Preliminary Geotechnical Engineering Report

Trelina Solar Project
Seneca County, New York
January 29, 2020
Terracon Project No. J5195163

Prepared for:
NextEra Energy Resources
Juno Beach, Florida

Prepared by:
Terracon Consultants-NY, Inc.
Rochester, New York

January 29, 2020

NextEra Energy Resources
700 Universe Boulevard
Juno Beach, Florida 33408

Attn: Mr. Joe Cartaya – Project Manager
P: (561) 694 4529
E: joe.cartaya@nexteraenergy.com

Re: Preliminary Geotechnical Engineering Report
Trelina Solar Project
Town of Waterloo
Seneca County, New York
Terracon Project No. J5195163

Dear Mr. Cartaya:

We have completed the Preliminary Geotechnical Engineering services for the above referenced project. This study was performed in general accordance with Terracon Proposal No. PJ5195163 dated September 6, 2019. This report presents the findings of the subsurface exploration and provides geotechnical recommendations concerning earthwork and the design and construction of solar panel foundations for the proposed project.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning this report or if we may be of further service, please contact us.

Sincerely,
Terracon Consultants-NY, Inc.

Zeru B. Kiffle, E.I.T.
Staff Engineer

Michele A. Fiorillo, P.E.
Geotechnical Department Manager

SME Reviewer: Scott D. Neely, P.E., G.E. (CA)

REPORT TOPICS

Note: This report was originally delivered in a web-based format. **Orange Bold** text in the report indicates a referenced section heading. The PDF version also includes hyperlinks which direct the reader to that section and clicking on the ***GeoReport*** logo will bring you back to this page. For more interactive features, please view your project online at client.terracon.com.

ATTACHMENTS

Note: Refer to each individual Attachment for a listing of contents.

Preliminary Geotechnical Engineering Report

Trelina Solar Project

Town of Waterloo

Seneca County, New York

Terracon Project No. J5195163

January 29, 2020

INTRODUCTION

This report presents the results of our subsurface exploration and geotechnical engineering services performed for the proposed Trelina Solar Project in the Town of Waterloo, Seneca County, New York. The purpose of these services is to provide subsurface information and geotechnical engineering recommendations relative to:

- Subsurface soil conditions
- Site preparation and earthwork
- Thermal resistivity of trench/backfill
- Pile load test results
- Unpaved access roads
- Groundwater conditions
- Foundation design and construction
- Electrical resistivity for grounding design
- Seismic Considerations

Our scope of services for the project consisted of:

- Soil borings for PV arrays and substations at 14 locations to depths ranging from 20 to 50 feet
- Test pits at 6 locations to depths ranging from 10 to 10.5 feet
- Temporary groundwater monitoring wells at 7 locations
- Infiltration (percolation) tests at 6 locations
- Laboratory testing of soil samples
- Field electrical resistivity testing at 9 locations
- Pile load testing at 7 locations
- Laboratory thermal resistivity tests at 4 locations
- Corrosivity suite testing at 7 locations
- Geotechnical engineering analysis and preparation of this report

Site location, exploration plans, and the boring logs are provided in **Appendix A**. Results of the laboratory tests are provided on the boring logs in **Appendix A** and in **Appendix B**. Results of the field electrical resistivity tests are provided in **Appendix C**. The pile load testing results are provided in **Appendix D** through **Appendix G**.

SITE CONDITIONS

The following description of site conditions is derived from our site visit in association with the field exploration and our review of publicly available geologic and topographic maps.

Item	Description
Parcel Information	The project is in Waterloo, New York. The final size of the project is yet unknown, as land permission is still being negotiated. Based upon the Google Earth Files received by NextEra, the size of the PV Array area is about 500 acres. (See Exhibit A001 in **Appendix A**). The center of the overall target site is located at: ■ Latitude: 42.8920°N (approximate) ■ Longitude: - 76.9461°W (approximate)
Existing Improvements	Mixture of private undeveloped land and farmland.
Current Ground Cover	Agricultural fields with wooded areas.
Existing Topography	A topographic site plan was not provided. Our review of USGS topographic maps indicate that the site is relatively level. Ground surface elevations (EL.) varies between El. 460 feet and El. 490 feet.

PROJECT DESCRIPTION

Our initial understanding of the project was provided in our proposal and was discussed during project planning. A period of collaboration has transpired since the project was initiated, and our final understanding of the project conditions is as follows:

Item	Description
Project Description	The project site will be developed as an 80-megawatt photovoltaic (PV) solar power facility. The proposed facility will also include a substation.
Proposed Structure	We anticipate that the proposed facility will have multiple photovoltaic panel arrays installed on steel raking frames supported on driven steel piles. Substation structures are expected to be founded on drilled shafts, mat foundations and/or shallow spread foundations.
Below Grade Structures	Limited to underground electrical conduits.
Maximum loads (Estimated by Terracon)	Structural loads were not provided, but have been estimated based on our experience on projects using single axis tracking rack systems: ■ Downward: 5 kips ■ Lateral: 3.5 kips ■ Uplift: 2 kips exclusive of frost heave loads

Item	Description
Grading / Slopes	We assume minimal changes to existing site grades. Arrays are expected to follow existing topography.
Access Roads (Based on NextEra)	We understand that access road cross sections used for construction of the project will be the responsibility of the EPC, and that only post construction traffic with an allowable rut depth of 2 inches is what we are to design for in this report. We anticipate low-volume, aggregate-surfaced and native soil access roads based on a design loading of 75,000 and will have travel over the access roads only once per week.

GEOTECHNICAL CHARACTERIZATION

Geology[1]

The project is located within the northwestern portion of Seneca County, in the Erie-Ontario Lowlands Physiographic Province. The soil deposits within this province generally consist of lacustrine silt, clay and sand. Bedrock is mapped as limestone (Middle Devonian age).

Subsurface Profile

We have developed a general characterization of the subsurface conditions based upon our review of the subsurface exploration, laboratory data, geologic setting and our understanding of the project. This characterization, termed GeoModel, forms the basis of our geotechnical calculations and evaluation of site preparation and foundation options. Conditions encountered at each exploration point are indicated on the individual logs. The GeoModels can be found in **Appendix A,** Exhibits A006 through A009 and the boring/test pits logs can be found in **Appendix A,** Exhibits A010 through A031.

As part of our analyses, we identified the following model layers within the subsurface profile. For a more detailed view of the model layer depths at each boring location, refer to the GeoModel.

[1] *References: Fisher, D.W., Isachsen, Y.W., and Rickard, L.V., Surficial and Geologic Maps of New York State, consisting of 5 sheets: Niagara, Finger Lakes, Hudson-Mohawk, Adirondack, and Lower Hudson, New York State Museum and Science Service, Map and Chart Series No. 15, scale 1:250,000.*

Model Layer	Layer Name	General Description
1	**Surficial**	Topsoil: contains significant organic matter, black
2	**Native Fine-Grained Soils**	Silts and Clays (CL, ML, and CL-ML); red, gray, brown; soft to hard
3	**Native Coarse-Grained Soils**	Sand and Silty Sand (SM, SP, and SP-SM); red, gray, brown; loose to dense

1. The sampling equipment utilized may preclude sampling particles larger than 2-inch in dimension.

Laboratory tests were conducted on selected soil samples and the test results are included in **Appendix B**. The natural moisture contents for the samples tested ranged from 8 to 35 percent, with an average value of approximately 23 percent. Atterberg Limit tests indicated non-plastic to low plastic behavior of the soil tested. Standard Proctor test results show maximum dry density ranging from approximately 104 to 110 pcf and optimum moisture content from 14 to 17 percent. The California Bearing Ratio (CBR) values for the samples tested (at 95 percent of the Standard Proctor) ranged from about 3.5 to 8.

Groundwater Conditions

We monitored the boreholes for the presence and level of groundwater while or at completion of drilling. Also, temporary water wells were installed at 7 locations (TR-1, TR-3, TR-4, TR-6, TR-8, TR-10, and TRSS-1) for delayed readings. The groundwater levels in each boring can be found on the boring/test pits logs in **Appendix A,** Exhibits A010 through A031. Summary of the groundwater table at the exploration locations are presented below.

Boring No.	Groundwater level at 1st Observation (ft.)	Groundwater level at 2nd observation (ft)
TR-1	None encountered on 11/04/2019	8 ft on 11/18/2019
TR-2	17.5 ft at completion of drilling	N/A
TR-3	None encountered on 11/05/2019	1.5 ft on 11/18/2019
TR-4	8 ft at completion of drilling	6 ft on 11/15/2019
TR-5	13.5 ft at completion of drilling	N/A
TR-6	8 ft at completion of drilling	1 ft on 11/15/2019
TR-8	None encountered on 11/06/2019	3 ft on 11/15/2019

Boring No.	Groundwater level at 1st Observation (ft.)	Groundwater level at 2nd observation (ft)
TR-9	16.5 ft at completion of drilling	N/A
TR-10	None encountered on 11/04/2019	2.5 ft on 11/18/2019
TRSS-1	18.5 ft at completion of drilling	14 ft on 11/15/2019
TRSS-2	20 ft at completion of drilling	N/A
TTP-3	10 ft at completion of excavation	N/A

Note: Groundwater was not encountered at the time of drilling in the remainder of the borings or during excavation in the remainder of the test pits.

Groundwater level fluctuations occur due to seasonal variations in the amount of rainfall, runoff and other factors not evident at the time the borings and test pits were performed. Lacustrine silts and clays were generally encountered in the borings and test pits and would be considered relatively impermeable. Therefore, perched groundwater conditions could be encountered in excavations where soil conditions are encountered, particularly after rainfall events or irrigation. Groundwater levels during construction or at other times in the life of the structure may be higher or lower than the levels indicated on the boring logs. The possibility of groundwater level fluctuations should be considered when developing the design and construction plans for the project.

EXPLORATION AND TESTING PROCEDURES

Field Exploration and Laboratory Testing

The following table summarizes the exploration completed for this geotechnical study:

Number of Explorations	Type of Exploration	Depth or Description	Planned Location
12 locations	SPT Boring	20 to 25 feet bgs	Array Area
2 locations		50 feet bgs	Substation Area
6 locations	Test Pit Excavation	10 to 10.5 feet bgs	Array Area
8 locations		2.5, 5, 10, 20, and 50 feet	Array Area

Number of Explorations	Type of Exploration	Depth or Description	Planned Location
1 location	Field Electrical Resistivity	0.5, 1, 1.5, 2, 3, 5, 7, 10, 15, 20, 30, 45, 70, 100, 150, and 250 feet	Substation Area
3 locations	Thermal Resistivity	6 lab tests (2 dry-out curves per location)	Array Area (Remolded 90 percent of the Standard Proctor maximum dry density and an undisturbed sample)
1 location		2 dry-out curves	Substation Area (Remolded 90 percent of the Standard Proctor maximum dry density and an undisturbed sample)
6 locations	Corrosion Testing	1 to 4 feet bgs	Array Area
1 location			Substation Area
7 locations (21 piles)	Pile Load Testing (PLT)	9 to 12 feet bgs (embedment depth[1])	Array Area

1. Prior to driving the tension piles, each tension location was pre-drilled with a 12-inch auger to a depth of 2 feet.

Boring Layout and Elevations: The exploration locations were selected by Terracon personnel based on the site and access conditions and the planned footprint of the PV arrays and substation locations provided by NextEra. The GPS coordinates of the boring locations were obtained with a handheld GPS unit with estimated horizontal accuracy of about ±10 feet. Elevations were estimated from the Google Earth. The boring locations and elevations should be considered accurate only to the degrees implied by the methods used to determine them. If elevations and a more precise boring layout are desired, we recommend borings be surveyed following completion of fieldwork.

Subsurface Exploration Procedures

Test Pits

The test pits were excavated using a tracked excavator. A Terracon field engineer prepared test pit logs at the time of the test pit excavation. The field logs included visual classification of the soils encountered during excavation. Groundwater levels were also observed during excavation and prior to backfill of the test pits. Bulk samples were collected from selected test pit locations for laboratory testing. A thin wall tube was obtained at the locations of TTP-2, TTP-3, and TTP-5 for thermal testing. In the thin-walled tube sampling procedure, a thin-walled, seamless steel tube with a sharp cutting edge was pushed into the soil to obtain a relatively undisturbed sample. The

tests pits were backfilled with excavated materials after their completion. The test pit logs are presented in **Appendix A,** Exhibits A026 through A031.

Test Borings

The borings were advanced with a track-mounted rotary drill rig using continuous flight, hollow-stem augers. Five samples were obtained in the upper 10 feet of each boring and at intervals of 5 feet thereafter. The borings were sampled using split spoon samplers. In the split-barrel sampling procedure, a standard 2-inch outer diameter split-barrel sampling spoon was driven into the ground by a 140-pound automatic hammer falling a distance of 30 inches. The number of blows required to advance the sampling spoon the middle 12 inches of a normal 24-inch penetration is recorded as the Standard Penetration Test (SPT) resistance value. The SPT resistance values, also referred to as N-values, are indicated on the boring logs at the test depths. We observed and recorded groundwater levels during drilling and sampling. Temporary groundwater monitoring wells were also installed at selected locations to obtain delayed groundwater level readings. For safety purposes, all borings were backfilled with auger cuttings after their completion. The boring logs are presented in **Appendix A,** Exhibits A010 through A025.

The sampling depths, penetration distances, and other sampling information were recorded on the field boring logs. The samples were placed in appropriate containers and taken to our soil laboratory for testing and classification by a Geotechnical Engineer. Our exploration team prepared field boring logs as part of the drilling operations. Field logs included visual classifications of the materials encountered during drilling and our interpretation of the subsurface conditions between samples. Final boring logs represent the Geotechnical Engineer's interpretation of the field logs and include modifications based on observations and tests of the samples in our laboratory.

Field Electrical Resistivity Test Results

Field electrical resistivity surveys (ER) were performed at 8 locations in the PV Array areas and 1 location in the proposed substation area. The approximate locations for the field resistivity tests are shown in **Appendix C**, Exhibit C001. The ER were generally performed along pairs of approximately perpendicular arrays at each location with the following electrode spacings (A-spacing):

- PV array areas: 2.5, 5, 10, 20, and 50 feet;
- Substation area: 0.5, 1, 1.5, 2, 3, 5, 7, 10, 15, 20, 30, 45, 70, 100, 150, and 250 feet.

At one location, TTP-6, as a result to planted field and an existing swamp area, it was not possible to complete the north-south string. ER were performed between October 15 and 16, 2019. The ER were performed in general accordance with ASTM Test Method G 57, and IEEE Standard 81, using the Wenner Four-Electrode Method. Results of the field electrical resistivity measurements are presented in **Appendix C,** Exhibits C001 through C019.

Corrosion Testing

Soil samples from seven (7) boring locations were tested for corrosivity potential. These samples were being tested for pH, water soluble sulfate, sulfides, chlorides, total salts, Red-Ox potential, and electrical resistivity. Results of the corrosivity suite tests are provided in **Appendix B,** Exhibits B012 through B014. We recommend a corrosion specialist be retained to evaluate our test results and make recommendations for protection of steel piles against potential corrosion.

Thermal Resistivity Laboratory Testing

Laboratory thermal resistivity tests were performed from soils samples recovered at four (4) locations. The tests on the bulk samples were completed on specimens remolded to 90 percent of the Standard Proctor maximum dry density. The tube samples were tested "as received". These tests were performed in accordance with IEEE Standard 442-2017.

Laboratory thermal resistivity test results and dry-out curves for bulk samples and the undisturbed sample are presented in **Appendix B,** Exhibits B015 through B0120.

Geotechnical Laboratory Testing

The project engineer reviewed the field data and assigned laboratory tests to understand the engineering properties of the various soil and rock strata, as necessary, for this project. Procedural standards noted below are for reference to methodology in general. In some cases, variations to methods were applied because of local practice or professional judgment. Standards noted below include reference to other, related standards. Such references are not necessarily applicable to describe the specific test performed.

- ASTM D2216 Standard Test Methods for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass
- ASTM D422 Standard Test Method for Particle-Size Analysis of Soils
- ASTM D4318 Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils
- ASTM D698 Moisture-Density Relationship (Standard Proctor)
- ASTM D1883 Standard Test Method for California Bearing Ratio (CBR) of Laboratory-Compacted Soils

The laboratory testing program often included examination of soil samples by an engineer. Based on the material's texture and plasticity, we described and classified the soil samples in accordance with the Unified Soil Classification System.

GEOTECHNICAL CONSIDERATION

The subsurface conditions encountered in the test borings were generally consistent with the mapped surficial geology. Subsurface conditions encountered in the borings indicated lacustrine clay, silt and sand. Bedrock was not encountered in the test borings within the explored depths.

The near surface fine-grained soil will become unstable with typical earthwork and construction traffic, especially after precipitation events. The effective drainage should be completed early in the construction sequence and maintained after construction to avoid potential issues. If possible, the grading should be performed during the warmer and drier times of the year (typically May to October). If grading is performed during the winter/spring months (typically November to April), an increased risk for possible undercutting and replacement of unstable subgrade will persist. Additional site preparation recommendations, including subgrade improvement and fill placement, are provided in the **Earthwork** section.

Driven piles are planned to be used to support the PV solar arrays. For PV arrays supported on driven pile foundations, maintenance of the connections between racking system and driven piles may be required during the life of these structures. Pile design recommendations presented in this report are based on our assumption that grades around the piles will not allow ponding of the surface water at the pile locations.

Pile load testing (PLT) results performed at some locations indicated longer driving time. Pre-drilling of undersized holes and backfilling with soil cutting may be required to accommodate pile installation in areas where difficult driving is encountered.

Geotechnical engineering recommendations for PV arrays and substation equipment support foundations are provided in the report. These recommendations are based on the results of field and laboratory testing data, engineering analyses, and our understanding of the project.

A qualified testing agency should be retained during the construction phase of the project to observe earthwork and to perform necessary tests and observations during subgrade preparation; proof-rolling; placement and compaction of controlled compacted fills; backfilling of excavations in the completed subgrade; and for construction of foundations.

Preliminary recommendations contained in this report are based upon the data obtained from the limited number of test borings. This report does not reflect conditions that may occur between the points investigated, or between sampling intervals in test borings. The nature and extent of variations between test borings and sampling intervals may not become evident until the course of construction. A detailed subsurface geotechnical investigation should be completed prior to final design and construction to assess localized subsurface conditions at proposed structure locations where existing data is lacking.

The **Access Roads** section addresses the design of aggregate-surfaced pavement systems.

The **General Comments** section provides an understanding of the report limitations

PILE LOAD TESTING

We have performed a full-scale load testing program that included:

- Directing the installation of a group of three test piles at 7 locations near TR-2, TR-4, TR-6, TR-7, TR-8, TR-10, and TR-12.
- Performing full-scale testing under axial tensile loads for 2 test piles in each group.
- Performing full-scale testing under compression loads for 1 test pile in each group
- Performing full-scale testing under lateral loads for 2 test piles in each group.

Pile Locations and Driving

Pile load tests were performed at 7 locations across the site. The test piles consisted of wide flange bare steel W6x9 sections. These test piles were installed to embedment depths of 9 and 12 feet below the ground surface (bgs). The test piles have been identified using an alphanumeric system. The pile identification system for each location begins with “TR” and is followed by the number corresponding to the test pile group location with the assigned letters “A”, “B” and “C”. Pile load tests with letter “A” and “B” were tested for axial tension first and lateral load next. Pile load tests with letter “C” were tested for axial compression only.

The approximate pile load testing locations are provided in **Appendix D**, Exhibits D001. The piles were installed in groups of three at 7 locations (Piles A, B and C). Prior to driving the tension piles, each location was pre-drilled with a 12-inch auger to a depth of 2 feet approximately. The pre-drilled hole was then backfilled, and the piles were pushed to depths described in **Appendix D,** Exhibits D002 through D004.

The piles were advanced on November 04 and 05, 2019 with a track mounted Vermeer PD10 Pile Driver equipped with hydraulic hammer to the required embedment. The time rate of installation was recorded with a stopwatch. The total time required to advance each pile to its specified embedment depth was recorded and is summarized in the following table:

Pile Location	Actual and Target Embedment Depths (feet)	Approximate Push Depth (feet)	Drive Time (seconds)	Average Drive Time (seconds/foot)
	Tests: Axial Tension, Lateral, and Axial Compression			
TR-2A	9	2.00	128.3	18.3
TR -2B	12	2.00	206.3	20.6
TR -2C	9	0.50	224.1	26.4
TR -4A	9	2.00	244.8	35.0
TR -4B	12	2.00	277.2	27.7
TR -4C	9	0.25	241.4	27.6
TR -6A	9	2.25	70.1	10.4
TR -6B	12	2.00	205.3	20.5
TR -6C	9	0.25	122.1	13.9
TR -7A	9	2.25	296.1	43.9
TR -7B	12	2.50	500.9	52.7
TR -7C	9	0.25	315.7	36.1
TR -8A	9	2.00	45.9	6.6
TR -8B	12	2.50	70.3	7.4
TR -8C	9	0.50	78.0	9.2
TR -10A	9	2.00	230.0	32.9
TR -10B	12	2.00	447.0	44.7
TR -10C	9	0.00	220.6	24.5
TR -12A	9	2.00	140.5	20.1
TR -12B	12	2.00	255.2	25.5
TR -12C	9	0.75	73.1	8.9

Testing Under Axial Tensile ("Pull-out") Load

We performed testing under axial tensile load for the piles at each location using the procedures generally outlined below.

A total of fourteen (14) piles, two piles in each PLT locations, were tested under axial tensile ("pull-out") load. The embedment depths for piles with the designation "A" was 9 feet below the ground surface, and for piles with the designation "B" was 12 feet below the ground surface.

The "pull-out" load reaction was developed using a tripod frame supported at an appropriate lateral distance from the post. The composite steel and aluminum "tripod" frame were centered over the test post and a system of appropriately rated chains and clevises were used to connect the reaction system (i.e. the eyebolt within the head of the tripod) in series with one Dillion ED Junior Dynamometer 25-kip electronic load cell, and a 10-kip locking "E-grip" clamp gripping the

test post web. By pulling a chain hoist the load was applied in successive 500-pound increments to a maximum of 10,000 lbs. Pile deflections were measured with a pair of digital gauges secured with magnetic mounting brackets to each outside flange of the test post with the needle of each gauge resting on a 4-inchx4-inch piece of lumber fastened at each end to steel angle iron that was driven into the ground. Following reaching the maximum target load of 10,000 pounds, the load was reduced in increments until it reached zero and the test was terminated. Results of the axial tension load tests are provided in **Appendix E**, Exhibits E001 through E014.

Testing Under Lateral Load

After testing under axial tensile load, the piles at each location were then tested under lateral load as described below.

A total of fourteen (14) piles, two piles in each PLT locations, were tested under lateral load soon after the completion of the axial tension load tests at those locations. Lateral load tests were performed on the piles designated as “A” and “B” at each test location. The lateral load was applied 2-feet above the ground surface. The load was applied with a chain hoist and the test was performed in 500-pound increments, with loading and unloading cycles and loaded until the maximum lateral load of 7,000 lbs. was reached or the pile reached 1-inch of lateral displacement measured at 6-inch above the ground surface. Each load increment was held for at least 1 minute and the stabilized deflection reading of both indicator gauges were recorded. Deflections were measured with Westward dial gauges and loads were measured with a Dillon ED Junior Dynamometer 25-kip electronic load cell. The gauges were read, and the data was recorded manually by Terracon field personnel. Lateral load test results are provided in **Appendix F**, Exhibits F001 through F016.

Testing Under Compression Load

Axial compression load tests were performed at 7 locations on the piles designated as “C”. The axial compression load was applied using a compression cylinder with load increments of 500 lbs. to a maximum compression load of 10,000 lbs. Two dial gauges were used to measure the pile vertical movement. The test was ended after the conclusion of the maximum load schedule. Axial compression test results are provided in **Appendix G**, Exhibits G001 through G007.

Summary of Pile Load Test Results

The pile load test locations are provided in **Appendix D**, Exhibit D001. The axial tension test load versus deflection graphs, lateral load versus deflection curves, compression load versus deflection curves, and the tension load on shallow embedment piles versus deflection curves are provided in Appendices D through G.

The following table provides a summary of the pile embedment depth, tension load and compression load at approximately 0.25-inch vertical displacement, and lateral load at 0.5-inch lateral displacement at 6 inches above ground surface.

Pile Location	Actual and Target Embedment Depth (feet)	Tension Load at 0.25-inch displacement, (lbs.)	Lateral Load at 0.5- inch Displacement (lbs.)	Compression Load at 0.25-inch displacement, (lbs.)
TR-2A	9	10,000+	2,200	---
TR -2B	12	10,000+	2,500	---
TR -2C	9	---	--	10,000+
TR -4A	9	10,000+	2,900	---
TR -4B	12	7,400	2,200	---
TR -4C	9	---	---	10,000+
TR -6A	9	7,000	1,750	---
TR -6B	12	10,000+	2,100	---
TR -6C	9	---	---	10,000+
TR -7A	9	10,000+	2,500	---
TR -7B	12	10,000+	2,100	---
TR -7C	9	---	---	10,000+
TR -8A	9	9,700	1,850	---
TR -8B	12	10,000+	1,550	---
TR -8C	9	---	---	10,000+
TR -10A	9	10,000+	2,100	---
TR -10B	12	10,000+	2,200	---
TR -10C	9	---	---	10,000+
TR -12A	9	10,000+	2,200	---
TR -12B	12	10,000+	1,900	---
TR -12C	9	---	---	10,000+

PV ARRAY FOUNDATION SYSTEM

Results of the pile load tests indicate that driven steel piles with embedment depths of 9 to 12 feet should be suitable for support of the planned solar panel arrays. Recommendations for design of the driven steel W-section piles including ultimate skin friction, end-bearing capacity, and L-PILE input parameters are provided in the following sections of this report. These recommendations are based our analyses of the data obtained from the subsurface soil conditions encountered in our borings and the results of the pile load tests performed at the site.

Based on the subsurface conditions encountered in our borings and pile load testing data, the site has been divided into two (2) major zones, Zone A and B. The zoning map is provided in **Appendix A**, Exhibit A003. The minimum installation drive times at each zone should be used for the pile driving based on the average driving time versus depth of penetration graphs provided in **Appendix D**, Exhibits D002 through D004.

The pile driving charts presented in **Appendix D**, Exhibits D002 through D004 are applicable for piles that are driven using equipment similar to a Vermeer PD10 equipped with hydraulic hammer. The average pile driving time versus depth of penetration may vary, if a different pile driving equipment is used.

Driven Pile Design Recommendations - Axial Tension Capacity

The axial load carrying capacity of driven piles can be estimated based on skin friction developed along the block perimeter of the pile. When computing embedment depths, the perimeter of a wide flange beam should be taken as twice the sum of the flange width and web depth for a block analyses design method. The upper 2.5 feet of soil for each pile should be neglected in all axial tension capacity analyses to account for frost heave.

The ultimate axial capacity of driven steel piles can be estimated using the skin friction and end-bearing values presented in the following table. The ultimate unit skin frictions are based on the results of the axial tension load testing. The ultimate end-bearing values are based on the results of the soil borings and pile load testing for axial compression loads.

Parameters for Analysis of Axial Capacity				
Soil Zones	**Embedment Depth (feet)**	**Minimum Drive Time (sec)**	**Ultimate Skin Friction (psf)**	**Ultimate End-Bearing (lbs.)**
Zone A	9 and 12	241	450	225
Zone B	9 and 12	46	675	

It is our opinion that the soils anticipated to be encountered across the project site are frost-susceptible. Frost heave on pile foundations may be significant. If the anchorage of the foundations and the deadweight of the solar panel equipment are not sufficient to resist these forces, it can cause uplift. Based on our review of soil samples obtained in the exploration, our local experience, and available public data, we recommend that an ultimate adfreeze stress (frost heave) of 1,500 psf acting along the pile perimeter to a depth of 30 inches below the ground surface be considered.

For Allowable Stress Design (ASD), we recommend the allowable skin friction and end-bearing be computed by applying a factor of safety of at least 1.5 to the ultimate values. Piles should

have a minimum center-to-center spacing of at least 3 times their largest cross-sectional dimension to prevent reduction in the axial capacities due to group effects.

Driven Pile Design - Lateral Loading

Lateral load tests from each design zone with various pile embedment depths were grouped and plotted. L-PILE analyses were performed for each pile embedment depth groups by applying the field test load that resulted in approximately ½-inch deflection at approximately 6 inches above the ground surface.

The calculated p-y curve from L-PILE analyses was adjusted by the varying p-multiplier (by trial method) such that the applied load resulted with a deflection value that approximately matched the measured test results at about 0.5 to 0.6-inch lateral deflection. These results are intended only for use with L-PILE program. In our analyses, the piles were modeled as an elastic section (non-yielding). The results of the lateral load models in L-PILE are provided below in this report.

Lateral Capacity Recommendations

Lateral load response of pile foundations was evaluated based on the lateral load test results and using the commercial software L-PILE 2018, by Ensoft, Inc. We modeled the lateral response of the tested piles to modify the L-PILE input parameters that can be used for design of the production piles. Recommended L-PILE input parameters for lateral load analysis are provided in the tables below.

Zone A and B				
Depth Range (ft)	**Soil Type (P-y) Curve Model[1]**	**Effective Unit Weight[1] (pcf)**	**Friction Angle Φ' [1] (degrees)**	**Undrained Cohesion, C[1] (ksf)**
0.0-5.0	Stiff Clay without Free Water (Reese)	125	0	1,750
5.0-11.5	Stiff Clay with Free Water (Reese)	63	0	1,750
11.5-20.0	Sand (Reese)	58	30°	0

Note: Estimated average depth to groundwater is 5 feet

1. Use default subgrade modulus reaction (k) and Strain Factor (ε)

P-Multipliers:

Location	Embedment Depth (feet)	P Multiplier
Zone A and B	9	1.3
	12	1.1

The structural engineer should evaluate the moment capacity of the pile as part of their structural evaluation. Piles should have a minimum center-to-center spacing of at least 5 times their largest cross-sectional dimension in the direction of the lateral loads, or the lateral capacities should be reduced due to group effects. If piles will be spaced closer than 5 times their largest cross-sectional dimension we should be notified to provide supplemental recommendations.

Driven Pile Construction Considerations

Although refusal was not encountered in the borings, pile installation via conventional methods – such as driving into undisturbed soils may encounter difficulty and may result in early refusal and inadequate penetration, or else may cause excessive pile deflection, rotation or torsional rotation. In locations where pile driving difficulty is encountered, pre-drilling of undersize or oversized holes and grouting may be required.

Although we expect driven piles should typically achieve the required embedment depths when driven through native soils, it is possible that occasional driven pile refusal may occur. The following recommendations address areas where pre-drilling may be required.

Undersize Holes Design Recommendations

In areas of driven pile refusal prior to reaching the desired pile depth, it may be appropriate to pre-drill an undersized hole. The predrilled hole may then be backfilled with the cuttings, provided cobbles and boulders are culled from the material. The objective of pre-drilling an undersized hole is to facilitate the driving of the web without disturbing the native soils supporting the flanges. Since the lateral and axial capacities are mostly reliant on the soil pile interaction at the flanges, the soil parameters in the table provided in the previous section remain applicable.

SHALLOW FOUNDATIONS

General

We understand within the substation that some equipment may be supported on mat/slab foundations, while other structures may be supported on shallow footing foundations. Transmission line structures are anticipated to be constructed as poles on drilled shafts or as direct embed poles.

Spread Footing Design Recommendations

Item	Description
Maximum net allowable bearing pressure [1, 2]	2,000 psf
Required bearing stratum [3]	Minimum 9 inches of compacted Structural Fill placed upon stable native soils. The Structural Fill should extend a minimum lateral distance of 9 inches beyond the edges of the foundations
Minimum foundation dimensions	Isolated: 30 inches Continuous: 18 inches
Ultimate passive resistance [4] (equivalent fluid pressures)	250 pcf
Ultimate coefficient of sliding friction [5]	0.50 (Concrete on compacted Structural Fill)
Minimum embedment below finished grade [6]	30 inches
Estimated total settlement from structural loads [2]	Less than about 1 inch
Estimated differential settlement [2, 7]	About ¾ of total settlement

1. The maximum net allowable bearing pressure is the pressure in excess of the minimum surrounding overburden pressure at the footing base elevation. The allowable bearing pressure may be increased by one-third when considering the alternative load combinations of Section 1605.3.2 of the 2015 International Building Code, however, it should not be increased when loads are determined by the basic allowable stress design load combinations of Section 1605.3.1.
2. Values provided are for maximum loads noted in **Project Description**.
3. Unsuitable or soft soils should be overexcavated and replaced according to the recommendations presented in **Earthwork**.
4. Use of passive earth pressures require the sides of the excavation for the spread footing foundation to be nearly vertical and the concrete placed neat against these vertical faces or that the footing forms be removed and compacted structural fill be placed against the vertical footing face.
5. Can be used to compute sliding resistance where foundations are placed on suitable soil/materials. Should be neglected for foundations subject to net uplift conditions. Should be neglected if passive pressure is used to resist lateral loads.
6. Embedment necessary to resist the effects of frost and/or seasonal water content variations. For sloping ground, maintain depth below the lowest adjacent exterior grade within 10 horizontal feet of the structure.
7. Differential settlements are as measured over a span of up to 50 feet.

The allowable foundation bearing pressures apply to dead loads plus design live load conditions. The weight of the foundation concrete below grade may be neglected in dead load computations.

Spread Footing Construction Considerations

The bottom of all foundation excavations should be free of water and loose soil prior to placing concrete. Concrete should be placed soon after excavating to reduce bearing soil disturbance. Care should be taken to prevent wetting or drying of the bearing materials during construction.

Extremely wet or dry material or any loose or disturbed material in the bottom of the footing excavations should be removed before foundation concrete is placed.

If unsuitable bearing soils are encountered in footing excavations, the excavations should be extended deeper to suitable soils and the footings could bear directly on those soils at the lower level. Alternatively, the over-excavations could be backfilled with Structural Fill, clean gravel or lean concrete. More complete foundation design and construction recommendations can be provided as the design of the facility progresses.

Foundation excavations should be observed by the Geotechnical Engineer. If the soil conditions encountered differ significantly from those presented in this report, Terracon should be contacted to provide additional evaluation and supplemental recommendations.

Mat Foundation Design Recommendations

Reinforced concrete support slabs (mat foundations) are recommended to support the proposed ancillary equipment. We recommend concrete slabs have thickened edges with a minimum embedment depth to bottom of edge of 12 inches below finished grade. It is our opinion the thickened edge may help in both confining the aggregate placed beneath the slab and minimizing the potential for erosion and foundation damage from storm runoff.

Item	Description
Foundation Type	Mat Foundation.
Maximum Net Allowable Bearing Pressure[1, 2]	2,000 psf
Required Bearing Stratum[2]	Minimum 12-inch thickness of NFS material, Structural Fill, or Crushed Stone placed on either the native material or compacted fill placed for site grading, the surface of which should be proof-rolled. Bearing material should extend a minimum of 12 inches beyond the edges of the foundations.
Foundation Dimensions	■ Mat foundations of unknown dimensions. ■ Minimum foundation width of 12 inches for thickened edges.
Ultimate Coefficient of Sliding Friction[3]	0.45-Structural Fill or NFS. 0.50-Crushed Stone
Minimum Embedment below Finished Grade[4]	■ NFS material will need to be placed at least 30 inches deep to reduce the effects of freeze-thaw. Alternately, the slab (mat) could be designed to allow movement due to frost action. ■ Minimum 12 inches for thickened edges.
Estimated Total Settlement from Structural Loads	Less than about 1 inch

Item	Description
Estimated Differential Settlement	About 2/3 of total settlement

1. The maximum net allowable bearing pressure is the pressure in excess of the minimum surrounding overburden pressure at the footing base elevation. An appropriate factor of safety has been applied. The allowable bearing pressure may be increased by ⅓ when considering the alternative load combinations of Section 1605.3.2 of the *2012 International Building Code*, however, it should not be increased when loads are determined by the basic allowable stress design load combinations of Section 1605.3.1.
2. Unsuitable or soft soils should be over-excavated and replaced per the recommendations presented in the **Earthwork**.
3. Can be used to compute sliding resistance where foundations are placed on suitable soil/materials. Should be neglected for foundations subject to uplift conditions. A factor of safety of at least 1.5 should be applied to the sliding resistance.
4. Slab foundations will move due to freeze-thaw effects. NFS material will need to be placed at least 30 inches deep to significantly reduce the effects of freeze-thaw. Alternately, the slab could be designed to allow movement due to frost action.

Foundations should be reinforced as necessary to reduce the potential for distress caused by differential foundation movement. Other details including treatment of loose foundation soils, superstructure reinforcement and observation of foundation excavations as outlined in the **Earthwork** section of this report are applicable for the design and construction of a mat foundation.

For structural design of mat foundations, a Modulus of Subgrade Reaction (Kv_1) of 150 pounds per cubic inch (pci) may be used. The Modulus of Subgrade Reaction (K_v) for the mat is not a constant for a given soil[2]. It depends on several factors, such as length and width of the foundation. Typically, the value of the K_v decreases with the width of the foundation and would vary according to the following equations:

- $K_v = K_{v1} * ((B+1)/(2*B))^2$ Foundations on Structural Fill

Where: K_v is the modulus for the size footing being analyzed
B is the width of the mat foundation

Mat Foundation Construction Considerations

On most sites, the site grading is generally accomplished early in the construction phase. However, as construction proceeds, the subgrade may be disturbed by foundation excavations, construction traffic, rainfall, etc. As a result, the subgrade may not be suitable for placement of fill, and corrective action will be required.

We recommend the area underlying the mat foundation be rough graded and proof-rolled with a vibratory roller or heavy plate compactor prior to final grading and placement of Structural Fill.

[2] Principle of Foundation Engineering, 3rd Edition, Braja M. Das; pgs. 260-265.

Subgrades with fine-grained soils may need to be proof-rolled/compacted in static mode to avoid disturbance. Attention should be paid to high traffic areas that were rutted and disturbed earlier and to areas previously filled or backfilled. Areas where unsuitable or unstable conditions are located should be repaired by replacing the affected material with properly compacted Structural Fill, as necessary. Surface drainage should be provided away from the edge of foundations to reduce moisture transmission into the subgrade.

Drilled Shaft Foundation Design

Transmission line structures are anticipated to be constructed as poles on drilled shafts or as direct embed poles. Deep foundations, including drilled shaft foundations and/or direct embedment foundations with concrete backfill, may be utilized for the support of substation transmission line structures for the project. Drilled shaft foundations should have a minimum embedment depth of 4B (where B is the shaft diameter).

Based on the geotechnical engineering analyses, subsurface exploration and laboratory test results, the geotechnical design parameters have been determined for the subsurface profile and are presented in the following sections.

Design Parameters

Recommended geotechnical parameters for lateral load analysis of the drilled shaft foundations have been developed for L-PILE and MFAD analysis and they are presented in the following table:

Zone A and B							
Depth Range (ft)	**Soil Type (P-y) Curve Model[1]**	**Effective Unit Weight[1] (pcf)**	**Undrained Cohesion, C[1, 2] (ksf)**	**Friction Angle Φ' [1, 2] (degrees)**	**Pressure Modulus [2] (Ksi)**	**Ultimate Skin Friction[1, 2] (ksf)**	**Ultimate End Bearing[1, 2] (ksf)**
0.0-2.5	Stiff Clay without Free Water (Reese)	125	1,750	0	1	Neglect	---
2.5-5.0						0.40	
5.0-11.5	Stiff Clay with Free Water (Reese)	63	1,750	0	1	0.55	6
11.5-20.0	Sand (Reese)	58	0	30°	2	1.10	15

Note: Estimated average depth to groundwater is 5 feet

1. For L-pile Analysis: Use default subgrade modulus reaction (k) and Strain Factor (ε)
2. For MFAD Analysis

Lateral resistance and friction in the upper 2.5 feet should be ignored due to the potential effects of frost action, desiccation, and drilling disturbance. Tensile reinforcement should extend to the bottom of piers subjected to uplift loading. Buoyant unit weights of the soil and concrete should be used in the calculations below the highest anticipated groundwater elevation.

Drilled Shaft Construction Considerations

We anticipate shaft drilling to be achieved with conventional methods, although it is possible it may encounter some difficulty. Concentrated effort may be necessary to advance the shaft excavation through the hard/dense layer.

Groundwater was encountered during drilling and may be encountered during drilled shaft excavation. Therefore, temporary casing may be needed to advance drilled shaft excavations. Temporary casing should be installed if personnel will enter the shafts.

The bottom of the shaft excavations should be cleaned of any water and loose material before placing reinforcing steel and concrete. A minimum shaft diameter of at least 30 inches is required for entry of personnel.

Concrete should be placed soon after excavating to reduce bearing surface disturbance. Any water that accumulates in the shaft excavation should be pumped from the excavation. Otherwise, the water level should be allowed to stabilize and then concrete should be placed using the tremie method.

If concrete will be placed as the temporary casing is being removed, we recommend the concrete mixture be designed with a slump of about 5 to 7 inches to reduce the potential for arching when removing the casing. While removing the casing from a shaft excavation during concrete placement, the concrete inside the casing should be maintained at a sufficient level to resist any earth and hydrostatic pressures outside the casing during the entire casing removal procedure.

We recommend that a representative of Terracon be present during drilling activities to observe the materials removed from the drilled shaft excavation to document when adequate bearing materials have been encountered, to observe the base of the drilled shaft excavation to document that the cuttings have been adequately removed, and to observe concrete placement.

Although obvious signs of harmful gases such as methane, carbon monoxide, etc., were not noted in the borings during the drilling operations, gas could be encountered in the drilled shaft excavations during construction. The contractor should check for gases and/or oxygen deficiency prior to any workers entering the excavation. Casing will be required if personnel enter the excavation.

EARTHWORK

Earthwork will include clearing and grubbing as well as grading, excavation, and fill placement. The following sections provide recommendations for use in the preparation of specifications for the work. Recommendations include critical quality control criteria as necessary to prepare the site subsurface conditions consistent with the conditions considered in our geotechnical engineering evaluation for slabs/mats, and aggregate surfaced roadways.

Site Preparation

The site is mostly fields with some wooded areas. Prior to placing fill, existing vegetation and root mat should be removed. Complete stripping of the topsoil, forest mat and otherwise unsuitable or disturbed materials should be removed prior to placing fill. Stripped materials consisting of vegetation and organic materials should be wasted from the site or used to revegetate landscaped areas or exposed slopes after completion of grading operations. If it is necessary to dispose of organic materials on-site, they should be placed in non-structural areas, and in fill sections not exceeding 5 feet in height.

The exposed subgrade should be proof-compacted with a heavy vibratory roller in static mode on cohesive soil. Unstable subgrades should be replaced with compacted Structural Fill, as necessary. Structural Fill may then be placed to attain the required grade. Should Crushed Stone be used instead of Structural Fill, a geotextile separation fabric (Mirafi 140, or similar) should be placed on the native material prior to placing the Crushed Stone.

It is our understanding minimal grading will be performed within the solar arrays. Proposed grades will generally follow existing natural ground elevations. Except in areas to be excavated, stump holes and other holes caused by removal of tree roots and obstructions in wooded areas should be backfilled with suitable material and compacted in accordance with **Fill Compaction Requirements**. All grading within the equipment pads should incorporate the limits of the proposed structures plus a minimum lateral extent of 1 foot.

Based on the outcome of the proof-rolling operations, some undercutting or subgrade stabilization may be expected. Methods of stabilization, outlined below, could include scarification and re-compaction and/or replacing unstable materials with granular fill (with or without geotextiles). The more suitable method of stabilization, if required, will be dependent upon factors such as schedule, weather, size of area to be stabilized and the nature of the instability.

- **Scarification and Re-compaction** - It may be feasible to scarify, dry, and re-compact the exposed subgrades during periods of dry weather. The success of this procedure would depend primarily upon the extent of the disturbed area. Stable subgrades may not be achievable if the thickness of the soft soil is greater than 12 inches.

- **Granular Fill** - The use of Crushed Stone or Structural Fill could be considered to improve subgrade stability. Typical undercut depths would range from about 8 to 24 inches. The use of high modulus geotextiles should be limited to outside of the array area. The maximum particle size of granular material placed immediately over geotextile fabric or geogrid should not exceed 2 inches.

Reuse of On-Site Materials

Excavated soils may be suitable for reuse as Structural Fill to attain proposed subgrade elevation, provided during construction proper compaction and optimum moisture content can be achieved. If construction is performed during the wet season, it is possible the moisture content of the excavated soils is in excess of the optimum moisture content required to achieve proper compaction, and proper compaction of the on-site soils may be difficult to achieve. We anticipate imported Structural Fill may be required. Saturated soils which cannot achieve compaction should be removed or used in non-structural areas where significant post construction settlement is acceptable. The contractor is ultimately responsible for moisture conditioning of fill/backfill materials to achieve proper compaction.

Fill Material Types

Fill required to achieve design grade should be classified as Structural Fill and General Fill. Structural Fill is material used below, or within 10 feet of equipment slabs/mats, roadways or constructed slopes. General Fill is material used to achieve grade outside of these areas. Earthen materials used for Structural and General Fill should meet the following material property requirements:

Fill Type [1]	USCS Classification or NYSDOT Specification	Acceptable Location for Placement
Structural Fill [2]	GW, GW-GM, SW, SW-SM, SP, GP	All locations and elevations; NYSDOT Item 733-0402, Type 2 is suitable to be used as imported Structural Fill.
Common Fill [3]	Varies	Common Fill may be used for general site grading. Common Fill should not be used under settlement or frost-sensitive structures.
Non-Frost Susceptible (NFS) Fill [4]	GW, GP, SW, SP	Under slabs, or as raise-in-grade fill to reduce potential effects of frost action.
Crushed Stone	GP	For leveling subgrades and to facilitate dewatering, if required. Should be uniform ¾-inch angular Crushed Stone wrapped in a geotextile separation fabric (Mirafi 140N, or similar).

Fill Type [1]	USCS Classification or NYSDOT Specification	Acceptable Location for Placement
Lean Concrete	Not applicable	Can be used to level subgrades between foundations and native soils. Lean Concrete should be flowable, self-compacting concrete with a compressive strength between 750 and 2,000 psi.

1. Compacted fill should consist of approved materials that are free of organic matter and debris. Frozen material should not be used. Fill should not be placed on a frozen subgrade. A sample of each material type should be submitted to the Geotechnical Engineer for evaluation prior to use on this site.
2. **Imported Structural Fill** should meet the following gradation specifications:

Structural Fill	
Sieve Size	**Percent Passing by Weight**
2″	100
¼ in	25-60
No. 40	5-40
No. 200	0 - 10

3. General Fill should have a maximum particle size of 6 inches and no more than 20 percent by weight passing the No. 200 sieve.
4. NFS Fill should contain less than 5 percent material passing No. 200 sieve size.

Fill Compaction Requirements

Structural and General Fill should meet the following compaction requirements.

Item	Description
Maximum Fill Lift Thickness	■ 12 inches or less in loose thickness when heavy, self-propelled compaction equipment is used. ■ 6 inches in loose thickness when hand-guided equipment (i.e. jumping jack or plate compactor) is used.
Compaction Requirements [1]	95 percent maximum modified Proctor dry density (ASTM D1557, Method C).
Moisture Content – Granular Material	Workable moisture levels.

1. We recommend fill be tested for moisture content and compaction during placement. Should the results of the in-place density tests indicate the specified moisture or compaction limits have not been met, the area represented by the test should be reworked and retested, as required, until the specified moisture and compaction requirements are achieved.

Utility Trench Backfill

Trench excavations should be made with sufficient working space to permit construction including backfill placement and compaction. As utility trenches can provide a conduit for groundwater flow, trenches should be backfilled with material that approximately matches the permeability

characteristics of the surrounding soil. Consideration should be given to installing seepage collars and/or check dams to reduce the likelihood of migration of water through the trenches.

Grading and Drainage

Adequate drainage should be provided at the site to reduce the likelihood of an increase in moisture content of the foundation soils. Surface drainage would likely consist of limited swales to control erosion and flow of runoff towards the equipment.

Earthwork Construction Considerations

Most part of the excavations for the bearing grade of proposed project can be achieved with conventional construction equipment. Although the exposed soil subgrade is anticipated to be relatively stable upon initial exposure, unstable subgrade conditions could develop during general construction operations, particularly if the soils are wetted and/or subjected to repetitive construction traffic. Should unstable subgrade conditions develop, stabilization measures will need to be employed.

Upon completion of filling and grading, care should be taken to maintain the subgrade water content prior to construction of slabs. Construction traffic over the completed subgrades should be avoided. The site should also be graded to prevent ponding of surface water on the prepared subgrades or in excavations. Water collecting over, or adjacent to, construction areas should be removed. If the subgrade freezes, desiccates, saturates, or is disturbed, the affected material should be removed, or the materials should be scarified, moisture conditioned, and recompacted, prior to slab construction.

As a minimum, temporary excavations should be sloped or braced, as required by Occupational Safety and Health Administration (OSHA) regulations, to provide stability and safe working conditions. The contractor is usually responsible for designing and constructing stable, temporary excavations and should shore, slope or bench the sides of the excavations, as required, to maintain stability of both the excavation sides and bottom. All excavations should comply with applicable local, State, and federal safety regulations, including the current OSHA Excavation and Trench Safety Standards.

Construction site safety is the sole responsibility of the contractor who controls the means, methods, and sequencing of construction operations. Under no circumstances shall the information provided herein be interpreted to mean Terracon is assuming responsibility for construction site safety, or the contractor's activities; such responsibility shall neither be implied nor inferred.

Construction Observation and Testing

A qualified testing agency should be retained during the construction phase of the project to observe earthwork and to perform necessary tests and observations during subgrade preparation; proof-rolling; placement and compaction of controlled compacted fills; backfilling of excavations in the completed subgrade; and for construction of foundations.

Each lift of compacted fill should be tested, evaluated, and reworked as necessary until approved by the Geotechnical Engineer prior to placement of additional lifts. Each lift of fill should be tested for density and water content at a frequency of at least one test for every 5,000 square feet of compacted fill in open areas and every 50 linear feet of compacted utility trench backfill. In areas of foundation excavations, the bearing subgrade should be evaluated under the direction of the Geotechnical Engineer. If unanticipated conditions are encountered, the Geotechnical Engineer should prescribe mitigation options.

In addition to the documentation of the essential parameters necessary for construction, the continuation of the Geotechnical Engineer into the construction phase of the project provides the continuity to maintain the Geotechnical Engineer's evaluation of subsurface conditions, including assessing variations and associated design changes.

SEISMIC CONSIDERATIONS

The seismic design requirements for buildings and other structures are based on Seismic Design Category. Site Classification is required to determine the Seismic Design Category for a structure. The Site Classification is based on the upper 100 feet of the site profile defined by a weighted average value of either shear wave velocity, standard penetration resistance, or undrained shear strength in accordance with Section 20.4 of ASCE 7 and the International Building Code (IBC). Based on the soil properties encountered at the site and as described on the exploration logs and results, it is our professional opinion that the **Seismic Site Classification** is **D**. Subsurface explorations at this site were extended to a maximum depth of 50 feet. The site properties below the boring depth to 100 feet were estimated based on our experience and knowledge of geologic conditions of the general area. Additional deeper borings or geophysical testing may be performed to confirm the conditions below the current boring depth.

ACCESS ROADWAYS

General Comments

Surficial materials below the topsoil at the site primarily consists of loose to medium dense mixtures of silt, sand and gravel. It is expected that the proposed site grades will be established

near the existing site grades using engineered fill material similar to the surficial soils to level the planned haul road areas.

We understand that haul roads consist of aggregate sections with no asphalt or concrete surface. Recommendations are presented below for two alternative aggregate sections: one assuming the aggregate section placed over stable, proofrolled native subgrade materials; the second for the case where achieving a stabilized subgrade may be difficult or not possible due to weather conditions at the time of construction.

The access road area subgrades should be properly sloped to direct water from beneath the drive area gravel section toward the edge, and/or down gradient. Collected water should be channeled away from the access road. Adequate sloping of the gravel surface will minimize the potential for ponding of water on or within proximity to the drive area, which will shorten the life of the unpaved roadways.

The aggregate sections presented in this report are considered minimal sections based upon the expected traffic and the composite subgrade conditions; however, they are expected to function with periodic maintenance if good drainage is provided and maintained.

Aggregate Section Over Stable Subgrade

The haul road subgrades should be prepared in accordance with the recommendations provided in **Earthwork** section, above, including proof-rolling and removal/replacement of soft/unstable areas identified by the proof-rolling. These subgrades should be prepared immediately prior to the time of aggregate placement to reduce the risk of disturbance due to weather or construction vehicle traffic. If this cannot be done, the subgrades should be reevaluated by a qualified Geotechnical Engineer for disturbance or softening immediately prior to aggregate placement. For subgrades prepared in accordance with **Earthwork** section, we recommend that the aggregate section consist of a minimum 9 inches of NYSDOT Type 2 Subbase Course Aggregate compacted to 95 percent of its maximum dry density as determined by the ASTM D1557 test procedure (Modified Proctor Test).

To maintain surface drainage, the subgrade should have a minimum ¼-inch per foot slope and the final grade adjacent to the road should slope down from road edges at a minimum 2 percent.

Aggregate Section Over Weak Subgrades

The requested pervious haul road could also be established over a relatively weak subgrade with CBR values less than 3, which would allow placement of the roadway section over on-site soils with minimal subgrade preparation activities, without the need for proof-rolling with a heavy construction equipment.

For this scenario, we recommend that the aggregate section consist of a minimum of 15 inches of compacted NYSDOT Type 2 Subbase Course Aggregate placed over high-performance geotextile Mirafi RS380i, or equivalent, installed over the existing subgrade. The high-performance geotextile will provide reinforcement strength to the aggregate material and will limit migration from the underlying subgrade, which may contribute to its degradation and loss of strength. Based upon the soil conditions at the time of construction, additional Subbase Course Aggregate and/or multiple layers of high-strength geotextile may be required to stabilize the aggregate section.

