Appendix 10-A
Preliminary Geotechnical Engineering Report

Preliminary Geotechnical Engineering Report

Cider Solar Site
Genesee County, New York
December 24, 2020
Terracon Project No. J5205161

Prepared for:
Stantec
Rochester, New York

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

December 24, 2020

Stantec
61 Commercial St, Suite 100
Rochester, New York 14614

Attn: Mr. Thomas Palumbo – Principal - Community Development
P: (585) 413 5225
E: thomas.palumbo@stantec.com

Re: Preliminary Geotechnical Engineering Report
Cider Solar Site
Genesee County, New York
Terracon Project No. J5205161

Dear Mr. Palumbo:

We have completed the Preliminary Geotechnical Engineering services for the above referenced project. This study was performed in general accordance with Terracon Proposal No. PJ5205161 dated June 18, 2020 and revised July 28, 2020. This report presents the findings of the subsurface exploration and provides preliminary geotechnical recommendations concerning earthwork, solar panel foundations, substation foundations, unpaved access roads and ancillary structures 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 Kiffle, E.I.T
Staff Engineer

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

SME Review By: James M. Jackson, P.E. (FL)

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.

REPORT SUMMARY

Topic [1]	Overview Statement [2]
Project Description	The approximately 3,500-acre site is to be developed with a solar farm.
Subsurface Conditions	In general, the borings found glaciolacustrine and glacial till deposits (mainly silt, sand and clay soils) to an explored maximum depth of about 48.5 feet. Weathered bedrock was encountered at one location (CSSB-2) at a depth of 40 feet below ground surface.
PV Array	Based on the subsurface conditions encountered in the borings and test pits completed at the site, it is our opinion that solar panel racking systems may be supported on driven steel piles. Shallow and/or mat foundations (isolated slab) may also be used for support of miscellaneous structure associated with the solar development.
Substation	Based on the subsurface conditions encountered in the borings, the proposed substation structures may be supported on drilled shaft foundations and/or shallow foundations using the soil properties presented in this section. Other ancillary structures may be supported on mat foundations.
Access Roads	Substation Access Roads: ▪ 6 to 12 inches of Aggregate Base potentially stabilized with geogrid. Array Access Roads: ▪ 6 inches of Aggregate Base over compacted subgrade.
General Comments	This section contains important information about the limitations of this geotechnical engineering report.

1. If the reader is reviewing this report as a pdf, the topics above can be used to access the appropriate section of the report by simply clicking on the topic itself.
2. This summary is for convenience only. It should be used in conjunction with the entire report for design purposes.

Preliminary Geotechnical Engineering Report

Cider Solar Site

Genesee County, New York

Terracon Project No. J5205161

December 24, 2020

INTRODUCTION

This report presents the results of our subsurface exploration and preliminary geotechnical engineering services performed for the proposed 500-Megawatt (MW) AC photovoltaic (PV) solar power facility to be located in Genesee County, New York. The purpose of these services is to provide information and preliminary geotechnical engineering recommendations relative to:

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

Our preliminary geotechnical engineering scope of work for this phase of the project included the following:

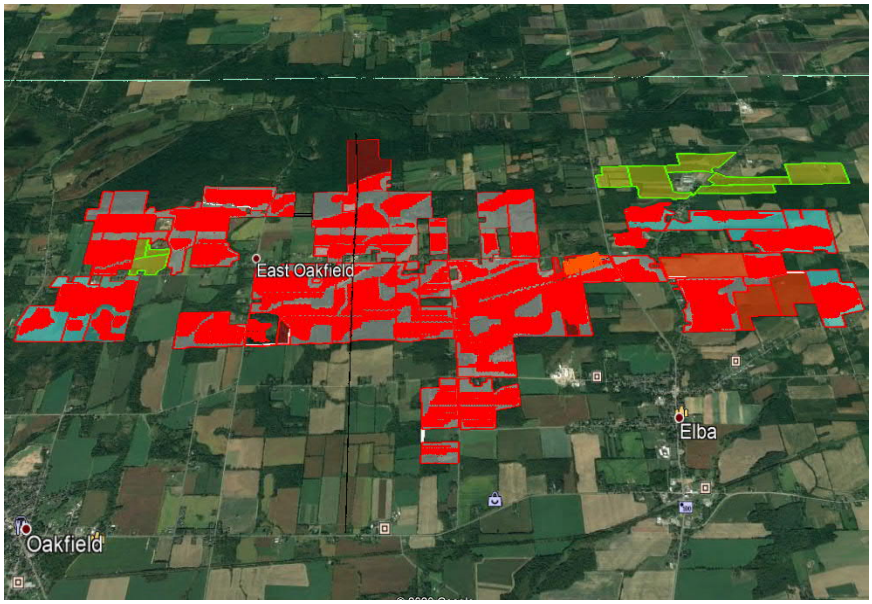
- Drilling twenty-four (24) SPT borings (CSB-1 through CSB-24) in the solar array areas to approximate depths ranging from 18.5 to 20 feet below the existing ground surface (bgs). Two additional borings (CSSB-1 and CSB-2) were drilled at the proposed substation area to depths of 46 to 48.5 feet.
- Test pits (CSTP-1 through CSTP-4) completed at four (4) locations to a depth of 8 feet.
- Field electrical resistivity testing at six (6) locations within the solar array and substation areas.
- Laboratory thermal resistivity dry-out curve testing conducted on bulk samples obtained from two (2) locations, one (1) within the solar array areas and one (1) in the substation area. The samples were obtained from depths of approximately 1 to 4 feet bgs.
- Laboratory corrosion tests performed on bulk samples obtained at two (2) locations within the solar array areas from depths of approximately 1 to 4 feet bgs.
- Laboratory testing of soil samples.
- Geotechnical engineering analysis and preparation of this report.

Site location and locations of the borings and test pits are shown on the Plans (Exhibit A-001 to A-003) in **Appendix A**. The GeoModel and logs of each boring and test pit also included in **Appendix A**. Laboratory testing results (including corrosion and thermal resistivity) performed on soil samples obtained from the borings and test pits are included in **Appendix B**. The location of the field soil electrical resistivity tests is shown on the Electrical Resistivity Locations Diagram

(Exhibit C-001) in **Appendix C**. The field soil electrical resistivity test results are also included in **Appendix C**.

SITE CONDITIONS

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

Item	Description
Parcel Information	The project is located on non-contiguous parcels in the towns of East Oakfield and Elba, Genesee County, New York. The site encompasses approximately 3,500 acres.  (From Google Earth, Yellow and Red line/shade limits of project site.)
Existing Improvements and Current Ground Cover	The areas to be developed with the solar development are generally undeveloped and consisting of agricultural and grass fields with scattered trees.
Existing Topography (From Google Earth)	The elevation of the project area ranges from about elevations (El.) +630 feet above mean sea level (amsl) in low lying areas to over +750 feet on top of hills within the solar development.

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
Information Provided	The following documents provided in the link included in the email dated June 11, 2020: ■ Cider Properties Under LOL 4.10.20.kmz ■ Cider Solar NY Additional Lands.kmz ■ Hecate Cider Properties under Option 4.10.20.kmz
Proposed Project	Based upon the Google Earth Files received by Stantec, the planned PV solar development encompass an area of about 3,500 acres. The site development may consist of an approximately 500-MWac photovoltaic (PV) solar power facility. We understand that power plant will consist of solar panels installed on ground mounted steel structures and various other equipment and appurtenances associated with the power plant (e.g. switchgear, transformers, inverters, overhead and underground electrical conveyance, substation, and operations and maintenance (O&M) building).
Proposed Construction	We anticipate the proposed project will include the construction of ground-mounted solar panels on steel racks supported on driven W-Section steel beams (W6x9 or similar). Electrical equipment and substation elements (including transmission lines) are anticipated to be supported on concrete pads, mat and spread foundations, and/or drilled shafts.
Other Improvements	Other improvements associated with this project are not specified at this time, but could include electrical equipment pads to support switchgear, inverters, transformers, and buried utilities.
Typical Loads for Racking Structures	Structural loads were not provided, but the following loads have been estimated based on our experience with similar projects using fixed rack systems: ■ Downward: 3 to 7 kips ■ Uplift: 2 kips (does not include frost heave loads) ■ Lateral: 3.5 kips ■ Substation structures: TBD
Grading	We assume minimal changes to existing site grades. Arrays are expected to generally follow existing topography.

Item	Description
Unpaved Access Roads	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 assume low-volume, aggregate-surfaced and native soil access roads will have a maximum vehicle load of 30,000 lbs. and will travel over the access roads only once per week.

GEOLOGY

Physiography

The project site is located within the northwestern portion of New York throughout the towns of East Oakfield and Elba in Genesee County, approximately 25 miles south of Lake Ontario and northeast of Lake Erie (Figure 1).

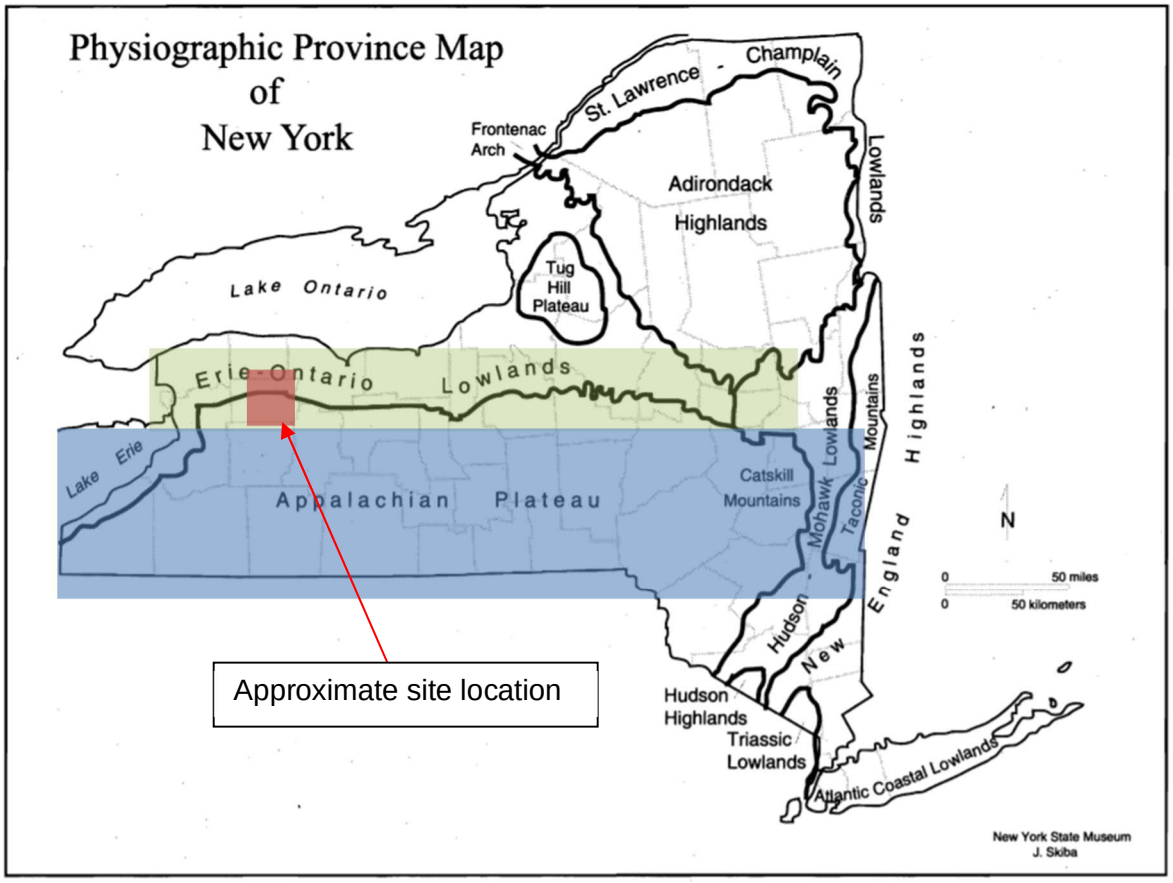


Figure 1: Geologic Map showing Genesee County within the northwestern portion of New York. Notice the Erie-Ontario Plain (or Lowlands), is represented by areas shaded in green, while the Appalachian Plateau is recognized by areas shaded in blue, and the Genesee County, in red. Modified from Cremeens and Hart (2003).

Genesee County extends approximately 18 miles from north to south, and 28 miles from east to west (Lewis et al., 1922). It comprises a total surface area of approximately 496 square miles within the Erie-Ontario Lake Plain physiographic province, thereby resting north of the Appalachian Plateau (Figure 2; Owens, 1986). Surface elevations amongst the area vary significantly from approximately 600 to 800 feet above sea level at the northern end, to nearly 1,460 feet above sea level in the southern end. Moreover, these changes in elevation coincide with topographic expressions from north to south. Surface plains in areas north for example, are comprised of gently sloped, rolling hills with undulating relief that are joined by relatively steep, rolling hills with irregular relief in areas north-east. Such topographic expressions, however, nearly diminish with increasing surface elevation in areas south, whereby surface plains are relatively flat, and comprised of slopes that are although smooth, comparably steep.

