02</u>	<u>SA 9132S a-e</u>	<u>5/11/21 9:00</u>		<u>NW</u>	<u>↓</u>	<u>↓</u>	<u>↓</u>	<u>↓</u>	<u>↓</u>	<u>↓</u>	
<u>03</u>	<u>SO 8305 a-e</u>	<u>5/11/21 9:30</u>		<u>NW</u>	<u>↓</u>	<u>↓</u>	<u>↓</u>	<u>↓</u>	<u>↓</u>	<u>↓</u>	
<u>04</u>	<u>SO 8823 a-e</u>	<u>5/11/21 10:00</u>		<u>NW</u>	<u>↓</u>	<u>↓</u>	<u>↓</u>	<u>↓</u>	<u>↓</u>	<u>↓</u>	
Preservative Code: A = None B = HCl C = HNO ₃ D = H ₂ SO ₄ E = NaOH F = MeOH G = NaHSO ₄ H = Na ₂ S ₂ O ₃ K/E = Zn Ac/NaOH O = Other		Container Code: P = Plastic A = Amber Glass V = Vial G = Glass B = Bacteria Cup C = Cube O = Other E = Encore D = BOD Bottle		Westboro: Certification No: MA935 Mansfield: Certification No: MA015		Container Type Preservative		Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. BY EXECUTING THIS COC, THE CLIENT HAS READ AND AGREES TO BE BOUND BY ALPHA'S TERMS & CONDITIONS. (See reverse side.)			
		Relinquished By:		Date/Time		Received By:		Date/Time			
		<u>Nick Wilker</u>		<u>5/11/21 2:30pm</u>		<u>Joey (AA)</u>		<u>5/11/21 14:30</u>			
		<u>Joey (AA)</u>		<u>5/11/21 14:30</u>				<u>5/12/21 01:00</u>			

**CALIFORNIA BEARING RATIO
RESULTS**

BEARING RATIO TEST REPORT ASTM D 1883-07



	Molded			Soaked			CBR (%)		Linearity Correction (in.)	Surcharge (lbs.)	Max. Swell (%)
	Density (pcf)	Percent of Max. Dens.	Moisture (%)	Density (pcf)	Percent of Max. Dens.	Moisture (%)	0.10 in.	0.20 in.			
1 ○	88.3	90	14.5	86.5	88.1	34.5	0.7	0.8	0.000	10	2.1
2 △											
3 □											

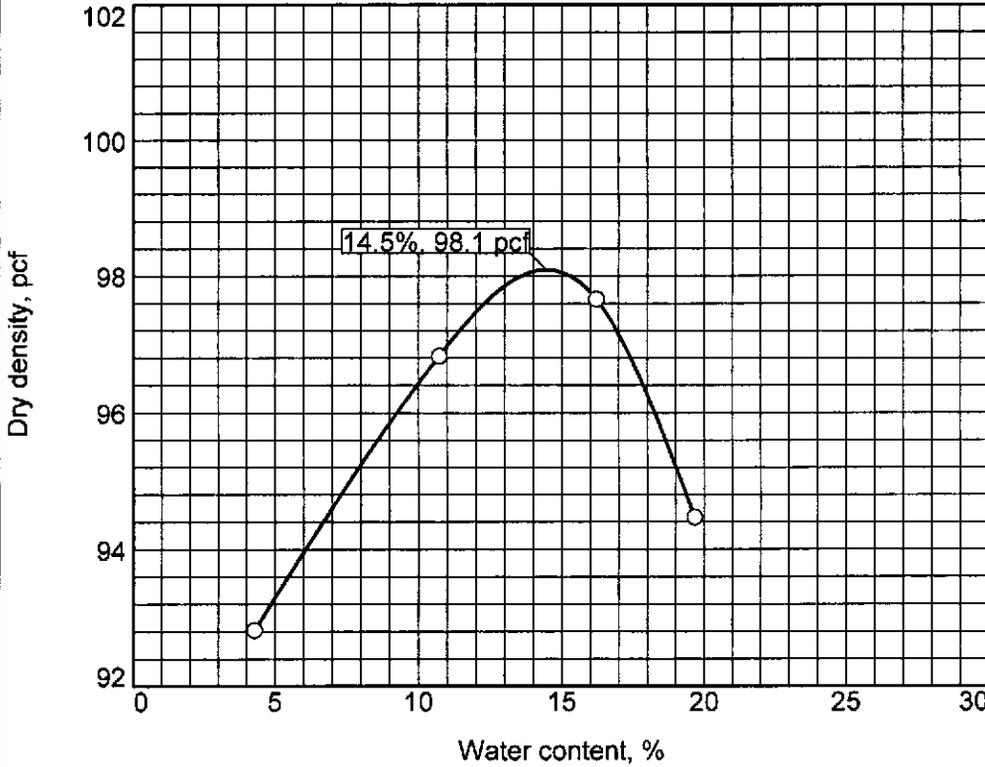
Material Description	USCS	Max. Dens. (pcf)	Optimum Moisture (%)	LL	PI
			98.1	14.5	

Project No: AOV-5632
Project: AES- Somerset Solar, Somerset, NY
Location: B-04, CBR,
Sample Number: S-17 **Depth:** 1'-3'
Date:

Test Description/Remarks:

COMPACTION TEST REPORT

Curve No.
S-17



Test Specification:
ASTM D 698-12 Method B Standard

Preparation Method _____
Hammer Wt. _____ 5.5 lb.
Hammer Drop _____ 12 in.
Number of Layers _____ three
Blows per Layer _____ 25
Mold Size _____ 0.03333 cu. ft.

Test Performed on Material
Passing _____ 3/8 in. **Sieve** _____

NM _____ **LL** _____ **PI** _____

Sp.G. (ASTM D 854) _____

%>3/8 in. _____ **%<No.200** _____

USCS _____ **AASHTO** _____

Date Sampled _____

Date Tested _____

Tested By _____

TESTING DATA

	1	2	3	4	5	6
WM + WS	12.65	13.00	13.21	13.19		
WM	9.43	9.43	9.43	9.43		
WW + T #1	819.3	965.2	696.0	765.5		
WD + T #1	785.6	871.7	598.9	639.7		
TARE #1	0.0	0.0	0.0	0.0		
WW + T #2						
WD + T #2						
TARE #2						
MOISTURE	4.3	10.7	16.2	19.7		
DRY DENSITY	92.8	96.8	97.7	94.5		

TEST RESULTS

Maximum dry density = 98.1 pcf

Optimum moisture = 14.5 %

Project No. AOV-5632 **Client:** ANS GEO, Inc.

Project: AES- Somerset Solar, Somerset, NY

○ **Location:** B-04, CBR, **Depth:** 1'-3' **Sample Number:** S-17

ANS CONSULTANTS, INC.

South Plainfield, New Jersey

Material Description

Remarks:

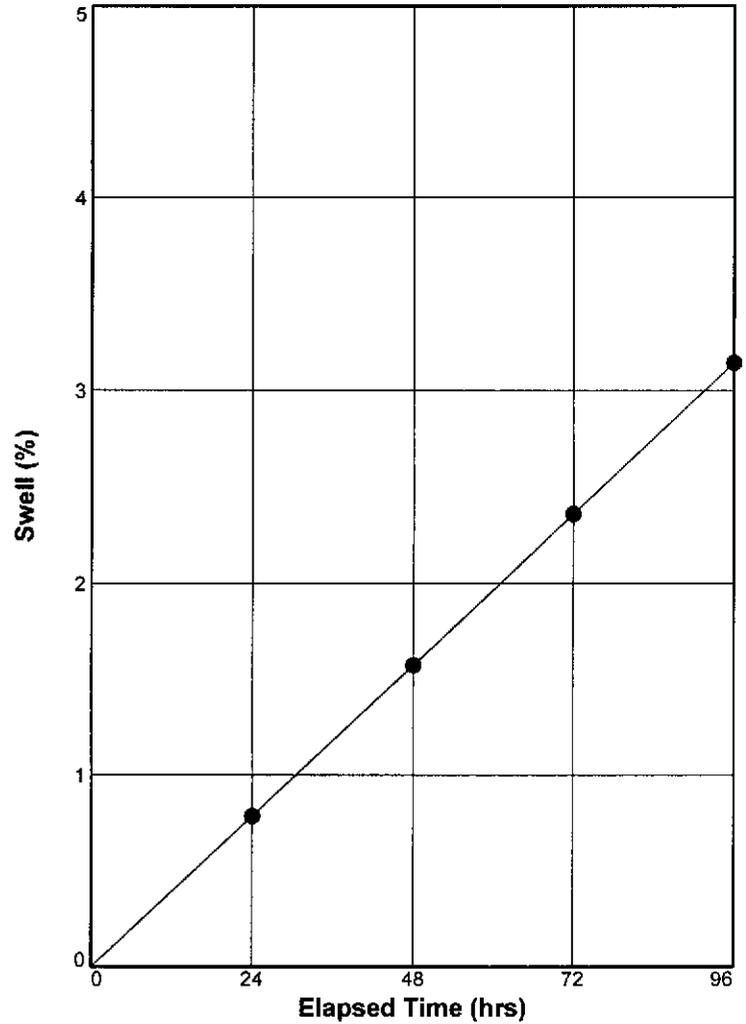
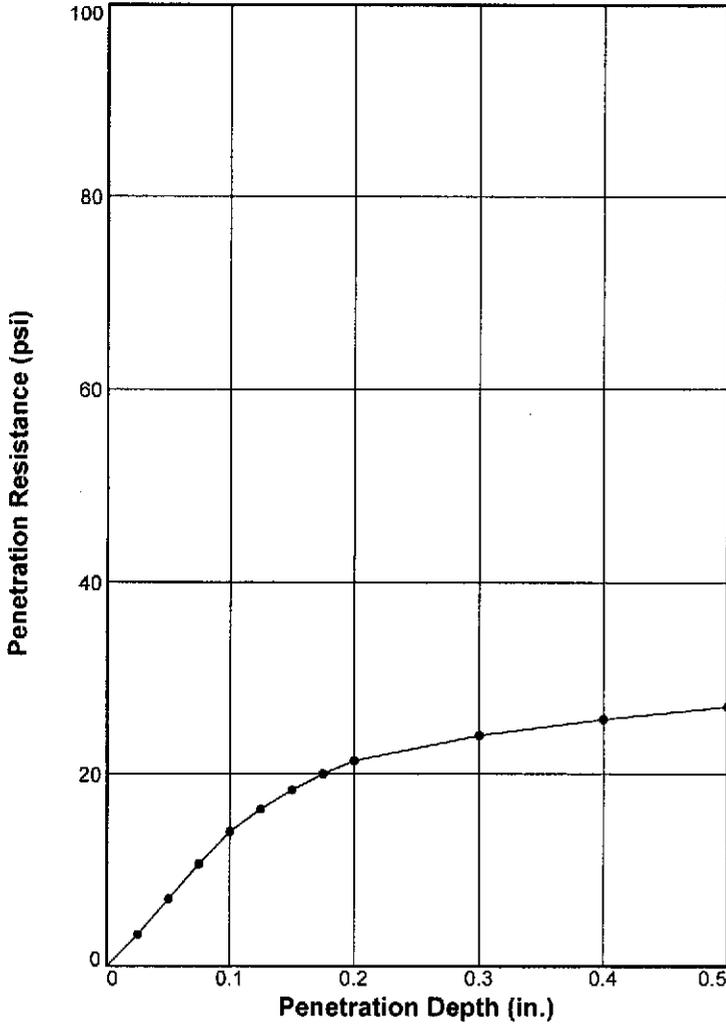
Checked by:

Title:

Figure 17 F 2

BEARING RATIO TEST REPORT

ASTM D 1883-07



	Molded			Soaked			CBR (%)		Linearity Correction (in.)	Surcharge (lbs.)	Max. Swell (%)
	Density (pcf)	Percent of Max. Dens.	Moisture (%)	Density (pcf)	Percent of Max. Dens.	Moisture (%)	0.10 in.	0.20 in.			
1 ○	94.8	90	12.1	91.9	87.3	23.6	1.4	1.4	0.000	10	3.1
2 △											
3 □											

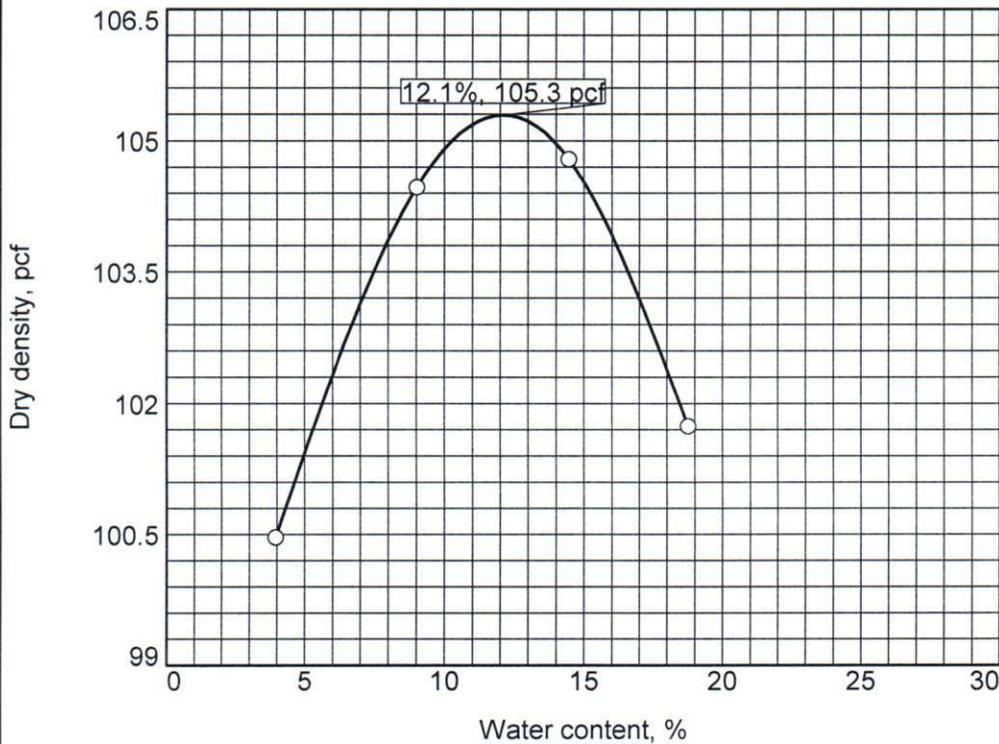
Material Description	USCS	Max. Dens. (pcf)	Optimum Moisture (%)	LL	PI

Project No: AOV-5632
Project: AES- Somerset Solar, Somerset, NY
Location: B-18, CBR
Sample Number: S-19 **Depth:** 1'-3'
Date:

Test Description/Remarks:

COMPACTION TEST REPORT

Curve No.
S-19



Test Specification:
ASTM D 698-12 Method B Standard

Preparation Method _____
Hammer Wt. _____ 5.5 lb.
Hammer Drop _____ 12 in.
Number of Layers _____ three
Blows per Layer _____ 25
Mold Size _____ 0.03333 cu. ft.

Test Performed on Material
Passing _____ 3/8 in. _____ Sieve

NM _____ **LL** _____ **PI** _____

Sp.G. (ASTM D 854) _____

%>3/8 in. _____ **%<No.200** _____

USCS _____ **AASHTO** _____

Date Sampled _____

Date Tested _____

Tested By _____

TESTING DATA

	1	2	3	4	5	6
WM + WS	12.91	13.22	13.42	13.45		
WM	9.43	9.43	9.43	9.43		
WW + T #1	647.3	610.8	786.4	870.9		
WD + T #1	622.7	560.3	687.1	733.3		
TARE #1	0.0	0.0	0.0	0.0		
WW + T #2						
WD + T #2						
TARE #2						
MOISTURE	4.0	9.0	14.5	18.8		
DRY DENSITY	100.5	104.5	104.8	101.7		

TEST RESULTS

Maximum dry density = 105.3 pcf

Optimum moisture = 12.1 %

Project No. AOV-5632 **Client:** ANS GEO, Inc.

Project: AES- Somerset Solar, Somerset, NY

○ **Location:** B-18, CBR **Depth:** 1'-3' **Sample Number:** S-19

ANS CONSULTANTS, INC.

South Plainfield, New Jersey

Material Description

Remarks:

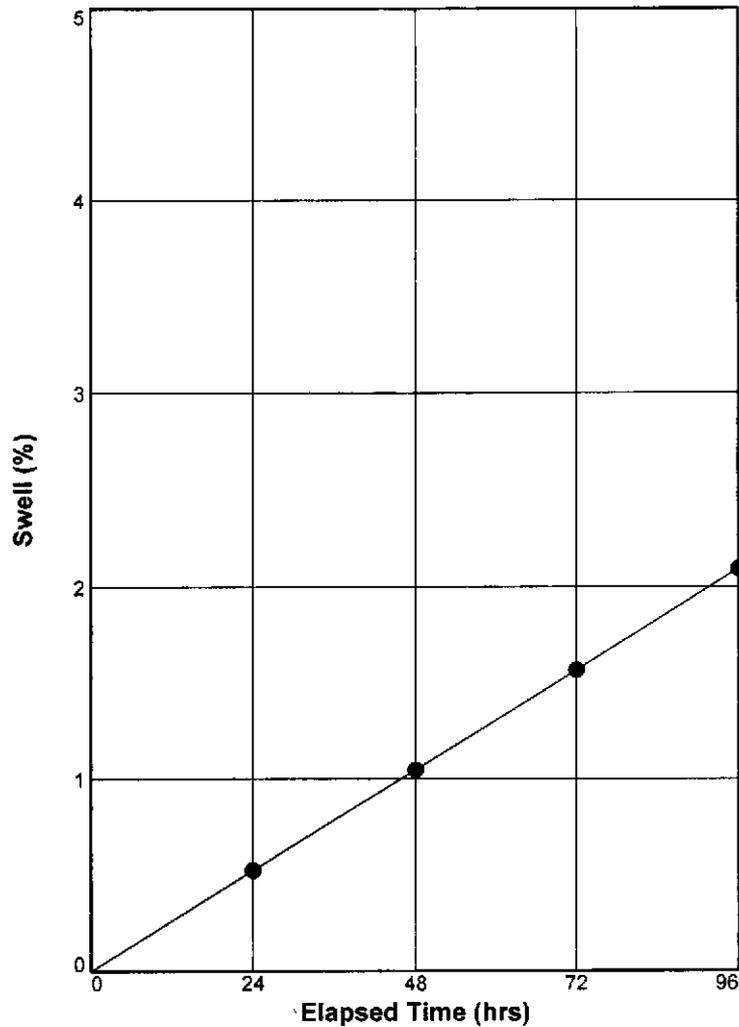
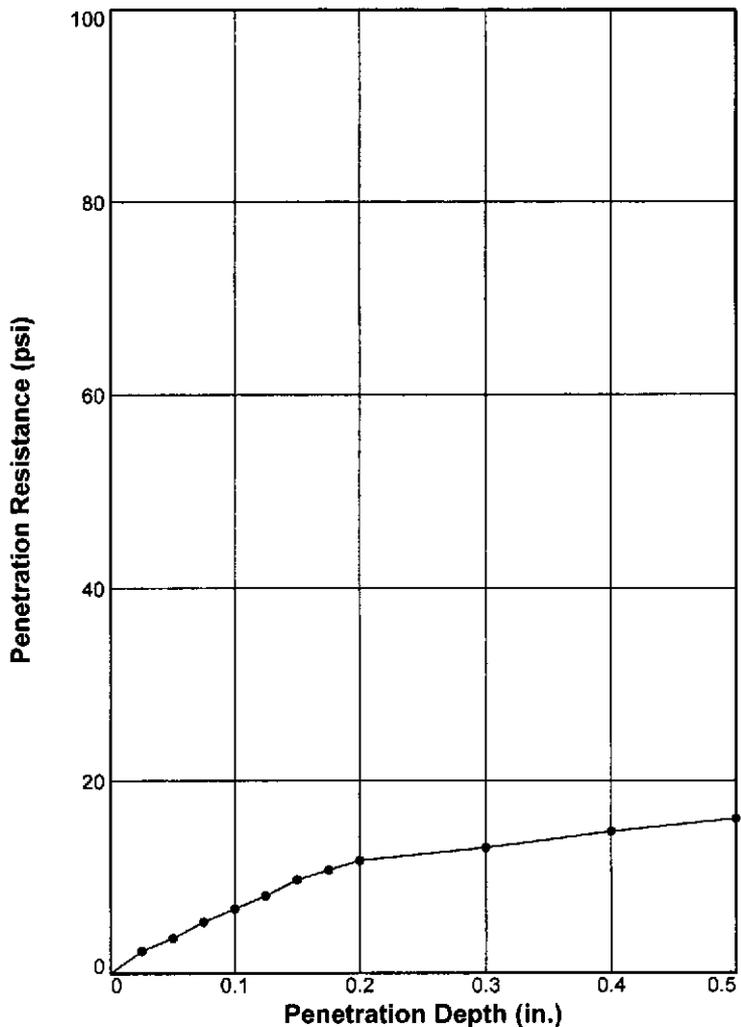
Checked by:

Title:

Figure 19 F 2

BEARING RATIO TEST REPORT

ASTM D 1883-07



	Molded			Soaked			CBR (%)		Linearity Correction (in.)	Surcharge (lbs.)	Max. Swell (%)
	Density (pcf)	Percent of Max. Dens.	Moisture (%)	Density (pcf)	Percent of Max. Dens.	Moisture (%)	0.10 in.	0.20 in.			
1 ○	95.0	89.8	11.1	93.0	87.9	11.1	0.7	0.8	0.000	10	2.1
2 △											
3 □											

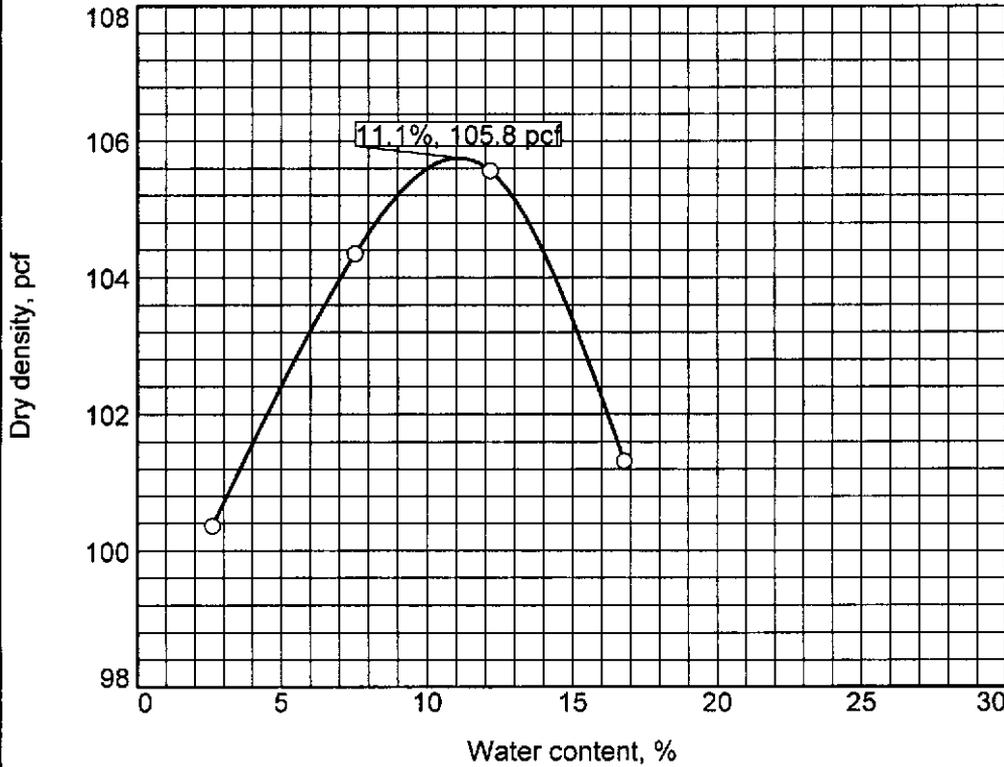
Material Description	USCS	Max. Dens. (pcf)	Optimum Moisture (%)	LL	PI
			105.8	11.1	

Project No: AOV-5632
Project: AES- Somerset Solar, Somerset, NY
Location: B-31, CBR,
Sample Number: S-18 **Depth:** 1'-3'
Date:

Test Description/Remarks:

COMPACTION TEST REPORT

Curve No.
S-18



Test Specification:
ASTM D 698-12 Method B Standard

Preparation Method _____
Hammer Wt. 5.5 lb.
Hammer Drop 12 in.
Number of Layers three
Blows per Layer 25
Mold Size 0.03333 cu. ft.

Test Performed on Material
Passing 3/8 in. **Sieve**

NM _____ **LL** _____ **PI** _____

Sp.G. (ASTM D 854) _____

%>3/8 in. _____ **%<No.200** _____

USCS _____ **AASHTO** _____

Date Sampled _____

Date Tested _____

Tested By _____

TESTING DATA

	1	2	3	4	5	6
WM + WS	12.86	13.17	13.37	13.37		
WM	9.43	9.43	9.43	9.43		
WW + T #1	611.6	832.0	608.7	885.9		
WD + T #1	596.0	773.6	542.6	758.6		
TARE #1	0.0	0.0	0.0	0.0		
WW + T #2						
WD + T #2						
TARE #2						
MOISTURE	2.6	7.5	12.2	16.8		
DRY DENSITY	100.4	104.3	105.6	101.3		

TEST RESULTS

Maximum dry density = 105.8 pcf

Optimum moisture = 11.1 %

Project No. AOV-5632 **Client:** ANS GEO, Inc.

Project: AES- Somerset Solar, Somerset, NY

○ **Location:** B-31, CBR, **Depth:** 1'-3' **Sample Number:** S-18

ANS CONSULTANTS, INC.

South Plainfield, New Jersey

Material Description

Remarks:

Checked by:

Title:

Figure 18 F 2

Attachment E

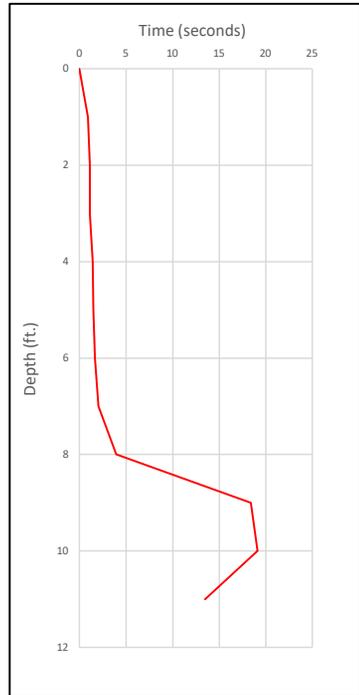
Pile Load Testing Logs

Project:	AES - Somerset Solar	Site Location:	Somerset, NY	Pile ID:	PT-01A
Date/Time Installed:	4/10/21 8:55 AM	Date/Time Tested:	4/24/21 10:10 AM	Pile Type/Size:	W6x9
Pre-Auger/Pre-Drill (Y/N)?:	N	Pre-Auger Depth (ft.):	N/A	Pile Length:	15
Pre-Drill Depth (ft.):	N/A	Pre-Drill Diameter (in.):	N/A	Total Drive Time (sec):	64.53
Pushed to Depth (ft.):	0.5	Embedment Depth (ft.):	10.60	Avg. Installation Rate (sec/ft)	6.09

Embedment Data	
Depth (ft.)	Time (s)
0	0
1	0.90
2	1.09
3	1.10
4	1.39
5	1.47
6	1.65
7	2.03
8	3.93
9	18.39
10	19.11
11	13.47
Total Time (s) =	64.53

Tensile Testing					
Hold Time (min)	Target Load (lbs)	Load (lbs)	Deflection 1 (in.)	Deflection 2 (in.)	Average Deflection (in.)
1	0	0	0.0000	0.0000	0.0000
1	1,500	1,500	0.0045	0.0010	0.0028
1	3,000	3,000	0.0065	0.0050	0.0058
1	4,000	4,000	0.0065	0.0105	0.0085
1	5,000	5,000	0.0045	0.0145	0.0095
1	6,000	6,100	0.0040	0.0205	0.0123
1	7,000	7,000	0.0020	0.0275	0.0148
1	8,000	8,000	0.0000	0.0360	0.0180
1	9,000	9,100	-0.0030	0.0420	0.0195
1	10,000	10,000	-0.0050	0.0495	0.0223
Unload					
1	0	0	0.0010	0.0070	0.0040
Reload					
1	Max.	10,000	-0.0005	0.0465	0.0230
Unload					
1	0	0	-0.0015	0.0030	0.0008

Lateral Testing					
Lateral Load Height Above Grade (ft):		3	Deflection Gauge Height (in):		4
Hold Time (min)	Target Load (lbs)	Load (lbs)	Deflection 1 (in.)	Deflection 2 (in.)	Average Deflection (in.)
1	0	0	0.0000	0.0000	0.0000
1	500	500	0.2290	0.0655	0.1473
1	1,000	1,000	0.3900	0.1255	0.2578
1	1,500	1,500	0.5045	0.1955	0.3500
1	0	0	0.0640	0.0070	0.0355
1	500	500	0.2915	0.0325	0.1620
1	1,000	1,000	0.4945	0.1425	0.3185
1	1,500	1,500	0.6060	0.2150	0.4105
1	2,000	2,000	0.6105	0.2925	0.4515
1	2,500	2,500	0.6240	0.3705	0.4973
1	0	0	0.1045	0.0175	0.0610
1	2,500	2,500	0.7460	0.3830	0.5645
1	3,000	3,000	0.7465	0.4555	0.6010
1	3,500	3,500	0.7760	0.5455	0.6608
1	4,000	4,000	0.7990	0.6420	0.7205
Unload					
1	0	0	0.4190	0.6030	0.5110
Reload					
1	Max.	2,160	1.3860	0.9660	1.1760
Unload					
1	0	0	0.7970	0.5380	0.6675



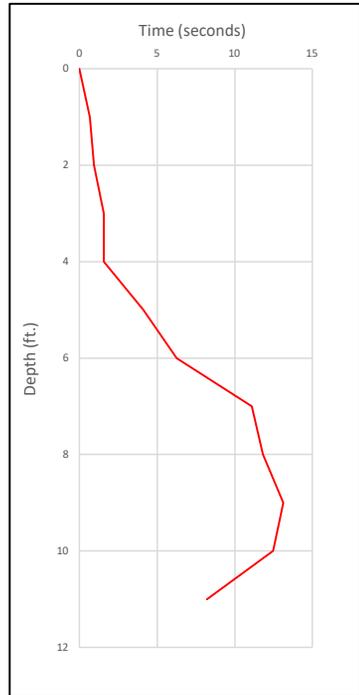
Field Notes

Project:	AES - Somerset Solar	Site Location:	Somerset, NY	Pile ID:	PT-01B
Date/Time Installed:	4/10/21 9:00 AM	Date/Time Tested:	4/24/21 10:15 AM	Pile Type/Size:	W6x9
Pre-Auger/Pre-Drill (Y/N)?:	N	Pre-Auger Depth (ft.):	N/A	Pile Length:	15
Pre-Drill Depth (ft.):	N/A	Pre-Drill Diameter (in.):	N/A	Total Drive Time (sec):	71.79
Pushed to Depth (ft.):	0.5	Embedment Depth (ft.):	10.50	Avg. Installation Rate (sec/ft)	6.84