In areas where fill materials are required to level the proposed pavement subgrade, we recommend that these fill materials be compacted at least to the density of the existing subgrade soils.

Haul Road Maintenance

Regardless of the design, unsurfaced roadways will display varying levels of wear and deterioration. We recommend implementation of a site inspection program at a frequency of at least once per year to verify the adequacy of the roadways. Preventative measures should be applied as needed for erosion control and regrading. An initial site inspection should be completed approximately three months following construction. For planning purposes, we recommend assuming that over time the placement of additional aggregate material will likely be required to level depressions and long-term rutting. These areas should be filled with additional aggregate rather than scalping of material from adjacent areas.

Shoulder build-up on both sides of proposed roadways should match the road surface elevation and slope outwards at a minimum grade of 10 percent for five feet. Surface drainage should be provided away from the edge of roadways to reduce lateral moisture transmission into the subgrade.

When potholes, ruts, depressions or yielding subgrades develop, they must be repaired prior to applying additional traffic loads. Typical repairs could consist of placing additional Crushed Stone in ruts or depressed areas and, in some cases, complete removal of Crushed Stone surfacing, repair of unstable subgrade, and replacement of the Crushed Stone surfacing. Potholes and depressions should not be filled by blading adjacent ridges or high areas into the depressed areas. New material should be added to the depressed areas as they develop. Failure to make timely repairs will result in more rapid deterioration of the roadways, making more extensive repairs necessary.

GENERAL COMMENTS

Our analysis and opinions are based upon our understanding of the project, the geotechnical conditions in the area, and the data obtained from our site exploration. Natural variations will occur between exploration point locations or due to the modifying effects of construction or weather. The nature and extent of such variations may not become evident until during or after construction. Terracon should be retained as the Geotechnical Engineer, where noted in this report, to provide observation and testing services during pertinent construction phases. If variations appear, we can provide further evaluation and supplemental recommendations. If variations are noted in the absence of our observation and testing services on-site, we should be immediately notified so that we can provide evaluation and supplemental recommendations.

Our Scope of Services does not include either specifically or by implication any environmental or biological (e.g., mold, fungi, bacteria) assessment of the site or identification or prevention of pollutants, hazardous materials or conditions. If the owner is concerned about the potential for such contamination or pollution, other studies should be undertaken.

Our services and any correspondence or collaboration through this system are intended for the sole benefit and exclusive use of our client for specific application to the project discussed and are accomplished in accordance with generally accepted geotechnical engineering practices with no third-party beneficiaries intended. Any third-party access to services or correspondence is solely for information purposes to support the services provided by Terracon to our client. Reliance upon the services and any work product is limited to our client, and is not intended for third parties. Any use or reliance of the provided information by third parties is done solely at their own risk. No warranties, either express or implied, are intended or made.

Site characteristics as provided are for design purposes and not to estimate excavation cost. Any use of our report in that regard is done at the sole risk of the excavating cost estimator as there may be variations on the site that are not apparent in the data that could significantly impact excavation cost. Any parties charged with estimating excavation costs should seek their own site characterization for specific purposes to obtain the specific level of detail necessary for costing. Site safety, and cost estimating including, excavation support, and dewatering requirements/design are the responsibility of others. If changes in the nature, design, or location of the project are planned, our conclusions and recommendations shall not be considered valid unless we review the changes and either verify or modify our conclusions in writing.

ATTACHMENTS

APPENDIX A

LOCATION PLAN AND FIELD EXPLORATION RESULTS

(Exhibits- A001 through A032)

SITE LOCATION

Trelina Solar Site ■ Geneva, New York
Project No.: J5195163

Terracon GeoReport

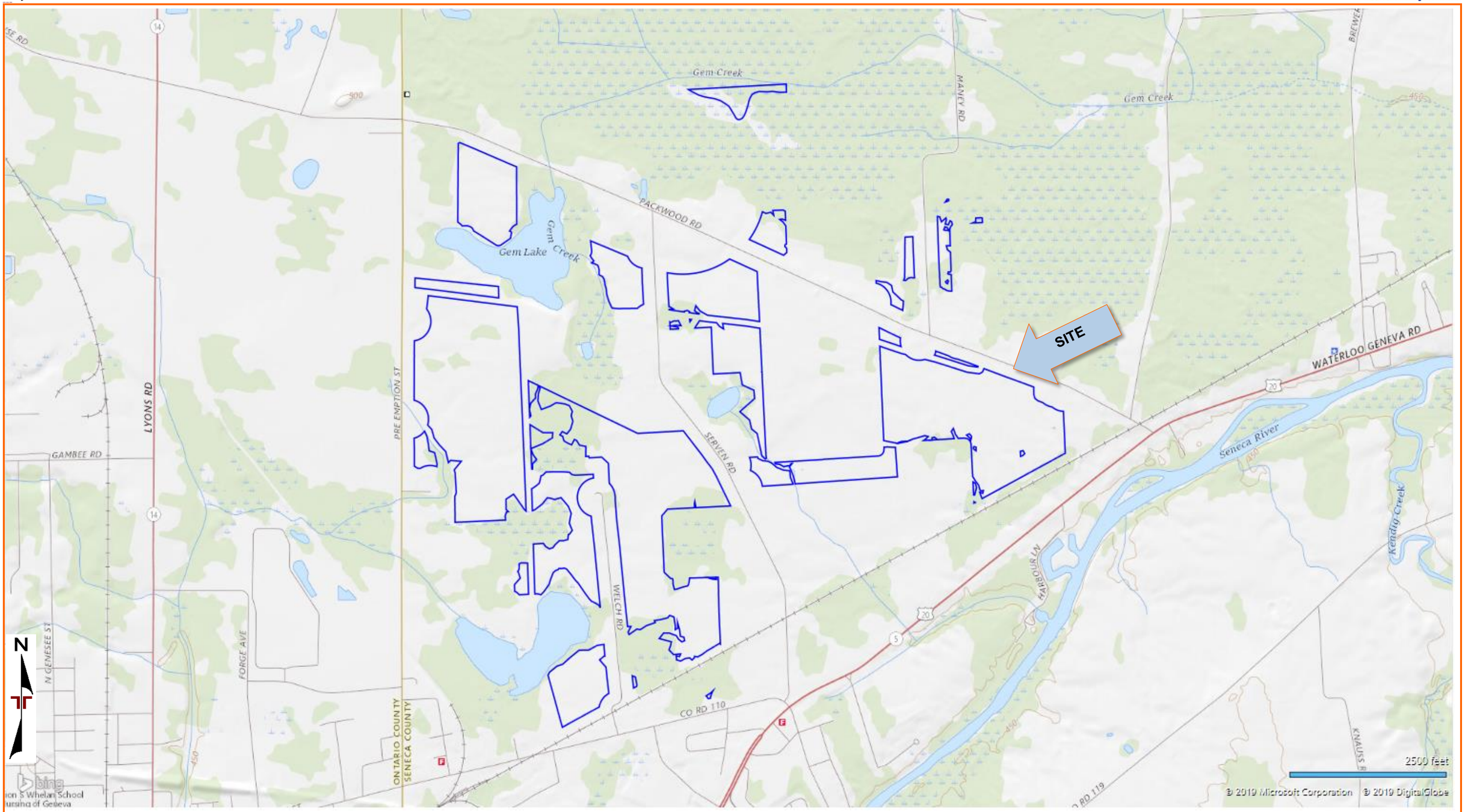


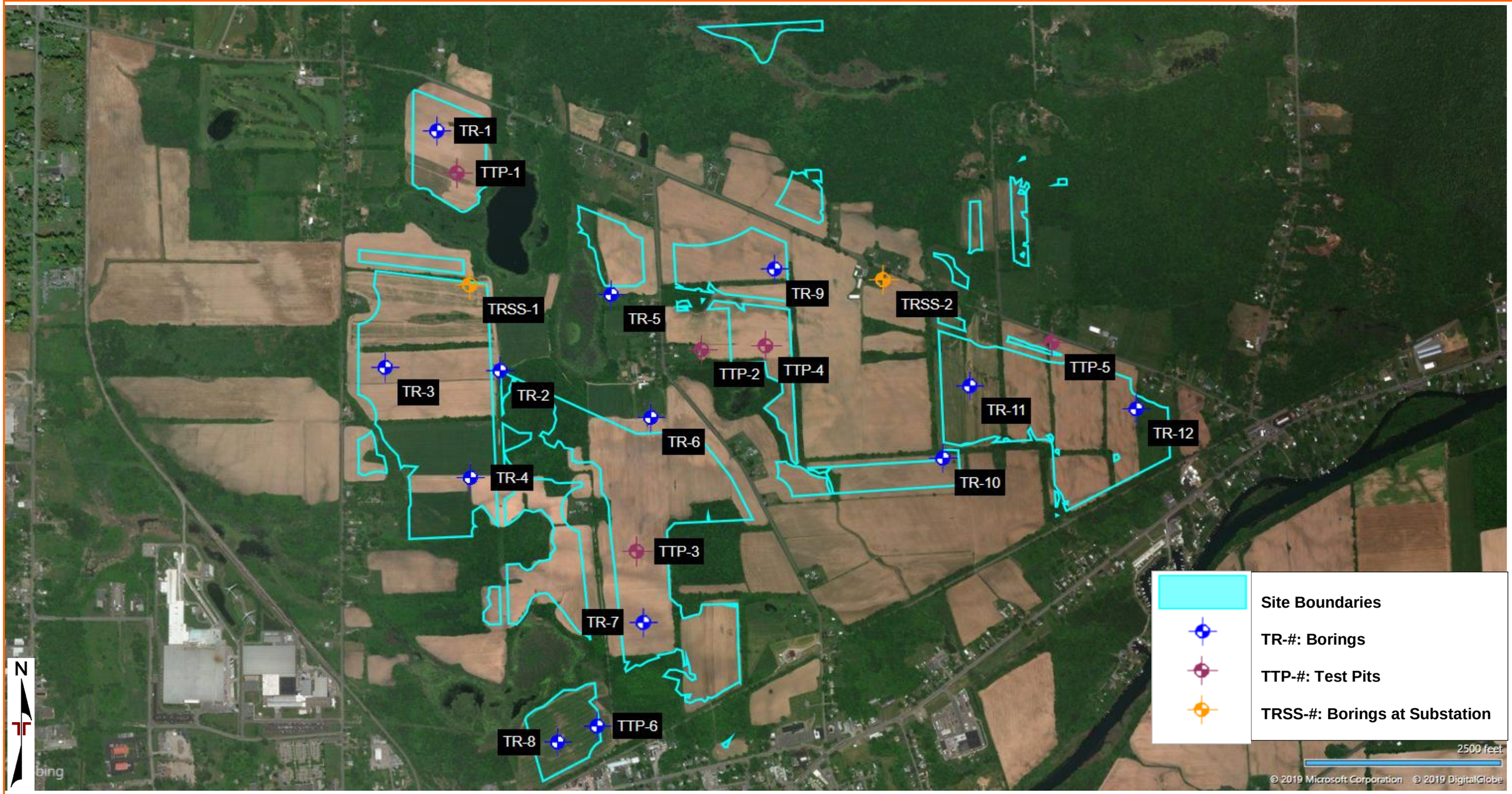
DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

MAP PROVIDED BY MICROSOFT BING MAPS

EXPLORATION PLAN: BORING LOCATIONS

Trelina Solar Site ■ Geneva, New York

Project No.: J5195163



IAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

MAP PROVIDED BY USGS

EXPLORATION PLAN: BORING LOGS WITH ANALYSIS ZONES

Trelina Solar Site ■ Geneva, New York
Project No.: J5195163

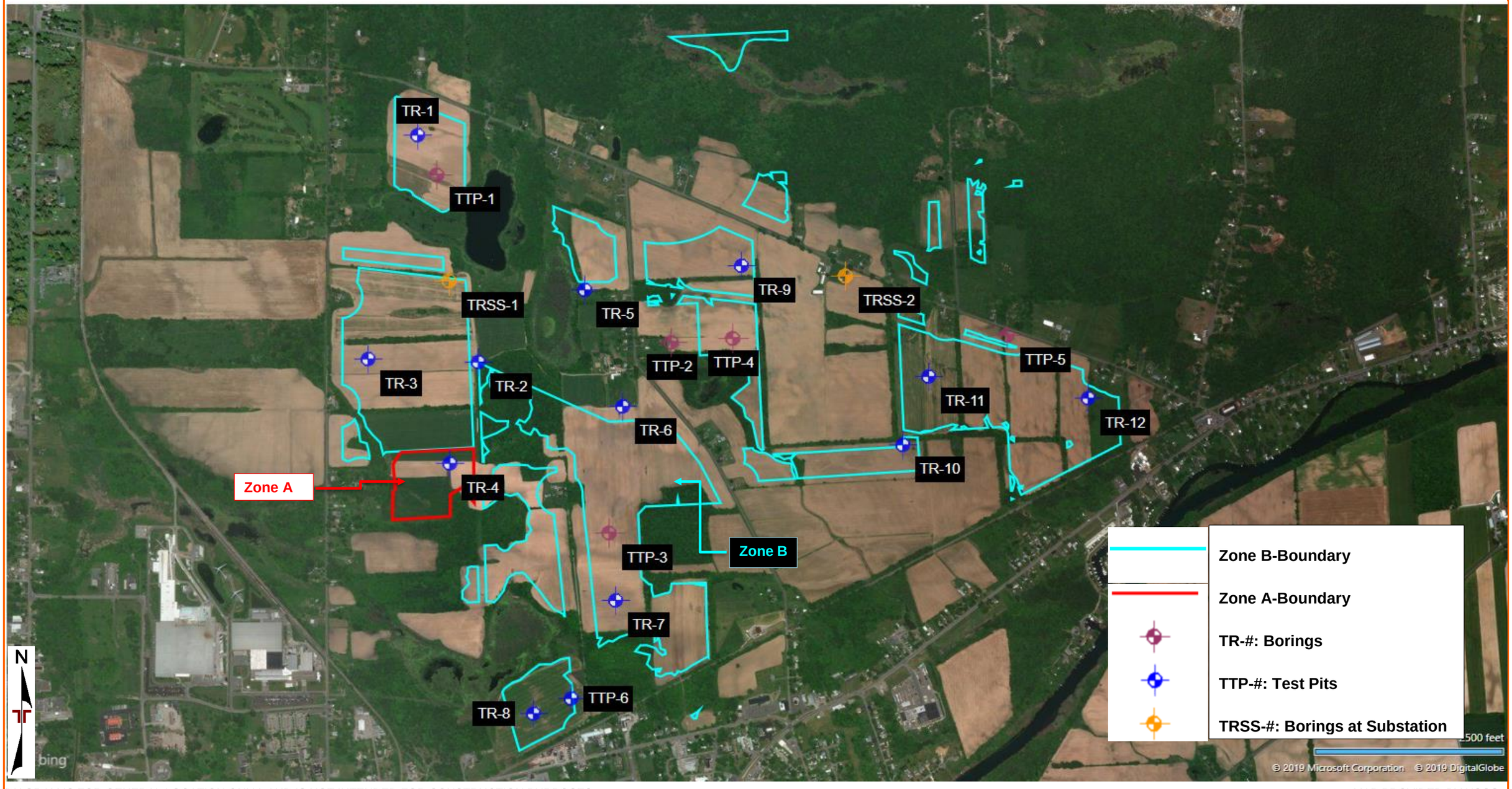


DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

MAP PROVIDED BY USGS

GENERAL NOTES

DESCRIPTION OF SYMBOLS AND ABBREVIATIONS

Trelina Solar Site - Preliminary ■ Geneva, NY

■ Terracon Project No. J5195163

Terracon GeoReport

SAMPLING	WATER LEVEL	FIELD TESTS
Grab Sample Standard Penetration Test	**Water Initially Encountered** **Water Level After a Specified Period of Time** **Water Level After a Specified Period of Time** Water levels indicated on the soil boring logs are the levels measured in the borehole at the times indicated. Groundwater level variations will occur over time. In low permeability soils, accurate determination of groundwater levels is not possible with short term water level observations.	**N** Standard Penetration Test Resistance (Blows/Ft.) **(HP)** Hand Penetrometer **(T)** Torvane **(DCP)** Dynamic Cone Penetrometer **UC** Unconfined Compressive Strength **(PID)** Photo-Ionization Detector **(OVA)** Organic Vapor Analyzer

DESCRIPTIVE SOIL CLASSIFICATION

Soil classification is based on the Unified Soil Classification System. Coarse Grained Soils have more than 50% of their dry weight retained on a #200 sieve; their principal descriptors are: boulders, cobbles, gravel or sand. Fine Grained Soils have less than 50% of their dry weight retained on a #200 sieve; they are principally described as clays if they are plastic, and silts if they are slightly plastic or non-plastic. Major constituents may be added as modifiers and minor constituents may be added according to the relative proportions based on grain size. In addition to gradation, coarse-grained soils are defined on the basis of their in-place relative density and fine-grained soils on the basis of their consistency.

LOCATION AND ELEVATION NOTES

Unless otherwise noted, Latitude and Longitude are approximately determined using a hand-held GPS device. The accuracy of such devices is variable. Surface elevation data annotated with +/- indicates that no actual topographical survey was conducted to confirm the surface elevation. Instead, the surface elevation was approximately determined from topographic maps of the area.

STRENGTH TERMS

RELATIVE DENSITY OF COARSE-GRAINED SOILS (More than 50% retained on No. 200 sieve.) Density determined by Standard Penetration Resistance		CONSISTENCY OF FINE-GRAINED SOILS (50% or more passing the No. 200 sieve.) Consistency determined by laboratory shear strength testing, field visual-manual procedures or standard penetration resistance		
Descriptive Term (Density)	**Standard Penetration or N-Value Blows/Ft.**	**Descriptive Term (Consistency)**	**Unconfined Compressive Strength Qu, (tsf)**	**Standard Penetration or N-Value Blows/Ft.**
Very Loose	0 - 3	Very Soft	less than 0.25	0 - 1
Loose	4 - 9	Soft	0.25 to 0.50	2 - 4
Medium Dense	10 - 29	Medium Stiff	0.50 to 1.00	4 - 8
Dense	30 - 50	Stiff	1.00 to 2.00	8 - 15
Very Dense	> 50	Very Stiff	2.00 to 4.00	15 - 30
		Hard	> 4.00	> 30

RELATIVE PROPORTIONS OF SAND AND GRAVEL		RELATIVE PROPORTIONS OF FINES	
Descriptive Term(s) of other constituents	Percent of Dry Weight	**Descriptive Term(s) of other constituents**	**Percent of Dry Weight**
Trace	<15	Trace	<5
With	15-29	With	5-12
Modifier	>30	Modifier	>12

GRAIN SIZE TERMINOLOGY		PLASTICITY DESCRIPTION	
Major Component of Sample	**Particle Size**	**Term**	**Plasticity Index**
Boulders	Over 12 in. (300 mm)	Non-plastic	0
Cobbles	12 in. to 3 in. (300mm to 75mm)	Low	1 - 10
Gravel	3 in. to #4 sieve (75mm to 4.75 mm)	Medium	11 - 30
Sand	#4 to #200 sieve (4.75mm to 0.075mm	High	> 30
Silt or Clay	Passing #200 sieve (0.075mm)		

UNIFIED SOIL CLASSIFICATION SYSTEM

Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests [A]					Soil Classification	
					Group Symbol	Group Name [B]
Coarse-Grained Soils: More than 50% retained on No. 200 sieve	**Gravels:** More than 50% of coarse fraction retained on No. 4 sieve	**Clean Gravels:** Less than 5% fines [C]	$Cu \geq 4$ and $1 \leq Cc \leq 3$ [E]		GW	Well-graded gravel [F]
			$Cu < 4$ and/or [$Cc<1$ or $Cc>3.0$] [E]		GP	Poorly graded gravel [F]
		Gravels with Fines: More than 12% fines [C]	Fines classify as ML or MH		GM	Silty gravel [F, G, H]
			Fines classify as CL or CH		GC	Clayey gravel [F, G, H]
	Sands: 50% or more of coarse fraction passes No. 4 sieve	**Clean Sands:** Less than 5% fines [D]	$Cu \geq 6$ and $1 \leq Cc \leq 3$ [E]		SW	Well-graded sand [I]
			$Cu < 6$ and/or [$Cc<1$ or $Cc>3.0$] [E]		SP	Poorly graded sand [I]
		Sands with Fines: More than 12% fines [D]	Fines classify as ML or MH		SM	Silty sand [G, H, I]
			Fines classify as CL or CH		SC	Clayey sand [G, H, I]
Fine-Grained Soils: 50% or more passes the No. 200 sieve	**Silts and Clays:** Liquid limit less than 50	**Inorganic:**	PI > 7 and plots on or above "A"		CL	Lean clay [K, L, M]
			PI < 4 or plots below "A" line [J]		ML	Silt [K, L, M]
		Organic:	Liquid limit - oven dried	< 0.75	OL	Organic clay [K, L, M, N]
			Liquid limit - not dried			Organic silt [K, L, M, O]
	Silts and Clays: Liquid limit 50 or more	**Inorganic:**	PI plots on or above "A" line		CH	Fat clay [K, L, M]
			PI plots below "A" line		MH	Elastic Silt [K, L, M]
		Organic:	Liquid limit - oven dried	< 0.75	OH	Organic clay [K, L, M, P]
			Liquid limit - not dried			Organic silt [K, L, M, Q]
Highly organic soils:	Primarily organic matter, dark in color, and organic odor				PT	Peat

[A] Based on the material passing the 3-inch (75-mm) sieve.

[B] If field sample contained cobbles or boulders, or both, add "with cobbles or boulders, or both" to group name.

[C] Gravels with 5 to 12% fines require dual symbols: GW-GM well-graded gravel with silt, GW-GC well-graded gravel with clay, GP-GM poorly graded gravel with silt, GP-GC poorly graded gravel with clay.

[D] Sands with 5 to 12% fines require dual symbols: SW-SM well-graded sand with silt, SW-SC well-graded sand with clay, SP-SM poorly graded sand with silt, SP-SC poorly graded sand with clay.

[E] $Cu = D_{60}/D_{10}$ $\quad Cc = \dfrac{(D_{30})^2}{D_{10} \times D_{60}}$

[F] If soil contains ≥ 15% sand, add "with sand" to group name.

[G] If fines classify as CL-ML, use dual symbol GC-GM, or SC-SM.

[H] If fines are organic, add "with organic fines" to group name.

[I] If soil contains ≥ 15% gravel, add "with gravel" to group name.

[J] If Atterberg limits plot in shaded area, soil is a CL-ML, silty clay.

[K] If soil contains 15 to 29% plus No. 200, add "with sand" or "with gravel," whichever is predominant.

[L] If soil contains ≥ 30% plus No. 200 predominantly sand, add "sandy" to group name.

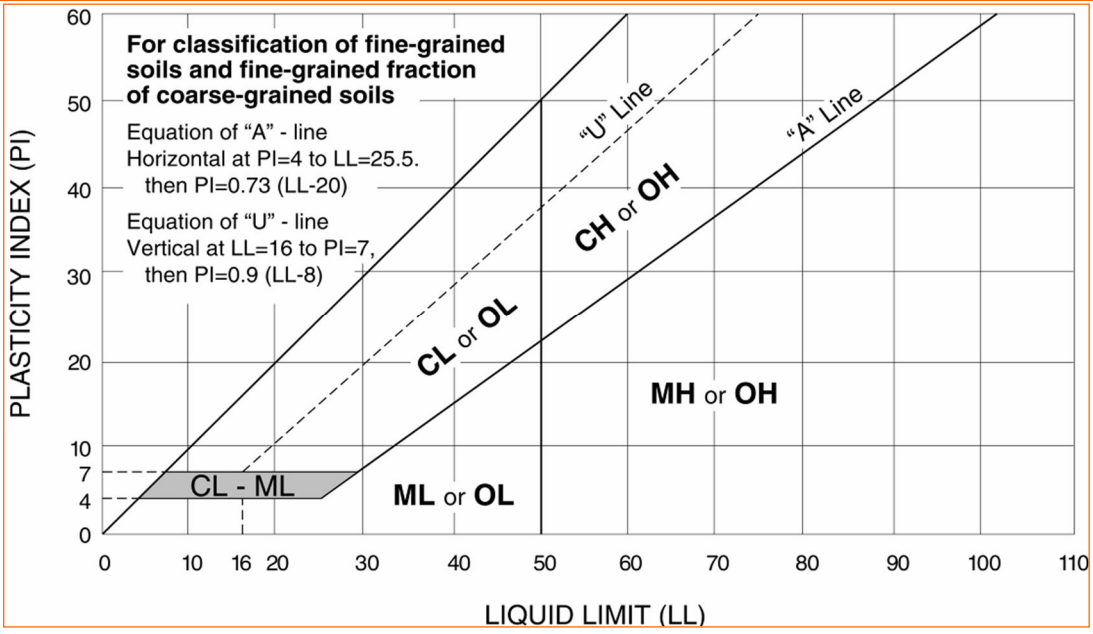
[M] If soil contains ≥ 30% plus No. 200, predominantly gravel, add "gravelly" to group name.

[N] PI ≥ 4 and plots on or above "A" line.

[O] PI < 4 or plots below "A" line.

[P] PI plots on or above "A" line.

[Q] PI plots below "A" line.



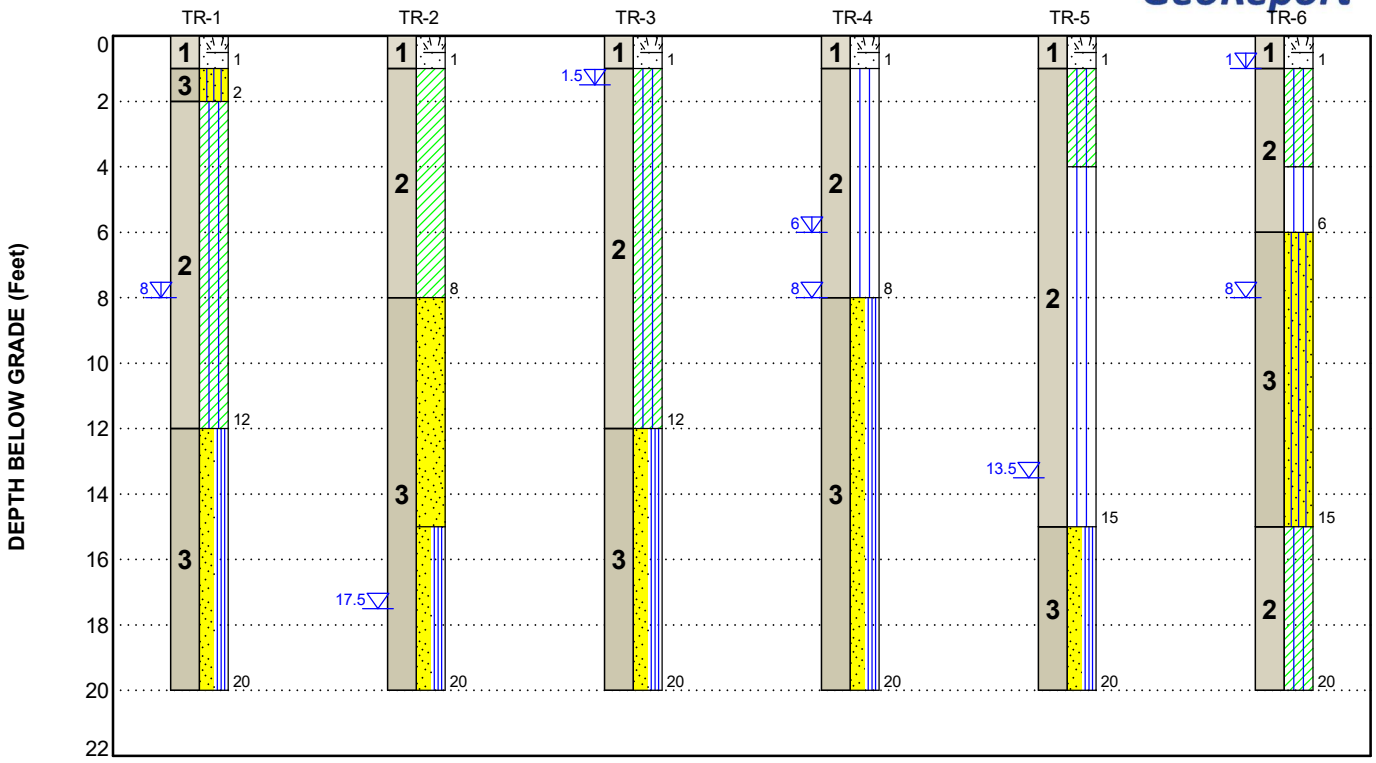
GEOMODELS (Exhibits- A006 through A009)

BORING LOGS (Exhibits- A010 through A031)

INFILTRATION TEST DATA (Exhibits-A032)

GEOMODEL-1

Trelina Solar Site - Preliminary ■ Geneva, NY
Terracon Project No. J5195163



This is not a cross section. This is intended to display the Geotechnical Model only. See individual logs for more detailed conditions.

Model Layer	Layer Name	General Description
1	**Surficial**	Topsoil: contains significant organic matter, black
2	**Native Fine Grained Soils**	Silts and Clays (CL, ML, and CL-ML), red to brown, soft to very stiff
3	**Native Coarse Grained Soils**	Sand and Silty Sand (SM, SP, and SM,SP), red to brown, loose to dense

LEGEND

- Topsoil
- Silty Sand
- Silty Clay
- Poorly-graded Sand with Silt
- Lean Clay
- Poorly-graded Sand
- Silt

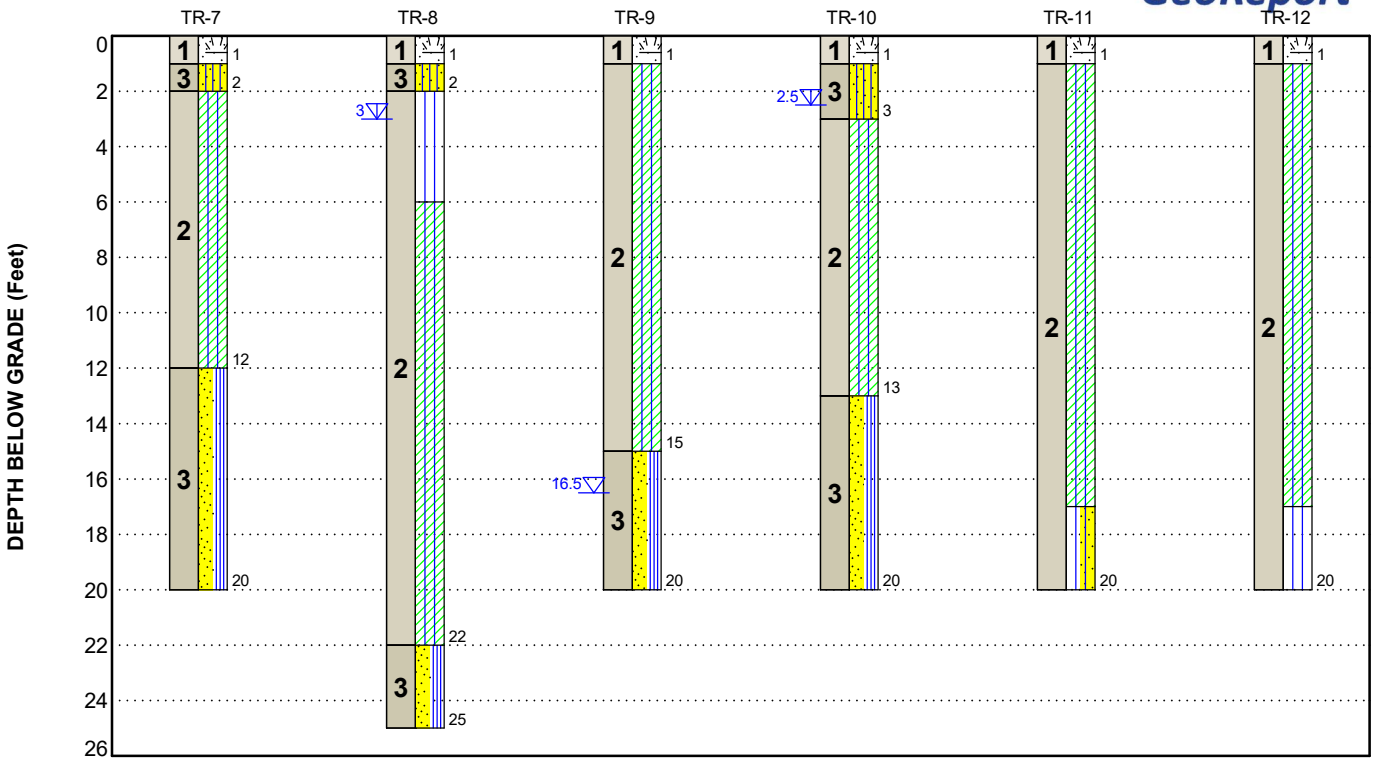
▽ First Water Observation
▽ Second Water Observation

NOTES:
Layering shown on this figure has been developed by the geotechnical engineer for purposes of modeling the subsurface conditions as required for the subsequent geotechnical engineering for this project. Numbers adjacent to soil column indicate depth below ground surface.

GEOMODEL-2

Trelina Solar Site - Preliminary ■ Geneva, NY
Terracon Project No. J5195163

Terracon GeoReport



This is not a cross section. This is intended to display the Geotechnical Model only. See individual logs for more detailed conditions.

Model Layer	Layer Name	General Description
1	**Surficial**	Topsoil: contains significant organic matter, black
2	**Native Fine Grained Soils**	Silts and Clays (CL, ML, and CL-ML), red to brown, soft to very stiff
3	**Native Coarse Grained Soils**	Sand and Silty Sand (SM, SP, and SM,SP), red to brown, loose to dense

LEGEND

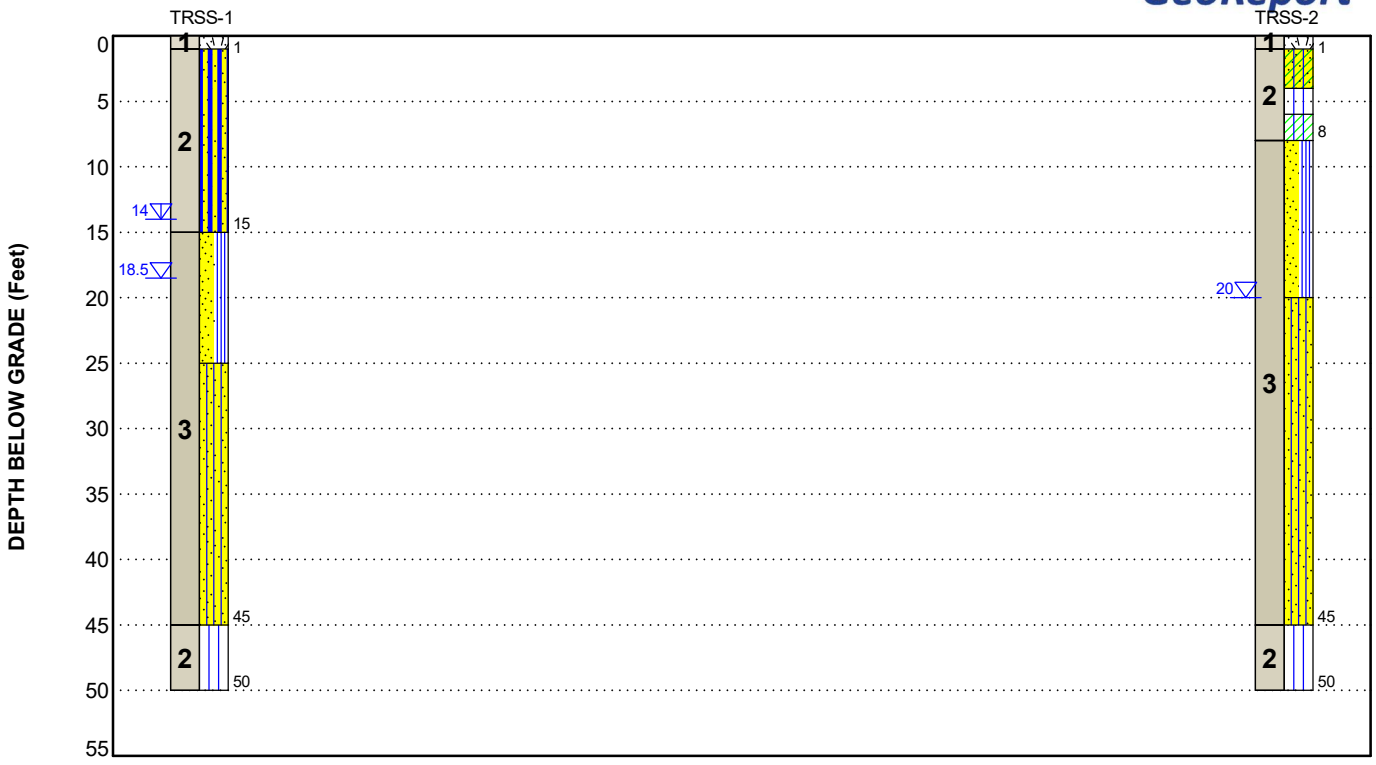
- Topsoil
- Silty Sand
- Silty Clay
- Poorly-graded Sand with Silt
- Silt
- Silt with Sand

▽ First Water Observation
▽ Second Water Observation

NOTES:
Layering shown on this figure has been developed by the geotechnical engineer for purposes of modeling the subsurface conditions as required for the subsequent geotechnical engineering for this project. Numbers adjacent to soil column indicate depth below ground surface.

GEOMODEL-3

Trelina Solar Site - Preliminary ■ Geneva, NY
Terracon Project No. J5195163



This is not a cross section. This is intended to display the Geotechnical Model only. See individual logs for more detailed conditions.

Model Layer	Layer Name	General Description
1	**Surficial**	Topsoil: contains significant organic matter, black
2	**Native Fine Grained Soils**	Silts and Clays (CL, ML, and CL-ML), red to brown, soft to very stiff
3	**Native Coarse Grained Soils**	Sand and Silty Sand (SM, SP, and SM,SP), red to brown, loose to dense

LEGEND

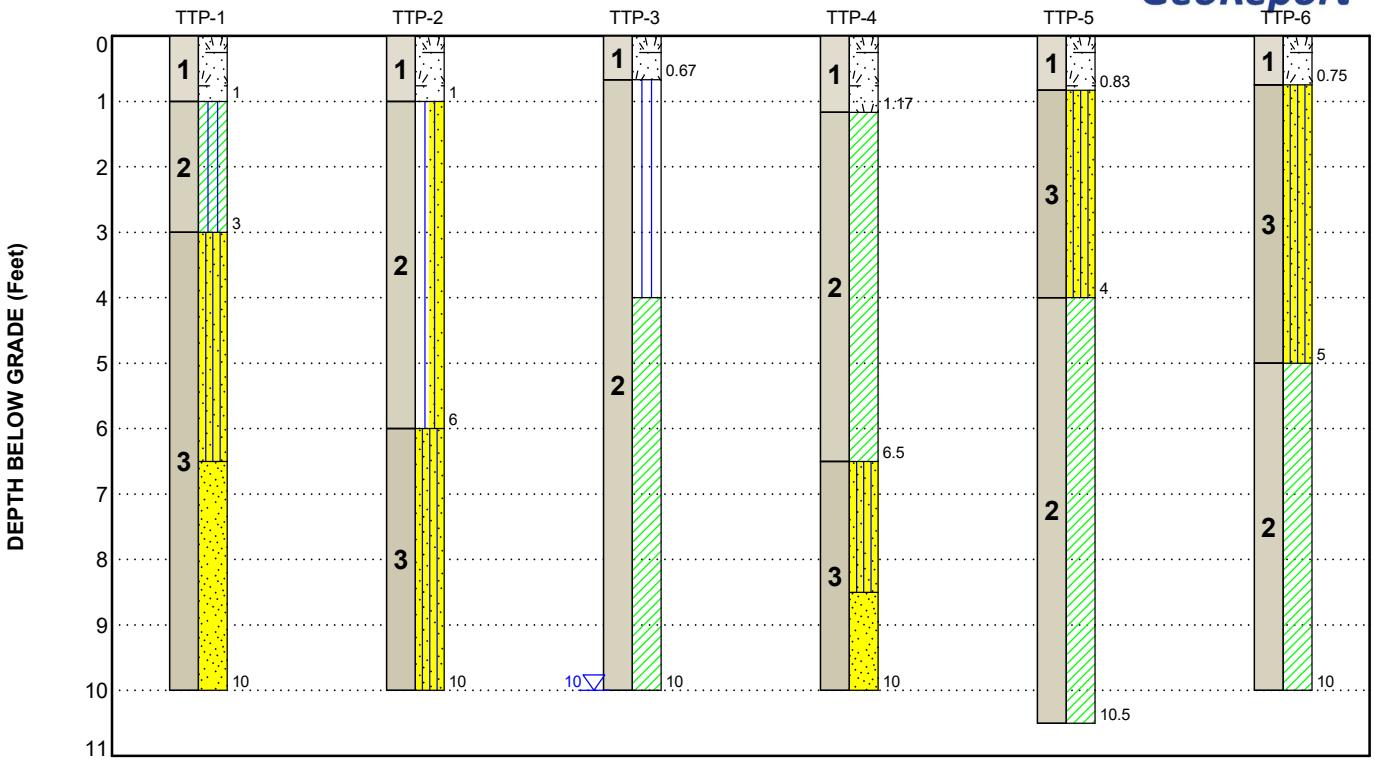
- Topsoil
- Sandy Silt
- Poorly-graded Sand with Silt
- Silty Sand
- Silt
- Sandy Silty Clay
- Silty Clay

▽ First Water Observation
▽ Second Water Observation

NOTES:
Layering shown on this figure has been developed by the geotechnical engineer for purposes of modeling the subsurface conditions as required for the subsequent geotechnical engineering for this project. Numbers adjacent to soil column indicate depth below ground surface.

GEOMODEL-4

Trelina Solar Site - Preliminary ■ Geneva, NY
Terracon Project No. J5195163



This is not a cross section. This is intended to display the Geotechnical Model only. See individual logs for more detailed conditions.

Model Layer	Layer Name	General Description
1	**Surficial**	Topsoil: contains significant organic matter, black
2	**Native Fine Grained Soils**	Silts and Clays (CL, ML, and CL-ML), red to brown, soft to very stiff
3	**Native Coarse Grained Soils**	Sand and Silty Sand (SM, SP, and SM,SP), red to brown, loose to dense

LEGEND

- Topsoil
- Poorly-graded Sand
- Lean Clay
- Silty Clay
- Silt with Sand
- Silty Sand
- Silt

▽ First Water Observation
▽ Second Water Observation

NOTES:
Layering shown on this figure has been developed by the geotechnical engineer for purposes of modeling the subsurface conditions as required for the subsequent geotechnical engineering for this project. Numbers adjacent to soil column indicate depth below ground surface.

BORING LOG NO. TR-1

PROJECT: Trelina Solar Site - Preliminary

CLIENT: NextEra Energy Constructors, LLC
Juno Beach, FL

SITE: PreEmption St
Geneva, NY

LOCATION See Exploration Plan

Latitude: 42.9038° Longitude: -76.9589°

Approximate Surface Elev.: 479 (Ft.) +/-

MODEL LAYER	GRAPHIC LOG	DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI
1		0.0	479+/-							
		TOPSOIL, black, friable and contains significant organic matter								
		1.0	478+/-							
3		**SILTY SAND (SM)**, red brown, loose					14	2-2-2-2 N=4	11	
		2.0	477+/-							
2		**SILTY CLAY (CL-ML)**, red brown, soft to very stiff, occasional silt seams and sand lenses					17	2-2-2-2 N=4	19	
				5			19	3-5-8-10 N=13	21	
					▽		20	9-10-12-10 N=22	25	
							19	3-3-4-6 N=7	27	
				10						
		12.0	467+/-							
3		**POORLY GRADED SAND WITH SILT (SP-SM)**, red brown, very loose to loose, occasional silt seams								
				15			16	4-2-1-2 N=3	24	
							22	2-2-4-5 N=6	23	
		20.0	459+/-	20						
		Boring Terminated at 20 Feet								

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
3.25 inch ID Hollow Stem Augers and 2 inch Split Barrel Sampler

Abandonment Method:
Temporary groundwater well installed upon completion

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

Elevations were interpolated from a Google Earth

Notes:
Temporary groundwater wells was installed at this location

WATER LEVEL OBSERVATIONS

No free water observed on 11/04/2019

▽ *8' BGS on 11/18/2019*

Terracon
15 Marway Cir, Ste 2B
Rochester, NY

Boring Started: 11-04-2019 | Boring Completed: 11-04-2019

Drill Rig: Diedrich D-50 | Driller: J. Tojdowski

Project No.: J5195163

BORING LOG NO. TR-2

PROJECT: Trelina Solar Site - Preliminary

CLIENT: NextEra Energy Constructors, LLC
Juno Beach, FL

SITE: PreEmption St
Geneva, NY

LOCATION See Exploration Plan

Latitude: 42.8953° Longitude: -76.9559°

Approximate Surface Elev.: 481 (Ft.) +/-

MODEL LAYER	GRAPHIC LOG	DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI
1		0.0	480+/-							
			TOPSOIL, black, friable and contains significant organic matter							
		1.0	480+/-							
			LEAN CLAY (CL), trace sand, red-brown, stiff to very stiff				17	3-5-5-6 N=10	19	
							19	6-8-10-8 N=18	25	
2				5			18	3-3-5-6 N=8	24	32-19-13
			Contains occasioal fine sand lenses				17	8-10-8-8 N=18	24	
		8.0	473+/-							
			POORLY GRADED SAND (SP), trace silt, brown, loose				17	5-4-5-8 N=9	8	
3				10						
		15.0	466+/-							
			POORLY GRADED SAND WITH SILT (SP-SM), occasional silt seams, occasional clay partings, brown, loose to medium dense	15			14	5-6-5-6 N=11	26	
					▽					
							20	4-4-5-4 N=9	27	
		20.0	461+/-	20						
			Boring Terminated at 20 Feet							

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
3.25 inch ID Holllow Stem Augers and 2 inch Split Barrel Sampler

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

Elevations were interpolated from a Google Earth

Notes:

WATER LEVEL OBSERVATIONS

▽ *17.5' at completion of drilling*

Terracon
15 Marway Cir, Ste 2B
Rochester, NY

Boring Started: 10-30-2019 | Boring Completed: 10-31-2019

Drill Rig: Diedrich D-50 | Driller: J. Tojdowski

Project No.: J5195163

BORING LOG NO. TR-3

PROJECT: Trelina Solar Site - Preliminary

CLIENT: NextEra Energy Constructors, LLC
Juno Beach, FL

SITE: PreEmption St
Geneva, NY

LOCATION See Exploration Plan

Latitude: 42.8954° Longitude: -76.9614°

Approximate Surface Elev.: 473 (Ft.) +/-

MODEL LAYER	GRAPHIC LOG	DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI
1		0	472+/-							
		1.0								
2							20	5-5-5-6 N=10	11	
							19	8-11-12-15 N=23	20	
				5			16	5-5-7-10 N=12	20	
							18	10-7-6-6 N=13	24	
							14	2-2-3-5 N=5	24	
		12.0	461+/-	10						
3										
				15			18	6-6-7-7 N=13	19	
							20	4-6-8-7 N=14	21	
		20.0	453+/-	20						

TOPSOIL, black, friable and contains significant organic matter

SILTY CLAY (CL-ML), red brown, medium stiff to very stiff, occasional silt partings and silt seams

Contains occasional fine sand lenses

POORLY GRADED SAND WITH SILT (SP-SM), red brown, medium dense, becomes brown gray, occasional silt seams and clay partings

Boring Terminated at 20 Feet

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
3.25 inch ID Holllow Stem Augers and 2 inch Split Barrel Sampler

Abandonment Method:
Temporary groundwater well installed upon completion

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

Elevations were interpolated from a Google Earth

Notes:
Temporary groundwater wells was installed at this location

WATER LEVEL OBSERVATIONS

No free water observed on 11/05/2019

1.5' BGS on 11/18/2019

Terracon
15 Marway Cir, Ste 2B
Rochester, NY

Boring Started: 11-05-2019 | Boring Completed: 11-05-2019

Drill Rig: Diedrich D-50 | Driller: J. Tojdowski

Project No.: J5195163

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL J5195163 TRELINA SOLAR SIT.GPJ TERRACON_DATATEMPLATE.GDT 1/20/20

BORING LOG NO. TR-4

PROJECT: Trelina Solar Site - Preliminary

CLIENT: NextEra Energy Constructors, LLC
Juno Beach, FL

SITE: PreEmption St
Geneva, NY

LOCATION See Exploration Plan

Latitude: 42.8915° Longitude: -76.9573°

Approximate Surface Elev.: 470 (Ft.) +/-

MODEL LAYER	GRAPHIC LOG	DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI
1		0.0	469+/-							
							18	3-3-6-7 N=9	21	
							16	8-10-14-14 N=24	18	
2				5			18	5-6-9-9 N=15	19	40-29-11
							22	10-12-16-19 N=28	28	
		8.0	462+/-							
3				10			16	4-4-4-4 N=8	27	
				15			18	3-9-13-16 N=22	23	
							20	14-10-12-9 N=22	23	
		20.0	450+/-	20						

TOPSOIL, black, friable and contains significant organic matter

SILT (ML), trace sand, red-brown, stiff to very stiff

Contains occasional silt partings and seams

POORLY GRADED SAND WITH SILT (SP-SM), fine grained, brown, loose

Becomes brown-gray, medium dense

Contains occasional silt seams

Boring Terminated at 20 Feet

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
3.25 inch ID Holllow Stem Augers and 2 inch Split Barrel Sampler

Abandonment Method:
Temporary groundwater well installed upon completion

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

Elevations were interpolated from a Google Earth

Notes:
Temporary groundwater wells was installed at this location

WATER LEVEL OBSERVATIONS

8' at completion of drilling

6.0' BGS on 11/15/2019

Terracon
15 Marway Cir, Ste 2B
Rochester, NY

Boring Started: 10-30-2019 | Boring Completed: 10-31-2019

Drill Rig: Diedrich D-50 | Driller: J. Tojdowski

Project No.: J5195163

BORING LOG NO. TR-5

PROJECT: Trelina Solar Site - Preliminary

CLIENT: NextEra Energy Constructors, LLC
Juno Beach, FL

SITE: PreEmption St
Geneva, NY

LOCATION See Exploration Plan

Latitude: 42.898° Longitude: -76.9506°

Approximate Surface Elev.: 478 (Ft.) +/-

MODEL LAYER	GRAPHIC LOG	DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI
2		**SILTY CLAY (CL-ML)**, trace sand, red-brown, soft to medium stiff								
		2.0	476+/-				18	2-2-2-3 N=4	33	
							11	3-3-4-5 N=7	22	
		4.0	474+/-							
		SILT (ML), trace sand, fine grained, brown, very stiff		5			15	7-7-9-9 N=16	24	
							17	9-12-12-8 N=24	32	
		Becomes red-brown, becomes medium stiff					18	3-3-3-5 N=6	33	39-26-13
				10	▽					
		15.0	463+/-							
3		**POORLY GRADED SAND WITH SILT (SP-SM)**, fine grained, gray, medium dense		15			11	5-8-4-3 N=12	24	
							16	5-5-8-7 N=13	23	
		20.0	458+/-	20						
		Boring Terminated at 20 Feet								

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
3.25 inch ID Holllow Stem Augers and 2 inch Split Barrel Sampler

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

Elevations were interpolated from a Google Earth

Notes:

WATER LEVEL OBSERVATIONS

▽ *13.5' at completion of drilling*

Terracon
15 Marway Cir, Ste 2B
Rochester, NY

Boring Started: 10-30-2019 | Boring Completed: 10-31-2019

Drill Rig: Diedrich D-50 | Driller: J. Tojdowski

Project No.: J5195163

BORING LOG NO. TR-6

PROJECT: Trelina Solar Site - Preliminary

CLIENT: NextEra Energy Constructors, LLC
Juno Beach, FL

SITE: PreEmption St
Geneva, NY

LOCATION See Exploration Plan

Latitude: 42.8936° Longitude: -76.9488°

Approximate Surface Elev.: 474 (Ft.) +/-

MODEL LAYER	GRAPHIC LOG	DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI
1		0.0	474+/-							
		TOPSOIL, black, friable and contains significant organic matter								
		1.0	473+/-							
2		**SILTY CLAY (CL-ML)**, trace sand, red-brown, medium stiff to stiff					19	1-2-3-4 N=5	26	
							17	4-5-7-7 N=12	24	
		4.0	470+/-							
		SILT (ML), trace sand, occasional clay partings, red-brown, very stiff		5			17	8-7-13-16 N=20	22	
		6.0	468+/-							
3		**SILTY SAND (SM)**, trace gravel, brown, dense to medium dense					16	11-15-19-18 N=34	22	NP
							15	4-7-10-11 N=17	22	
				10						
		15.0	459+/-							
2		**SILTY CLAY (CL-ML)**, trace sand, brown-gray, soft, occasional silt seams		15			18	4-1-1-2 N=2	32	
		Contains occasional silt seams								
		20.0	454+/-				20	WOH-2-2-6 N=4	27	
		Boring Terminated at 20 Feet		20						

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
3.25 inch ID Holllow Stem Augers and 2 inch Split Barrel Sampler