The town of Elba occupies the central-north sector of Genesee County and is, in part, associated with the Lower Stafford Marsh which occupies areas north-northwest of the site. Oak Orchard creek flows in an east-west direction just north of the project site. While its stream and stream tributaries meander frequently throughout the town of Elba, they occur particularly along Oak Orchard, Lockport, Graham, Maltby, Snyder, and Miller Weatherwax Roads.

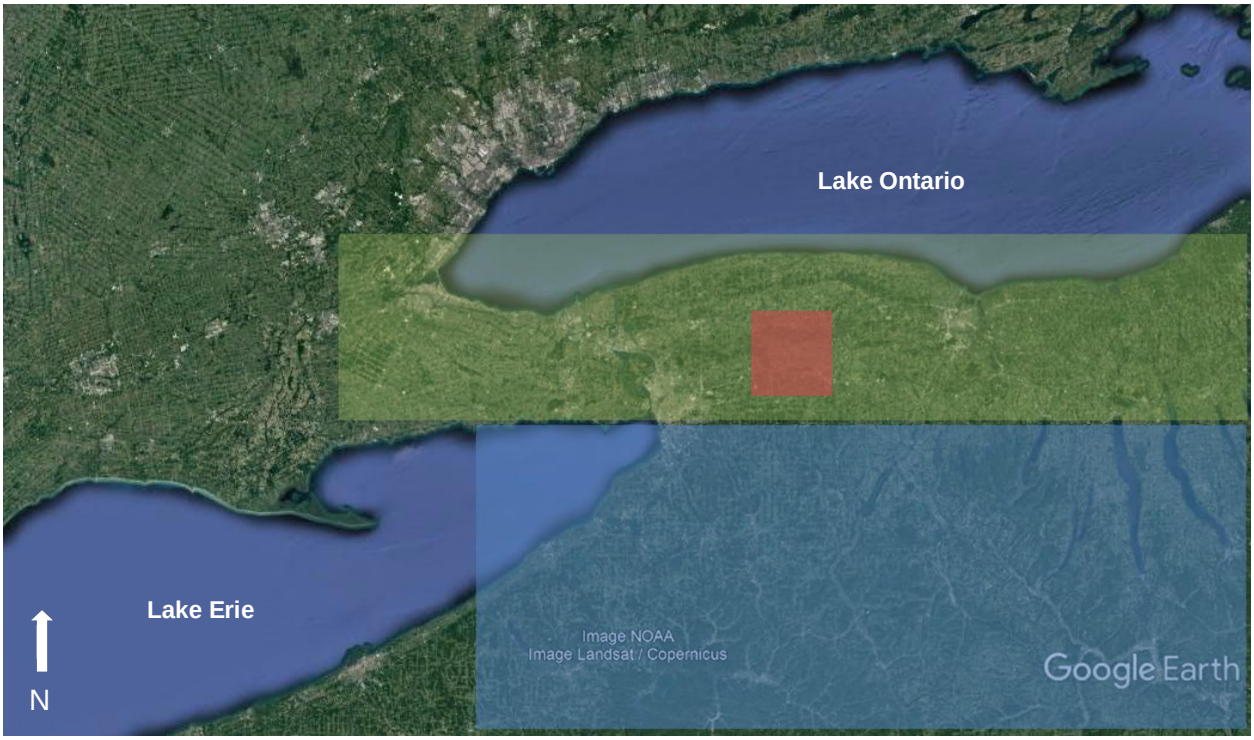


Figure 2: Locality Map depicting Genesee County resting within the Erie-Ontario Plain, just north of the Appalachian Plateau. The Erie-Ontario Plain is recognized here by the green shaded area while the Appalachian Plateau is represented by blue, and the Genesee County, by red. Notice the country lies south of Lake Ontario and northeast of Lake Erie. Note that these areas are general and intended for illustrative purposes only. Photo by courtesy of Google Earth.

Regional Geology

Current topographic expressions, and thus, the development of Genesee County, result from pre- and post-glacial processes such as ice advancement (erosion) and ice recession (deposition) which date back 300,000 years ago (Owens, 1986). These glacial processes coincide in part with those of the Late Wisconsin Ice Stage and reflect largely, a receding ice sheet presumed to have occurred approximately 10,000 years ago, thereby establishing the current topographic expressions (i.e., drumlins, kames, moraines, kettle lakes, eskers, outwash channels, and proglacial lake shorelines) observed throughout Upstate New York today (LaFleur, 1975 year; Young, 2003).

Surficial and Bedrock Geology

The underlying bedrock comprising Genesee County is of the Upper Silurian age, and varies in composition from shale, dolostone, salt, and gypsum (Owens, 1986; USGS). Geological maps[1] indicate surficial deposits at the project site to consist of glacial till and glacio-lacustrine deposits underlain by bedrock of shale, dolostone, salt, and gypsum, which together comprise the Upper Silurian Camillus, Syracuse, and Vernon Formations.

GEOTECHNICAL CHARACTERIZATION

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 boring and test pit logs. The individual boring and test pit logs and the GeoModels can be found in Exhibit A-008 through A-043 of the **Appendix A** of this report.

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 and test pit locations, refer to the GeoModel.

[1] *Fisher, D.W., Isachsen, Y.W., and Rickard, L.V., 1970, Geologic Map 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[1]	General Description
1	**Surface**	Topsoil
2	**Glaciolacustrine Deposits**	Fine-grained (fine sand, silt, and clay) sediments with gravel; brown to gray; very soft to very stiff or loose to medium dense
3	**Glacial Till**	Mixtures of sand and silt with gravel, rock/cobble fragments. Occasional clay partings; brown to gray; medium dense to very dense
4	**Weathered Bedrock**[2]	Weathered shale, highly fragmented, dark gray

1. The sampling equipment utilized may preclude sampling particles larger than 2-inch in dimension. Split-spoon sampler refusal was encountered at some locations within the depths explored, indicating the presence of possible cobbles and boulders.
2. Bedrock was encountered only in CSSB-2 at a depth of about 40 feet below the existing surface.

Specific conditions encountered at each SPT boring and test pits are indicated on the individual logs included in **Appendix A** of this report. Stratification boundaries on the logs and profiles represent the approximate location of changes in soil types; in-situ, the transition between materials may be more gradual.

Groundwater Conditions

Open boreholes and test pits were observed either during, at completion of drilling/excavation, or after removing augers for the presence and level of groundwater. The groundwater levels at each exploration location can be found on the boring logs and test pit logs included in **Appendix A** of this report. A summary of the groundwater table at the exploration locations are presented below.

Boring /Test Pit No.	Groundwater level at 1st Observation (ft.)	Groundwater level at 2nd observation (ft)
CSB-1	None encountered at completion of drilling	14.5 ft. after pulling augers
CSB-2	None encountered at completion of drilling	8 ft. after pulling augers
CSB-3	8.5 ft. at completion of drilling	2.5 ft. after pulling augers
CSB-4	None encountered at completion of drilling	13 ft. after pulling augers
CSB-5	0 ft. at completion of drilling	N/A
CSB-6	10.5 ft. at completion of drilling	8 ft. after pulling augers
CSB-7	0 ft. at completion of drilling	0 ft. after pulling augers
CSB-8	0 ft. at completion of drilling	0 ft. after pulling augers

Boring /Test Pit No.	Groundwater level at 1st Observation (ft.)	Groundwater level at 2nd observation (ft)
CSB-12	14 ft. at completion of drilling	8.5 ft. after pulling augers
CSB-13	None encountered at completion of drilling	3.5 ft. after pulling augers
CSB-14	15 ft. at completion of drilling	N/A
CSB-16	None encountered at completion of drilling	14.5 ft. after pulling augers
CSB-19	14 ft. at completion of drilling	12 ft. after pulling augers
CSB-21	0 ft. at completion of drilling	12.5 ft. after pulling augers
CSSB-1	8 ft. at completion of drilling	N/A
CSSB-2	7.5 ft. at completion of drilling	4 ft. after pulling augers
CSTP-1	4 ft. while excavating	N/A
CSTP-2	5 ft. while excavating	N/A

Note: Groundwater was not encountered at completion of drilling or after pulling augers in the remainder of the borings or during/ after 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. Water may also become temporarily perched over low permeability layers, or bedrock, especially after rainfall. Therefore, 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 or test pits. The possibility of groundwater level fluctuations should be considered when developing the design and construction plans for the project.

LABORATORY THERMAL RESISTIVITY

Laboratory thermal resistivity testing was performed by GEOTHERM USA on soil samples obtained from two locations during our field exploration from a depth of approximately 1 to 4 feet below the existing ground surface. The thermal resistivity testing was performed in general accordance with the IEEE standard. Dry-out curves were developed from soil specimens compacted to 85% of the standard Proctor (ASTM D698) maximum dry density at each location. Each sample was incrementally dried back to 0% moisture to allow for a dry-out curve to be developed. The results of the laboratory thermal resistivity testing are presented on Exhibit B-012 to B-014 in **Appendix B**.

CORROSIVITY

Samples for corrosion testing were obtained from five locations. The samples were obtained from depths of approximately 1 to 4 feet below existing ground surface. The samples were tested for pH, water soluble sulfate, chloride content, sulfides, oxygen reduction potential, total salts, and electrical resistivity. The results of the Corrosion Series Testing are presented on Exhibit B-011 in **Appendix B**.

FIELD SOIL ELECTRICAL RESISTIVITY

Field measurements of soil electrical resistivity were performed by Terracon on November 20, 2020. Soil resistivity test locations are shown in in Exhibit C-001 in **Appendix C**. The Wenner arrangement (equal electrode spacing) was used with "a" spacings of:

- 2.5, 5, 10, 15, and 20 feet at four locations within the solar array area and;
- 2.5, 5, 10, 15, 20, 40, 50, 70, 100, 150 and 200 at two locations within the proposed substation.

The "a" spacing is generally considered to be the depth of influence of the test. The testing was performed in both a north-south and an east-west orientation at each location. Results of the soil resistivity measurements are presented on Exhibit C-002 through C-007 in **Appendix C**.

SEISMIC CONSIDERATIONS

The seismic design requirements for buildings and other structure 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 soil profile defined by a weighted average value of either shear wave velocity, standard penetration resistance, or undrained shear strength in accordance with Section 1613 Earthquake Loads of the 2020 Building Code of New York State, which refer to Chapter 20 of ASCE 7.

Based on the soil properties encountered at the site and as described on the boring logs/test pits, it is our professional opinion that Seismic Site Classification of D can be used for the site. Subsurface explorations at this site were extended to a maximum depth of 48.5 feet. The site properties below the boring depth to 100 feet were estimated based on our experience and knowledge of geologic conditions in the general area. Additional deeper borings or geophysical testing may be completed to confirm the conditions below the current boring depth.

CONTRIBUTORY RISK COMPONENTS

ITEM	DESCRIPTION
Suitability Statement	The proposed site appears suitable for the use of driven steel W-Section steel piles for the support of the proposed solar arrays.
Soil Conditions	The project site is separated into two zones based on the subsurface exploration encountered in the borings and test pits, Zone 1 and Zone 2. In general: ■ Zone 1 found medium dense to dense soil conditions with average SPT-N values ranging from 8 to 30. ■ Zone 2 found more dense soil conditions with cobble/rock fragments and SPT-N values generally greater than 30.
Access	Wet and loose/soft surface conditions due to rainwater will create access issues for vehicles. The site will generally be more accessible in the summer and early fall due to the improved drying conditions.
Grading	We anticipate minimal site grading will be required. On-site materials appear to generally be suitable for re-use as fill or backfill. We assume grading will require less than 2 feet of excavation or fill placement.
Groundwater	Groundwater was observed at depths ranging from about 0 to 15 feet below the ground surface. Excavations, such as trenches for electrical cable and conduits could encounter groundwater and could require dewatering. Excavations for shallow foundations could also encounter groundwater, especially if construction is performed during periods of seasonally high groundwater. While precipitation is relatively constant throughout the year, groundwater levels are expected to be deepest during the late summer due to increased evaporation rates. We recommend assuming groundwater levels to be shallow for design and construction.
Corrosion Hazard	The results of our laboratory testing of soil chemical properties are expected to assist a qualified engineer design corrosion protection for the production piles and other project elements.
Excavation Hazards	Based on the results of our borings and our experience with the geology of the project site, we do not expect that difficult excavation conditions or widespread obstructions to pile driving operations will be encountered during construction in Zone 1. However, in Zone 2, excavation difficulty may be encountered due to dense soil condition or the presence of frequent cobbles/boulders. As previously noted, groundwater is expected to be encountered at several locations across the site in excavations. Additionally, we expect general instability in the form of caving, sloughing, and raveling to be encountered in excavations advanced where groundwater is encountered. Contractor should be aware that excavations could require bracing, sloping, and/or other means to create safe and stable working conditions.