Embedment Data	
Depth (ft.)	Time (s)
0	0
1	0.65
2	0.93
3	1.56
4	1.57
5	4.11
6	6.25
7	11.1
8	11.81
9	13.14
10	12.47
11	8.2
Total Time (s) =	71.79

Tensile Testing					
Hold Time (min)	Target Load (lbs)	Load (lbs)	Deflection 1 (in.)	Deflection 2 (in.)	Average Deflection (in.)
1	0	0	0.0000	0.0000	0.0000
1	1,500	1,500	0.0000	0.0035	0.0018
1	3,000	3,000	0.0000	0.0130	0.0065
1	4,000	4,000	0.0005	0.0195	0.0100
1	5,000	5,000	0.0010	0.0280	0.0145
1	6,000	6,000	0.0020	0.0360	0.0190
1	7,000	7,000	0.0050	0.0520	0.0285
1	8,000	8,000	0.0090	0.0660	0.0375
1	9,000	9,000	0.0120	0.0740	0.0430
1	10,000	10,000	0.0175	0.0860	0.0518
Unload					
1	0	0	0.0175	0.0220	0.0198
Reload					
1	Max.	10,000	0.0185	0.1030	0.0608
Unload					
1	0	0	0.0215	0.0260	0.0238

Lateral Testing					
Lateral Load Height Above Grade (ft):		3	Deflection Gauge Height (in):		4
Hold Time (min)	Target Load (lbs)	Load (lbs)	Deflection 1 (in.)	Deflection 2 (in.)	Average Deflection (in.)
1	0	0	0.0000	0.0000	0.0000
1	500	500	0.2675	-0.0315	0.1180
1	1,000	1,000	0.3825	-0.0180	0.1823
1	1,500	1,500	0.5025	0.0140	0.2583
1	0	0	0.1135	0.0005	0.0570
1	500	500	0.2845	-0.0155	0.1345
1	1,000	1,000	0.4375	-0.0005	0.2185
1	1,500	1,500	0.5435	0.0295	0.2865
1	2,000	2,000	0.6340	0.0715	0.3528
1	2,500	2,500	0.7315	0.1285	0.4300
1	0	0	0.1130	0.0340	0.0735
1	2,500	2,500	0.7670	0.1460	0.4565
1	3,000	3,000	0.8570	0.2060	0.5315
1	3,500	3,500	0.9640	0.2950	0.6295
1	4,000	4,000	1.0770	0.4090	0.7430
Unload					
1	0	0	0.0720	0.1265	0.0993
Reload					
1	Max.	2,160	0.8045	0.2305	0.5175
Unload					
1	0	0	0.0380	0.1440	0.0910



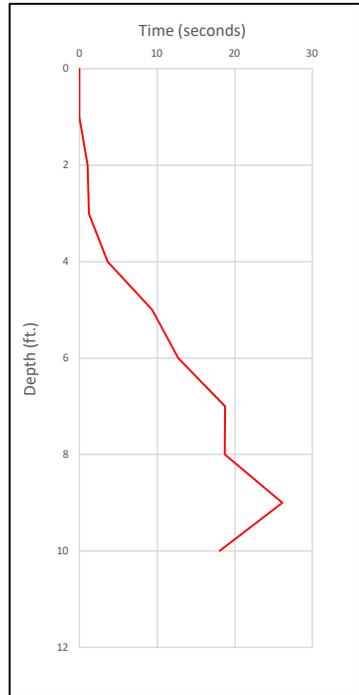
Field Notes

Project:	AES - Somerset Solar	Site Location:	Somerset, NY	Pile ID:	PT-02A
Date/Time Installed:	4/10/21 9:15 AM	Date/Time Tested:	4/24/21 9:30 AM	Pile Type/Size:	W6x9
Pre-Auger/Pre-Drill (Y/N)?:	N	Pre-Auger Depth (ft.):	N/A	Pile Length:	15
Pre-Drill Depth (ft.):	N/A	Pre-Drill Diameter (in.):	N/A	Total Drive Time (sec):	109.57
Pushed to Depth (ft.):	1	Embedment Depth (ft.):	9.50	Avg. Installation Rate (sec/ft)	11.53

Embedment Data	
Depth (ft.)	Time (s)
0	0
1	0
2	1.03
3	1.21
4	3.60
5	9.35
6	12.73
7	18.76
8	18.68
9	26.15
10	18.06
Total Time (s) =	109.57

Tensile Testing					
Hold Time (min)	Target Load (lbs)	Load (lbs)	Deflection 1 (in.)	Deflection 2 (in.)	Average Deflection (in.)
1	0	0	0.0000	0.0000	0.0000
1	1,500	1,500	0.0010	0.0000	0.0005
1	3,000	3,000	0.0065	0.0000	0.0033
1	4,000	4,000	0.0130	-0.0030	0.0050
1	5,000	5,000	0.0175	-0.0055	0.0060
1	6,000	6,000	0.0265	-0.0085	0.0090
1	7,000	7,000	0.0345	-0.0120	0.0113
1	8,000	8,000	0.0435	-0.0170	0.0133
1	9,000	9,000	0.0545	-0.0255	0.0145
1	10,000	10,000	0.0630	-0.0255	0.0188
Unload					
1	0	0	0.0060	-0.0255	-0.0098
Reload					
1	Max.	10,000	0.0655	-0.0255	0.0200
Unload					
1	0	0	0.0030	-0.0030	0.0000

Lateral Testing					
Lateral Load Height Above Grade (ft):		3	Deflection Gauge Height (in):		4
Hold Time (min)	Target Load (lbs)	Load (lbs)	Deflection 1 (in.)	Deflection 2 (in.)	Average Deflection (in.)
1	0	0	0.0000	0.0000	0.0000
1	500	500	0.0510	0.2045	0.1278
1	1,000	1,000	0.1010	0.3165	0.2088
1	1,500	1,500	0.1730	0.4510	0.3120
1	0	0	0.0690	0.0320	0.0505
1	500	500	0.1105	0.2315	0.1710
1	1,000	1,000	0.1495	0.3515	0.2505
1	1,500	1,500	0.2030	0.4680	0.3355
1	2,000	2,000	0.2880	0.5955	0.4418
1	2,500	2,500	0.3910	0.6175	0.5043
1	0	0	0.1620	-0.0005	0.0808
1	2,500	2,500	0.4475	0.7015	0.5745
1	3,000	3,000	0.5400	0.7090	0.6245
1	3,500	3,500	0.6715	0.7215	0.6965
1	4,000	3,900	0.8840	0.7320	0.8080
Unload					
1	0	0	0.3675	-0.0945	0.1365



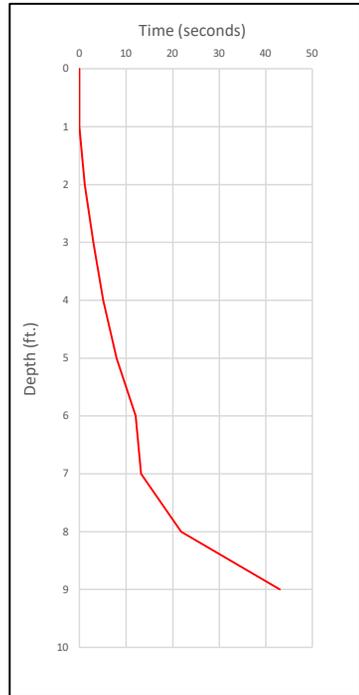
Field Notes

Project:	AES - Somerset Solar	Site Location:	Somerset, NY	Pile ID:	PT-02B
Date/Time Installed:	4/10/21 9:25 AM	Date/Time Tested:	4/24/21 9:15 AM	Pile Type/Size:	W6x9
Pre-Auger/Pre-Drill (Y/N)?:	N	Pre-Auger Depth (ft.):	N/A	Pile Length:	15
Pre-Drill Depth (ft.):	N/A	Pre-Drill Diameter (in.):	N/A	Total Drive Time (sec):	107.13
Pushed to Depth (ft.):	1.1	Embedment Depth (ft.):	9.10	Avg. Installation Rate (sec/ft)	11.77

Embedment Data	
Depth (ft.)	Time (s)
0	0
1	0
2	1.09
3	2.96
4	5.09
5	7.96
6	12.02
7	13.18
8	21.82
9	43.01
Total Time (s) =	107.13

Tensile Testing					
Hold Time (min)	Target Load (lbs)	Load (lbs)	Deflection 1 (in.)	Deflection 2 (in.)	Average Deflection (in.)
1	0	0	0.0000	0.0000	0.0000
1	1,500	1,500	0.0020	0.0000	0.0010
1	3,000	3,000	0.0030	0.0020	0.0025
1	4,000	4,100	0.0025	0.0065	0.0045
1	5,000	5,100	0.0025	0.0120	0.0073
1	6,000	6,000	0.0025	0.0200	0.0113
1	7,000	7,000	0.0015	0.0285	0.0150
1	8,000	8,100	0.0025	0.0385	0.0205
1	9,000	9,000	0.0020	0.0505	0.0263
1	10,000	10,000	0.0025	0.0615	0.0320
Unload					
1	0	0	0.0065	0.0245	0.0155
Reload					
1	Max.	10,000	0.0085	0.0620	0.0353
Unload					
1	0	0	0.0085	0.0270	0.0178

Lateral Testing					
Lateral Load Height Above Grade (ft):		3	Deflection Gauge Height (in):		4
Hold Time (min)	Target Load (lbs)	Load (lbs)	Deflection 1 (in.)	Deflection 2 (in.)	Average Deflection (in.)
1	0	0	0.0000	0.0000	0.0000
1	500	500	0.1505	0.1420	0.1463
1	1,000	1,000	0.2405	0.2640	0.2523
1	1,500	1,500	0.3380	0.4055	0.3718
1	0	0	0.0705	0.0400	0.0553
1	500	500	0.1860	0.1440	0.1650
1	1,000	1,000	0.2675	0.2845	0.2760
1	1,500	1,500	0.3500	0.4195	0.3848
1	2,000	2,000	0.4430	0.5530	0.4980
1	2,500	2,500	0.5335	0.6765	0.6050
1	0	0	0.1120	0.0270	0.0695
1	2,500	2,500	0.5620	0.6990	0.6305
1	3,000	3,000	0.6355	0.8015	0.7185
1	3,500	3,500	0.7250	0.9230	0.8240
1	4,000	3,900	0.9050	1.1375	1.0213
Unload					
1	0	0	0.1820	0.0785	0.1303



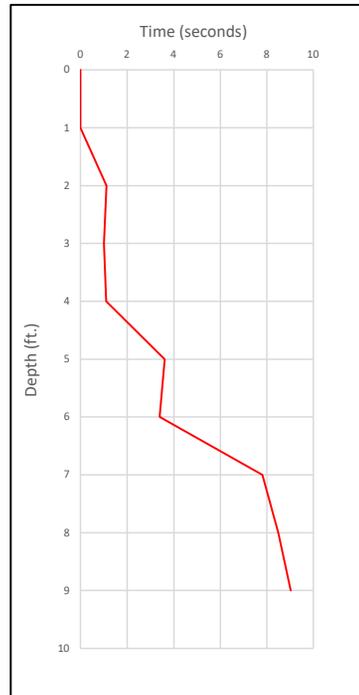
Field Notes

Project:	AES - Somerset Solar	Site Location:	Somerset, NY	Pile ID:	PT-06A
Date/Time Installed:	4/9/21 8:05 AM	Date/Time Tested:	4/19/21 9:00 AM	Pile Type/Size:	W6x9
Pre-Auger/Pre-Drill (Y/N)?:	N	Pre-Auger Depth (ft.):	N/A	Pile Length:	15
Pre-Drill Depth (ft.):	N/A	Pre-Drill Diameter (in.):	N/A	Total Drive Time (sec):	35.54
Pushed to Depth (ft.):	1	Embedment Depth (ft.):	9.00	Avg. Installation Rate (sec/ft)	3.95

Embedment Data	
Depth (ft.)	Time (s)
0	0
1	0
2	1.11
3	1.00
4	1.10
5	3.61
6	3.39
7	7.81
8	8.49
9	9.03
Total Time (s) =	35.54

Tensile Testing					
Hold Time (min)	Target Load (lbs)	Load (lbs)	Deflection 1 (in.)	Deflection 2 (in.)	Average Deflection (in.)
1	0	0	0.0000	0.0000	0.0000
1	1,500	1,500	0.0190	-0.0135	0.0028
1	3,000	3,020	0.0405	-0.0200	0.0103
1	4,000	4,000	0.0505	-0.0235	0.0135
1	5,000	5,000	0.0605	-0.0255	0.0175
1	6,000	6,020	0.0705	0.0250	0.0478
1	7,000	7,060	0.0845	-0.0210	0.0318
1	8,000	8,040	0.1010	-0.0125	0.0443
1	9,000	9,000	0.1330	0.0075	0.0703
1	10,000	9,900	0.1340	0.0115	0.0728
Unload					
1	0	0	0.0310	0.0235	0.0273

Lateral Testing					
Lateral Load Height Above Grade (ft):		3	Deflection Gauge Height (in):		4
Hold Time (min)	Target Load (lbs)	Load (lbs)	Deflection 1 (in.)	Deflection 2 (in.)	Average Deflection (in.)
1	0	0	0.0000	0.0000	0.0000
1	500	500	0.0935	0.8800	0.4868
1	1,000	1,000	0.1975	0.1930	0.1953
1	1,500	1,500	0.3270	0.3120	0.3195
1	0	0	0.0665	0.0215	0.0440
1	500	520	0.1400	0.1235	0.1318
1	1,000	1,000	0.2380	0.2240	0.2310
1	1,500	1,500	0.3480	0.3295	0.3388
1	2,000	2,000	0.4885	0.4530	0.4708
1	2,500	2,500	0.6161	0.5595	0.5878
1	0	0	0.1130	0.0640	0.0885
1	2,500	2,500	0.6810	0.6125	0.6468
1	3,000	3,000	0.8370	0.7350	0.7860
1	3,500	3,500	1.0185	0.8805	0.9495
1	4,000	3,660	1.0990	0.9475	1.0233
Unload					
1	0	0	0.1735	0.1155	0.1445



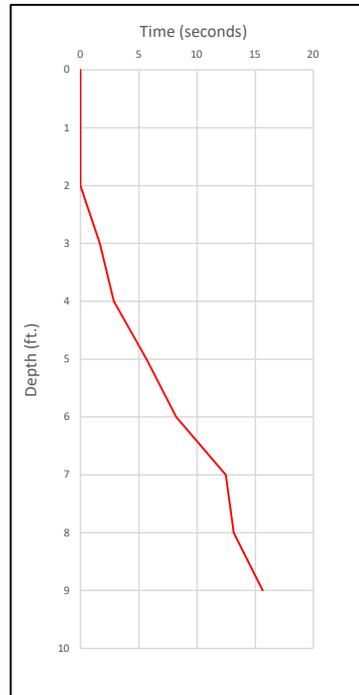
Field Notes

Project:	AES - Somerset Solar	Site Location:	Somerset, NY	Pile ID:	PT-06B
Date/Time Installed:	4/9/21 8:10 AM	Date/Time Tested:	4/19/21 9:00 AM	Pile Type/Size:	W6x9
Pre-Auger/Pre-Drill (Y/N)?:	N	Pre-Auger Depth (ft.):	N/A	Pile Length:	15
Pre-Drill Depth (ft.):	N/A	Pre-Drill Diameter (in.):	N/A	Total Drive Time (sec):	59.6
Pushed to Depth (ft.):	2	Embedment Depth (ft.):	9.00	Avg. Installation Rate (sec/ft)	6.62

Embedment Data	
Depth (ft.)	Time (s)
0	0
1	0
2	0
3	1.64
4	2.84
5	5.65
6	8.20
7	12.48
8	13.15
9	15.64
Total Time (s) =	59.6

Tensile Testing					
Hold Time (min)	Target Load (lbs)	Load (lbs)	Deflection 1 (in.)	Deflection 2 (in.)	Average Deflection (in.)
1	0	0	0.0000	0.0000	0.0000
1	1,500	1,520	-0.0045	0.0050	0.0003
1	3,000	3,000	-0.0020	0.0010	-0.0005
1	4,000	4,000	-0.0020	0.0010	-0.0005
1	5,000	5,040	0.0000	0.0010	0.0005
1	6,000	6,000	0.0045	0.0010	0.0028
1	7,000	7,080	0.0110	0.0010	0.0060
1	8,000	8,040	0.0190	0.0010	0.0100
1	9,000	9,040	0.0325	0.0000	0.0163
1	10,000	10,000	0.0520	-0.0005	0.0258
Unload					
1	0	0	0.0470	-0.0015	0.0228
Reload					
1	Max.	10,800	0.0820	-0.0050	0.0385
Unload					
1	0	0	0.0750	-0.0030	0.0360

Lateral Testing					
Lateral Load Height Above Grade (ft):		3	Deflection Gauge Height (in):		4
Hold Time (min)	Target Load (lbs)	Load (lbs)	Deflection 1 (in.)	Deflection 2 (in.)	Average Deflection (in.)
1	0	0	0.0000	0.0000	0.0000
1	500	500	0.0730	0.0935	0.0833
1	1,000	1,000	0.1665	0.2030	0.1848
1	1,500	1,500	0.2770	0.2770	0.2770
1	0	0	0.0160	0.0420	0.0290
1	500	520	0.0890	0.1235	0.1063
1	1,000	1,000	0.1860	0.2310	0.2085
1	1,500	1,500	0.2875	0.3400	0.3138
1	2,000	2,000	0.4060	0.4215	0.4138
1	2,500	2,500	0.5080	0.4625	0.4853
1	0	0	0.0365	0.0875	0.0620
1	2,500	2,500	0.5515	0.6385	0.5950
1	3,000	3,000	0.6760	0.7790	0.7275
1	3,500	3,500	0.8395	0.9845	0.9120
1	4,000	3,660	0.9005	1.0535	0.9770
Unload					
1	0	0	0.0890	0.1615	0.1253



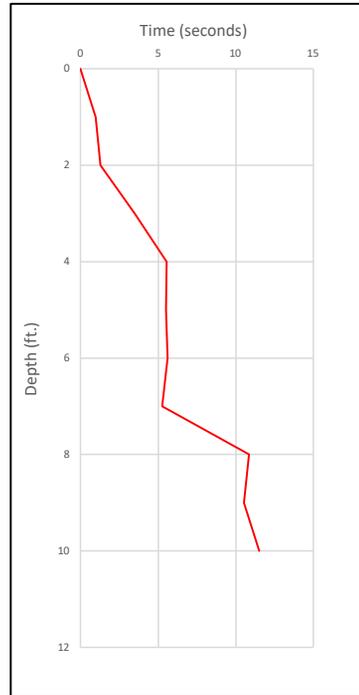
Field Notes

Project:	AES - Somerset Solar	Site Location:	Somerset, NY	Pile ID:	PT-07A
Date/Time Installed:	4/9/21 9:00 AM	Date/Time Tested:	4/19/21 11:00 AM	Pile Type/Size:	W6x9
Pre-Auger/Pre-Drill (Y/N)?:	N	Pre-Auger Depth (ft.):	N/A	Pile Length:	15
Pre-Drill Depth (ft.):	N/A	Pre-Drill Diameter (in.):	N/A	Total Drive Time (sec.):	60.5
Pushed to Depth (ft.):	0.3	Embedment Depth (ft.):	10.00	Avg. Installation Rate (sec/ft)	6.05

Embedment Data	
Depth (ft.)	Time (s)
0	0
1	0.96
2	1.28
3	3.49
4	5.53
5	5.5
6	5.6
7	5.26
8	10.85
9	10.51
10	11.52
Total Time (s) =	60.5

Tensile Testing					
Hold Time (min)	Target Load (lbs)	Load (lbs)	Deflection 1 (in.)	Deflection 2 (in.)	Average Deflection (in.)
1	0	0	0.0000	0.0000	0.0000
1	1,500	1,500	0.0015	-0.0010	0.0003
1	3,000	3,040	0.0030	0.0010	0.0020
1	4,000	4,000	0.0030	0.0045	0.0038
1	5,000	5,040	0.0030	0.0085	0.0058
1	6,000	6,040	0.0040	0.0125	0.0083
1	7,000	7,040	0.0060	0.0175	0.0118
1	8,000	8,040	0.0080	0.0225	0.0153
1	9,000	9,020	0.0105	0.0305	0.0205
1	10,000	10,020	0.0135	0.0375	0.0255
Unload					
1	0	0	0.0080	0.0085	0.0083
0.092					
1	Max.	14,020	0.0450	0.0920	0.0685
Unload					
1	0	0	0.0405	0.0490	0.0448

Lateral Testing					
Lateral Load Height Above Grade (ft):		3	Deflection Gauge Height (in):		4
Hold Time (min)	Target Load (lbs)	Load (lbs)	Deflection 1 (in.)	Deflection 2 (in.)	Average Deflection (in.)
1	0	0	0.0000	0.0000	0.0000
1	500	500	0.0635	0.0445	0.0540
1	1,000	1,000	0.1310	0.1075	0.1193
1	1,500	1,500	0.2060	0.1835	0.1948
1	0	0	0.0325	0.0360	0.0343
1	500	500	0.0860	0.0755	0.0808
1	1,000	1,000	0.1515	0.1325	0.1420
1	1,500	1,520	0.2495	0.2885	0.2690
1	2,000	2,020	0.3225	0.3620	0.3423
1	2,500	2,520	0.4090	0.4510	0.4300
1	0	0	0.0850	0.1600	0.1225
1	2,500	2,500	0.4300	0.4725	0.4513
1	3,000	3,020	0.5115	0.5555	0.5335
1	3,500	3,500	0.6380	0.6625	0.6503
1	4,000	4,000	0.7765	0.7695	0.7730
Unload					
1	0	0	0.1445	0.2215	0.1830
Reload					
1	Max.	4,880	0.9875	1.0475	1.0175
Unload					
1	0	0	0.2170	0.2910	0.2540



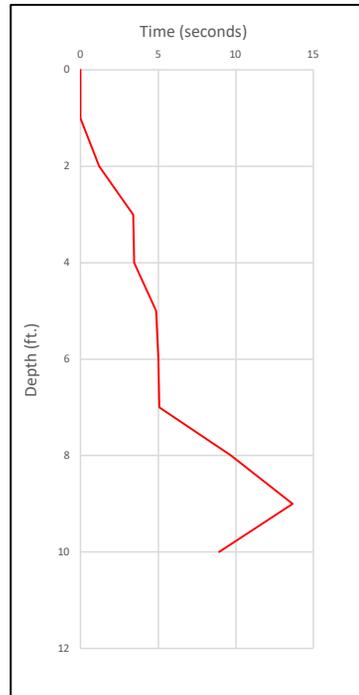
Field Notes

Project:	AES - Somerset Solar	Site Location:	Somerset, NY	Pile ID:	PT-07B
Date/Time Installed:	4/9/21 9:05 AM	Date/Time Tested:	4/19/21 11:00 AM	Pile Type/Size:	W6x9
Pre-Auger/Pre-Drill (Y/N)?:	N	Pre-Auger Depth (ft.):	N/A	Pile Length:	15
Pre-Drill Depth (ft.):	N/A	Pre-Drill Diameter (in.):	N/A	Total Drive Time (sec):	55.21
Pushed to Depth (ft.):	1	Embedment Depth (ft.):	10.00	Avg. Installation Rate (sec/ft)	5.52

Embedment Data	
Depth (ft.)	Time (s)
0	0
1	0
2	1.19
3	3.39
4	3.45
5	4.86
6	5.00
7	5.07
8	9.67
9	13.66
10	8.92
Total Time (s) =	55.21

Tensile Testing					
Hold Time (min)	Target Load (lbs)	Load (lbs)	Deflection 1 (in.)	Deflection 2 (in.)	Average Deflection (in.)
1	0	0	0.0000	0.0000	0.0000
1	1,500	1,500	0.0080	-0.0040	0.0020
1	3,000	3,020	0.0140	-0.0045	0.0048
1	4,000	4,020	0.0165	-0.0030	0.0068
1	5,000	5,000	0.0200	-0.0010	0.0095
1	6,000	6,060	0.0235	0.0015	0.0125
1	7,000	7,040	0.0265	0.0045	0.0155
1	8,000	8,100	0.0315	0.0105	0.0210
1	9,000	9,000	0.0345	0.0140	0.0243
1	10,000	10,020	0.0415	0.0210	0.0313
Unload					
1	0	0	0.0105	0.008	0.0093
Reload					
1	Max.	14,220	0.0920	0.0660	0.0790
Unload					
1	0	0	0.0390	0.0360	0.0375

Lateral Testing					
Lateral Load Height Above Grade (ft):		3	Deflection Gauge Height (in):		4
Hold Time (min)	Target Load (lbs)	Load (lbs)	Deflection 1 (in.)	Deflection 2 (in.)	Average Deflection (in.)
1	0	0	0.0000	0.0000	0.0000
1	500	500	0.0045	0.1085	0.0565
1	1,000	1,000	0.0495	0.2135	0.1315
1	1,500	1,500	0.1170	0.3105	0.2138
1	0	0	0.0105	0.0145	0.0125
1	500	500	0.0125	0.1360	0.0743
1	1,000	1,000	0.0595	0.2360	0.1478
1	1,500	1,520	0.1195	0.3205	0.2200
1	2,000	2,020	0.1910	0.4060	0.2985
1	2,500	2,520	0.2795	0.4970	0.3883
1	0	0	0.0270	0.0140	0.0205
1	2,500	2,500	0.2890	0.5215	0.4053
1	3,000	3,020	0.3760	0.6060	0.4910
1	3,500	3,500	0.4765	0.6940	0.5853
1	4,000	4,000	0.5850	0.7860	0.6855
Unload					
1	0	0	0.0545	0.0205	0.0375
Reload					
1	Max.	4,880	0.8140	0.9880	0.9010
Unload					
1	0	0	0.0920	0.0365	0.0643



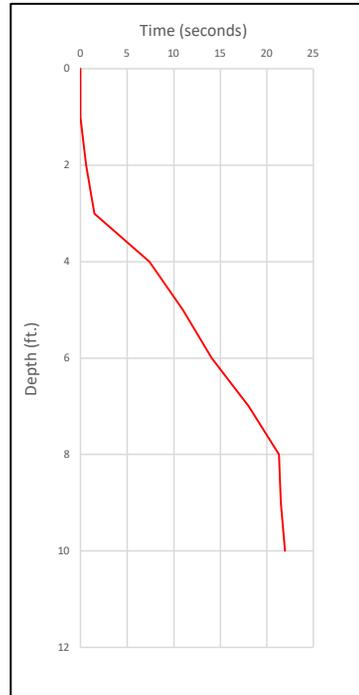
Field Notes

Project:	AES - Somerset Solar	Site Location:	Somerset, NY	Pile ID:	PT-11A
Date/Time Installed:	4/13/21 8:45 AM	Date/Time Tested:	4/20/21 1:30 PM	Pile Type/Size:	W6x9
Pre-Auger/Pre-Drill (Y/N)?:	N	Pre-Auger Depth (ft.):	N/A	Pile Length:	15
Pre-Drill Depth (ft.):	N/A	Pre-Drill Diameter (in.):	N/A	Total Drive Time (sec):	117.24
Pushed to Depth (ft.):	1.8	Embedment Depth (ft.):	10.00	Avg. Installation Rate (sec/ft)	11.72

Embedment Data	
Depth (ft.)	Time (s)
0	0
1	0
2	0.58
3	1.46
4	7.38
5	10.98
6	14.09
7	18.03
8	21.29
9	21.48
10	21.95
Total Time (s) =	117.24

Tensile Testing					
Hold Time (min)	Target Load (lbs)	Load (lbs)	Deflection 1 (in.)	Deflection 2 (in.)	Average Deflection (in.)
1	0	0	0.0000	0.0000	0.0000
1	1,500	1,500	-0.0030	-0.0010	-0.0020
1	3,000	3,000	-0.0065	-0.0015	-0.0040
1	4,000	4,040	-0.0100	-0.0040	-0.0070
1	5,000	5,060	-0.0130	-0.0065	-0.0098
1	6,000	6,060	-0.0155	-0.0085	-0.0120
1	7,000	7,020	-0.0145	-0.0090	-0.0118
1	8,000	8,040	-0.0140	-0.0175	-0.0158
1	9,000	9,080	-0.0065	-0.0205	-0.0135
1	10,000	10,100	-0.0025	-0.0195	-0.0110
Unload					
1	0	0	0.0105	0.0000	0.0053
Reload					
1	Max.	10,800	-0.0010	-0.0175	-0.0093
Unload					
1	0	0	0.0140	0.0030	0.0085

Lateral Testing					
Lateral Load Height Above Grade (ft):		3	Deflection Gauge Height (in):		4
Hold Time (min)	Target Load (lbs)	Load (lbs)	Deflection 1 (in.)	Deflection 2 (in.)	Average Deflection (in.)
1	0	0	0.0000	0.0000	0.0000
1	500	520	0.0610	0.0750	0.0680
1	1,000	1,020	0.1430	0.1780	0.1605
1	1,500	1,500	0.2435	0.2845	0.2640
1	0	0	0.0345	0.0325	0.0335
1	500	500	0.0920	0.1085	0.1003
1	1,000	1,000	0.1595	0.2010	0.1803
1	1,500	1,540	0.2535	0.3080	0.2808
1	2,000	2,020	0.3650	0.4275	0.3963
1	2,500	2,500	0.4885	0.5580	0.5233
1	0	0	0.0845	0.0640	0.0743
1	2,500	2,500	0.5155	0.5915	0.5535
1	3,000	3,000	0.6195	0.7035	0.6615
1	3,500	3,400	0.7500	0.8450	0.7975
Unload					
1	0	0	0.1300	0.0825	0.1063