Abandonment Method:
Temporary groundwater well installed upon completion

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

Elevations were interpolated from a Google Earth

Notes:
Temporary groundwater wells was installed at this location

WATER LEVEL OBSERVATIONS

8' at completion of drilling

1' BGS on 11/15/2019

Terracon
15 Marway Cir, Ste 2B
Rochester, NY

Boring Started: 10-30-2019 | Boring Completed: 11-01-2019

Drill Rig: Diedrich D-50 | Driller: J. Tojdowski

Project No.: J5195163

BORING LOG NO. TR-7

PROJECT: Trelina Solar Site - Preliminary

CLIENT: NextEra Energy Constructors, LLC
Juno Beach, FL

SITE: PreEmption St
Geneva, NY

LOCATION See Exploration Plan

Latitude: 42.8863° Longitude: -76.9491°

Approximate Surface Elev.: 464 (Ft.) +/-

MODEL LAYER	GRAPHIC LOG	DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI
1		0.0	463+/-							
		TOPSOIL, black, friable and contains significant organic matter								
		1.0	463+/-							
3		**SILTY SAND (SM)**, trace clay, red brown, soft to medium stiff					18	2-2-2-3 N=4	18	
		2.0	462+/-							
2		**SILTY CLAY (CL-ML)**, trace sand, medium stiff to very stiff					16	5-4-8-10 N=12	21	
				5			19	4-5-9-12 N=14	19	
							21	12-14-16-15 N=30	21	
		Contains occasional silt seams					19	3-3-4-6 N=7	31	
				10						
		12.0	452+/-							
3		**POORLY GRADED SAND WITH SILT (SP-SM)**, dark gray, loose, occasional silt seams and clay partings								
				15			22	2-1-3-4 N=4	25	
							21	3-3-4-5 N=7	23	
		20.0	444+/-	20						
		Boring Terminated at 20 Feet								

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
3.25 inch ID Holllow Stem Augers and 2 inch Split Barrel Sampler

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

Elevations were interpolated from a Google Earth

Notes:

WATER LEVEL OBSERVATIONS

No free water observed at completion of drilling

Terracon
15 Marway Cir, Ste 2B
Rochester, NY

Boring Started: 11-06-2019 | Boring Completed: 11-06-2019

Drill Rig: Diedrich D-50 | Driller: J. Tojdowski

Project No.: J5195163

BORING LOG NO. TR-8

PROJECT: Trelina Solar Site - Preliminary

CLIENT: NextEra Energy Constructors, LLC
Juno Beach, FL

SITE: PreEmption St
Geneva, NY

LOCATION See Exploration Plan

Latitude: 42.882° Longitude: -76.9532°

Approximate Surface Elev.: 462 (Ft.) +/-

MODEL LAYER	GRAPHIC LOG	DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI
1		1.0	461+/-							
			TOPSOIL, black, friable and contains significant organic matter							
3		2.0	460+/-				18	2-2-3-3 N=5	22	
			SILTY SAND (SM), brown and gray, loose							
			SILT (ML), brown and red, stiff, contains occasional clay partings				22	5-6-7-6 N=13	23	
				5			16	5-4-5-5 N=9	22	
		6.0	456+/-							
2			**SILTY CLAY (CL-ML)**, brown and red, medium stiff to stiff, occasional clay seams and silt partings				17	6-7-5-9 N=12	23	
							19	3-4-1-2 N=5	29	
				10						
			Becomes brown-gray							
			Becomes very soft	15			18	WOH/2'	30	
							17	WOH/2'	33	
				20			19	WOH/1.5'-7	27	
		22.0	440+/-							
3			**POORLY GRADED SAND WITH SILT (SP-SM)**, brown, very loose, occasional clay partings				15	WOH-WOH-3-4 N=3	23	
		25.0	437+/-	25						
			Boring Terminated at 25 Feet							

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
3.25 inch ID Hollow Stem Augers and 2 inch Split Barrel Sampler

Abandonment Method:
Temporary groundwater well installed upon completion

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

Elevations were interpolated from a Google Earth

Notes:
WOH = Weight of Hammer and Rods
Temporary groundwater wells was installed at this location

WATER LEVEL OBSERVATIONS

No free water observed on 11/06/2019

3.0' BGS on 11/15/2019

Terracon
15 Marway Cir, Ste 2B
Rochester, NY

Boring Started: 11-06-2019 | Boring Completed: 11-06-2019

Drill Rig: Diedrich D-50 | Driller: J. Tojdowski

Project No.: J5195163

BORING LOG NO. TR-9

PROJECT: Trelina Solar Site - Preliminary

CLIENT: NextEra Energy Constructors, LLC
Juno Beach, FL

SITE: PreEmption St
Geneva, NY

LOCATION See Exploration Plan

Latitude: 42.8989° Longitude: -76.9429°

Approximate Surface Elev.: 480 (Ft.) +/-

MODEL LAYER	GRAPHIC LOG	DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI
1		0	480							
		1.0	479+/-							
2							20	3-2-5-6 N=7	18	
							16	5-5-6-9 N=11	26	
				5			18	4-6-7-9 N=13	23	
							19	10-14-10-8 N=24	32	
							18	3-2-1-2 N=3	35	
				10						
		15.0	465+/-							
3				15	▽		14	5-5-5-6 N=10	22	
							20	4-4-4-4 N=8	21	
		20.0	460+/-	20						

TOPSOIL, black, friable and contains significant organic matter

SILTY CLAY (CL-ML), trace sand, red-brown, medium stiff to very stiff

Contains occasional fine sand lenses

Becomes soft

POORLY GRADED SAND WITH SILT (SP-SM), occasional silt seams, occasional clay partings, brown, loose to medium dense

Boring Terminated at 20 Feet

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
3.25 inch ID Holllow Stem Augers and 2 inch Split Barrel Sampler

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

Elevations were interpolated from a Google Earth

Notes:

WATER LEVEL OBSERVATIONS

▽ *16.5' at completion of drilling*

Terracon
15 Marway Cir, Ste 2B
Rochester, NY

Boring Started: 10-31-2019 | Boring Completed: 11-01-2019

Drill Rig: Diedrich D-50 | Driller: J. Tojdowski

Project No.: J5195163

BORING LOG NO. TR-10

PROJECT: Trelina Solar Site - Preliminary

CLIENT: NextEra Energy Constructors, LLC
Juno Beach, FL

SITE: PreEmption St
Geneva, NY

LOCATION See Exploration Plan

Latitude: 42.8922° Longitude: -76.9349°

Approximate Surface Elev.: 471 (Ft.) +/-

MODEL LAYER	GRAPHIC LOG	DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI
1		0.0	470+/-							
		TOPSOIL, black, friable and contains significant organic matter								
		1.0	470+/-							
3		**SILTY SAND (SM)**, trace clay, red brown, loose					19	2-2-3-5 N=5	13	
		3.0	468+/-		▽		18	6-8-9-11 N=17	15	
2		**SILTY CLAY (CL-ML)**, red brown, very stiff to medium stiff		5			22	4-7-9-12 N=16	21	
							19	10-11-14-14 N=25	25	
		Occasional fine sand lenses		10			19	3-4-3-3 N=7	26	
		13.0	458+/-							
3		**POORLY GRADED SAND WITH SILT (SP)**, dark gray, very loose to loose, occasional silt seams and clay partings		15			19	4-2-1-4 N=3	17	
							22	3-3-5-4 N=8	19	
		20.0	451+/-	20						
		Boring Terminated at 20 Feet								

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
3.25 inch ID Holllow Stem Augers and 2 inch Split Barrel Sampler

Abandonment Method:
Temporary groundwater well installed upon completion

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

Elevations were interpolated from a Google Earth

Notes:
Temporary groundwater wells was installed at this location

WATER LEVEL OBSERVATIONS

No free water observed on 11/04/2019

▽ *2.5' BGS on 11/18/2019*

Terracon
15 Marway Cir, Ste 2B
Rochester, NY

Boring Started: 11-04-2019 | Boring Completed: 11-04-2019

Drill Rig: Diedrich D-50 | Driller: J. Tojdowski

Project No.: J5195163

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL J5195163 TRELINA SOLAR SIT.GPJ TERRACON_DATATEMPLATE.GDT 1/20/20

BORING LOG NO. TR-11

PROJECT: Trelina Solar Site - Preliminary

CLIENT: NextEra Energy Constructors, LLC
Juno Beach, FL

SITE: PreEmption St
Geneva, NY

LOCATION See Exploration Plan

Latitude: 42.8947° Longitude: -76.9336°

Approximate Surface Elev.: 475 (Ft.) +/-

MODEL LAYER	DEPTH	ELEVATION (Ft.)		DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI
1	0.0	475+/-	**TOPSOIL**, black, friable and contains significant organic matter							
	1.0	474+/-	**SILTY CLAY (CL-ML)**, trace sand, red brown, medium stiff to stiff, occasional silt seams				19	3-2-4-5 N=6	19	
							17	3-4-8-10 N=12	21	
				5			18	4-7-9-12 N=16	22	
							17	9-10-9-9 N=19	23	
							22	3-2-3-3 N=5	26	
2			Becomes brown	10						
			Becomes soft	15			14	1-1-1-1 N=2	25	
	17.0	458+/-	**SILT WITH SAND (ML)**, trace clay partings, brown, medium dense							
							20	5-7-9-12 N=16	17	
	20.0	455+/-	***Boring Terminated at 20 Feet***	20						

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
3.25 inch ID Holllow Stem Augers and 2 inch Split Barrel Sampler

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

Elevations were interpolated from a Google Earth

Notes:

WATER LEVEL OBSERVATIONS

No free water observed at completion of drilling

Terracon
15 Marway Cir, Ste 2B
Rochester, NY

Boring Started: 11-04-2019 | Boring Completed: 11-04-2019

Drill Rig: Diedrich D-50 | Driller: J. Tojdowski

Project No.: J5195163

BORING LOG NO. TR-12

PROJECT: Trelina Solar Site - Preliminary

CLIENT: NextEra Energy Constructors, LLC
Juno Beach, FL

SITE: PreEmption St
Geneva, NY

LOCATION See Exploration Plan

Latitude: 42.8939° Longitude: -76.9257°

Approximate Surface Elev.: 477 (Ft.) +/-

MODEL LAYER	GRAPHIC LOG	DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI
1		0.0	477							
		1.0	476+/-							
2							19	1-2-3-4 N=5	23	
							16	4-4-5-6 N=9	27	
				5			18	4-5-8-10 N=13	25	
							17	5-6-8-7 N=14	28	
							16	WOH-WOH-4-3 N=4	33	
				10						
				15			17	2-1-2-5 N=3	27	
				20			16	3-3-3-7 N=6	24	
		17.0	460+/-							
		20.0	457+/-							

TOPSOIL, black, friable and contains significant organic matter

SILTY CLAY (CL-ML), trace peat, brown and black, medium stiff to stiff

Occasional silt seams

Becomes soft

Becomes reddish gray

SILT (ML), brown and gray, medium stiff, occasional clay seams

Boring Terminated at 20 Feet

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
3.25 inch ID Holllow Stem Augers and 2 inch Split Barrel Sampler

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

Elevations were interpolated from a Google Earth

Notes:

WATER LEVEL OBSERVATIONS

No free water observed at completion of drilling

Terracon
15 Marway Cir, Ste 2B
Rochester, NY

Boring Started: 11-05-2019 | Boring Completed: 11-05-2019

Drill Rig: Diedrich D-50 | Driller: J. Tojdowski

Project No.: J5195163

BORING LOG NO. TRSS-1

PROJECT: Trelina Solar Site - Preliminary

CLIENT: NextEra Energy Constructors, LLC
Juno Beach, FL

SITE: PreEmption St
Geneva, NY

LOCATION See Exploration Plan

Latitude: 42.8983° Longitude: -76.9573°

Approximate Surface Elev.: 487 (Ft.) +/-

MODEL LAYER	GRAPHIC LOG	DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI
1		0	486+/-							
			TOPSOIL, black, friable and contains significant organic matter							
		1.0	486+/-							
2			**SANDY SILT (ML)**, red-brown, medium stiff to very stiff				18	2-2-4-5 N=6	29	NP
			Contains occasional silt partings and seams				20	6-6-10-11 N=16	21	
				5			17	6-4-4-6 N=8	23	
							19	10-11-12-15 N=23	31	
			Contains occasional fine sand lenses				15	3-5-5-6 N=10	21	
				10	▽					
		15.0	472+/-							
3			**POORLY GRADED SAND WITH SILT (SP-SM)**, fine grained, brown, medium dense	15			14	9-9-14-18 N=23	23	
					▽					
				20			14	13-12-14-14 N=26	23	
		25.0	462+/-							
			SILTY SAND (SM), fine grained, brown, medium dense	25				13-8-12-12		

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
3.25 inch ID Holllow Stem Augers and 2 inch Split Barrel Sampler

Abandonment Method:
Temporary groundwater well installed upon completion

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

Elevations were interpolated from a Google Earth

Notes:
Temporary groundwater wells was installed at this location

WATER LEVEL OBSERVATIONS

▽ *18.5' at completion of drilling on 10/29/2019*

▽ *14' BGS on 11/15/2019*

Terracon
15 Marway Cir, Ste 2B
Rochester, NY

Boring Started: 10-29-2019 | Boring Completed: 10-29-2019

Drill Rig: Diedrich D-50 | Driller: J. Tojdowski

Project No.: J5195163

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL J5195163 TRELINA SOLAR SIT.GPJ TERRACON_DATATEMPLATE.GDT 1/20/20

BORING LOG NO. TRSS-1

PROJECT: Trelina Solar Site - Preliminary

CLIENT: NextEra Energy Constructors, LLC
Juno Beach, FL

SITE: PreEmption St
Geneva, NY

LOCATION See Exploration Plan

Latitude: 42.8983° Longitude: -76.9573°

Approximate Surface Elev.: 487 (Ft.) +/-

MODEL LAYER	GRAPHIC LOG	DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI
3							14	N=20	21	
				30			15	9-12-14-16 N=26	22	
				35			15	11-10-13-18 N=23	23	
				40			16	12-14-15-18 N=29	22	
				45			16	10-10-7-12 N=17	22	
							19	6-7-8-6 N=15	28	
				50						

SILTY SAND (SM), fine grained, brown, medium dense *(continued)*

45.0 — 442+/-

2

SILT (ML), with sand, gray, very stiff

50.0 — 437+/-

Boring Terminated at 50 Feet

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
3.25 inch ID Holllow Stem Augers and 2 inch Split Barrel Sampler

Abandonment Method:
Temporary groundwater well installed upon completion

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

Elevations were interpolated from a Google Earth

Notes:

WATER LEVEL OBSERVATIONS

18.5' at completion of drilling on 10/29/2019

14' BGS on 11/15/2019

Terracon
15 Marway Cir, Ste 2B
Rochester, NY

Boring Started: 10-29-2019 | Boring Completed: 10-29-2019

Drill Rig: Diedrich D-50 | Driller: J. Tojdowski

Project No.: J5195163

BORING LOG NO. TRSS-2

PROJECT: Trelina Solar Site - Preliminary

CLIENT: NextEra Energy Constructors, LLC
Juno Beach, FL

SITE: PreEmption St
Geneva, NY

LOCATION See Exploration Plan

Latitude: 42.8985° Longitude: -76.9377°

Approximate Surface Elev.: 483 (Ft.) +/-

MODEL LAYER	DEPTH	ELEVATION (Ft.)	DESCRIPTION	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI
1	1.0	482+/-	**TOPSOIL**, black, friable and contains significant organic matter							
2	4.0	479+/-	**SANDY SILTY CLAY (CL-ML)**, brown, medium stiff to stiff Becomes red-brown				19	2-3-4-6 N=7	25	
							18	5-6-6-7 N=12	24	
	6.0	477+/-	**SILT (ML)**, trace sand, trace clay, brown, hard	5			20	6-16-17-19 N=33	17	
	8.0	475+/-	**SILTY CLAY (CL-ML)**, trace sand, occasional silt partings, red-brown, very stiff				19	10-11-15-23 N=26	24	
3			**POORLY GRADED SAND WITH SILT (SP-SM)**, fine grained, brown, medium dense				14	7-12-12-19 N=24	23	
				10						
				15			15	8-10-12-10 N=22	26	
	20.0	463+/-			▽					
			SILTY SAND (SM), fine grained, brown, medium dense	20			14	6-5-7-10 N=12	23	
				25				4-6-9-10		

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
3.25 inch ID Hollow Stem Augers and 2 inch Split Barrel Sampler

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

Elevations were interpolated from a Google Earth

Notes:

WATER LEVEL OBSERVATIONS

▽ *20' at completion of drilling*

Terracon
15 Marway Cir, Ste 2B
Rochester, NY

Boring Started: 10-29-2019 | Boring Completed: 10-29-2019

Drill Rig: Diedrich D-50 | Driller: J. Tojdowski

Project No.: J5195163

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL J5195163 TRELINA SOLAR SIT.GPJ TERRACON_DATATEMPLATE.GDT 1/20/20

BORING LOG NO. TRSS-2

PROJECT: Trelina Solar Site - Preliminary

CLIENT: NextEra Energy Constructors, LLC
Juno Beach, FL

SITE: PreEmption St
Geneva, NY

LOCATION See Exploration Plan

Latitude: 42.8985° Longitude: -76.9377°

Approximate Surface Elev.: 483 (Ft.) +/-

MODEL LAYER	GRAPHIC LOG	DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI
3			**SILTY SAND (SM)**, fine grained, brown, medium dense *(continued)*				12	N=15	25	
				30			12	5-6-9-12 N=15	22	
			Becomes brown-gray	35			13	4-5-8-10 N=13	21	
				40			14	6-9-12-11 N=21	22	
2		45.0	438+/- **SILT (ML)**, trace sand, gray, stiff to very stiff	45			16	7-5-9-7 N=14	22	
							18	14-7-10-9 N=17	19	
		50.0	433+/- ***Boring Terminated at 50 Feet***	50						

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
3.25 inch ID Holllow Stem Augers and 2 inch Split Barrel Sampler

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

Elevations were interpolated from a Google Earth

Notes:

WATER LEVEL OBSERVATIONS

20' at completion of drilling

Terracon
15 Marway Cir, Ste 2B
Rochester, NY

Boring Started: 10-29-2019 | Boring Completed: 10-29-2019

Drill Rig: Diedrich D-50 | Driller: J. Tojdowski

Project No.: J5195163

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL J5195163 TRELINA SOLAR SIT.GPJ TERRACON_DATATEMPLATE.GDT 1/20/20

TEST PIT LOG NO. TTP-1

PROJECT: Trelina Solar Site - Preliminary

CLIENT: NextEra Energy Constructors, LLC
Juno Beach, FL

SITE: PreEmption St
Geneva, NY

LOCATION See Exploration Plan

Latitude: 42.9023° Longitude: -76.9579°

Approximate Surface Elev.: 478 (Ft.) +/-

MODEL LAYER	GRAPHIC LOG	DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI
1		0.0	478+/-							
		TOPSOIL, black, friable and contains significant organic matter								
		1.0	477+/-							
2		**SILTY CLAY (CL-ML)**, trace gravel, reddish brown								
		3.0	475+/-							
3		**SILTY SAND (SM)**, trace gravel, brown		5						
		6.5	471.5+/-							
		POORLY GRADED SAND (SP), brown								
		10.0	468+/-	10						
		Test Pit Terminated at 10 Feet								

Stratification lines are approximate. In-situ, the transition may be gradual.

Advancement Method:
Bucket

Abandonment Method:
Excavation backfilled with spoils upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

Elevations were interpolated from a Google Earth

Notes:

WATER LEVEL OBSERVATIONS

No free water observed

Terracon
15 Marway Cir, Ste 2B
Rochester, NY

Test Pit Started: 10-23-2019 | Test Pit Completed: 10-23-2019

Excavator: Excavator | Operator: T.Wooden

Project No.: J5195163

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL J5195163 TRELINA SOLAR SIT.GPJ TERRACON_DATATEMPLATE.GDT 1/20/20

TEST PIT LOG NO. TTP-2

PROJECT: Trelina Solar Site - Preliminary

CLIENT: NextEra Energy Constructors, LLC
Juno Beach, FL

SITE: PreEmption St
Geneva, NY

LOCATION See Exploration Plan

Latitude: 42.896° Longitude: -76.9463°

Approximate Surface Elev.: 476 (Ft.) +/-

MODEL LAYER	GRAPHIC LOG	DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI
1		1.0	475+/-							NP
2		6.0	470+/-	5						
3		10.0	466+/-	10						

TOPSOIL, black, friable and contains significant organic matter

SILT WITH SAND (ML), brown

SILTY SAND (SM), brown to tan

Test Pit Terminated at 10 Feet

Stratification lines are approximate. In-situ, the transition may be gradual.

Advancement Method:
Bucket

Abandonment Method:
Excavation backfilled with spoils upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

Elevations were interpolated from a Google Earth

Notes:

WATER LEVEL OBSERVATIONS

No free water observed

Terracon
15 Marway Cir, Ste 2B
Rochester, NY

Test Pit Started: 10-23-2019 | Test Pit Completed: 10-23-2019

Excavator: Excavator | Operator: T.Wooden

Project No.: J5195163

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL J5195163 TRELINA SOLAR SIT.GPJ TERRACON_DATATEMPLATE.GDT 1/20/20

TEST PIT LOG NO. TTP-3

PROJECT: Trelina Solar Site - Preliminary

CLIENT: NextEra Energy Constructors, LLC
Juno Beach, FL

SITE: PreEmption St
Geneva, NY

LOCATION See Exploration Plan

Latitude: 42.8888° Longitude: -76.9494°

Approximate Surface Elev.: 464 (Ft.) +/-

MODEL LAYER	GRAPHIC LOG	DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI
1		0.7	463.5+/-							NP
			TOPSOIL, black, friable and contains significant organic matter							
			SILT (ML), trace sand and gravel, brown							
		4.0	460+/-							
2			**LEAN CLAY (CL)**, reddish brown	5						
		10.0	454+/-	10	▽					
			Test Pit Terminated at 10 Feet							

Stratification lines are approximate. In-situ, the transition may be gradual.

Advancement Method:
Bucket

Abandonment Method:
Excavation backfilled with spoils upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

Elevations were interpolated from a Google Earth

Notes:

WATER LEVEL OBSERVATIONS

▽ *10' at completion of excavation*

Terracon
15 Marway Cir, Ste 2B
Rochester, NY

Test Pit Started: 10-23-2019 | Test Pit Completed: 10-23-2019

Excavator: Excavator | Operator: T.Wooden

Project No.: J5195163

TEST PIT LOG NO. TTP-4

PROJECT: Trelina Solar Site - Preliminary

CLIENT: NextEra Energy Constructors, LLC
Juno Beach, FL

SITE: PreEmption St
Geneva, NY

LOCATION See Exploration Plan

Latitude: 42.8962° Longitude: -76.9432°

Approximate Surface Elev.: 481 (Ft.) +/-

MODEL LAYER	GRAPHIC LOG	DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI
1		0								
		TOPSOIL, black, friable and contains significant organic matter								
		1.2	480+/-							
2		**LEAN CLAY (CL)**, reddish brown		5						
		6.5	474.5+/-							
3		**SILTY SAND (SM)**, trace gravel, brown								
		8.5	472.5+/-							
		POORLY GRADED SAND (SP), trace silt, brown								
		10.0	471+/-	10						
		Test Pit Terminated at 10 Feet								

Stratification lines are approximate. In-situ, the transition may be gradual.

Advancement Method:
Bucket

Abandonment Method:
Excavation backfilled with spoils upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

Elevations were interpolated from a Google Earth

Notes:

WATER LEVEL OBSERVATIONS

No free water observed

Terracon
15 Marway Cir, Ste 2B
Rochester, NY

Test Pit Started: 10-23-2019 | Test Pit Completed: 10-23-2019

Excavator: Excavator | Operator: T.Wooden

Project No.: J5195163

TEST PIT LOG NO. TTP-5

PROJECT: Trelina Solar Site - Preliminary

CLIENT: NextEra Energy Constructors, LLC
Juno Beach, FL

SITE: PreEmption St
Geneva, NY

LOCATION See Exploration Plan

Latitude: 42.8963° Longitude: -76.9296°

Approximate Surface Elev.: 477 (Ft.) +/-

MODEL LAYER	GRAPHIC LOG	DEPTH		ELEVATION (Ft.)
1		0.8	**TOPSOIL**, black, friable and contains significant organic matter	476+/-
3		4.0	**SILTY SAND (SM)**, brown	473+/-
2		10.5	**LEAN CLAY (CL)**, reddish brown	466.5+/-
			Test Pit Terminated at 10.5 Feet	

DEPTH (Ft.): 5, 10

WATER LEVEL OBSERVATIONS | SAMPLE TYPE | RECOVERY (In.) | FIELD TEST RESULTS | WATER CONTENT (%) | ATTERBERG LIMITS LL-PL-PI

ATTERBERG LIMITS: NP

Stratification lines are approximate. In-situ, the transition may be gradual.

Advancement Method:
Bucket

Abandonment Method:
Excavation backfilled with spoils upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

Elevations were interpolated from a Google Earth

Notes:

WATER LEVEL OBSERVATIONS

No free water observed

Terracon
15 Marway Cir, Ste 2B
Rochester, NY

Test Pit Started: 10-23-2019 | Test Pit Completed: 10-23-2019

Excavator: Excavator | Operator: T.Wooden

Project No.: J5195163

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL J5195163 TRELINA SOLAR SIT.GPJ TERRACON_DATATEMPLATE.GDT 1/20/20

TEST PIT LOG NO. TTP-6

PROJECT: Trelina Solar Site - Preliminary

CLIENT: NextEra Energy Constructors, LLC
Juno Beach, FL

SITE: PreEmption St
Geneva, NY

LOCATION See Exploration Plan

Latitude: 42.8826° Longitude: -76.9513°

Approximate Surface Elev.: 465 (Ft.) +/-

MODEL LAYER	GRAPHIC LOG	DEPTH	DESCRIPTION	ELEVATION (Ft.)
1		0.8	**TOPSOIL**, black, friable and contains significant organic matter	464.5+/-
3		5.0	**SILTY SAND (SM)**, brown	460+/-
2		10.0	**LEAN CLAY (CL)**, reddish brown	455+/-
			Test Pit Terminated at 10 Feet	

DEPTH (Ft.): 5, 10

WATER LEVEL OBSERVATIONS | SAMPLE TYPE | RECOVERY (In.) | FIELD TEST RESULTS | WATER CONTENT (%) | ATTERBERG LIMITS LL-PL-PI

Stratification lines are approximate. In-situ, the transition may be gradual.

Advancement Method:
Bucket

Abandonment Method:
Excavation backfilled with spoils upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

Elevations were interpolated from a Google Earth

Notes:

WATER LEVEL OBSERVATIONS

No free water observed

Terracon
15 Marway Cir, Ste 2B
Rochester, NY

Test Pit Started: 10-23-2019 | Test Pit Completed: 10-23-2019

Excavator: Excavator | Operator: T.Wooden

Project No.: J5195163

INFILTRATION TEST DATA SUMMARY

Project: Trelina Sollar Site - Preliminary
Weather: Overcast
Presoak Date: 14-Nov-2019

Terracon Project No.: J5195163
Tester : Tyler Wooden
Test Date: 15-Nov-2019

Test Location	Test Depth (ft)	Soil Description	Trial Number	Water Drop (inches)	Elapsed Time (hours)	Infiltration Rate (inches/hour)
TRSS-1	5.0	Sandy Silt (ML)	1	0.0	1.0	0.0
			2	0.0	1.0	0.0
			3	0.0	1.0	0.0
			4	0.0	1.0	0.0
			Average infiltration rate for the four trials was 0 inches per hour. Infiltration rate of the final trial was 0 inches per hour.			
TR-3	4.0	Silty Clay (CL-ML)	1	1.0	1.0	1.0
			2	0.0	1.0	0.0
			3	0.0	1.0	0.0
			4	0.0	1.0	0.0
			Infiltration rate of the final trial was 0.0 inches per hour.			
TR-6	3.5	Silty Clay (CL-ML)	1	0.1	1.0	0.1
			2	0.0	1.0	0.0
			3	0.0	1.0	0.0
			4	0.0	1.0	0.0
			Infiltration rate of the final trial was 0.0 inches per hour.			
TR-7	4.0	Silty Clay (CL-ML)	1	0.0	1.0	0.0
			2	0.0	1.0	0.0
			3	0.0	1.0	0.0
			4	0.0	1.0	0.0
			Infiltration rate of the final trial was 0.0 inches per hour.			
TR-8	4.0	Silt (ML)	1	0.1	1.0	0.1
			2	0.0	1.0	0.0
			3	-0.1	1.0	-0.1
			4	-0.1	1.0	-0.1
			Infiltration rate of the final trial was -0.1 inches per hour (water kept on coming out of the borehole.			
TR-11	4.0	Silty Clay (CL-ML)	1	0.0	1.0	0.0
			2	0.0	1.0	0.0
			3	0.0	1.0	0.0
			4	0.0	1.0	0.0
			Infiltration rate of the final trial was 0.0 inches per hour.			
Testing was conducted in general accordance with Appendix D of the New York State Storm Water Management Design Manual.						

APPENDIX B
LABORATORY TESTING
(Exhibits- B001 through B020)

SUMMARY OF LABORATORY RESULTS

BORING ID	Depth (Ft.)	Soil Classification USCS	% Gravel	% Sand	% Fines	Liquid Limit	Plastic Limit	Plasticity Index	Proctor Dry Density (pcf) / Opt. Moisture (%)	CBR @95%
TR-2	4 - 6	LEAN CLAY(CL)	0.8	6.8	92.4	32	19	13		
TR-4	4 - 6	SILT(ML)	1.0	13.9	85.1	40	29	11		
TR-5	8 - 10	SILT(ML)	2.5	6.8	90.7	39	26	13		
TR-6	6 - 8	SILTY SAND(SM)	0.0	63.3	36.7	NP	NP	NP		
TRSS-1	0 - 2	SANDY SILT(ML)	0.4	43.7	56.0	NP	NP	NP	106.2 / 13.9	
TTP-2	1 - 4	SILT with SAND(ML)	0.6	21.4	78.0	NP	NP	NP	103.7 / 16.8	3.5
TTP-3	1 - 4	SILT(ML)	0.3	13.2	86.5	NP	NP	NP	110.1 / 13.8	
TTP-5	1 - 4	SILTY SAND(SM)	0.2	56.3	43.5	NP	NP	NP	107.0 / 14.6	5.8

PROJECT: Trelina Solar Site - Preliminary

SITE: PreEmption St
Geneva, NY

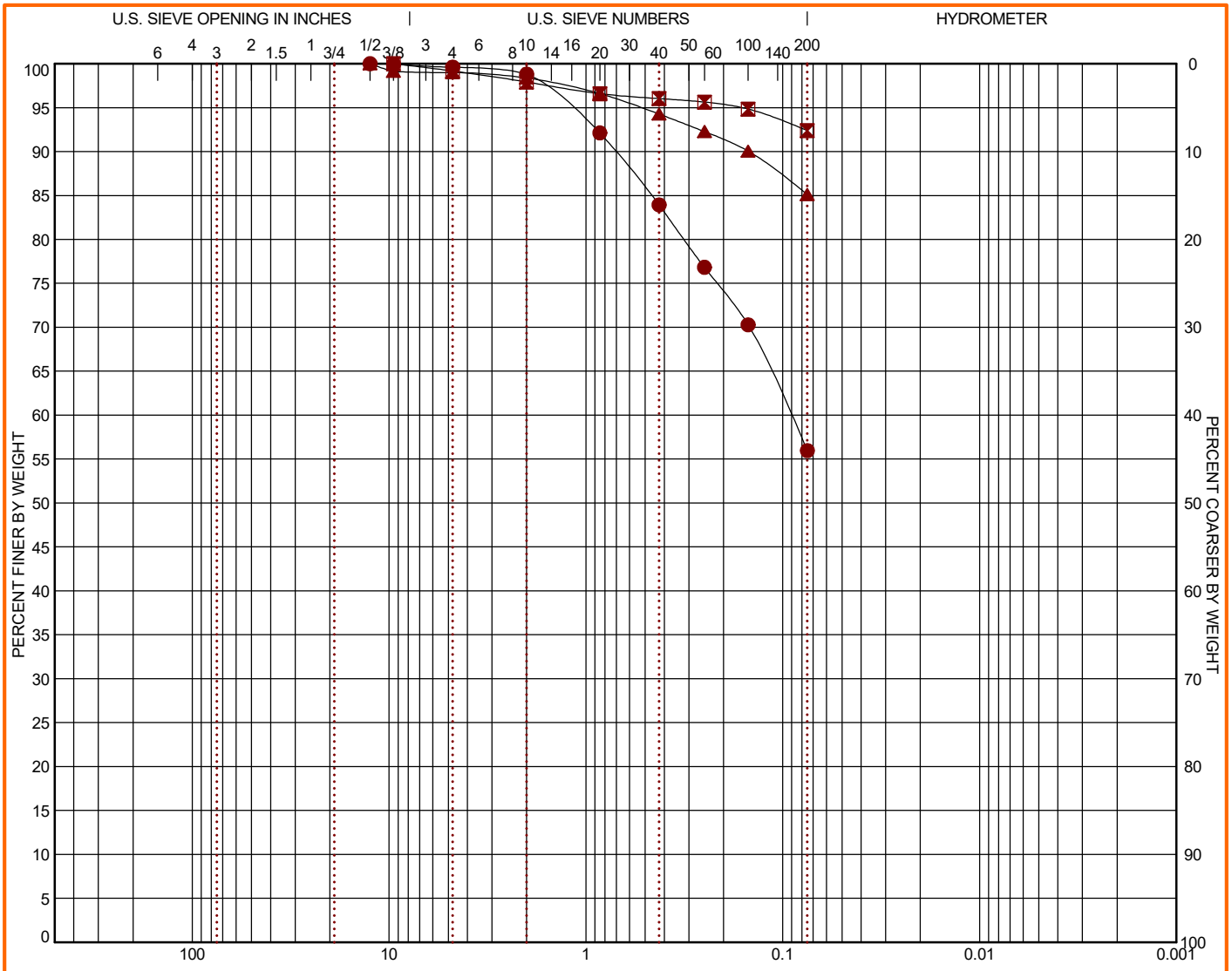
Terracon
15 Marway Cir, Ste 2B
Rochester, NY
PH. 585-247-3471 FAX.

PROJECT NUMBER: J5195163

CLIENT: NextEra Energy Constructors, LLC
Juno Beach, FL

GRAIN SIZE DISTRIBUTION

ASTM D422 / ASTM C136



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BORING ID	DEPTH	% COBBLES	% GRAVEL	% SAND	% SILT	% FINES	% CLAY	USCS
●	TRSS-1	1 - 4	0.0	0.4	43.7		56.0		ML
⊠	TR-2	4 - 6	0.0	0.8	6.8		92.4		CL
▲	TR-4	4 - 6	0.0	1.0	13.9		85.1		ML

GRAIN SIZE	●	⊠	▲
D_{60}	0.091		
D_{30}			
D_{10}			

COEFFICIENTS	●	⊠	▲
C_C			
C_U			

● Sieve	● % Finer	⊠ Sieve	⊠ % Finer	▲ Sieve	▲ % Finer
1/2"	100.0	3/8"	100.0	1/2"	100.0
3/8"	99.92	#4	99.17	3/8"	99.13
#4	99.61	#10	97.91	#4	98.98
#10	98.82	#20	96.59	#10	98.37
#20	92.12	#40	96.03	#20	96.6
#40	83.93	#60	95.63	#40	94.27
#60	76.83	#100	94.84	#60	92.28
#100	70.28	#200	92.38	#100	90.05
#200	55.96			#200	85.12

SOIL DESCRIPTION	
●	SANDY SILT (ML)
⊠	LEAN CLAY (CL)
▲	SILT (ML)

REMARKS	
●	
⊠	
▲	

PROJECT: Trelina Solar Site - Preliminary

PROJECT NUMBER: J5195163

SITE: PreEmption St
Geneva, NY

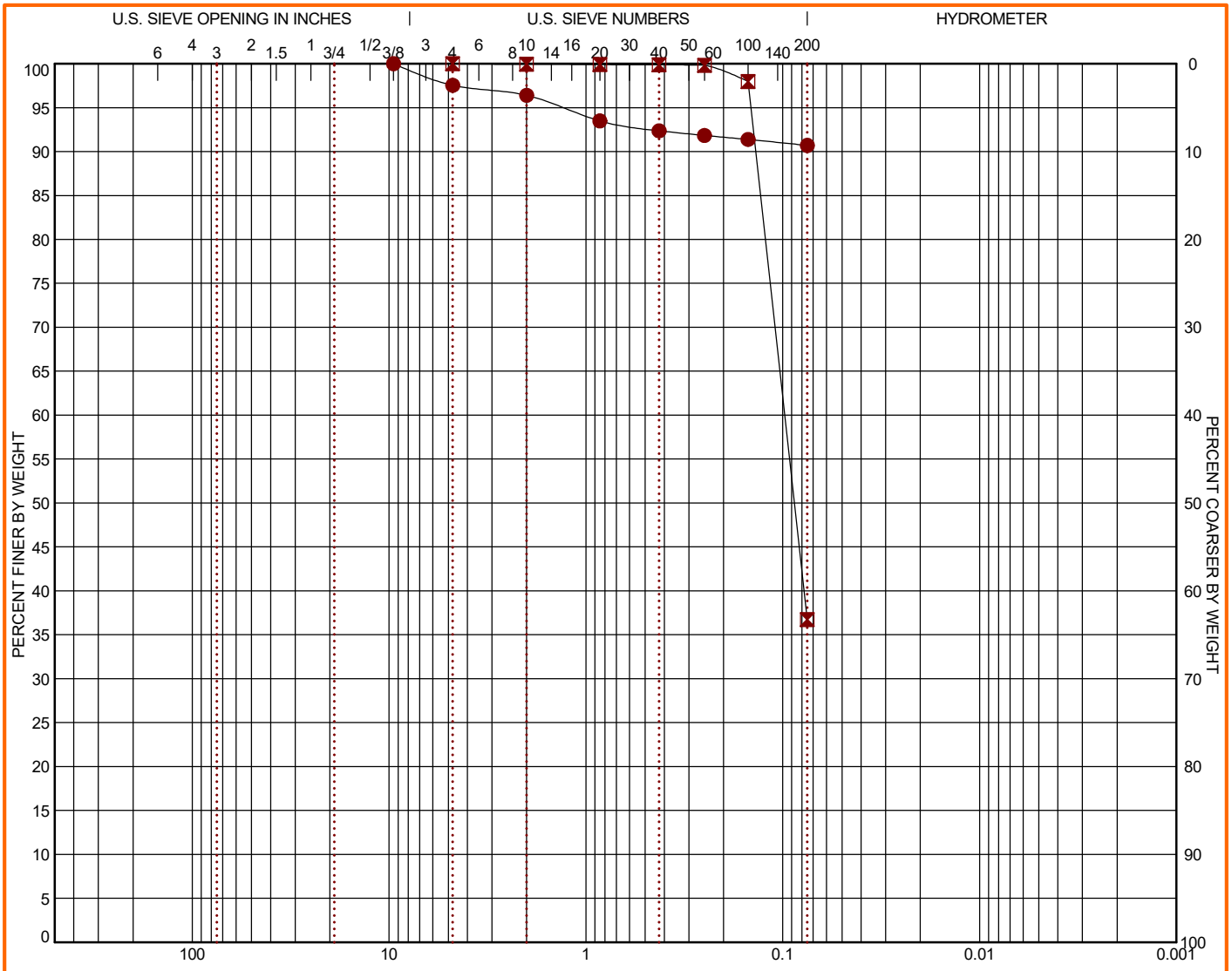
Terracon
15 Marway Cir, Ste 2B
Rochester, NY

CLIENT: NextEra Energy Constructors, LLC
Juno Beach, FL

LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GRAIN SIZE: USCS 1 J5195163 TRELINA SOLAR SIT.GPJ TERRACON_DATATEMPLATE.GDT 12/10/19

GRAIN SIZE DISTRIBUTION

ASTM D422 / ASTM C136



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BORING ID	DEPTH	% COBBLES	% GRAVEL	% SAND	% SILT	% FINES	% CLAY	USCS
●	TR-5	8 - 10	0.0	2.5	6.8		90.7		ML
⊠	TR-6	6 - 8	0.0	0.0	63.3		36.7		SM

GRAIN SIZE	●	⊠
D_{60}		0.098
D_{30}		
D_{10}		

COEFFICIENTS	●	⊠
C_C		
C_U		

● Sieve	● % Finer	⊠ Sieve	⊠ % Finer	Sieve	% Finer
3/8"	100.0	#4	100.0		
#4	97.54	#10	99.93		
#10	96.4	#20	99.9		
#20	93.49	#40	99.87		
#40	92.35	#60	99.83		
#60	91.83	#100	97.97		
#100	91.37	#200	36.72		
#200	90.7				

SOIL DESCRIPTION	
●	SILT (ML)
⊠	SILTY SAND (SM)

REMARKS	
●	
⊠	

PROJECT: Trelina Solar Site - Preliminary

PROJECT NUMBER: J5195163

SITE: PreEmption St
Geneva, NY

Terracon
15 Marway Cir, Ste 2B
Rochester, NY

CLIENT: NextEra Energy Constructors, LLC
Juno Beach, FL

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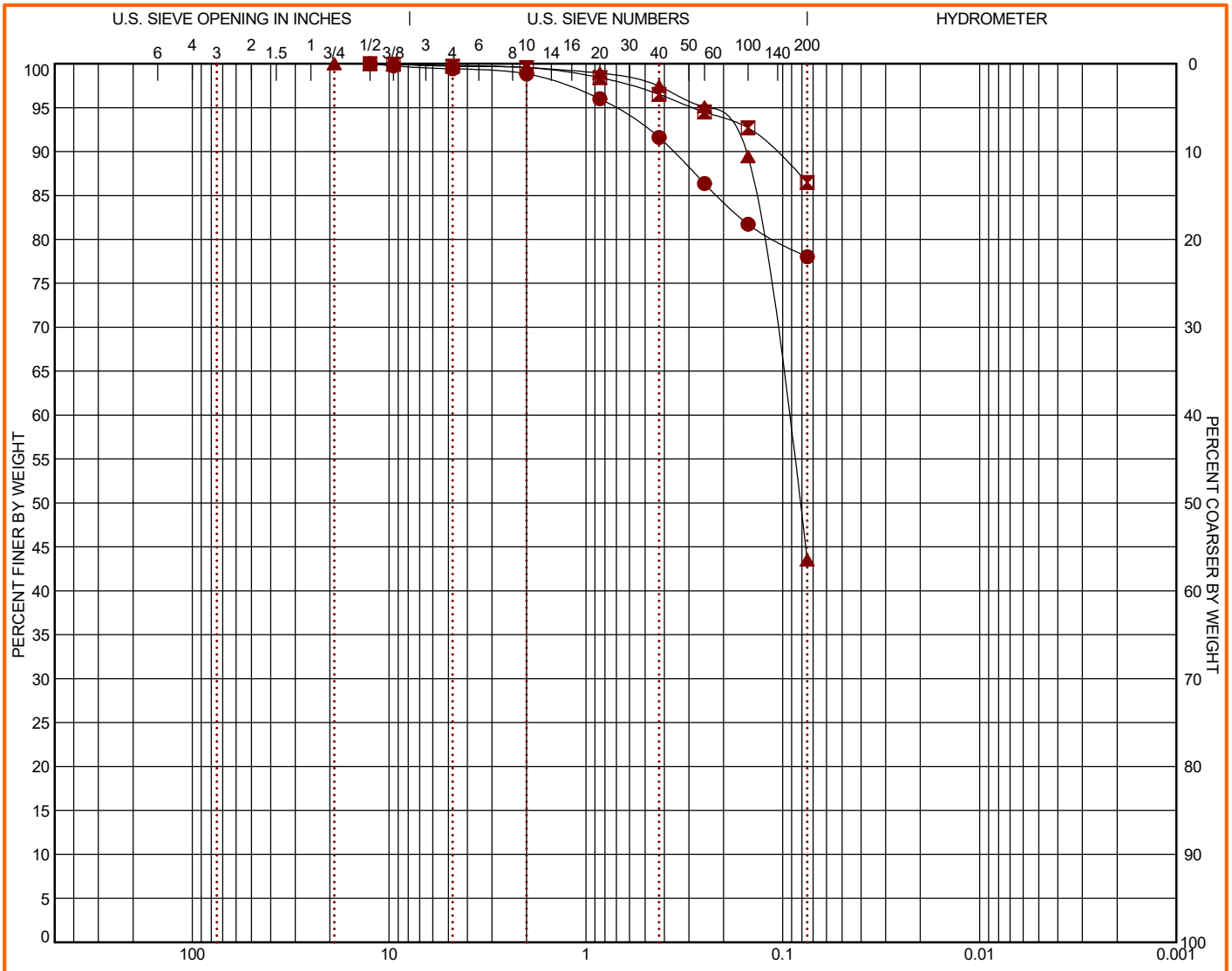
GRAIN SIZE DISTRIBUTION

ASTM D422 / ASTM C136



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BORING ID	DEPTH	% COBBLES	% GRAVEL	% SAND	% SILT	% FINES	% CLAY	USCS
●	TTP-2	1 - 4	0.0	0.6	21.4		78.0		ML
⊠	TTP-3	1 - 4	0.0	0.3	13.2		86.5		ML
▲	TTP-5	1 - 4	0.0	0.2	56.3		43.5		SM

GRAIN SIZE	●	⊠	▲
D_{60}			0.096
D_{30}			
D_{10}			

COEFFICIENTS	●	⊠	▲
C_C			
C_U			

●		⊠		▲	
Sieve	% Finer	Sieve	% Finer	Sieve	% Finer
1/2"	100.0	1/2"	100.0	3/4"	100.0
3/8"	99.75	3/8"	99.93	1/2"	99.95
#4	99.41	#4	99.71	3/8"	99.9
#10	98.83	#10	99.56	#4	99.8
#20	96.01	#20	98.42	#10	99.56
#40	91.61	#40	96.51	#20	98.92
#60	86.36	#60	94.49	#40	97.44
#100	81.73	#100	92.7	#60	95.09
#200	78.02	#200	86.47	#100	89.42
				#200	43.53

SOIL DESCRIPTION	
●	SILT with SAND (ML)
⊠	SILT (ML)
▲	SILTY SAND (SM)

REMARKS	
●	
⊠	
▲	

PROJECT: Trelina Solar Site - Preliminary

PROJECT NUMBER: J5195163

SITE: PreEmption St
Geneva, NY

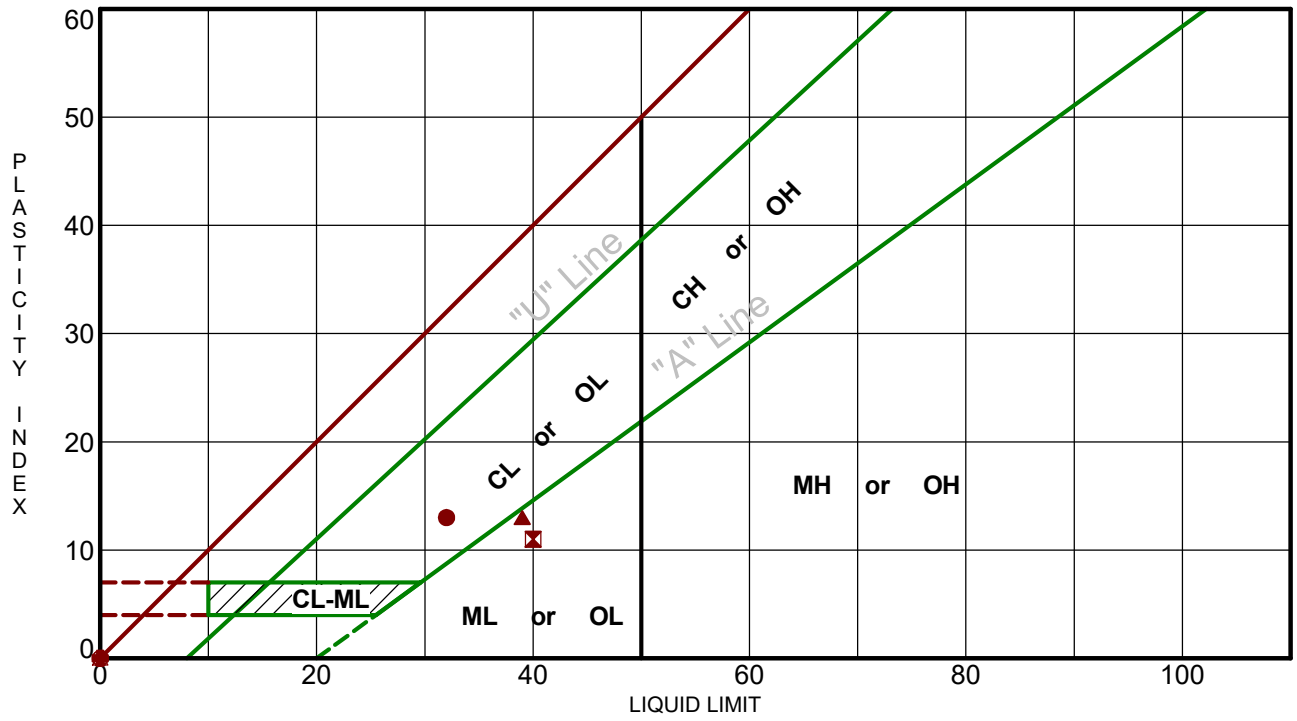
Terracon
15 Marway Cir, Ste 2B
Rochester, NY

CLIENT: NextEra Energy Constructors, LLC
Juno Beach, FL

LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GRAIN SIZE: USCS 1 J5195163 TRELINA SOLAR SIT.GPJ TERRACON_DATATEMPLATE.GDT 12/10/19

ATTERBERG LIMITS RESULTS

ASTM D4318



Boring ID		Depth	LL	PL	PI	Fines	USCS	Description
●	TR-2	4 - 6	32	19	13	92.4	CL	LEAN CLAY
⊠	TR-4	4 - 6	40	29	11	85.1	ML	SILT
▲	TR-5	8 - 10	39	26	13	90.7	ML	SILT
★	TR-6	6 - 8	NP	NP	NP	36.7	SM	SILTY SAND
⊙	TRSS-1	1 - 4	NP	NP	NP	56.0	ML	SANDY SILT
✿	TTP-2	1 - 4	NP	NP	NP	78.0	ML	SILT with SAND
○	TTP-3	1 - 4	NP	NP	NP	86.5	ML	SILT
△	TTP-5	1 - 4	NP	NP	NP	43.5	SM	SILTY SAND

PROJECT: Trelina Solar Site - Preliminary

PROJECT NUMBER: J5195163

SITE: PreEmption St
Geneva, NY

Terracon
15 Marway Cir, Ste 2B
Rochester, NY

CLIENT: NextEra Energy Constructors, LLC
Juno Beach, FL

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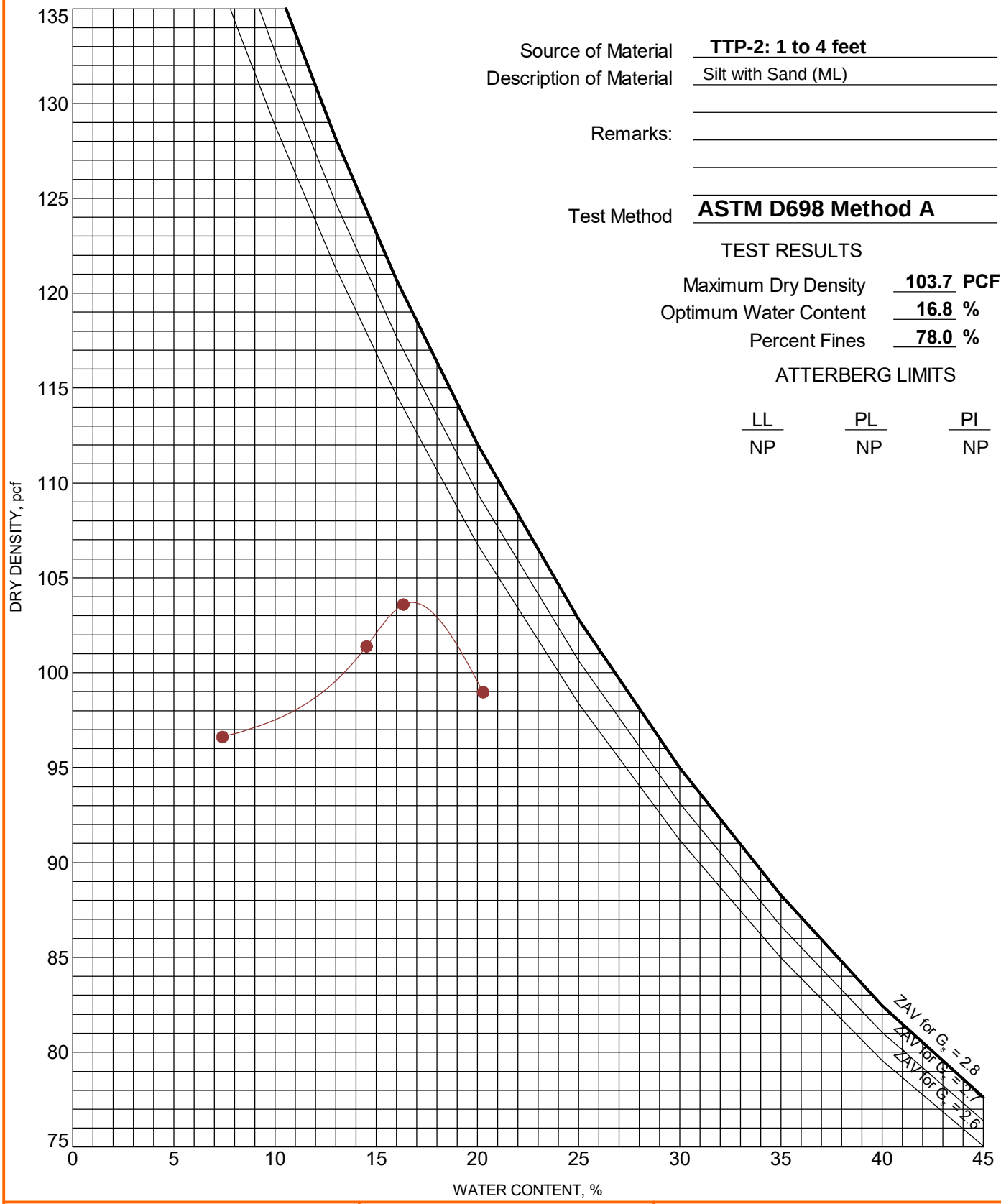
MOISTURE-DENSITY RELATIONSHIP