ITEM	DESCRIPTION
Anticipated Pile Drivability	In Zone 1, there is a very low likelihood of encountering difficulties during pile driving. However, piles driven into the native soils can be expected to encounter refusal in the Zone 2 areas and we anticipate pre-drilling in these areas. It should be noted that the observations are based solely upon the results of borings and test pits completed at discrete locations and significant spacing (i.e. greater than 100 feet). Therefore, the limits of Zone 1 and Zone 2 as shown in this report are approximate.
Adfreeze Stress	Based on our review of soil samples, we recommend an adfreeze stress of 1,500 psf be considered when determining the frost heave load on a pile. The box perimeter of the pile (two times the depth plus two times the flange width) acting over a maximum depth of about 2 feet below ground surface should be considered when determining the frost heave load on a pile.
General Construction Considerations	The near-surface soils are moderately moisture sensitive and subject to degradation with exposure to moisture. To the extent practical, earthwork should be performed during drier periods of weather (late fall to late spring) to reduce the amount of subgrade remedial measures for loose and unstable conditions beneath access roadways, equipment pads, etc.
Substation Structures	We would expect drilled shafts or shallow foundations to provide suitable support for substation structures.

PRELIMINARY EARTHWORK RECOMMENDATIONS

The site work conditions will be largely dependent on the weather conditions and the contractor's means and methods in controlling surface drainage and protecting the subgrade. The near-surface silt, clay and sand encountered in the borings may provide relatively wet subgrade during construction. Site preparation for ancillary structures associated with the PV solar development should include clearing and grubbing, installation of a site drainage system (where necessary), subgrade preparation, proof-rolling and vibratory densification as necessary. Site preparation is not necessary in the PV Array field or where inverters will be supported on driven piles except to improve site drainage where necessary.

We would expect typical earthmoving equipment (bulldozers, excavators, steel drum vibratory rollers) to be suitable for completion of earthwork activities on the site. The most challenging obstacle for earthwork construction will be the control of surface and groundwater, especially during the typical wet season. The site should be graded to prevent ponding of surface water. Additionally, dewatering (rim ditches, sump pumps, well points, etc.) may be needed to lower the groundwater and allow for adequate compaction in trenches.

PRELIMINARY RECOMMENDATIONS FOR DRIVEN PILE FOUNDATIONS

Geotechnical Considerations

We have performed preliminary geotechnical analyses for driven pile foundations to support the typical PV panel racking system. Subsequent analyses will be required once design level geotechnical information is available and once other design considerations are more fully defined. **Therefore, the results of the analyses described below are not suitable for final design.** Instead, this analysis is intended to assist you in roughly evaluating construction costs and development viability for the proposed project. It should also be noted that our analyses are based on short-term conditions based on boring information. For this type of foundation system, provisions for flexible or adjustable connection between the posts and the array superstructure are recommended.

We would expect the PV panels to be supported by driven piles while inverters, in the array field, could be supported on driven piles or mat foundations. Settlement and strength parameters were analyzed using soil compressibility properties derived from the SPT borings.

Understanding that driven piles are the preferred foundation system for a solar PV project, and the presence of possible cobbles and boulders within the anticipated foundation driving depth, we recommend a full-scale pile driving and testing program be developed to confirm the amount of piles knocked off their alignment due to hard driving, and the record the drive times to assess the difficulty with which piles may penetrate the subgrade soil conditions on this site. In areas of driven pile refusal prior to reaching the desired pile depth, it may be appropriate to pre-drill an undersized hole (typically 80 to 90% of selected W-section diagonal width) at the pile location to a depth of about 1 foot above the designed embedment depth of the pile.

The results of the borings encountered variable subsurface conditions throughout the site. Therefore, we have separated the site into two zones, Zone 1 and Zone 2 as shown in Exhibit A-003 in **Appendix A**. In general:

- Zone 1 indicate medium dense to dense soil conditions with average SPT-N values ranging from 8 to 30. Based on these results, we would not expect pre-drilling to be required in Zone 1.
- Zone 2 indicate more dense soil conditions with cobble/rock fragments and SPT-N values greater than 30. We would expect pre-drilling to be required for piles to reach to their target embedment depths in this zone.

Recommendations contained in this report are based upon the data obtained from the relatively 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. Therefore, the limits of Zone 1 and Zone 2 as shown in this report are approximate.

Adfreeze Stress

It is Terracon's professional opinion that the overburden soils encountered in the borings are frost susceptible. In cold weather climates, design to resist frost heave forces exerted on foundations is often the limiting factor in the foundation design. Specifically, pile lengths will need to be long enough to counteract potential heave forces in the seasonal frost zone.

As the frost penetrates deeper into the soil and the ground swells due to freezing, the ground surface will rise due to frost heaving. The upward displacement is due to freezing water contained in the soil voids along with the formation of ice lenses in the soil. The freezing material grips the steel pile and exerts an uplift force due to the adfreeze stress developed around the surface area of the pile. The amount of upward force depends on the following:

- The thickness of ice lenses formed in the seasonal frozen ground
- The bond between the steel pile surface and the frozen ground
- The surface area of the steel pile in the seasonally frozen ground

Based on our review of soil samples, we recommend an adfreeze stress of 1,500 psf be considered when determining the frost heave load on a pile. The box perimeter of the pile (two times the depth plus two times the flange width) acting over a maximum depth of about 2 feet below ground surface should be considered when determining the frost heave load on a pile.

Uplift forces will likely govern the design and length of the panel array piles; therefore, uplift will be the primary factor in foundation costs. The factor of safety against uplift should be determined based on discussions with the owner and design engineer considering the desired level or risk,

Preliminary Axial Capacity Recommendations

Subject to successful pile load testing, the proposed solar PV panels may be supported on a driven pile foundation system. The design capacity of a single-driven pile is a function of several factors including:

- Size and type of pile;
- Type and capacity of pile installation equipment;
- Pile integrity after installation; and
- Engineering properties of the subsurface soils.

Terracon should be retained to perform a supplemental pile load test program and additional analyses. Foundation design parameters presented in this report have been based upon soil

strength criteria determined from correlations with the field and laboratory testing conducted during exploration.

The following parameters have been estimated based on static pile analysis for small W-section piles typically used for solar array support driven into native soils. Note that conventional pile analyses typically underestimate the capacity of piles used in solar arrays, and the more effective means of determining pile capacities for tension, compression, or lateral loads is through pile load tests. The upper 2 feet of soil should be neglected when calculating the ultimate capacity from skin friction.

Zone 1		
Minimum Pile Embedment Depth Below Ground Surface (feet)	**Ultimate Skin Friction (psf)**	**Ultimate End Bearing Pressure (psf)**
0 to 2	Neglect	Neglect
2 to 10	290	50,000
10 to 20	700	100,000

Zone 2		
Minimum Pile Embedment Depth Below Ground Surface (feet)	**Ultimate Skin Friction (psf)**	**Ultimate End Bearing Pressure (psf)**
0 to 2	Neglect	Neglect
2 to 10	400	80,000
10 to 20	950	135,000

The above values are to be used in the following equations to obtain the ultimate compressive or uplift capacity of a pile:

$Q_{ult\ (compressive)} = q_t * A * (1{,}000\ lb/k) + q_s * P * H$
$Q_{ult\ (uplift)} = q_s * P * H$

$Q_{ult\ (compressive)}$ = Ultimate compressive capacity of pile (lbs)
$Q_{ult\ (uplift)}$ = Ultimate uplift capacity of pile (lbs)
q_t = Toe (end) bearing pressure per table above (ksf)
A = Cross sectional area of pile tip (i.e. W6x9 = 0.019 sf)
q_s = Skin friction per table above (psf)
P = Perimeter area per foot of pile (i.e. W6x9 = 1.64 sf/ft)
H = Depth of embedment of pile (ft)

The skin friction perimeter for pre-drilled piles can be calculated using the surface area of the pre-drilled hole. The values provided in the table represent ultimate values. Therefore, a factor of safety of 2 should be applied to the skin friction and 3 for end bearing values.

Preliminary Lateral Capacity Recommendations

The parameters in the following table can be used for analysis of the lateral capacity of steel piles driven in either native soil, under-sized pre-drilled holes, or over-sized pre-drilled and grouted holes for support of solar panel arrays. These parameters are based on correlations with SPT results, published values, and our experience with similar soil types.

LPile Parameters – Zone 1				
Depth (feet)	**LPile (P-y) Curve Soil Model**	**Effective Unit Weight, γ (pcf)** [1]	**Friction Angle, Φ (deg)**	**P-Multiplier** [2]
0 to 2	Sand (Reese) [3]	110	30	0.7
2 to 10	Sand (Reese) [3]	110	30	1.0
10 to 20	Sand (Reese) [3]	52	32	1.0

1. Buoyant unit weight used below groundwater (assumed to be at 10 feet bgs).
2. Reduced in the upper 2 feet to account for freeze/thaw effects.
3. Use a default value of Soil Modulus, k

LPile Parameters – Zone 2				
Depth (feet)	**LPile (P-y) Curve Soil Model**	**Effective Unit Weight, γ (pcf)** [1]	**Friction Angle, Φ (deg)**	**P-Multiplier** [2]
0 to 2	Sand (Reese) [3]	110	30	0.7
2 to 10	Sand (Reese) [3]	120	33	1.0
10 to 20	Sand (Reese) [3]	62	36	1.0

1. Buoyant unit weight used below groundwater (assumed to be at 10 feet bgs).
2. Reduced in the upper 2 feet to account for freeze/thaw effects.
3. Use a default value of Soil Modulus, k

The above indicated parameters have no factor of safety and may be used to analyze suitability of the proposed section and serviceability requirements. These parameters are based on correlations with SPT results, published values, and our experience with similar soil types. Existing p-y models typically under-predict the lateral capacity of shallow driven piles. Therefore,

the P-multiplier is most likely higher but would need to be confirmed based on results of site-specific load test results.

Driven Pile Construction Considerations

Although the presence of particles larger than 2-inches was not evident during sampling, cobbles and boulders are commonly found in glacially deposited soil and should be anticipated at the site. Pile installation via conventional methods – such as driving in to a virgin subgrade may encounter difficulty and may result in early refusal and inadequate penetration, or else may cause excessive pile deflection, rotation or torsional rotation. We recommend a pile driving and testing program be developed to confirm the amount of piles knocked off their alignment due to cobbles and/or boulders (if encountered), and the record the drive times to assess the difficulty with which piles may penetrate the subgrade soil conditions on this site. In location where obstructions are encountered, pre-drilling either undersized or over-sized holes and grouting will be required.

Auger drilling typically is unsuccessful for subgrades containing appreciable cobbles and boulders. We expect that percussive drilling methods such as ODEX or air-rotary will be necessary to complete pre-drilled holes to their design depth.

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 (typically 80 to 90% of selected W-section diagonal width) at the pile location to a depth of about 1 foot above the designed embedment depth of the pile. The pre-drilled hole may then be backfilled with the cuttings, provided cobbles and boulders are culled from the material, and the pile driven to the design embedment depth. The objective of pre-drilling an undersized hole is to facilitate the driving of the web without disturbing the native soils/rock supporting the flanges. Since the lateral and axial capacities are mostly reliant on the soil/rock pile interaction at the flanges, the soil/rock parameters in the table provided in the previous section remain applicable. Production pile testing should be performed on piles installed in pre-drilled holes to confirm their capability to carry the foundation loads.

PRELIMINARY SPREAD FOOTING AND MAT/SLAB FOUNDATIONS

We understand that some equipment may be supported on mat/slab foundations while other structures and O&M building may be supported on shallow foundations. Loose to medium dense sands were encountered near the surface and may require improvement prior to foundation construction. Based on the anticipated types of structures and the expected magnitude of loading, surface compaction using a moderate to heavy vibratory roller should provide adequate improvement for shallow foundation support of these structures. We would expect an allowable

bearing capacity of 2,500 psf with total and differential settlements of less than 1 to 2 inches, depending on foundation width and embedment depths.

The base 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. Excessively wet or dry material or any loose/disturbed material in the bottom of the footing excavations should be removed/reconditioned before foundation concrete is placed.