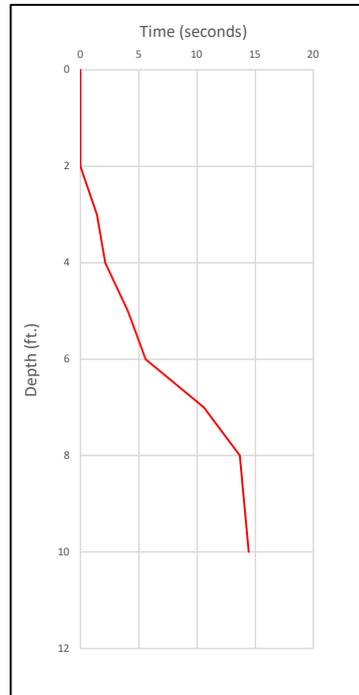
Field Notes

Project:	AES - Somerset Solar	Site Location:	Somerset, NY	Pile ID:	PT-11B
Date/Time Installed:	4/13/21 8:55 AM	Date/Time Tested:	4/20/21 1:30 AM	Pile Type/Size:	W6x9
Pre-Auger/Pre-Drill (Y/N)?:	N	Pre-Auger Depth (ft.):	N/A	Pile Length:	15
Pre-Drill Depth (ft.):	N/A	Pre-Drill Diameter (in.):	N/A	Total Drive Time (sec):	65.93
Pushed to Depth (ft.):	2.5	Embedment Depth (ft.):	10.00	Avg. Installation Rate (sec/ft)	6.59

Embedment Data	
Depth (ft.)	Time (s)
0	0
1	0
2	0
3	1.39
4	2.12
5	4.06
6	5.59
7	10.59
8	13.68
9	14.05
10	14.45
Total Time (s) =	65.93

Tensile Testing					
Hold Time (min)	Target Load (lbs)	Load (lbs)	Deflection 1 (in.)	Deflection 2 (in.)	Average Deflection (in.)
1	0	0	0.0000	0.0000	0.0000
1	1,500	1,500	0.0010	-0.0020	-0.0005
1	3,000	3,040	0.0025	-0.0035	-0.0005
1	4,000	4,020	0.0025	-0.0045	-0.0010
1	5,000	5,020	0.0025	-0.0045	-0.0010
1	6,000	6,040	0.0020	-0.0045	-0.0013
1	7,000	7,000	0.0030	-0.0020	0.0005
1	8,000	8,020	0.0080	0.0045	0.0063
1	9,000	9,000	0.0130	0.0115	0.0123
1	10,000	10,000	0.0195	0.0215	0.0205
Unload					
1	0	0	0.0215	0.0150	0.0183

Lateral Testing					
Lateral Load Height Above Grade (ft):		3	Deflection Gauge Height (in):		4
Hold Time (min)	Target Load (lbs)	Load (lbs)	Deflection 1 (in.)	Deflection 2 (in.)	Average Deflection (in.)
1	0	0	0.0000	0.0000	0.0000
1	500	520	0.1635	0.0605	0.1120
1	1,000	1,020	0.3195	0.1660	0.2428
1	1,500	1,500	0.4585	0.2845	0.3715
1	0	0	0.0705	0.0380	0.0543
1	500	500	0.2030	0.0940	0.1485
1	1,000	1,000	0.3445	0.1920	0.2683
1	1,500	1,540	0.4865	0.3100	0.3983
1	2,000	2,020	0.6060	0.4335	0.5198
1	2,500	2,500	0.7545	0.5885	0.6715
1	0	0	0.1185	0.0865	0.1025
1	2,500	2,500	0.8035	0.6360	0.7198
1	3,000	3,000	0.9065	0.7750	0.8408
1	3,500	3,400	1.0365	0.9785	1.0075
Unload					
1	0	0	0.0695	0.1250	0.0973



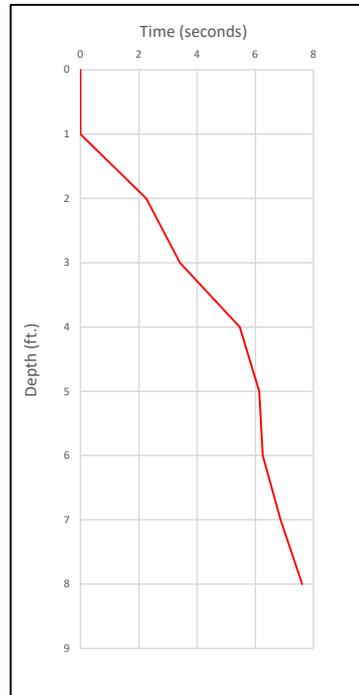
Field Notes

Project:	AES - Somerset Solar	Site Location:	Somerset, NY	Pile ID:	PT-12B
Date/Time Installed:	4/9/21 11:50 AM	Date/Time Tested:	4/19/21 2:30 PM	Pile Type/Size:	W6x9
Pre-Auger/Pre-Drill (Y/N)?:	N	Pre-Auger Depth (ft.):	N/A	Pile Length:	15
Pre-Drill Depth (ft.):	N/A	Pre-Drill Diameter (in.):	N/A	Total Drive Time (sec):	47.62
Pushed to Depth (ft.):	1	Embedment Depth (ft.):	9.00	Avg. Installation Rate (sec/ft)	5.29

Embedment Data	
Depth (ft.)	Time (s)
0	0
1	0
2	2.25
3	3.41
4	5.47
5	6.14
6	6.25
7	6.87
8	7.61
9	9.62
Total Time (s) =	47.62

Tensile Testing					
Hold Time (min)	Target Load (lbs)	Load (lbs)	Deflection 1 (in.)	Deflection 2 (in.)	Average Deflection (in.)
1	0	0	0.0000	0.0000	0.0000
1	1,500	1,520	0.0035	0.0005	0.0020
1	3,000	3,000	0.0045	0.0025	0.0035
1	4,000	4,000	0.0060	0.0045	0.0053
1	5,000	5,020	0.0085	0.0005	0.0045
1	6,000	6,040	0.0125	0.0130	0.0128
1	7,000	7,060	0.0185	0.0200	0.0193
1	8,000	8,000	0.0290	0.0345	0.0318
1	9,000	9,020	0.0435	0.0515	0.0475
1	10,000	10,000	0.0640	0.0755	0.0698
Unload					
1	0	0	0.0550	0.0525	0.0538
Reload					
1	Max.	11,500	0.1225	0.1345	0.1285
Unload					
1	0	0	0.1080	0.1060	0.1070

Lateral Testing					
Lateral Load Height Above Grade (ft):		3	Deflection Gauge Height (in):		4
Hold Time (min)	Target Load (lbs)	Load (lbs)	Deflection 1 (in.)	Deflection 2 (in.)	Average Deflection (in.)
1	0	0	0.0000	0.0000	0.0000
1	500	520	0.0510	0.0000	0.0255
1	1,000	1,000	0.1320	0.0490	0.0905
1	1,500	1,500	0.2100	0.1225	0.1663
1	0	0	0.0145	0.0000	0.0073
1	500	500	0.0725	0.0025	0.0375
1	1,000	1,000	0.1470	0.0600	0.1035
1	1,500	1,520	0.2450	0.1360	0.1905
1	2,000	2,000	0.3270	0.2140	0.2705
1	2,500	2,500	0.4020	0.2955	0.3488
1	0	0	0.0455	0.0000	0.0228
1	2,500	2,500	0.4175	0.3065	0.3620
1	3,000	3,000	0.5000	0.3870	0.4435
1	3,500	3,500	0.5880	0.4735	0.5308
1	4,000	4,000	0.6900	0.5715	0.6308
Unload					
1	0	0	0.0605	0.0000	0.0303
Reload					
1	Max.	4,460	0.7900	0.6660	0.7280
Unload					
1	0	0	0.0825	0.0105	0.0465



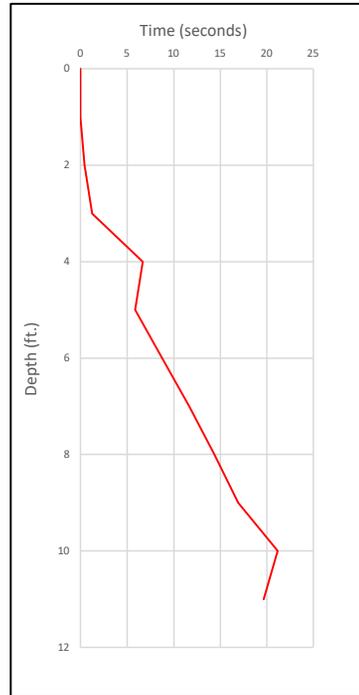
Field Notes

Project:	AES - Somerset Solar	Site Location:	Somerset, NY	Pile ID:	PT-14A
Date/Time Installed:	4/9/21 11:20 AM	Date/Time Tested:	4/19/21 1:00 PM	Pile Type/Size:	W6x9
Pre-Auger/Pre-Drill (Y/N)?:	N	Pre-Auger Depth (ft.):	N/A	Pile Length:	15
Pre-Drill Depth (ft.):	N/A	Pre-Drill Diameter (in.):	N/A	Total Drive Time (sec):	106.69
Pushed to Depth (ft.):	1.5	Embedment Depth (ft.):	10.70	Avg. Installation Rate (sec/ft)	9.97

Embedment Data	
Depth (ft.)	Time (s)
0	0
1	0
2	0.42
3	1.24
4	6.67
5	5.85
6	8.75
7	11.66
8	14.36
9	16.92
10	21.16
11	19.66
Total Time (s) =	106.69

Tensile Testing					
Hold Time (min)	Target Load (lbs)	Load (lbs)	Deflection 1 (in.)	Deflection 2 (in.)	Average Deflection (in.)
1	0	0	0.0000	0.0000	0.0000
1	1,500	1,520	0.0205	-0.0035	0.0085
1	3,000	3,080	0.0510	-0.0065	0.0223
1	4,000	4,020	0.0620	-0.0075	0.0273
1	5,000	5,080	0.0735	-0.0085	0.0325
1	6,000	6,040	0.0840	-0.0085	0.0378
1	7,000	7,100	0.0920	-0.0100	0.0410
1	8,000	8,060	0.0990	-0.0105	0.0443
1	9,000	9,080	0.1075	-0.0120	0.0478
1	10,000	10,080	0.1150	0.0135	0.0643
Unload					
1	0	0	0.0145	0.0175	0.0160
Reload					
1	Max.	17,020	0.2185	0.0350	0.1268
Unload					
1	0	0	0.0620	0.0545	0.0583

Lateral Testing					
Lateral Load Height Above Grade (ft):		3	Deflection Gauge Height (in):		4
Hold Time (min)	Target Load (lbs)	Load (lbs)	Deflection 1 (in.)	Deflection 2 (in.)	Average Deflection (in.)
1	0	0	0.0000	0.0000	0.0000
1	500	500	0.1020	0.0680	0.0850
1	1,000	1,020	0.2135	0.1490	0.1813
1	1,500	1,520	0.3210	0.2380	0.2795
1	0	0	0.0410	0.0115	0.0263
1	500	500	0.1405	0.0695	0.1050
1	1,000	1,020	0.2450	0.1455	0.1953
1	1,500	1,520	0.3415	0.2290	0.2853
1	2,000	2,000	0.4380	0.3180	0.3780
1	2,500	2,500	0.5480	0.4195	0.4838
1	0	0	0.0635	0.0305	0.0470
1	2,500	2,500	0.5705	0.4510	0.5108
1	3,000	3,000	0.6800	0.5555	0.6178
1	3,500	3,500	0.8035	0.6710	0.7373
1	4,000	4,000	0.9380	0.7945	0.8663
Unload					
1	0	0	0.1270	0.0735	0.1003
Reload					
1	Max.	4,340	1.0680	0.9030	0.9855
Unload					
1	0	0	0.1750	0.0860	0.1305



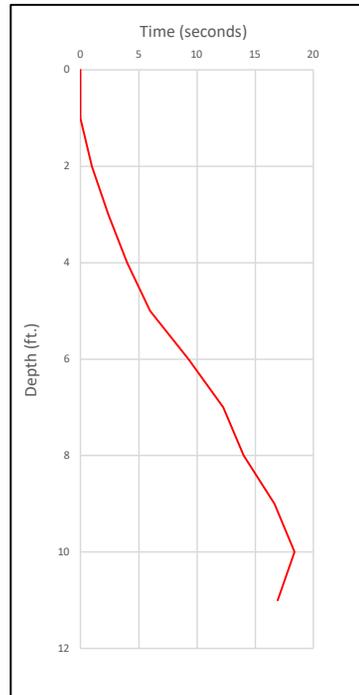
Field Notes

Project:	AES - Somerset Solar	Site Location:	Somerset, NY	Pile ID:	PT-14B
Date/Time Installed:	4/9/21 11:25 AM	Date/Time Tested:	4/19/2021	Pile Type/Size:	W6x9
Pre-Auger/Pre-Drill (Y/N)?:	N	Pre-Auger Depth (ft.):	N/A	Pile Length:	15
Pre-Drill Depth (ft.):	N/A	Pre-Drill Diameter (in.):	N/A	Total Drive Time (sec):	100.79
Pushed to Depth (ft.):	1.5	Embedment Depth (ft.):	10.70	Avg. Installation Rate (sec/ft)	9.42

Embedment Data	
Depth (ft.)	Time (s)
0	0
1	0
2	0.97
3	2.39
4	4
5	5.96
6	9.26
7	12.26
8	14
9	16.65
10	18.39
11	16.91
Total Time (s) =	100.79

Tensile Testing					
Hold Time (min)	Target Load (lbs)	Load (lbs)	Deflection 1 (in.)	Deflection 2 (in.)	Average Deflection (in.)
1	0	0	0.0000	0.0000	0.0000
1	1,500	1,540	0.0215	0.0215	0.0215
1	3,000	3,280	0.0400	0.0425	0.0413
1	4,000	4,120	0.0455	0.0505	0.0480
1	5,000	5,080	0.0500	0.0585	0.0543
1	6,000	6,060	0.0530	0.0660	0.0595
1	7,000	7,080	0.0550	0.0740	0.0645
1	8,000	8,040	0.0570	0.0840	0.0705
1	9,000	9,120	0.0585	0.0940	0.0763
1	10,000	10,000	0.0600	0.1055	0.0828
Unload					
1	0	0	0.0025	0.0115	0.0070
Reload					
1	Max.	15,040	0.0315	0.1825	0.1070
Unload					
1	0	0	0.0275	0.0380	0.0328

Lateral Testing					
Lateral Load Height Above Grade (ft):		3	Deflection Gauge Height (in):		4
Hold Time (min)	Target Load (lbs)	Load (lbs)	Deflection 1 (in.)	Deflection 2 (in.)	Average Deflection (in.)
1	0	0	0.0000	0.0000	0.0000
1	500	500	0.0915	0.0750	0.0833
1	1,000	1,020	0.2035	0.1790	0.1913
1	1,500	1,520	0.3115	0.2965	0.3040
1	0	0	0.0075	0.0155	0.0115
1	500	500	0.1010	0.0820	0.0915
1	1,000	1,020	0.2100	0.1850	0.1975
1	1,500	1,520	0.3135	0.2945	0.3040
1	2,000	2,000	0.4155	0.4060	0.4108
1	2,500	2,500	0.5235	0.5315	0.5275
1	0	0	0.0155	0.0220	0.0188
1	2,500	2,500	0.5430	0.5515	0.5473
1	3,000	3,000	0.6475	0.6800	0.6638
1	3,500	3,500	0.7620	0.8110	0.7865
1	4,000	4,000	0.8815	0.9490	0.9153
Unload					
1	0	0	0.0450	0.0370	0.0410
Reload					
1	Max.	4,340	0.9920	1.0710	1.0315
Unload					
1	0	0	0.0530	0.0480	0.0505



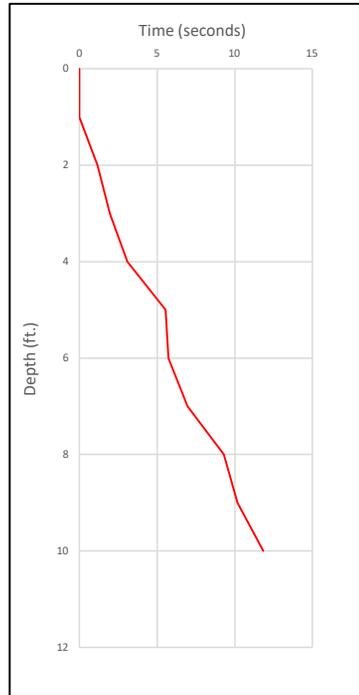
Field Notes

Project:	AES - Somerset Solar	Site Location:	Somerset, NY	Pile ID:	PT-19A
Date/Time Installed:	4/7/21 9:00 AM	Date/Time Tested:	4/25/21 10:30 AM	Pile Type/Size:	W6x9
Pre-Auger/Pre-Drill (Y/N)?:	N	Pre-Auger Depth (ft.):	N/A	Pile Length:	15
Pre-Drill Depth (ft.):	N/A	Pre-Drill Diameter (in.):	N/A	Total Drive Time (sec):	55.7
Pushed to Depth (ft.):	1.5	Embedment Depth (ft.):	10.00	Avg. Installation Rate (sec/ft)	5.57

Embedment Data	
Depth (ft.)	Time (s)
0	0
1	0
2	1.15
3	1.95
4	3.08
5	5.53
6	5.73
7	6.95
8	9.29
9	10.18
10	11.84
Total Time (s) =	55.7

Tensile Testing					
Hold Time (min)	Target Load (lbs)	Load (lbs)	Deflection 1 (in.)	Deflection 2 (in.)	Average Deflection (in.)
1	0	0	0.0000	0.0000	0.0000
1	1,500	1,500	-0.0005	0.0035	0.0015
1	3,000	3,000	0.0015	0.0055	0.0035
1	4,000	4,000	0.0055	0.0065	0.0060
1	5,000	5,000	0.0090	0.0070	0.0080
1	6,000	6,000	0.0130	0.0085	0.0108
1	7,000	7,000	0.0190	0.0120	0.0155
1	8,000	8,000	0.0260	0.0170	0.0215
1	9,000	9,000	0.0325	0.0225	0.0275
1	10,000	10,000	0.0400	0.0310	0.0355
Unload					
1	0	0	0.0175	0.0160	0.0168
Reload					
1	Max.	10,000	0.0490	0.0330	0.0410
Unload					
1	0	0	0.0200	0.0170	0.0185

Lateral Testing					
Lateral Load Height Above Grade (ft):		3	Deflection Gauge Height (in):		4
Hold Time (min)	Target Load (lbs)	Load (lbs)	Deflection 1 (in.)	Deflection 2 (in.)	Average Deflection (in.)
1	0	0	0.0000	0.0000	0.0000
1	500	500	0.1035	0.0910	0.0973
1	1,000	1,000	0.2385	0.2055	0.2220
1	1,500	1,500	0.3255	0.2900	0.3078
1	0	0	0.0400	0.0730	0.0565
1	500	500	0.1580	0.1530	0.1555
1	1,000	1,000	0.2595	0.2390	0.2493
1	1,500	1,500	0.3475	0.3350	0.3413
1	2,000	2,000	0.4285	0.4115	0.4200
1	2,500	2,500	0.5470	0.5275	0.5373
1	0	0	0.0505	0.1005	0.0755
1	2,500	2,500	0.6065	0.5625	0.5845
1	3,000	3,000	0.7075	0.6765	0.6920
1	3,500	3,500	0.8835	0.8195	0.8515
1	4,000	4,180	1.0265	0.9855	1.0060
Unload					
1	0	0	0.0855	0.1580	0.1218



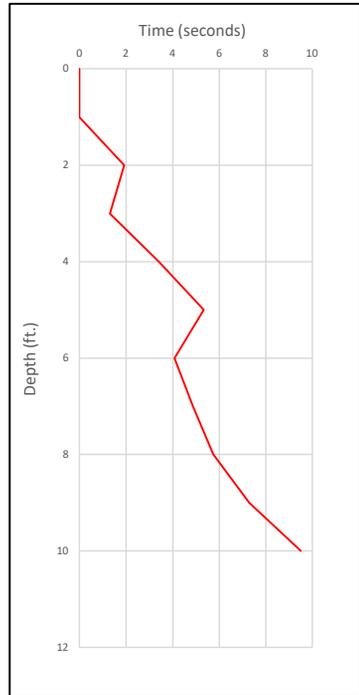
Field Notes

Project:	AES - Somerset Solar	Site Location:	Somerset, NY	Pile ID:	PT-19B
Date/Time Installed:	4/7/21 9:10 AM	Date/Time Tested:	4/25/21 10:35 AM	Pile Type/Size:	W6x9
Pre-Auger/Pre-Drill (Y/N)?:	N	Pre-Auger Depth (ft.):	N/A	Pile Length:	15
Pre-Drill Depth (ft.):	N/A	Pre-Drill Diameter (in.):	N/A	Total Drive Time (sec):	43.43
Pushed to Depth (ft.):	1.2	Embedment Depth (ft.):	10.00	Avg. Installation Rate (sec/ft)	4.34

Embedment Data	
Depth (ft.)	Time (s)
0	0
1	0
2	1.92
3	1.3
4	3.41
5	5.33
6	4.07
7	4.86
8	5.74
9	7.29
10	9.51
Total Time (s) =	43.43

Tensile Testing					
Hold Time (min)	Target Load (lbs)	Load (lbs)	Deflection 1 (in.)	Deflection 2 (in.)	Average Deflection (in.)
1	0	0	0.0000	0.0000	0.0000
1	1,500	1,500	0.0050	-0.0025	0.0013
1	3,000	3,000	0.0075	-0.0010	0.0033
1	4,000	4,000	0.0085	0.0015	0.0050
1	5,000	5,000	0.0095	0.0045	0.0070
1	6,000	6,000	0.0105	0.0075	0.0090
1	7,000	7,000	0.0115	0.0125	0.0120
1	8,000	8,000	0.0125	0.0170	0.0148
1	9,000	9,000	0.0140	0.0230	0.0185
1	10,000	10,000	0.0160	0.0300	0.0230
Unload					
1	0	0	0.0080	0.0105	0.0093
Reload					
1	Max.	10,000	0.0145	0.0375	0.0260
Unload					
1	0	0	0.0095	0.0135	0.0115

Lateral Testing					
Lateral Load Height Above Grade (ft):		3	Deflection Gauge Height (in):		4
Hold Time (min)	Target Load (lbs)	Load (lbs)	Deflection 1 (in.)	Deflection 2 (in.)	Average Deflection (in.)
1	0	0	0.0000	0.0000	0.0000
1	500	500	0.1685	0.0405	0.1045
1	1,000	1,000	0.3020	0.1245	0.2133
1	1,500	1,500	0.4060	0.1935	0.2998
1	0	0	0.0685	0.0270	0.0478
1	500	500	0.2140	0.0695	0.1418
1	1,000	1,000	0.3300	0.1360	0.2330
1	1,500	1,500	0.4420	0.2140	0.3280
1	2,000	2,000	0.5315	0.2825	0.4070
1	2,500	2,500	0.6650	0.3935	0.5293
1	0	0	0.0810	0.0535	0.0673
1	2,500	2,500	0.7050	0.4125	0.5588
1	3,000	2,500	0.8480	0.5235	0.6858
1	3,500	3,500	0.9895	0.6485	0.8190
1	4,000	4,180	1.1585	0.8255	0.9920
Unload					
1	0	0	0.0985	0.0995	0.0990



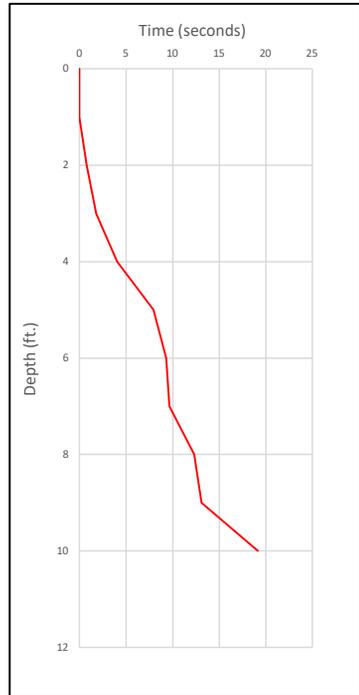
Field Notes

Project:	AES - Somerset Solar	Site Location:	Somerset, NY	Pile ID:	PT-20A
Date/Time Installed:	4/7/21 10:05 AM	Date/Time Tested:	4/25/21 11:15 AM	Pile Type/Size:	W6x9
Pre-Auger/Pre-Drill (Y/N)?:	N	Pre-Auger Depth (ft.):	N/A	Pile Length:	15
Pre-Drill Depth (ft.):	N/A	Pre-Drill Diameter (in.):	N/A	Total Drive Time (sec):	77.99
Pushed to Depth (ft.):	1.6	Embedment Depth (ft.):	10.00	Avg. Installation Rate (sec/ft)	7.80

Embedment Data	
Depth (ft.)	Time (s)
0	0
1	0
2	0.76
3	1.77
4	4.02
5	7.93
6	9.31
7	9.65
8	12.3
9	13.09
10	19.16
Total Time (s) =	77.99

Tensile Testing					
Hold Time (min)	Target Load (lbs)	Load (lbs)	Deflection 1 (in.)	Deflection 2 (in.)	Average Deflection (in.)
1	0	0	0.0000	0.0000	0.0000
1	1,500	1,500	-0.0040	0.0115	0.0038
1	3,000	3,000	-0.0040	0.0175	0.0068
1	4,000	4,000	0.0000	0.0180	0.0090
1	5,000	5,000	0.0035	0.0175	0.0105
1	6,000	6,000	0.0090	0.0165	0.0128
1	7,000	7,000	0.0145	0.0150	0.0148
1	8,000	8,000	0.0230	0.0140	0.0185
1	9,000	9,000	0.0330	0.0100	0.0215
1	10,000	10,000	0.0435	0.0065	0.0250
Unload					
1	0	0	0.0065	0.0045	0.0055
Reload					
1	Max.	10,000	0.0345	0.0225	0.0285
Unload					
1	0	0	0.0065	0.0060	0.0063

Lateral Testing					
Lateral Load Height Above Grade (ft):		3	Deflection Gauge Height (in):		4
Hold Time (min)	Target Load (lbs)	Load (lbs)	Deflection 1 (in.)	Deflection 2 (in.)	Average Deflection (in.)
1	0	0	0.0000	0.0000	0.0000
1	500	500	0.1605	0.0460	0.1033
1	1,000	1,000	0.3155	0.1275	0.2215
1	1,500	1,500	0.4260	0.2035	0.3148
1	0	0	0.0775	0.0065	0.0420
1	500	500	0.2345	0.0475	0.1410
1	1,000	1,000	0.3705	0.1490	0.2598
1	1,500	1,500	0.4790	0.2380	0.3585
1	2,000	2,000	0.5835	0.3230	0.4533
1	2,500	2,500	0.7345	0.4645	0.5995
1	0	0	0.1345	0.0015	0.0680
1	2,500	2,500	0.7825	0.4920	0.6373
1	3,000	3,000	0.9080	0.6160	0.7620
1	3,500	3,500	1.0805	0.7895	0.9350
1	4,000	3,700	1.0700	0.8135	0.9418
Unload					
1	0	0	0.2045	0.0235	0.1140



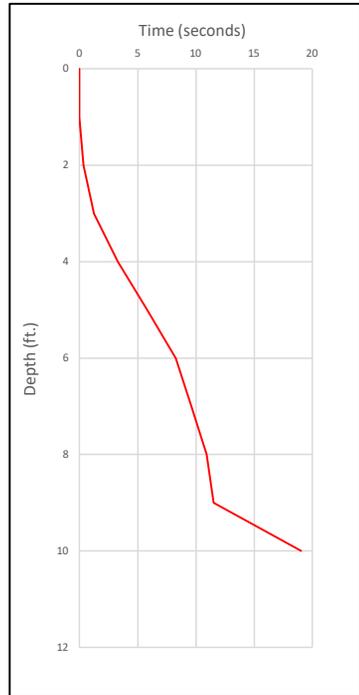
Field Notes

Project:	AES - Somerset Solar	Site Location:	Somerset, NY	Pile ID:	PT-20B
Date/Time Installed:	4/7/21 10:15 AM	Date/Time Tested:	4/25/21 11:30 AM	Pile Type/Size:	W6x9
Pre-Auger/Pre-Drill (Y/N)?:	N	Pre-Auger Depth (ft.):	N/A	Pile Length:	15
Pre-Drill Depth (ft.):	N/A	Pre-Drill Diameter (in.):	N/A	Total Drive Time (sec):	69.95
Pushed to Depth (ft.):	1.8	Embedment Depth (ft.):	10.00	Avg. Installation Rate (sec/ft)	7.00

Embedment Data	
Depth (ft.)	Time (s)
0	0
1	0
2	0.34
3	1.22
4	3.29
5	5.79
6	8.27
7	9.59
8	10.9
9	11.52
10	19.03
Total Time (s) =	69.95

Tensile Testing					
Hold Time (min)	Target Load (lbs)	Load (lbs)	Deflection 1 (in.)	Deflection 2 (in.)	Average Deflection (in.)
1	0	0	0.0000	0.0000	0.0000
1	1,500	1,500	0.0105	-0.0030	0.0038
1	3,000	3,000	0.0195	-0.0065	0.0065
1	4,000	4,000	0.0275	-0.0110	0.0083
1	5,000	5,000	0.0350	-0.0160	0.0095
1	6,000	6,000	0.0435	-0.0205	0.0115
1	7,000	7,000	0.0530	-0.0245	0.0143
1	8,000	8,000	0.0625	-0.0260	0.0183
1	9,000	9,000	0.0775	-0.0180	0.0298
1	10,000	9,300	0.078	-0.0200	0.0290
Unload					
1	0	0	0.0085	0.0030	0.0058
Reload					
1	Max.	7,700	0.0685	-0.0135	0.0275
Unload					
1	0	0	0.0085	0.0045	0.0065

Lateral Testing					
Lateral Load Height Above Grade (ft):		3	Deflection Gauge Height (in):		4
Hold Time (min)	Target Load (lbs)	Load (lbs)	Deflection 1 (in.)	Deflection 2 (in.)	Average Deflection (in.)
1	0	0	0.0000	0.0000	0.0000
1	500	500	0.1695	0.0375	0.1035
1	1,000	1,000	0.3010	0.1240	0.2125
1	1,500	1,500	0.3975	0.1970	0.2973
1	0	0	0.0620	0.0030	0.0325
1	500	500	0.2085	0.0535	0.1310
1	1,000	1,000	0.3400	0.1445	0.2423
1	1,500	1,500	0.4410	0.2280	0.3345
1	2,000	2,000	0.5425	0.3045	0.4235
1	2,500	2,500	0.7120	0.4305	0.5713
1	0	0	0.1235	0.0125	0.0680
1	2,500	2,500	0.7715	0.4575	0.6145
1	3,000	3,000	0.9165	0.5740	0.7453
1	3,500	3,500	1.1160	0.7390	0.9275
1	4,000	3,700	1.1490	0.7640	0.9565
Unload					
1	0	0	0.1985	0.0545	0.1265



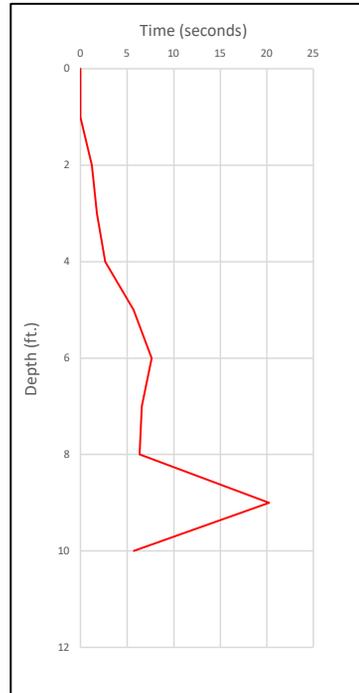
Field Notes

Project:	AES - Somerset Solar	Site Location:	Somerset, NY	Pile ID:	PT-23A
Date/Time Installed:	4/8/21 11:00 AM	Date/Time Tested:	4/18/2021	Pile Type/Size:	W6x9
Pre-Auger/Pre-Drill (Y/N)?:	N	Pre-Auger Depth (ft.):	N/A	Pile Length:	15
Pre-Drill Depth (ft.):	N/A	Pre-Drill Diameter (in.):	N/A	Total Drive Time (sec):	57.74
Pushed to Depth (ft.):	1	Embedment Depth (ft.):	10.00	Avg. Installation Rate (sec/ft)	5.77

Embedment Data	
Depth (ft.)	Time (s)
0	0
1	0
2	1.19
3	1.76
4	2.63
5	5.69
6	7.62
7	6.58
8	6.32
9	20.24
10	5.71
Total Time (s) =	57.74

Tensile Testing					
Hold Time (min)	Target Load (lbs)	Load (lbs)	Deflection 1 (in.)	Deflection 2 (in.)	Average Deflection (in.)
1	0	0	0.0000	0.0000	0.0000
1	1,500	1,520	0.0060	0.0055	0.0058
1	3,000	3,020	0.0230	0.0190	0.0210
1	4,000	4,040	0.0295	0.0180	0.0238
1	5,000	5,020	0.0375	0.0165	0.0270
1	6,000	6,040	0.0455	0.0170	0.0313
1	7,000	7,020	0.0565	0.0185	0.0375
1	8,000	8,040	0.0660	0.0200	0.0430
1	9,000	9,060	0.0790	0.0255	0.0523
1	10,000	10,060	0.0930	0.0360	0.0645
Unload					
1	0	0	0.0425	0.0405	0.0415
Reload					
1	Max.	10,600	0.1035	0.0695	0.0865
Unload					
1	0	0	0.0565	0.0510	0.0538

Lateral Testing					
Lateral Load Height Above Grade (ft):		3	Deflection Gauge Height (in):		4
Hold Time (min)	Target Load (lbs)	Load (lbs)	Deflection 1 (in.)	Deflection 2 (in.)	Average Deflection (in.)
1	0	0	0.0000	0.0000	0.0000
1	500	500	0.0620	0.1010	0.0815
1	1,000	1,020	0.1585	0.2175	0.1880
1	1,500	1,500	0.2580	0.3215	0.2898
1	0	0	0.0305	0.0375	0.0340
1	500	500	0.1030	0.1515	0.1273
1	1,000	1,020	0.1915	0.2520	0.2218
1	1,500	1,500	0.2795	0.3420	0.3108
1	2,000	2,000	0.3820	0.4360	0.4090
1	2,500	2,500	0.4905	0.5475	0.5190
1	0	0	0.0555	0.0730	0.0643
1	2,500	2,500	0.5270	0.5740	0.5505
1	3,000	3,000	0.6445	0.6810	0.6628
1	3,500	3,500	0.7785	0.8015	0.7900
1	4,000	3,780	0.8755	0.8900	0.8828
Unload					
1	0	0	0.1345	0.1065	0.1205
Reload					
1	Max.	4,040	1.0340	1.0055	1.0198
Unload					
1	0	0	0.1810	0.1490	0.1650



Field Notes

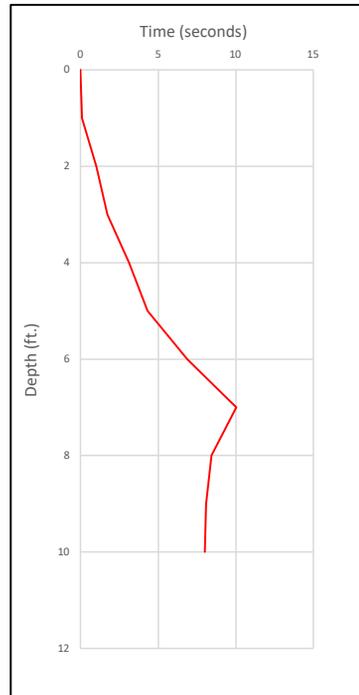
Sub contractor stopped pounding during 9 foot increment.