ASTM D698/D1557



Source of Material: **TTP-2: 1 to 4 feet**

Description of Material: Silt with Sand (ML)

Remarks:

Test Method: **ASTM D698 Method A**

TEST RESULTS

Maximum Dry Density	**103.7**	**PCF**
Optimum Water Content	**16.8**	**%**
Percent Fines	**78.0**	**%**

ATTERBERG LIMITS

LL	PL	PI
NP	NP	NP

PROJECT: Trelina Solar Site - Preliminary

PROJECT NUMBER: J5195163

SITE: PreEmption St
Geneva, NY

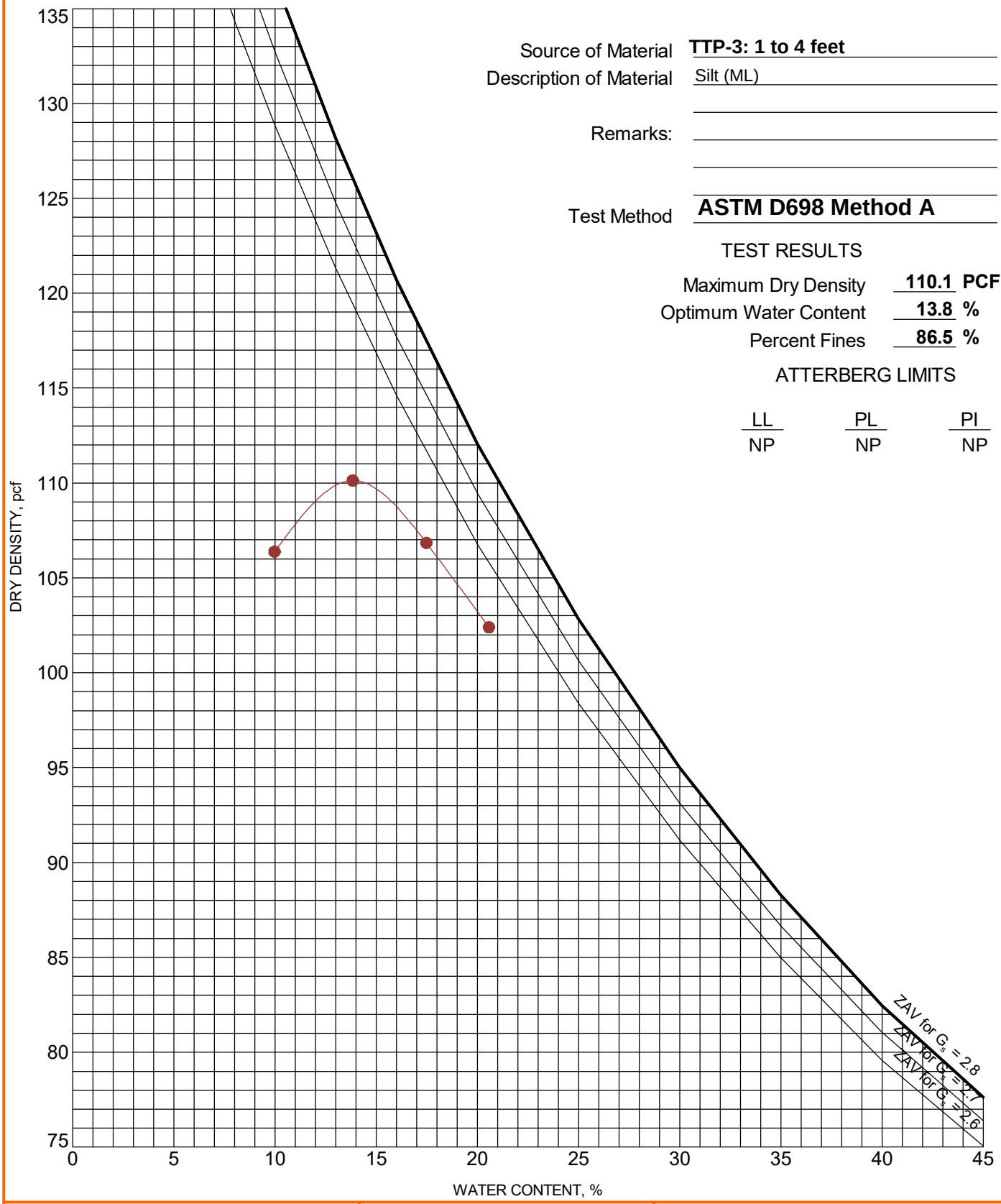
Terracon
15 Marway Cir, Ste 2B
Rochester, NY

CLIENT: NextEra Energy Constructors, LLC
Juno Beach, FL

LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. COMPACTION - V2 J5195163 TRELINA SOLAR SIT.GPJ TERRACON_DATATEMPLATE.GDT 12/6/19

MOISTURE-DENSITY RELATIONSHIP

ASTM D698/D1557



Source of Material **TTP-3: 1 to 4 feet**

Description of Material Silt (ML)

Remarks:

Test Method **ASTM D698 Method A**

TEST RESULTS

Maximum Dry Density	**110.1**	**PCF**
Optimum Water Content	**13.8**	**%**
Percent Fines	**86.5**	**%**

ATTERBERG LIMITS

LL	PL	PI
NP	NP	NP

PROJECT: Trelina Solar Site - Preliminary

PROJECT NUMBER: J5195163

SITE: PreEmption St
Geneva, NY

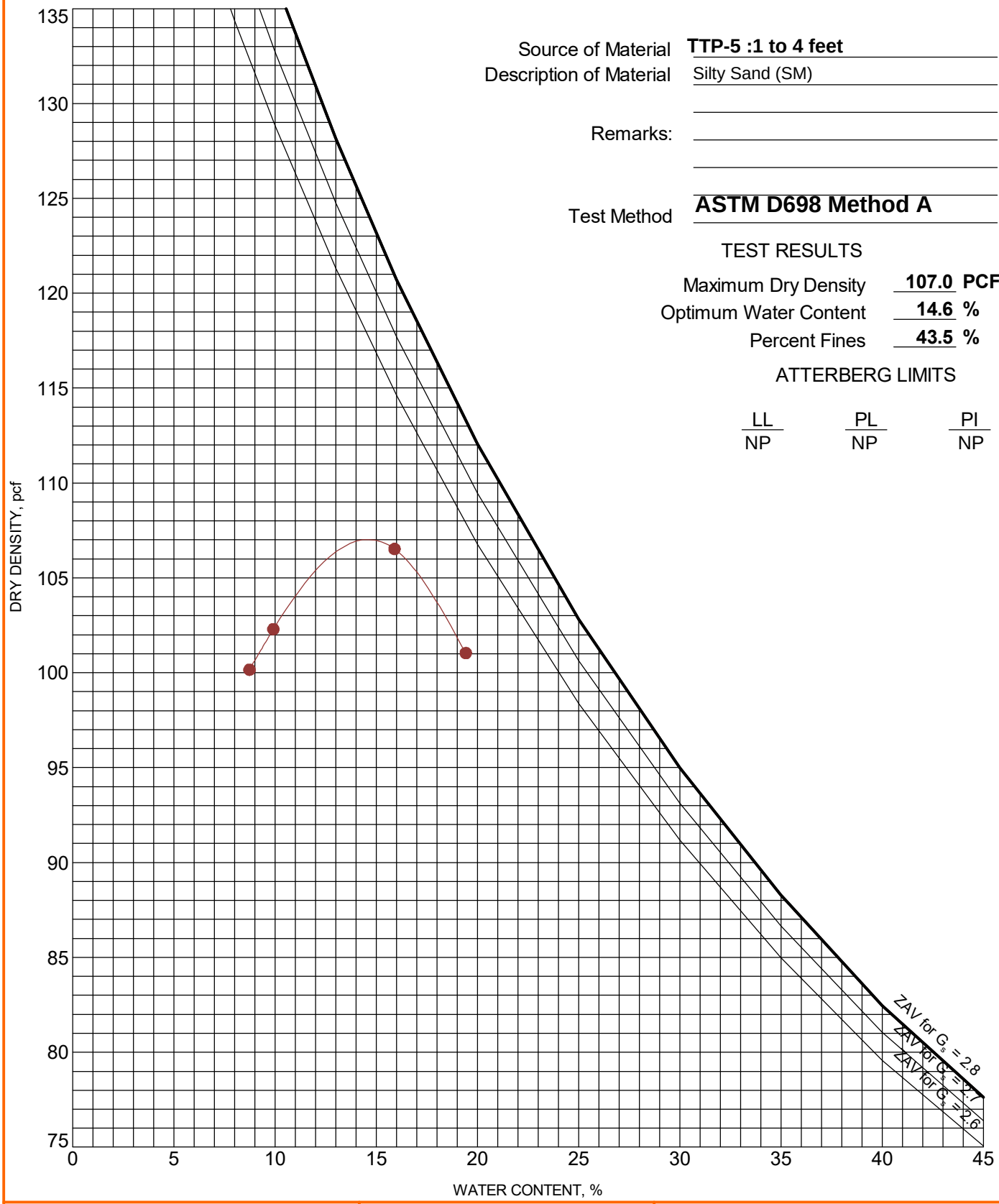
Terracon
15 Marway Cir, Ste 2B
Rochester, NY

CLIENT: NextEra Energy Constructors, LLC
Juno Beach, FL

LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. COMPACTION - V2 J5195163 TRELINA SOLAR SIT.GPJ TERRACON_DATATEMPLATE.GDT 12/6/19

MOISTURE-DENSITY RELATIONSHIP

ASTM D698/D1557



Source of Material **TTP-5 :1 to 4 feet**

Description of Material Silty Sand (SM)

Remarks:

Test Method **ASTM D698 Method A**

TEST RESULTS

Maximum Dry Density	**107.0**	**PCF**
Optimum Water Content	**14.6**	**%**
Percent Fines	**43.5**	**%**

ATTERBERG LIMITS

LL	PL	PI
NP	NP	NP

PROJECT: Trelina Solar Site - Preliminary

PROJECT NUMBER: J5195163

SITE: PreEmption St
Geneva, NY

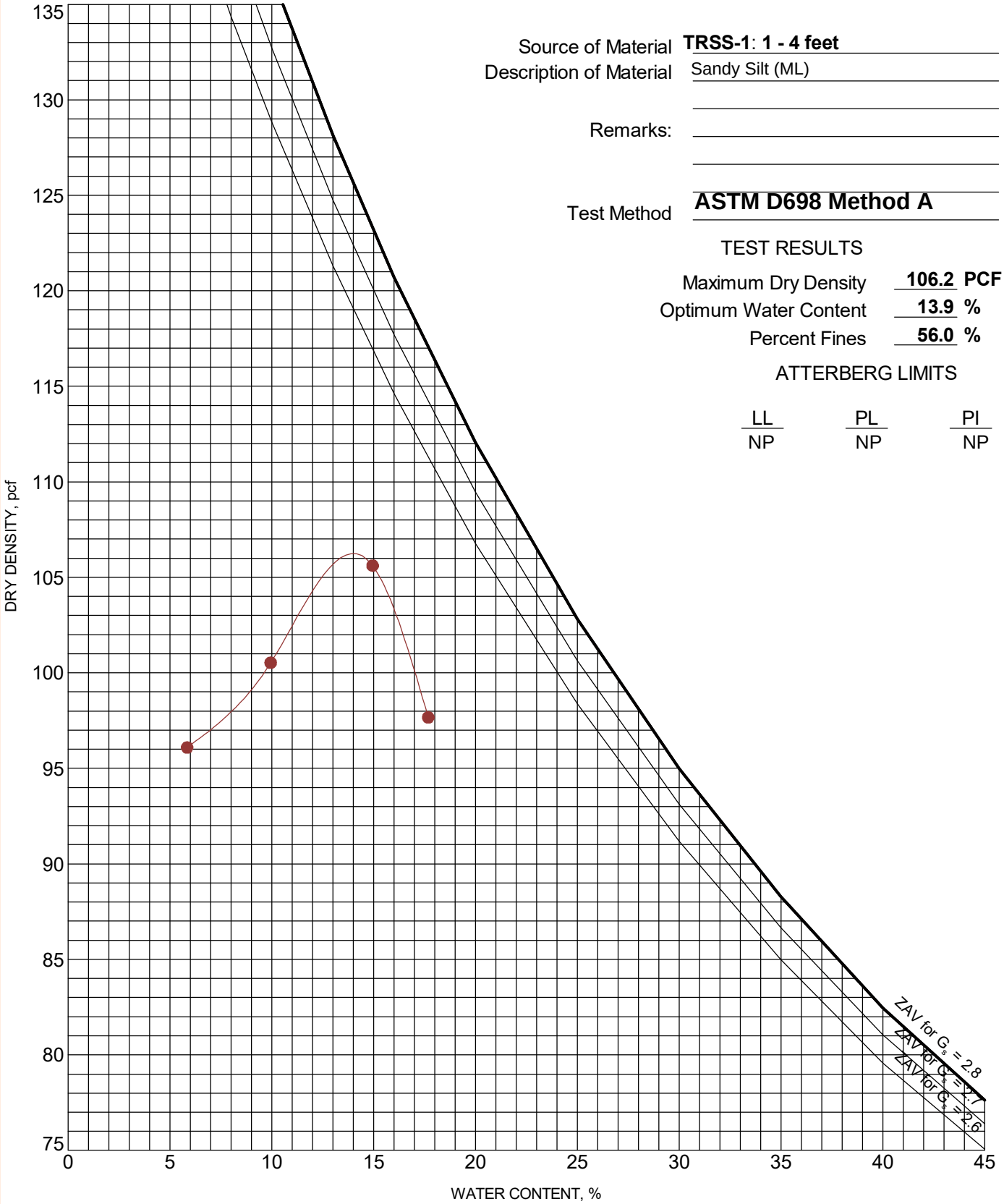
Terracon
15 Marway Cir, Ste 2B
Rochester, NY

CLIENT: NextEra Energy Constructors, LLC
Juno Beach, FL

LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. COMPACTION - V2 J5195163 TRELINA SOLAR SIT.GPJ TERRACON_DATATEMPLATE.GDT 12/6/19

MOISTURE-DENSITY RELATIONSHIP

ASTM D698/D1557



Source of Material **TRSS-1: 1 - 4 feet**

Description of Material Sandy Silt (ML)

Remarks:

Test Method **ASTM D698 Method A**

TEST RESULTS

Maximum Dry Density	**106.2**	**PCF**
Optimum Water Content	**13.9**	**%**
Percent Fines	**56.0**	**%**

ATTERBERG LIMITS

LL	PL	PI
NP	NP	NP

PROJECT: Trelina Solar Site - Preliminary

PROJECT NUMBER: J5195163

SITE: PreEmption St
Geneva, NY

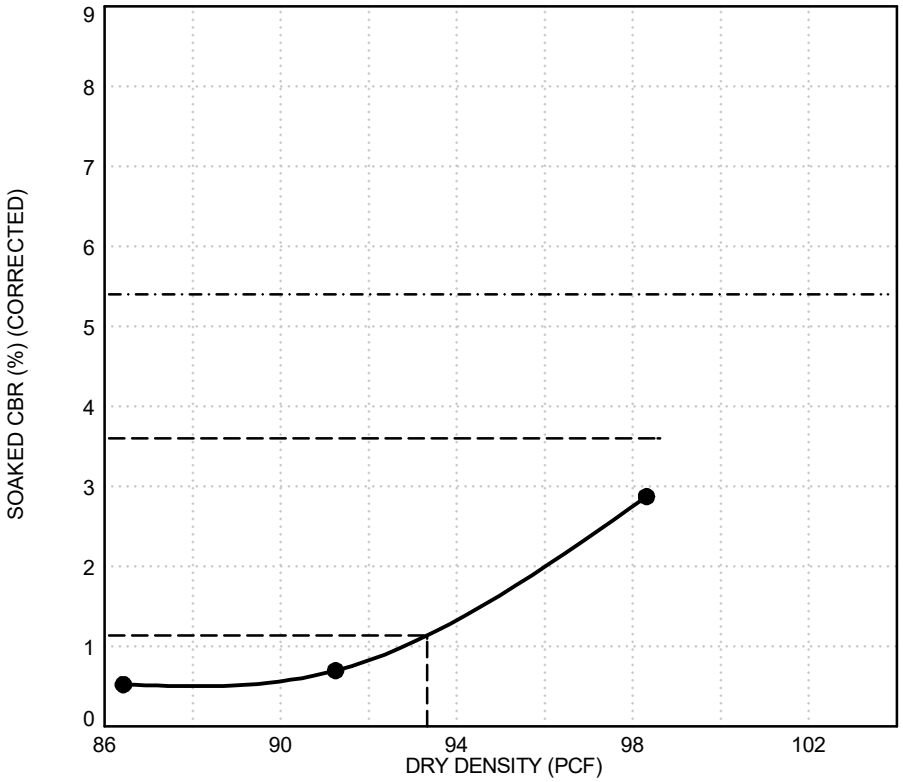
Terracon
15 Marway Cir, Ste 2B
Rochester, NY

CLIENT: NextEra Energy Constructors, LLC
Juno Beach, FL

LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. COMPACTION - V2 J5195163 TRELINA SOLAR SIT.GPJ TERRACON_DATATEMPLATE.GDT 12/6/19

CALIFORNIA BEARING RATIO

ASTM D1883-07[2]



Source of Material: **TTP-2: 1 to 4 ft**

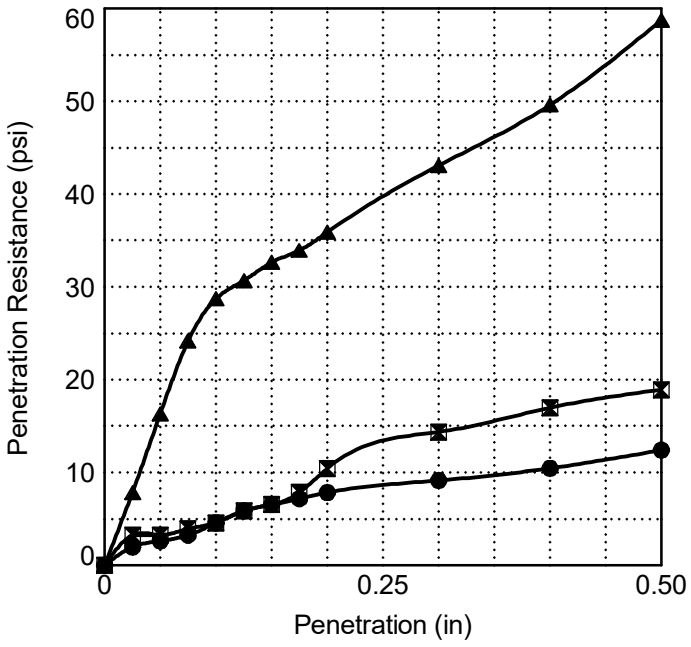
Description of Material: Silt with Sand (ML)

Remarks:

Percent Fines: **78.0 %**

Atterberg Limits

LL	PL	PI
NP	NP	NP



Sample No.	1	2	3
Sample Condition		Soaked	
Compaction Method		698C	
Maximum Dry Density, (pcf)	103.7	103.7	103.7
Optimum Moisture Content, (%)	16.8	16.8	16.8
Dry Density before Soaking, (pcf)	86.43	91.25	98.31
Moisture Content, (%)			
After Compaction	19.1	19.1	19.1
Top 1" After Soaking	26.9	28.6	24.6
Surcharge,. (lbs)	5.00	5.00	5.00
Swell, (%)	1.55	2.53	1.77
Bearing Ratio, (%)	0.5	0.5	2.9

Dry Density @ 90% 93.3 pcf

Dry Density @ 95% 98.5 pcf

Dry Density @ 100% 103.7 pcf

CBR @ 90% Density 1.1

CBR @ 95% Density 3.5

CBR @ 100% Density 5.2

PROJECT: Trelina Solar Site - Preliminary

SITE: PreEmption St
Geneva, NY

Terracon
15 Marway Cir, Ste 2B
Rochester, NY

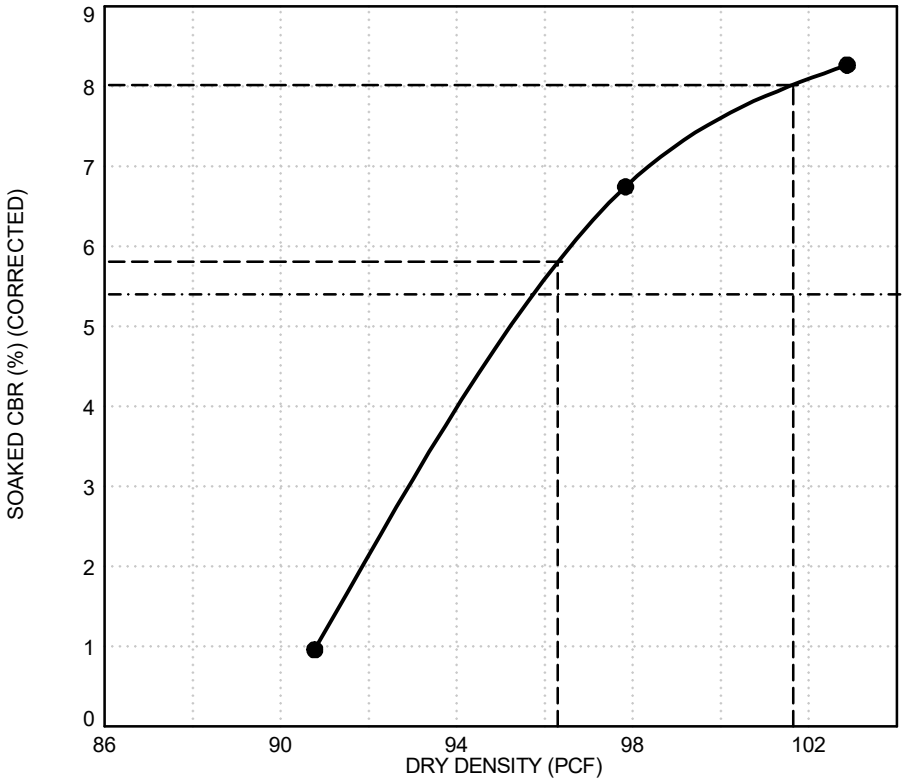
PROJECT NUMBER: J5195163

CLIENT: NextEra Energy Constructors, LLC
Juno Beach, FL

LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. CBR 3PT REPORT J5195163 TRELINA SOLAR SITOLD.GPJ TERRACON_DATATEMPLATE.GDT 12/6/19

CALIFORNIA BEARING RATIO

ASTM D1883-07[2]



Source of Material: **TTP-5: 1 to 4 ft**

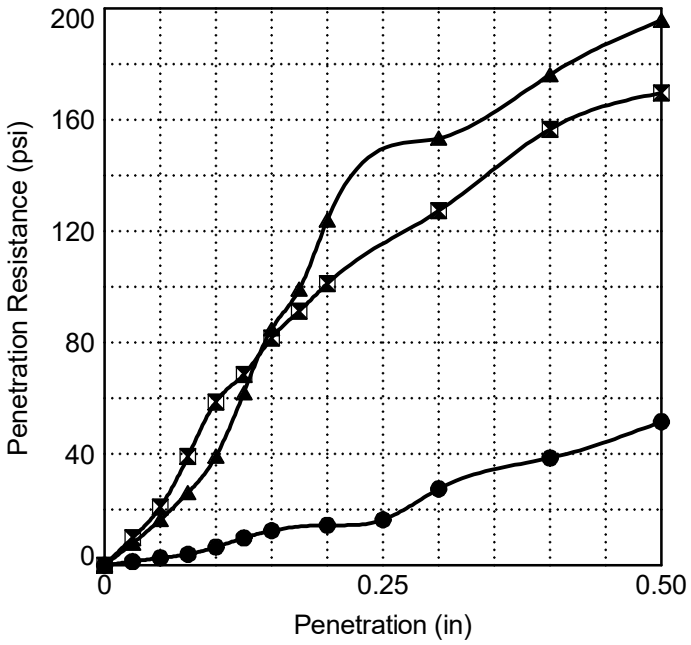
Description of Material: Silty Sand (SM)

Remarks:

Percent Fines: **43.5 %**

Atterberg Limits

LL	PL	PI
NP	NP	NP



Sample No.	1	2	3
Sample Condition		Soaked	
Compaction Method		698C	
Maximum Dry Density, (pcf)	107	107	107
Optimum Moisture Content, (%)	14.6	14.6	14.6
Dry Density before Soaking, (pcf)	90.78	97.84	102.88
Moisture Content, (%)			
After Compaction	15.5	15.5	15.5
Top 1" After Soaking	25.6	23.2	20.4
Surcharge,. (lbs)	5.00	5.00	5.00
Swell, (%)	0.11	0.63	0.79
Bearing Ratio, (%)	1.0	6.7	8.3

Dry Density @ 90% 96.3 pcf

Dry Density @ 95% 101.7 pcf

Dry Density @ 100% 107.0 pcf

CBR @ 90% Density < 1

CBR @ 95% Density 5.8

CBR @ 100% Density 8.0

PROJECT: Trelina Solar Site - Preliminary

SITE: PreEmption St
Geneva, NY

Terracon
15 Marway Cir, Ste 2B
Rochester, NY

PROJECT NUMBER: J5195163

CLIENT: NextEra Energy Constructors, LLC
Juno Beach, FL

LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. CBR 3PT REPORT J5195163 TRELINA SOLAR SITOLD.GPJ TERRACON_DATATEMPLATE.GDT 12/6/19

CORROSION TESTING

(Exhibits- B012 through B014)

CHEMICAL LABORATORY TEST REPORT

Project Number: J5195163
Service Date: 11/06/19
Report Date: 11/25/19
Task:

Terracon
750 Pilot Road, Suite F
Las Vegas, Nevada 89119
(702) 597-9393

Client

NextEra Energy Constructors, LLC
Juno Beach, FL

Project

Trelina Solar Site - Preliminary

Sample Submitted By: Terracon (J5) **Date Received:** 10/29/2019 **Lab No.: 19-1302**

Results of Corrosion Analysis

Sample Number				
Sample Location	TTP-1	TTP-2	TTP-3	TTP-4
Sample Depth (ft.)	1- 4	1- 4	1- 4	1- 4
pH Analysis, AWWA 4500 H	7.77	6.72	6.65	7.84
Water Soluble Sulfate (SO4), ASTM C 1580 (mg/kg)	4	83	73	30
Sulfides, AWWA 4500-S D, (mg/kg)	Nil	Nil	Nil	Nil
Chlorides, ASTM D 512, (mg/kg)	43	25	23	60
Red-Ox, AWWA 2580, (mV)	+685	+677	+678	+687
Total Salts, AWWA 2540, (mg/kg)	953	122	128	1338
Resistivity, ASTM G 57, (ohm-cm)	2910	6111	15520	1455

Analyzed By:

Trisha Campo
Chemist

CHEMICAL LABORATORY TEST REPORT

Project Number: J5195163
Service Date: 11/06/19
Report Date: 11/25/19
Task:

Terracon
750 Pilot Road, Suite F
Las Vegas, Nevada 89119
(702) 597-9393

Client

NextEra Energy Constructors, LLC
Juno Beach, FL

Project

Trelina Solar Site - Preliminary

Sample Submitted By: Terracon (J5) **Date Received:** 10/29/2019 **Lab No.: 19-1302**

Results of Corrosion Analysis

Sample Number		
Sample Location	TTP-5	TTP-6
Sample Depth (ft.)	1- 4	1- 4
pH Analysis, AWWA 4500 H	7.11	7.68
Water Soluble Sulfate (SO4), ASTM C 1580 (mg/kg)	18	103
Sulfides, AWWA 4500-S D, (mg/kg)	Nil	Nil
Chlorides, ASTM D 512, (mg/kg)	25	50
Red-Ox, AWWA 2580, (mV)	+679	+683
Total Salts, AWWA 2540, (mg/kg)	191	874
Resistivity, ASTM G 57, (ohm-cm)	20855	5432

Analyzed By: Trisha Campo
Chemist

CHEMICAL LABORATORY TEST REPORT

Project Number: J5195163
Service Date: 11/11/19
Report Date: 11/25/19
Task:

Terracon
750 Pilot Road, Suite F
Las Vegas, Nevada 89119
(702) 597-9393

Client

NextEra Energy Constructors, LLC
Juno Beach, FL

Project

Trelina Solar Site - Preliminary

Sample Submitted By: Terracon (J5) **Date Received:** 11/4/2019 **Lab No.: 19-1303**

Results of Corrosion Analysis

Sample Number	
Sample Location	TRSS-1
Sample Depth (ft.)	1-4
pH Analysis, AWWA 4500 H	7.35
Water Soluble Sulfate (SO4), ASTM C 1580 (mg/kg)	62
Sulfides, AWWA 4500-S D, (mg/kg)	Nil
Chlorides, ASTM D 512, (mg/kg)	70
Red-Ox, AWWA 2580, (mV)	+687
Total Salts, AWWA 2540, (mg/kg)	17640
Resistivity, ASTM G 57, (ohm-cm)	258

Analyzed By: Trisha Campo
Chemist

THERMAL RESISTIVITY TEST RESULTS
(BULK SAMPLES/UNDISTURBED SAMPLES)
(Exhibits- B015 through B020)

21239 FM529 Rd., Bldg. F
Cypress, TX 77433
Tel: 281-985-9344
Fax: 832-427-1752
info@geothermusa.com
http://www.geothermusa.com

November 18, 2019

Terracon Consultants, Inc.
15 Marway Circle, Suite 2B
Rochester, New York 14624
Attn: Travis Wooden, E.I.T.

Re: Thermal Analysis of Native Soil Samples
Trelina Solar Site – Geneva, NY (Project No. J5195163)

The following is the report of thermal dryout characterization tests conducted on four (4) bulk soil samples and 4 tube samples from the referenced project sent to our laboratory.

Thermal Dryout Characterization Tests: The bulk samples were tested at their 'optimum' moisture content and at 90% of the maximum dry density provided by ***Terracon***. The tube samples were tested 'as-is'. The tests were conducted in accordance with the **IEEE standard 442-2017**. The results are tabulated below and the thermal dryout curves are presented in **Figures 1 to 4.**

Sample ID, Description, Thermal Resistivity, Moisture Content and Density

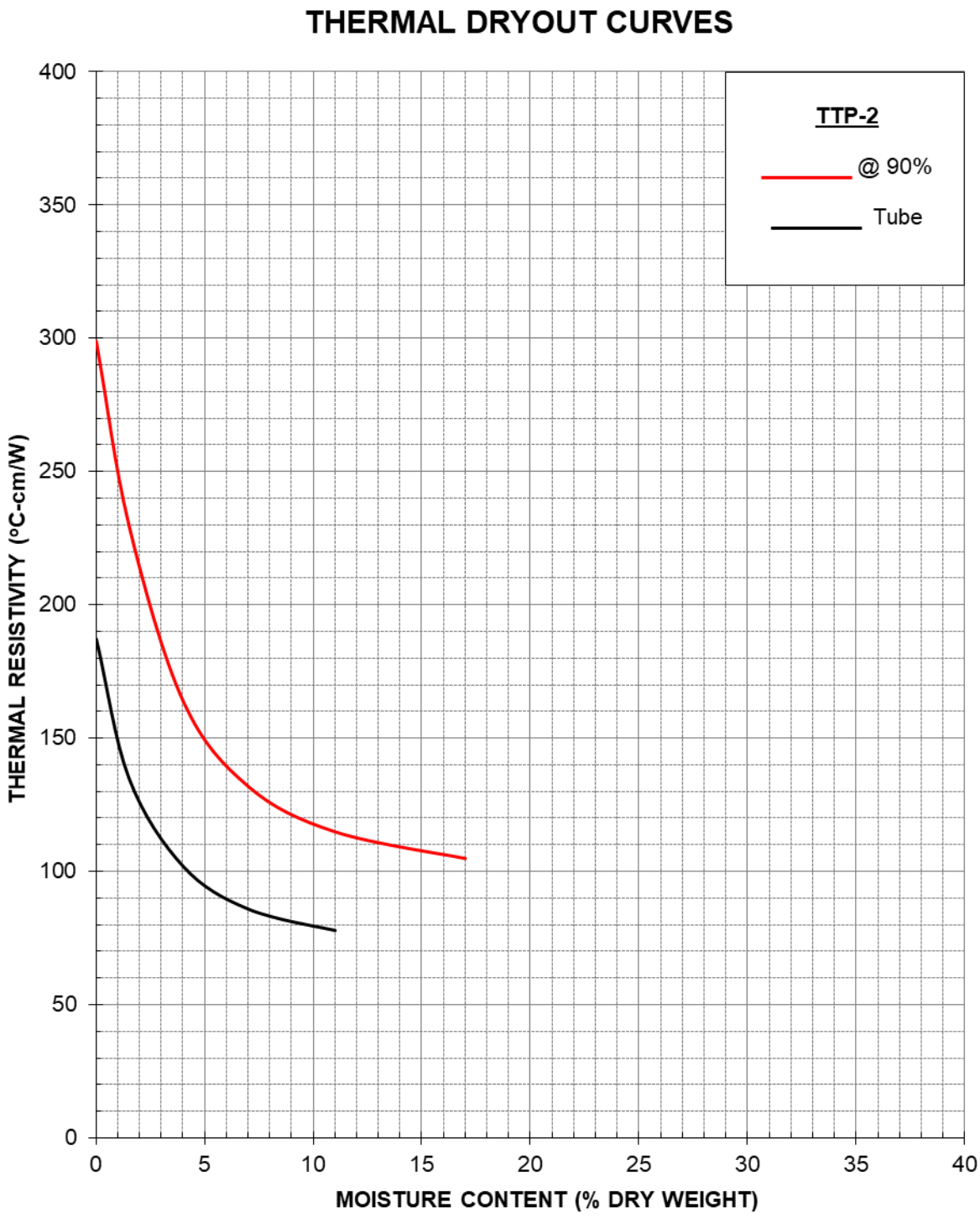
Sample ID @ 1'-4'	Compaction (%)	Description (Terracon)	Thermal Resistivity (°C-cm/W)		Moisture Content (%)	Dry Density (lb/ft^3)
			Wet	Dry		
TTP-2	90	Silt with Sand (ML)	105	299	17	93
	Tube		78	186	11	97
TTP-3	90	Silt (ML)	59	236	14	99
	Tube		52	388	24	96
TTP-5	90	Silty Sand (SM)	65	344	15	96
	Tube		70	210	33	89
TRSS-1	90	Sandy Silt (ML)	87	242	14	96
	Tube		63	198	30	101

Comments: The thermal characteristic depicted in the dryout curves apply for the soils at their respective test dry density.

Please contact us if you have any questions or if we can be of further assistance.

Geotherm USA

Nimesh Patel

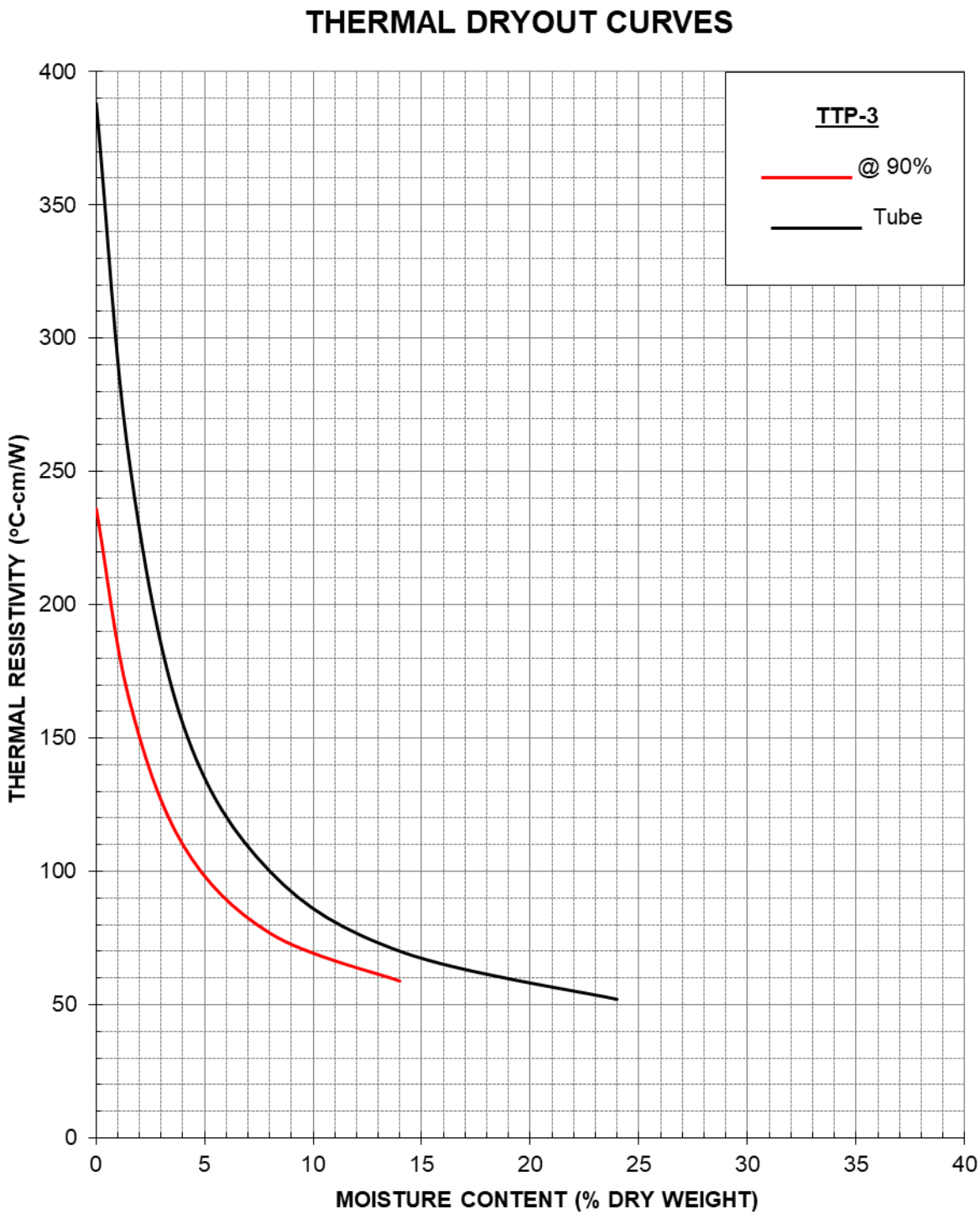


Terracon Consultants, Inc. (Project No. J5195163)

Thermal Analysis of Native Soil

Trelina Solar Site – Geneva, NY

November 2019 **Figure 1**



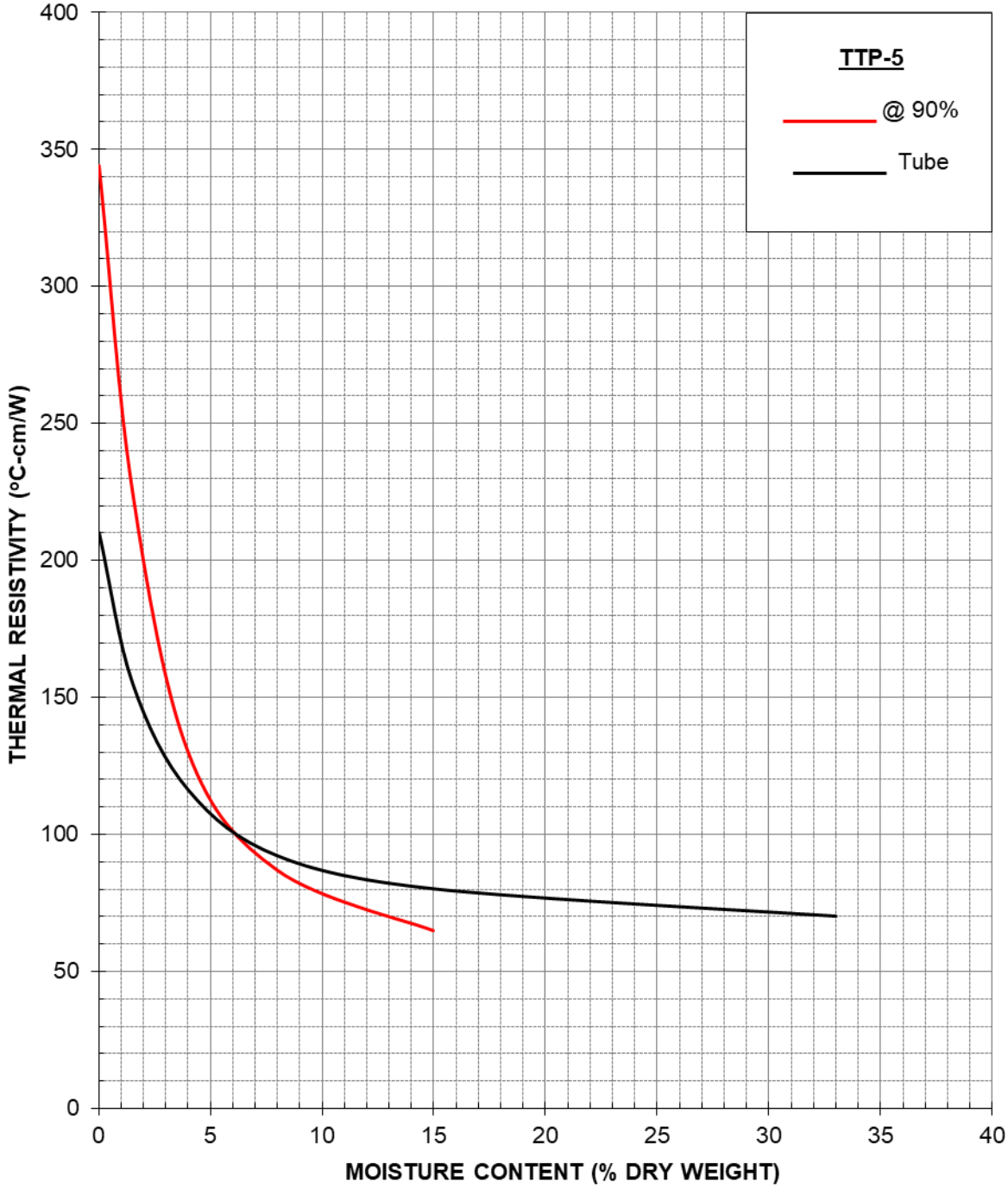
Terracon Consultants, Inc. (Project No. J5195163)

Thermal Analysis of Native Soil

Trelina Solar Site – Geneva, NY

November 2019 **Figure 2**

THERMAL DRYOUT CURVES



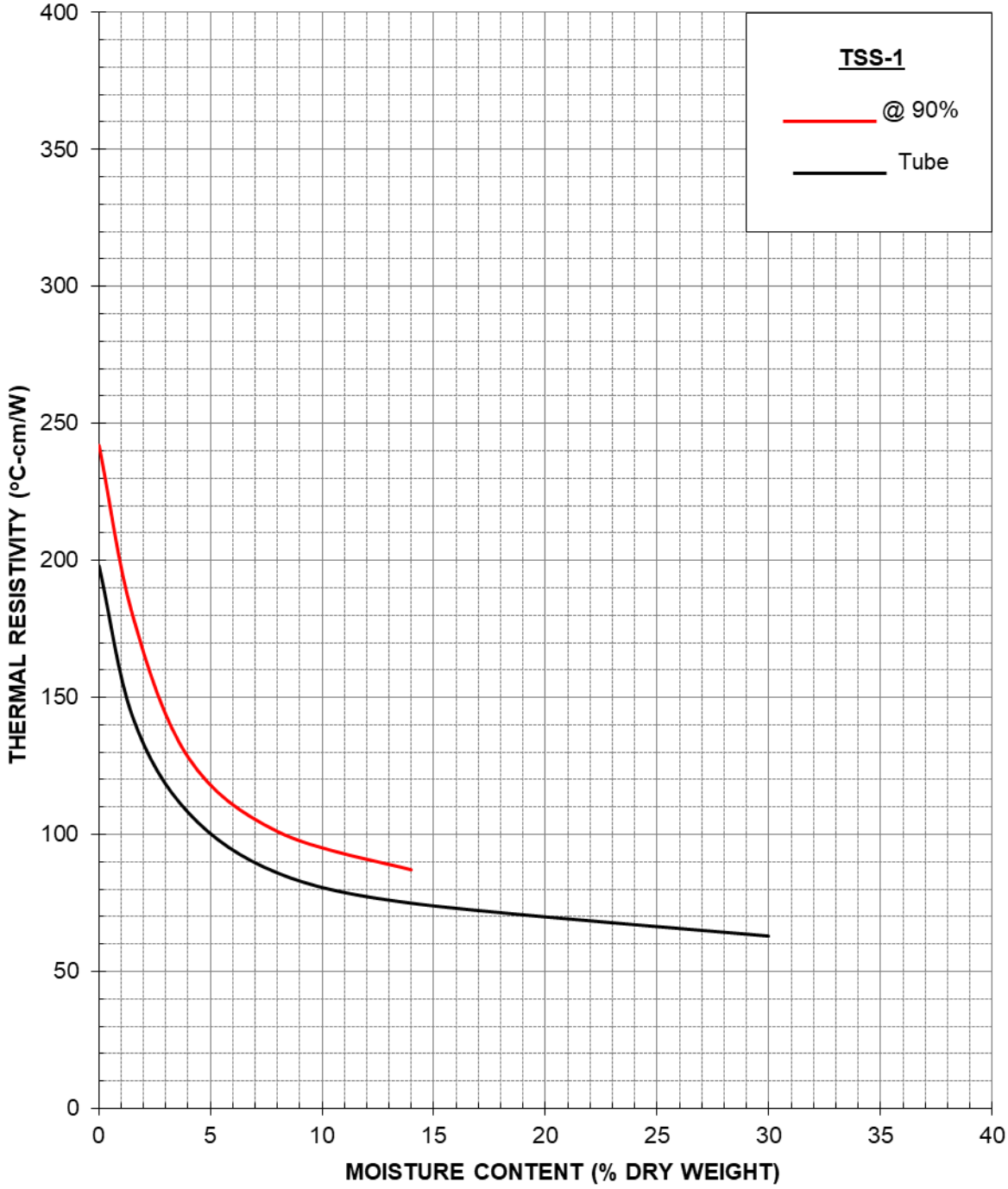
Terracon Consultants, Inc. (Project No. J5195163)

Thermal Analysis of Native Soil

Trelina Solar Site – Geneva, NY

November 2019 **Figure 3**

THERMAL DRYOUT CURVES



Terracon Consultants, Inc. (Project No. J5195163)

Thermal Analysis of Native Soil

Trelina Solar Site – Geneva, NY

November 2019 **Figure 4**

APPENDIX C

FIELD ELECTRICAL RESISTIVITY TEST RESULTS

(Exhibits- C001 through C019)

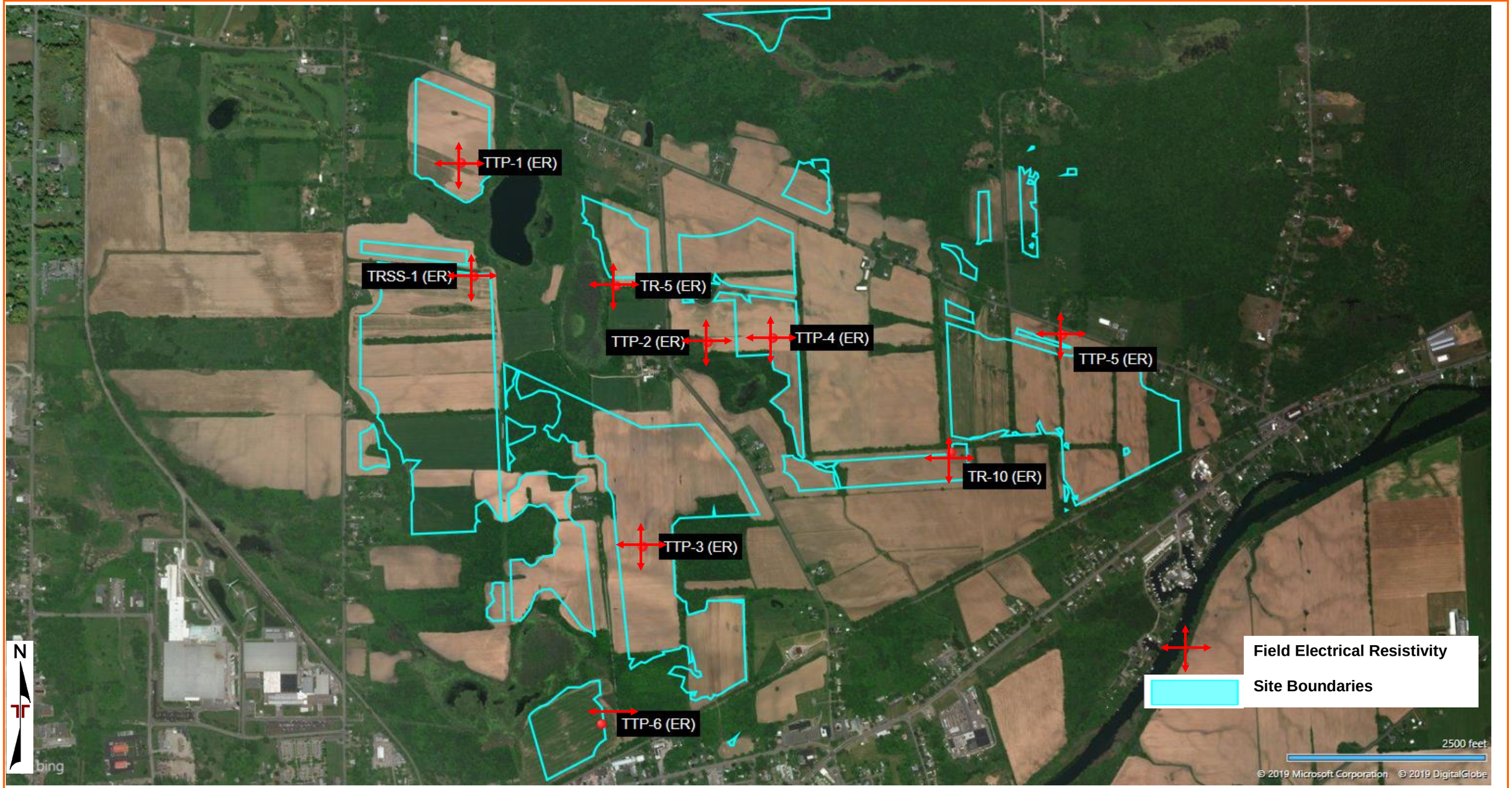


DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

MAP PROVIDED BY USGS

Field Electrical Resistivity Test Results
Trelina Solar Site - Preliminary
Town of Geneva, NY
Project No. J5195163

Terracon

Test Location: TRSS-1 Substation	Equipment: Mini Res
Test Date: 10/15/19	Tested by: Tyler Wooden
Weather: clear, sunny	Temperature: 60°F

Resistivity Line 1					
Probe Spacing (ft)	Resistance Reading (Ω)				Apparent Resistivity (Ω-cm)
	R1	R2	R3	Average	
0.5	69.3	69.3	69.3	69	6,635
1	30	30	30	30	5,745
1.5	14.875	14.875	14.875	15	4,273
2	8.945	8.945	8.945	9	3,426
3	4.871	4.871	4.871	5	2,798
5	3.029	3.029	3.029	3	2,900
7	2.597	2.597	2.597	3	3,481
10	2.249	2.249	2.249	2	4,307
15	1.9796	1.9796	1.9796	2	5,686
20	1.9972	1.9972	1.9972	2	7,649
30	1.6987	1.6987	1.6987	2	9,759
45	1.3396	1.3396	1.3396	1	11,544
70	0.976	0.976	0.976	1	13,083
100	0.6717	0.6717	0.6717	1	12,863
150	0.3815	0.3815	0.3815	0	10,959
250	0.1973	0.1973	0.1973	0	9,446
Center Coordinates: 42.8983° N, -76.9573° W					Line Orientation:North-South

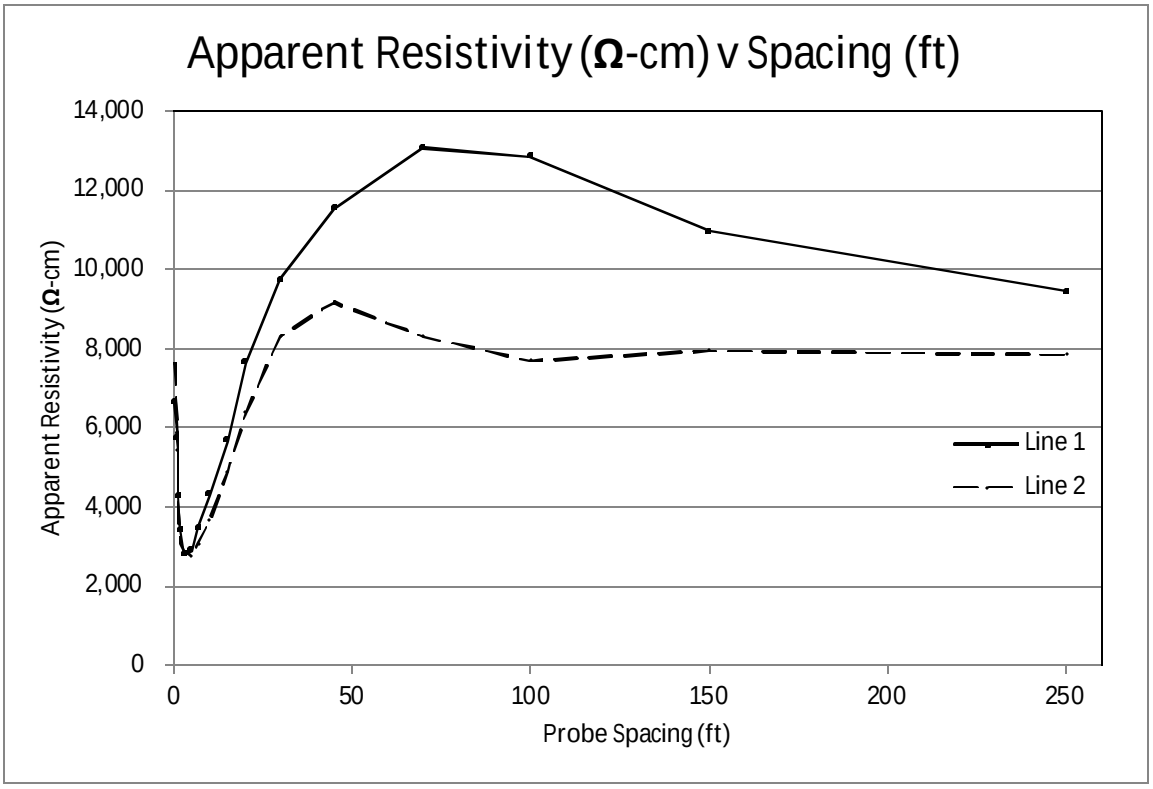
Line Notes: Area of POI Substation

Resistivity Line 2					
Probe Spacing (ft)	Resistance Reading (Ω)				Apparent Resistivity (Ω-cm)
	R1	R2	R3	Average	
0.5	79.6	79.6	79.6	80	7,622
1	28.3	28.3	28.3	28	5,419
1.5	15.037	15.037	15.037	15	4,319
2	8.075	8.075	8.075	8	3,093
3	4.987	4.987	4.987	5	2,865
5	2.872	2.872	2.872	3	2,750
7	2.294	2.294	2.294	2	3,075
10	1.9174	1.9174	1.9174	2	3,672
15	1.7064	1.7064	1.7064	2	4,902
20	1.6706	1.6706	1.6706	2	6,398
30	1.4445	1.4445	1.4445	1	8,299
45	1.0643	1.0643	1.0643	1	9,172
70	0.6205	0.6205	0.6205	1	8,318
100	0.4017	0.4017	0.4017	0	7,693
150	0.2768	0.2768	0.2768	0	7,951
250	0.1642	0.1642	0.1642	0	7,861
Center Coordinates: 42.8983° N, -76.9573° W					Line Orientation:East - West

Line Notes: Area of POI Substation

Field Electrical Resistivity Test Results
Trelina Solar Site - Preliminary
Town of Geneva, NY
Project No. J5195163

Test Location: TRSS-1 Substation



Comments:

1. Field electrical resistivity testing performed per ASTM G57-06, "Standard Test Method for Field Measurement of Electrical Resistivity Using the Wenner Four-Electrode Method"
2. Ground Conditions: Edge of bean field, some grass

3. Field resistivity values may be affected by circumstances such as precipitation, ground temperature and air temperature. Resistivity testing may also be influenced by site conditions such as: presence of cobbles, boulders , bedrock, and groundwater; as well as moisture content of the soils and the compactness of the soil.