Lightly loaded ancillary equipment may be supported on slabs underlain by at least a 12-inch thickness of Non-Frost Susceptible (NFS) material or Structural Fill placed on either the native material or compacted fill placed for site grading, the surface of which should be proof-rolled. Crushed Stone (ASTM C33 Blend 57), wrapped in a geotextile separation fabric, may be used in place of Structural Fill. Slab foundations will move due to freeze-thaw effects. NFS material will need to be placed at least 3 feet deep to significantly reduce the effects of freeze-thaw related movements. Alternately, the slab could be designed to allow movement due to frost action.

All grading within the equipment pads should incorporate the limits if the proposed structures plus a minimum lateral extent of 5 feet. We recommend concrete slabs have thickened edges, with a minimum embedment depth to bottom of edge of 18 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.

PRELIMINARY RECOMMENDATIONS FOR DRILLED SHAFTS

General

Compressive axial loads on drilled shaft foundations are resisted by both skin friction along the shaft and by end bearing at the base of the shaft, while uplift loads are resisted by skin friction along the shaft, the weight of the shaft, and the dead load acting on the foundation itself.

We have provided in the tables the preliminary allowable side resistance (skin friction) and end bearing values, along with the lateral load parameters discussed below. Generally, a factor of safety of three was applied to end bearing, two to side resistance in compression, and two to side resistance in uplift (tension). We recommend ignoring the side resistance in the upper 5 feet as a result of disturbance during construction. The actual factor of safety should be chosen by the foundation designer and will depend on several factors including: the type of structure, location of the structure, intended performance of the structure, use of the structure, and applicable code requirements. We recommend a minimum shaft diameter of 30 inches be used in order to permit cleaning and testing of the shaft bottoms. The drilled shaft should have a minimum embedded length of 10 feet.

It is our understanding that the designer for this project intends to use LPile to evaluate lateral capacities for substation foundation structures and MFAD for transmission line structures. Recommended **preliminary** LPile and MFAD soil parameters are provided in the table provided below and are based on the data gathered from SPT borings CSSB-1 and CSSB-2 which were located near the proposed substation.

Depth[1] (feet)	Layer Description & LPile Soil p-y Model	Effective Unit Weight, γ (pcf)[2]	Allowable Skin Friction[3] (psf)	Allowable End Bearing Pressure[3] (psf)	Friction angle (degrees)	Deformation Modulus, (ksi)
0 to 5[3]	Silt and Sand [4] Sand (Reese)	115	---	---	30	1.0
5 to 20		62	900	4,000	34	5.0
20 to 40		68	1000	6,000	36	5.0

1. Depth below ground surface at boring location.
2. Estimated groundwater level is 5 feet below the ground surface.
3. End bearing values include a safety factor of 3; skin friction values include a safety factor of 2.
4. Straight-sided drilled shafts cast in direct contact with adjacent soil (uncased). Ignore side resistance in upper 5 feet due to disturbance during drilling.
5. For LPile analysis, take a default value for Static Lateral Subgrade Modulus, k (lbs./ in^3).

The drilled shaft will likely be designed to resist tension loads and therefore should have reinforcing steel installed throughout the entire length of the shaft. Technical specifications should be prepared that require material and installation detail submittals, proof of experience in drilled shaft installation, concrete placement methods, and the use and removal of temporary steel casing.

Drilled Shaft Construction Considerations

The drilled shaft should be designed and constructed in accord with the recommended procedures of ACI 336.1-89, Standard Specification for the Construction of Drilled Piers and ACI 336.3R-93, Design and Construction of Drilled Piers. We recommend the following guidelines be incorporated into the technical specifications for drilled shaft installation:

- The contractor should take measures to prevent collapse of the shaft during excavation and prior to concreting. We recommend full-depth temporary casing be placed for the shaft excavation into the overburden soils
- The conditions of the bearing surface at the drilled shaft location should be observed by the geotechnical engineer or his representative.
- The bottom of the shaft should be prepared with a cleanout bucket; no more than 1-inch of spoil material over the entire base shall be allowed.

- Reinforcing steel cage placement must be done in a controlled manner to ensure accurate placement and appropriate concrete cover is achieved. The reinforcing cage shall be placed and centered in the hole for the shaft prior to concreting. Centralizers should be installed at the bottom and along the axial length of the steel reinforcing at sufficient spacing to maintain at least 3 inches of concrete cover, but at a spacing that does not exceed 10 feet. Bottom support (i.e. cylindrical feet) made of a material that is not detrimental to the reinforcement or concrete, should also be placed at the bottom of the cage to ensure the bottom of the cage is maintained at the proper elevation.
- Reinforcing cage and concrete should be placed within 2 hours after the drilled shaft has been excavated, cleaned out, inspected, and accepted by the geotechnical engineering representative. Concreting should be one continuous operation to avoid cold joints.
- Concrete may be dropped into the drilled shaft without segregation, provided there is less than 3 inches of water in the hole, and concrete is not allowed to bounce off the side of the shaft hole. The impact of the falling concrete should be adequate to provide densification, and vibration is generally not required, with the exception of approximately the last 5 feet, where the height of fall is limited.
- The shaft hole should be maintained relatively dry (i.e. less than 3 inches of water in the hole) prior to placement of the concrete. If this is difficult, concrete may be placed using tremie methods. If a tremie is used, the end of the tremie must be at least 5 feet below the surface of the concrete to prevent the water from contaminating the fresh concrete. For the concrete to pass freely through the tremie, the minimum diameter of the tremie shall be 10 inches. The tremie should be clean, smooth, and free of built-up concrete and other foreign material.
- Construction operations which may cause soil movement immediately adjacent (within 5 feet) to the drilled shaft shall be avoided for a minimum of 24 hours after completing the shaft concrete pour.
- Terracon should be retained to observe the drilled shaft excavation to evaluate the suitability of the bearing materials and to verify conditions in the drilled shaft excavation are consistent with those encountered in the test borings. If unsuitable materials are encountered at planned depths, it may be necessary to deepen the shaft.

PRELIMINARY UNPAVED ACCESS ROADS RECOMMENDATIONS

Surficial materials below the topsoil at the site primarily consists of mixtures of silt, sand, and clay. It is expected that the proposed site grades will be established near the existing site grades using small amounts of engineered fill material similar to the surficial soils to level the planned access road areas. Reportedly, the planned access roads will experience light traffic load, primarily during construction stage, with very little maintenance traffic thereafter.

Typical unpaved access roads in the lightly loaded array areas consisting of about 6 inches of Aggregate Base on compacted native soil should be suitable. The substation access road will

likely require 6 to 12 inches of Aggregate Base compacted native soils or native soils reinforced with a geogrid. Based upon the soil conditions at the time of construction, additional Aggregate Base and/or multiple layers of high-strength geotextile may be required to stabilize the aggregate section.

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.

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 preliminary 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

EXPLORATION AND TESTING PROCEDURES

Field Exploration and Laboratory Testing

Number of Explorations	Type of Exploration	Depth or "a" Spacing (feet)[1]	Planned Location
26	SPT Boring	18.5 to 48.5	Array area and substation area
4	Test Pit	8	Array area
4	Electrical Resistivity	2.5, 5, 10, 15, and 20	Array area
2		2.5, 5, 10, 15, 20, 40, 50, 70, 100, 150 and 200	Substation area
2	Thermal Resistivity	1 to 4	Array area and substation area
2	Corrosion Testing	1 to 4	Array area

1. Below ground surface.

Boring Layout and Elevations:

Terracon personnel provided the exploration layout. Coordinates were obtained with a handheld GPS unit (estimated horizontal accuracy of about ±10 feet) and approximate elevations were obtained by interpolation from USGS Maps. If elevations and a more precise exploration layout are desired, we recommend explorations be surveyed following completion of fieldwork.

SPT Borings: We advanced the borings with an ATV-mounted rotary drill rig using continuous hollow stem flight augers. Six samples were generally obtained using a split-spoon sampler in the upper 12 feet of each boring and at intervals of 5 feet thereafter. In the split-spoon sampling procedure, a standard 2-inch outer diameter split-barrel sampling spoon is driven into the ground by a 140-pound automatic hammer falling 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.

For safety purposes, borings were backfilled with auger cuttings after their completion. Sampling depths, penetration distances, and other sampling information were recorded on the field boring logs. 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, prepared from the field 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 Portions of the samples from the borings were sealed in jars to reduce moisture loss, and then the jars were taken to our laboratory for further observation and classification. Upon completion, the boreholes were backfilled with soil cuttings.

Test Pits: The test pits were excavated using an excavator with a 19.5-inch wide bucket. Continuous lithologic logs of each test pit were recorded by our field engineer during the field exploration and photographs of the excavated pits were taken. Samples were collected from the test pits and were placed in sealed plastic bags to prevent moisture loss, and then transported to our laboratory for further observation, testing, and classification. The test pits were backfilled with excavated soils upon completion.

Soil Electrical Resistivity Testing: Soil electrical resistivity data was obtained in accordance with ASTM G57 Standard Test Method for Field Measurement of Soil Resistivity Using the Wenner Four-Electrode Method. For testing, we performed two mutually perpendicular lines with electrode “a” spacing of:

- 2.5, 5, 10, 15, and 20 at four locations within the solar array areas.
- 2.5, 5, 10, 15, 20, 40, 50, 70, 100, 150 and 200 feet at two locations within the substation areas.

Laboratory Testing

The project engineer reviewed the field data and assigned laboratory tests to understand the engineering properties of the various soil 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.

- Moisture Contest Test
- Atterberg Limit Test
- Grain Size Distribution Test
- Moisture-Density Relationship Test
- CBR Test

Our laboratory testing program also included examination of soil samples by an engineer. Based on observation and test data, the engineer classified the soil samples in accordance with the Unified Soil Classification System (ASTM D2487). Additional laboratory testing was also completed as described below:

Corrosion Testing

Two soil samples were collected from a depth of 1 to 4 feet bgs for laboratory corrosion testing. The corrosion testing consisted of water-soluble sulfate ion content (ASTM C1580), water-soluble chloride ion content (ASTM D512), pH (ASTM D4972), Sulfides (ASTM D4658), Oxidation Reduction Potential (ASTM G200), and electrical resistivity using the "soil box" method (ASTM G187).

Laboratory Thermal Resistivity Testing

Laboratory thermal resistivity testing was performed by Terracon on two soil samples obtained from two locations during our field exploration from a depth of approximately 1 to 4 feet below the existing ground surface. The thermal resistivity testing was performed in general accordance with the IEEE standard. The dry-out curves were developed from soil specimens compacted to 85% of the standard Proctor criteria (ASTM D698) at the optimum moisture content.

APPENDIX A – FIELD EXPLORATION

Contents:

Note: All attachments are one page unless noted above.