Project:	AES - Somerset Solar	Site Location:	Somerset, NY	Pile ID:	PT-23B
Date/Time Installed:	4/8/21 11:05 AM	Date/Time Tested:	4/18/21 8:45 AM	Pile Type/Size:	W6x9
Pre-Auger/Pre-Drill (Y/N)?:	N	Pre-Auger Depth (ft.):	N/A	Pile Length:	15
Pre-Drill Depth (ft.):	N/A	Pre-Drill Diameter (in.):	N/A	Total Drive Time (sec):	51.62
Pushed to Depth (ft.):	0.8	Embedment Depth (ft.):	10.00	Avg. Installation Rate (sec/ft)	5.16

Embedment Data	
Depth (ft.)	Time (s)
0	0
1	0.09
2	1
3	1.72
4	3.11
5	4.31
6	6.86
7	10.03
8	8.42
9	8.08
10	8.00
Total Time (s) =	51.62

Tensile Testing					
Hold Time (min)	Target Load (lbs)	Load (lbs)	Deflection 1 (in.)	Deflection 2 (in.)	Average Deflection (in.)
1	0	0	0.0000	0.0000	0.0000
1	1,500	1,500	0.0085	0.0030	0.0058
1	3,000	3,020	0.0055	0.0035	0.0045
1	4,000	4,040	-0.0010	0.0015	0.0003
1	5,000	5,060	-0.0095	-0.0005	-0.0050
1	6,000	6,080	-0.0240	-0.0035	-0.0138
1	7,000	7,080	-0.0355	-0.0045	-0.0200
1	8,000	8,060	-0.0415	-0.0055	-0.0235
1	9,000	9,060	-0.0380	-0.0070	-0.0225
1	10,000	10,020	-0.0325	-0.0085	-0.0205
Unload					
1	0	0	0.0180	-0.0010	0.0085
Reload					
1	Max.	10,220	-0.018	-0.0090	-0.0135
Unload					
1	0	0	0.0295	-0.0020	0.0138

Lateral Testing					
Lateral Load Height Above Grade (ft):		3	Deflection Gauge Height (in):		4
Hold Time (min)	Target Load (lbs)	Load (lbs)	Deflection 1 (in.)	Deflection 2 (in.)	Average Deflection (in.)
1	0	0	0.0000	0.0000	0.0000
1	500	500	0.1110	0.1010	0.1060
1	1,000	1,020	0.2220	0.2250	0.2235
1	1,500	1,500	0.3195	0.3380	0.3288
1	0	0	0.0100	0.0380	0.0240
1	500	500	0.1420	0.1315	0.1368
1	1,000	1,020	0.2490	0.2435	0.2463
1	1,500	1,500	0.3380	0.3505	0.3443
1	2,000	2,000	0.4360	0.4555	0.4458
1	2,500	2,500	0.5420	0.5675	0.5548
1	0	0	0.0360	0.0695	0.0528
1	2,500	2,500	0.5700	0.5850	0.5775
1	3,000	3,000	0.6800	0.6945	0.6873
1	3,500	3,500	0.8065	0.8215	0.8140
1	4,000	3,780	0.8985	0.9175	0.9080
Unload					
1	0	0	0.0475	0.0810	0.0643
Reload					
1	Max.	4,040	1.0055	1.0150	1.0103
Unload					
1	0	0	0.0890	0.1165	0.1028



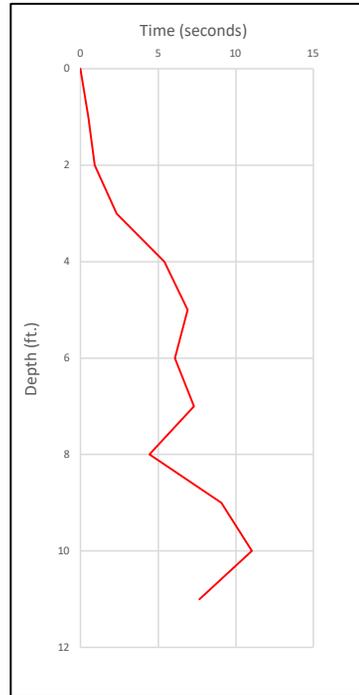
Field Notes

Project:	AES - Somerset Solar	Site Location:	Somerset, NY	Pile ID:	PT-24A
Date/Time Installed:	4/8/21 1:30 PM	Date/Time Tested:	4/18/21 3:30 PM	Pile Type/Size:	W6x9
Pre-Auger/Pre-Drill (Y/N)?:	N	Pre-Auger Depth (ft.):	N/A	Pile Length:	15
Pre-Drill Depth (ft.):	N/A	Pre-Drill Diameter (in.):	N/A	Total Drive Time (sec):	61.53
Pushed to Depth (ft.):	0.9	Embedment Depth (ft.):	10.70	Avg. Installation Rate (sec/ft)	5.75

Embedment Data	
Depth (ft.)	Time (s)
0	0
1	0.5
2	0.91
3	2.32
4	5.39
5	6.89
6	6.07
7	7.29
8	4.42
9	9.06
10	11.04
11	7.64
Total Time (s) =	61.53

Tensile Testing					
Hold Time (min)	Target Load (lbs)	Load (lbs)	Deflection 1 (in.)	Deflection 2 (in.)	Average Deflection (in.)
1	0	0	0.0000	0.0000	0.0000
1	1,500	1,500	0.0120	0.0175	0.0148
1	3,000	3,000	0.0100	0.0270	0.0185
1	4,000	4,000	0.0120	0.0310	0.0215
1	5,000	5,040	0.0145	0.0350	0.0248
1	6,000	6,060	0.0195	0.0410	0.0303
1	7,000	7,060	0.0270	0.0475	0.0373
1	8,000	8,060	0.0390	0.0590	0.0490
1	9,000	9,060	0.0535	0.0720	0.0628
1	10,000	10,020	0.0780	0.0950	0.0865
Unload					
1	0	0	0.0650	0.0560	0.0605
Reload					
1	Max.	11,240	0.1510	0.1675	0.1593
Unload					
1	0	0	0.1205	0.1125	0.1165

Lateral Testing					
Lateral Load Height Above Grade (ft):		3	Deflection Gauge Height (in):		4
Hold Time (min)	Target Load (lbs)	Load (lbs)	Deflection 1 (in.)	Deflection 2 (in.)	Average Deflection (in.)
1	0	0	0.0000	0.0000	0.0000
1	500	500	0.0475	0.1330	0.0903
1	1,000	1,000	0.1245	0.2550	0.1898
1	1,500	1,500	0.2305	0.3690	0.2998
1	0	0	0.0375	0.0475	0.0425
1	500	520	0.0920	0.1795	0.1358
1	1,000	1,000	0.1640	0.2860	0.2250
1	1,500	1,500	0.2410	0.3830	0.3120
1	2,000	2,000	0.3360	0.4855	0.4108
1	2,500	2,500	0.4660	0.6030	0.5345
1	0	0	0.0830	0.0825	0.0828
1	2,500	2,500	0.5015	0.6290	0.5653
1	3,000	3,000	0.6105	0.7285	0.6695
1	3,500	3,500	0.7325	0.8490	0.7908
1	4,000	4,020	0.8585	0.9630	0.9108
Unload					
1	0	0	0.1575	0.1605	0.1590
Reload					
1	Max.	4,260	0.9710	1.0950	1.0330
Unload					
1	0	0	0.1950	0.1740	0.1845



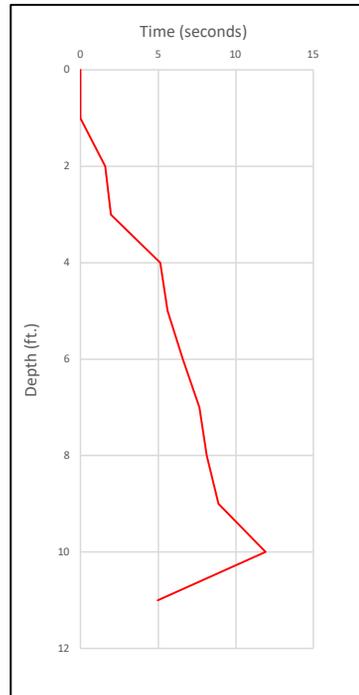
Field Notes

Project:	AES - Somerset Solar	Site Location:	Somerset, NY	Pile ID:	PT-24B
Date/Time Installed:	4/8/21 1:35 PM	Date/Time Tested:	4/18/21 3:30 PM	Pile Type/Size:	W6x9
Pre-Auger/Pre-Drill (Y/N)?:	N	Pre-Auger Depth (ft.):	N/A	Pile Length:	15
Pre-Drill Depth (ft.):	N/A	Pre-Drill Diameter (in.):	N/A	Total Drive Time (sec):	62.38
Pushed to Depth (ft.):	1	Embedment Depth (ft.):	10.30	Avg. Installation Rate (sec/ft)	6.06

Embedment Data	
Depth (ft.)	Time (s)
0	0
1	0
2	1.58
3	1.95
4	5.13
5	5.6
6	6.59
7	7.65
8	8.12
9	8.87
10	11.92
11	4.97
Total Time (s) =	62.38

Tensile Testing					
Hold Time (min)	Target Load (lbs)	Load (lbs)	Deflection 1 (in.)	Deflection 2 (in.)	Average Deflection (in.)
1	0	0	0.0000	0.0000	0.0000
1	1,500	1,500	-0.0005	0.0085	0.0040
1	3,000	3,000	0.0030	0.0145	0.0088
1	4,000	4,000	0.0100	0.0190	0.0145
1	5,000	5,040	0.0160	0.0235	0.0198
1	6,000	6,060	0.0240	0.0305	0.0273
1	7,000	7,060	0.0355	0.0385	0.0370
1	8,000	8,060	0.0525	0.0530	0.0528
1	9,000	9,060	0.0755	0.0695	0.0725
1	10,000	10,020	0.1010	0.091	0.0960
Unload					
1	0	0	0.0460	0.0510	0.0485
Reload					
1	Max.	11,240	0.1695	0.1635	0.1665
Unload					
1	0	0	0.1010	0.1085	0.1048

Lateral Testing					
Lateral Load Height Above Grade (ft):		3	Deflection Gauge Height (in):		4
Hold Time (min)	Target Load (lbs)	Load (lbs)	Deflection 1 (in.)	Deflection 2 (in.)	Average Deflection (in.)
1	0	0	0.0000	0.0000	0.0000
1	500	500	0.1375	0.0620	0.0998
1	1,000	1,000	0.2645	0.1535	0.2090
1	1,500	1,500	0.3875	0.2510	0.3193
1	0	0	0.0485	0.0150	0.0318
1	500	520	0.1680	0.0845	0.1263
1	1,000	1,000	0.2865	0.1710	0.2288
1	1,500	1,500	0.3860	0.2545	0.3203
1	2,000	2,000	0.4845	0.3425	0.4135
1	2,500	2,500	0.5990	0.4460	0.5225
1	0	0	0.0890	0.0350	0.0620
1	2,500	2,500	0.6110	0.4100	0.5105
1	3,000	3,000	0.7105	0.5560	0.6333
1	3,500	3,500	0.8175	0.6495	0.7335
1	4,000	4,020	0.9220	0.7405	0.8313
Unload					
1	0	0	0.1230	0.0630	0.0930
Reload					
1	Max.	4,260	1.1010	0.8135	0.9573
Unload					
1	0	0	0.1405	0.0825	0.1115



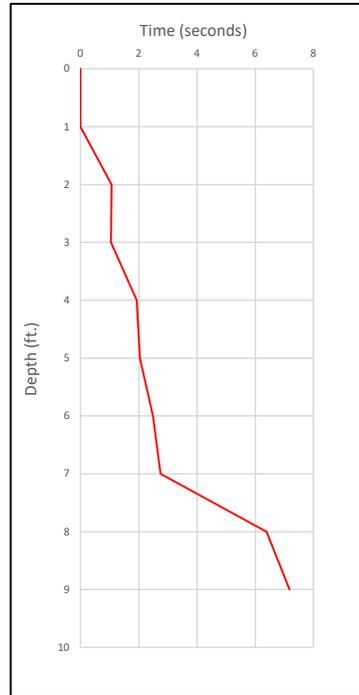
Field Notes

Project:	AES - Somerset Solar	Site Location:	Somerset, NY	Pile ID:	PT-26A
Date/Time Installed:	4/8/21 2:40 PM	Date/Time Tested:	4/21/21 4:20 PM	Pile Type/Size:	W6x9
Pre-Auger/Pre-Drill (Y/N)?:	N	Pre-Auger Depth (ft.):	N/A	Pile Length:	15
Pre-Drill Depth (ft.):	N/A	Pre-Drill Diameter (in.):	N/A	Total Drive Time (sec):	24.85
Pushed to Depth (ft.):	1	Embedment Depth (ft.):	9.00	Avg. Installation Rate (sec/ft)	2.76

Embedment Data	
Depth (ft.)	Time (s)
0	0
1	0
2	1.06
3	1.04
4	1.92
5	2.04
6	2.48
7	2.74
8	6.39
9	7.18
Total Time (s) =	24.85

Tensile Testing					
Hold Time (min)	Target Load (lbs)	Load (lbs)	Deflection 1 (in.)	Deflection 2 (in.)	Average Deflection (in.)
1	0	0	0.0000	0.0000	0.0000
1	1,500	1,580	0.0085	0.0065	0.0075
1	3,000	3,000	0.0180	0.0175	0.0178
1	4,000	4,000	0.0360	0.0355	0.0358
1	5,000	5,040	0.0620	0.0605	0.0613
1	6,000	6,080	0.1110	0.1105	0.1108
1	7,000	7,000	0.1905	0.1900	0.1903
1	8,000	8,000	0.3600	0.3630	0.3615
1	9,000	9,000	0.6135	0.6190	0.6163
1	10,000	9,700	1.0750	1.0785	1.0768
Unload					
1	0	0	1.0075	1.0085	1.0080

Lateral Testing					
Lateral Load Height Above Grade (ft):		3	Deflection Gauge Height (in):		4
Hold Time (min)	Target Load (lbs)	Load (lbs)	Deflection 1 (in.)	Deflection 2 (in.)	Average Deflection (in.)
1	0	0	0.0000	0.0000	0.0000
1	500	500	0.0595	0.1100	0.0848
1	1,000	1,000	0.1235	0.2000	0.1618
1	1,500	1,500	0.2125	0.3155	0.2640
1	0	0	0.0405	0.0455	0.0430
1	500	500	0.1075	0.1770	0.1423
1	1,000	1,000	0.1620	0.2435	0.2028
1	1,500	1,500	0.2420	0.3460	0.2940
1	2,000	2,020	0.3160	0.4315	0.3738
1	2,500	2,500	0.4345	0.5525	0.4935
1	0	0	0.0905	0.0780	0.0843
1	2,500	2,500	0.5525	0.5935	0.5730
1	3,000	3,020	0.6770	0.7195	0.6983
1	3,500	3,500	0.8540	0.9120	0.8830
1	4,000	3,600	0.9725	1.0095	0.9910
Unload					
1	0	0	0.1520	0.1490	0.1505



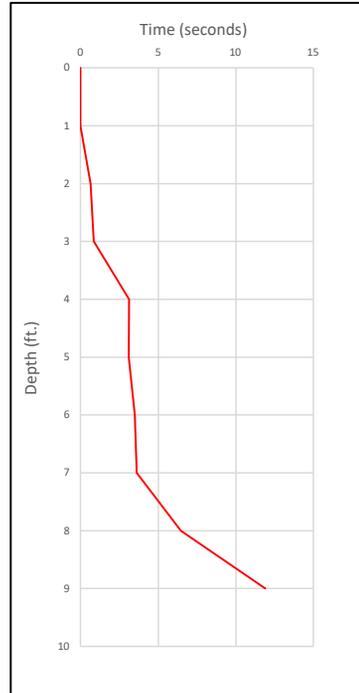
Field Notes

Project:	AES - Somerset Solar	Site Location:	Somerset, NY	Pile ID:	PT-26B
Date/Time Installed:	4/8/21 2:45 PM	Date/Time Tested:	4/21/21 4:20 PM	Pile Type/Size:	W6x9
Pre-Auger/Pre-Drill (Y/N)?:	N	Pre-Auger Depth (ft.):	N/A	Pile Length:	15
Pre-Drill Depth (ft.):	N/A	Pre-Drill Diameter (in.):	N/A	Total Drive Time (sec):	33.14
Pushed to Depth (ft.):	1	Embedment Depth (ft.):	9.00	Avg. Installation Rate (sec/ft)	3.68

Embedment Data	
Depth (ft.)	Time (s)
0	0
1	0
2	0.63
3	0.84
4	3.11
5	3.09
6	3.49
7	3.62
8	6.46
9	11.9
Total Time (s) =	33.14

Tensile Testing					
Hold Time (min)	Target Load (lbs)	Load (lbs)	Deflection 1 (in.)	Deflection 2 (in.)	Average Deflection (in.)
1	0	0	0.0000	0.0000	0.0000
1	1,500	1,500	0.0055	0.0110	0.0083
1	3,000	3,040	0.0105	0.0190	0.0148
1	4,000	4,080	0.0180	0.0305	0.0243
1	5,000	5,080	0.0305	0.0460	0.0383
1	6,000	6,000	0.0505	0.0695	0.0600
1	7,000	7,080	0.0925	0.1155	0.1040
1	8,000	8,060	0.1915	0.2180	0.2048
1	9,000	9,000	0.4075	0.4400	0.4238
1	10,000	9,800	0.6410	0.6770	0.6590
Unload					
1	0	0	0.5990	0.6050	0.6020
Reload					
1	Max.	9,800	0.8085	0.8415	0.8250
Unload					
1	0	0	0.7600	0.7735	0.7668

Lateral Testing					
Lateral Load Height Above Grade (ft):		3	Deflection Gauge Height (in):		4
Hold Time (min)	Target Load (lbs)	Load (lbs)	Deflection 1 (in.)	Deflection 2 (in.)	Average Deflection (in.)
1	0	0	0.0000	0.0000	0.0000
1	500	500	0.0750	0.1270	0.1010
1	1,000	1,000	0.1445	0.2350	0.1898
1	1,500	1,500	0.2485	0.3685	0.3085
1	0	0	0.0250	0.0750	0.0500
1	500	500	0.1185	0.2190	0.1688
1	1,000	1,000	0.1815	0.2990	0.2403
1	1,500	1,500	0.2785	0.4145	0.3465
1	2,000	2,020	0.3680	0.5155	0.4418
1	2,500	2,500	0.5110	0.6660	0.5885
1	0	0	0.0635	0.1335	0.0985
1	2,500	2,500	0.5495	0.7100	0.6298
1	3,000	3,020	0.7005	0.8695	0.7850
1	3,500	3,500	0.8805	1.0595	0.9700
1	4,000	3,600	0.9340	1.1175	1.0258
Unload					
1	0	0	0.1445	0.2535	0.1990



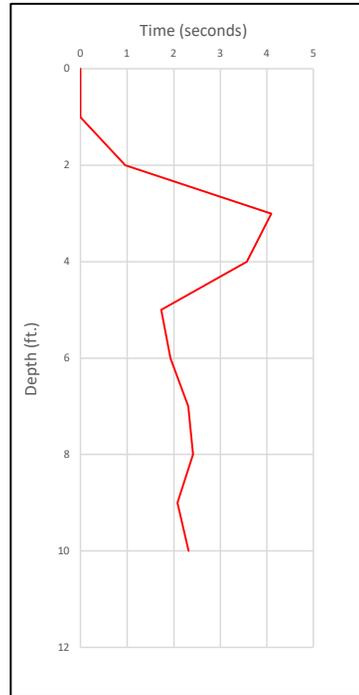
Field Notes

Project:	AES - Somerset Solar	Site Location:	Somerset, NY	Pile ID:	PT-27A
Date/Time Installed:	4/8/21 3:05 PM	Date/Time Tested:	4/22/21 7:45 AM	Pile Type/Size:	W6x9
Pre-Auger/Pre-Drill (Y/N)?:	N	Pre-Auger Depth (ft):	N/A	Pile Length:	15
Pre-Drill Depth (ft):	N/A	Pre-Drill Diameter (in):	N/A	Total Drive Time (sec):	21.41
Pushed to Depth (ft.):	1	Embedment Depth (ft.):	10.00	Avg. Installation Rate (sec/ft)	2.14

Embedment Data	
Depth (ft.)	Time (s)
0	0
1	0
2	0.96
3	4.1
4	3.57
5	1.73
6	1.93
7	2.31
8	2.41
9	2.08
10	2.32
Total Time (s) =	21.41

Tensile Testing					
Hold Time (min)	Target Load (lbs)	Load (lbs)	Deflection 1 (in.)	Deflection 2 (in.)	Average Deflection (in.)
1	0	0	0.0000	0.0000	0.0000
1	1,500	1,580	-0.0010	0.0035	0.0013
1	3,000	3,040	0.0080	0.0105	0.0093
1	4,000	4,020	0.0140	0.0160	0.0150
1	5,000	5,060	0.0270	0.0280	0.0275
1	6,000	6,020	0.0420	0.0420	0.0420
1	7,000	7,020	0.0725	0.0710	0.0718
1	8,000	8,000	0.1360	0.1340	0.1350
1	9,000	8,800	0.1920	0.1885	0.1903
Unload					
1	0	0	0.1480	0.1490	0.1485
Reload					
1	Max.	5,000	0.1715	0.1685	0.1700
Unload					
1	0	0	0.1515	0.1445	0.1480

Lateral Testing					
Lateral Load Height Above Grade (ft):		3	Deflection Gauge Height (in):		4
Hold Time (min)	Target Load (lbs)	Load (lbs)	Deflection 1 (in.)	Deflection 2 (in.)	Average Deflection (in.)
1	0	0	0.0000	0.0000	0.0000
1	500	500	0.1120	0.0390	0.0755
1	1,000	1,000	0.2205	0.1115	0.1660
1	1,500	1,500	0.3365	0.2030	0.2698
1	0	0	0.0805	0.0360	0.0583
1	500	500	0.1530	0.0725	0.1128
1	1,000	1,000	0.2525	0.1340	0.1933
1	1,500	1,500	0.3440	0.2065	0.2753
1	2,000	2,000	0.4500	0.3030	0.3765
1	2,500	2,500	0.5735	0.4115	0.4925
1	0	0	0.0860	0.0615	0.0738
1	2,500	2,500	0.6150	0.4350	0.5250
1	3,000	3,000	0.7250	0.5310	0.6280
1	3,500	3,500	0.8620	0.6545	0.7583
1	4,000	4,000	1.0090	0.7925	0.9008
Unload					
1	0	0	0.1470	0.0990	0.1230
Reload					
1	Max.	4,220	1.1530	0.9235	1.0383
Unload					
1	0	0	0.1370	0.1160	0.1265



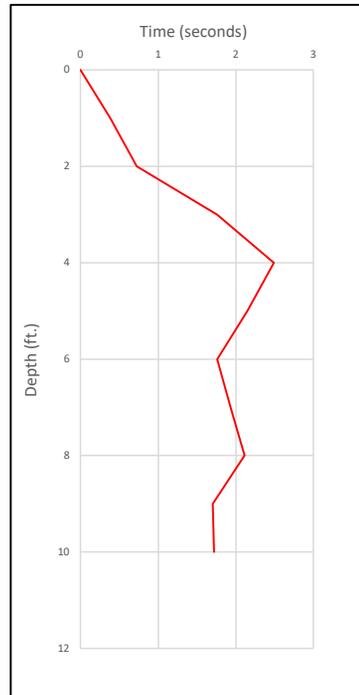
Field Notes

Project:	AES - Somerset Solar	Site Location:	Somerset, NY	Pile ID:	PT-27B
Date/Time Installed:	4/8/21 3:10 PM	Date/Time Tested:	4/22/21 7:45 AM	Pile Type/Size:	W6x9
Pre-Auger/Pre-Drill (Y/N)?:	N	Pre-Auger Depth (ft.):	N/A	Pile Length:	15
Pre-Drill Depth (ft.):	N/A	Pre-Drill Diameter (in.):	N/A	Total Drive Time (sec):	16.72
Pushed to Depth (ft.):	0.8	Embedment Depth (ft.):	10.00	Avg. Installation Rate (sec/ft)	1.67

Embedment Data	
Depth (ft.)	Time (s)
0	0
1	0.38
2	0.72
3	1.76
4	2.49
5	2.15
6	1.76
7	1.93
8	2.11
9	1.7
10	1.72
Total Time (s) =	16.72

Tensile Testing					
Hold Time (min)	Target Load (lbs)	Load (lbs)	Deflection 1 (in.)	Deflection 2 (in.)	Average Deflection (in.)
1	0	0	0.0000	0.0000	0.0000
1	1,500	1,520	-0.0005	-0.0010	-0.0008
1	3,000	3,000	0.0025	0.0020	0.0023
1	4,000	4,040	0.0070	0.0055	0.0063
1	5,000	5,020	0.0135	0.0125	0.0130
1	6,000	6,060	0.0260	0.0260	0.0260
1	7,000	7,060	0.0435	0.0435	0.0435
1	8,000	8,080	0.0755	0.0760	0.0758
1	9,000	9,080	0.1360	0.1355	0.1358
1	10,000	10,040	0.1920	0.1920	0.1920
Unload					
1	0	0	0.1585	0.1565	0.1575
Reload					
1	Max.	10,280	0.2568	0.2570	0.2569
Unload					
1	0	0	0.2210	0.2200	0.2205

Lateral Testing					
Lateral Load Height Above Grade (ft):		3	Deflection Gauge Height (in):		4
Hold Time (min)	Target Load (lbs)	Load (lbs)	Deflection 1 (in.)	Deflection 2 (in.)	Average Deflection (in.)
1	0	0	0.0000	0.0000	0.0000
1	500	500	0.0030	0.1710	0.0870
1	1,000	1,000	0.0605	0.2950	0.1778
1	1,500	1,500	0.1355	0.4010	0.2683
1	0	0	0.0240	0.0585	0.0413
1	500	500	0.0205	0.1965	0.1085
1	1,000	1,000	0.0735	0.3100	0.1918
1	1,500	1,500	0.1360	0.4000	0.2680
1	2,000	2,000	0.2070	0.4935	0.3503
1	2,500	2,500	0.2810	0.5900	0.4355
1	0	0	0.0400	0.0360	0.0380
1	2,500	2,500	0.2955	0.6100	0.4528
1	3,000	3,000	0.3670	0.6980	0.5325
1	3,500	3,500	0.4565	0.8190	0.6378
1	4,000	4,000	0.5560	0.9585	0.7573
Unload					
1	0	0	0.0665	0.0655	0.0660
Reload					
1	Max.	4,220	0.6490	1.1020	0.8755
Unload					
1	0	0	0.0910	0.0425	0.0668