Field Electrical Resistivity Test Results
Trelina Solar Site - Preliminary
Town of Geneva, NY
Project No. J5195163

Test Location: TTP-1	Equipment: Mini Res
Test Date: 10/16/19	Tested by: Tyler Wooden
Weather: overcast, windy	Temperature: 55°F

Resistivity Line 1					
Probe Spacing (ft)	Resistance Reading (Ω)				Apparent Resistivity (Ω-cm)
	R1	R2	R3	Average	
2.5	14.55	14.55	14.55	15	6,966
5	7.512	7.512	7.512	8	7,193
10	5.506	5.506	5.506	6	10,544
20	3.692	3.692	3.692	4	14,140
50	1.188	1.188	1.188	1	11,375
Center Coordinates: 42.9012°N, -76.9577°W					
Line Orientation:North-South					

Line Notes: Hay field

Resistivity Line 2					
Probe Spacing (ft)	Resistance Reading (Ω)				Apparent Resistivity (Ω-cm)
	R1	R2	R3	Average	
2.5	13.23	13.23	13.23	13	6,335
5	6.993	6.993	6.993	7	6,696
10	5.338	5.338	5.338	5	10,222
20	3.391	3.391	3.391	3	12,988
50	1.06	1.06	1.06	1	10,150
Center Coordinates: 42.9012°N, -76.9577°W					
Line Orientation: East - West					

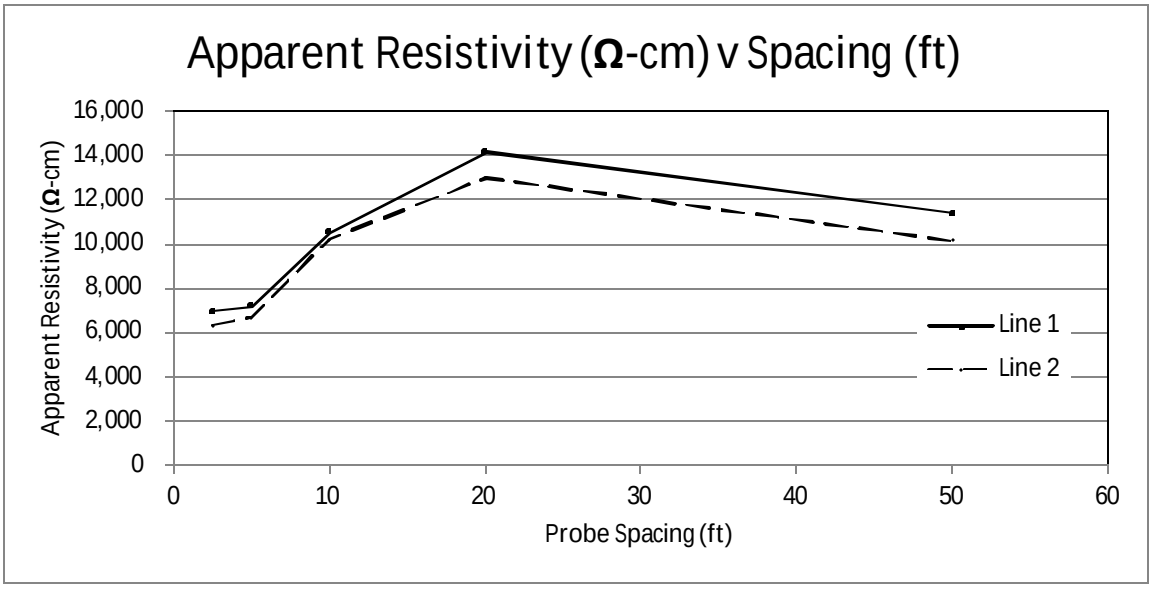
Line Notes: Hay Field

Comments:

1. Field electrical resistivity testing performed per ASTM G57-06, "Standard Test Method for Field Measurement of Electrical Resistivity Using the Wenner Four-Electrode Method"
2. Ground Conditions: Hay field, grass
3. Field resistivity values may be affected by circumstances such as precipitation, ground temperature and air temperature. Resistivity testing may also be influenced by site conditions such as: presence of cobbles, boulders , bedrock, and groundwater; as well as moisture content of the soils and the compactness of the soil.

Field Electrical Resistivity Test Results
Trelina Solar Site - Preliminary
Town of Geneva, NY
Project No. J5195163

Test Location: TTP-1



Field Electrical Resistivity Test Results
Trelina Solar Site - Preliminary
Town of Geneva, NY
Project No. J5195163

Test Location: TTP-2	Equipment: Mini Res
Test Date: 10/15/19	Tested by: Tyler Wooden
Weather: clear, sunny	Temperature: 60°F

Resistivity Line 1					
Probe Spacing (ft)	Resistance Reading (Ω)				Apparent Resistivity (Ω-cm)
	R1	R2	R3	Average	
2.5	1.410	1.410	1.410	1	675
5	0.7891	0.7891	0.7891	1	756
10	0.4529	0.4529	0.4529	0	867
20	0.2916	0.2916	0.2916	0	1,117
50	0.1716	0.1716	0.1716	0	1,643
Center Coordinates: 42.8933° N, -76.9584° W					
Line Orientation:North-South					

Line Notes: Hay Field

Resistivity Line 2					
Probe Spacing (ft)	Resistance Reading (Ω)				Apparent Resistivity (Ω-cm)
	R1	R2	R3	Average	
2.5	1.824	1.824	1.824	2	873
5	0.8481	0.8481	0.8481	1	812
10	0.4669	0.4669	0.4669	0	894
20	0.2963	0.2963	0.2963	0	1,135
50	0.1670	0.1670	0.1670	0	1,599
Center Coordinates: 42.8933° N, -76.9584° W					
Line Orientation: East - West					

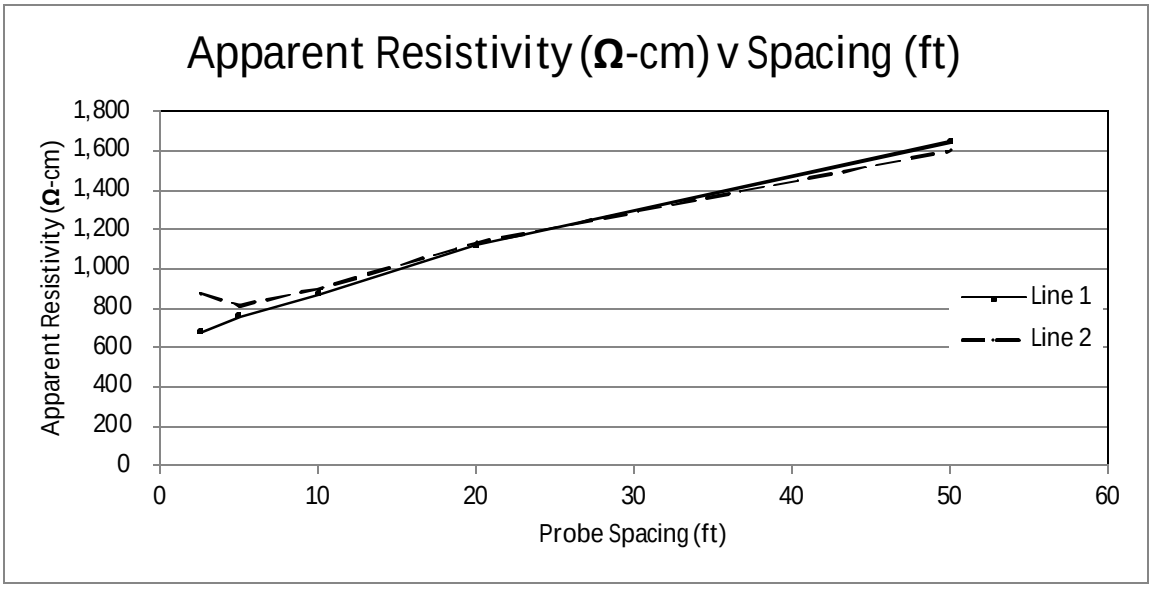
Line Notes: Hay field

Comments:

1. Field electrical resistivity testing performed per ASTM G57-06, "Standard Test Method for Field Measurement of Electrical Resistivity Using the Wenner Four-Electrode Method"
2. Ground Conditions: Hay field, grass
3. Field resistivity values may be affected by circumstances such as precipitation, ground temperature and air temperature. Resistivity testing may also be influenced by site conditions such as: presence of cobbles, boulders , bedrock, and groundwater; as well as moisture content of the soils and the compactness of the soil.

Field Electrical Resistivity Test Results
Trelina Solar Site - Preliminary
Town of Geneva, NY
Project No. J5195163

Test Location: TTP-2



Field Electrical Resistivity Test Results
Trelina Solar Site - Preliminary
Town of Geneva, NY
Project No. J5195163

Test Location: TTP-3	Equipment: Mini Res
Test Date: 10/16/19	Tested by: Tyler Wooden
Weather: overcast, windy	Temperature: 55°F

Resistivity Line 1					
Probe Spacing (ft)	Resistance Reading (Ω)				Apparent Resistivity (Ω-cm)
	R1	R2	R3	Average	
2.5	23.7	23.7	23.7	24	11,346
5	11.84	11.84	11.84	12	11,333
10	3.414	3.414	3.414	3	6,538
20	1.098	1.098	1.098	1	4,205
50	0.4963	0.4963	0.4963	0	4,752
Center Coordinates: 42.8876°N, -76.9509°W					
Line Orientation:North-South					

Line Notes: Bean and corn fields

Resistivity Line 2					
Probe Spacing (ft)	Resistance Reading (Ω)				Apparent Resistivity (Ω-cm)
	R1	R2	R3	Average	
2.5	25.1	25.1	25.1	25	12,017
5	12.71	12.71	12.71	13	12,165
10	3.793	3.793	3.793	4	7,264
20	1.101	1.101	1.101	1	4,217
50	0.5112	0.5112	0.5112	1	4,895
Center Coordinates: 42.8876°N, -76.9509°W					
Line Orientation: East - West					

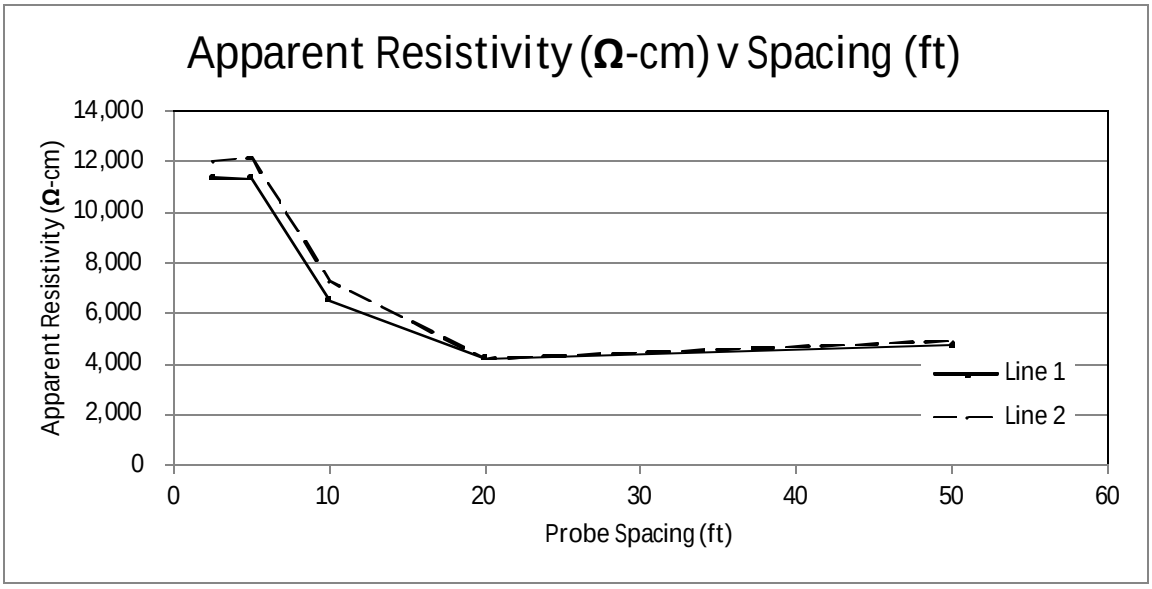
Line Notes: Bean and corn fields

Comments:

1. Field electrical resistivity testing performed per ASTM G57-06, "Standard Test Method for Field Measurement of Electrical Resistivity Using the Wenner Four-Electrode Method"
2. Ground Conditions: Bean field/Corn field, corner
3. Field resistivity values may be affected by circumstances such as precipitation, ground temperature and air temperature. Resistivity testing may also be influenced by site conditions such as: presence of cobbles, boulders , bedrock, and groundwater; as well as moisture content of the soils and the compactness of the soil.

Field Electrical Resistivity Test Results
Trelina Solar Site - Preliminary
Town of Geneva, NY
Project No. J5195163

Test Location: TTP-3



Field Electrical Resistivity Test Results
Trelina Solar Site - Preliminary
Town of Geneva, NY
Project No. J5195163

Test Location: TTP-4	Equipment: Mini Res
Test Date: 10/15/19	Tested by: Tyler Wooden
Weather: clear, sunny	Temperature: 60°F

Resistivity Line 1					
Probe Spacing (ft)	Resistance Reading (Ω)				Apparent Resistivity (Ω-cm)
	R1	R2	R3	Average	
2.5	9.6	9.6	9.6	10	4,596
5	2.829	2.829	2.829	3	2,709
10	1.6709	1.6709	1.6709	2	3,200
20	1.3228	1.3228	1.3228	1	5,066
50	0.7966	0.7966	0.7966	1	7,627
Center Coordinates: 42.8960° N, -76.9464° W					
Line Orientation:North-South					

Line Notes: Grass and bean field

Resistivity Line 2					
Probe Spacing (ft)	Resistance Reading (Ω)				Apparent Resistivity (Ω-cm)
	R1	R2	R3	Average	
2.5	7.608	7.608	7.608	8	3,642
5	3.274	3.274	3.274	3	3,135
10	1.775	1.775	1.775	2	3,399
20	1.475	1.475	1.475	1	5,649
50	0.905	0.905	0.905	1	8,665
Center Coordinates: 42.8960° N, -76.9464° W					
Line Orientation: East - West					

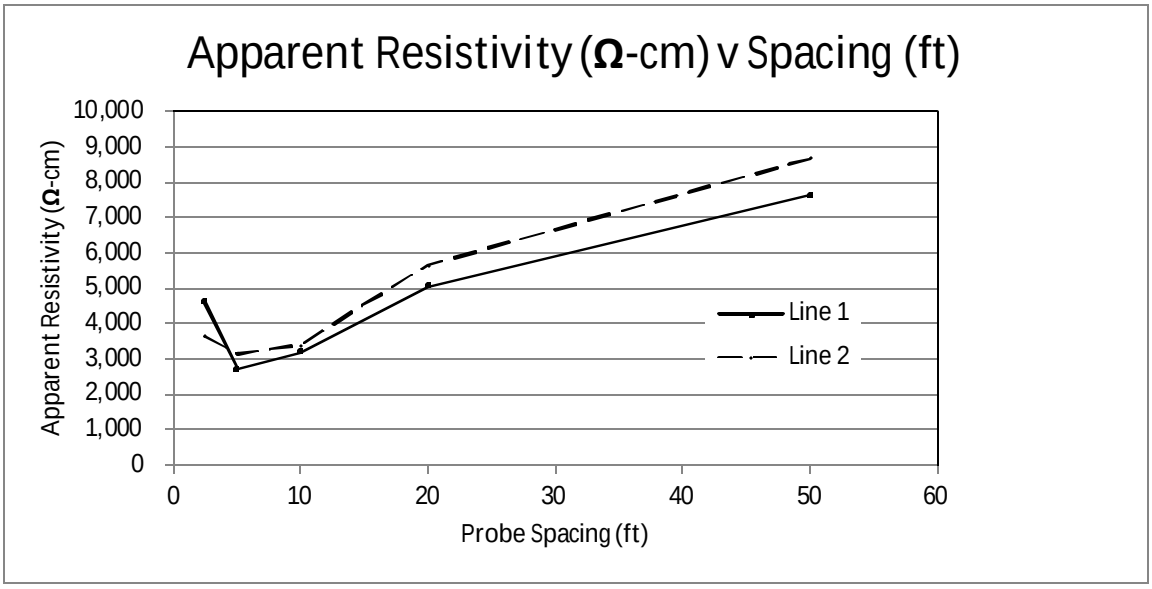
Line Notes: Grass and bean field

Comments:

1. Field electrical resistivity testing performed per ASTM G57-06, "Standard Test Method for Field Measurement of Electrical Resistivity Using the Wenner Four-Electrode Method"
2. Ground Conditions: Grass and bean field
3. Field resistivity values may be affected by circumstances such as precipitation, ground temperature and air temperature. Resistivity testing may also be influenced by site conditions such as: presence of cobbles, boulders , bedrock, and groundwater; as well as moisture content of the soils and the compactness of the soil.

Field Electrical Resistivity Test Results
Trelina Solar Site - Preliminary
Town of Geneva, NY
Project No. J5195163

Test Location: TTP-4



Field Electrical Resistivity Test Results
Trelina Solar Site - Preliminary
Town of Geneva, NY
Project No. J5195163

Test Location: TTP-5	Equipment: Mini Res
Test Date: 10/16/19	Tested by: Tyler Wooden
Weather: overcast, windy	Temperature: 55°F

Resistivity Line 1					
Probe Spacing (ft)	Resistance Reading (Ω)				Apparent Resistivity (Ω-cm)
	R1	R2	R3	Average	
2.5	3.548	3.548	3.548	4	1,699
5	1.49	1.49	1.49	1	1,427
10	1.304	1.304	1.304	1	2,497
20	1.299	1.299	1.299	1	4,975
50	0.7008	0.7008	0.7008	1	6,710
Center Coordinates: 42.8969°N, -76.9319°W					
Line Orientation:North-South					

Line Notes: Bean field

Resistivity Line 2					
Probe Spacing (ft)	Resistance Reading (Ω)				Apparent Resistivity (Ω-cm)
	R1	R2	R3	Average	
2.5	3.659	3.659	3.659	4	1,752
5	1.405	1.405	1.405	1	1,345
10	0.7413	0.7413	0.7413	1	1,420
20	0.5579	0.5579	0.5579	1	2,137
50	0.4185	0.4185	0.4185	0	4,007
Center Coordinates: 42.8969°N, -76.9319°W					
Line Orientation: East - West					

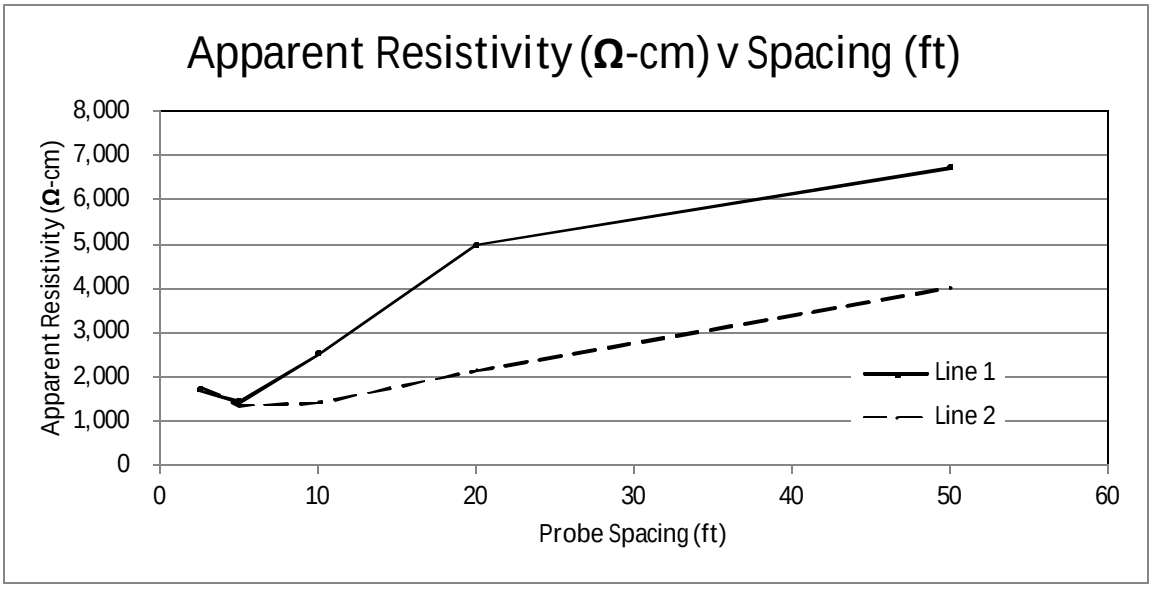
Line Notes: Bean field

Comments:

1. Field electrical resistivity testing performed per ASTM G57-06, "Standard Test Method for Field Measurement of Electrical Resistivity Using the Wenner Four-Electrode Method"
2. Ground Conditions: Bean field, corner
3. Field resistivity values may be affected by circumstances such as precipitation, ground temperature and air temperature. Resistivity testing may also be influenced by site conditions such as: presence of cobbles, boulders , bedrock, and groundwater; as well as moisture content of the soils and the compactness of the soil.

Field Electrical Resistivity Test Results
Trelina Solar Site - Preliminary
Town of Geneva, NY
Project No. J5195163

Test Location: TTP-5



Field Electrical Resistivity Test Results
Trelina Solar Site - Preliminary
Town of Geneva, NY
Project No. J5195163

Test Location: TTP-6	Equipment: Mini Res
Test Date: 10/16/19	Tested by: Tyler Wooden
Weather: overcast, windy	Temperature: 55°F

Resistivity Line 1					
Probe Spacing (ft)	Resistance Reading (Ω)				Apparent Resistivity (Ω-cm)
	R1	R2	R3	Average	
2.5	7.691	7.691	7.691	8	3,682
5	3.69	3.69	3.69	4	3,533
10	1.676	1.676	1.676	2	3,210
20	0.8734	0.8734	0.8734	1	3,345
50	0.5088	0.5088	0.5088	1	4,872
Center Coordinates: 42.8835°N, -76.9514°W					
Line Orientation:East					

Line Notes: Unable to run North-south string due to planted field and swamp.

Resistivity Line 2					
Probe Spacing (ft)	Resistance Reading (Ω)				Apparent Resistivity (Ω-cm)
	R1	R2	R3	Average	
2.5	7.834	7.834	7.834	8	3,751
5	3.745	3.745	3.745	4	3,586
10	1.619	1.619	1.619	2	3,100
20	0.8772	0.8772	0.8772	1	3,360
50	0.5139	0.5139	0.5139	1	4,921
Center Coordinates: 42.8835°N, -76.9514°W					
Line Orientation: West					

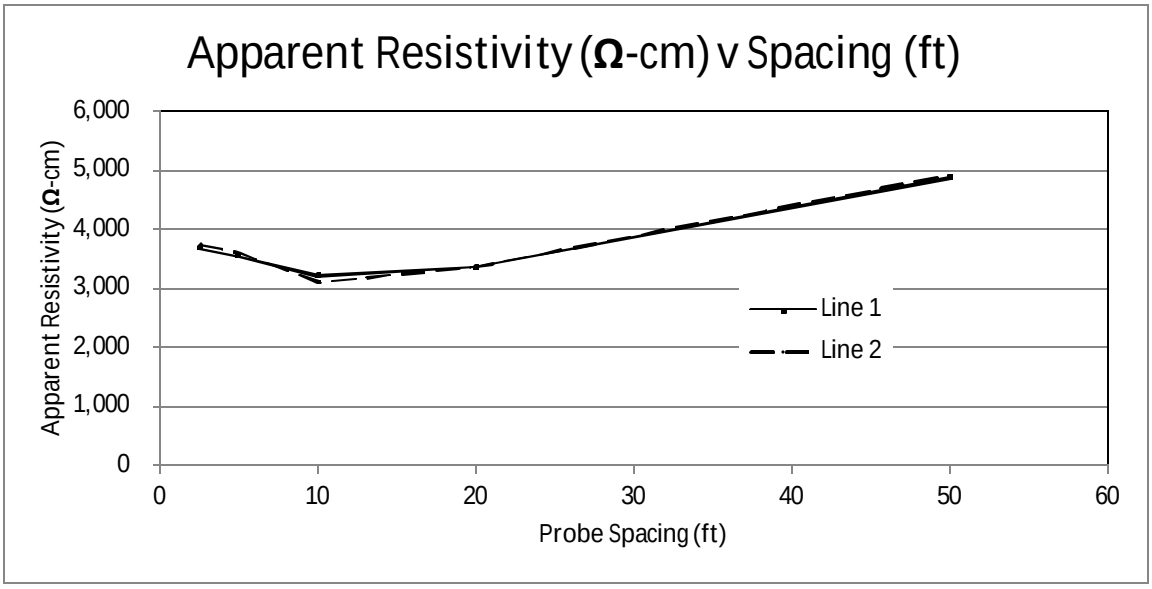
Line Notes: Unable to run North-south string due to planted field and swamp.

Comments:

1. Field electrical resistivity testing performed per ASTM G57-06, "Standard Test Method for Field Measurement of Electrical Resistivity Using the Wenner Four-Electrode Method"
2. Ground Conditions: Plowed field, moist
3. Field resistivity values may be affected by circumstances such as precipitation, ground temperature and air temperature. Resistivity testing may also be influenced by site conditions such as: presence of cobbles, boulders , bedrock, and groundwater; as well as moisture content of the soils and the compactness of the soil.

Field Electrical Resistivity Test Results
Trelina Solar Site - Preliminary
Town of Geneva, NY
Project No. J5195163

Test Location: TTP-6



Field Electrical Resistivity Test Results
Trelina Solar Site - Preliminary
Town of Geneva, NY
Project No. J5195163

Test Location: TR-5	Equipment: Mini Res
Test Date: 10/15/19	Tested by: Tyler Wooden
Weather: clear, sunny	Temperature: 60°F

Resistivity Line 1					
Probe Spacing (ft)	Resistance Reading (Ω)				Apparent Resistivity (Ω-cm)
	R1	R2	R3	Average	
2.5	12.264	12.264	12.264	12	5,871
5	4.32	4.32	4.32	4	4,136
10	2.61	2.61	2.61	3	4,998
20	1.3648	1.3648	1.3648	1	5,227
50	0.6234	0.6234	0.6234	1	5,969
Center Coordinates: 42.8980° N, -76.9506° W					
Line Orientation:North-South					

Line Notes: Edge of corn field

Resistivity Line 2					
Probe Spacing (ft)	Resistance Reading (Ω)				Apparent Resistivity (Ω-cm)
	R1	R2	R3	Average	
2.5	11.99	11.99	11.99	12	5,740
5	5.026	5.026	5.026	5	4,812
10	2.594	2.594	2.594	3	4,968
20	1.332	1.332	1.332	1	5,102
50	0.7146	0.7146	0.7146	1	6,842
Center Coordinates: 42.8980° N, -76.9506° W					
Line Orientation: East - West					

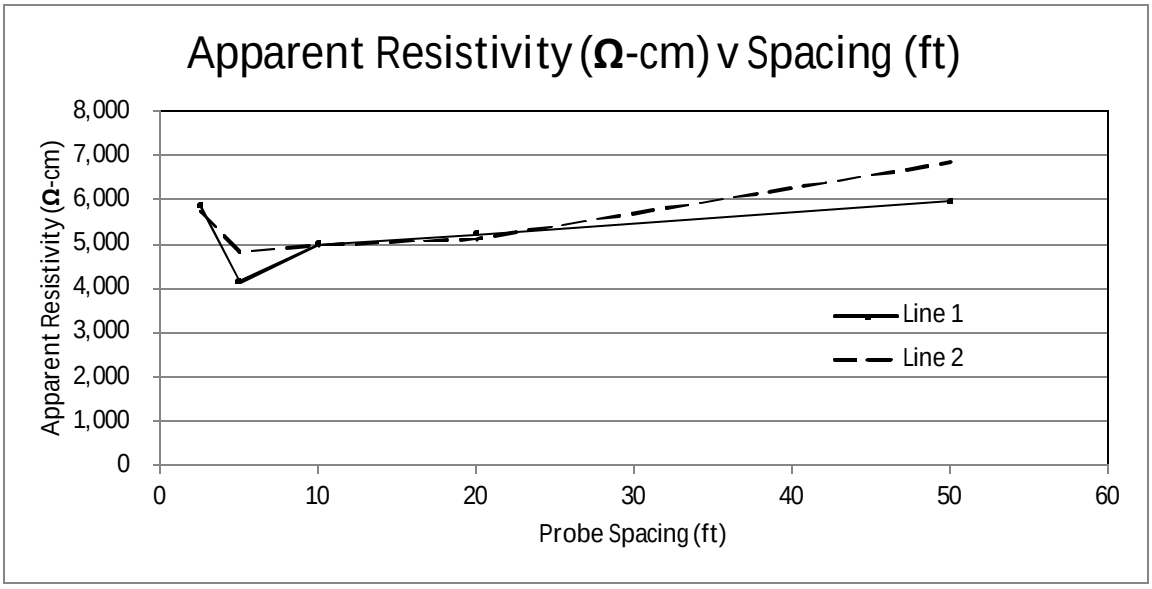
Line Notes: Edge of corn field

Comments:

1. Field electrical resistivity testing performed per ASTM G57-06, "Standard Test Method for Field Measurement of Electrical Resistivity Using the Wenner Four-Electrode Method"
2. Ground Conditions: Edge of corn field
3. Field resistivity values may be affected by circumstances such as precipitation, ground temperature and air temperature. Resistivity testing may also be influenced by site conditions such as: presence of cobbles, boulders , bedrock, and groundwater; as well as moisture content of the soils and the compactness of the soil.

Field Electrical Resistivity Test Results
Trelina Solar Site - Preliminary
Town of Geneva, NY
Project No. J5195163

Test Location: TR-5



Field Electrical Resistivity Test Results
Trelina Solar Site - Preliminary
Town of Geneva, NY
Project No. J5195163

Test Location: TR-10	Equipment: Mini Res
Test Date: 10/15/19	Tested by: Tyler Wooden
Weather: clear, sunny	Temperature: 60°F

Resistivity Line 1					
Probe Spacing (ft)	Resistance Reading (Ω)				Apparent Resistivity (Ω-cm)
	R1	R2	R3	Average	
2.5	301.9	301.9	301.9	302	144,535
5	64.4	64.4	64.4	64	61,663
10	3.723	3.723	3.723	4	7,130
20	0.9134	0.9134	0.9134	1	3,498
50	0.6324	0.6324	0.6324	1	6,055
Center Coordinates: 42.8922° N, -76.9344° W					
Line Orientation:North-South					

Line Notes: Edge of bean field

Resistivity Line 2					
Probe Spacing (ft)	Resistance Reading (Ω)				Apparent Resistivity (Ω-cm)
	R1	R2	R3	Average	
2.5	429.3	429.3	429.3	429	205,527
5	50.9	50.9	50.9	51	48,737
10	2.96	2.96	2.96	3	5,668
20	0.572	0.572	0.572	1	2,191
50	0.392	0.392	0.392	0	3,753
Center Coordinates: 42.8922° N, -76.9344° W					
Line Orientation: East - West					

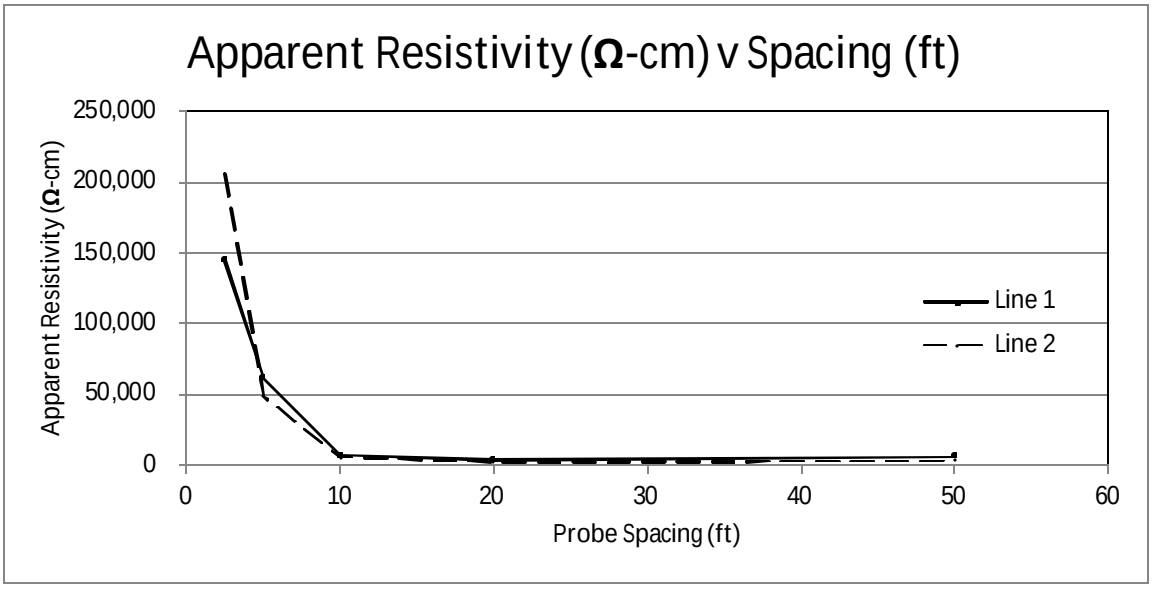
Line Notes: Edge of bean field

Comments:

1. Field electrical resistivity testing performed per ASTM G57-06, "Standard Test Method for Field Measurement of Electrical Resistivity Using the Wenner Four-Electrode Method"
2. Ground Conditions: Edge of bean field
3. Field resistivity values may be affected by circumstances such as precipitation, ground temperature and air temperature. Resistivity testing may also be influenced by site conditions such as: presence of cobbles, boulders , bedrock, and groundwater; as well as moisture content of the soils and the compactness of the soil.

Field Electrical Resistivity Test Results
Trelina Solar Site - Preliminary
Town of Geneva, NY
Project No. J5195163

Test Location: TR-10



APPENDIX D
PILE LOAD TESTING DATA
(PILE DRIVING DATA)

(Exhibits- D001 through D004)

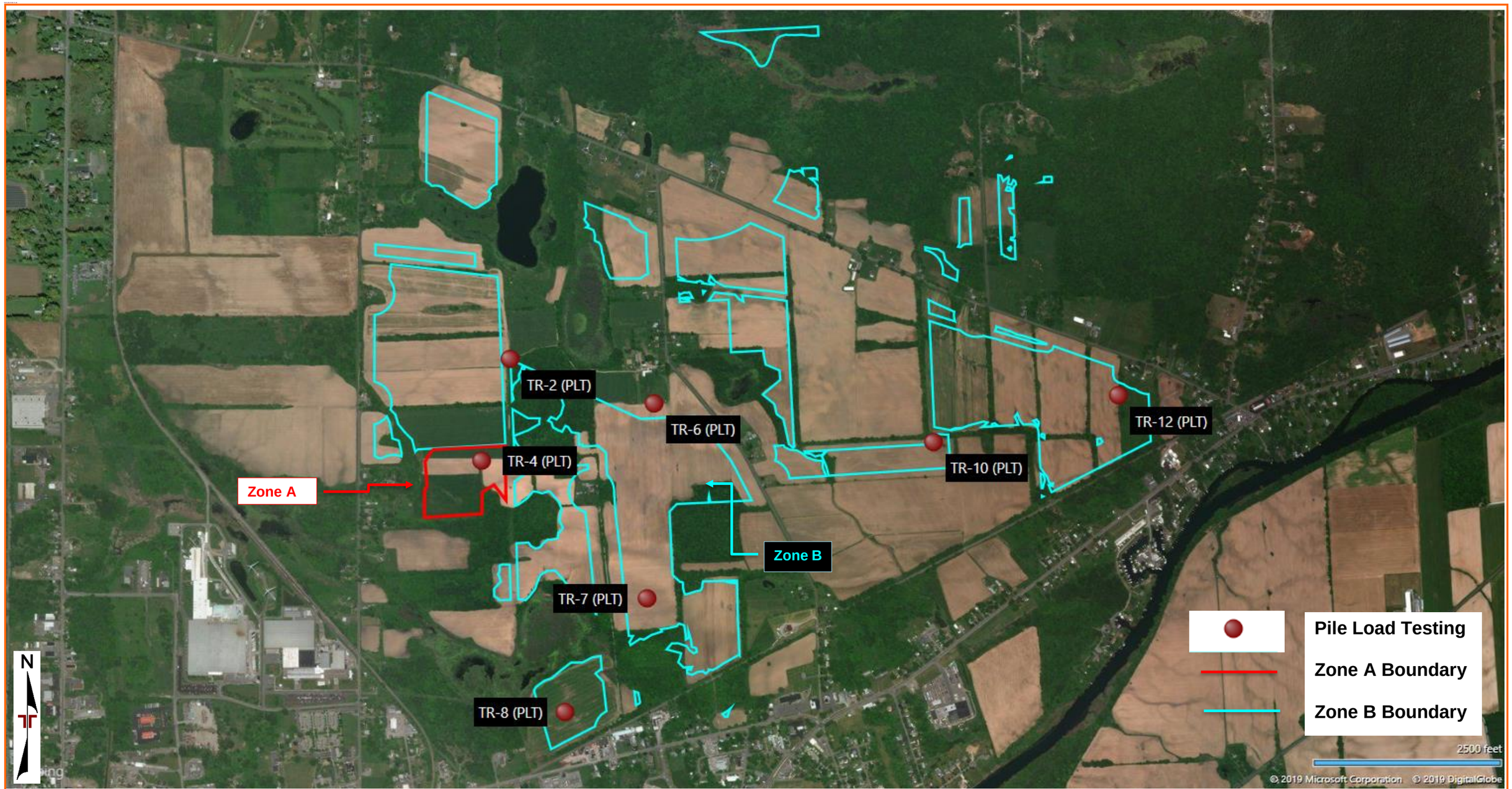
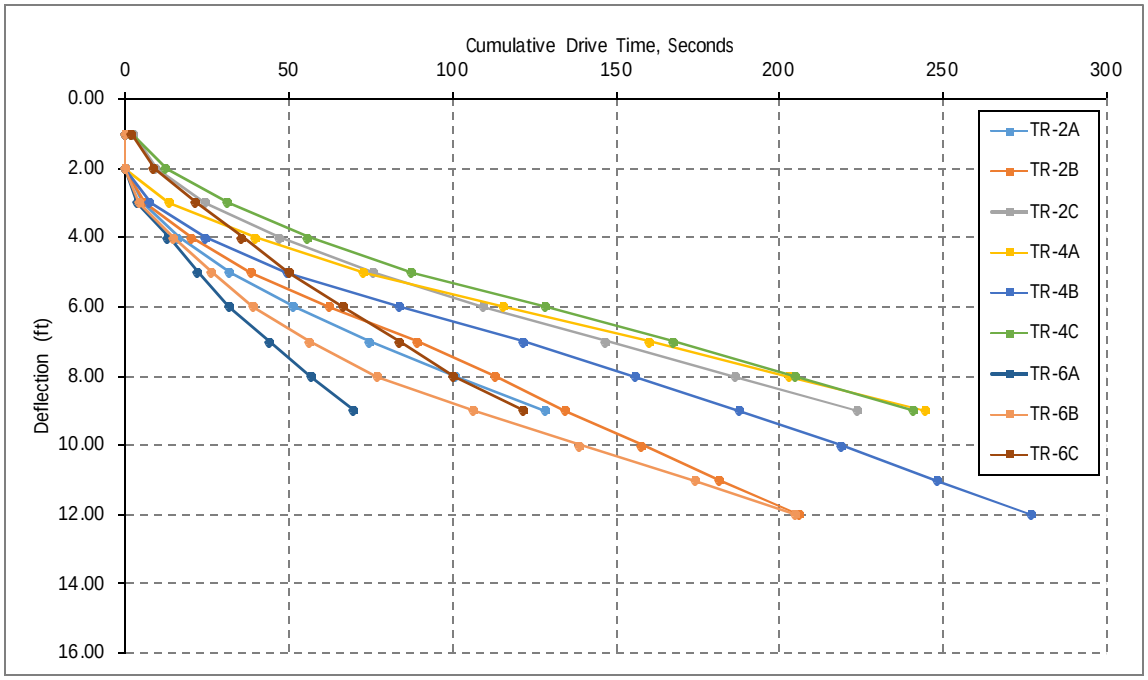


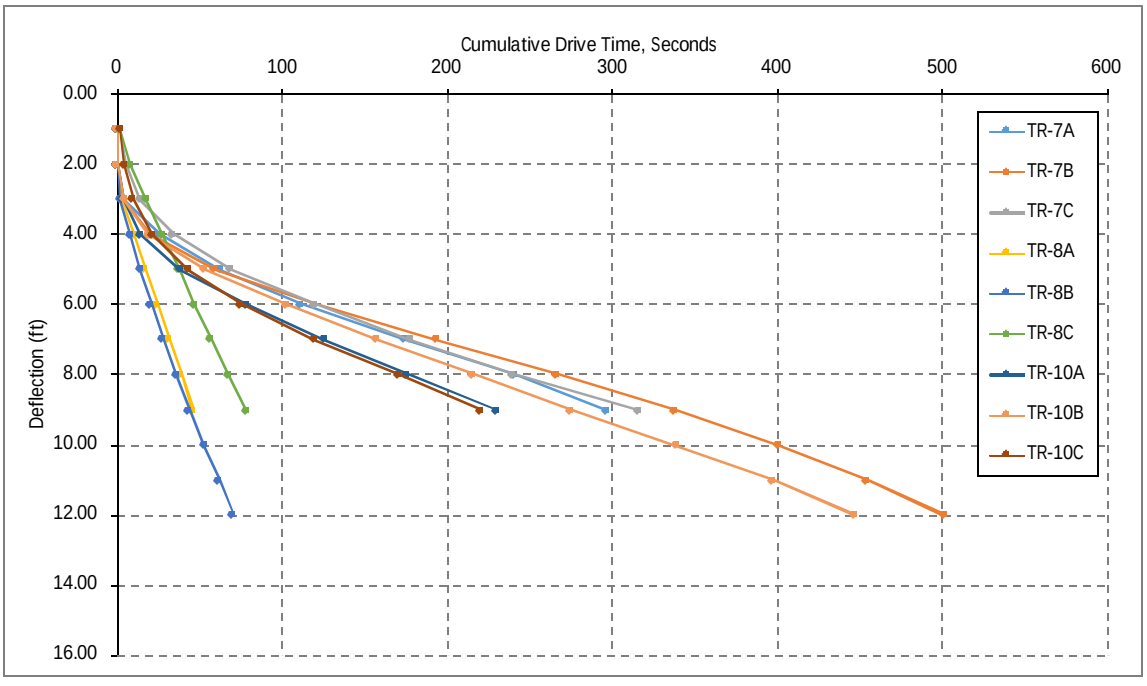
DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

MAP PROVIDED BY USGS

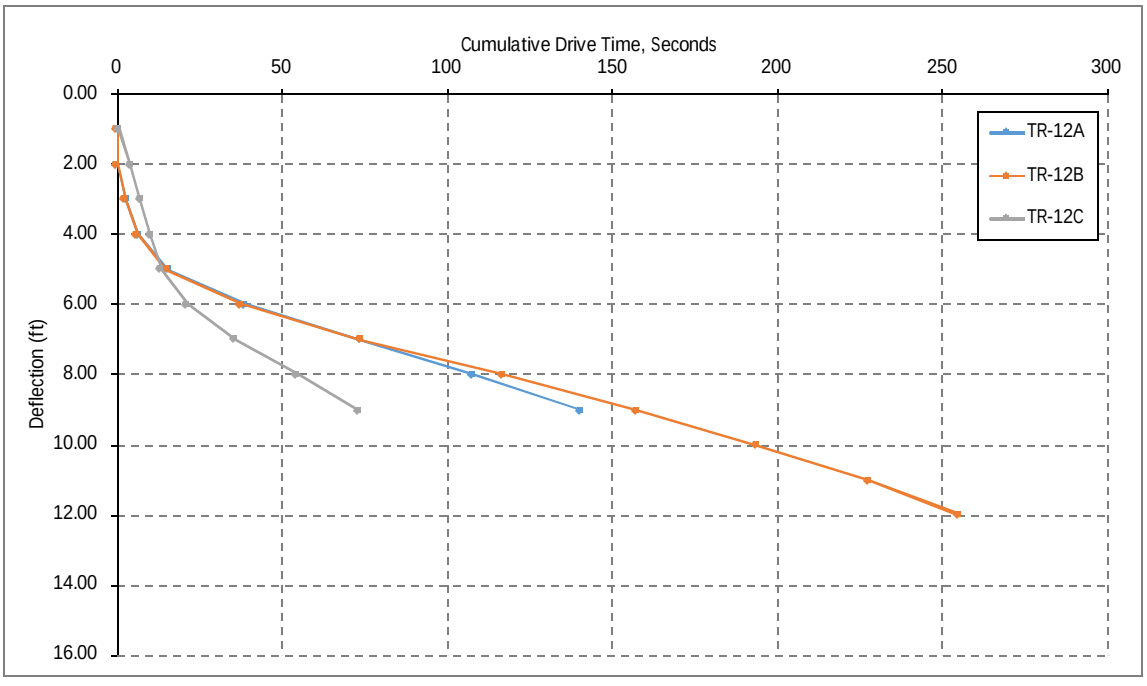
	Cumulative Driving Time (seconds)								
Depth (ft)	**TR-2A**	**TR-2B**	**TR-2C**	**TR-4A**	**TR-4B**	**TR-4C**	**TR-6A**	**TR-6B**	**TR-6C**
1	0	0	2.34	0	0	1.77	0	0	1.67
2	0	0	9.52	0	0	12.54	0	0	8.9
3	5.1	5.73	24.33	13.41	7.59	31.39	3.71	4.34	21.78
4	16.23	20.27	47.04	39.65	24.44	55.85	13	14.53	35.87
5	32.06	38.58	76.09	73.08	49.4	87.88	22.28	26.47	50.13
6	51.71	62.21	109.37	115.89	84.23	128.68	31.73	39.24	66.52
7	74.59	89.26	147.06	160.2	121.77	167.63	44.1	56.1	83.9
8	101.1	113.46	186.63	202.92	156.06	205.22	56.91	77.19	100.49
9	128.28	134.56	224.06	244.75	187.85	241.38	70.1	106.78	122.05
10		158.13			218.9			139.04	
11		181.91			248.4			174.25	
12		206.31			277.18			205.31	
13									
14									
15									
Total Drive Time	**128.28**	**206.31**	**224.06**	**244.75**	**277.18**	**241.38**	**70.1**	**205.31**	**122.05**
Drive Rate ft/sec.	**18.33**	**20.63**	**26.36**	**34.96**	**27.72**	**27.59**	**10.39**	**20.53**	**13.95**
Embedment Depth	**9**	**12**	**9**	**9**	**12**	**9**	**9**	**12**	**9**
Approximate Push Depth (ft)	**2**	**2**	**0.5**	**2**	**2**	**0.25**	**2.25**	**2**	**0.25**
Section	**W6x9**								



	Cumulative Driving Time (seconds)								
Depth (ft)	**TR-7A**	**TR-7B**	**TR-7C**	**TR-8A**	**TR-8B**	**TR-8C**	**TR-10A**	**TR-10B**	**TR-10C**
1	0	0	1.25	0	0	1.45	0	0	1.66
2	0	0	5.58	0	0	8.09	0	0	4.51
3	4.24	3.47	13.63	3.27	1.77	17.42	3.8	3.94	9.95
4	25.58	20.25	34.03	10.01	7.89	27.45	13.87	18.57	21.18
5	62.31	59.66	69.21	17.2	14.16	37.27	38.14	53.03	43.14
6	111.74	120.08	119.92	24.27	20.51	46.87	77.92	102.56	74.85
7	174.35	193.56	177.5	31.63	27.88	57.14	125.69	157.69	119.4
8	240.56	266.78	240.27	38.88	35.62	67.02	175.52	215.64	170.28
9	296.14	338	315.67	45.94	43.87	77.95	230	275.26	220.62
10		401.2			52.73			339.05	
11		454.72			61.83			397.59	
12		500.91			70.33			447	
13									
14									
15									
Total Drive Time	**296.14**	**500.91**	**315.67**	**45.94**	**70.33**	**77.95**	**230**	**447**	**220.62**
Drive Rate ft/sec.	**43.8726**	**52.7274**	**36.0766**	**6.56286**	**7.40316**	**9.17059**	**32.8571**	**44.7**	**24.5133**
Embedment Depth	**9**	**12**	**9**	**9**	**12**	**9**	**9**	**12**	**9**
Approximate Push Depth (ft)	**2.25**	**2.5**	**0.25**	**2**	**2.5**	**0.5**	**2**	**2**	**0**
Section	**W6x9**								



	Cumulative Driving Time (seconds)								
Depth (ft)	**TR-12A**	**TR-12B**	**TR-12C**						
1	0	0	0.5						
2	0	0	4.07						
3	2.85	2.27	7.01						
4	6.27	6.1	10.06						
5	15.52	14.76	13.42						
6	38.8	37.42	21.26						
7	73.65	73.68	35.73						
8	107.58	116.59	54.6						
9	140.53	157.29	73.09						
10		194.04							
11		227.63							
12		255.21							
13									
14									
15									
Total Drive Time	**140.53**	**255.21**	**73.09**						
Drive Rate ft/sec.	**20.0757**	**25.521**	**8.85939**						
Embedment Depth	**9**	**12**	**9**						
Approximate Push Depth (ft)	**2**	**2**	**0.75**						
Section	**W6x9**								



APPENDIX E
PILE LOAD TESTING DATA
(AXIAL TENSION)

(Exhibits- E001 through E014)

Tension Load Test Result for TR-2A

Project Information

Project Name:	Trelina Solar
Project Location:	Waterloo, New York
Project Number:	J5195163

Axial Load Test Set Up

Number of Gauges:	2
Height of Gauges [in]:	6
Load Cell:	Dillon Ed Jr

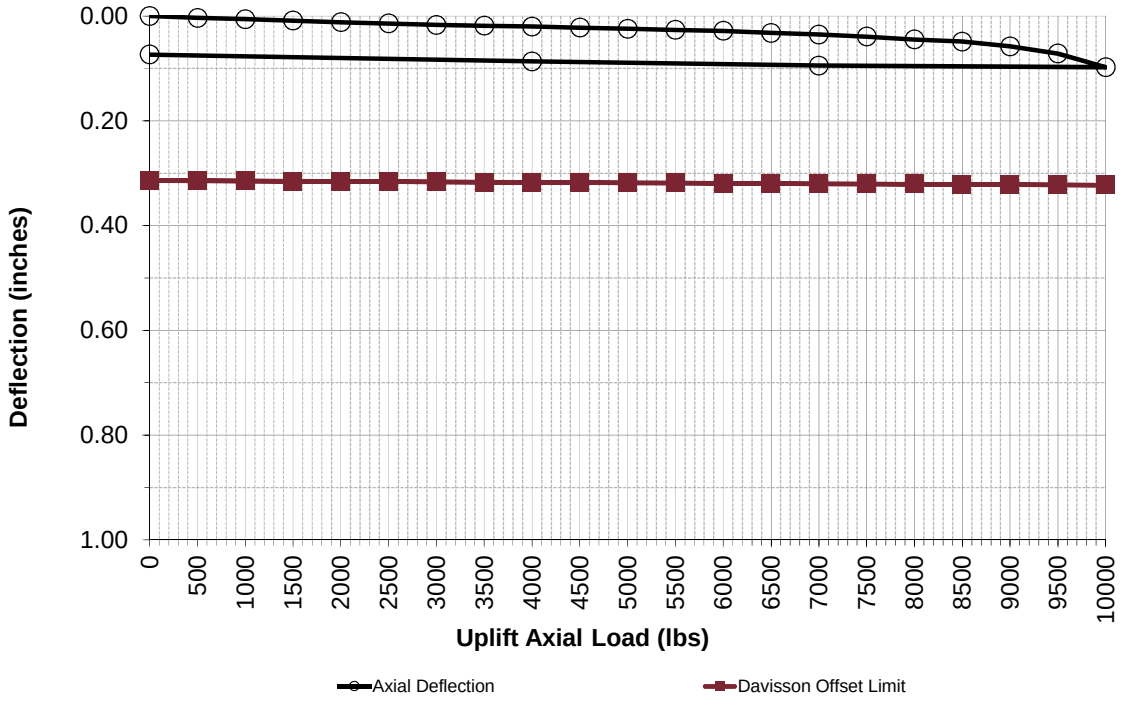
Test Date and Representative

Tested By Terracon Rep:	TW
Date Tested:	11/4/2019

Pile Information

Pile ID:	TR-2A
Latitude:	42.89527
Longitude:	-76.95592
Pile Type:	W6x9
Pile Embedment Depth [in]:	84
Pile Perimeter [in]:	19.68
Pile Stick-Up [in]:	54
Axial Design Load [lbs]:	2000
Pile Area [sq. in]:	2.68
Elastic Modulus [ksi]:	36,000
Drive Time [sec]:	90

Tension Test Results			Davisson Offset Limit Lines		
% of Design Load	Axial Load [lbs]	Deflection Δ (in.) Gauges #1 & #2	Elastic Data (in) (PL/AE)	Davisson Offest Limit (in) (0.15+D/120+(PL/AE))	Comments
0%	0	0.000	0.000	0.314	
25%	500	0.004	0.000	0.314	
50%	1000	0.006	0.001	0.315	
75%	1500	0.009	0.001	0.315	
100%	2000	0.012	0.002	0.316	
125%	2500	0.014	0.002	0.316	
150%	3000	0.017	0.003	0.317	
175%	3500	0.018	0.003	0.317	
200%	4000	0.020	0.003	0.317	
225%	4500	0.022	0.004	0.318	
250%	5000	0.024	0.004	0.318	
275%	5500	0.026	0.005	0.319	
300%	6000	0.028	0.005	0.319	
325%	6500	0.032	0.006	0.320	
350%	7000	0.035	0.006	0.320	
375%	7500	0.039	0.007	0.321	
400%	8000	0.045	0.007	0.321	
425%	8500	0.049	0.007	0.321	
450%	9000	0.058	0.008	0.322	
475%	9500	0.072	0.008	0.322	
500%	10000	0.098	0.009	0.323	
350%	7000	0.095	0.006	0.320	
200%	4000	0.087	0.003	0.317	
0%	0	0.073	0.000	0.314	



Note: The pile embedment depth in this analysis ignores the approximate push depth. Refer Appendix D for theapproximate push depth.