SITE LOCATION
Cider Solar ■ Genesee County, NY
Terracon Project No. J5205161

Terracon GeoReport

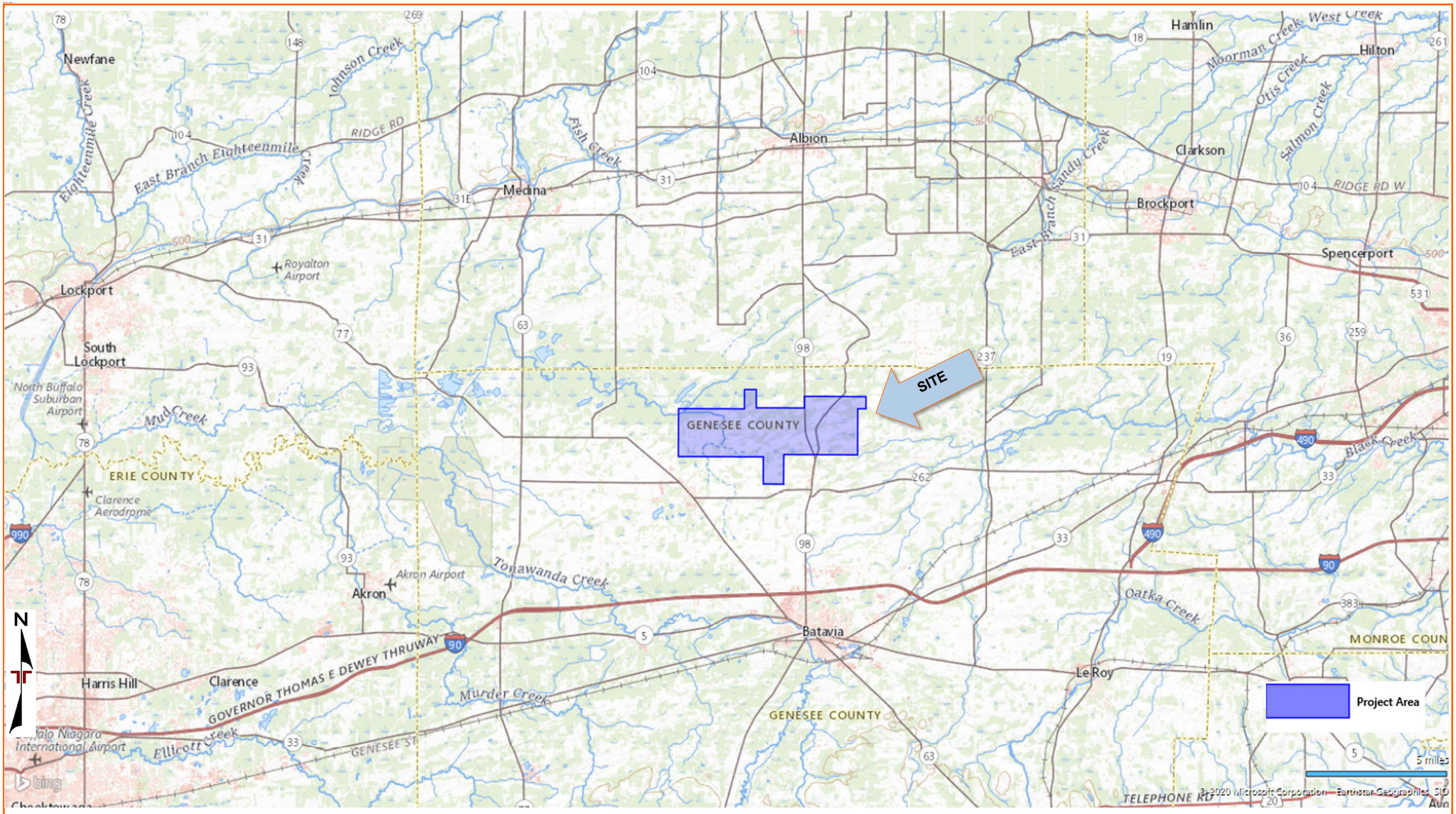


DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

MAP PROVIDED BY MICROSOFT BING MAPS

Exhibit A-001

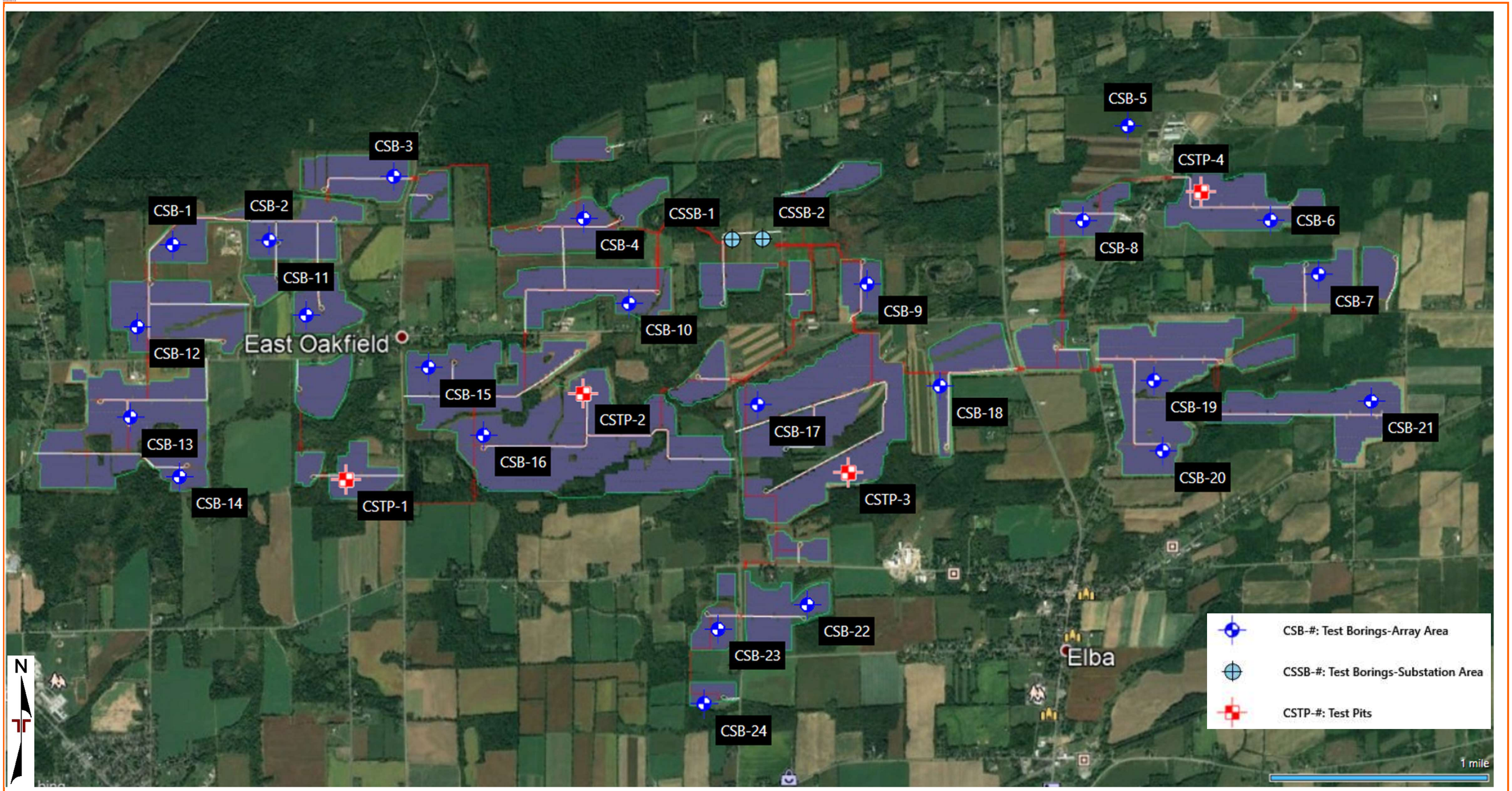


DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

MAP PROVIDED BY USGS

EXPLORATION PLAN: ANALYSIS ZONES

Cider Solar Site ■ Genesee County, NY
Terracon Project No. J5205161

Terracon GeoReport

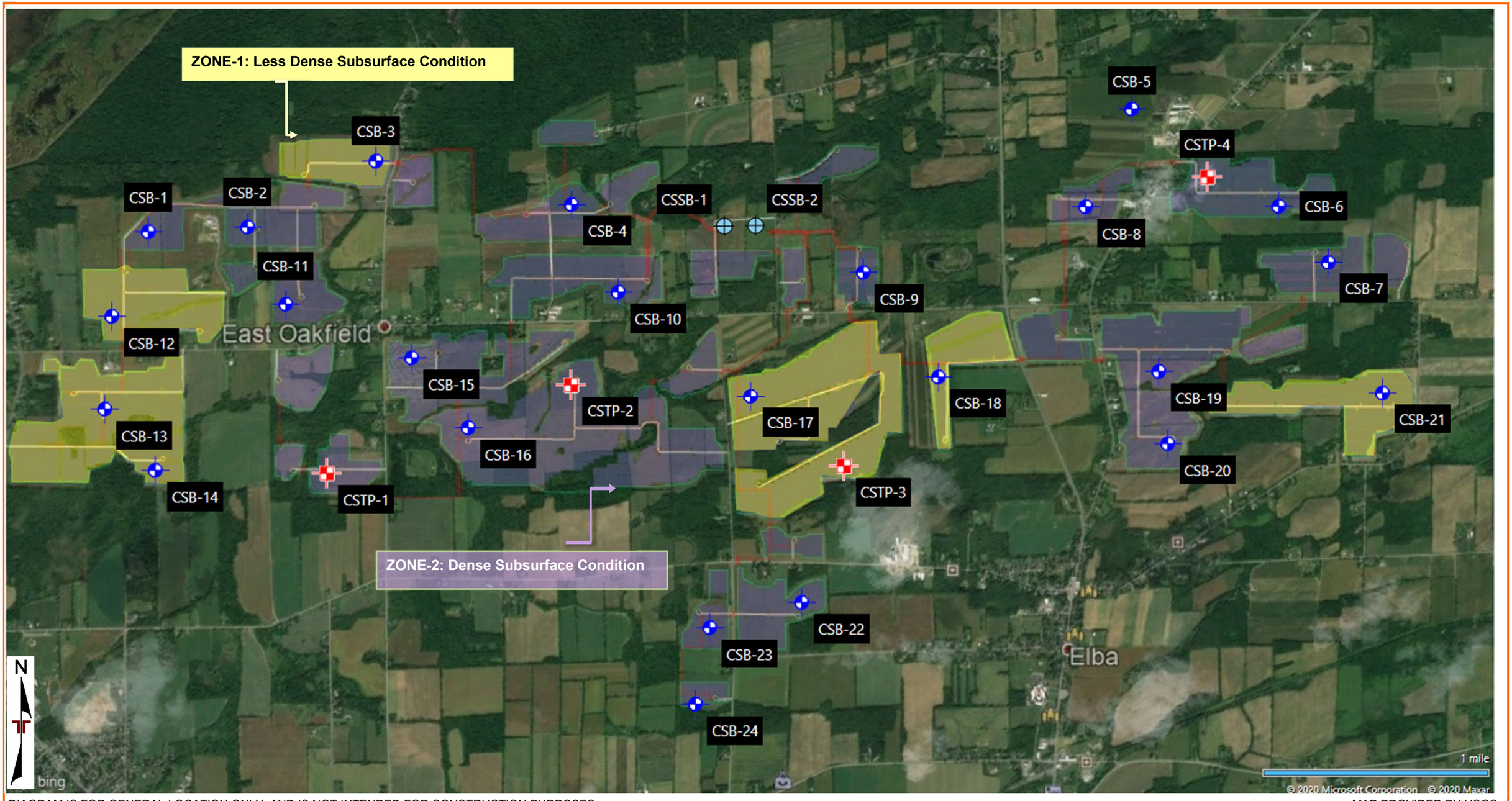


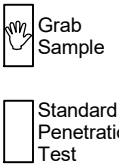
DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

MAP PROVIDED BY USGS

GENERAL NOTES

DESCRIPTION OF SYMBOLS AND ABBREVIATIONS
Cider Solar ■ Genesee County, NY
Terracon Project No. J5205161

Terracon GeoReport

SAMPLING	WATER LEVEL	FIELD TESTS
 Grab Sample; Shelby Tube; Standard Penetration Test	**Water Initially Encountered** **Water Level After a Specified Period of Time** **Water Level After a Specified Period of Time** **Cave In Encountered** 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 as noted on the soil boring logs is based Unified Soil Classification System. Where sufficient laboratory data exist to classify the soils consistent with ASTM D2487 "Classification of Soils for Engineering Purposes" this procedure is used. ASTM D2488 "Description and Identification of Soils (Visual-Manual Procedure)" is also used to classify the soils, particularly where insufficient laboratory data exist to classify the soils in accordance with ASTM D2487. In addition to USCS classification, coarse grained soils are classified on the basis of their in-place relative density, and fine-grained soils are classified on the basis of their consistency. See "Strength Terms" table below for details. The ASTM standards noted above are for reference to methodology in general. In some cases, variations to methods are applied as a result of local practice or professional judgment.

LOCATION AND ELEVATION NOTES

Exploration point locations as shown on the Exploration Plan and as noted on the soil boring logs in the form of Latitude and Longitude are approximate. See Exploration and Testing Procedures in the report for the methods used to locate the exploration points for this project. 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

RELEVANCE OF SOIL BORING LOG

The soil boring logs contained within this document are intended for application to the project as described in this document. Use of these soil boring logs for any other purpose may not be appropriate.

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.

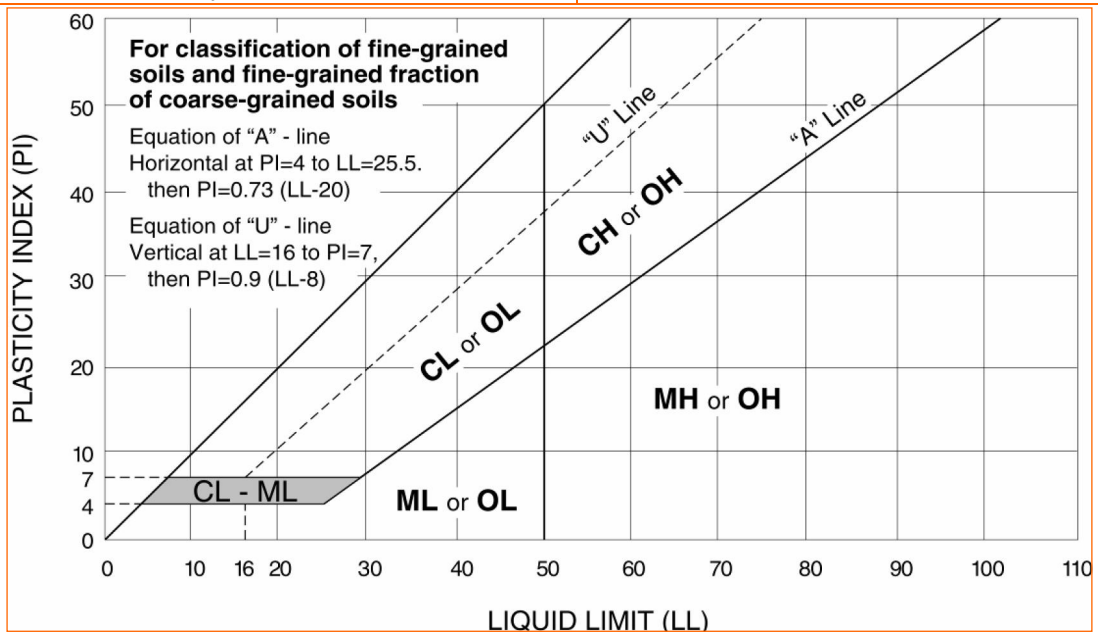
[M] If soil contains ≥ 30% plus No. 200, predominantly gravel, add "gravelly" to group name.