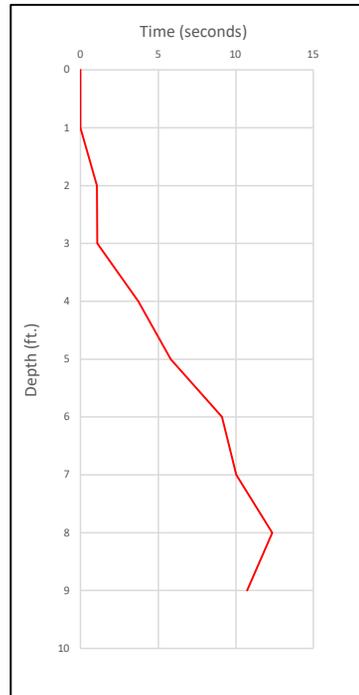
Field Notes

Project:	AES - Somerset Solar	Site Location:	Somerset, NY	Pile ID:	PT-30B
Date/Time Installed:	4/12/21 11:00 AM	Date/Time Tested:	4/22/2021	Pile Type/Size:	W6x9
Pre-Auger/Pre-Drill (Y/N)?:	N	Pre-Auger Depth (ft.):	N/A	Pile Length:	15
Pre-Drill Depth (ft.):	N/A	Pre-Drill Diameter (in.):	N/A	Total Drive Time (sec):	53.82
Pushed to Depth (ft.):	1	Embedment Depth (ft.):	9.00	Avg. Installation Rate (sec/ft)	5.98

Embedment Data	
Depth (ft.)	Time (s)
0	0
1	0
2	1.05
3	1.06
4	3.72
5	5.8
6	9.1
7	10.02
8	12.35
9	10.72
Total Time (s) =	53.82

Tensile Testing					
Hold Time (min)	Target Load (lbs)	Load (lbs)	Deflection 1 (in.)	Deflection 2 (in.)	Average Deflection (in.)
1	0	0	0.0000	0.0000	0.0000
1	1,500	1,500	0.0010	0.0030	0.0020
1	3,000	3,000	-0.0090	0.0130	0.0020
1	4,000	4,000	-0.0260	0.0310	0.0025
1	5,000	5,000	-0.0415	0.0520	0.0053
1	6,000	6,000	-0.0560	0.0690	0.0065
Unload					
1	0	0	-0.0035	0.0040	0.0003
Reload					
1	Max.	8800	-0.5585	0.0830	-0.2378
Unload					
1	0	0	-0.0045	0.0065	0.0010

Lateral Testing					
Lateral Load Height Above Grade (ft):		3	Deflection Gauge Height (in):		4
Hold Time (min)	Target Load (lbs)	Load (lbs)	Deflection 1 (in.)	Deflection 2 (in.)	Average Deflection (in.)
1	0	0	0.0000	0.0000	0.0000
1	500	500	0.1660	0.1350	0.1505
1	1,000	1,000	0.3115	0.2985	0.3050
1	1,500	1,500	0.4425	0.4490	0.4458
1	0	0	0.0750	0.0695	0.0723
1	500	560	0.2130	0.1930	0.2030
1	1,000	1,000	0.3430	0.3380	0.3405
1	1,500	1,500	0.4625	0.4620	0.4623
1	2,000	2,000	0.5845	0.5910	0.5878
1	2,500	2,500	0.7095	0.7250	0.7173
1	0	0	0.0900	0.1015	0.0958
1	2,500	2,500	0.7400	0.7510	0.7455
1	3,000	3,000	0.8640	0.8860	0.8750
1	3,500	3,500	0.9850	1.0195	1.0023
1	4,000	3,660	1.0140	1.0495	1.0318
Unload					
1	0	0	0.0660	0.1160	0.0910



Field Notes

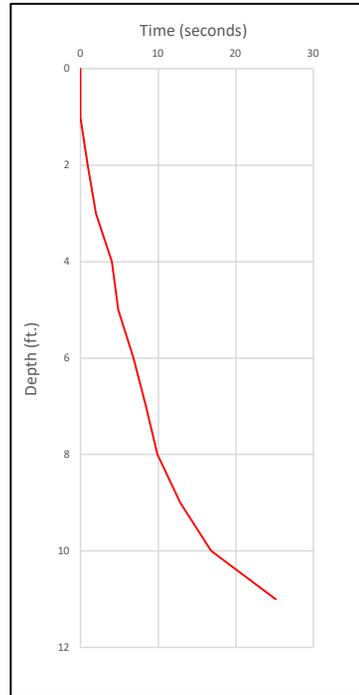
Footing failure during initial uplift test.

Project:	AES - Somerset Solar	Site Location:	Somerset, NY	Pile ID:	PT-32A
Date/Time Installed:	4/12/21 10:25 AM	Date/Time Tested:	4/22/21 11:00 AM	Pile Type/Size:	W6x9
Pre-Auger/Pre-Drill (Y/N)?:	N	Pre-Auger Depth (ft.):	N/A	Pile Length:	15
Pre-Drill Depth (ft.):	N/A	Pre-Drill Diameter (in.):	N/A	Total Drive Time (sec):	91.69
Pushed to Depth (ft.):	1.4	Embedment Depth (ft.):	11.00	Avg. Installation Rate (sec/ft)	8.34

Embedment Data	
Depth (ft.)	Time (s)
0	0
1	0
2	0.92
3	1.97
4	4.02
5	4.85
6	6.83
7	8.41
8	9.87
9	12.84
10	16.81
11	25.17
Total Time (s) =	91.69

Tensile Testing					
Hold Time (min)	Target Load (lbs)	Load (lbs)	Deflection 1 (in.)	Deflection 2 (in.)	Average Deflection (in.)
1	0	0	0.0000	0.0000	0.0000
1	1,500	1,500	0.0060	-0.0075	-0.0008
1	3,000	3,000	0.0125	-0.0110	0.0008
1	4,000	4,000	0.0160	-0.0120	0.0020
1	5,000	5,000	0.0195	-0.0115	0.0040
1	6,000	6,000	0.0235	-0.0110	0.0063
1	7,000	7,000	0.0260	-0.0105	0.0078
1	8,000	8,000	0.0305	-0.0090	0.0108
1	9,000	9,000	0.0350	-0.0085	0.0133
1	10,000	10,000	0.0400	-0.0065	0.0168
Unload					
1	0	0	0.0100	-0.0035	0.0033
Reload					
1	Max.	10,000	0.0450	-0.0050	0.0200
Unload					
1	0	0	0.0125	0.0050	0.0088

Lateral Testing					
Lateral Load Height Above Grade (ft):		3	Deflection Gauge Height (in):		4
Hold Time (min)	Target Load (lbs)	Load (lbs)	Deflection 1 (in.)	Deflection 2 (in.)	Average Deflection (in.)
1	0	0	0.0000	0.0000	0.0000
1	500	500	0.0735	0.1040	0.0888
1	1,000	1,000	0.1790	0.2250	0.2020
1	1,500	1,500	0.2860	0.2475	0.2668
1	0	0	0.0640	0.0755	0.0698
1	500	520	0.1360	0.1730	0.1545
1	1,000	1,000	0.2225	0.2750	0.2488
1	1,500	1,500	0.3130	0.3770	0.3450
1	2,000	2,000	0.4290	0.5060	0.4675
1	2,500	2,500	0.5615	0.6540	0.6078
1	0	0	0.1310	0.1350	0.1330
1	2,500	2,500	0.5960	0.6935	0.6448
1	3,000	3,000	0.7260	0.8335	0.7798
1	3,500	3,500	0.8945	1.0110	0.9528
1	4,000	3,700	0.9525	1.0705	1.0115
Unload					
1	0	0	0.1750	0.1620	0.1685



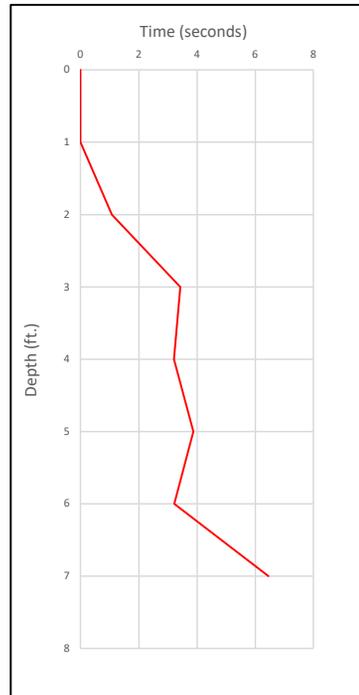
Field Notes

Project:	AES - Somerset Solar	Site Location:	Somerset, NY	Pile ID:	PT-33B
Date/Time Installed:	4/12/21 10:15 AM	Date/Time Tested:	4/22/21 11:00 AM	Pile Type/Size:	W6x9
Pre-Auger/Pre-Drill (Y/N)?:	N	Pre-Auger Depth (ft.):	N/A	Pile Length:	15
Pre-Drill Depth (ft.):	N/A	Pre-Drill Diameter (in.):	N/A	Total Drive Time (sec):	21.24
Pushed to Depth (ft.):	1	Embedment Depth (ft.):	7.00	Avg. Installation Rate (sec/ft)	3.03

Embedment Data	
Depth (ft.)	Time (s)
0	0
1	0
2	1.07
3	3.42
4	3.2
5	3.87
6	3.22
7	6.46
Total Time (s) =	21.24

Tensile Testing					
Hold Time (min)	Target Load (lbs)	Load (lbs)	Deflection 1 (in.)	Deflection 2 (in.)	Average Deflection (in.)
1	0	0	0.0000	0.0000	0.0000
1	1,500	1,500	-0.0045	0.0020	-0.0013
1	3,000	3,000	-0.0060	-0.0025	-0.0043
1	4,000	4,000	-0.0060	-0.0015	-0.0038
1	5,000	5,000	-0.0050	0.0005	-0.0023
1	6,000	5,900	0.0000	0.0085	0.0043
Unload					
1	0	0	0.0040	0.0380	0.0210
Reload					
1	Max.	10,000	0.5235	0.5260	0.5248
Unload					
1	0	0	0.5140	0.5060	0.5100

Lateral Testing					
Lateral Load Height Above Grade (ft):		3	Deflection Gauge Height (in):		4
Hold Time (min)	Target Load (lbs)	Load (lbs)	Deflection 1 (in.)	Deflection 2 (in.)	Average Deflection (in.)
1	0	0	0.0000	0.0000	0.0000
1	500	500	0.0690	0.0600	0.0645
1	1,000	1,000	0.1610	0.1350	0.1480
1	1,500	1,500	0.2640	0.2340	0.2490
1	0	0	0.0750	0.0105	0.0428
1	500	500	0.1220	0.0770	0.0995
1	1,000	1,080	0.2110	0.1670	0.1890
1	1,500	1,500	0.2835	0.2405	0.2620
1	2,000	2,020	0.3935	0.3535	0.3735
1	2,500	2,500	0.5360	0.5000	0.5180
1	0	0	0.1510	0.0680	0.1095
1	2,500	2,500	0.5850	0.5580	0.5715
1	3,000	3,000	0.7250	0.7075	0.7163
1	3,500	3,500	0.9235	0.9180	0.9208
1	4,000	3,780	1.0210	1.0150	1.0180
Unload					
1	0	0	0.2055	0.1675	0.1865



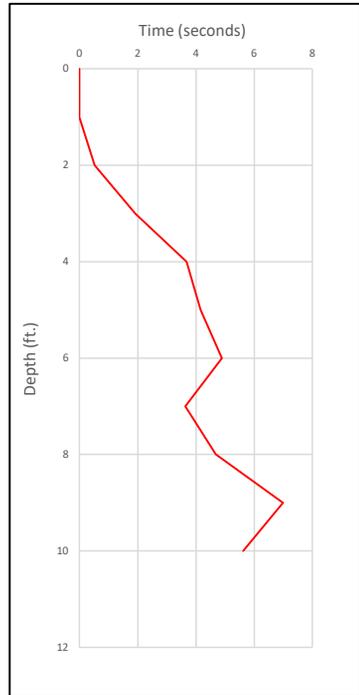
Field Notes

Project:	AES - Somerset Solar	Site Location:	Somerset, NY	Pile ID:	PT-35B
Date/Time Installed:	4/12/21 8:45 AM	Date/Time Tested:	4/23/21 8:30 AM	Pile Type/Size:	W6x9
Pre-Auger/Pre-Drill (Y/N)?:	N	Pre-Auger Depth (ft.):	N/A	Pile Length:	15
Pre-Drill Depth (ft.):	N/A	Pre-Drill Diameter (in.):	N/A	Total Drive Time (sec):	36.08
Pushed to Depth (ft.):	1.8	Embedment Depth (ft.):	10.00	Avg. Installation Rate (sec/ft)	3.61

Embedment Data	
Depth (ft.)	Time (s)
0	0
1	0
2	0.52
3	1.91
4	3.68
5	4.16
6	4.89
7	3.63
8	4.68
9	6.99
10	5.62
Total Time (s) =	36.08

Tensile Testing					
Hold Time (min)	Target Load (lbs)	Load (lbs)	Deflection 1 (in.)	Deflection 2 (in.)	Average Deflection (in.)
1	0	0	0.0000	0.0000	0.0000
1	1,500	1,500	-0.0045	0.0170	0.0063
1	3,000	3,000	-0.0060	0.0250	0.0095
1	4,000	4,000	-0.0030	0.0290	0.0130
1	5,000	5,000	0.0015	0.0330	0.0173
1	6,000	6,000	0.0110	0.0390	0.0250
1	7,000	7,000	0.0240	0.0445	0.0343
1	8,000	8,000	0.0440	0.0545	0.0493
1	9,000	9,000	0.0665	0.0675	0.0670
Unload					
1	0	0	0.0490	0.0475	0.0483
Reload					
1	Max.	9,100	0.0885	0.0860	0.0873
Unload					
1	0	0	0.0640	0.0605	0.0623

Lateral Testing					
Lateral Load Height Above Grade (ft):		3	Deflection Gauge Height (in):		4
Hold Time (min)	Target Load (lbs)	Load (lbs)	Deflection 1 (in.)	Deflection 2 (in.)	Average Deflection (in.)
1	0	0	0.0000	0.0000	0.0000
1	500	500	0.1315	0.0815	0.1065
1	1,000	1,000	0.2445	0.1695	0.2070
1	1,500	1,500	0.3580	0.2695	0.3138
1	0	0	0.0915	0.0450	0.0683
1	500	500	0.1865	0.1135	0.1500
1	1,000	1,000	0.2795	0.1910	0.2353
1	1,500	1,500	0.3800	0.2790	0.3295
1	2,000	2,000	0.4955	0.3735	0.4345
1	2,500	2,500	0.6215	0.4790	0.5503
1	0	0	0.1315	0.0715	0.1015
1	2,500	2,500	0.6640	0.5100	0.5870
1	3,000	3,000	0.7825	0.6155	0.6990
1	3,500	3,500	0.9290	0.7490	0.8390
1	4,000	3,660	0.9915	0.8075	0.8995
Unload					
1	0	0	0.1610	0.0955	0.1283



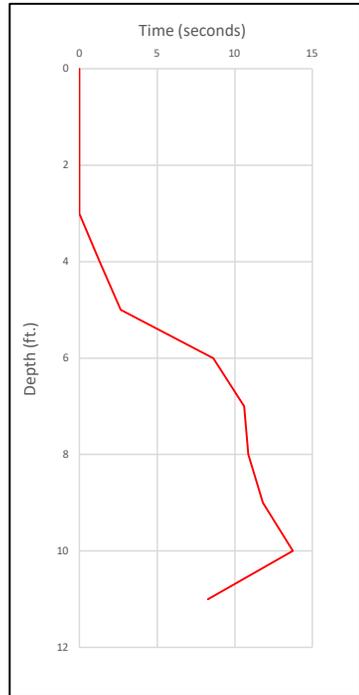
Field Notes

Project:	AES - Somerset Solar	Site Location:	Somerset, NY	Pile ID:	PT-38A
Date/Time Installed:	4/10/21 11:20 AM	Date/Time Tested:	4/23/21 12:30 PM	Pile Type/Size:	W6x9
Pre-Auger/Pre-Drill (Y/N)?:	N	Pre-Auger Depth (ft.):	N/A	Pile Length:	15
Pre-Drill Depth (ft.):	N/A	Pre-Drill Diameter (in.):	N/A	Total Drive Time (sec):	67.83
Pushed to Depth (ft.):	3	Embedment Depth (ft.):	10.60	Avg. Installation Rate (sec/ft)	6.40

Embedment Data	
Depth (ft.)	Time (s)
0	0
1	0
2	0
3	0
4	1.3
5	2.65
6	8.62
7	10.6
8	10.86
9	11.8
10	13.74
11	8.26
Total Time (s) = 67.83	

Tensile Testing					
Hold Time (min)	Target Load (lbs)	Load (lbs)	Deflection 1 (in.)	Deflection 2 (in.)	Average Deflection (in.)
1	0	0	0.0000	0.0000	0.0000
1	1,500	1,600	0.0030	0.0045	0.0038
1	3,000	3,000	0.0125	0.0030	0.0078
1	4,000	4,000	0.0255	-0.0015	0.0120
1	5,000	5,000	0.0420	-0.0050	0.0185
1	6,000	6,000	0.0605	-0.0085	0.0260
1	7,000	7,000	0.0795	-0.0090	0.0353
1	8,000	8,000	0.1030	-0.0105	0.0463
1	9,000	9,000	0.1195	-0.0100	0.0548
1	10,000	10,000	0.1410	-0.0100	0.0655
Unload					
1	0	0	0.0530	0.0385	0.0458
Reload					
1	Max.	10,000	0.1545	-0.0010	0.0768
Unload					
1	0	0	0.0640	0.0480	0.0560

Lateral Testing					
Lateral Load Height Above Grade (ft):		3	Deflection Gauge Height (in):		4
Hold Time (min)	Target Load (lbs)	Load (lbs)	Deflection 1 (in.)	Deflection 2 (in.)	Average Deflection (in.)
1	0	0	0.0000	0.0000	0.0000
1	500	500	0.0510	0.1660	0.1085
1	1,000	1,000	0.1310	0.2875	0.2093
1	1,500	1,500	0.2250	0.3985	0.3118
1	0	0	0.0305	0.1050	0.0678
1	500	500	0.1015	0.2305	0.1660
1	1,000	1,000	0.1790	0.3440	0.2615
1	1,500	1,500	0.2480	0.4335	0.3408
1	2,000	2,000	0.3395	0.5395	0.4395
1	2,500	2,500	0.4350	0.6480	0.5415
1	0	0	0.0750	0.1420	0.1085
1	2,500	2,500	0.4605	0.6890	0.5748
1	3,000	3,000	0.5500	0.7900	0.6700
1	3,500	3,500	0.6790	0.9340	0.8065
1	4,000	4,000	0.8225	1.1085	0.9655
Unload					
1	0	0	0.1310	0.2250	0.1780
Reload					
1	Max.	4,080	0.8680	1.1825	1.0253
Unload					
1	0	0	0.1585	0.2145	0.1865



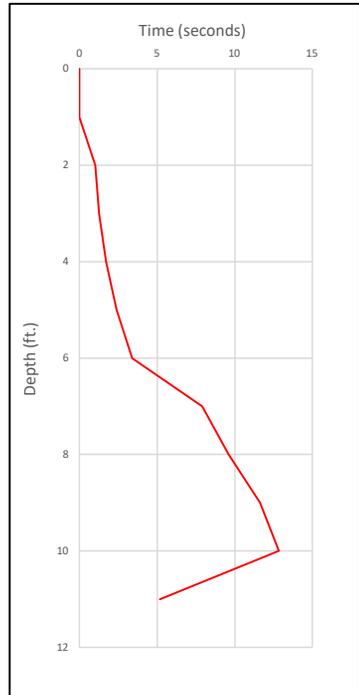
Field Notes

Project:	AES - Somerset Solar	Site Location:	Somerset, NY	Pile ID:	PT-38B
Date/Time Installed:	4/10/21 11:25 AM	Date/Time Tested:	4/23/21 12:15 PM	Pile Type/Size:	W6x9
Pre-Auger/Pre-Drill (Y/N)?:	N	Pre-Auger Depth (ft.):	N/A	Pile Length:	15
Pre-Drill Depth (ft.):	N/A	Pre-Drill Diameter (in.):	N/A	Total Drive Time (sec):	56.84
Pushed to Depth (ft.):	1.2	Embedment Depth (ft.):	10.20	Avg. Installation Rate (sec/ft)	5.57

Embedment Data	
Depth (ft.)	Time (s)
0	0
1	0
2	1
3	1.26
4	1.7
5	2.37
6	3.39
7	7.9
8	9.59
9	11.63
10	12.84
11	5.16
Total Time (s) =	56.84

Tensile Testing					
Hold Time (min)	Target Load (lbs)	Load (lbs)	Deflection 1 (in.)	Deflection 2 (in.)	Average Deflection (in.)
1	0	0	0.0000	0.0000	0.0000
1	1,500	1,500	0.0015	0.0065	0.0040
1	3,000	3,000	0.0075	0.0065	0.0070
1	4,000	4,000	0.0175	0.0025	0.0100
1	5,000	5,000	0.0300	-0.0010	0.0145
1	6,000	6,000	0.0420	-0.0050	0.0185
1	7,000	7,000	0.0585	-0.0075	0.0255
1	8,000	8,000	0.0755	-0.0100	0.0328
1	9,000	9,000	0.0920	-0.0125	0.0398
1	10,000	10,000	0.1120	-0.0145	0.0488
Unload					
1	0	0	0.0475	0.0310	0.0393
Reload					
1	Max.	10,000	0.1235	-0.0065	0.0585
Unload					
1	0	0	0.0585	0.0390	0.0488

Lateral Testing					
Lateral Load Height Above Grade (ft):		3	Deflection Gauge Height (in):		4
Hold Time (min)	Target Load (lbs)	Load (lbs)	Deflection 1 (in.)	Deflection 2 (in.)	Average Deflection (in.)
1	0	0	0.0000	0.0000	0.0000
1	500	500	0.2205	0.0140	0.1173
1	1,000	1,000	0.3030	0.1610	0.2320
1	1,500	1,500	0.4030	0.2275	0.3153
1	0	0	0.0735	0.0040	0.0388
1	500	500	0.2325	0.1250	0.1788
1	1,000	1,000	0.3505	0.2815	0.3160
1	1,500	1,500	0.4330	0.3330	0.3830
1	2,000	2,000	0.5250	0.3945	0.4598
1	2,500	2,500	0.6625	0.4605	0.5615
1	0	0	0.1275	0.0990	0.1133
1	2,500	2,500	0.6920	0.4695	0.5808
1	3,000	3,000	0.7765	0.6365	0.7065
1	3,500	3,500	0.8920	0.7365	0.8143
1	4,000	4,000	1.0320	0.9585	0.9953
Unload					
1	0	0	0.1830	0.0355	0.1093
Reload					
1	Max.	4,080	1.1990	0.9895	1.0943
Unload					
1	0	0	0.1585	0.5950	0.3768



Field Notes

Attachment F

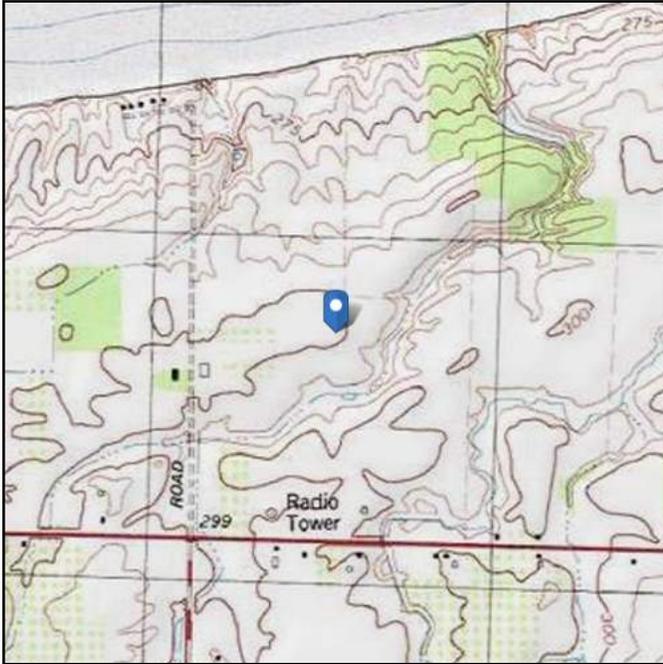
Seismic Support Data

ASCE 7 Hazards Report

Address:
No Address at This
Location

Standard: ASCE/SEI 7-16
Risk Category: II
Soil Class: D - Stiff Soil

Elevation: 299.97 ft (NAVD 88)
Latitude: 43.354122
Longitude: -78.599429

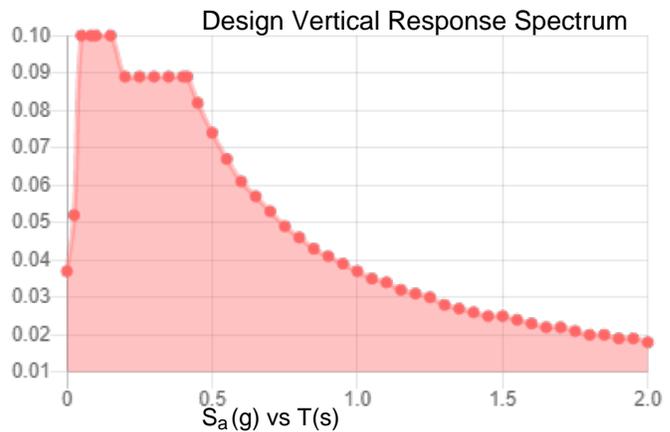
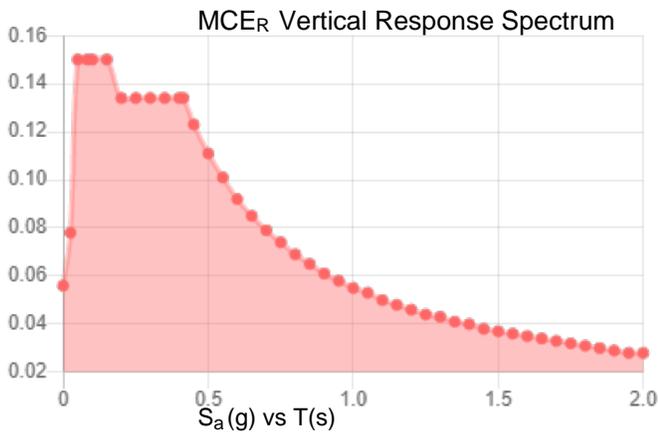
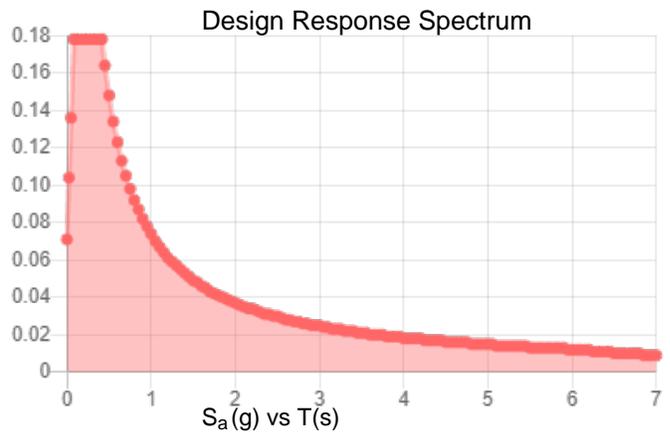
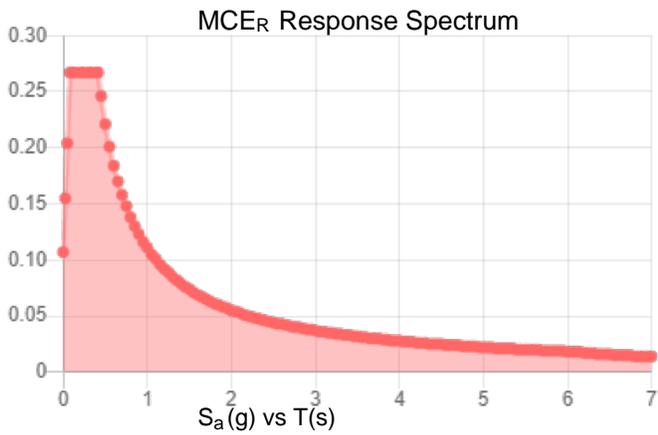


Site Soil Class: D - Stiff Soil

Results:

S_s :	0.167	S_{D1} :	0.074
S_1 :	0.046	T_L :	6
F_a :	1.6	PGA :	0.093
F_v :	2.4	PGA _M :	0.149
S_{MS} :	0.267	F_{PGA} :	1.6
S_{M1} :	0.111	I_e :	1
S_{DS} :	0.178	C_v :	0.7

Seismic Design Category B



Data Accessed:

Wed Apr 21 2021

Date Source:

USGS Seismic Design Maps based on ASCE/SEI 7-16 and ASCE/SEI 7-16 Table 1.5-2. Additional data for site-specific ground motion procedures in accordance with ASCE/SEI 7-16 Ch. 21 are available from USGS.