Tension Load Test Result for TR-2B

Project Information

Project Name:	Trelina Solar
Project Location:	Waterloo, New York
Project Number:	J5195163

Axial Load Test Set Up

Number of Gauges:	2
Height of Gauges [in]:	6
Load Cell:	Dillon Ed Jr

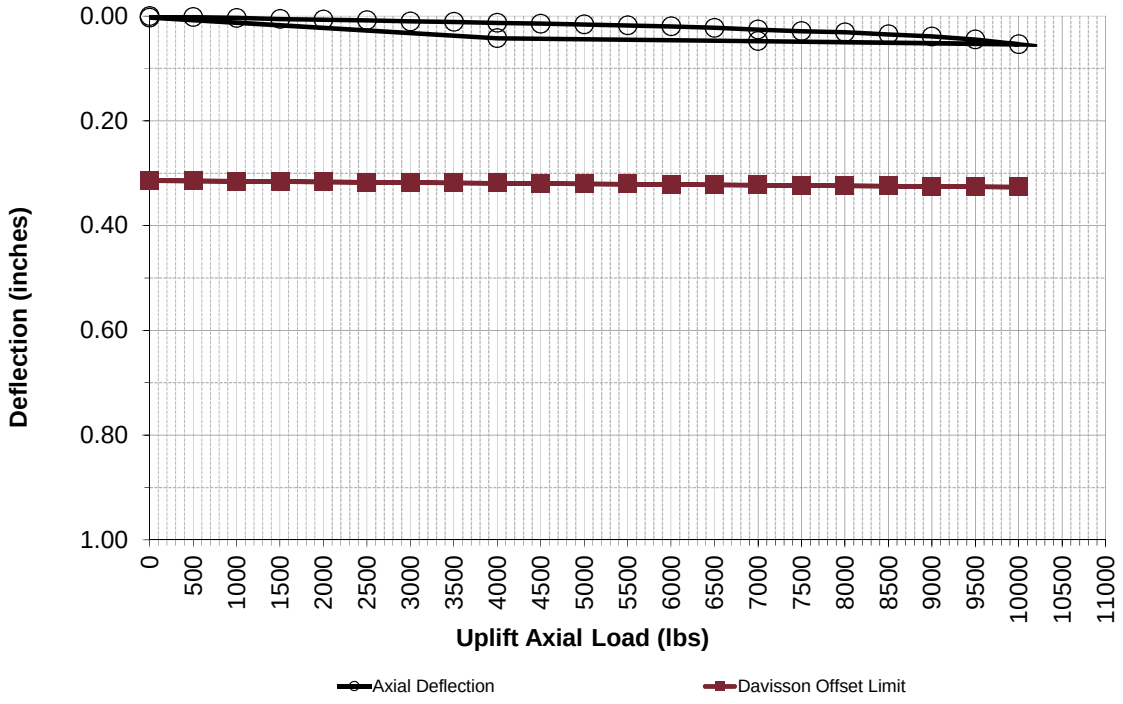
Test Date and Representative

Tested By Terracon Rep:	TW
Date Tested:	11/4/2019

Pile Information

Pile ID:	TR-2B
Latitude:	42.89527
Longitude:	-76.95592
Pile Type:	W6x9
Pile Embedment Depth [in]:	120
Pile Perimeter [in]:	19.68
Pile Stick-Up [in]:	54
Axial Design Load [lbs]:	2000
Pile Area [sq. in]:	2.68
Elastic Modulus [ksi]:	36,000
Drive Time [sec]:	360

Tension Test Results			Davisson Offset Limit Lines		
% of Design Load	Axial Load [lbs]	Deflection Δ (in.) Gauges #1 & #2	Elastic Data (in) (PL/AE)	Davisson Offest Limit (in) (0.15+D/120+(PL/AE))	Comments
0%	0	0.000	0.000	0.314	
25%	500	0.002	0.001	0.315	
50%	1000	0.004	0.001	0.315	
75%	1500	0.005	0.002	0.316	
100%	2000	0.007	0.002	0.316	
125%	2500	0.008	0.003	0.317	
150%	3000	0.010	0.004	0.318	
175%	3500	0.011	0.004	0.318	
200%	4000	0.013	0.005	0.319	
225%	4500	0.015	0.006	0.320	
250%	5000	0.016	0.006	0.320	
275%	5500	0.018	0.007	0.321	
300%	6000	0.020	0.007	0.321	
325%	6500	0.022	0.008	0.322	
350%	7000	0.026	0.009	0.323	
375%	7500	0.029	0.009	0.323	
400%	8000	0.031	0.010	0.324	
425%	8500	0.035	0.011	0.325	
450%	9000	0.039	0.011	0.325	
475%	9500	0.045	0.012	0.326	
500%	10000	0.054	0.012	0.326	
350%	7000	0.048	0.009	0.323	
200%	4000	0.042	0.005	0.319	
0%	0	0.003	0.000	0.314	



Note: The pile embedment depth in this analysis ignores the approximate push depth. Refer Appendix D for theapproximate push depth.

Tension Load Test Result for TR-4A

Project Information

Project Name:	Trelina Solar
Project Location:	Waterloo, New York
Project Number:	J5195163

Axial Load Test Set Up

Number of Gauges:	2
Height of Gauges [in]:	6
Load Cell:	Dillon Ed Jr

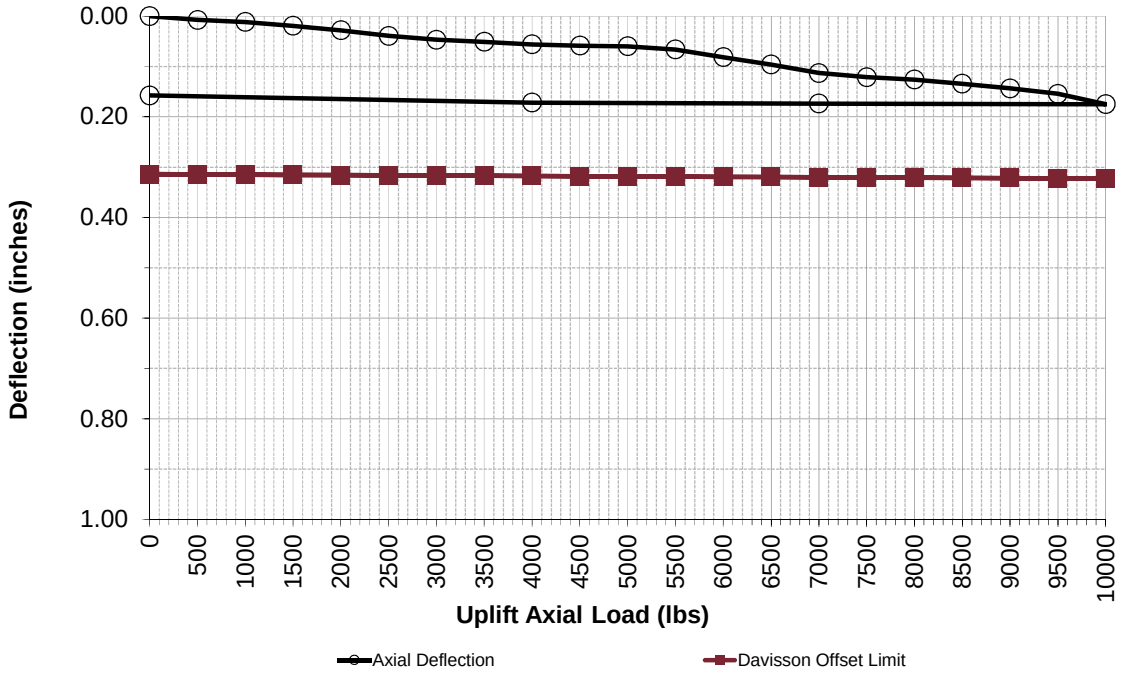
Test Date and Representative

Tested By Terracon Rep:	TW
Date Tested:	11/4/2019

Pile Information

Pile ID:	TR-4A
Latitude:	42.89146
Longitude:	-76.95733
Pile Type:	W6x9
Pile Embedment Depth [in]:	84
Pile Perimeter [in]:	19.68
Pile Stick-Up [in]:	54
Axial Design Load [lbs]:	2000
Pile Area [sq. in]:	2.68
Elastic Modulus [ksi]:	36,000
Drive Time [sec]:	130

Tension Test Results			Davisson Offset Limit Lines		
% of Design Load	Axial Load [lbs]	Deflection Δ (in.) Gauges #1 & #2	Elastic Data (in) (PL/AE)	Davisson Offest Limit (in) (0.15+D/120+(PL/AE))	Comments
0%	0	0.000	0.000	0.314	
25%	500	0.007	0.000	0.314	
50%	1000	0.011	0.001	0.315	
75%	1500	0.019	0.001	0.315	
100%	2000	0.028	0.002	0.316	
125%	2500	0.039	0.002	0.316	
150%	3000	0.047	0.003	0.317	
175%	3500	0.051	0.003	0.317	
200%	4000	0.056	0.003	0.317	
225%	4500	0.059	0.004	0.318	
250%	5000	0.060	0.004	0.318	
275%	5500	0.066	0.005	0.319	
300%	6000	0.082	0.005	0.319	
325%	6500	0.096	0.006	0.320	
350%	7000	0.113	0.006	0.320	
375%	7500	0.121	0.007	0.321	
400%	8000	0.126	0.007	0.321	
425%	8500	0.134	0.007	0.321	
450%	9000	0.143	0.008	0.322	
475%	9500	0.154	0.008	0.322	
500%	10000	0.175	0.009	0.323	
350%	7000	0.174	0.006	0.320	
200%	4000	0.172	0.003	0.317	
0%	0	0.157	0.000	0.314	



Note: The pile embedment depth in this analysis ignores the approximate push depth. Refer Appendix D for theapproximate push depth.

Tension Load Test Result for TR-4B

Project Information

Project Name:	Trelina Solar
Project Location:	Waterloo, New York
Project Number:	J5195163

Axial Load Test Set Up

Number of Gauges:	2
Height of Gauges [in]:	6
Load Cell:	Dillon Ed Jr

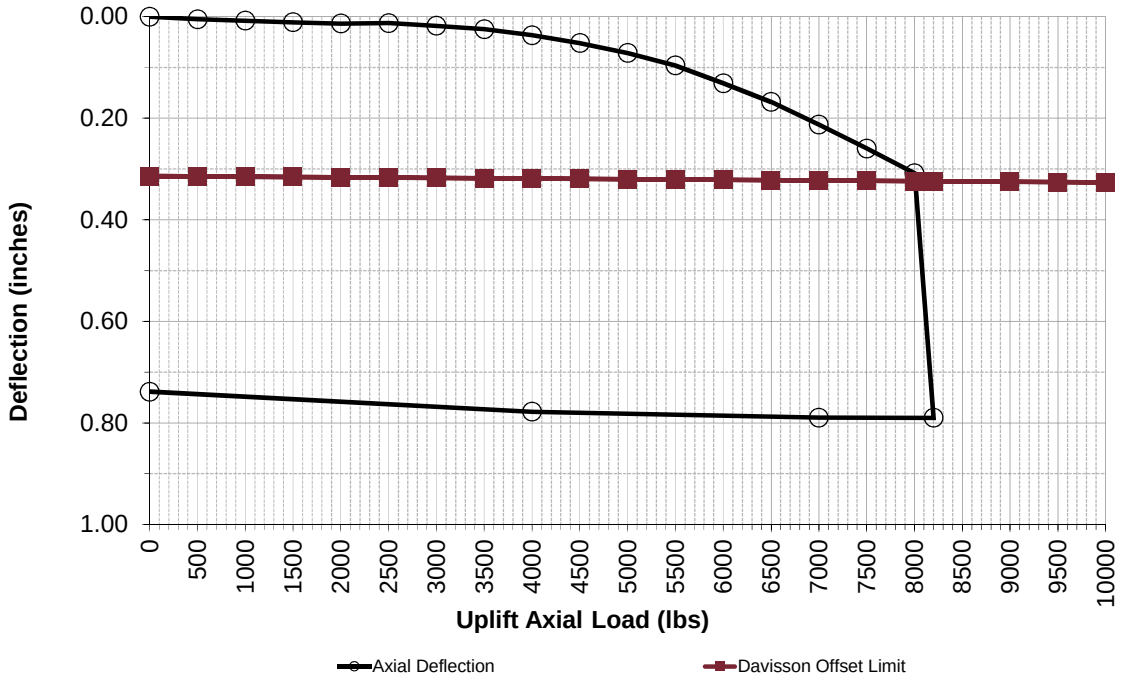
Test Date and Representative

Tested By Terracon Rep:	TW
Date Tested:	11/4/2019

Pile Information

Pile ID:	TR-4B
Latitude:	42.89146
Longitude:	-76.95733
Pile Type:	W6x9
Pile Embedment Depth [in]:	120
Pile Perimeter [in]:	19.68
Pile Stick-Up [in]:	54
Axial Design Load [lbs]:	2000
Pile Area [sq. in]:	2.68
Elastic Modulus [ksi]:	36,000
Drive Time [sec]:	137

Tension Test Results			Davisson Offset Limit Lines		
% of Design Load	Axial Load [lbs]	Deflection Δ (in.) Gauges #1 & #2	Elastic Data (in) (PL/AE)	Davisson Offest Limit (in) (0.15+D/120+(PL/AE))	Comments
0%	0	0.000	0.000	0.314	
25%	500	0.005	0.001	0.315	
50%	1000	0.008	0.001	0.315	
75%	1500	0.011	0.002	0.316	
100%	2000	0.014	0.002	0.316	
125%	2500	0.013	0.003	0.317	
150%	3000	0.018	0.004	0.318	
175%	3500	0.025	0.004	0.318	
200%	4000	0.037	0.005	0.319	
225%	4500	0.052	0.006	0.320	
250%	5000	0.072	0.006	0.320	
275%	5500	0.096	0.007	0.321	
300%	6000	0.131	0.007	0.321	
325%	6500	0.168	0.008	0.322	
350%	7000	0.213	0.009	0.323	
375%	7500	0.260	0.009	0.323	
400%	8000	0.309	0.010	0.324	
410%	8200	0.790	0.010	0.324	
450%	9000		0.011	0.325	
475%	9500		0.012	0.326	
500%	10000		0.012	0.326	
350%	7000	0.790	0.009	0.323	
200%	4000	0.778	0.005	0.319	
0%	0	0.739	0.000	0.314	



Note: The pile embedment depth in this analysis ignores the approximate push depth. Refer Appendix D for theapproximate push depth.

Tension Load Test Result for TR-6A

Project Information

Project Name:	Trelina Solar
Project Location:	Waterloo, New York
Project Number:	J5195163

Axial Load Test Set Up

Number of Gauges:	2
Height of Gauges [in]:	6
Load Cell:	Dillon Ed Jr

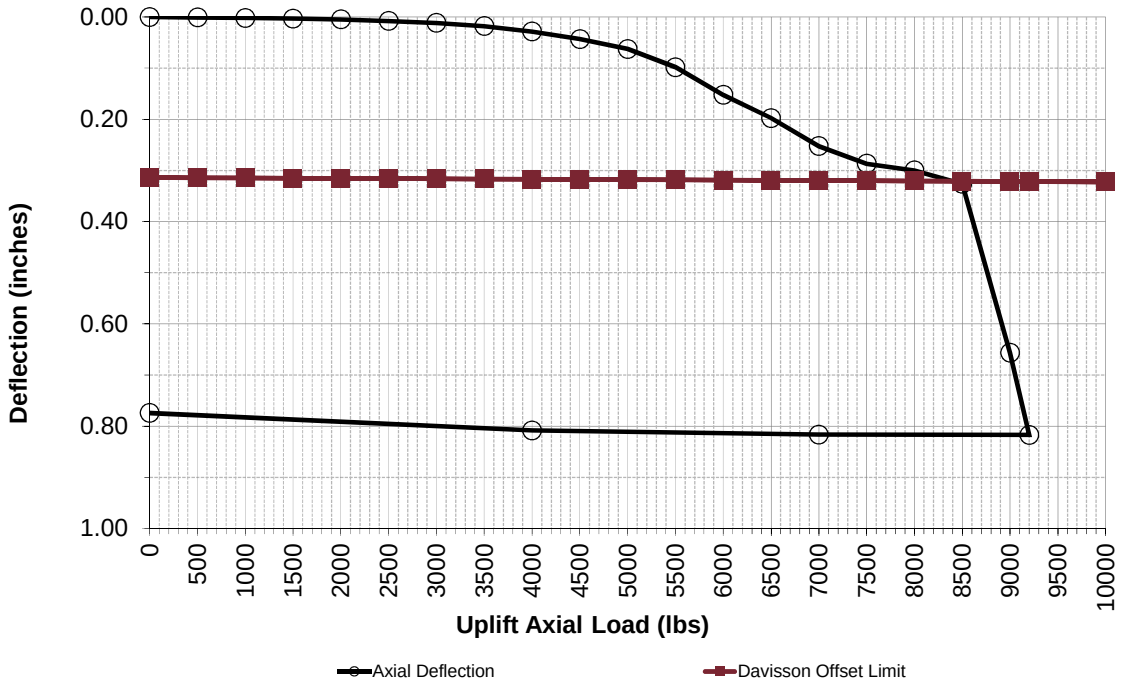
Test Date and Representative

Tested By Terracon Rep:	TW
Date Tested:	11/4/2019

Pile Information

Pile ID:	TR-6A
Latitude:	42.89360
Longitude:	-76.94875
Pile Type:	W6x9
Pile Embedment Depth [in]:	81
Pile Perimeter [in]:	19.68
Pile Stick-Up [in]:	54
Axial Design Load [lbs]:	2000
Pile Area [sq. in]:	2.68
Elastic Modulus [ksi]:	36,000
Drive Time [sec]:	161

Tension Test Results			Davisson Offset Limit Lines		
% of Design Load	Axial Load [lbs]	Deflection Δ (in.) Gauges #1 & #2	Elastic Data (in) (PL/AE)	Davisson Offest Limit (in) (0.15+D/120+(PL/AE))	Comments
0%	0	0.000	0.000	0.314	
25%	500	0.001	0.000	0.314	
50%	1000	0.002	0.001	0.315	
75%	1500	0.003	0.001	0.315	
100%	2000	0.005	0.002	0.316	
125%	2500	0.008	0.002	0.316	
150%	3000	0.012	0.003	0.317	
175%	3500	0.018	0.003	0.317	
200%	4000	0.029	0.003	0.317	
225%	4500	0.043	0.004	0.318	
250%	5000	0.063	0.004	0.318	
275%	5500	0.098	0.005	0.319	
300%	6000	0.152	0.005	0.319	
325%	6500	0.198	0.005	0.319	
350%	7000	0.253	0.006	0.320	
375%	7500	0.287	0.006	0.320	
400%	8000	0.300	0.007	0.321	
425%	8500	0.326	0.007	0.321	
450%	9000	0.657	0.008	0.322	
460%	9200	0.817	0.008	0.322	
500%	10000		0.008	0.322	
350%	7000	0.817	0.006	0.320	
200%	4000	0.809	0.003	0.317	
0%	0	0.774	0.000	0.314	



Note: The pile embedment depth in this analysis ignores the approximate push depth. Refer Appendix D for theapproximate push depth.

Tension Load Test Result for TR-6B

Project Information

Project Name:	Trelina Solar
Project Location:	Waterloo, New York
Project Number:	J5195163

Axial Load Test Set Up

Number of Gauges:	2
Height of Gauges [in]:	6
Load Cell:	Dillon Ed Jr

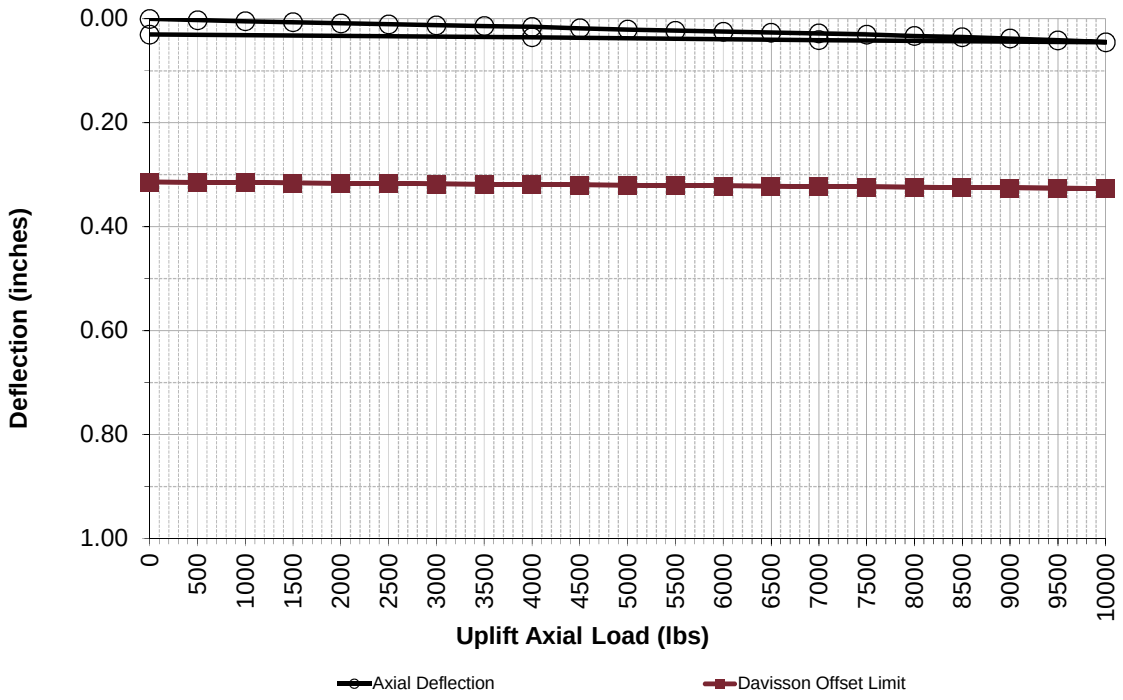
Test Date and Representative

Tested By Terracon Rep:	TW
Date Tested:	11/4/2019

Pile Information

Pile ID:	TR-6B
Latitude:	42.89360
Longitude:	-76.94875
Pile Type:	W6x9
Pile Embedment Depth [in]:	120
Pile Diameter [in]:	19.68
Pile Perimeter [in]:	54
Axial Design Load [lbs]:	2000
Pile Area [sq. in]:	2.68
Elastic Modulus [ksi]:	36,000
Drive Time [sec]:	284

Tension Test Results			Davisson Offset Limit Lines		
% of Design Load	Axial Load [lbs]	Deflection Δ (in.) Gauges #1 & #2	Elastic Data (in) (PL/AE)	Davisson Offest Limit (in) (0.15+D/120+(PL/AE))	Comments
0%	0	0.000	0.000	0.314	
25%	500	0.003	0.001	0.315	
50%	1000	0.005	0.001	0.315	
75%	1500	0.007	0.002	0.316	
100%	2000	0.009	0.002	0.316	
125%	2500	0.011	0.003	0.317	
150%	3000	0.012	0.004	0.318	
175%	3500	0.014	0.004	0.318	
200%	4000	0.015	0.005	0.319	
225%	4500	0.018	0.006	0.320	
250%	5000	0.021	0.006	0.320	
275%	5500	0.023	0.007	0.321	
300%	6000	0.025	0.007	0.321	
325%	6500	0.027	0.008	0.322	
350%	7000	0.028	0.009	0.323	
375%	7500	0.030	0.009	0.323	
400%	8000	0.033	0.010	0.324	
425%	8500	0.035	0.011	0.325	
450%	9000	0.038	0.011	0.325	
475%	9500	0.041	0.012	0.326	
500%	10000	0.045	0.012	0.326	
350%	7000	0.041	0.009	0.323	
200%	4000	0.035	0.005	0.319	
0%	0	0.030	0.000	0.314	



Note: The pile embedment depth in this analysis ignores the approximate push depth. Refer Appendix D for theapproximate push depth.

Tension Load Test Result for TR-7A

Project Information

Project Name:	Trelina Solar
Project Location:	Waterloo, New York
Project Number:	J5195163

Axial Load Test Set Up

Number of Gauges:	2
Height of Gauges [in]:	6
Load Cell:	Dillon Ed Jr

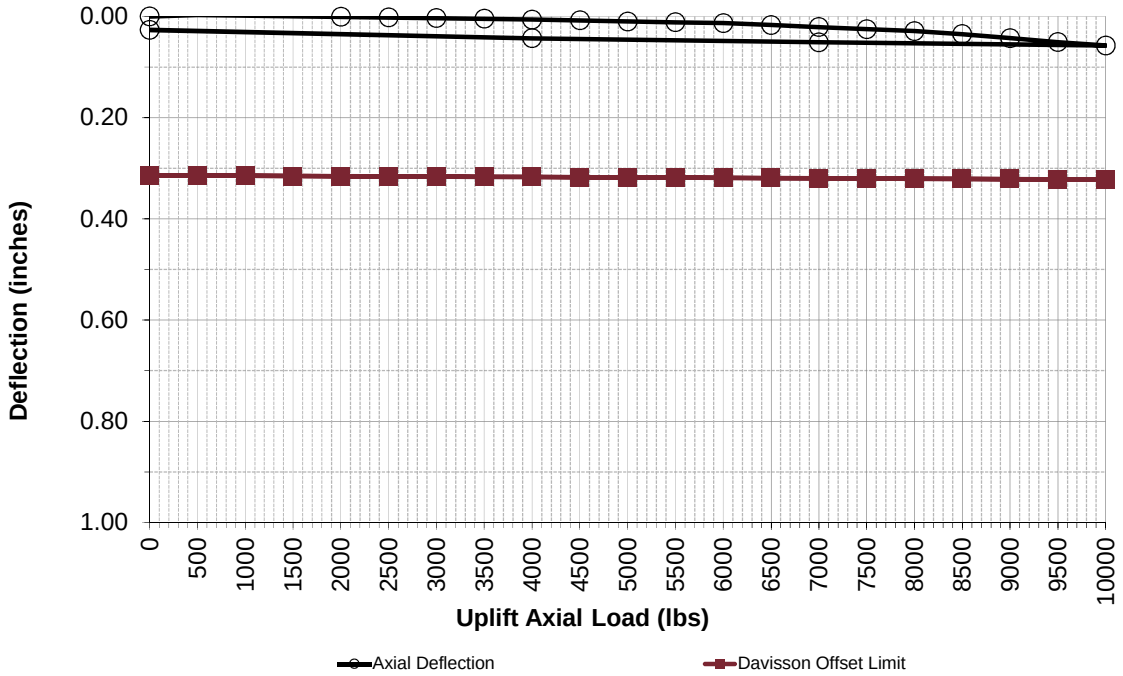
Test Date and Representative

Tested By Terracon Rep:	TW
Date Tested:	11/4/2019

Pile Information

Pile ID:	TR-7A
Latitude:	42.88630
Longitude:	-76.94910
Pile Type:	W6x9
Pile Embedment Depth [in]:	81
Pile Perimeter [in]:	19.68
Pile Stick-Up [in]:	54
Axial Design Load [lbs]:	2000
Pile Area [sq. in]:	2.68
Elastic Modulus [ksi]:	36,000
Drive Time [sec]:	109

Tension Test Results			Davisson Offset Limit Lines		
% of Design Load	Axial Load [lbs]	Deflection Δ (in.) Gauges #1 & #2	Elastic Data (in) (PL/AE)	Davisson Offest Limit (in) (0.15+D/120+(PL/AE))	Comments
0%	0	0.000	0.000	0.314	
25%	500	-0.003	0.000	0.314	
50%	1000	-0.002	0.001	0.315	
75%	1500	0.000	0.001	0.315	
100%	2000	0.001	0.002	0.316	
125%	2500	0.002	0.002	0.316	
150%	3000	0.003	0.003	0.317	
175%	3500	0.005	0.003	0.317	
200%	4000	0.006	0.003	0.317	
225%	4500	0.008	0.004	0.318	
250%	5000	0.010	0.004	0.318	
275%	5500	0.012	0.005	0.319	
300%	6000	0.013	0.005	0.319	
325%	6500	0.017	0.005	0.319	
350%	7000	0.021	0.006	0.320	
375%	7500	0.025	0.006	0.320	
400%	8000	0.029	0.007	0.321	
425%	8500	0.035	0.007	0.321	
450%	9000	0.043	0.008	0.322	
475%	9500	0.051	0.008	0.322	
500%	10000	0.057	0.008	0.322	
350%	7000	0.051	0.006	0.320	
200%	4000	0.043	0.003	0.317	
0%	0	0.027	0.000	0.314	



Note: The pile embedment depth in this analysis ignores the approximate push depth. Refer Appendix D for theapproximate push depth.

Tension Load Test Result for TR-7B

Project Information

Project Name:	Trelina Solar
Project Location:	Waterloo, New York
Project Number:	J5195163

Axial Load Test Set Up

Number of Gauges:	2
Height of Gauges [in]:	6
Load Cell:	Dillon Ed Jr

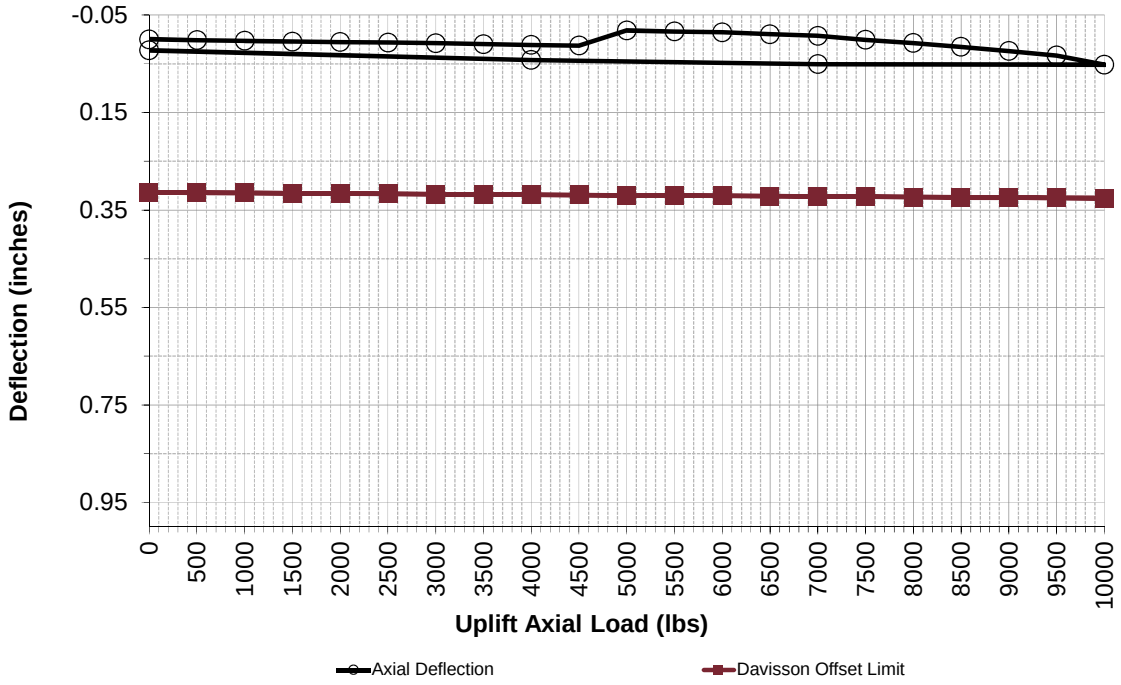
Test Date and Representative

Tested By Terracon Rep:	TW
Date Tested:	11/4/2019

Pile Information

Pile ID:	TR-7B
Latitude:	42.88630
Longitude:	-76.94910
Pile Type:	W6x9
Pile Embedment Depth [in]:	114
Pile Perimeter [in]:	19.68
Pile Stick-Up [in]:	54
Axial Design Load [lbs]:	2000
Pile Area [sq. in]:	2.68
Elastic Modulus [ksi]:	36,000
Drive Time [sec]:	181

Tension Test Results			Davisson Offset Limit Lines		
% of Design Load	Axial Load [lbs]	Deflection Δ (in.) Gauges #1 & #2	Elastic Data (in) (PL/AE)	Davisson Offest Limit (in) (0.15+D/120+(PL/AE))	Comments
0%	0	0.000	0.000	0.314	
25%	500	0.002	0.001	0.315	
50%	1000	0.003	0.001	0.315	
75%	1500	0.004	0.002	0.316	
100%	2000	0.006	0.002	0.316	
125%	2500	0.007	0.003	0.317	
150%	3000	0.008	0.004	0.318	
175%	3500	0.010	0.004	0.318	
200%	4000	0.011	0.005	0.319	
225%	4500	0.013	0.005	0.319	
250%	5000	-0.018	0.006	0.320	
275%	5500	-0.016	0.006	0.320	
300%	6000	-0.014	0.007	0.321	
325%	6500	-0.011	0.008	0.322	
350%	7000	-0.007	0.008	0.322	
375%	7500	0.001	0.009	0.323	
400%	8000	0.008	0.009	0.323	
425%	8500	0.015	0.010	0.324	
450%	9000	0.024	0.011	0.325	
475%	9500	0.033	0.011	0.325	
500%	10000	0.052	0.012	0.326	
350%	7000	0.051	0.008	0.322	
200%	4000	0.042	0.005	0.319	
0%	0	0.023	0.000	0.314	



Note: The pile embedment depth in this analysis ignores the approximate push depth. Refer Appendix D for theapproximate push depth.

Tension Load Test Result for TR-8A

Project Information

Project Name:	Trelina Solar
Project Location:	Waterloo, New York
Project Number:	J5195163

Axial Load Test Set Up

Number of Gauges:	2
Height of Gauges [in]:	6
Load Cell:	Dillon Ed Jr

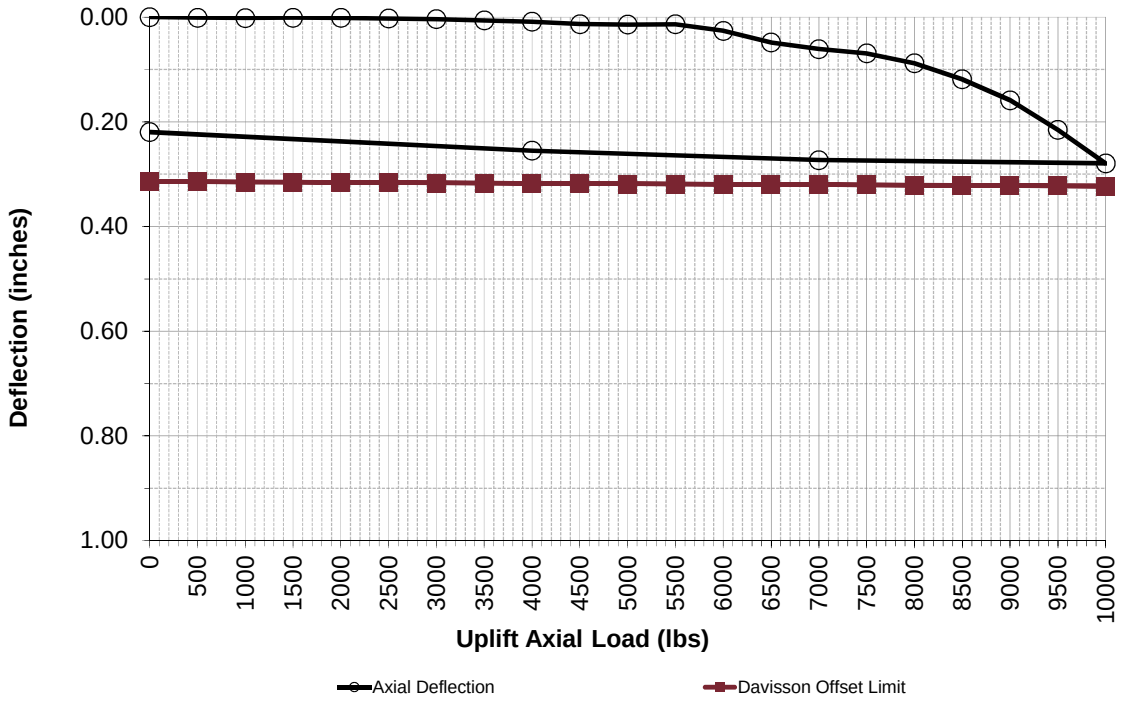
Test Date and Representative

Tested By Terracon Rep:	TW
Date Tested:	11/4/2019

Pile Information

Pile ID:	TR-8A
Latitude:	42.88203
Longitude:	-76.95318
Pile Type:	W6x9
Pile Embedment Depth [in]:	84
Pile Perimeter [in]:	19.68
Pile Stick-Up [in]:	54
Axial Design Load [lbs]:	2000
Pile Area [sq. in]:	2.68
Elastic Modulus [ksi]:	36,000
Drive Time [sec]:	125

Tension Test Results			Davisson Offset Limit Lines		
% of Design Load	Axial Load [lbs]	Deflection Δ (in.) Gauges #1 & #2	Elastic Data (in) (PL/AE)	Davisson Offest Limit (in) (0.15+D/120+(PL/AE))	Comments
0%	0	0.000	0.000	0.314	
25%	500	0.001	0.000	0.314	
50%	1000	0.002	0.001	0.315	
75%	1500	0.001	0.001	0.315	
100%	2000	0.002	0.002	0.316	
125%	2500	0.003	0.002	0.316	
150%	3000	0.004	0.003	0.317	
175%	3500	0.007	0.003	0.317	
200%	4000	0.009	0.003	0.317	
225%	4500	0.013	0.004	0.318	
250%	5000	0.014	0.004	0.318	
275%	5500	0.014	0.005	0.319	
300%	6000	0.026	0.005	0.319	
325%	6500	0.049	0.006	0.320	
350%	7000	0.061	0.006	0.320	
375%	7500	0.069	0.007	0.321	
400%	8000	0.088	0.007	0.321	
425%	8500	0.119	0.007	0.321	
450%	9000	0.159	0.008	0.322	
475%	9500	0.215	0.008	0.322	
500%	10000	0.280	0.009	0.323	
350%	7000	0.273	0.006	0.320	
200%	4000	0.255	0.003	0.317	
0%	0	0.220	0.000	0.314	



Note: The pile embedment depth in this analysis ignores the approximate push depth. Refer Appendix D for theapproximate push depth.

Tension Load Test Result for TR-8B

Project Information

Project Name:	Trelina Solar
Project Location:	Waterloo, New York
Project Number:	J5195163

Axial Load Test Set Up

Number of Gauges:	2
Height of Gauges [in]:	6
Load Cell:	Dillon Ed Jr

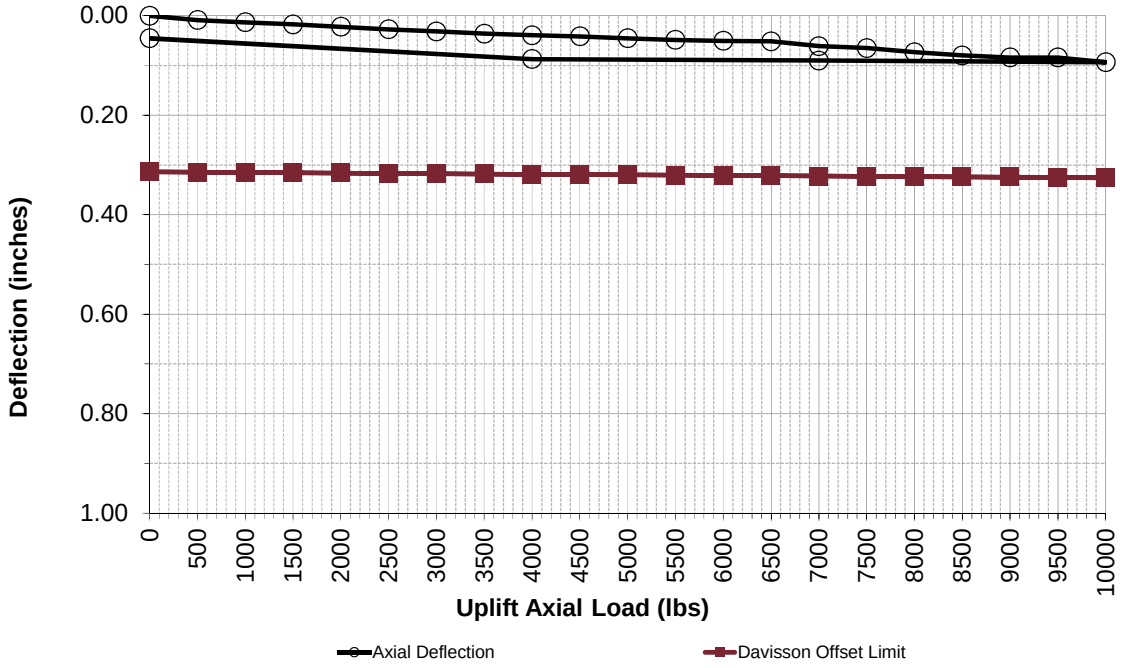
Test Date and Representative

Tested By Terracon Rep:	TW
Date Tested:	11/4/2019

Pile Information

Pile ID:	TR-8B
Latitude:	42.88203
Longitude:	-76.95318
Pile Type:	W6x9
Pile Embedment Depth [in]:	114
Pile Perimeter [in]:	19.68
Pile Stick-Up [in]:	54
Axial Design Load [lbs]:	2000
Pile Area [sq. in]:	2.68
Elastic Modulus [ksi]:	36,000
Drive Time [sec]:	348

Tension Test Results			Davisson Offset Limit Lines		
% of Design Load	Axial Load [lbs]	Deflection Δ (in.) Gauges #1 & #2	Elastic Data (in) (PL/AE)	Davisson Offest Limit (in) (0.15+D/120+(PL/AE))	Comments
0%	0	0.000	0.000	0.314	
25%	500	0.009	0.001	0.315	
50%	1000	0.013	0.001	0.315	
75%	1500	0.018	0.002	0.316	
100%	2000	0.022	0.002	0.316	
125%	2500	0.027	0.003	0.317	
150%	3000	0.032	0.004	0.318	
175%	3500	0.036	0.004	0.318	
200%	4000	0.039	0.005	0.319	
225%	4500	0.042	0.005	0.319	
250%	5000	0.045	0.006	0.320	
275%	5500	0.049	0.006	0.320	
300%	6000	0.050	0.007	0.321	
325%	6500	0.052	0.008	0.322	
350%	7000	0.061	0.008	0.322	
375%	7500	0.065	0.009	0.323	
400%	8000	0.073	0.009	0.323	
425%	8500	0.080	0.010	0.324	
450%	9000	0.084	0.011	0.325	
475%	9500	0.084	0.011	0.325	
500%	10000	0.094	0.012	0.326	
350%	7000	0.090	0.008	0.322	
200%	4000	0.087	0.005	0.319	
0%	0	0.046	0.000	0.314	



Note: The pile embedment depth in this analysis ignores the approximate push depth. Refer Appendix D for theapproximate push depth.

Tension Load Test Result for TR-10A

Project Information

Project Name:	Trelina Solar
Project Location:	Waterloo, New York
Project Number:	J5195163

Axial Load Test Set Up

Number of Gauges:	2
Height of Gauges [in]:	6
Load Cell:	Dillon Ed Jr

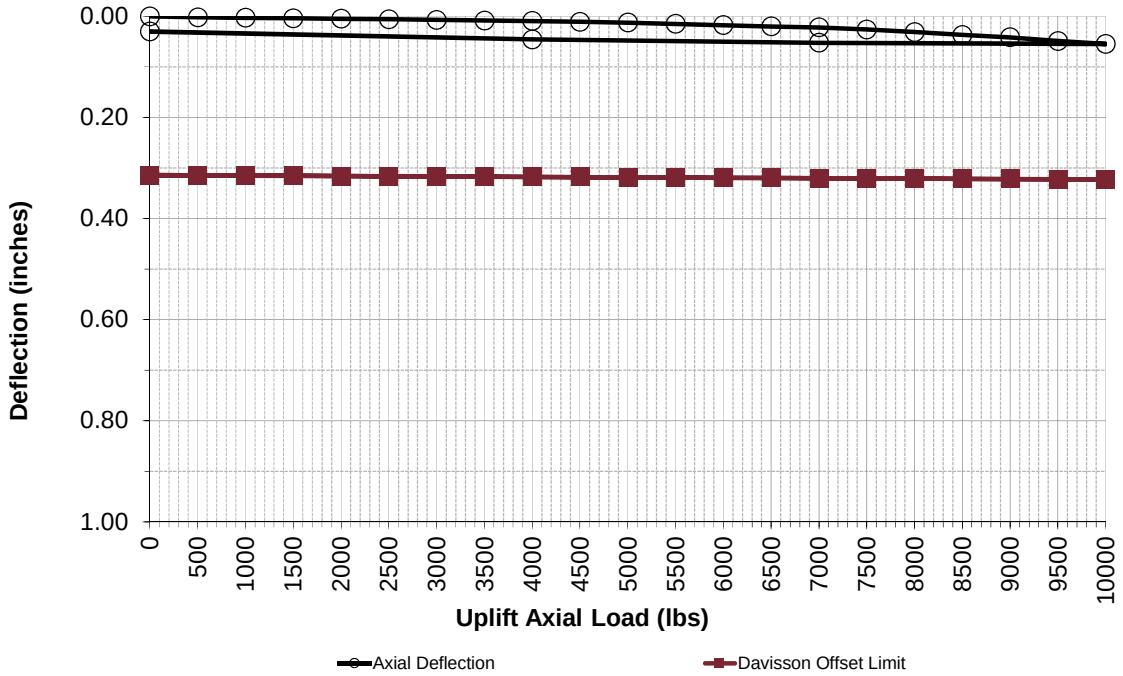
Test Date and Representative

Tested By Terracon Rep:	TW
Date Tested:	11/4/2019

Pile Information

Pile ID:	TR-10A
Latitude:	42.89215
Longitude:	-76.93486
Pile Type:	W6x9
Pile Embedment Depth [in]:	84
Pile Perimeter [in]:	19.68
Pile Stick-Up [in]:	54
Axial Design Load [lbs]:	2000
Pile Stick-Up [in]:	2.68
Elastic Modulus [ksi]:	36,000
Drive Time [sec]:	75

Tension Test Results			Davisson Offset Limit Lines		
% of Design Load	Axial Load [lbs]	Deflection Δ (in.) Gauges #1 & #2	Elastic Data (in) (PL/AE)	Davisson Offest Limit (in) (0.15+D/120+(PL/AE))	Comments
0%	0	0.000	0.000	0.314	
25%	500	0.002	0.000	0.314	
50%	1000	0.003	0.001	0.315	
75%	1500	0.004	0.001	0.315	
100%	2000	0.005	0.002	0.316	
125%	2500	0.006	0.002	0.316	
150%	3000	0.007	0.003	0.317	
175%	3500	0.008	0.003	0.317	
200%	4000	0.009	0.003	0.317	
225%	4500	0.011	0.004	0.318	
250%	5000	0.012	0.004	0.318	
275%	5500	0.015	0.005	0.319	
300%	6000	0.017	0.005	0.319	
325%	6500	0.020	0.006	0.320	
350%	7000	0.022	0.006	0.320	
375%	7500	0.026	0.007	0.321	
400%	8000	0.031	0.007	0.321	
425%	8500	0.037	0.007	0.321	
450%	9000	0.042	0.008	0.322	
475%	9500	0.049	0.008	0.322	
500%	10000	0.054	0.009	0.323	
350%	7000	0.052	0.006	0.320	
200%	4000	0.046	0.003	0.317	
0%	0	0.030	0.000	0.314	



Note: The pile embedment depth in this analysis ignores the approximate push depth. Refer Appendix D for theapproximate push depth.

Tension Load Test Result for TR-10B

Project Information

Project Name:	Trelina Solar
Project Location:	Waterloo, New York
Project Number:	J5195163

Axial Load Test Set Up

Number of Gauges:	2
Height of Gauges [in]:	6
Load Cell:	Dillon Ed Jr

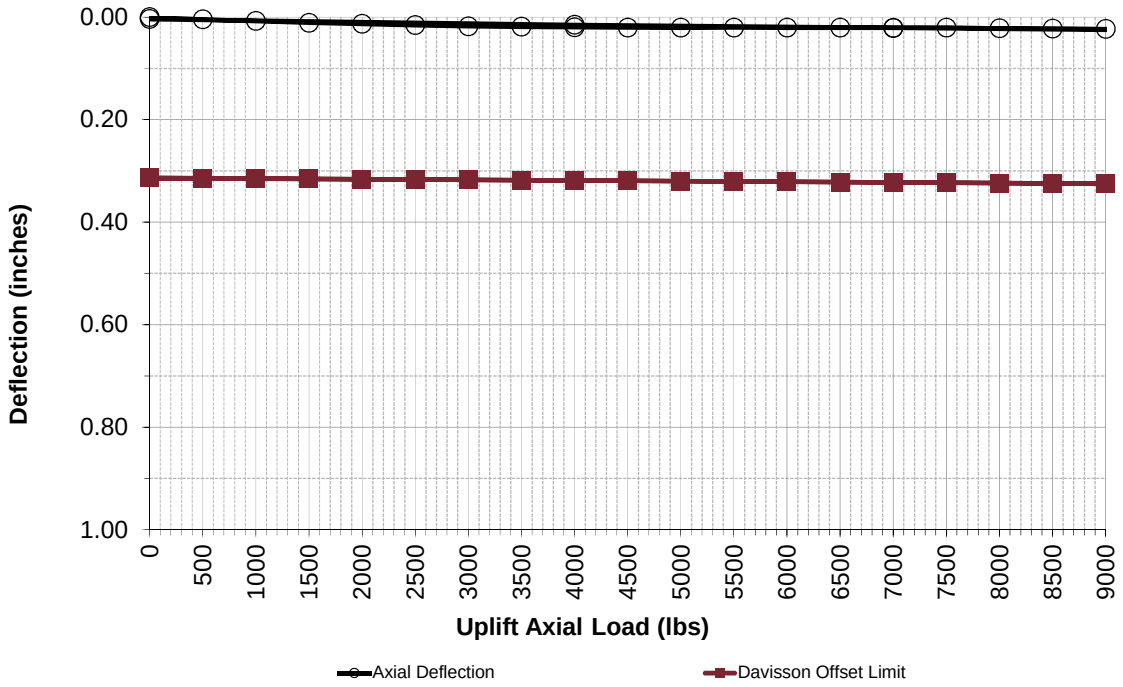
Test Date and Representative

Tested By Terracon Rep:	TW
Date Tested:	11/4/2019

Pile Information

Pile ID:	TR-10B
Latitude:	42.89215
Longitude:	-76.93486
Pile Type:	W6x9
Pile Embedment Depth [in]:	120
Pile Perimeter [in]:	19.68
Pile Stick-Up [in]:	54
Axial Design Load [lbs]:	2000
Pile Area [sq. in]:	2.68
Elastic Modulus [ksi]:	36,000
Drive Time [sec]:	164

Tension Test Results			Davisson Offset Limit Lines		
% of Design Load	Axial Load [lbs]	Deflection Δ (in.) Gauges #1 & #2	Elastic Data (in) (PL/AE)	Davisson Offest Limit (in) (0.15+D/120+(PL/AE))	Comments
0%	0	0.000	0.000	0.314	
25%	500	0.005	0.001	0.315	
50%	1000	0.008	0.001	0.315	
75%	1500	0.011	0.002	0.316	
100%	2000	0.013	0.002	0.316	
125%	2500	0.016	0.003	0.317	
150%	3000	0.018	0.004	0.318	
175%	3500	0.019	0.004	0.318	
200%	4000	0.020	0.005	0.319	
225%	4500	0.020	0.006	0.320	
250%	5000	0.021	0.006	0.320	
275%	5500	0.020	0.007	0.321	
300%	6000	0.021	0.007	0.321	
325%	6500	0.021	0.008	0.322	
350%	7000	0.021	0.009	0.323	
375%	7500	0.021	0.009	0.323	
400%	8000	0.022	0.010	0.324	
425%	8500	0.022	0.011	0.325	
450%	9000	0.023	0.011	0.325	
475%	9500	0.024	0.012	0.326	
500%	10000	0.027	0.012	0.326	
350%	7000	0.021	0.009	0.323	
200%	4000	0.015	0.005	0.319	
0%	0	0.004	0.000	0.314	



Note: The pile embedment depth in this analysis ignores the approximate push depth. Refer Appendix D for theapproximate push depth.