[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.



WEATHERING	
Term	**Description**
Unweathered	No visible sign of rock material weathering, perhaps slight discoloration on major discontinuity surfaces.
Slightly weathered	Discoloration indicates weathering of rock material and discontinuity surfaces. All the rock material may be discolored by weathering and may be somewhat weaker externally than in its fresh condition.
Moderately weathered	Less than half of the rock material is decomposed and/or disintegrated to a soil. Fresh or discolored rock is present either as a continuous framework or as corestones.
Highly weathered	More than half of the rock material is decomposed and/or disintegrated to a soil. Fresh or discolored rock is present either as a discontinuous framework or as corestones.
Completely weathered	All rock material is decomposed and/or disintegrated to soil. The original mass structure is still largely intact.
Residual soil	All rock material is converted to soil. The mass structure and material fabric are destroyed. There is a large change in volume, but the soil has not been significantly transported.

STRENGTH OR HARDNESS		
Description	**Field Identification**	**Uniaxial Compressive Strength, psi (MPa)**
Extremely weak	Indented by thumbnail	40-150 (0.3-1)
Very weak	Crumbles under firm blows with point of geological hammer, can be peeled by a pocket knife	150-700 (1-5)
Weak rock	Can be peeled by a pocket knife with difficulty, shallow indentations made by firm blow with point of geological hammer	700-4,000 (5-30)
Medium strong	Cannot be scraped or peeled with a pocket knife, specimen can be fractured with single firm blow of geological hammer	4,000-7,000 (30-50)
Strong rock	Specimen requires more than one blow of geological hammer to fracture it	7,000-15,000 (50-100)
Very strong	Specimen requires many blows of geological hammer to fracture it	15,000-36,000 (100-250)
Extremely strong	Specimen can only be chipped with geological hammer	>36,000 (>250)

DISCONTINUITY DESCRIPTION			
Fracture Spacing (Joints, Faults, Other Fractures)		**Bedding Spacing (May Include Foliation or Banding)**	
Description	**Spacing**	**Description**	**Spacing**
Extremely close	< ¾ in (<19 mm)	**Laminated**	< ½ in (<12 mm)
Very close	¾ in – 2-1/2 in (19 - 60 mm)	**Very thin**	½ in – 2 in (12 – 50 mm)
Close	2-1/2 in – 8 in (60 – 200 mm)	**Thin**	2 in – 1 ft. (50 – 300 mm)
Moderate	8 in – 2 ft. (200 – 600 mm)	**Medium**	1 ft. – 3 ft. (300 – 900 mm)
Wide	2 ft. – 6 ft. (600 mm – 2.0 m)	**Thick**	3 ft. – 10 ft. (900 mm – 3 m)
Very Wide	6 ft. – 20 ft. (2.0 – 6 m)	**Massive**	> 10 ft. (3 m)

Discontinuity Orientation (Angle): Measure the angle of discontinuity relative to a plane perpendicular to the longitudinal axis of the core. (For most cases, the core axis is vertical; therefore, the plane perpendicular to the core axis is horizontal.) For example, a horizontal bedding plane would have a 0-degree angle.

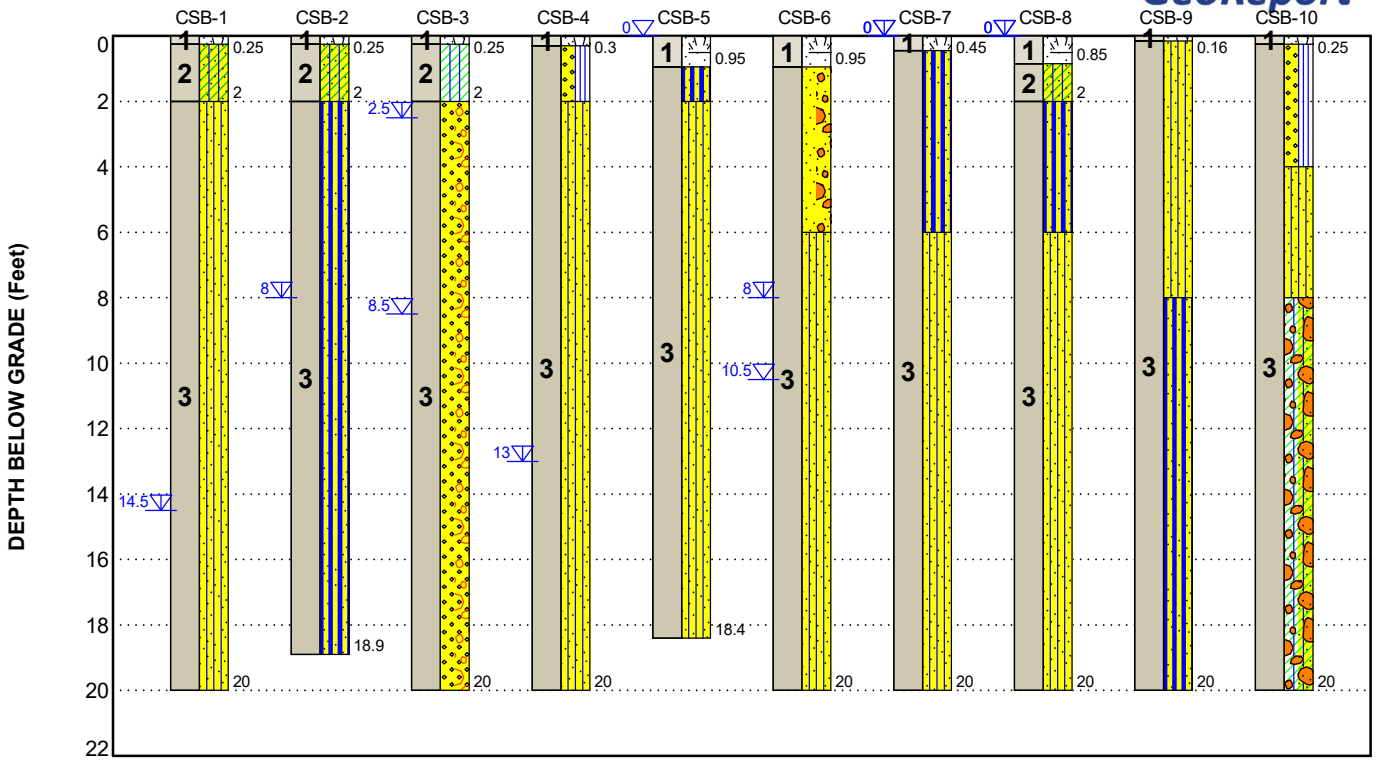
ROCK QUALITY DESIGNATION (RQD) [1]	
Description	**RQD Value (%)**
Very Poor	0 - 25
Poor	25 – 50
Fair	50 – 75
Good	75 – 90
Excellent	90 - 100

1. The combined length of all sound and intact core segments equal to or greater than 4 inches in length, expressed as a percentage of the total core run length.

Reference: U.S. Department of Transportation, Federal Highway Administration, Publication No FHWA-NHI-10-034, December 2009 Technical Manual for Design and Construction of Road Tunnels – Civil Elements

GEOMODEL

Cider Solar ■ Genesee County, NY
Terracon Project No. J5205161



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	Surface	Topsoil
2	Glaciolacustrine Deposits	Fine-grained (fine sand, silt, and clay) sediments with gravel; brown to gray; very soft to very stiff or loose to medium dense
3	Glacial Till	Mixtures of sand and silt with gravel, occasional rock/cobbles fragments. Occasional clay partings; brown to gray; medium dense to very dense
4	Weathered Bedrock	Weathered shale, highly fragmented, dark gray

LEGEND

- Topsoil
- Sandy Silty Clay
- Silty Sand
- Sandy Silt
- Silty Clay
- Well-graded Sand with Gravel
- Well-graded Sand with Silt
- Poorly-graded Sand with Gravel
- Gravelly Silty Clay with Sand

▽ First Water Observation
▽ Second Water Observation

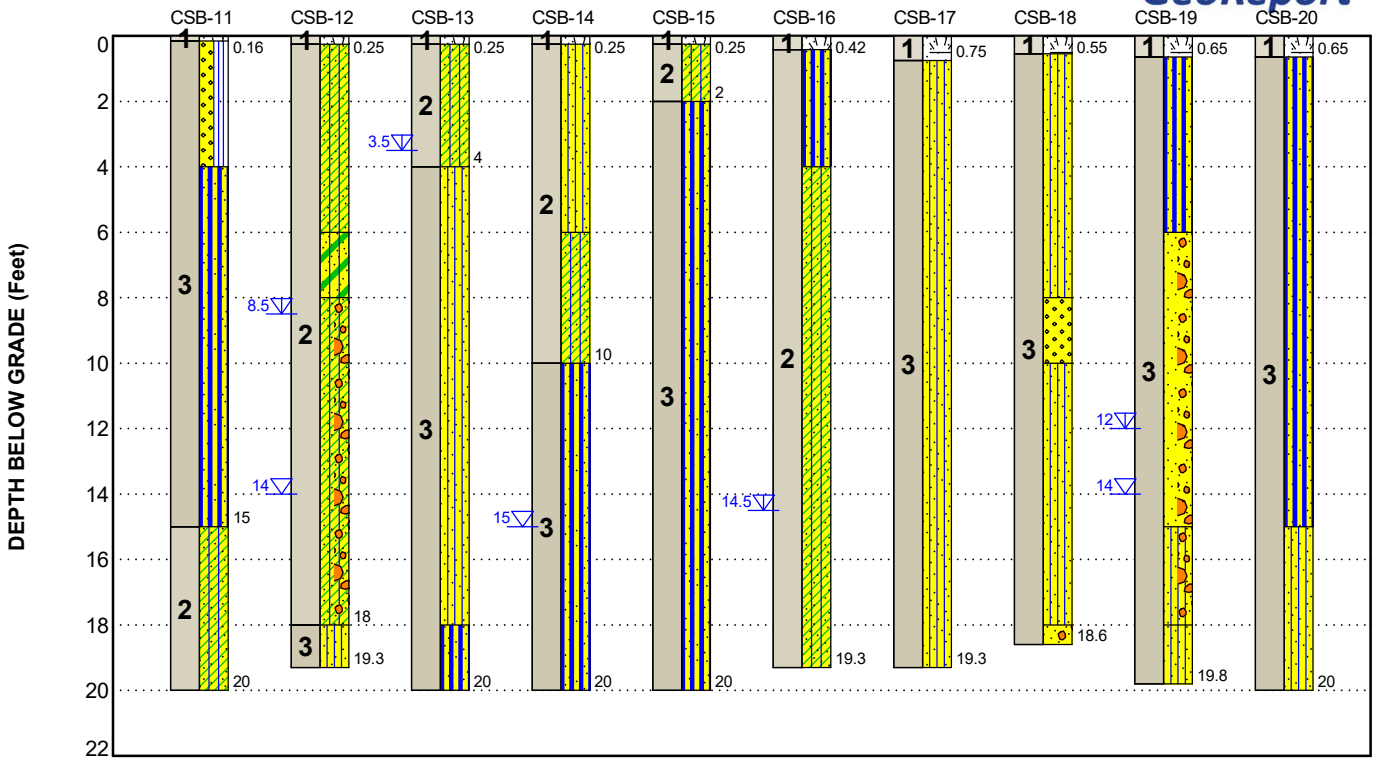
Groundwater levels are temporal. The levels shown are representative of the date and time of our exploration. Significant changes are possible over time. Water levels shown are as measured during and/or after drilling. In some cases, boring advancement methods mask the presence/absence of groundwater. See individual logs for details.