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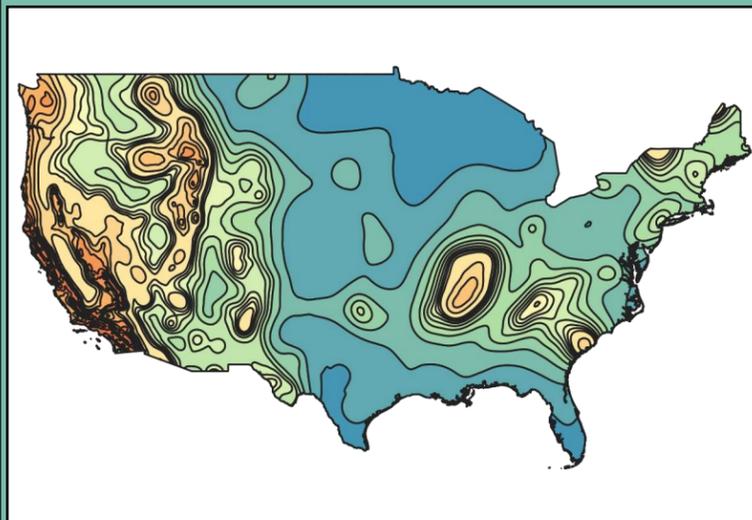
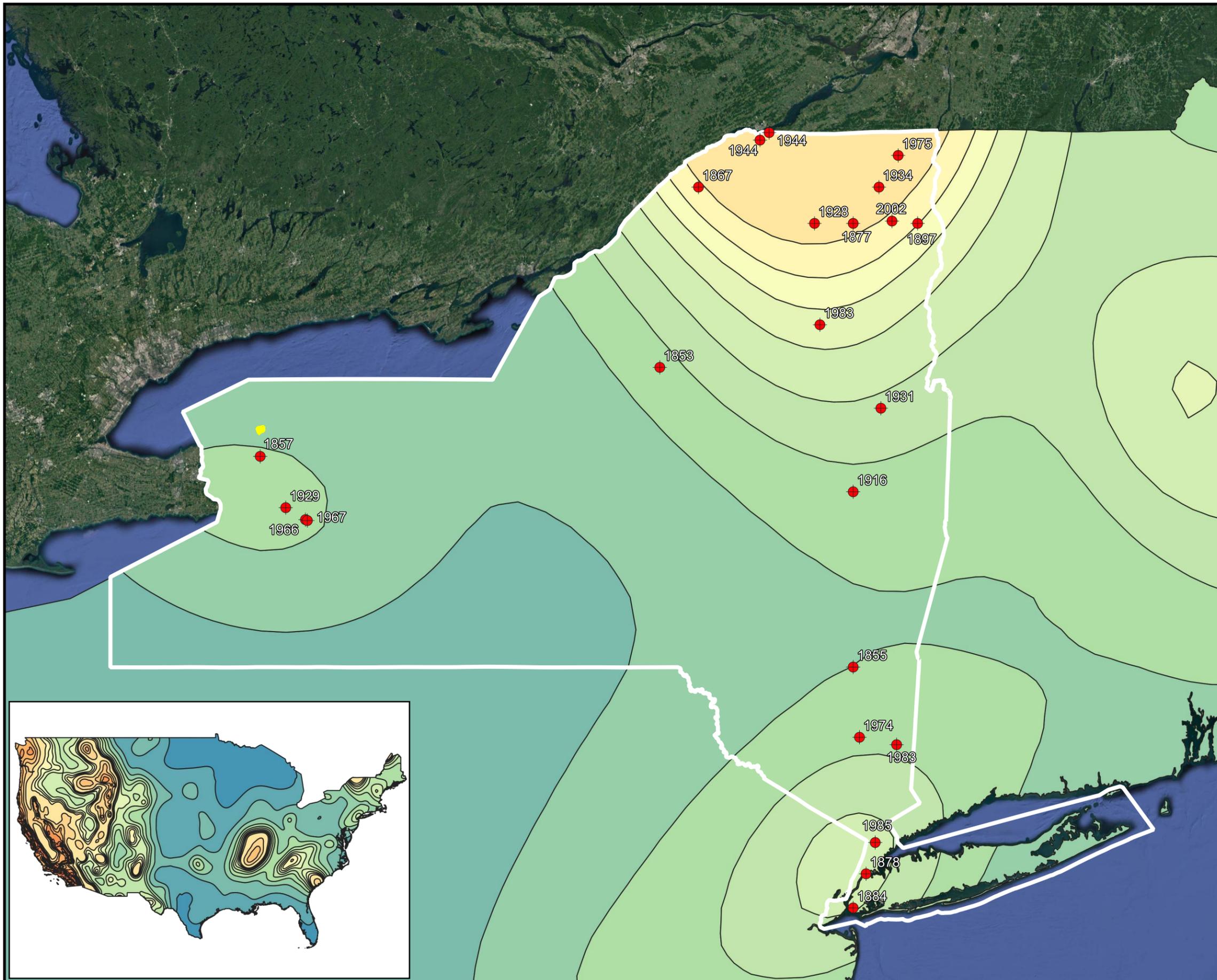


Client:



SEISMIC HAZARD MAP

**AES
SOMERSET SOLAR PROJECT
SOMERSET, NEW YORK**



Legend

- Historical Earthquake (Labeled as year of event)

Seismic Hazard
(from 2018 USGS Long-term National Seismic Hazard Map)

■ Lowest Risk



■ Highest Risk

0 40 80 mi



Absolute Scale: 1 inch = 40 miles
Scale at 11" x 17" AS SHOWN

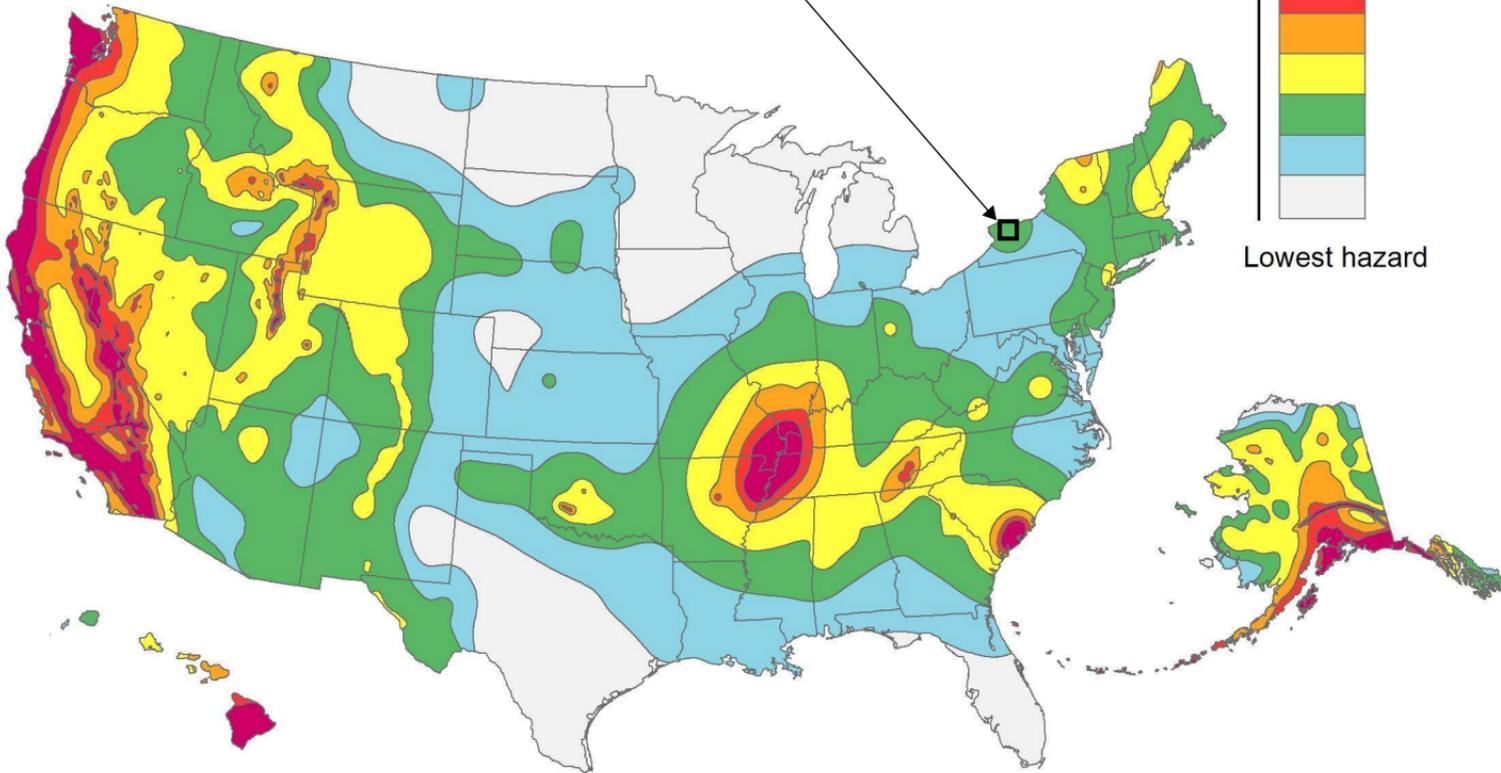
Prepared by: Kyle Hansen
Date: April 25, 2021
Drawing Number: SHM-1 Rev.0

Project Area

Highest hazard



Lowest hazard



Attachment G

NRCS Soil Report

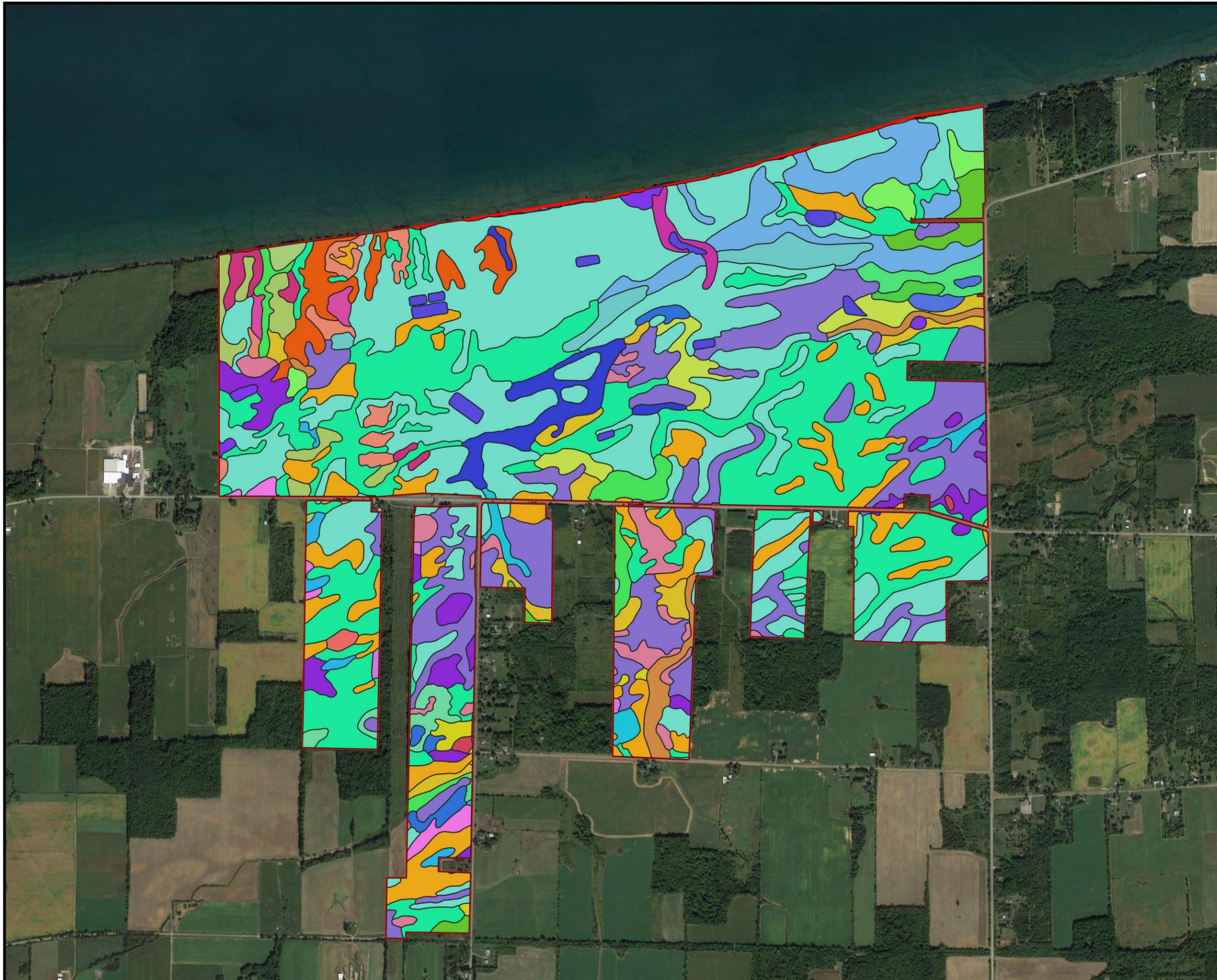


Client:



NRCS SOIL UNITS MAP

**AES
SOMERSET SOLAR PROJECT
SOMERSET, NEW YORK**



Legend

Site Boundaries

NRCS Soil Units

ApA	CoB	GnB	NaA
ArB	Cs	Ha	NaB
ArC	DuB	HgB	OnD3
Ca	DuC3	HIA	OvA
CcB	DvD3	HIB	OvB
CmA	EIA	HsB	RbA
CmB	EIB	Ma	RbB
CnA	Fr	Md	W
CnB	GnA	Mn	Wa

0 1,500 3,000 ft

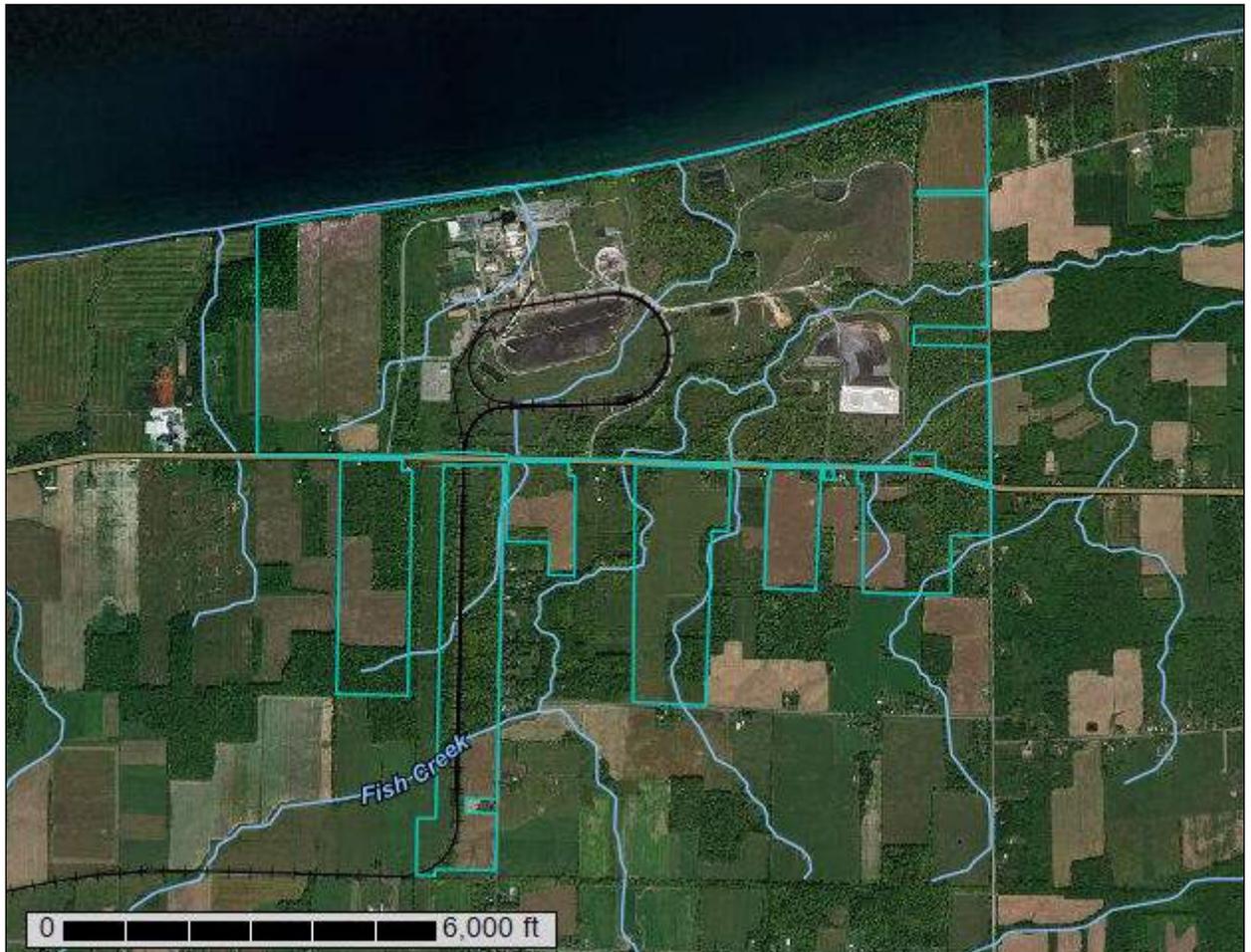


**Absolute Scale: 1 inch = 1,500 feet
Scale at 11" x 17" AS SHOWN**

Prepared by: Kyle Hansen
Date: April 25, 2021
Drawing Number: SUM-1 Rev.0

Custom Soil Resource Report for Niagara County Area, New York

Somerset Solar



Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (<http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/>) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (<https://offices.sc.egov.usda.gov/locator/app?agency=nrcs>) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

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scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

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identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report Soil Map (Somerset Solar)



Map Scale: 1:27,800 if printed on A portrait (8.5" x 11") sheet.



Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 17N WGS84



MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features

-  Blowout
-  Borrow Pit
-  Clay Spot
-  Closed Depression
-  Gravel Pit
-  Gravelly Spot
-  Landfill
-  Lava Flow
-  Marsh or swamp
-  Mine or Quarry
-  Miscellaneous Water
-  Perennial Water
-  Rock Outcrop
-  Saline Spot
-  Sandy Spot
-  Severely Eroded Spot
-  Sinkhole
-  Slide or Slip
-  Sodic Spot

-  Spoil Area
-  Stony Spot
-  Very Stony Spot
-  Wet Spot
-  Other
-  Special Line Features

Water Features

 Streams and Canals

Transportation

-  Rails
-  Interstate Highways
-  US Routes
-  Major Roads
-  Local Roads

Background

 Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
 Web Soil Survey URL:
 Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Niagara County Area, New York
 Survey Area Data: Version 19, Jun 11, 2020

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Dec 31, 2009—Oct 18, 2016

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend (Somerset Solar)

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
ApA	Appleton silt loam, 0 to 3 percent slopes	17.8	1.0%
ArB	Arkport very fine sandy loam, 0 to 6 percent slopes	22.4	1.3%
ArC	Arkport very fine sandy loam, 6 to 12 percent slopes	10.1	0.6%
Ca	Canandaigua silt loam	2.0	0.1%
CcB	Cayuga and Cazenovia silt loams, 2 to 6 percent slopes	5.2	0.3%
CmA	Claverack loamy fine sand, 0 to 2 percent slopes	41.0	2.3%
CmB	Claverack loamy fine sand, 2 to 6 percent slopes	32.3	1.8%
CnA	Collamer silt loam, 0 to 2 percent slopes	129.3	7.2%
CnB	Collamer silt loam, 2 to 6 percent slopes	491.0	27.5%
CoB	Colonie loamy fine sand, 0 to 6 percent slopes	6.1	0.3%
Cs	Cosad fine sandy loam	10.2	0.6%
DuB	Dunkirk silt loam, 2 to 6 percent slopes	20.5	1.1%
DuC3	Dunkirk silt loam, 6 to 12 percent slopes, eroded	34.1	1.9%
DvD3	Dunkirk and Arkport soils, 12 to 20 percent slopes, eroded	3.5	0.2%
EIA	Elnora loamy fine sand, 0 to 2 percent slopes	1.9	0.1%
EIB	Elnora loamy fine sand, 2 to 6 percent slopes	6.0	0.3%
Fr	Fredon gravelly loam	2.6	0.1%
GnA	Galen very fine sandy loam, 0 to 2 percent slopes	7.6	0.4%
GnB	Galen very fine sandy loam, 2 to 6 percent slopes	5.6	0.3%
Ha	Hamlin silt loam	26.4	1.5%
HgB	Hilton gravelly loam, 3 to 8 percent slopes	14.6	0.8%
HIA	Hilton silt loam, 0 to 3 percent slopes	26.9	1.5%
HIB	Hilton silt loam, 3 to 8 percent slopes	79.1	4.4%
HsB	Hudson silt loam, 2 to 6 percent slopes	32.9	1.8%

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Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Ma	Madalin silt loam, 0 to 3 percent slopes	12.7	0.7%
Md	Madalin silt loam, loamy subsoil variant	11.5	0.6%
Mn	Minoa very fine sandy loam	9.0	0.5%
NaA	Niagara silt loam, 0 to 2 percent slopes	374.8	21.0%
NaB	Niagara silt loam, 2 to 6 percent slopes	32.9	1.8%
OnD3	Ontario loam, 15 to 30 percent slopes	7.6	0.4%
OvA	Ovid silt loam, 0 to 2 percent slopes	13.5	0.8%
OvB	Ovid silt loam, 2 to 6 percent slopes	4.3	0.2%
RbA	Rhinebeck silt loam, 0 to 2 percent slopes	224.4	12.5%
RbB	Rhinebeck silt loam, 2 to 6 percent slopes	28.5	1.6%
W	Water	14.5	0.8%
Wa	Wayland soils complex, 0 to 3 percent slopes, frequently flooded	20.3	1.1%
Totals for Area of Interest		1,788.4	100.0%

Map Unit Descriptions (Somerset Solar)

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They

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generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Niagara County Area, New York

ApA—Appleton silt loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2w5hn
Elevation: 260 to 1,740 feet
Mean annual precipitation: 31 to 57 inches
Mean annual air temperature: 41 to 50 degrees F
Frost-free period: 100 to 190 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Appleton and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Appleton

Setting

Landform: Drumlins, ridges, till plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Calcareous loamy lodgment till derived from limestone, sandstone, and shale

Typical profile

Ap - 0 to 8 inches: silt loam
E - 8 to 16 inches: loam
Bt - 16 to 30 inches: gravelly silt loam
C1 - 30 to 54 inches: gravelly loam
C2 - 54 to 79 inches: gravelly loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.01 to 1.42 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 40 percent
Available water capacity: Moderate (about 8.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: B/D
Ecological site: F101XY013NY - Moist Till
Hydric soil rating: No

Minor Components

Lima

Percent of map unit: 5 percent
Landform: Drumlins, till plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Lyons

Percent of map unit: 4 percent
Landform: Drainageways, depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Churchville

Percent of map unit: 3 percent
Landform: Lake plains, till plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope, rise, talf
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Darien

Percent of map unit: 3 percent
Landform: Drainageways, till plains
Landform position (two-dimensional): Footslope, summit
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

ArB—Arkport very fine sandy loam, 0 to 6 percent slopes

Map Unit Setting

National map unit symbol: 9tvf
Elevation: 300 to 900 feet
Mean annual precipitation: 31 to 37 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 145 to 190 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Arkport and similar soils: 80 percent

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Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Arkport

Setting

Landform: Deltas on lake plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Glaciofluvial or deltaic deposits with a high content of fine and very fine sand

Typical profile

H1 - 0 to 8 inches: very fine sandy loam
H2 - 8 to 20 inches: loamy very fine sand
H3 - 20 to 48 inches: loamy fine sand
H4 - 48 to 60 inches: fine sand

Properties and qualities

Slope: 0 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Available water capacity: Low (about 5.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: A
Ecological site: F101XY005NY - Dry Outwash
Hydric soil rating: No

Minor Components

Unnamed soils

Percent of map unit: 4 percent
Hydric soil rating: No

Claverack

Percent of map unit: 4 percent
Hydric soil rating: No

Collamer

Percent of map unit: 4 percent
Hydric soil rating: No

Dunkirk

Percent of map unit: 4 percent
Hydric soil rating: No

Galen

Percent of map unit: 4 percent

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Hydric soil rating: No

ArC—Arkport very fine sandy loam, 6 to 12 percent slopes

Map Unit Setting

National map unit symbol: 9tvg

Elevation: 300 to 900 feet

Mean annual precipitation: 31 to 37 inches

Mean annual air temperature: 46 to 50 degrees F

Frost-free period: 145 to 190 days

Farmland classification: Farmland of statewide importance

Map Unit Composition

Arkport and similar soils: 80 percent

Minor components: 20 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Arkport

Setting

Landform: Deltas on lake plains

Landform position (two-dimensional): Shoulder

Landform position (three-dimensional): Tread

Down-slope shape: Convex

Across-slope shape: Convex

Parent material: Glaciofluvial or deltaic deposits with a high content of fine and very fine sand

Typical profile

H1 - 0 to 8 inches: very fine sandy loam

H2 - 8 to 20 inches: loamy very fine sand

H3 - 20 to 48 inches: loamy fine sand

H4 - 48 to 60 inches: fine sand

Properties and qualities

Slope: 6 to 12 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum content: 15 percent

Available water capacity: Low (about 5.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 3e

Hydrologic Soil Group: A

Ecological site: F101XY005NY - Dry Outwash

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Hydric soil rating: No

Minor Components

Colonie

Percent of map unit: 4 percent

Hydric soil rating: No

Unnamed soils

Percent of map unit: 4 percent

Hydric soil rating: No

Collamer

Percent of map unit: 4 percent

Hydric soil rating: No

Dunkirk

Percent of map unit: 4 percent

Hydric soil rating: No

Galen

Percent of map unit: 4 percent

Hydric soil rating: No

Ca—Canandaigua silt loam

Map Unit Setting

National map unit symbol: 9tvn

Elevation: 100 to 1,000 feet

Mean annual precipitation: 31 to 37 inches

Mean annual air temperature: 46 to 50 degrees F

Frost-free period: 145 to 190 days

Farmland classification: Not prime farmland

Map Unit Composition

Canandaigua and similar soils: 75 percent

Minor components: 25 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Canandaigua

Setting

Landform: Depressions

Landform position (two-dimensional): Toeslope

Landform position (three-dimensional): Tread

Down-slope shape: Concave

Across-slope shape: Concave

Parent material: Silty and clayey glaciolacustrine deposits

Typical profile

H1 - 0 to 7 inches: silt loam

H2 - 7 to 24 inches: silty clay loam

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H3 - 24 to 60 inches: stratified loamy fine sand to silt to clay

Properties and qualities

Slope: 0 to 2 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Very poorly drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)

Depth to water table: About 0 inches

Frequency of flooding: None

Frequency of ponding: Frequent

Calcium carbonate, maximum content: 15 percent

Available water capacity: High (about 12.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 5w

Hydrologic Soil Group: C/D

Ecological site: F101XY010NY - Wet Lake Plain Depression

Hydric soil rating: Yes

Minor Components

Rhinebeck

Percent of map unit: 5 percent

Hydric soil rating: No

Raynham

Percent of map unit: 5 percent

Hydric soil rating: No

Appleton

Percent of map unit: 4 percent

Hydric soil rating: No

Lakemont

Percent of map unit: 4 percent

Landform: Depressions

Hydric soil rating: Yes

Madalin

Percent of map unit: 4 percent

Landform: Depressions

Hydric soil rating: Yes

Sun

Percent of map unit: 3 percent

Landform: Depressions

Hydric soil rating: Yes

CcB—Cayuga and Cazenovia silt loams, 2 to 6 percent slopes

Map Unit Setting

National map unit symbol: 9tvr
Elevation: 250 to 660 feet
Mean annual precipitation: 31 to 37 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 145 to 190 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Cayuga and similar soils: 40 percent
Cazenovia and similar soils: 35 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Cayuga

Setting

Landform: Till plains, lake plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest, tread
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Clayey glaciolacustrine deposits over loamy till derived from limestone, dolomite, sandstone, or shale

Typical profile

H1 - 0 to 8 inches: silt loam
H2 - 8 to 25 inches: silty clay
H3 - 25 to 60 inches: gravelly loam

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 18 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Available water capacity: Moderate (about 8.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: D
Ecological site: F101XY009NY - Moist Lake Plain
Hydric soil rating: No

Description of Cazenovia

Setting

Landform: Reworked lake plains, till plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Loamy till that contains limestone with an admixture of reddish lake-laid clays or reddish clay shale

Typical profile

H1 - 0 to 11 inches: silt loam
H2 - 11 to 28 inches: silty clay loam
H3 - 28 to 60 inches: silt loam

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 24 to 48 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Available water capacity: Moderate (about 8.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Ecological site: F101XY013NY - Moist Till
Hydric soil rating: No

Minor Components

Ovid

Percent of map unit: 5 percent
Hydric soil rating: No

Hilton

Percent of map unit: 5 percent
Hydric soil rating: No

Hudson

Percent of map unit: 5 percent
Hydric soil rating: No

Collamer

Percent of map unit: 5 percent
Hydric soil rating: No

Churchville

Percent of map unit: 5 percent
Hydric soil rating: No

CmA—Claverack loamy fine sand, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 9tw1
Elevation: 600 to 1,800 feet
Mean annual precipitation: 31 to 37 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 145 to 190 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Claverack and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Claverack

Setting

Landform: Lake plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Sandy glaciolacustrine deposits, derived primarily from non-calcareous sandstone or granite, that overlie clayey glaciolacustrine deposits

Typical profile

H1 - 0 to 8 inches: loamy fine sand
H2 - 8 to 32 inches: loamy fine sand
H3 - 32 to 60 inches: silty clay

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 20 to 40 inches to strongly contrasting textural stratification
Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 18 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Available water capacity: Very low (about 2.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F101XY006NY - Moist Outwash

Custom Soil Resource Report

Hydric soil rating: No

Minor Components

Cosad

Percent of map unit: 5 percent

Hydric soil rating: No

Elnora

Percent of map unit: 3 percent

Hydric soil rating: No

Rhinebeck

Percent of map unit: 3 percent

Hydric soil rating: No

Galen

Percent of map unit: 3 percent

Hydric soil rating: No

Unnamed soils

Percent of map unit: 3 percent

Hydric soil rating: No

Hudson

Percent of map unit: 3 percent

Hydric soil rating: No

CmB—Claverack loamy fine sand, 2 to 6 percent slopes

Map Unit Setting

National map unit symbol: 9tw2

Elevation: 600 to 1,800 feet

Mean annual precipitation: 31 to 37 inches

Mean annual air temperature: 46 to 50 degrees F

Frost-free period: 145 to 190 days

Farmland classification: All areas are prime farmland

Map Unit Composition

Claverack and similar soils: 80 percent

Minor components: 20 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Claverack

Setting

Landform: Lake plains

Landform position (two-dimensional): Summit

Landform position (three-dimensional): Tread

Down-slope shape: Concave

Across-slope shape: Convex

Custom Soil Resource Report

Parent material: Sandy glaciolacustrine deposits, derived primarily from non-calcareous sandstone or granite, that overlie clayey glaciolacustrine deposits

Typical profile

H1 - 0 to 8 inches: loamy fine sand
H2 - 8 to 32 inches: loamy fine sand
H3 - 32 to 60 inches: silty clay

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: 20 to 40 inches to strongly contrasting textural stratification
Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 18 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Available water capacity: Very low (about 2.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F101XY006NY - Moist Outwash
Hydric soil rating: No

Minor Components

Colonie

Percent of map unit: 4 percent
Hydric soil rating: No

Elnora

Percent of map unit: 4 percent
Hydric soil rating: No

Galen

Percent of map unit: 4 percent
Hydric soil rating: No

Arkport

Percent of map unit: 4 percent
Hydric soil rating: No

Cosad

Percent of map unit: 2 percent
Hydric soil rating: No

Unnamed soils

Percent of map unit: 2 percent
Hydric soil rating: No

CnA—Collamer silt loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 9tw3
Elevation: 250 to 640 feet
Mean annual precipitation: 31 to 37 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 145 to 190 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Collamer and similar soils: 75 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Collamer