Tension Load Test Result for TR-12A

Project Information

Project Name:	Trelina Solar
Project Location:	Waterloo, New York
Project Number:	J5195163

Axial Load Test Set Up

Number of Gauges:	2
Height of Gauges [in]:	6
Load Cell:	Dillon Ed Jr

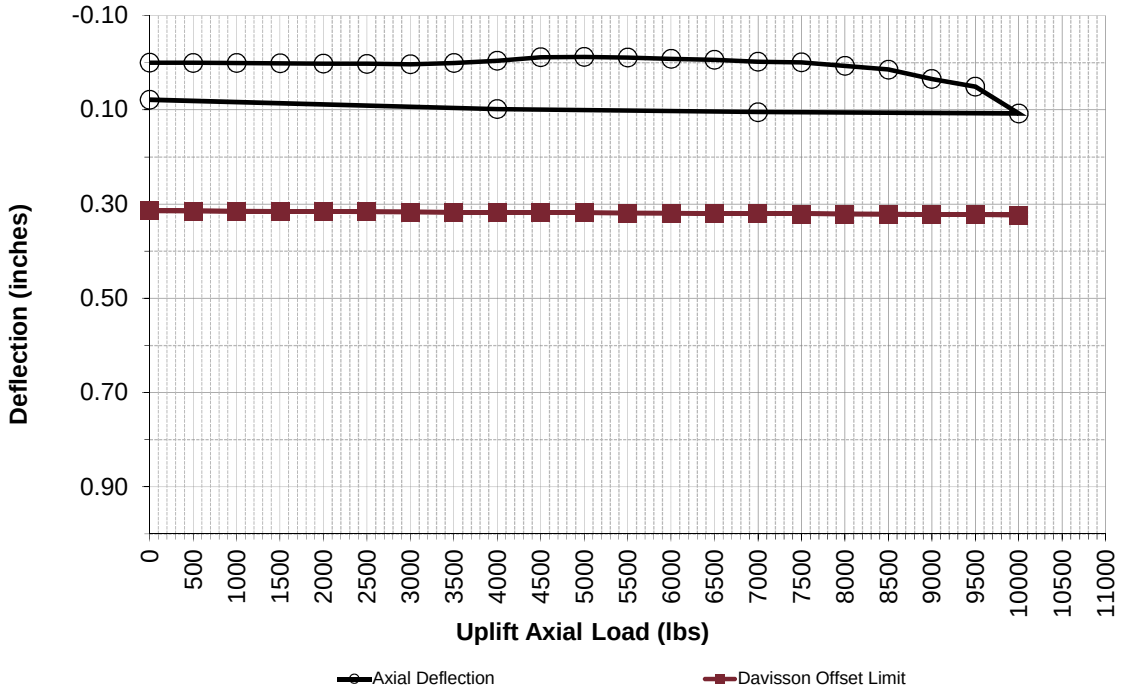
Test Date and Representative

Tested By Terracon Rep:	TW
Date Tested:	11/5/2019

Pile Information

Pile ID:	TR-12A
Latitude:	42.89391
Longitude:	-76.92566
Pile Type:	W6x9
Pile Embedment Depth [in]:	84
Pile Perimeter [in]:	19.68
Pile Stick-Up [in]:	54
Axial Design Load [lbs]:	2000
Pile Area [sq. in]:	2.68
Elastic Modulus [ksi]:	36,000
Drive Time [sec]:	178

Tension Test Results			Davisson Offset Limit Lines		
% of Design Load	Axial Load [lbs]	Deflection Δ (in.) Gauges #1 & #2	Elastic Data (in) (PL/AE)	Davisson Offest Limit (in) (0.15+D/120+(PL/AE))	Comments
0%	0	0.000	0.000	0.314	
25%	500	0.000	0.000	0.314	
50%	1000	0.001	0.001	0.315	
75%	1500	0.001	0.001	0.315	
100%	2000	0.002	0.002	0.316	
125%	2500	0.002	0.002	0.316	
150%	3000	0.003	0.003	0.317	
175%	3500	0.001	0.003	0.317	
200%	4000	-0.004	0.003	0.317	
225%	4500	-0.012	0.004	0.318	
250%	5000	-0.012	0.004	0.318	
275%	5500	-0.011	0.005	0.319	
300%	6000	-0.008	0.005	0.319	
325%	6500	-0.006	0.006	0.320	
350%	7000	-0.002	0.006	0.320	
375%	7500	-0.001	0.007	0.321	
400%	8000	0.007	0.007	0.321	
425%	8500	0.014	0.007	0.321	
450%	9000	0.034	0.008	0.322	
475%	9500	0.051	0.008	0.322	
500%	10000	0.108	0.009	0.323	
350%	7000	0.105	0.006	0.320	
200%	4000	0.098	0.003	0.317	
0%	0	0.078	0.000	0.314	



Note: The pile embedment depth in this analysis ignores the approximate push depth. Refer Appendix D for theapproximate push depth.

Tension Load Test Result for TR-12B

Project Information

Project Name:	Trelina Solar
Project Location:	Waterloo, New York
Project Number:	J5195163

Axial Load Test Set Up

Number of Gauges:	2
Height of Gauges [in]:	6
Load Cell:	Dillon Ed Jr

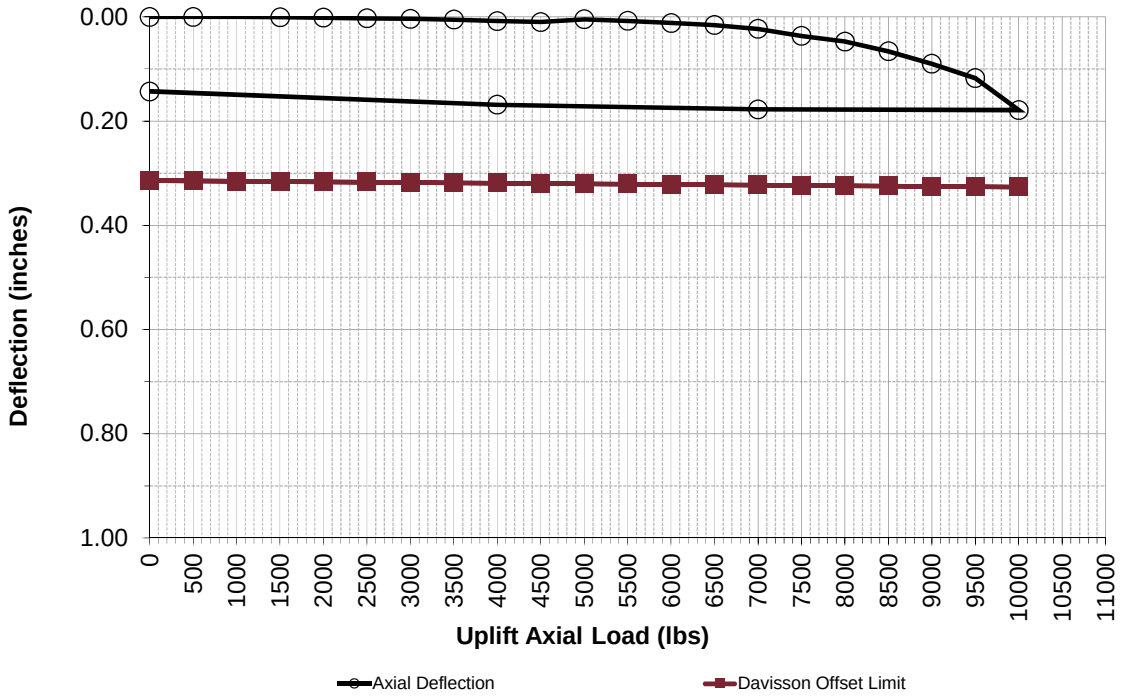
Test Date and Representative

Tested By Terracon Rep:	TW
Date Tested:	11/5/2019

Pile Information

Pile ID:	TR-12B
Latitude:	42.89391
Longitude:	-76.92566
Pile Type:	W6x9
Pile Embedment Depth [in]:	120
Pile Perimeter [in]:	19.68
Pile Stick-Up [in]:	54
Axial Design Load [lbs]:	2000
Pile Area [sq. in]:	2.68
Elastic Modulus [ksi]:	36,000
Drive Time [sec]:	350

Tension Test Results			Davisson Offset Limit Lines		
% of Design Load	Axial Load [lbs]	Deflection Δ (in.) Gauges #1 & #2	Elastic Data (in) (PL/AE)	Davisson Offest Limit (in) (0.15+D/120+(PL/AE))	Comments
0%	0	0.000	0.000	0.314	
25%	500	0.000	0.001	0.315	
50%	1000	0.000	0.001	0.315	
75%	1500	0.001	0.002	0.316	
100%	2000	0.002	0.002	0.316	
125%	2500	0.003	0.003	0.317	
150%	3000	0.004	0.004	0.318	
175%	3500	0.005	0.004	0.318	
200%	4000	0.008	0.005	0.319	
225%	4500	0.010	0.006	0.320	
250%	5000	0.005	0.006	0.320	
275%	5500	0.008	0.007	0.321	
300%	6000	0.012	0.007	0.321	
325%	6500	0.016	0.008	0.322	
350%	7000	0.023	0.009	0.323	
375%	7500	0.036	0.009	0.323	
400%	8000	0.047	0.010	0.324	
425%	8500	0.066	0.011	0.325	
450%	9000	0.090	0.011	0.325	
475%	9500	0.118	0.012	0.326	
500%	10000	0.179	0.012	0.326	
350%	7000	0.177	0.009	0.323	
200%	4000	0.169	0.005	0.319	
0%	0	0.143	0.000	0.314	



Note: The pile embedment depth in this analysis ignores the approximate push depth. Refer Appendix D for theapproximate push depth.

APPENDIX F

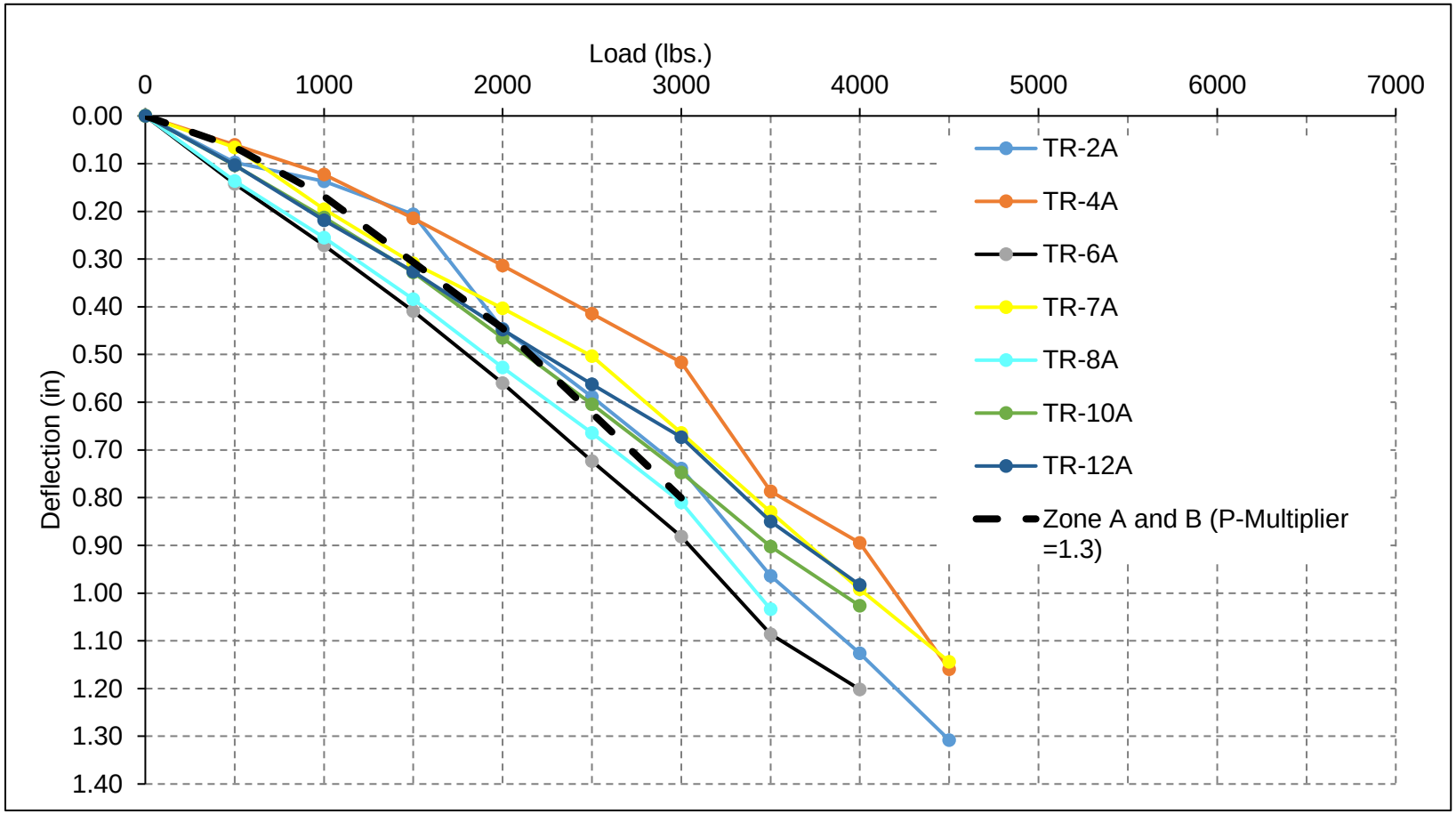
PILE LOAD TESTING DATA (LATERAL LOADS)

(Exhibits- F001 through F0016)

Terracon

Lateral Load Graphs

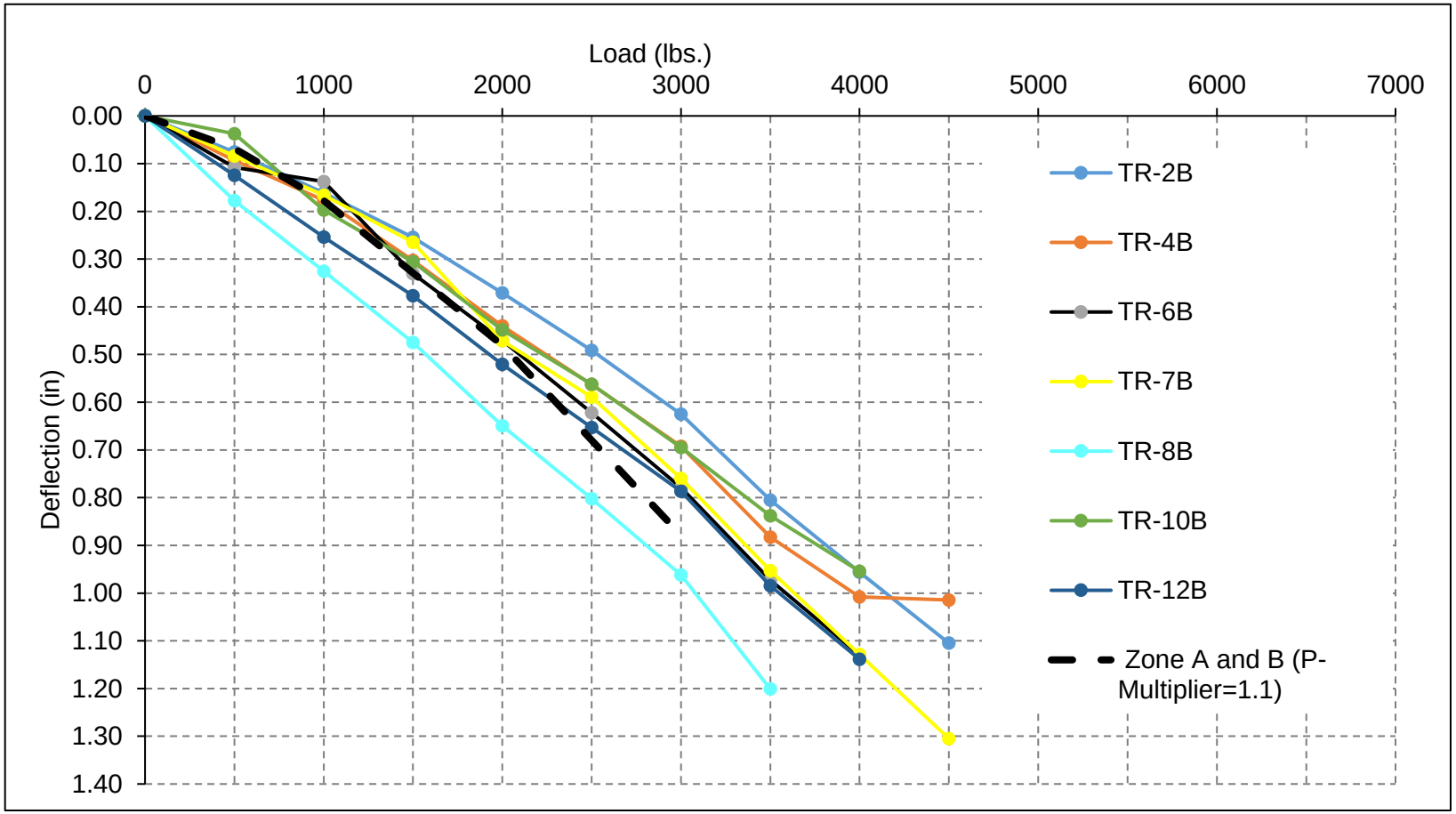
W6x9 Piles, 9-foot Embedment



Terracon

Lateral Load Graphs

W6x9 Piles,12-foot Embedment



Lateral Load Test Result for TR-2A

Project Information

Project Name:	Trelina Solar
Project Location:	Waterloo, New York
Project Number:	J5195163

Lateral Load Test Set Up

Number of Top Gauges:	0
Number of Bottom Gauges:	2
Height of Top Gauges [in]:	24
Height of Bottom Gauges [in]:	6
Height of Applied Load [in]:	24
Load Cell:	Dillon Ed Jr

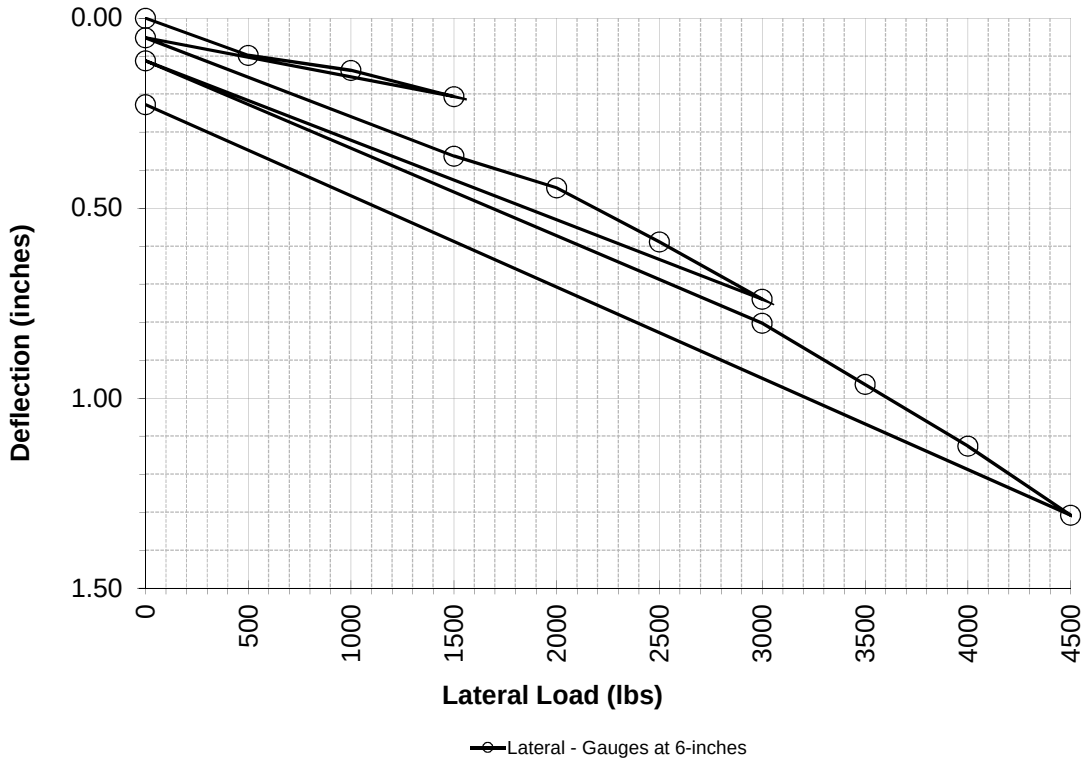
Test Date and Representative

Tested By Terracon Rep:	TW
Date Tested:	11/5/2019

Pile Information

Pile ID:	TR-2A
Latitude:	42.89527
Longitude:	-76.95592
Pile Type:	W6x9
Pile Embedment Depth [in]:	81
Pile Stick-Up [in]:	54
Lateral Design Load [lbs]:	3500
Drive Time [sec]:	90

% of Design Load	Lateral Load [lbs]	Deflection Δ (in.) Gauges #1 & #2	Comments
0%	0	0.000	
14%	500	0.098	
29%	1000	0.137	
43%	1500	0.206	
0%	0	0.051	
43%	1500	0.363	
57%	2000	0.446	
71%	2500	0.589	
86%	3000	0.739	
0%	0	0.112	
86%	3000	0.802	
100%	3500	0.964	
114%	4000	1.126	
129%	4500	1.308	
0%	0	0.227	
114%	4000		
143%	5000		
157%	5500		
171%	6000		
0%	0		
143%	5000		
171%	6000		
186%	6500		
200%	7000		
0%	0		



Note: The pile embedment depth in this analysis ignores the approximate push depth. Refer Appendix D for theapproximate push depth.

Lateral Load Test Result for TR-2B

Project Information

Project Name:	Trelina Solar
Project Location:	Waterloo, New York
Project Number:	J5195163

Lateral Load Test Set Up

Number of Top Gauges:	0
Number of Bottom Gauges:	2
Height of Top Gauges [in]:	24
Height of Bottom Gauges [in]:	6
Height of Applied Load [in]:	24
Load Cell:	Dillon Ed Jr

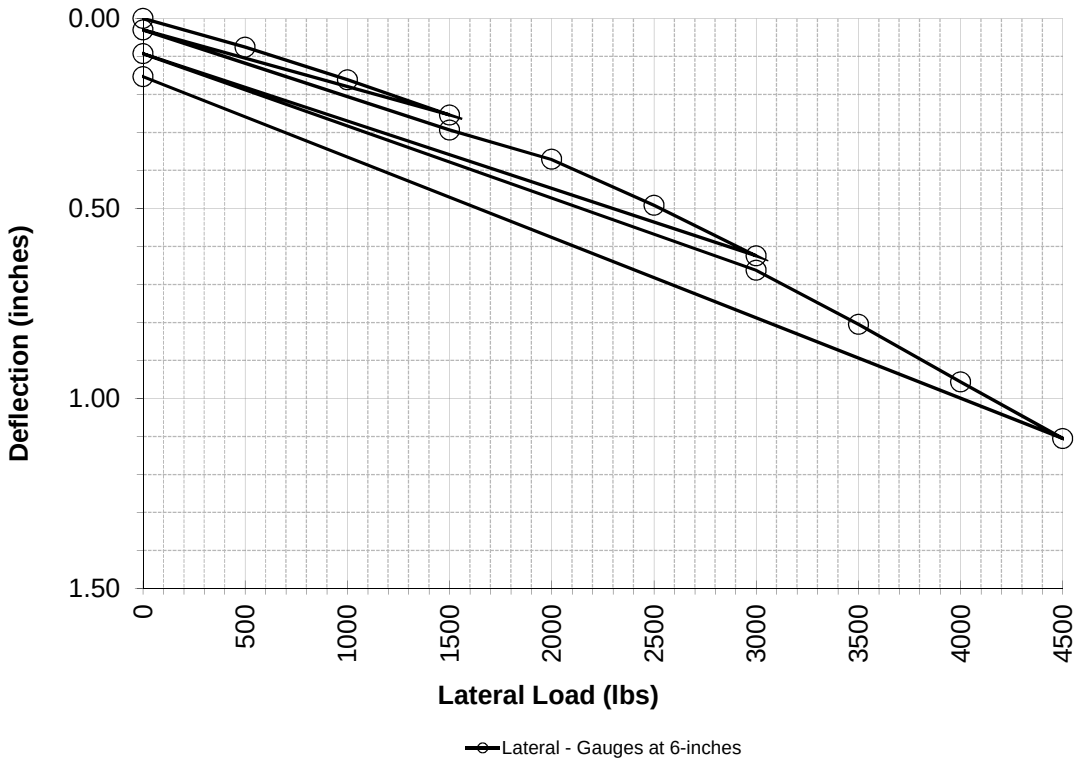
Test Date and Representative

Tested By Terracon Rep:	TW
Date Tested:	11/5/2019

Pile Information

Pile ID:	TR-2B
Latitude:	42.89527
Longitude:	-76.95592
Pile Type:	W6x9
Pile Embedment Depth [in]:	120
Pile Stick-Up [in]:	54
Lateral Design Load [lbs]:	3500
Drive Time [sec]:	360

% of Design Load	Lateral Load [lbs]	Deflection Δ (in.) Gauges #1 & #2	Comments
0%	0	0.000	
14%	500	0.075	
29%	1000	0.162	
43%	1500	0.254	
0%	0	0.030	
43%	1500	0.294	
57%	2000	0.371	
71%	2500	0.492	
86%	3000	0.625	
0%	0	0.093	
86%	3000	0.662	
100%	3500	0.805	
114%	4000	0.956	
129%	4500	1.105	
0%	0	0.153	
114%	4000		
143%	5000		
157%	5500		
171%	6000		
0%	0		
143%	5000		
171%	6000		
186%	6500		
200%	7000		
0%	0		



Note: The pile embedment depth in this analysis ignores the approximate push depth. Refer Appendix D for theapproximate push depth.

Lateral Load Test Result for TR-4A

Project Information

Project Name:	Trelina Solar
Project Location:	Waterloo, New York
Project Number:	J5195163

Lateral Load Test Set Up

Number of Top Gauges:	0
Number of Bottom Gauges:	2
Height of Top Gauges [in]:	24
Height of Bottom Gauges [in]:	6
Height of Applied Load [in]:	24
Load Cell:	Dillon Ed Jr

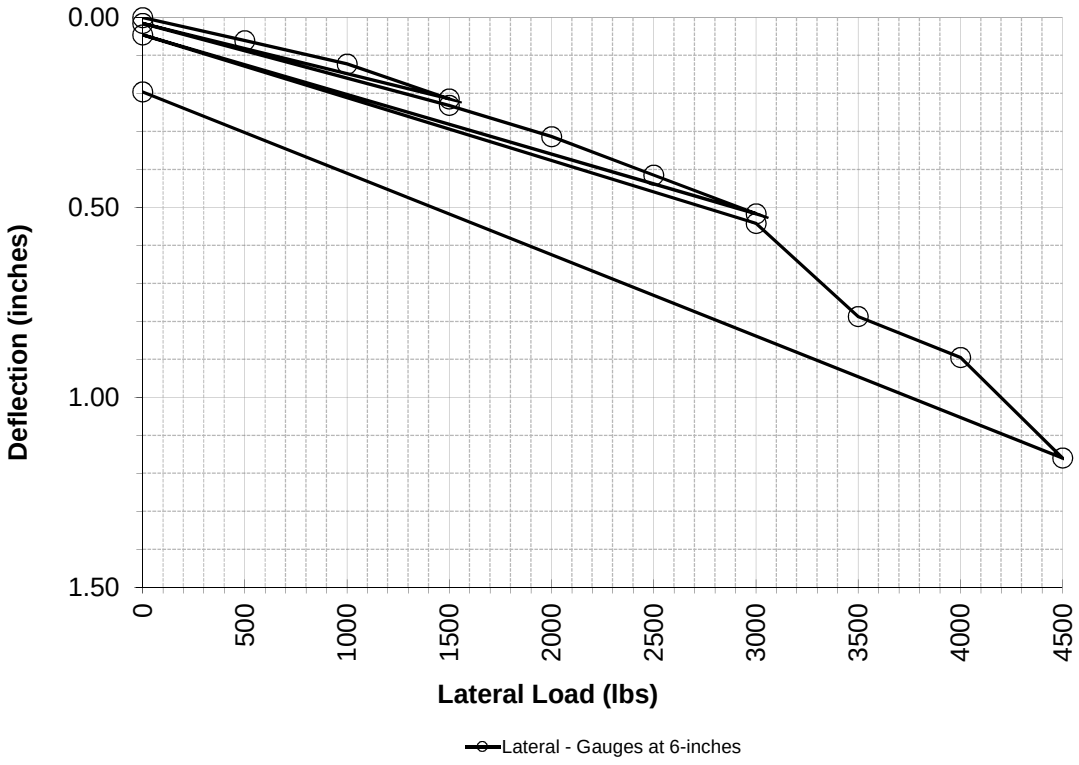
Test Date and Representative

Tested By Terracon Rep:	TW
Date Tested:	11/5/2019

Pile Information

Pile ID:	TR-4A
Latitude:	42.89146
Longitude:	-76.95733
Pile Type:	W6x9
Pile Embedment Depth [in]:	84
Pile Stick-Up [in]:	54
Lateral Design Load [lbs]:	3500
Drive Time [sec]:	130

% of Design Load	Lateral Load [lbs]	Deflection Δ (in.) Gauges #1 & #2	Comments
0%	0	0.000	
14%	500	0.061	
29%	1000	0.123	
43%	1500	0.214	
0%	0	0.016	
43%	1500	0.231	
57%	2000	0.313	
71%	2500	0.414	
86%	3000	0.517	
0%	0	0.046	
86%	3000	0.542	
100%	3500	0.787	
114%	4000	0.894	
129%	4500	1.160	
0%	0	0.195	
114%	4000		
143%	5000		
157%	5500		
171%	6000		
0%	0		
143%	5000		
171%	6000		
186%	6500		
200%	7000		
0%	0		



Note: The pile embedment depth in this analysis ignores the approximate push depth. Refer Appendix D for theapproximate push depth.

Lateral Load Test Result for TR-4B

Project Information

Project Name:	Trelina Solar
Project Location:	Waterloo, New York
Project Number:	J5195163

Lateral Load Test Set Up

Number of Top Gauges:	0
Number of Bottom Gauges:	2
Height of Top Gauges [in]:	24
Height of Bottom Gauges [in]:	6
Height of Applied Load [in]:	24
Load Cell:	Dillon Ed Jr

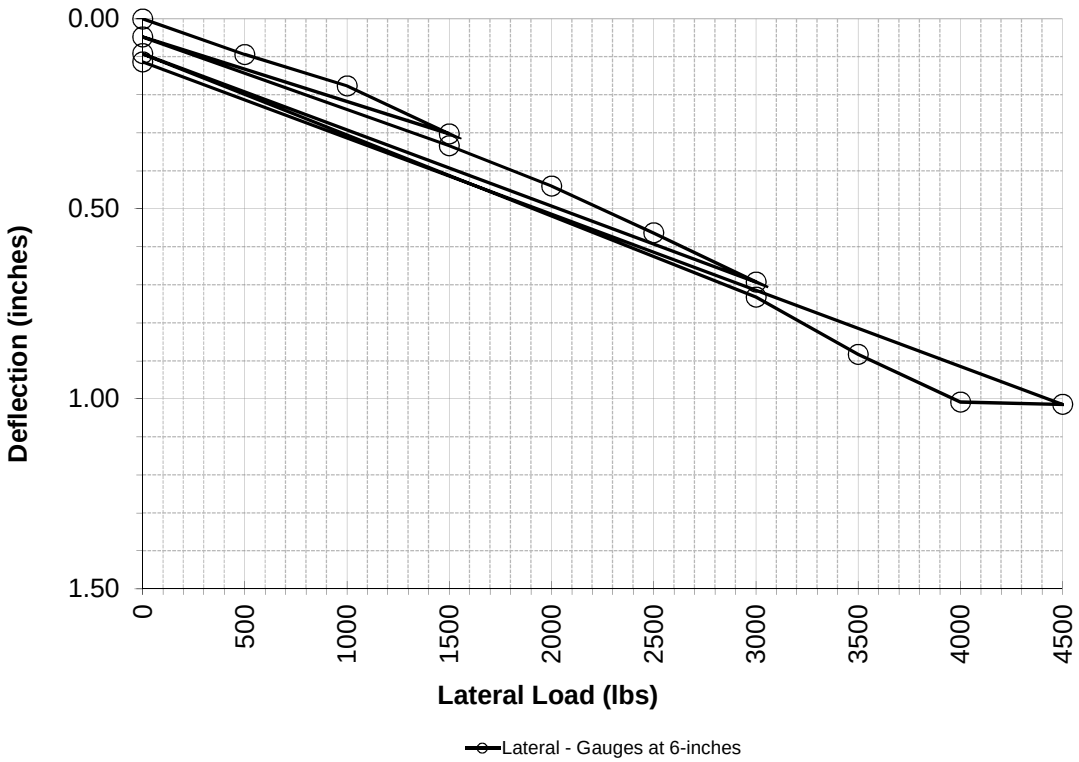
Test Date and Representative

Tested By Terracon Rep:	TW
Date Tested:	11/5/2019

Pile Information

Pile ID:	TR-4B
Latitude:	42.89146
Longitude:	-76.95733
Pile Type:	W6x9
Pile Embedment Depth [in]:	120
Pile Stick-Up [in]:	54
Lateral Design Load [lbs]:	3500
Drive Time [sec]:	137

% of Design Load	Lateral Load [lbs]	Deflection Δ (in.) Gauges #1 & #2	Comments
0%	0	0.000	
14%	500	0.094	
29%	1000	0.177	
43%	1500	0.303	
0%	0	0.048	
43%	1500	0.334	
57%	2000	0.440	
71%	2500	0.563	
86%	3000	0.692	
0%	0	0.092	
86%	3000	0.732	
100%	3500	0.882	
114%	4000	1.008	
129%	4500	1.014	
0%	0	0.113	
114%	4000		
143%	5000		
157%	5500		
171%	6000		
0%	0		
143%	5000		
171%	6000		
186%	6500		
200%	7000		
0%	0		



Note: The pile embedment depth in this analysis ignores the approximate push depth. Refer Appendix D for theapproximate push depth.

Lateral Load Test Result for TR-6A

Project Information

Project Name:	Trelina Solar
Project Location:	Waterloo, New York
Project Number:	J5195163

Lateral Load Test Set Up

Number of Top Gauges:	0
Number of Bottom Gauges:	2
Height of Top Gauges [in]:	24
Height of Bottom Gauges [in]:	6
Height of Applied Load [in]:	24
Load Cell:	Dillon Ed Jr

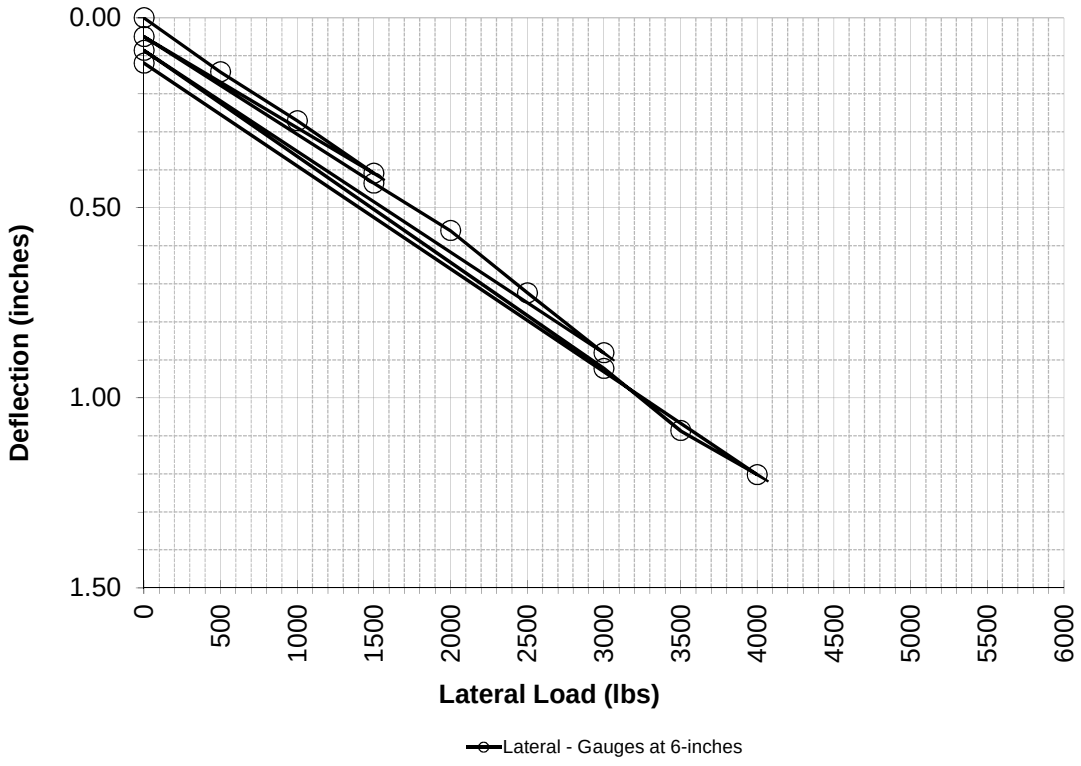
Test Date and Representative

Tested By Terracon Rep:	TW
Date Tested:	11/5/2019

Pile Information

Pile ID:	TR-6A
Latitude:	42.89360
Longitude:	-76.94875
Pile Type:	W6x9
Pile Embedment Depth [in]:	84
Pile Stick-Up [in]:	54
Lateral Design Load [lbs]:	3500
Drive Time [sec]:	161

% of Design Load	Lateral Load [lbs]	Deflection Δ (in.) Gauges #1 & #2	Comments
0%	0	0.000	
14%	500	0.142	
29%	1000	0.271	
43%	1500	0.409	
0%	0	0.049	
43%	1500	0.435	
57%	2000	0.560	
71%	2500	0.724	
86%	3000	0.881	
0%	0	0.086	
86%	3000	0.922	
100%	3500	1.086	
114%	4000	1.202	
129%	4500		
0%	0	0.119	
114%	4000		
143%	5000		
157%	5500		
171%	6000		
0%	0		
143%	5000		
171%	6000		
186%	6500		
200%	7000		
0%	0		



Note: The pile embedment depth in this analysis ignores the approximate push depth. Refer Appendix D for theapproximate push depth.

Lateral Load Test Result for TR-6B

Project Information

Project Name:	Trelina Solar
Project Location:	Waterloo, New York
Project Number:	J5195163

Lateral Load Test Set Up

Number of Top Gauges:	0
Number of Bottom Gauges:	2
Height of Top Gauges [in]:	24
Height of Bottom Gauges [in]:	6
Height of Applied Load [in]:	24
Load Cell:	Dillon Ed Jr

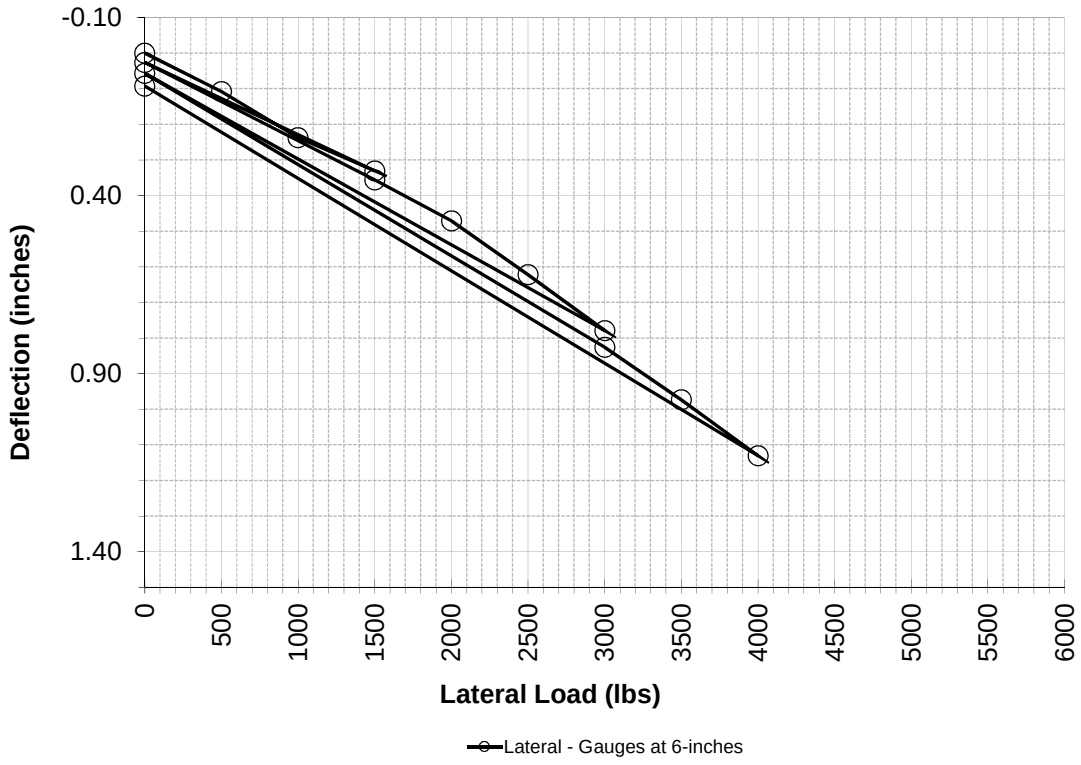
Test Date and Representative

Tested By Terracon Rep:	TW
Date Tested:	11/5/2019

Pile Information

Pile ID:	TR-6B
Latitude:	42.89360
Longitude:	-76.94875
Pile Type:	W6x9
Pile Embedment Depth [in]:	120
Pile Stick-Up [in]:	54
Lateral Design Load [lbs]:	3500
Drive Time [sec]:	284

% of Design Load	Lateral Load [lbs]	Deflection Δ (in.) Gauges #1 & #2	Comments
0%	0	0.000	
14%	500	0.108	
29%	1000	0.237	
43%	1500	0.331	
0%	0	0.026	
43%	1500	0.356	
57%	2000	0.471	
71%	2500	0.622	
86%	3000	0.779	
0%	0	0.057	
86%	3000	0.826	
100%	3500	0.973	
114%	4000	1.130	
129%	4500		
0%	0	0.093	
114%	4000		
143%	5000		
157%	5500		
171%	6000		
0%	0		
143%	5000		
171%	6000		
186%	6500		
200%	7000		
0%	0		



Note: The pile embedment depth in this analysis ignores the approximate push depth. Refer Appendix D for theapproximate push depth.

Lateral Load Test Result for TR-7A

Project Information

Project Name:	Trelina Solar
Project Location:	Waterloo, New York
Project Number:	J5195163

Lateral Load Test Set Up

Number of Top Gauges:	0
Number of Bottom Gauges:	2
Height of Top Gauges [in]:	24
Height of Bottom Gauges [in]:	6
Height of Applied Load [in]:	24
Load Cell:	Dillon Ed Jr

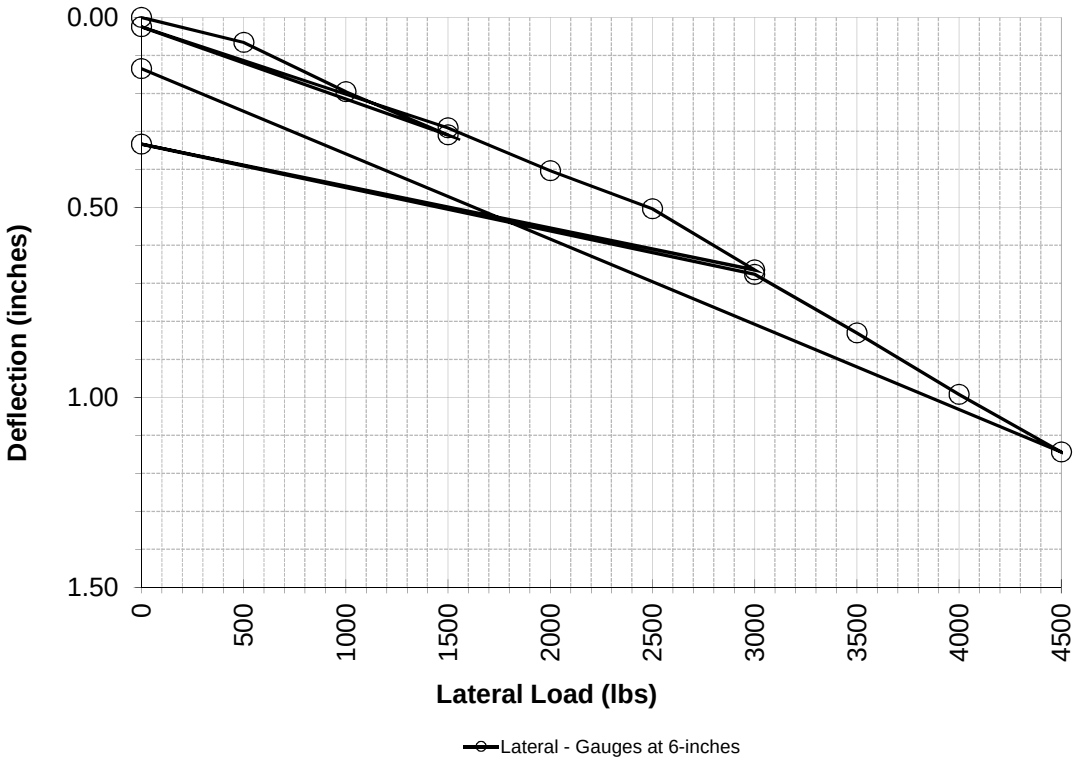
Test Date and Representative

Tested By Terracon Rep:	TW
Date Tested:	11/5/2019

Pile Information

Pile ID:	TR-7A
Latitude:	42.88630
Longitude:	-76.94910
Pile Type:	W6x9
Pile Embedment Depth [in]:	81
Pile Stick-Up [in]:	54
Lateral Design Load [lbs]:	3500
Drive Time [sec]:	109

% of Design Load	Lateral Load [lbs]	Deflection Δ (in.) Gauges #1 & #2	Comments
0%	0	0.000	
14%	500	0.066	
29%	1000	0.195	
43%	1500	0.309	
0%	0	0.024	
43%	1500	0.290	
57%	2000	0.403	
71%	2500	0.503	
86%	3000	0.664	
0%	0	0.334	
86%	3000	0.676	
100%	3500	0.830	
114%	4000	0.992	
129%	4500	1.144	
0%	0	0.135	
114%	4000		
143%	5000		
157%	5500		
171%	6000		
0%	0		
143%	5000		
171%	6000		
186%	6500		
200%	7000		
0%	0		



Note: The pile embedment depth in this analysis ignores the approximate push depth. Refer Appendix D for theapproximate push depth.

Lateral Load Test Result for TR-7B

Project Information

Project Name:	Trelina Solar
Project Location:	Waterloo, New York
Project Number:	J5195163

Lateral Load Test Set Up

Number of Top Gauges:	0
Number of Bottom Gauges:	2
Height of Top Gauges [in]:	24
Height of Bottom Gauges [in]:	6
Height of Applied Load [in]:	24
Load Cell:	Dillon Ed Jr

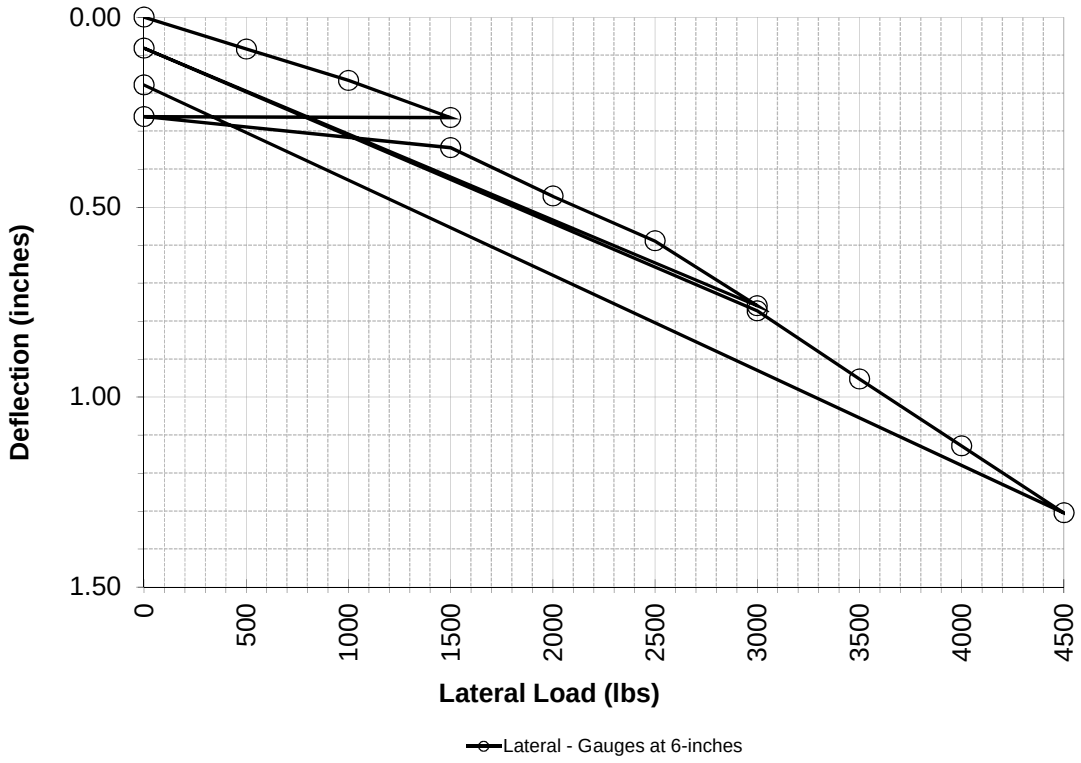
Test Date and Representative

Tested By Terracon Rep:	TW
Date Tested:	11/5/2019

Pile Information

Pile ID:	TR-7B
Latitude:	42.88630
Longitude:	-76.94910
Pile Type:	W6x9
Pile Embedment Depth [in]:	120
Pile Stick-Up [in]:	54
Lateral Design Load [lbs]:	3500
Drive Time [sec]:	181

% of Design Load	Lateral Load [lbs]	Deflection Δ (in.) Gauges #1 & #2	Comments
0%	0	0.000	
14%	500	0.084	
29%	1000	0.167	
43%	1500	0.265	
0%	0	0.262	
43%	1500	0.343	
57%	2000	0.471	
71%	2500	0.589	
86%	3000	0.760	
0%	0	0.082	
86%	3000	0.773	
100%	3500	0.953	
114%	4000	1.129	
129%	4500	1.305	
0%	0	0.178	
114%	4000		
143%	5000		
157%	5500		
171%	6000		
0%	0		
143%	5000		
171%	6000		
186%	6500		
200%	7000		
0%	0		



Note: The pile embedment depth in this analysis ignores the approximate push depth. Refer Appendix D for theapproximate push depth.