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

Cider Solar ■ Genesee County, NY
Terracon Project No. J5205161

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	Surface	Topsoil
2	Glaciolacustrine Deposits	Fine-grained (fine sand, silt, and clay) sediments with gravel; brown to gray; very soft to very stiff or loose to medium dense
3	Glacial Till	Mixtures of sand and silt with gravel, occasional rock/cobbles fragments. Occasional clay partings; brown to gray; medium dense to very dense
4	Weathered Bedrock	Weathered shale, highly fragmented, dark gray

LEGEND

- Topsoil
- Well-graded Sand with Silt
- Sandy Silt
- Sandy Silty Clay
- Silty Clayey Sand
- Sandy Silty Clay with Gravel
- Silty Sand
- Well-graded Sand
- Poorly-graded Sand with Gravel
- Silty Sand with Gravel

▽ First Water Observation
▽ Second Water Observation

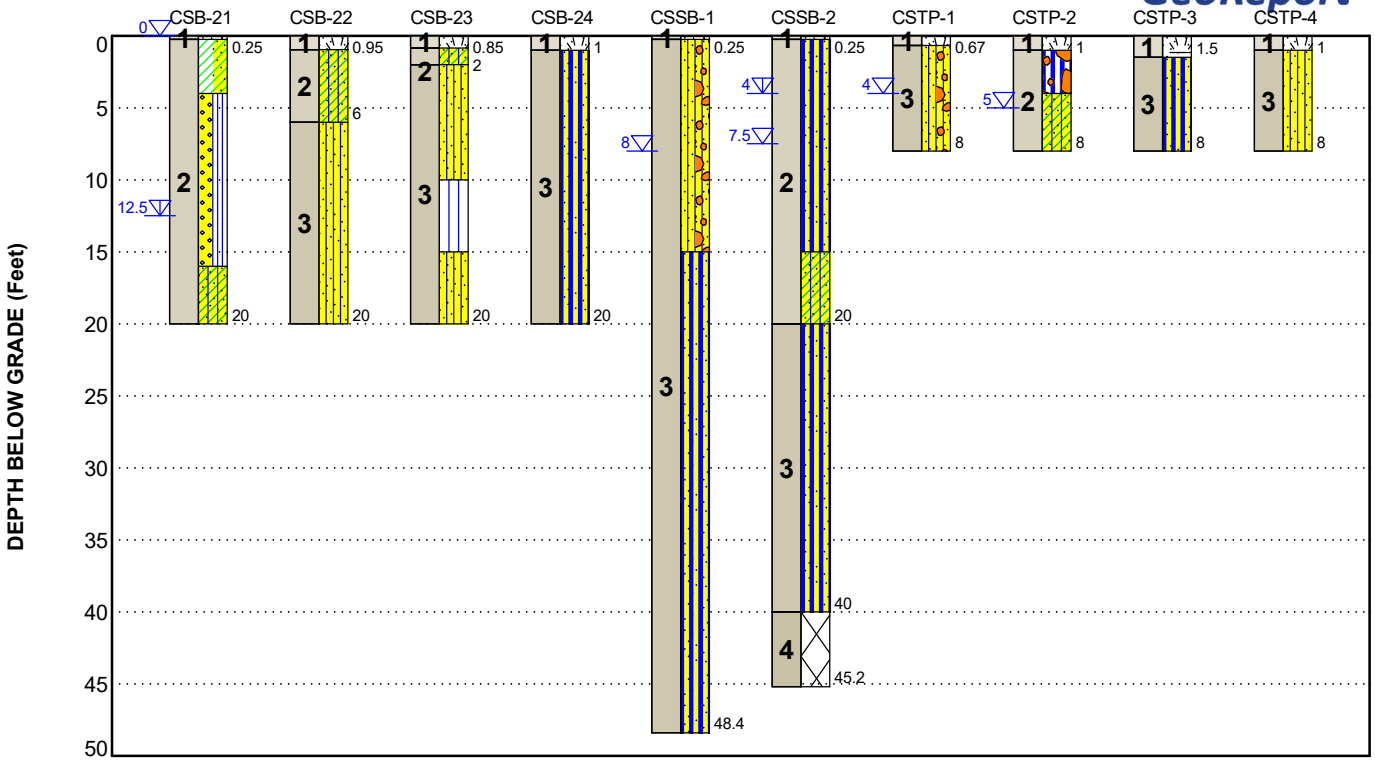
Groundwater levels are temporal. The levels shown are representative of the date and time of our exploration. Significant changes are possible over time. Water levels shown are as measured during and/or after drilling. In some cases, boring advancement methods mask the presence/absence of groundwater. See individual logs for details.

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

Cider Solar ■ Genesee County, NY
Terracon Project No. J5205161

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	**Surface**	Topsoil
2	**Glaciolacustrine Deposits**	Fine-grained (fine sand, silt, and clay) sediments with gravel; brown to gray; very soft to very stiff or loose to medium dense
3	**Glacial Till**	Mixtures of sand and silt with gravel, occasional rock/cobbles fragments. Occasional clay partings; brown to gray; medium dense to very dense
4	**Weathered Bedrock**	Weathered shale, highly fragmented, dark gray

LEGEND

- Topsoil
- Lean Clay with Sand
- Well-graded Sand with Silt
- Sandy Silty Clay
- Silty Sand
- Silt
- Sandy Silt
- Silty Sand with Gravel
- Weathered Rock
- Gravelly Silt

▽ First Water Observation
▽ Second Water Observation

Groundwater levels are temporal. The levels shown are representative of the date and time of our exploration. Significant changes are possible over time. Water levels shown are as measured during and/or after drilling. In some cases, boring advancement methods mask the presence/absence of groundwater. See individual logs for details.

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. CSB-1

PROJECT: Cider Solar

CLIENT: Stantec Consulting Services Inc
Rochester, NY

SITE: Oakland
Genesee County, NY

LOCATION See Exploration Plan

Latitude: 43.1043° Longitude: -78.2680°

Approximate Surface Elev.: 648 (Ft.) +/-

MODEL LAYER	GRAPHIC LOG	DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY ()	FIELD TEST RESULTS	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
1		0.3	648+/-								
2			**TOPSOIL**								
			SANDY SILTY CLAY (CL-ML), trace gravel, brown, medium stiff				17	2-2-3-9 N=5	19.2		
		2.0	646+/-								
3			**SILTY SAND (SM)**, trace gravel, occasional rock/cobble fragments, brown to gray, medium dense				5	10-9-8-7 N=17	9.5		
			Contains trace clay	5			13	5-6-6-7 N=12	9.5		
			Becomes very dense				15	6-7-45-14 N=52	10.4		
			Becomes medium dense				16	4-12-16-18 N=28	10.2		
			Becomes dense	10			19	10-16-24-33 N=40			
			Becomes medium dense	15			14	10-6-8-22 N=14	8.5		
			Becomes very dense				15	19-23-31-44 N=54	10.6		
		20.0	628+/-	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 OD Split Barrel Sampler

Abandonment Method:
Boring backfilled with 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 Google Earth Pro.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered at completion of drilling

14.5' BGS after pulling augers

Terracon
15 Marway Cir, Ste 2B
Rochester, NY

Boring Started: 11-05-2020 | Boring Completed: 11-05-2020

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

Project No.: J5205161

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL J5205161 CIDER SOLAR - ZBK (12-03-2020).GPJ TERRACON_DATATEMPLATE.GDT 12/11/20

Exhibit A-010

BORING LOG NO. CSB-2

PROJECT: Cider Solar

CLIENT: Stantec Consulting Services Inc
Rochester, NY

SITE: Oakland
Genesee County, NY

LOCATION See Exploration Plan

Latitude: 43.1046° Longitude: -78.2592°

Approximate Surface Elev.: 640 (Ft.) +/-

MODEL LAYER	GRAPHIC LOG	DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY ()	FIELD TEST RESULTS	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
1		0.3	640+/-								
		TOPSOIL									
2		**SANDY SILTY CLAY (CL-ML)**, trace gravel with occasional rock/cobble fragments, brown, medium stiff					14	2-3-2-6 N=5	12.7		
		2.0	638+/-								
3		**SANDY SILT (ML)**, trace clay and gravel, brown, dense to very dense					13	11-11-22-30 N=33	9.6		
		Contains occasional rock/cobble fragments		5			17	23-23-35-46 N=58	8.1		
							6	38-50/5"	7.2		
					▽						
							9	20-50/5"	10.0		
				10							
							15	8-39-47-45 N=86	7.6		
				15							
							14	20-35-46-50 N=81	8.8		
							6	49-50/5"	9.7		
		18.9	621+/-								
		Sample Spoon Penetration refusal encountered at 18.9 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 OD Split Barrel Sampler

Abandonment Method:
Boring backfilled with 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 Google Earth Pro.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered at completion of drilling

▽ *8' BGS after pulling augers*

Terracon
15 Marway Cir, Ste 2B
Rochester, NY

Boring Started: 11-17-2020 | Boring Completed: 11-17-2020

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

Project No.: J5205161

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL J5205161 CIDER SOLAR - ZBK (12-03-2020).GPJ TERRACON_DATATEMPLATE.GDT 12/11/20

Exhibit A-011

BORING LOG NO. CSB-3

PROJECT: Cider Solar

CLIENT: Stantec Consulting Services Inc
Rochester, NY

SITE: Oakland
Genesee County, NY

LOCATION See Exploration Plan

Latitude: 43.1088° Longitude: -78.2479°

Approximate Surface Elev.: 630 (Ft.) +/-

MODEL LAYER	GRAPHIC LOG	DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY ()	FIELD TEST RESULTS	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
1		0.3	630+/-								
2		**TOPSOIL** **SILTY CLAY (CL-ML)**, orange weathering stains visible, gray, soft						WOH-WOH-3-4 N=3	33.7		
		2.0	628+/-								
3		**WELL GRADED SAND W/GRAVEL (SW)**, occasional rock/cobble fragments, gray brown, loose to medium dense			▽		15	7-6-7-8 N=13	17.6		
				5			14	6-6-7-7 N=13	18.2		
							18	6-8-8-9 N=16	19.8		
		Contains clay partings			▽		16	4-4-1-4 N=5	20.0		
				10			15	1-2-6-12 N=8	19.9		
				15			9	7-9-14-18 N=23	16.3		
		Becomes dense					19	15-16-15-10 N=31	16.2		
		20.0	610+/-	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 OD Split Barrel Sampler

Abandonment Method:
Boring backfilled with 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 Google Earth Pro.

Notes:

WATER LEVEL OBSERVATIONS

▽ *8.5' BGS at completion of drilling*

▽ *2.5' BGS after pulling augers*

Terracon
15 Marway Cir, Ste 2B
Rochester, NY

Boring Started: 11-11-2020 | Boring Completed: 11-11-2020

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

Project No.: J5205161

BORING LOG NO. CSB-4

PROJECT: Cider Solar

CLIENT: Stantec Consulting Services Inc
Rochester, NY

SITE: Oakland
Genesee County, NY

LOCATION See Exploration Plan

Latitude: 43.1060° Longitude: -78.2307°

Approximate Surface Elev.: 645 (Ft.) +/-

MODEL LAYER	GRAPHIC LOG	DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY ()	FIELD TEST RESULTS	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
1		0.3	644.5+/-								
		TOPSOIL									
		WELL GRADED SAND WITH SILT (SW-SM), trace clay and gravel, orangish brown, loose					3.5	2-2-6-7 N=8	14.2		
		2.0	643+/-								
		SILTY SAND (SM), trace clay with rock/cobble fragments, brown, dense					11.5	12-19-22-20 N=41	8.1		
		Contains orange weathering stains		5			23.5	19-20-24-25 N=44	7.9		
3							21	23-19-18-18 N=37	7.7		
							24	19-18-15-16 N=33	7.3		
				10			24	14-15-18-16 N=33	7.9		
					▽						
				15			24	14-16-16-16 N=32	8.7		
							24	13-18-24-18 N=42	7.9		
		20.0	625+/-	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 OD Split Barrel Sampler

Abandonment Method:
Boring backfilled with 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 Google Earth Pro.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered at completion of drilling

▽ *13' BGS after pulling augers*

Terracon
15 Marway Cir, Ste 2B
Rochester, NY

Boring Started: 11-03-2020 | Boring Completed: 11-05-2020

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

Project No.: J5205161

BORING LOG NO. CSB-5

PROJECT: Cider Solar

CLIENT: Stantec Consulting Services Inc
Rochester, NY

SITE: Oakland
Genesee County, NY

LOCATION See Exploration Plan

Latitude: 43.1122° Longitude: -78.1814°

Approximate Surface Elev.: 685 (Ft.) +/-

MODEL LAYER	GRAPHIC LOG	DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY ()	FIELD TEST RESULTS	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
1		1.0	684+/-				14.5	3-3-4-8 N=7	13.6		
		2.0	683+/-				22	9-15-23-25 N=38	8.2		
3				5			19	10-23-29-30 N=52	8.5		
							17	31-40-50/5"	6.0		
							13	15-50/5"	6.6		
				10			12.5	10-40-50/3"	9.1		
				15			18	45-50/3"	12.8		
		18.4	666.5+/-				11.5	50/5"	6.8		

TOPSOIL

SANDY SILT (ML), occasional rock/cobble fragments, orangish brown, loose

SILTY SAND (SM), trace gravel, dense to very dense

Becomes dense to very dense

Becomes very dense

Becomes grayish brown

Sample Spoon Penetration refusal encountered at 18.4 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 OD Split Barrel Sampler

Abandonment Method:
Boring backfilled with 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 Google Earth Pro.