Setting

Landform: Lake plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Silty and clayey glaciolacustrine deposits

Typical profile

H1 - 0 to 8 inches: silt loam
H2 - 8 to 19 inches: silt loam
H3 - 19 to 29 inches: silt loam
H4 - 29 to 60 inches: silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.57 in/hr)
Depth to water table: About 18 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Available water capacity: High (about 10.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F101XY009NY - Moist Lake Plain
Hydric soil rating: No

Minor Components

Minoa

Percent of map unit: 4 percent
Hydric soil rating: No

Rhinebeck

Percent of map unit: 4 percent
Hydric soil rating: No

Hudson

Percent of map unit: 4 percent
Hydric soil rating: No

Galen

Percent of map unit: 4 percent
Hydric soil rating: No

Unnamed soils

Percent of map unit: 3 percent
Hydric soil rating: No

Niagara

Percent of map unit: 3 percent
Hydric soil rating: No

Dunkirk

Percent of map unit: 3 percent
Hydric soil rating: No

CnB—Collamer silt loam, 2 to 6 percent slopes

Map Unit Setting

National map unit symbol: 9tw4
Elevation: 250 to 640 feet
Mean annual precipitation: 31 to 37 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 145 to 190 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Collamer and similar soils: 75 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Collamer

Setting

Landform: Lake plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Concave

Custom Soil Resource Report

Across-slope shape: Convex

Parent material: Silty and clayey glaciolacustrine deposits

Typical profile

H1 - 0 to 8 inches: silt loam

H2 - 8 to 19 inches: silt loam

H3 - 19 to 29 inches: silt loam

H4 - 29 to 60 inches: silt loam

Properties and qualities

Slope: 2 to 6 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Moderately well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.57 in/hr)

Depth to water table: About 18 to 24 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum content: 15 percent

Available water capacity: High (about 10.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 2e

Hydrologic Soil Group: C/D

Ecological site: F101XY009NY - Moist Lake Plain

Hydric soil rating: No

Minor Components

Dunkirk

Percent of map unit: 5 percent

Hydric soil rating: No

Niagara

Percent of map unit: 4 percent

Hydric soil rating: No

Canandaigua

Percent of map unit: 4 percent

Landform: Depressions

Hydric soil rating: Yes

Hudson

Percent of map unit: 3 percent

Hydric soil rating: No

Arkport

Percent of map unit: 3 percent

Hydric soil rating: No

Galen

Percent of map unit: 3 percent

Hydric soil rating: No

Unnamed soils

Percent of map unit: 3 percent

Hydric soil rating: No

CoB—Colonie loamy fine sand, 0 to 6 percent slopes

Map Unit Setting

National map unit symbol: 9tw5
Elevation: 150 to 1,000 feet
Mean annual precipitation: 31 to 37 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 145 to 190 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Colonie and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Colonie

Setting

Landform: Beach ridges, deltas
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Sandy glaciofluvial or eolian deposits

Typical profile

H1 - 0 to 8 inches: loamy fine sand
H2 - 8 to 50 inches: fine sand
H3 - 50 to 60 inches: fine sand

Properties and qualities

Slope: 0 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): High to very high (1.98 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Low (about 4.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: A
Ecological site: F101XY005NY - Dry Outwash
Hydric soil rating: No

Minor Components

Elnora

Percent of map unit: 4 percent
Hydric soil rating: No

Arkport

Percent of map unit: 4 percent
Hydric soil rating: No

Claverack

Percent of map unit: 4 percent
Hydric soil rating: No

Unnamed soils

Percent of map unit: 4 percent
Hydric soil rating: No

Otisville

Percent of map unit: 4 percent
Hydric soil rating: No

Cs—Cosad fine sandy loam

Map Unit Setting

National map unit symbol: 9tw6
Elevation: 200 to 800 feet
Mean annual precipitation: 31 to 37 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 145 to 190 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Cosad and similar soils: 70 percent
Minor components: 30 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Cosad

Setting

Landform: Lake plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Sandy glaciofluvial or deltaic deposits over clayey glaciolacustrine deposits

Typical profile

H1 - 0 to 9 inches: fine sandy loam
H2 - 9 to 14 inches: loamy fine sand

Custom Soil Resource Report

H3 - 14 to 26 inches: loamy fine sand

H4 - 26 to 60 inches: silty clay

Properties and qualities

Slope: 0 to 2 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Somewhat poorly drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)

Depth to water table: About 6 to 18 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum content: 15 percent

Available water capacity: Moderate (about 7.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 3w

Hydrologic Soil Group: C/D

Ecological site: F101XY006NY - Moist Outwash

Hydric soil rating: No

Minor Components

Minoa

Percent of map unit: 4 percent

Hydric soil rating: No

Claverack

Percent of map unit: 4 percent

Hydric soil rating: No

Cheektowaga

Percent of map unit: 4 percent

Landform: Depressions

Hydric soil rating: Yes

Lakemont

Percent of map unit: 4 percent

Landform: Depressions

Hydric soil rating: Yes

Rhinebeck

Percent of map unit: 3 percent

Hydric soil rating: No

Madalin

Percent of map unit: 3 percent

Landform: Depressions

Hydric soil rating: Yes

Odessa

Percent of map unit: 3 percent

Hydric soil rating: No

Stafford

Percent of map unit: 3 percent

Hydric soil rating: No

Unnamed soils

Percent of map unit: 2 percent
Hydric soil rating: No

DuB—Dunkirk silt loam, 2 to 6 percent slopes

Map Unit Setting

National map unit symbol: 9tw8
Elevation: 100 to 1,000 feet
Mean annual precipitation: 31 to 37 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 145 to 190 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Dunkirk and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Dunkirk

Setting

Landform: Lake plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Silty and clayey glaciolacustrine deposits

Typical profile

H1 - 0 to 9 inches: silt loam
H2 - 9 to 17 inches: silt loam
H3 - 17 to 32 inches: silt loam
H4 - 32 to 70 inches: silt loam

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Available water capacity: High (about 10.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e

Custom Soil Resource Report

Hydrologic Soil Group: C
Hydric soil rating: No

Minor Components

Galen

Percent of map unit: 4 percent
Hydric soil rating: No

Niagara

Percent of map unit: 4 percent
Hydric soil rating: No

Hudson

Percent of map unit: 4 percent
Hydric soil rating: No

Collamer

Percent of map unit: 4 percent
Hydric soil rating: No

Arkport

Percent of map unit: 4 percent
Hydric soil rating: No

DuC3—Dunkirk silt loam, 6 to 12 percent slopes, eroded

Map Unit Setting

National map unit symbol: 9tw9
Elevation: 100 to 1,000 feet
Mean annual precipitation: 31 to 37 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 145 to 190 days
Farmland classification: Not prime farmland

Map Unit Composition

Dunkirk, eroded, and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Dunkirk, Eroded

Setting

Landform: Lake plains
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Silty and clayey glaciolacustrine deposits

Typical profile

H1 - 0 to 9 inches: silt loam

Custom Soil Resource Report

H2 - 9 to 17 inches: silt loam
H3 - 17 to 32 inches: silt loam
H4 - 32 to 70 inches: silt loam

Properties and qualities

Slope: 6 to 12 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Available water capacity: High (about 10.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Hydric soil rating: No

Minor Components

Arkport

Percent of map unit: 5 percent
Hydric soil rating: No

Galen

Percent of map unit: 5 percent
Hydric soil rating: No

Collamer

Percent of map unit: 5 percent
Hydric soil rating: No

Hudson

Percent of map unit: 5 percent
Hydric soil rating: No

DvD3—Dunkirk and Arkport soils, 12 to 20 percent slopes, eroded

Map Unit Setting

National map unit symbol: 9twb
Elevation: 100 to 1,000 feet
Mean annual precipitation: 31 to 37 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 145 to 190 days
Farmland classification: Not prime farmland

Map Unit Composition

Dunkirk, eroded, and similar soils: 41 percent

Custom Soil Resource Report

Arkport and similar soils: 39 percent

Minor components: 20 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Dunkirk, Eroded

Setting

Landform: Lake plains

Landform position (two-dimensional): Backslope

Landform position (three-dimensional): Riser

Down-slope shape: Convex

Across-slope shape: Convex

Parent material: Silty and clayey glaciolacustrine deposits

Typical profile

H1 - 0 to 9 inches: silt loam

H2 - 9 to 17 inches: silt loam

H3 - 17 to 32 inches: silt loam

H4 - 32 to 70 inches: silt loam

Properties and qualities

Slope: 12 to 20 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum content: 15 percent

Available water capacity: High (about 10.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 4e

Hydrologic Soil Group: C

Hydric soil rating: No

Description of Arkport

Setting

Landform: Deltas on lake plains

Landform position (two-dimensional): Backslope

Landform position (three-dimensional): Riser

Down-slope shape: Convex

Across-slope shape: Convex

Parent material: Glaciofluvial or deltaic deposits with a high content of fine and very fine sand

Typical profile

H1 - 0 to 8 inches: very fine sandy loam

H2 - 8 to 20 inches: loamy very fine sand

H3 - 20 to 48 inches: loamy fine sand

H4 - 48 to 60 inches: fine sand

Properties and qualities

Slope: 12 to 20 percent

Depth to restrictive feature: More than 80 inches

Custom Soil Resource Report

Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Available water capacity: Low (about 5.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: A
Ecological site: F101XY005NY - Dry Outwash
Hydric soil rating: No

Minor Components

Otisville

Percent of map unit: 4 percent
Hydric soil rating: No

Colonie

Percent of map unit: 4 percent
Hydric soil rating: No

Hudson

Percent of map unit: 4 percent
Hydric soil rating: No

Howard

Percent of map unit: 4 percent
Hydric soil rating: No

Collamer

Percent of map unit: 2 percent
Hydric soil rating: No

Galen

Percent of map unit: 2 percent
Hydric soil rating: No

EIA—Elnora loamy fine sand, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 9twc
Elevation: 250 to 620 feet
Mean annual precipitation: 31 to 37 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 145 to 190 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Elnora and similar soils: 75 percent

Minor components: 25 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Elnora

Setting

Landform: Beach ridges, deltas

Landform position (two-dimensional): Summit

Landform position (three-dimensional): Tread

Down-slope shape: Concave

Across-slope shape: Convex

Parent material: Sandy glaciofluvial, eolian, or deltaic deposits

Typical profile

H1 - 0 to 6 inches: loamy fine sand

H2 - 6 to 20 inches: loamy fine sand

H3 - 20 to 60 inches: loamy fine sand

Properties and qualities

Slope: 0 to 2 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Moderately well drained

Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)

Depth to water table: About 18 to 24 inches

Frequency of flooding: None

Frequency of ponding: None

Available water capacity: Low (about 3.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 2w

Hydrologic Soil Group: A/D

Hydric soil rating: No

Minor Components

Galen

Percent of map unit: 4 percent

Hydric soil rating: No

Colonie

Percent of map unit: 4 percent

Hydric soil rating: No

Stafford

Percent of map unit: 4 percent

Hydric soil rating: No

Minoa

Percent of map unit: 4 percent

Hydric soil rating: No

Unnamed soils

Percent of map unit: 3 percent

Hydric soil rating: No

Claverack

Percent of map unit: 3 percent
Hydric soil rating: No

Cosad

Percent of map unit: 3 percent
Hydric soil rating: No

EIB—Elnora loamy fine sand, 2 to 6 percent slopes

Map Unit Setting

National map unit symbol: 9twd
Elevation: 260 to 620 feet
Mean annual precipitation: 31 to 37 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 145 to 190 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Elnora and similar soils: 75 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Elnora

Setting

Landform: Beach ridges, deltas
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Sandy glaciofluvial, eolian, or deltaic deposits

Typical profile

H1 - 0 to 6 inches: loamy fine sand
H2 - 6 to 20 inches: loamy fine sand
H3 - 20 to 60 inches: loamy fine sand

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: About 18 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Low (about 3.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Custom Soil Resource Report

Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: A/D
Hydric soil rating: No

Minor Components

Altmar

Percent of map unit: 4 percent
Hydric soil rating: No

Fredon

Percent of map unit: 4 percent
Hydric soil rating: No

Minoa

Percent of map unit: 4 percent
Hydric soil rating: No

Stafford

Percent of map unit: 4 percent
Hydric soil rating: No

Unnamed soils

Percent of map unit: 3 percent
Hydric soil rating: No

Colonie

Percent of map unit: 3 percent
Hydric soil rating: No

Galen

Percent of map unit: 3 percent
Hydric soil rating: No

Fr—Fredon gravelly loam

Map Unit Setting

National map unit symbol: 9twh
Elevation: 250 to 1,200 feet
Mean annual precipitation: 31 to 37 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 145 to 190 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Fredon, poorly drained, and similar soils: 50 percent
Fredon, somewhat poorly drained, and similar soils: 25 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fredon, Poorly Drained

Setting

Landform: Valley trains, terraces
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Loamy over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 8 inches: gravelly loam
H2 - 8 to 22 inches: gravelly loam
H3 - 22 to 60 inches: stratified very gravelly sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high
(0.20 to 1.98 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Available water capacity: Low (about 4.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: B/D
Hydric soil rating: Yes

Description of Fredon, Somewhat Poorly Drained

Setting

Landform: Valley trains, terraces
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Loamy over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 8 inches: gravelly loam
H2 - 8 to 22 inches: gravelly loam
H3 - 22 to 60 inches: stratified very gravelly sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high
(0.20 to 1.98 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: None
Frequency of ponding: None

Custom Soil Resource Report

Calcium carbonate, maximum content: 15 percent
Available water capacity: Low (about 4.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: B/D
Hydric soil rating: No

Minor Components

Phelps

Percent of map unit: 4 percent
Hydric soil rating: No

Stafford

Percent of map unit: 4 percent
Hydric soil rating: No

Altmar

Percent of map unit: 4 percent
Hydric soil rating: No

Hilton

Percent of map unit: 4 percent
Hydric soil rating: No

Appleton

Percent of map unit: 3 percent
Hydric soil rating: No

Lamson

Percent of map unit: 3 percent
Landform: Depressions
Hydric soil rating: Yes

Unnamed soils

Percent of map unit: 3 percent
Hydric soil rating: No

GnA—Galen very fine sandy loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 9twk
Elevation: 250 to 610 feet
Mean annual precipitation: 31 to 37 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 145 to 190 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Galen and similar soils: 70 percent

Custom Soil Resource Report

Minor components: 30 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Galen

Setting

Landform: Deltas on lake plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Deltaic deposits with a high content of fine and very fine sand

Typical profile

H1 - 0 to 8 inches: very fine sandy loam
H2 - 8 to 27 inches: very fine sandy loam
H3 - 27 to 35 inches: loamy fine sand
H4 - 35 to 60 inches: stratified loamy very fine sand to silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high
(0.57 to 5.95 in/hr)
Depth to water table: About 18 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 1 percent
Available water capacity: Moderate (about 6.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: A/D
Hydric soil rating: No

Minor Components

Collamer

Percent of map unit: 4 percent
Hydric soil rating: No

Minoa

Percent of map unit: 4 percent
Hydric soil rating: No

Colonie

Percent of map unit: 4 percent
Hydric soil rating: No

Arkport

Percent of map unit: 4 percent
Hydric soil rating: No

Elnora

Percent of map unit: 4 percent
Hydric soil rating: No

Claverack

Percent of map unit: 4 percent
Hydric soil rating: No

Altmar

Percent of map unit: 3 percent
Hydric soil rating: No

Phelps

Percent of map unit: 3 percent
Hydric soil rating: No

GnB—Galen very fine sandy loam, 2 to 6 percent slopes

Map Unit Setting

National map unit symbol: 9twl
Elevation: 250 to 640 feet
Mean annual precipitation: 31 to 37 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 145 to 190 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Galen and similar soils: 70 percent
Minor components: 30 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Galen

Setting

Landform: Deltas on lake plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Deltaic deposits with a high content of fine and very fine sand

Typical profile

H1 - 0 to 8 inches: very fine sandy loam
H2 - 8 to 27 inches: very fine sandy loam
H3 - 27 to 35 inches: loamy fine sand
H4 - 35 to 60 inches: stratified loamy very fine sand to silt loam

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high
(0.57 to 5.95 in/hr)
Depth to water table: About 18 to 24 inches
Frequency of flooding: None

Custom Soil Resource Report

Frequency of ponding: None
Calcium carbonate, maximum content: 1 percent
Available water capacity: Moderate (about 6.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: A/D
Hydric soil rating: No

Minor Components

Elnora

Percent of map unit: 4 percent
Hydric soil rating: No

Colonie

Percent of map unit: 4 percent
Hydric soil rating: No

Niagara

Percent of map unit: 4 percent
Hydric soil rating: No

Claverack

Percent of map unit: 4 percent
Hydric soil rating: No

Arkport

Percent of map unit: 4 percent
Hydric soil rating: No

Minoa

Percent of map unit: 4 percent
Hydric soil rating: No

Altmar

Percent of map unit: 3 percent
Hydric soil rating: No

Collamer

Percent of map unit: 3 percent
Hydric soil rating: No

Ha—Hamlin silt loam

Map Unit Setting

National map unit symbol: 9twm
Elevation: 250 to 640 feet
Mean annual precipitation: 31 to 37 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 145 to 190 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Hamlin and similar soils: 85 percent

Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hamlin

Setting

Landform: Flood plains

Landform position (two-dimensional): Summit

Landform position (three-dimensional): Rise

Down-slope shape: Convex

Across-slope shape: Convex

Parent material: Silty alluvium mainly from areas of siltstone, shale, and limestone

Typical profile

H1 - 0 to 8 inches: silt loam

H2 - 8 to 29 inches: silt loam

H3 - 29 to 40 inches: silt loam

H4 - 40 to 60 inches: silty clay loam

Properties and qualities

Slope: 0 to 3 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained

*Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high
(0.57 to 1.98 in/hr)*

Depth to water table: About 36 to 72 inches

Frequency of flooding: OccasionalNone

Frequency of ponding: None

Calcium carbonate, maximum content: 1 percent

Available water capacity: High (about 10.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 1

Hydrologic Soil Group: B

Hydric soil rating: No

Minor Components

Unnamed soils

Percent of map unit: 5 percent

Hydric soil rating: No

Phelps

Percent of map unit: 4 percent

Hydric soil rating: No

Raynham

Percent of map unit: 3 percent

Hydric soil rating: No

Wayland

Percent of map unit: 3 percent

Landform: Flood plains

Hydric soil rating: Yes

HgB—Hilton gravelly loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2w3lb
Elevation: 260 to 1,050 feet
Mean annual precipitation: 31 to 57 inches
Mean annual air temperature: 41 to 50 degrees F
Frost-free period: 100 to 190 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Hilton and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hilton

Setting

Landform: Till plains, drumlins, ridges
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Crest
Down-slope shape: Linear
Across-slope shape: Convex, concave
Parent material: Calcareous loamy lodgment till derived from limestone, sandstone, and shale

Typical profile

Ap - 0 to 9 inches: gravelly loam
E - 9 to 17 inches: loam
Bt/E - 17 to 24 inches: gravelly loam
Bt - 24 to 36 inches: gravelly loam
C1 - 36 to 54 inches: gravelly loam
C2 - 54 to 79 inches: gravelly loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 1.42 in/hr)
Depth to water table: About 18 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 40 percent
Available water capacity: Moderate (about 7.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e

Custom Soil Resource Report

Hydrologic Soil Group: B/D
Hydric soil rating: No

Minor Components

Appleton

Percent of map unit: 5 percent
Landform: Drumlins, ridges, till plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Ontario

Percent of map unit: 5 percent
Landform: Drumlins, ridges, till plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Bombay

Percent of map unit: 3 percent
Landform: Drumlinoid ridges
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Crest, side slope
Down-slope shape: Concave
Across-slope shape: Convex
Hydric soil rating: No

Cayuga

Percent of map unit: 2 percent
Landform: Drumlinoid ridges
Landform position (two-dimensional): Shoulder, summit
Landform position (three-dimensional): Crest, side slope
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

HIA—Hilton silt loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2w3kz
Elevation: 260 to 660 feet
Mean annual precipitation: 31 to 57 inches
Mean annual air temperature: 41 to 50 degrees F
Frost-free period: 100 to 190 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Hilton and similar soils: 85 percent

Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hilton

Setting

Landform: Drumlins, ridges, till plains

Landform position (two-dimensional): Summit

Landform position (three-dimensional): Crest

Down-slope shape: Linear

Across-slope shape: Concave, convex

Parent material: Calcareous loamy lodgment till derived from limestone, sandstone, and shale

Typical profile

Ap - 0 to 9 inches: silt loam

E - 9 to 17 inches: loam

Bt/E - 17 to 24 inches: gravelly loam

Bt - 24 to 36 inches: gravelly loam

C1 - 36 to 54 inches: gravelly loam

C2 - 54 to 79 inches: gravelly loam

Properties and qualities

Slope: 0 to 3 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Moderately well drained

Runoff class: Low

Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 1.42 in/hr)

Depth to water table: About 18 to 24 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum content: 40 percent

Available water capacity: Moderate (about 7.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 2w

Hydrologic Soil Group: B/D

Hydric soil rating: No

Minor Components

Ontario

Percent of map unit: 5 percent

Landform: Till plains, drumlins, ridges

Landform position (two-dimensional): Summit

Landform position (three-dimensional): Crest

Down-slope shape: Convex

Across-slope shape: Convex

Hydric soil rating: No

Appleton

Percent of map unit: 5 percent

Custom Soil Resource Report

Landform: Drumlins, ridges, till plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Bombay

Percent of map unit: 3 percent
Landform: Drumlinoid ridges
Landform position (two-dimensional): Shoulder, backslope, summit
Landform position (three-dimensional): Crest, side slope
Down-slope shape: Concave
Across-slope shape: Convex
Hydric soil rating: No

Cayuga

Percent of map unit: 2 percent
Landform: Drumlinoid ridges
Landform position (two-dimensional): Shoulder, summit
Landform position (three-dimensional): Crest, side slope
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

HIB—Hilton silt loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2w3l9
Elevation: 260 to 1,640 feet
Mean annual precipitation: 31 to 57 inches
Mean annual air temperature: 41 to 50 degrees F
Frost-free period: 100 to 190 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Hilton and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hilton

Setting

Landform: Drumlins, ridges, till plains
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Crest
Down-slope shape: Linear
Across-slope shape: Concave, convex
Parent material: Calcareous loamy lodgment till derived from limestone, sandstone, and shale

Custom Soil Resource Report

Typical profile

Ap - 0 to 9 inches: silt loam
E - 9 to 17 inches: loam
Bt/E - 17 to 24 inches: gravelly loam
Bt - 24 to 36 inches: gravelly loam
C1 - 36 to 54 inches: gravelly loam
C2 - 54 to 79 inches: gravelly loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 1.42 in/hr)
Depth to water table: About 18 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 40 percent
Available water capacity: Moderate (about 7.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B/D
Hydric soil rating: No

Minor Components

Ontario

Percent of map unit: 5 percent
Landform: Drumlins, ridges, till plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Appleton

Percent of map unit: 5 percent
Landform: Drumlins, ridges, till plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Bombay

Percent of map unit: 3 percent
Landform: Drumlinoid ridges
Landform position (two-dimensional): Shoulder, backslope, summit
Landform position (three-dimensional): Crest, side slope
Down-slope shape: Concave
Across-slope shape: Convex
Hydric soil rating: No

Cayuga

Percent of map unit: 2 percent
Landform: Drumlinoid ridges
Landform position (two-dimensional): Shoulder, summit
Landform position (three-dimensional): Crest, side slope
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

HsB—Hudson silt loam, 2 to 6 percent slopes

Map Unit Setting

National map unit symbol: 9twy
Elevation: 300 to 1,800 feet
Mean annual precipitation: 31 to 37 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 145 to 190 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Hudson and similar soils: 70 percent
Minor components: 30 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hudson

Setting

Landform: Lake plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Clayey and silty glaciolacustrine deposits

Typical profile

H1 - 0 to 12 inches: silt loam
H2 - 12 to 20 inches: silty clay loam
H3 - 20 to 30 inches: silty clay
H4 - 30 to 60 inches: silt loam

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 18 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent

Custom Soil Resource Report

Available water capacity: High (about 9.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 2e

Hydrologic Soil Group: C/D

Hydric soil rating: No

Minor Components

Ovid

Percent of map unit: 4 percent

Hydric soil rating: No

Dunkirk

Percent of map unit: 4 percent

Hydric soil rating: No

Rhinebeck

Percent of map unit: 4 percent

Hydric soil rating: No

Collamer

Percent of map unit: 4 percent

Hydric soil rating: No

Niagara

Percent of map unit: 4 percent

Hydric soil rating: No

Cayuga

Percent of map unit: 3 percent

Hydric soil rating: No

Churchville

Percent of map unit: 3 percent

Hydric soil rating: No

Claverack

Percent of map unit: 2 percent

Hydric soil rating: No

Cazenovia

Percent of map unit: 2 percent

Hydric soil rating: No

Ma—Madalin silt loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2spk0

Elevation: 230 to 930 feet

Mean annual precipitation: 31 to 57 inches

Mean annual air temperature: 41 to 50 degrees F

Frost-free period: 100 to 190 days

Custom Soil Resource Report

Farmland classification: Farmland of statewide importance

Map Unit Composition

Madalin and similar soils: 85 percent

Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Madalin

Setting

Landform: Depressions

Landform position (two-dimensional): Toeslope

Landform position (three-dimensional): Tread

Down-slope shape: Concave

Across-slope shape: Concave

Parent material: Brown clayey glaciolacustrine deposits derived from calcareous shale

Typical profile

Ap - 0 to 8 inches: silt loam

Btg1 - 8 to 16 inches: silty clay loam

Btg2 - 16 to 25 inches: silty clay

Btg3 - 25 to 33 inches: silty clay

C - 33 to 79 inches: stratified silt to clay

Properties and qualities

Slope: 0 to 3 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Poorly drained

Runoff class: Very low

Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)

Depth to water table: About 0 to 8 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum content: 25 percent

Available water capacity: High (about 9.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 4w

Hydrologic Soil Group: C/D

Ecological site: F101XY010NY - Wet Lake Plain Depression

Hydric soil rating: Yes

Minor Components

Rhinebeck

Percent of map unit: 5 percent

Landform: Lake plains

Landform position (two-dimensional): Footslope

Landform position (three-dimensional): Tread

Down-slope shape: Concave

Across-slope shape: Linear

Hydric soil rating: No

Custom Soil Resource Report

Canandaigua

Percent of map unit: 4 percent
Landform: Depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Fonda

Percent of map unit: 4 percent
Landform: Depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Cosad

Percent of map unit: 2 percent
Landform: Lake plains
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Md—Madalin silt loam, loamy subsoil variant

Map Unit Setting

National map unit symbol: 9tx8
Elevation: 260 to 640 feet
Mean annual precipitation: 31 to 37 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 145 to 190 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Madalin variant, loamy substratum, and similar soils: 75 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Madalin Variant, Loamy Substratum

Setting

Landform: Depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Concave

Custom Soil Resource Report

Parent material: Clayey and silty glaciolacustrine deposits

Typical profile

H1 - 0 to 8 inches: silt loam
H2 - 8 to 26 inches: silty clay
H3 - 26 to 60 inches: silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 15 percent
Available water capacity: Moderate (about 8.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: C/D
Ecological site: F101XY010NY - Wet Lake Plain Depression
Hydric soil rating: Yes

Minor Components

Churchville

Percent of map unit: 5 percent
Hydric soil rating: No

Sun

Percent of map unit: 4 percent
Landform: Depressions
Hydric soil rating: Yes

Ovid

Percent of map unit: 4 percent
Hydric soil rating: No

Odessa

Percent of map unit: 4 percent
Hydric soil rating: No

Rhinebeck

Percent of map unit: 3 percent
Hydric soil rating: No

Lakemont

Percent of map unit: 3 percent
Landform: Depressions
Hydric soil rating: Yes

Unnamed soils

Percent of map unit: 2 percent
Hydric soil rating: No

Mn—Minoa very fine sandy loam

Map Unit Setting

National map unit symbol: 9txc
Elevation: 250 to 800 feet
Mean annual precipitation: 31 to 37 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 145 to 190 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Minoa and similar soils: 70 percent
Minor components: 30 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Minoa

Setting

Landform: Deltas on lake plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Deltaic or glaciolacustrine deposits with a high content of fine and very fine sand

Typical profile

H1 - 0 to 8 inches: very fine sandy loam
H2 - 8 to 20 inches: very fine sandy loam
H3 - 20 to 30 inches: loamy very fine sand
H4 - 30 to 60 inches: stratified very fine sand to silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Available water capacity: High (about 9.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: B/D
Ecological site: F101XY006NY - Moist Outwash
Hydric soil rating: No

Minor Components

Cosad

Percent of map unit: 4 percent
Hydric soil rating: No

Niagara

Percent of map unit: 4 percent
Hydric soil rating: No

Massena

Percent of map unit: 4 percent
Hydric soil rating: Yes

Elnora

Percent of map unit: 4 percent
Hydric soil rating: No

Galen

Percent of map unit: 4 percent
Hydric soil rating: No

Lamson

Percent of map unit: 4 percent
Landform: Depressions
Hydric soil rating: Yes

Canandaigua

Percent of map unit: 3 percent
Landform: Depressions
Hydric soil rating: Yes

Stafford

Percent of map unit: 3 percent
Hydric soil rating: No

NaA—Niagara silt loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 9txf
Elevation: 250 to 660 feet
Mean annual precipitation: 31 to 37 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 145 to 190 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Niagara and similar soils: 70 percent
Minor components: 30 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Niagara

Setting

Landform: Lake plains
Landform position (two-dimensional): Foothlope
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Silty and clayey glaciolacustrine deposits

Typical profile

H1 - 0 to 13 inches: silt loam
H2 - 13 to 30 inches: silt loam
H3 - 30 to 60 inches: silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Available water capacity: High (about 10.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D
Ecological site: F101XY009NY - Moist Lake Plain
Hydric soil rating: No

Minor Components

Collamer

Percent of map unit: 4 percent
Hydric soil rating: No

Galen

Percent of map unit: 4 percent
Hydric soil rating: No

Canandaigua

Percent of map unit: 4 percent
Landform: Depressions
Hydric soil rating: Yes

Rhinebeck

Percent of map unit: 4 percent
Hydric soil rating: No

Minoa

Percent of map unit: 4 percent
Hydric soil rating: No

Odessa

Percent of map unit: 4 percent
Hydric soil rating: No

Hilton

Percent of map unit: 3 percent
Hydric soil rating: No

Appleton

Percent of map unit: 3 percent
Hydric soil rating: No

NaB—Niagara silt loam, 2 to 6 percent slopes

Map Unit Setting

National map unit symbol: 9txg
Elevation: 250 to 510 feet
Mean annual precipitation: 31 to 37 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 145 to 190 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Niagara and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Niagara