Lateral Load Test Result for TR-8A

Project Information

Project Name:	Trelina Solar
Project Location:	Waterloo, New York
Project Number:	J5195163

Lateral Load Test Set Up

Number of Top Gauges:	0
Number of Bottom Gauges:	2
Height of Top Gauges [in]:	24
Height of Bottom Gauges [in]:	6
Height of Applied Load [in]:	24
Load Cell:	Dillon Ed Jr

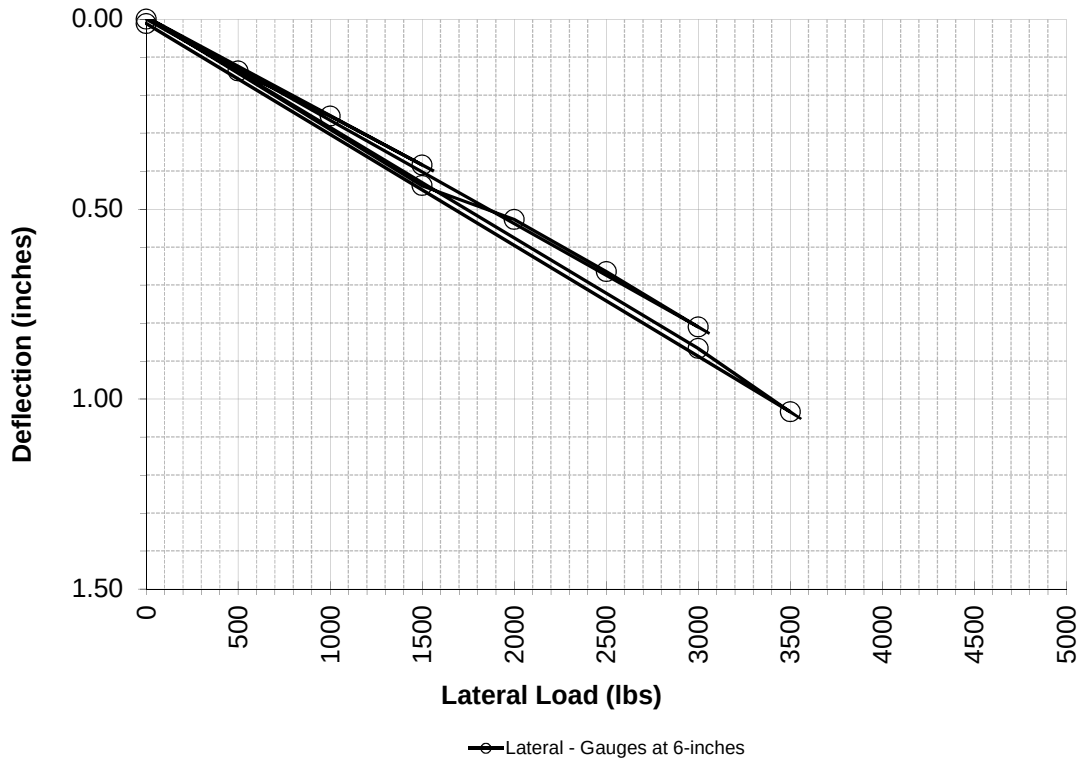
Test Date and Representative

Tested By Terracon Rep:	TW
Date Tested:	11/5/2019

Pile Information

Pile ID:	TR-8A
Latitude:	42.88203
Longitude:	-76.95318
Pile Type:	W6x9
Pile Embedment Depth [in]:	84
Pile Stick-Up [in]:	54
Lateral Design Load [lbs]:	3500
Drive Time [sec]:	125

% of Design Load	Lateral Load [lbs]	Deflection Δ (in.) Gauges #1 & #2	Comments
0%	0	0.000	
14%	500	0.136	
29%	1000	0.255	
43%	1500	0.384	
0%	0	-0.005	
43%	1500	0.438	
57%	2000	0.527	
71%	2500	0.665	
86%	3000	0.810	
0%	0	-0.006	
86%	3000	0.867	
100%	3500	1.034	
114%	4000		
129%	4500		
0%	0	0.012	
114%	4000		
143%	5000		
157%	5500		
171%	6000		
0%	0		
143%	5000		
171%	6000		
186%	6500		
200%	7000		
0%	0		



Note: The pile embedment depth in this analysis ignores the approximate push depth. Refer Appendix D for theapproximate push depth.

Lateral Load Test Result for TR-8B

Project Information

Project Name:	Trelina Solar
Project Location:	Waterloo, New York
Project Number:	J5195163

Lateral Load Test Set Up

Number of Top Gauges:	0
Number of Bottom Gauges:	2
Height of Top Gauges [in]:	24
Height of Bottom Gauges [in]:	6
Height of Applied Load [in]:	24
Load Cell:	Dillon Ed Jr

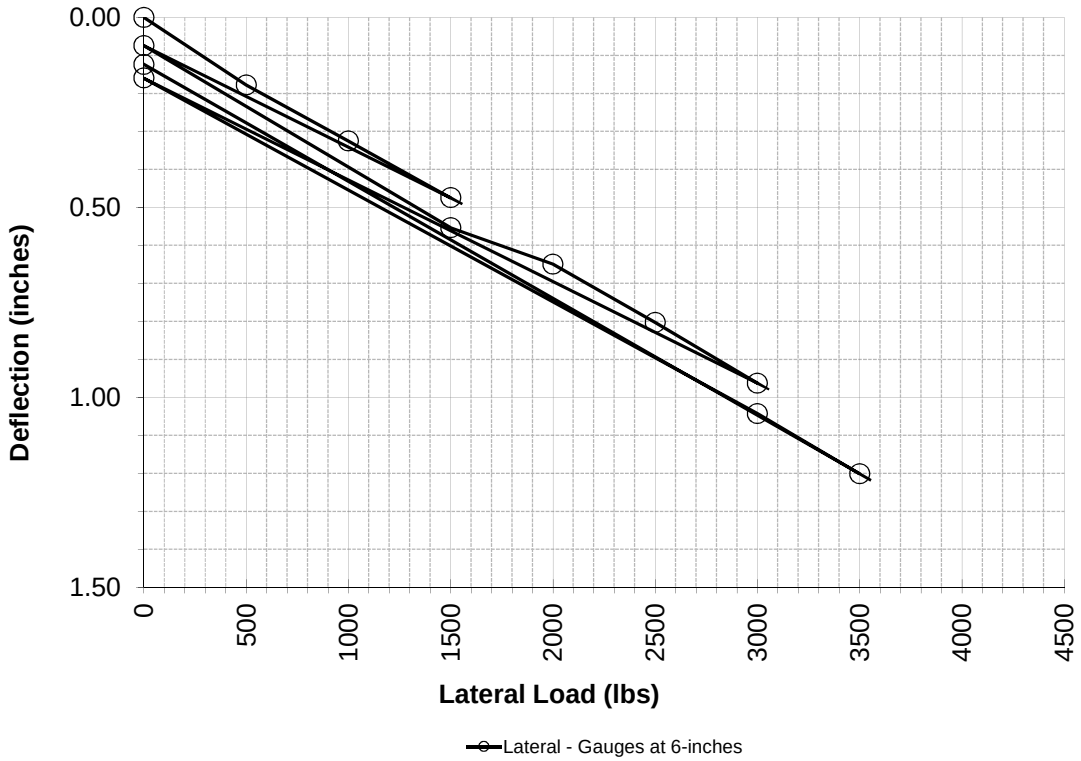
Test Date and Representative

Tested By Terracon Rep:	TW
Date Tested:	11/5/2019

Pile Information

Pile ID:	TR-8B
Latitude:	42.88203
Longitude:	-76.95318
Pile Type:	W6x9
Pile Embedment Depth [in]:	120
Pile Stick-Up [in]:	54
Lateral Design Load [lbs]:	3500
Drive Time [sec]:	348

% of Design Load	Lateral Load [lbs]	Deflection Δ (in.) Gauges #1 & #2	Comments
0%	0	0.000	
14%	500	0.178	
29%	1000	0.325	
43%	1500	0.475	
0%	0	0.074	
43%	1500	0.553	
57%	2000	0.650	
71%	2500	0.802	
86%	3000	0.962	
0%	0	0.160	
86%	3000	1.043	
100%	3500	1.201	
114%	4000		
129%	4500		
0%	0	0.124	
114%	4000		
143%	5000		
157%	5500		
171%	6000		
0%	0		
143%	5000		
171%	6000		
186%	6500		
200%	7000		
0%	0		



Note: The pile embedment depth in this analysis ignores the approximate push depth. Refer Appendix D for theapproximate push depth.

Lateral Load Test Result for TR-10A

Project Information

Project Name:	Trelina Solar
Project Location:	Waterloo, New York
Project Number:	J5195163

Lateral Load Test Set Up

Number of Top Gauges:	0
Number of Bottom Gauges:	2
Height of Top Gauges [in]:	24
Height of Bottom Gauges [in]:	6
Height of Applied Load [in]:	24
Load Cell:	Dillon Ed Jr

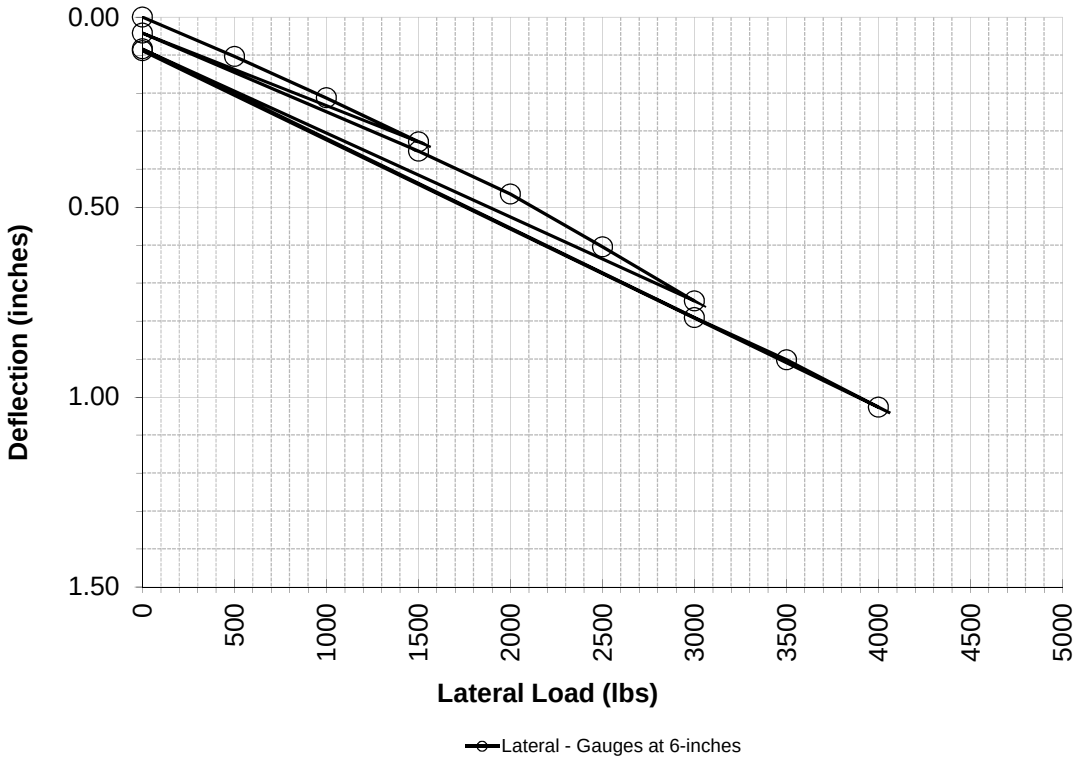
Test Date and Representative

Tested By Terracon Rep:	TW
Date Tested:	11/5/2019

Pile Information

Pile ID:	TR-10A
Latitude:	42.89215
Longitude:	-76.93486
Pile Type:	W6x9
Pile Embedment Depth [in]:	84
Pile Stick-Up [in]:	54
Lateral Design Load [lbs]:	3500
Drive Time [sec]:	75

% of Design Load	Lateral Load [lbs]	Deflection Δ (in.) Gauges #1 & #2	Comments
0%	0	0.000	
14%	500	0.104	
29%	1000	0.213	
43%	1500	0.328	
0%	0	0.042	
43%	1500	0.353	
57%	2000	0.465	
71%	2500	0.604	
86%	3000	0.747	
0%	0	0.084	
86%	3000	0.791	
100%	3500	0.902	
114%	4000	1.027	
129%	4500		
0%	0	0.088	
114%	4000		
143%	5000		
157%	5500		
171%	6000		
0%	0		
143%	5000		
171%	6000		
186%	6500		
200%	7000		
0%	0		



Note: The pile embedment depth in this analysis ignores the approximate push depth. Refer Appendix D for theapproximate push depth.

Lateral Load Test Result for TR-10B

Project Information

Project Name:	Trelina Solar
Project Location:	Waterloo, New York
Project Number:	J5195163

Lateral Load Test Set Up

Number of Top Gauges:	0
Number of Bottom Gauges:	2
Height of Top Gauges [in]:	24
Height of Bottom Gauges [in]:	6
Height of Applied Load [in]:	24
Load Cell:	Dillon Ed Jr

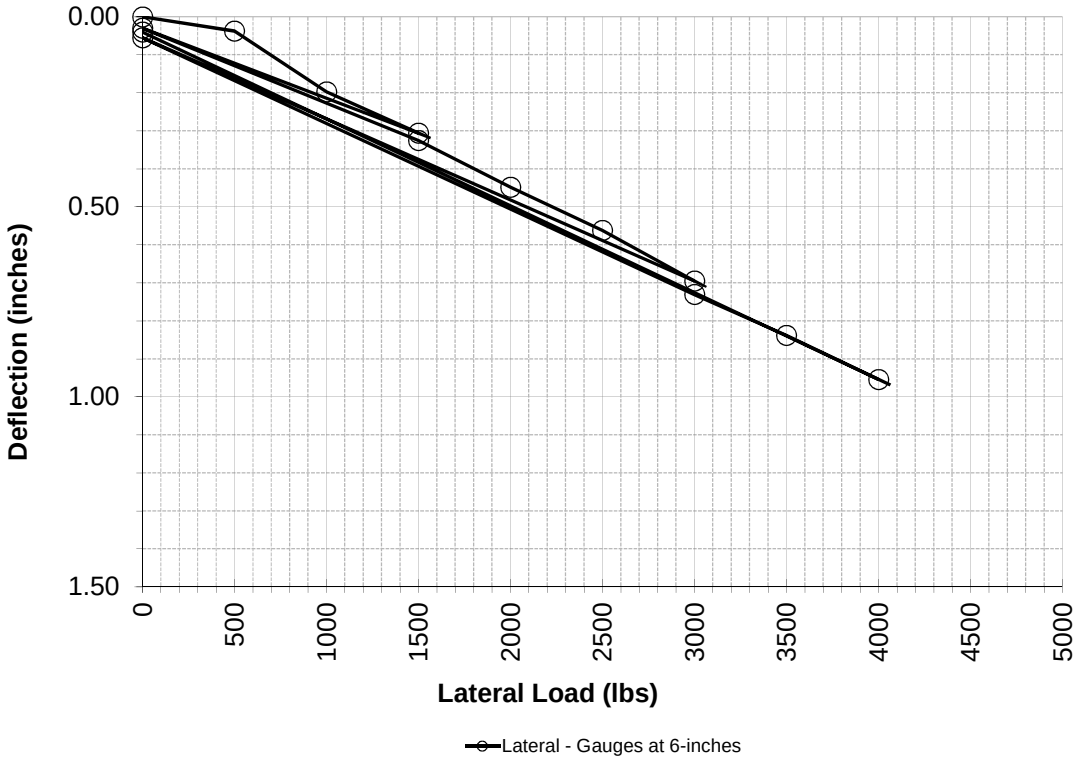
Test Date and Representative

Tested By Terracon Rep:	TW
Date Tested:	11/5/2019

Pile Information

Pile ID:	TR-10B
Latitude:	42.89215
Longitude:	-76.93486
Pile Type:	W6x9
Pile Embedment Depth [in]:	120
Pile Stick-Up [in]:	54
Lateral Design Load [lbs]:	3500
Drive Time [sec]:	164

% of Design Load	Lateral Load [lbs]	Deflection Δ (in.) Gauges #1 & #2	Comments
0%	0	0.000	
14%	500	0.037	
29%	1000	0.197	
43%	1500	0.306	
0%	0	0.030	
43%	1500	0.326	
57%	2000	0.448	
71%	2500	0.562	
86%	3000	0.695	
0%	0	0.055	
86%	3000	0.731	
100%	3500	0.838	
114%	4000	0.954	
129%	4500		
0%	0	0.040	
114%	4000		
143%	5000		
157%	5500		
171%	6000		
0%	0		
143%	5000		
171%	6000		
186%	6500		
200%	7000		
0%	0		



Note: The pile embedment depth in this analysis ignores the approximate push depth. Refer Appendix D for theapproximate push depth.

Lateral Load Test Result for TR-12A

Project Information

Project Name:	Trelina Solar
Project Location:	Waterloo, New York
Project Number:	J5195163

Lateral Load Test Set Up

Number of Top Gauges:	0
Number of Bottom Gauges:	2
Height of Top Gauges [in]:	24
Height of Bottom Gauges [in]:	6
Height of Applied Load [in]:	24
Load Cell:	Dillon Ed Jr

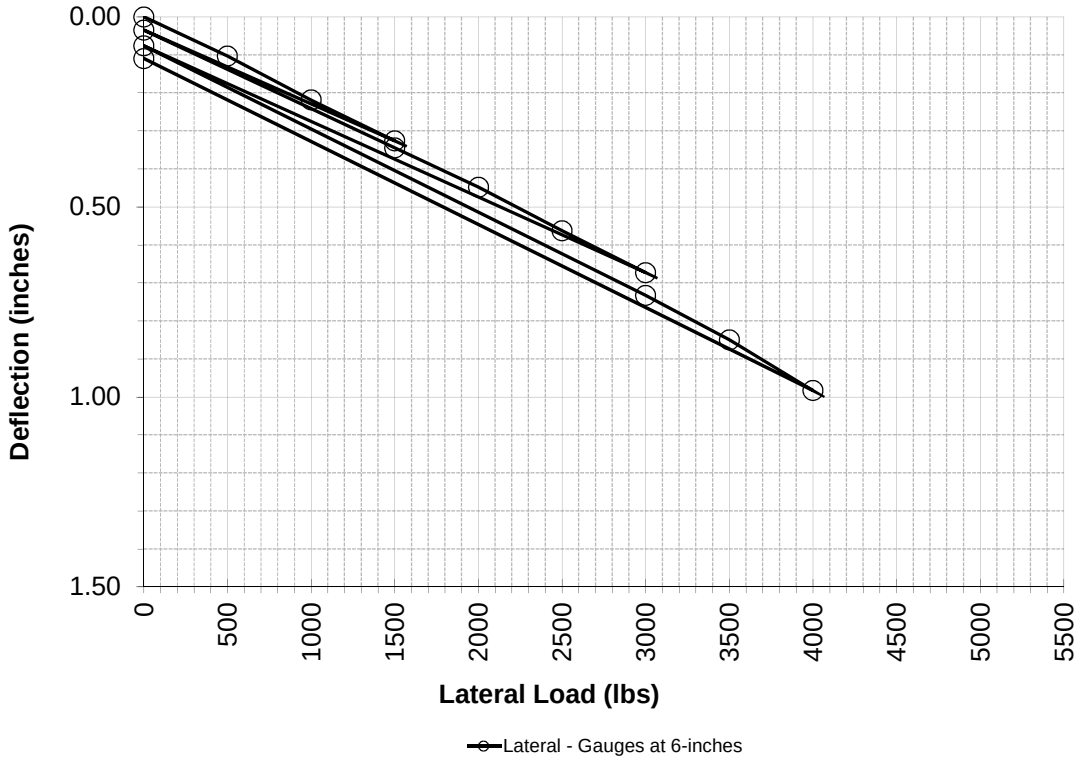
Test Date and Representative

Tested By Terracon Rep:	TW
Date Tested:	11/5/2019

Pile Information

Pile ID:	TR-12A
Latitude:	42.89391
Longitude:	-76.92566
Pile Type:	W6x9
Pile Embedment Depth [in]:	84
Pile Stick-Up [in]:	54
Lateral Design Load [lbs]:	3500
Drive Time [sec]:	178

% of Design Load	Lateral Load [lbs]	Deflection Δ (in.) Gauges #1 & #2	Comments
0%	0	0.000	
14%	500	0.103	
29%	1000	0.219	
43%	1500	0.326	
0%	0	0.035	
43%	1500	0.344	
57%	2000	0.448	
71%	2500	0.562	
86%	3000	0.673	
0%	0	0.076	
86%	3000	0.733	
100%	3500	0.850	
114%	4000	0.983	
129%	4500		
0%	0	0.109	
114%	4000		
143%	5000		
157%	5500		
171%	6000		
0%	0		
143%	5000		
171%	6000		
186%	6500		
200%	7000		
0%	0		



Note: The pile embedment depth in this analysis ignores the approximate push depth. Refer Appendix D for theapproximate push depth.

Lateral Load Test Result for TR-12B

Project Information

Project Name:	Trelina Solar
Project Location:	Waterloo, New York
Project Number:	J5195163

Lateral Load Test Set Up

Number of Top Gauges:	0
Number of Bottom Gauges:	2
Height of Top Gauges [in]:	24
Height of Bottom Gauges [in]:	6
Height of Applied Load [in]:	24
Load Cell:	Dillon Ed Jr

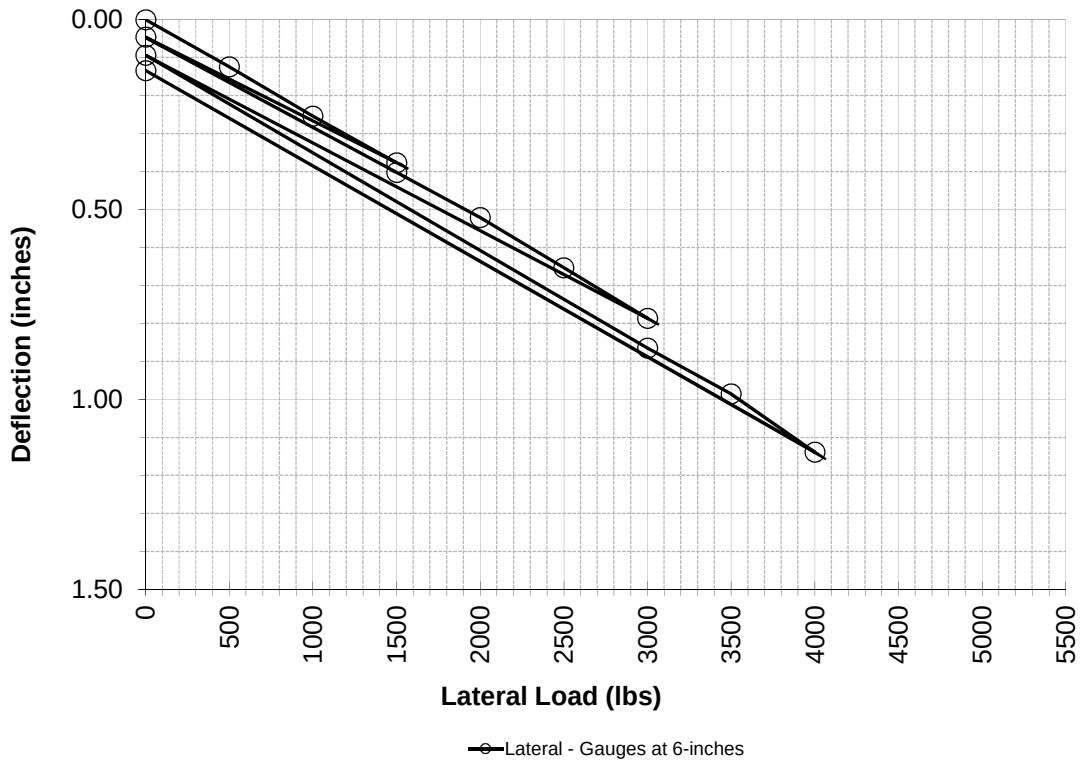
Test Date and Representative

Tested By Terracon Rep:	TW
Date Tested:	11/5/2019

Pile Information

Pile ID:	TR-12B
Latitude:	42.89391
Longitude:	-76.92566
Pile Type:	W6x9
Pile Embedment Depth [in]:	120
Pile Stick-Up [in]:	54
Lateral Design Load [lbs]:	3500
Drive Time [sec]:	350

% of Design Load	Lateral Load [lbs]	Deflection Δ (in.) Gauges #1 & #2	Comments
0%	0	0.000	
14%	500	0.124	
29%	1000	0.254	
43%	1500	0.377	
0%	0	0.046	
43%	1500	0.402	
57%	2000	0.521	
71%	2500	0.653	
86%	3000	0.787	
0%	0	0.094	
86%	3000	0.865	
100%	3500	0.985	
114%	4000	1.139	
129%	4500		
0%	0	0.134	
114%	4000		
143%	5000		
157%	5500		
171%	6000		
0%	0		
143%	5000		
171%	6000		
186%	6500		
200%	7000		
0%	0		



Note: The pile embedment depth in this analysis ignores the approximate push depth. Refer Appendix D for theapproximate push depth.

APPENDIX G
PILE LOAD TESTING RESULTS (COMPRESSION)
(Exhibits- G001 through G007)

Compression Load Test Result for TR-2C

Project Information

Project Name:	Trelina Solar
Project Location:	Waterloo, New York
Project Number:	J5195163

Axial Load Test Set Up

Number of Gauges:	2
Height of Gauges [in]:	6
Load Cell:	Dillon Ed Jr

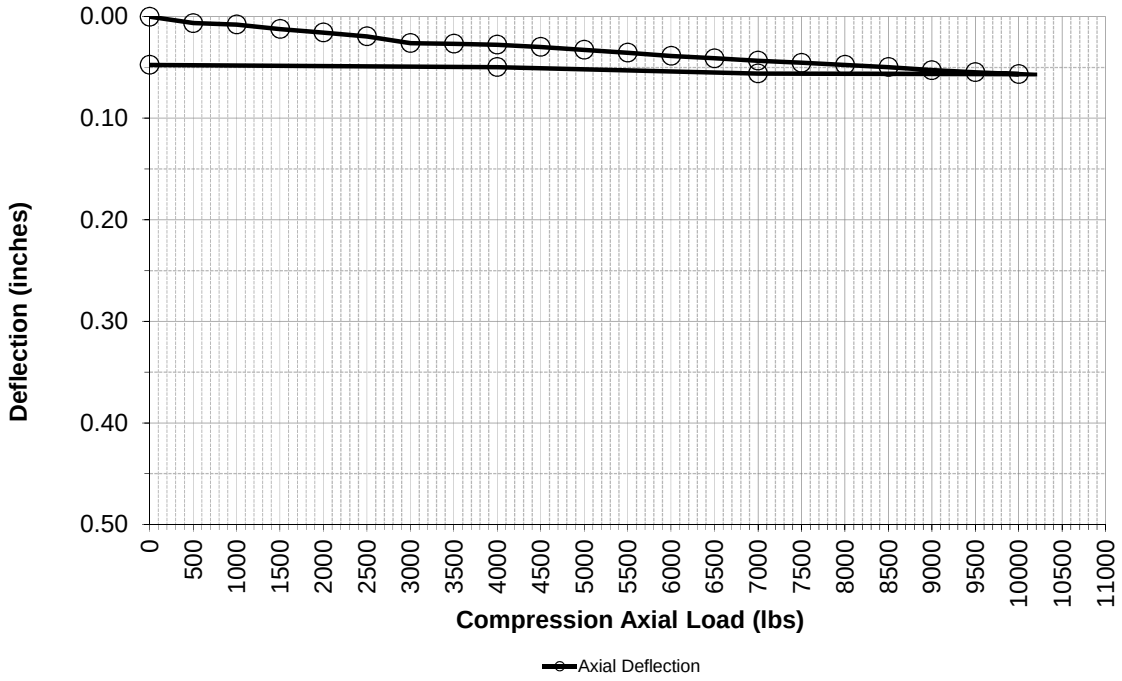
Test Date and Representative

Tested By Terracon Rep:	TW
Date Tested:	11/5/2019

Pile Information

Pile ID:	TR-2C
Latitude:	42.89527
Longitude:	-76.95592
Pile Type:	W6x9
Pile Embedment Depth [in]:	96
Pile Perimeter [in]:	19.68
Pile Stick-Up [in]:	54
Axial Design Load [lbs]:	5000
Pile Area [sq. in]:	2.68
Elastic Modulus [ksi]:	36,000
Drive Time [sec]:	189

Compression Test Results			
% of Design Load	Axial Load [lbs]	Deflection Δ (in.) Gauges #1 & #2	Comments
0%	0	0.000	
10%	500	0.006	
20%	1000	0.008	
30%	1500	0.012	
40%	2000	0.016	
50%	2500	0.019	
60%	3000	0.026	
70%	3500	0.027	
80%	4000	0.028	
90%	4500	0.030	
100%	5000	0.033	
110%	5500	0.036	
120%	6000	0.039	
130%	6500	0.041	
140%	7000	0.043	
150%	7500	0.045	
160%	8000	0.047	
170%	8500	0.050	
180%	9000	0.053	
190%	9500	0.055	
200%	10000	0.057	
140%	7000	0.056	
80%	4000	0.050	
0%	0	0.047	



Note: The pile embedment depth in this analysis ignores the approximate push depth. Refer Appendix D for the approximate push depth.

Compression Load Test Result for TR-4C

Project Information

Project Name:	Trelina Solar
Project Location:	Waterloo, New York
Project Number:	J5195163

Axial Load Test Set Up

Number of Gauges:	2
Height of Gauges [in]:	6
Load Cell:	Dillon Ed Jr

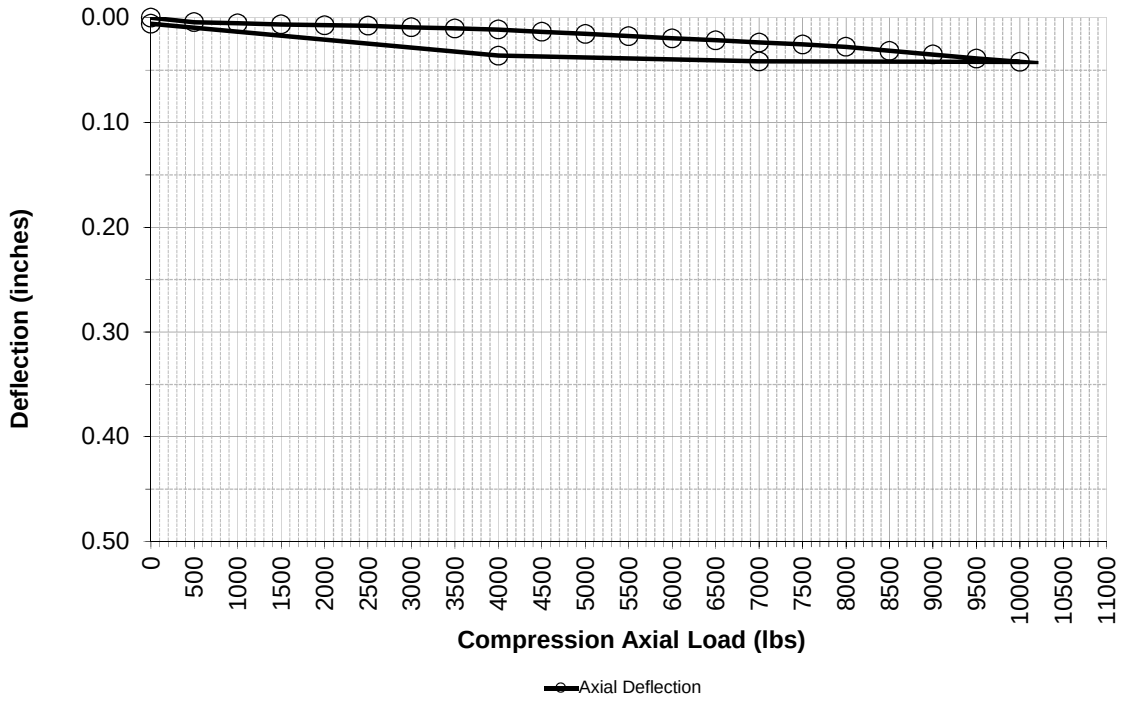
Test Date and Representative

Tested By Terracon Rep:	TW
Date Tested:	11/5/2019

Pile Information

Pile ID:	TR-4C
Latitude:	42.89146
Longitude:	-76.95733
Pile Type:	W6x9
Pile Embedment Depth [in]:	102
Pile Perimeter [in]:	19.68
Pile Stick-Up [in]:	54
Axial Design Load [lbs]:	5000
Pile Area [sq. in]:	2.68
Elastic Modulus [ksi]:	36,000
Drive Time [sec]:	111

Compression Test Results			
% of Design Load	Axial Load [lbs]	Deflection Δ (in.) Gauges #1 & #2	Comments
0%	0	0.000	
10%	500	0.004	
20%	1000	0.005	
30%	1500	0.006	
40%	2000	0.007	
50%	2500	0.008	
60%	3000	0.009	
70%	3500	0.010	
80%	4000	0.011	
90%	4500	0.013	
100%	5000	0.015	
110%	5500	0.018	
120%	6000	0.020	
130%	6500	0.021	
140%	7000	0.024	
150%	7500	0.026	
160%	8000	0.028	
170%	8500	0.032	
180%	9000	0.035	
190%	9500	0.039	
200%	10000	0.042	
140%	7000	0.042	
80%	4000	0.036	
0%	0	0.006	



Note: The pile embedment depth in this analysis ignores the approximate push depth. Refer Appendix D for the approximate push depth.

Compression Load Test Result for TR-6C

Project Information

Project Name:	Trelina Solar
Project Location:	Waterloo, New York
Project Number:	J5195163

Axial Load Test Set Up

Number of Gauges:	2
Height of Gauges [in]:	6
Load Cell:	Dillon Ed Jr

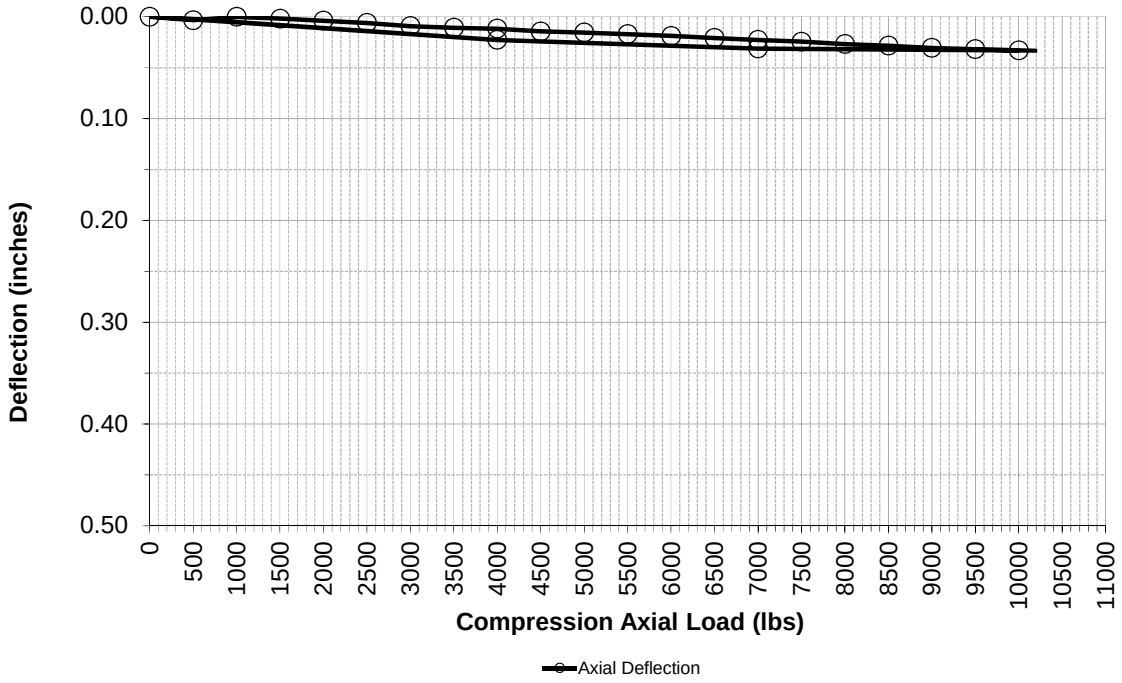
Test Date and Representative

Tested By Terracon Rep:	TW
Date Tested:	11/5/2019

Pile Information

Pile ID:	TR-6C
Latitude:	42.89360
Longitude:	-76.94875
Pile Type:	W6x9
Pile Embedment Depth [in]:	102
Pile Perimeter [in]:	19.68
Pile Stick-Up [in]:	54
Axial Design Load [lbs]:	5000
Pile Area [sq. in]:	2.68
Elastic Modulus [ksi]:	36,000
Drive Time [sec]:	152

Compression Test Results			
% of Design Load	Axial Load [lbs]	Deflection Δ (in.) Gauges #1 & #2	Comments
0%	0	0.000	
10%	500	0.003	
20%	1000	0.000	
30%	1500	0.002	
40%	2000	0.004	
50%	2500	0.006	
60%	3000	0.009	
70%	3500	0.011	
80%	4000	0.012	
90%	4500	0.014	
100%	5000	0.016	
110%	5500	0.017	
120%	6000	0.019	
130%	6500	0.021	
140%	7000	0.023	
150%	7500	0.025	
160%	8000	0.027	
170%	8500	0.028	
180%	9000	0.031	
190%	9500	0.032	
200%	10000	0.033	
140%	7000	0.031	
80%	4000	0.023	
0%	0	0.000	



Note: The pile embedment depth in this analysis ignores the approximate push depth. Refer Appendix D for the approximate push depth.

Compression Load Test Result for TR-7C

Project Information

Project Name:	Trelina Solar
Project Location:	Waterloo, New York
Project Number:	J5195163

Axial Load Test Set Up

Number of Gauges:	2
Height of Gauges [in]:	6
Load Cell:	Dillon Ed Jr

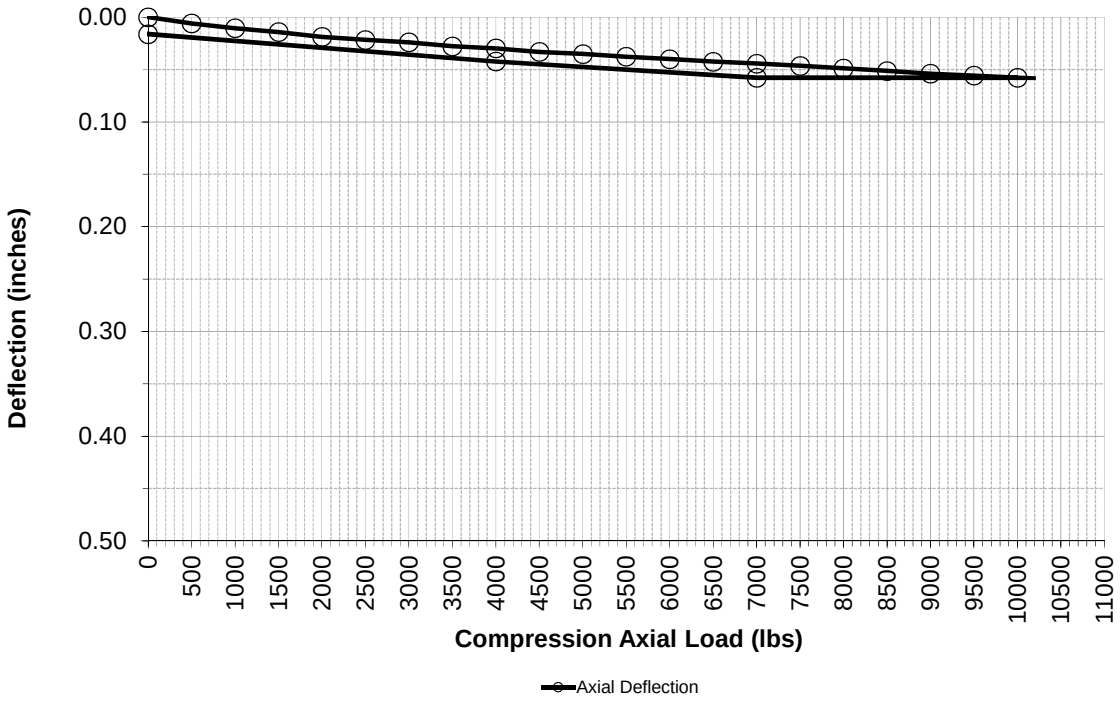
Test Date and Representative

Tested By Terracon Rep:	TW
Date Tested:	11/5/2019

Pile Information

Pile ID:	TR-7C
Latitude:	42.88630
Longitude:	-76.94910
Pile Type:	W6x9
Pile Embedment Depth [in]:	99
Pile Perimeter [in]:	19.68
Pile Stick-Up [in]:	54
Axial Design Load [lbs]:	5000
Pile Area [sq. in]:	2.68
Elastic Modulus [ksi]:	36,000
Drive Time [sec]:	92

Compression Test Results			
% of Design Load	Axial Load [lbs]	Deflection Δ (in.) Gauges #1 & #2	Comments
0%	0	0.000	
10%	500	0.006	
20%	1000	0.010	
30%	1500	0.014	
40%	2000	0.019	
50%	2500	0.022	
60%	3000	0.024	
70%	3500	0.028	
80%	4000	0.030	
90%	4500	0.033	
100%	5000	0.035	
110%	5500	0.038	
120%	6000	0.040	
130%	6500	0.042	
140%	7000	0.044	
150%	7500	0.046	
160%	8000	0.049	
170%	8500	0.051	
180%	9000	0.054	
190%	9500	0.056	
200%	10000	0.058	
140%	7000	0.058	
80%	4000	0.042	
0%	0	0.016	



Note: The pile embedment depth in this analysis ignores the approximate push depth. Refer Appendix D for the approximate push depth.

Compression Load Test Result for TR-8C

Project Information

Project Name:	Trelina Solar
Project Location:	Waterloo, New York
Project Number:	J5195163

Axial Load Test Set Up

Number of Gauges:	2
Height of Gauges [in]:	6
Load Cell:	Dillon Ed Jr

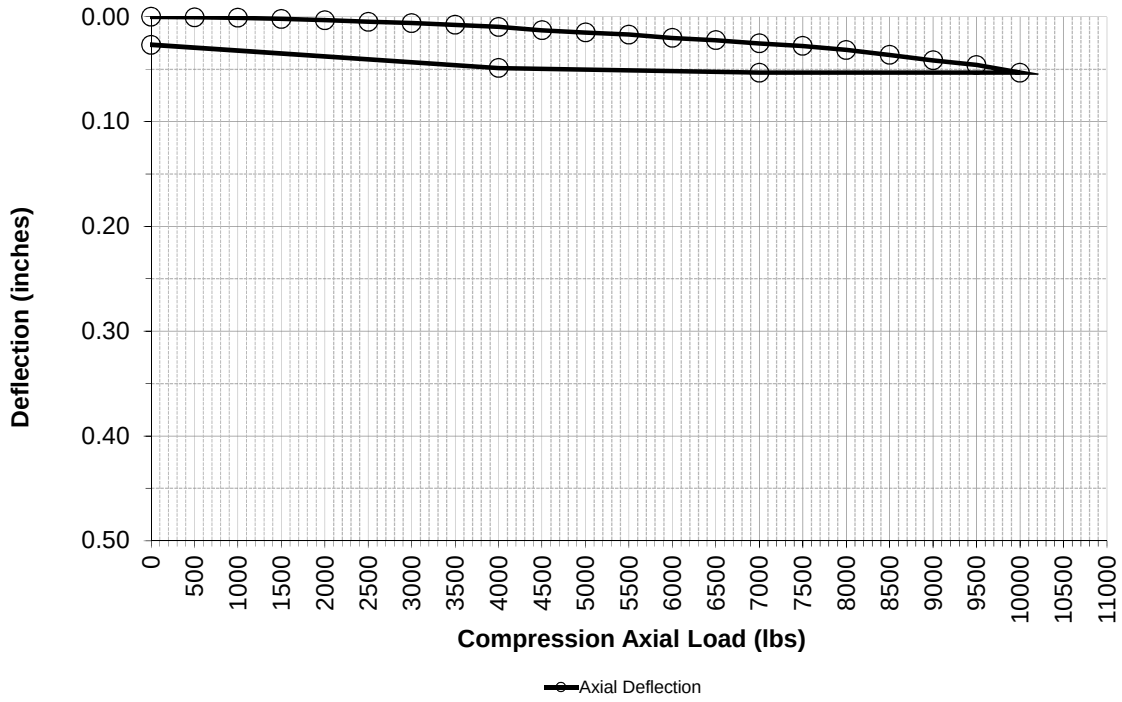
Test Date and Representative

Tested By Terracon Rep:	TW
Date Tested:	11/5/2019

Pile Information

Pile ID:	TR-8C
Latitude:	42.88203
Longitude:	-76.95318
Pile Type:	W6x9
Pile Embedment Depth [in]:	96
Pile Perimeter [in]:	19.68
Pile Stick-Up [in]:	54
Axial Design Load [lbs]:	5000
Pile Area [sq. in]:	2.68
Elastic Modulus [ksi]:	36,000
Drive Time [sec]:	162

Compression Test Results			
% of Design Load	Axial Load [lbs]	Deflection Δ (in.) Gauges #1 & #2	Comments
0%	0	0.000	
10%	500	0.000	
20%	1000	0.001	
30%	1500	0.002	
40%	2000	0.003	
50%	2500	0.005	
60%	3000	0.006	
70%	3500	0.008	
80%	4000	0.010	
90%	4500	0.013	
100%	5000	0.015	
110%	5500	0.017	
120%	6000	0.020	
130%	6500	0.022	
140%	7000	0.025	
150%	7500	0.028	
160%	8000	0.032	
170%	8500	0.036	
180%	9000	0.042	
190%	9500	0.046	
200%	10000	0.053	
140%	7000	0.053	
80%	4000	0.049	
0%	0	0.027	



Note: The pile embedment depth in this analysis ignores the approximate push depth. Refer Appendix D for the approximate push depth.

Compression Load Test Result for TR-10C

Project Information

Project Name:	Trelina Solar
Project Location:	Waterloo, New York
Project Number:	J5195163

Axial Load Test Set Up

Number of Gauges:	2
Height of Gauges [in]:	6
Load Cell:	Dillon Ed Jr

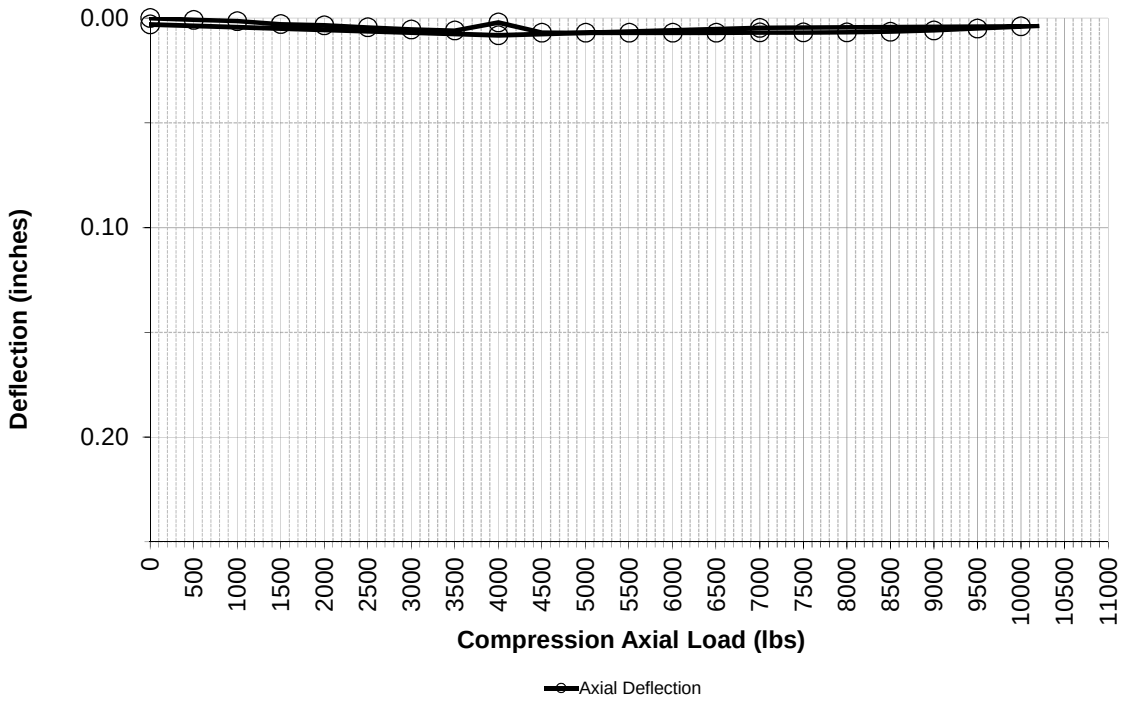
Test Date and Representative

Tested By Terracon Rep:	TW
Date Tested:	11/5/2019

Pile Information

Pile ID:	TR-10C
Latitude:	42.89215
Longitude:	-76.93486
Pile Type:	W6x9
Pile Embedment Depth [in]:	99
Pile Perimeter [in]:	19.68
Pile Stick-Up [in]:	54
Axial Design Load [lbs]:	5000
Pile Area [sq. in]:	2.68
Elastic Modulus [ksi]:	36,000
Drive Time [sec]:	104

Compression Test Results			
% of Design Load	Axial Load [lbs]	Deflection Δ (in.) Gauges #1 & #2	Comments
0%	0	0.000	
10%	500	0.001	
20%	1000	0.001	
30%	1500	0.003	
40%	2000	0.003	
50%	2500	0.004	
60%	3000	0.005	
70%	3500	0.006	
80%	4000	0.002	
90%	4500	0.007	
100%	5000	0.007	
110%	5500	0.007	
120%	6000	0.007	
130%	6500	0.007	
140%	7000	0.007	
150%	7500	0.007	
160%	8000	0.007	
170%	8500	0.007	
180%	9000	0.006	
190%	9500	0.005	
200%	10000	0.004	
140%	7000	0.005	
80%	4000	0.008	
0%	0	0.003	



Note: The pile embedment depth in this analysis ignores the approximate push depth. Refer Appendix D for the approximate push depth.

Compression Load Test Result for TR-12C

Project Information

Project Name:	Trelina Solar
Project Location:	Waterloo, New York
Project Number:	J5195163

Axial Load Test Set Up

Number of Gauges:	2
Height of Gauges [in]:	6
Load Cell:	Dillon Ed Jr

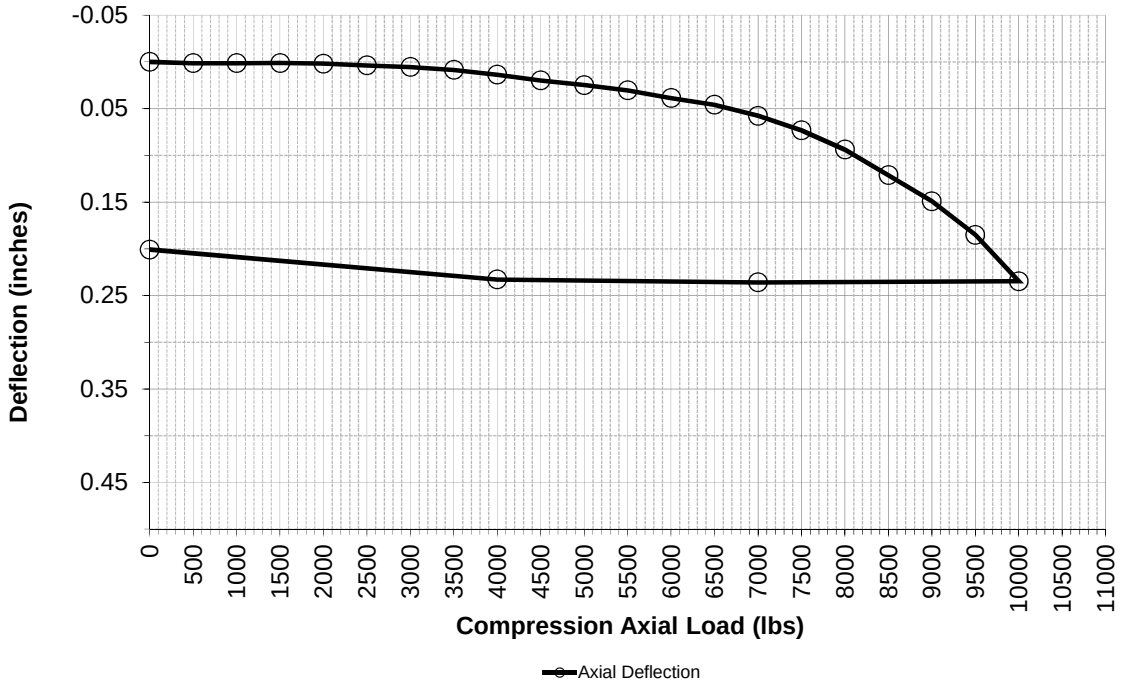
Test Date and Representative

Tested By Terracon Rep:	TW
Date Tested:	11/5/2019

Pile Information

Pile ID:	TR-12C
Latitude:	42.89391
Longitude:	-76.92566
Pile Type:	W6x9
Pile Embedment Depth [in]:	99
Pile Perimeter [in]:	19.68
Pile Stick-Up [in]:	54
Axial Design Load [lbs]:	5000
Pile Area [sq. in]:	2.68
Elastic Modulus [ksi]:	36,000
Drive Time [sec]:	175

Compression Test Results			
% of Design Load	Axial Load [lbs]	Deflection Δ (in.) Gauges #1 & #2	Comments
0%	0	0.000	
10%	500	0.001	
20%	1000	0.001	
30%	1500	0.001	
40%	2000	0.002	
50%	2500	0.004	
60%	3000	0.006	
70%	3500	0.009	
80%	4000	0.014	
90%	4500	0.020	
100%	5000	0.025	
110%	5500	0.030	
120%	6000	0.039	
130%	6500	0.046	
140%	7000	0.058	
150%	7500	0.073	
160%	8000	0.094	
170%	8500	0.121	
180%	9000	0.149	
190%	9500	0.185	
200%	10000	0.235	
140%	7000	0.236	
80%	4000	0.233	
0%	0	0.201	



Note: The pile embedment depth in this analysis ignores the approximate push depth. Refer Appendix D for the approximate push depth.