Setting

Landform: Lake plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Silty and clayey glaciolacustrine deposits

Typical profile

H1 - 0 to 13 inches: silt loam
H2 - 13 to 30 inches: silt loam
H3 - 30 to 60 inches: silt loam

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: None
Frequency of ponding: None

Custom Soil Resource Report

Calcium carbonate, maximum content: 15 percent
Available water capacity: High (about 10.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D
Ecological site: F101XY009NY - Moist Lake Plain
Hydric soil rating: No

Minor Components

Canandaigua

Percent of map unit: 4 percent
Landform: Depressions
Hydric soil rating: Yes

Claverack

Percent of map unit: 4 percent
Hydric soil rating: No

Collamer

Percent of map unit: 4 percent
Hydric soil rating: No

Hilton

Percent of map unit: 4 percent
Hydric soil rating: No

Galen

Percent of map unit: 4 percent
Hydric soil rating: No

OnD3—Ontario loam, 15 to 30 percent slopes

Map Unit Setting

National map unit symbol: 2w3q5
Elevation: 250 to 1,310 feet
Mean annual precipitation: 31 to 57 inches
Mean annual air temperature: 41 to 50 degrees F
Frost-free period: 100 to 190 days
Farmland classification: Not prime farmland

Map Unit Composition

Ontario and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ontario

Setting

Landform: Ridges, till plains, drumlins

Custom Soil Resource Report

Landform position (two-dimensional): Backslope, summit
Landform position (three-dimensional): Side slope, crest
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Calcareous loamy lodgment till derived from limestone, sandstone, and shale

Typical profile

Ap - 0 to 8 inches: loam
E - 8 to 14 inches: loam
Bt/E - 14 to 21 inches: loam
Bt - 21 to 39 inches: gravelly loam
C1 - 39 to 48 inches: gravelly loam
C2 - 48 to 79 inches: gravelly loam

Properties and qualities

Slope: 15 to 30 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 1.42 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 40 percent
Available water capacity: Moderate (about 7.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Ecological site: F101XY012NY - Till Upland
Hydric soil rating: No

Minor Components

Cazenovia

Percent of map unit: 5 percent
Landform: Till plains, reworked lake plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Concave
Across-slope shape: Convex
Hydric soil rating: No

Honeoye

Percent of map unit: 5 percent
Landform: Till plains, drumlins, ridges
Landform position (two-dimensional): Backslope, shoulder, summit
Landform position (three-dimensional): Side slope, crest
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Hilton

Percent of map unit: 3 percent

Custom Soil Resource Report

Landform: Till plains, drumlins, ridges
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Linear
Across-slope shape: Convex, concave
Hydric soil rating: No

Appleton

Percent of map unit: 2 percent
Landform: Drumlins, ridges, till plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

OvA—Ovid silt loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 9txt
Elevation: 250 to 1,000 feet
Mean annual precipitation: 31 to 37 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 145 to 190 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Ovid and similar soils: 75 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ovid

Setting

Landform: Reworked lake plains, till plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Loamy till with a significant component of reddish shale or reddish glaciolacustrine clays, mixed with limestone and some sandstone

Typical profile

H1 - 0 to 11 inches: silt loam
H2 - 11 to 24 inches: silty clay loam
H3 - 24 to 60 inches: loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained

Custom Soil Resource Report

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)

Depth to water table: About 6 to 18 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum content: 15 percent

Available water capacity: Moderate (about 8.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 3w

Hydrologic Soil Group: C/D

Ecological site: F101XY013NY - Moist Till

Hydric soil rating: No

Minor Components

Appleton

Percent of map unit: 5 percent

Hydric soil rating: No

Cayuga

Percent of map unit: 4 percent

Hydric soil rating: No

Cazenovia

Percent of map unit: 4 percent

Hydric soil rating: No

Churchville

Percent of map unit: 4 percent

Hydric soil rating: No

Sun

Percent of map unit: 4 percent

Landform: Depressions

Hydric soil rating: Yes

Unnamed soils

Percent of map unit: 4 percent

Hydric soil rating: No

OvB—Ovid silt loam, 2 to 6 percent slopes

Map Unit Setting

National map unit symbol: 9txv

Elevation: 250 to 1,000 feet

Mean annual precipitation: 31 to 37 inches

Mean annual air temperature: 46 to 50 degrees F

Frost-free period: 145 to 190 days

Farmland classification: Prime farmland if drained

Map Unit Composition

Ovid and similar soils: 75 percent

Minor components: 25 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ovid

Setting

Landform: Reworked lake plains, till plains

Landform position (two-dimensional): Footslope

Landform position (three-dimensional): Base slope

Down-slope shape: Concave

Across-slope shape: Linear

Parent material: Loamy till with a significant component of reddish shale or reddish glaciolacustrine clays, mixed with limestone and some sandstone

Typical profile

H1 - 0 to 11 inches: silt loam

H2 - 11 to 24 inches: silty clay loam

H3 - 24 to 60 inches: loam

Properties and qualities

Slope: 2 to 6 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Somewhat poorly drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)

Depth to water table: About 6 to 18 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum content: 15 percent

Available water capacity: Moderate (about 8.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 3w

Hydrologic Soil Group: C/D

Ecological site: F101XY013NY - Moist Till

Hydric soil rating: No

Minor Components

Cazenovia

Percent of map unit: 5 percent

Hydric soil rating: No

Churchville

Percent of map unit: 5 percent

Hydric soil rating: No

Cayuga

Percent of map unit: 5 percent

Hydric soil rating: No

Hilton

Percent of map unit: 3 percent

Hydric soil rating: No

Appleton

Percent of map unit: 3 percent
Hydric soil rating: No

Madalin

Percent of map unit: 2 percent
Landform: Depressions
Hydric soil rating: Yes

Unnamed soils

Percent of map unit: 2 percent
Hydric soil rating: No

RbA—Rhinebeck silt loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 9ty1
Elevation: 80 to 1,000 feet
Mean annual precipitation: 31 to 37 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 145 to 190 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Rhinebeck and similar soils: 70 percent
Minor components: 30 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Rhinebeck

Setting

Landform: Lake plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Clayey and silty glaciolacustrine deposits

Typical profile

H1 - 0 to 10 inches: silt loam
H2 - 10 to 23 inches: silty clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: None
Frequency of ponding: None

Custom Soil Resource Report

Calcium carbonate, maximum content: 15 percent
Available water capacity: Low (about 3.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D
Hydric soil rating: No

Minor Components

Madalin

Percent of map unit: 4 percent
Landform: Depressions
Hydric soil rating: Yes

Collamer

Percent of map unit: 4 percent
Hydric soil rating: No

Canandaigua

Percent of map unit: 4 percent
Landform: Depressions
Hydric soil rating: Yes

Hudson

Percent of map unit: 4 percent
Hydric soil rating: No

Niagara

Percent of map unit: 4 percent
Hydric soil rating: No

Cayuga

Percent of map unit: 4 percent
Hydric soil rating: No

Churchville

Percent of map unit: 3 percent
Hydric soil rating: No

Ovid

Percent of map unit: 3 percent
Hydric soil rating: No

RbB—Rhinebeck silt loam, 2 to 6 percent slopes

Map Unit Setting

National map unit symbol: 9ty2
Elevation: 80 to 1,000 feet
Mean annual precipitation: 31 to 37 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 145 to 190 days

Custom Soil Resource Report

Farmland classification: Prime farmland if drained

Map Unit Composition

Rhinebeck and similar soils: 70 percent

Minor components: 30 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Rhinebeck

Setting

Landform: Lake plains

Landform position (two-dimensional): Footslope

Landform position (three-dimensional): Tread

Down-slope shape: Concave

Across-slope shape: Linear

Parent material: Clayey and silty glaciolacustrine deposits

Typical profile

H1 - 0 to 10 inches: silt loam

H2 - 10 to 23 inches: silty clay loam

Properties and qualities

Slope: 2 to 6 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Somewhat poorly drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)

Depth to water table: About 6 to 18 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum content: 15 percent

Available water capacity: Low (about 3.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 3w

Hydrologic Soil Group: C/D

Hydric soil rating: No

Minor Components

Canandaigua

Percent of map unit: 4 percent

Landform: Depressions

Hydric soil rating: Yes

Churchville

Percent of map unit: 4 percent

Hydric soil rating: No

Collamer

Percent of map unit: 4 percent

Hydric soil rating: No

Hudson

Percent of map unit: 4 percent

Hydric soil rating: No

Custom Soil Resource Report

Madalin

Percent of map unit: 4 percent
Landform: Depressions
Hydric soil rating: Yes

Cayuga

Percent of map unit: 3 percent
Hydric soil rating: No

Niagara

Percent of map unit: 3 percent
Hydric soil rating: No

Cazenovia

Percent of map unit: 2 percent
Hydric soil rating: No

Ovid

Percent of map unit: 2 percent
Hydric soil rating: No

W—Water

Map Unit Setting

National map unit symbol: 9tyg
Mean annual precipitation: 31 to 37 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 145 to 190 days
Farmland classification: Not prime farmland

Map Unit Composition

Water: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Wa—Wayland soils complex, 0 to 3 percent slopes, frequently flooded

Map Unit Setting

National map unit symbol: 2srgv
Elevation: 160 to 1,970 feet
Mean annual precipitation: 31 to 68 inches
Mean annual air temperature: 43 to 52 degrees F
Frost-free period: 105 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Wayland and similar soils: 60 percent
Wayland, very poorly drained, and similar soils: 30 percent
Minor components: 10 percent

Custom Soil Resource Report

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wayland

Setting

Landform: Flood plains

Landform position (three-dimensional): Tread

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Silty and clayey alluvium derived from interbedded sedimentary rock

Typical profile

A - 0 to 6 inches: silt loam

Bg1 - 6 to 12 inches: silt loam

Bg2 - 12 to 18 inches: silt loam

C1 - 18 to 46 inches: silt loam

C2 - 46 to 72 inches: silty clay loam

Properties and qualities

Slope: 0 to 3 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Poorly drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 14.17 in/hr)

Depth to water table: About 0 to 6 inches

Frequency of flooding: FrequentNone

Frequency of ponding: None

Calcium carbonate, maximum content: 15 percent

Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)

Available water capacity: Very high (about 12.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 5w

Hydrologic Soil Group: B/D

Ecological site: F139XY009OH - Wet Floodplain

Hydric soil rating: Yes

Description of Wayland, Very Poorly Drained

Setting

Landform: Flood plains

Landform position (three-dimensional): Tread

Down-slope shape: Concave

Across-slope shape: Concave

Parent material: Silty and clayey alluvium derived from interbedded sedimentary rock

Typical profile

A - 0 to 6 inches: mucky silt loam

Bg1 - 6 to 12 inches: silt loam

Bg2 - 12 to 18 inches: silt loam

C1 - 18 to 46 inches: silt loam

C2 - 46 to 72 inches: silty clay loam

Properties and qualities

Slope: 0 to 3 percent

Custom Soil Resource Report

Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high
(0.14 to 14.17 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: FrequentNone
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 15 percent
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water capacity: Very high (about 12.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: B/D
Ecological site: F139XY009OH - Wet Floodplain
Hydric soil rating: Yes

Minor Components

Wakeville

Percent of map unit: 10 percent
Landform: Flood plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Talf
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Soil Information for All Uses

Suitabilities and Limitations for Use

The Suitabilities and Limitations for Use section includes various soil interpretations displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual map unit components. This aggregation process is defined for each interpretation.

Building Site Development

Building site development interpretations are designed to be used as tools for evaluating soil suitability and identifying soil limitations for various construction purposes. As part of the interpretation process, the rating applies to each soil in its described condition and does not consider present land use. Example interpretations can include corrosion of concrete and steel, shallow excavations, dwellings with and without basements, small commercial buildings, local roads and streets, and lawns and landscaping.

Corrosion of Concrete (Somerset Solar)

"Risk of corrosion" pertains to potential soil-induced electrochemical or chemical action that corrodes or weakens concrete. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors results in a severe hazard of corrosion. The concrete in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than the concrete in installations that are entirely within one kind of soil or within one soil layer.

The risk of corrosion is expressed as "low," "moderate," or "high."

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Background



Aerial Photography

Soils

Soil Rating Polygons



High



Moderate



Low



Not rated or not available

Soil Rating Lines



High



Moderate



Low



Not rated or not available

Soil Rating Points



High



Moderate



Low



Not rated or not available

Water Features



Streams and Canals

Transportation



Rails



Interstate Highways



US Routes



Major Roads



Local Roads

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service

Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Niagara County Area, New York

Survey Area Data: Version 19, Jun 11, 2020

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Dec 31, 2009—Oct 18, 2016

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Custom Soil Resource Report

Table—Corrosion of Concrete (Somerset Solar)

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
ApA	Appleton silt loam, 0 to 3 percent slopes	Low	17.8	1.0%
ArB	Arkport very fine sandy loam, 0 to 6 percent slopes	Moderate	22.4	1.3%
ArC	Arkport very fine sandy loam, 6 to 12 percent slopes	Moderate	10.1	0.6%
Ca	Canandaigua silt loam	Low	2.0	0.1%
CcB	Cayuga and Cazenovia silt loams, 2 to 6 percent slopes	Low	5.2	0.3%
CmA	Claverack loamy fine sand, 0 to 2 percent slopes	Low	41.0	2.3%
CmB	Claverack loamy fine sand, 2 to 6 percent slopes	Low	32.3	1.8%
CnA	Collamer silt loam, 0 to 2 percent slopes	Low	129.3	7.2%
CnB	Collamer silt loam, 2 to 6 percent slopes	Low	491.0	27.5%
CoB	Colonie loamy fine sand, 0 to 6 percent slopes	Moderate	6.1	0.3%
Cs	Cosad fine sandy loam	Moderate	10.2	0.6%
DuB	Dunkirk silt loam, 2 to 6 percent slopes	Low	20.5	1.1%
DuC3	Dunkirk silt loam, 6 to 12 percent slopes, eroded	Low	34.1	1.9%
DvD3	Dunkirk and Arkport soils, 12 to 20 percent slopes, eroded	Low	3.5	0.2%
EIA	Elnora loamy fine sand, 0 to 2 percent slopes	High	1.9	0.1%
EIB	Elnora loamy fine sand, 2 to 6 percent slopes	High	6.0	0.3%
Fr	Fredon gravelly loam	Moderate	2.6	0.1%
GnA	Galen very fine sandy loam, 0 to 2 percent slopes	Moderate	7.6	0.4%
GnB	Galen very fine sandy loam, 2 to 6 percent slopes	Moderate	5.6	0.3%
Ha	Hamlin silt loam	Low	26.4	1.5%
HgB	Hilton gravelly loam, 3 to 8 percent slopes	Moderate	14.6	0.8%

Custom Soil Resource Report

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
HIA	Hilton silt loam, 0 to 3 percent slopes	Moderate	26.9	1.5%
HIB	Hilton silt loam, 3 to 8 percent slopes	Moderate	79.1	4.4%
HsB	Hudson silt loam, 2 to 6 percent slopes	Low	32.9	1.8%
Ma	Madalin silt loam, 0 to 3 percent slopes	Low	12.7	0.7%
Md	Madalin silt loam, loamy subsoil variant	Low	11.5	0.6%
Mn	Minoa very fine sandy loam	Moderate	9.0	0.5%
NaA	Niagara silt loam, 0 to 2 percent slopes	Low	374.8	21.0%
NaB	Niagara silt loam, 2 to 6 percent slopes	Low	32.9	1.8%
OnD3	Ontario loam, 15 to 30 percent slopes	Moderate	7.6	0.4%
OvA	Ovid silt loam, 0 to 2 percent slopes	Low	13.5	0.8%
OvB	Ovid silt loam, 2 to 6 percent slopes	Low	4.3	0.2%
RbA	Rhinebeck silt loam, 0 to 2 percent slopes	Low	224.4	12.5%
RbB	Rhinebeck silt loam, 2 to 6 percent slopes	Low	28.5	1.6%
W	Water		14.5	0.8%
Wa	Wayland soils complex, 0 to 3 percent slopes, frequently flooded	Low	20.3	1.1%
Totals for Area of Interest			1,788.4	100.0%

Rating Options—Corrosion of Concrete (Somerset Solar)

Aggregation Method: Dominant Condition
Component Percent Cutoff: None Specified
Tie-break Rule: Higher

Corrosion of Steel (Somerset Solar)

"Risk of corrosion" pertains to potential soil-induced electrochemical or chemical action that corrodes or weakens uncoated steel. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. Special site examination and design may be needed if the combination of factors results in a severe hazard of corrosion. The steel in installations that intersect soil boundaries or soil layers is more susceptible

Custom Soil Resource Report

to corrosion than the steel in installations that are entirely within one kind of soil or within one soil layer.

The risk of corrosion is expressed as "low," "moderate," or "high."

Custom Soil Resource Report

Map—Corrosion of Steel (Somerset Solar)



Map Scale: 1:27,800 if printed on A portrait (8.5" x 11") sheet.



Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 17N WGS84

MAP LEGEND

- Area of Interest (AOI)**
 -  Area of Interest (AOI)
- Background**
 -  Aerial Photography
- Soils**
 - Soil Rating Polygons**
 -  High
 -  Moderate
 -  Low
 -  Not rated or not available
 - Soil Rating Lines**
 -  High
 -  Moderate
 -  Low
 -  Not rated or not available
 - Soil Rating Points**
 -  High
 -  Moderate
 -  Low
 -  Not rated or not available
- Water Features**
 -  Streams and Canals
- Transportation**
 -  Rails
 -  Interstate Highways
 -  US Routes
 -  Major Roads
 -  Local Roads

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

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Source of Map: Natural Resources Conservation Service
 Web Soil Survey URL:
 Coordinate System: Web Mercator (EPSG:3857)

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 Survey Area Data: Version 19, Jun 11, 2020

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Custom Soil Resource Report

Table—Corrosion of Steel (Somerset Solar)

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
ApA	Appleton silt loam, 0 to 3 percent slopes	High	17.8	1.0%
ArB	Arkport very fine sandy loam, 0 to 6 percent slopes	Low	22.4	1.3%
ArC	Arkport very fine sandy loam, 6 to 12 percent slopes	Low	10.1	0.6%
Ca	Canandaigua silt loam	High	2.0	0.1%
CcB	Cayuga and Cazenovia silt loams, 2 to 6 percent slopes	High	5.2	0.3%
CmA	Claverack loamy fine sand, 0 to 2 percent slopes	High	41.0	2.3%
CmB	Claverack loamy fine sand, 2 to 6 percent slopes	High	32.3	1.8%
CnA	Collamer silt loam, 0 to 2 percent slopes	High	129.3	7.2%
CnB	Collamer silt loam, 2 to 6 percent slopes	High	491.0	27.5%
CoB	Colonie loamy fine sand, 0 to 6 percent slopes	Low	6.1	0.3%
Cs	Cosad fine sandy loam	High	10.2	0.6%
DuB	Dunkirk silt loam, 2 to 6 percent slopes	Low	20.5	1.1%
DuC3	Dunkirk silt loam, 6 to 12 percent slopes, eroded	Low	34.1	1.9%
DvD3	Dunkirk and Arkport soils, 12 to 20 percent slopes, eroded	Low	3.5	0.2%
EIA	Elnora loamy fine sand, 0 to 2 percent slopes	High	1.9	0.1%
EIB	Elnora loamy fine sand, 2 to 6 percent slopes	High	6.0	0.3%
Fr	Fredon gravelly loam	High	2.6	0.1%
GnA	Galen very fine sandy loam, 0 to 2 percent slopes	High	7.6	0.4%
GnB	Galen very fine sandy loam, 2 to 6 percent slopes	High	5.6	0.3%
Ha	Hamlin silt loam	High	26.4	1.5%
HgB	Hilton gravelly loam, 3 to 8 percent slopes	High	14.6	0.8%

Custom Soil Resource Report

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
HIA	Hilton silt loam, 0 to 3 percent slopes	High	26.9	1.5%
HIB	Hilton silt loam, 3 to 8 percent slopes	High	79.1	4.4%
HsB	Hudson silt loam, 2 to 6 percent slopes	High	32.9	1.8%
Ma	Madalin silt loam, 0 to 3 percent slopes	Moderate	12.7	0.7%
Md	Madalin silt loam, loamy subsoil variant	High	11.5	0.6%
Mn	Minoa very fine sandy loam	High	9.0	0.5%
NaA	Niagara silt loam, 0 to 2 percent slopes	High	374.8	21.0%
NaB	Niagara silt loam, 2 to 6 percent slopes	High	32.9	1.8%
OnD3	Ontario loam, 15 to 30 percent slopes	Low	7.6	0.4%
OvA	Ovid silt loam, 0 to 2 percent slopes	High	13.5	0.8%
OvB	Ovid silt loam, 2 to 6 percent slopes	High	4.3	0.2%
RbA	Rhinebeck silt loam, 0 to 2 percent slopes	High	224.4	12.5%
RbB	Rhinebeck silt loam, 2 to 6 percent slopes	High	28.5	1.6%
W	Water		14.5	0.8%
Wa	Wayland soils complex, 0 to 3 percent slopes, frequently flooded	Moderate	20.3	1.1%
Totals for Area of Interest			1,788.4	100.0%

Rating Options—Corrosion of Steel (Somerset Solar)

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Land Management

Land management interpretations are tools designed to guide the user in evaluating existing conditions in planning and predicting the soil response to various land management practices, for a variety of land uses, including cropland, forestland, hayland, pastureland, horticulture, and rangeland. Example interpretations include suitability for a variety of irrigation practices, log landings, haul roads and major skid trails, equipment operability, site preparation, suitability for hand and mechanical

planting, potential erosion hazard associated with various practices, and ratings for fencing and waterline installation.

Erosion Hazard (Off-Road, Off-Trail) (Somerset Solar)

The ratings in this interpretation indicate the hazard of soil loss from off-road and off-trail areas after disturbance activities that expose the soil surface. The ratings are based on slope, soil erosion factor K, and an index of rainfall erosivity (R). The soil loss is caused by sheet or rill erosion in off-road or off-trail areas where 50 to 75 percent of the surface has been exposed by logging, grazing, mining, or other kinds of disturbance.

The ratings are both verbal and numerical. The hazard is described as "slight," "moderate," "severe," or "very severe." A rating of "slight" indicates that erosion is unlikely under ordinary climatic conditions; "moderate" indicates that some erosion is likely and that erosion-control measures may be needed; "severe" indicates that erosion is very likely and that erosion-control measures, including revegetation of bare areas, are advised; and "very severe" indicates that significant erosion is expected, loss of soil productivity and off-site damage are likely, and erosion-control measures are costly and generally impractical.

Numerical ratings indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the specified aspect of forestland management (1.00) and the point at which the soil feature is not a limitation (0.00).

The map unit components listed for each map unit in the accompanying Summary by Map Unit table in Web Soil Survey or the Aggregation Report in Soil Data Viewer are determined by the aggregation method chosen. An aggregated rating class is shown for each map unit. The components listed for each map unit are only those that have the same rating class as listed for the map unit. The percent composition of each component in a particular map unit is presented to help the user better understand the percentage of each map unit that has the rating presented.

Other components with different ratings may be present in each map unit. The ratings for all components, regardless of the map unit aggregated rating, can be viewed by generating the equivalent report from the Soil Reports tab in Web Soil Survey or from the Soil Data Mart site. Onsite investigation may be needed to validate these interpretations and to confirm the identity of the soil on a given site.

MAP LEGEND

- Area of Interest (AOI)**
 -  Area of Interest (AOI)
- Soils**
 - Soil Rating Polygons**
 -  Very severe
 -  Severe
 -  Moderate
 -  Slight
 -  Not rated or not available
 - Soil Rating Lines**
 -  Very severe
 -  Severe
 -  Moderate
 -  Slight
 -  Not rated or not available
 - Soil Rating Points**
 -  Very severe
 -  Severe
 -  Moderate
 -  Slight
 -  Not rated or not available
- Water Features**
 -  Streams and Canals
- Transportation**
 -  Rails
 -  Interstate Highways
-  US Routes
-  Major Roads
-  Local Roads
- Background**
 -  Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
 Web Soil Survey URL:
 Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Niagara County Area, New York
 Survey Area Data: Version 19, Jun 11, 2020

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Dec 31, 2009—Oct 18, 2016

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Custom Soil Resource Report

Tables—Erosion Hazard (Off-Road, Off-Trail) (Somerset Solar)

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
ApA	Appleton silt loam, 0 to 3 percent slopes	Slight	Appleton (85%)		17.8	1.0%
			Lima (5%)			
			Lyons (4%)			
			Churchville (3%)			
			Darien (3%)			
ArB	Arkport very fine sandy loam, 0 to 6 percent slopes	Slight	Arkport (80%)		22.4	1.3%
ArC	Arkport very fine sandy loam, 6 to 12 percent slopes	Moderate	Arkport (80%)	Surface kw times slope times R index (0.75)	10.1	0.6%
Ca	Canandaigua silt loam	Slight	Canandaigua (75%)		2.0	0.1%
CcB	Cayuga and Cazenovia silt loams, 2 to 6 percent slopes	Moderate	Cayuga (40%)	Surface kw times slope times R index (0.32)	5.2	0.3%
CmA	Claverack loamy fine sand, 0 to 2 percent slopes	Slight	Claverack (80%)		41.0	2.3%
CmB	Claverack loamy fine sand, 2 to 6 percent slopes	Slight	Claverack (80%)		32.3	1.8%
CnA	Collamer silt loam, 0 to 2 percent slopes	Slight	Collamer (75%)		129.3	7.2%
CnB	Collamer silt loam, 2 to 6 percent slopes	Moderate	Collamer (75%)	Surface kw times slope times R index (0.32)	491.0	27.5%
CoB	Colonie loamy fine sand, 0 to 6 percent slopes	Slight	Colonie (80%)		6.1	0.3%
Cs	Cosad fine sandy loam	Slight	Cosad (70%)		10.2	0.6%
DuB	Dunkirk silt loam, 2 to 6 percent slopes	Moderate	Dunkirk (80%)	Surface kw times slope times R index (0.32)	20.5	1.1%
DuC3	Dunkirk silt loam, 6 to 12 percent slopes, eroded	Severe	Dunkirk, eroded (80%)	Surface kw times slope times R index (0.82)	34.1	1.9%

Custom Soil Resource Report

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
DvD3	Dunkirk and Arkport soils, 12 to 20 percent slopes, eroded	Severe	Dunkirk, eroded (41%)	Surface kw times slope times R index (0.94)	3.5	0.2%
			Arkport (39%)	Surface kw times slope times R index (0.88)		
EIA	Elnora loamy fine sand, 0 to 2 percent slopes	Slight	Elnora (75%)		1.9	0.1%
EIB	Elnora loamy fine sand, 2 to 6 percent slopes	Slight	Elnora (75%)		6.0	0.3%
Fr	Fredon gravelly loam	Slight	Fredon, poorly drained (50%)		2.6	0.1%
			Fredon, somewhat poorly drained (25%)			
GnA	Galen very fine sandy loam, 0 to 2 percent slopes	Slight	Galen (70%)		7.6	0.4%
GnB	Galen very fine sandy loam, 2 to 6 percent slopes	Slight	Galen (70%)		5.6	0.3%
Ha	Hamlin silt loam	Slight	Hamlin (85%)		26.4	1.5%
HgB	Hilton gravelly loam, 3 to 8 percent slopes	Slight	Hilton (85%)		14.6	0.8%
			Bombay (3%)			
HIA	Hilton silt loam, 0 to 3 percent slopes	Slight	Hilton (85%)		26.9	1.5%
			Ontario (5%)			
			Appleton (5%)			
			Bombay (3%)			
			Cayuga (2%)			
HIB	Hilton silt loam, 3 to 8 percent slopes	Moderate	Hilton (85%)	Surface kw times slope times R index (0.14)	79.1	4.4%
			Appleton (5%)	Surface kw times slope times R index (0.04)		
			Ontario (5%)	Surface kw times slope times R index (0.04)		
			Cayuga (2%)	Surface kw times slope times R index (0.54)		
HsB	Hudson silt loam, 2 to 6 percent slopes	Moderate	Hudson (70%)	Surface kw times slope times R index (0.32)	32.9	1.8%

Custom Soil Resource Report

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
Ma	Madalin silt loam, 0 to 3 percent slopes	Slight	Madalin (85%)		12.7	0.7%
			Rhinebeck (5%)			
			Canandaigua (4%)			
			Fonda (4%)			
			Cosad (2%)			
Md	Madalin silt loam, loamy subsoil variant	Slight	Madalin variant, loamy substratum (75%)		11.5	0.6%
Mn	Minoa very fine sandy loam	Slight	Minoa (70%)		9.0	0.5%
NaA	Niagara silt loam, 0 to 2 percent slopes	Slight	Niagara (70%)		374.8	21.0%
NaB	Niagara silt loam, 2 to 6 percent slopes	Moderate	Niagara (80%)	Surface kw times slope times R index (0.32)	32.9	1.8%
OnD3	Ontario loam, 15 to 30 percent slopes	Severe	Ontario (85%)	Surface kw times slope times R index (0.90)	7.6	0.4%
			Cazenovia (5%)	Surface kw times slope times R index (0.90)		
			Honeoye (5%)	Surface kw times slope times R index (0.93)		
			Hilton (3%)	Surface kw times slope times R index (0.78)		
			Appleton (2%)	Surface kw times slope times R index (0.78)		
OvA	Ovid silt loam, 0 to 2 percent slopes	Slight	Ovid (75%)		13.5	0.8%
OvB	Ovid silt loam, 2 to 6 percent slopes	Slight	Ovid (75%)		4.3	0.2%
RbA	Rhinebeck silt loam, 0 to 2 percent slopes	Slight	Rhinebeck (70%)		224.4	12.5%
RbB	Rhinebeck silt loam, 2 to 6 percent slopes	Moderate	Rhinebeck (70%)	Surface kw times slope times R index (0.32)	28.5	1.6%
W	Water	Not rated	Water (100%)		14.5	0.8%
Wa	Wayland soils complex, 0 to 3 percent slopes,	Slight	Wayland (60%)		20.3	1.1%

Custom Soil Resource Report

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
	frequently flooded		Wayland, very poorly drained (30%)			
			Wakeville (10%)			
Totals for Area of Interest					1,788.4	100.0%

Rating	Acres in AOI	Percent of AOI
Slight	1,023.2	57.2%
Moderate	700.2	39.1%
Severe	45.3	2.5%
Null or Not Rated	14.5	0.8%
Totals for Area of Interest	1,788.4	100.0%

Rating Options—Erosion Hazard (Off-Road, Off-Trail) (Somerset Solar)

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

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