Notes:

WATER LEVEL OBSERVATIONS

0' BGS at completion of drilling

Terracon
15 Marway Cir, Ste 2B
Rochester, NY

Boring Started: 10-30-2020 | Boring Completed: 10-30-2020

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

Project No.: J5205161

BORING LOG NO. CSB-6

PROJECT: Cider Solar

CLIENT: Stantec Consulting Services Inc
Rochester, NY

SITE: Oakland
Genesee County, NY

LOCATION See Exploration Plan

Latitude: 43.1059° Longitude: -78.1684°

Approximate Surface Elev.: 689 (Ft.) +/-

MODEL LAYER	GRAPHIC LOG	DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY ()	FIELD TEST RESULTS	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
1		0.0	689+/-								
		TOPSOIL									
		1.0	688+/-								
3		**POORLY GRADED SAND WITH GRAVEL (SP)**, orangish brown, loose to medium dense					15	3-2-6-8 N=8	19.0		
							24	6-4-4-9 N=8	8.7		
		becomes medium dense		5			16.5	4-8-14-11 N=22	8.9		
		6.0	683+/-								
		SILTY SAND (SM), trace gravel with occasional rock/cobble fragments, gray brown, very dense					24	8-20-32-33 N=52	6.7		
		Becomes medium dense			▽		20.5	4-10-10-12 N=20	9.8		
		Contains orange weathering stains		10	▽		15.5	4-6-12-16 N=18	8.7		
		Occasional rock/cobble fragments Becomes dense		15			19.5	12-13-16-19 N=29	7.2		
		Contains trace clay, becomes dense					22	11-15-25-29 N=40	6.1		
		20.0	669+/-	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 OD Split Barrel Sampler

Abandonment Method:
Boring backfilled with 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 Google Earth Pro.

Notes:

WATER LEVEL OBSERVATIONS

▽ *10.5' BGS at completion of drilling*

▽ *8' BGS after pulling augers*

Terracon
15 Marway Cir, Ste 2B
Rochester, NY

Boring Started: 10-29-2020 | Boring Completed: 10-30-2020

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

Project No.: J5205161

BORING LOG NO. CSB-7

PROJECT: Cider Solar

CLIENT: Stantec Consulting Services Inc
Rochester, NY

SITE: Oakland
Genesee County, NY

LOCATION See Exploration Plan

Latitude: 43.1023° Longitude: -78.1641°

Approximate Surface Elev.: 705 (Ft.) +/-

MODEL LAYER	GRAPHIC LOG	DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY ()	FIELD TEST RESULTS	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
1		0.5	704.5+/-								
			TOPSOIL								
			SANDY SILT (ML), trace clay and gravel with occasional rock/cobble fragments, brown, loose to medium dense				10	2-2-4-6 N=6	14.0		
			Contains occasional rock/cobble fragments				20	6-7-7-6 N=14	12.5		
				5			24	6-10-17-20 N=27	11.6		
		6.0	699+/-								
3			**SILTY SAND (SM)**, trace gravel with occasional rock/cobble fragments, brown, very dense				23.5	24-25-27-29 N=52	9.7		
			Becomes dense				24	11-15-17-20 N=32	10.1		
			Becomes medium dense	10			19	7-14-10-13 N=24	11.1		
			Contains orange weathering stains	15			19.5	17-10-16-15/5" N=26	9.2		
			Becomes grayish brown, dense				24	5-6-27-16 N=33	8.5		
		20.0	685+/-	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 OD Split Barrel Sampler

Abandonment Method:
Boring backfilled with 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 Google Earth Pro.

Notes:

WATER LEVEL OBSERVATIONS

0' BGS at completion of drilling

0' BGS after pulling augers

Terracon
15 Marway Cir, Ste 2B
Rochester, NY

Boring Started: 10-28-2020 | Boring Completed: 10-28-2020

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

Project No.: J5205161

BORING LOG NO. CSB-8

PROJECT: Cider Solar

CLIENT: Stantec Consulting Services Inc
Rochester, NY

SITE: Oakland
Genesee County, NY

LOCATION See Exploration Plan

Latitude: 43.1059° Longitude: -78.1854°

Approximate Surface Elev.: 665 (Ft.) +/-

MODEL LAYER	GRAPHIC LOG	DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY ()	FIELD TEST RESULTS	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
1		0.9	664+/-								
		TOPSOIL									
2		2.0	663+/-				10.5	3-3-5-4 N=8	16.8		
		SANDY SILTY CLAY (CL-ML), trace gravel with occasional rock/cobble fragments, orangish brown, medium stiff									
3							21	4-5-5-5 N=10	17.7		
		SANDY SILT (ML), trace clay and gravel, brown, medium dense									
		Becomes loose		5			12	4-4-4-5 N=8	11.2		
		6.0	659+/-								
		SILTY SAND (SM), trace gravel with rock/cobble fragments, brown, dense to very dense					21.5	17-15-31-50 N=46	7.2		
							18	13-35-50/5"	5.8		
				10			7.5	21-50/5"	6.5		
		Contains trace clay		15			22	10-15-21-33 N=36	5.3		
							24	31-30-21-20 N=51	10.3		
		20.0	645+/-	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 OD Split Barrel Sampler

Abandonment Method:
Boring backfilled with 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 Google Earth Pro.

Notes:

WATER LEVEL OBSERVATIONS

0' BGS at completion of drilling

0' BGS after pulling augers

Terracon
15 Marway Cir, Ste 2B
Rochester, NY

Boring Started: 11-09-2020 | Boring Completed: 11-09-2020

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

Project No.: J5205161

BORING LOG NO. CSB-9

PROJECT: Cider Solar

CLIENT: Stantec Consulting Services Inc
Rochester, NY

SITE: Oakland
Genesee County, NY

LOCATION See Exploration Plan

Latitude: 43.1016° Longitude: -78.2050°

Approximate Surface Elev.: 716 (Ft.) +/-

MODEL LAYER	GRAPHIC LOG	DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY ()	FIELD TEST RESULTS	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
1		0.2	716+/-								
			TOPSOIL								
			SILTY SAND (SM), fine grained. contains trace gravel, orange brown, medium dense to dense				18	2-3-7-8 N=10	15.0		
			Occasional rock/cobble fragments				19	10-14-18-25 N=32	9.1		
			Frequent rock/cobble fragments. becomes very dense	5			18	25-35-29-32 N=64	7.6		
							12	37-40-50/4"	7.5		
		8.0	708+/-								
3			**SANDY SILT (ML)**, contains rock/cobble fragments, orange brown, dense to very dense				16	29-25-22-28 N=47	9.1		
			Contains trace clay	10			18	10-14-18-26 N=32	8.4		
				15			19	18-20-24-35 N=44	7.6		
							17	28-33-35-42 N=68	7.9		
		20.0	696+/-	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 OD Split Barrel Sampler

Abandonment Method:
Boring backfilled with 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 Google Earth Pro.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered at completion of drilling

Groundwater not encountered after pulling augers

Terracon
15 Marway Cir, Ste 2B
Rochester, NY

Boring Started: 11-11-2020 | Boring Completed: 11-11-2020

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

Project No.: J5205161

BORING LOG NO. CSB-10

PROJECT: Cider Solar

CLIENT: Stantec Consulting Services Inc
Rochester, NY

SITE: Oakland
Genesee County, NY

LOCATION See Exploration Plan

Latitude: 43.1003° Longitude: -78.2266°

Approximate Surface Elev.: 682 (Ft.) +/-

MODEL LAYER	GRAPHIC LOG	DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY ()	FIELD TEST RESULTS	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
1		0.3	682+/-								
			TOPSOIL								
			WELL GRADED SAND WITH SILT (SW-SM), trace gravel, brown, loose to medium dense				18	2-2-4-6 N=6	15.2		
							19	6-9-12-18 N=21	12.1		
		4.0	678+/-								
			SILTY SAND (SM), occasional clay partings, brown, very dense	5			20	14-26-28-48 N=54	5.8		
							8	22-50/5"	7.3		
		8.0	674+/-								
3			**GRAVELLY SILTY CLAY WITH SAND (CL-ML)**, occasional silt and clay partings, brown, hard to very hard	10			21	11-20-21-23 N=41	7.3	19-12-7	
							22	4-12-20-21 N=32	8.3		
			Becomes gray	15			23	20-14-21-26 N=35	7.3		
							20	19-22-31-38 N=53	7.2		
		20.0	662+/-	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 OD Split Barrel Sampler

Abandonment Method:
Boring backfilled with 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 Google Earth Pro.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered at completion of drilling

Groundwater not encountered after pulling augers

Terracon
15 Marway Cir, Ste 2B
Rochester, NY

Boring Started: 11-05-2020 | Boring Completed: 11-05-2020

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

Project No.: J5205161

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL J5205161 CIDER SOLAR - ZBK (12-03-2020).GPJ TERRACON_DATATEMPLATE.GDT 12/11/20

Exhibit A-019

BORING LOG NO. CSB-11

PROJECT: Cider Solar

CLIENT: Stantec Consulting Services Inc
Rochester, NY

SITE: Oakland
Genesee County, NY

LOCATION See Exploration Plan

Latitude: 43.0996° Longitude: -78.2559°

Approximate Surface Elev.: 647 (Ft.) +/-

MODEL LAYER	GRAPHIC LOG	DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY ()	FIELD TEST RESULTS	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
1		0.2	647+/-								
			TOPSOIL								
			SAND WITH SILT (SW-SM), fine grained with occasional trace gravel, brown, loose to medium dense				13	1-3-3-6 N=6	10.7		
			Trace clay with occasional rock/cobble fragments				13	7-4-10-7 N=14	16.0		
		4.0	643+/-								
3			**SANDY SILT (ML)**, fine grained, trace clay and gravel with frequent rock/cobble fragments, light brown, medium dense to very dense	5			17	16-9-10-12 N=19	10.4		
							19	16-22-35-50/5" N=57	7.3		
							5	20-50/5"	7.3		
			Orange weathering stains visible	10			13	6-42-50 N=92	11.1		
		15.0	632+/-	15							
2			**SANDY SILTY CLAY (CL-ML)**, trace gravel with occasional rock/cobble fragments, gray brown, hard				2	18-20-21-23 N=41	14.3		
			Becomes very stiff				14	7-8-9-9 N=17	10.3		
		20.0	627+/-	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 OD Split Barrel Sampler

Abandonment Method:
Boring backfilled with 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 Google Earth Pro.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered at completion of drilling

Terracon
15 Marway Cir, Ste 2B
Rochester, NY

Boring Started: 11-17-2020 | Boring Completed: 11-17-2020

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

Project No.: J5205161

BORING LOG NO. CSB-12

PROJECT: Cider Solar

CLIENT: Stantec Consulting Services Inc
Rochester, NY

SITE: Oakland
Genesee County, NY

LOCATION See Exploration Plan

Latitude: 43.0988° Longitude: -78.2712°

Approximate Surface Elev.: 649 (Ft.) +/-

MODEL LAYER	GRAPHIC LOG	DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY ()	FIELD TEST RESULTS	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
1		0.3	649+/-								
		TOPSOIL									
		SANDY SILTY CLAY (CL-ML), trace gravel, brown, medium stiff to stiff					16	2-2-3-3 N=5	23.3		
							18	4-4-7-7 N=11	22.2		
		becomes medium stiff		5			13	3-2-4-7 N=6			
		6.0	643+/-								
		SILTY CLAYEY SAND (SC-SM), trace gravel, brown, medium dense					12	16-17-12-11 N=29	18.1		
		8.0	641+/-								
2		**SANDY SILTY CLAY WITH GRAVEL (CL-ML)**, brown, stiff to hard			▽		16	4-5-7-16 N=12	17.6	17-15-2	
				10			17	7-9-7-12 N=16	22.7		
		becomes stiff									
					▽						
				15			11	14-26-17-11 N=43	19.2		
		18.0	631+/-								
3		**SILTY SAND (SM)**, trace clay and gravel with rock/cobble fragments, gray brown, very dense					12	27-24-50/4"	10.0		
		19.3	629.5+/-								
		Sample Spoon Penetration refusal encountered at 19.3 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 OD Split Barrel Sampler

Abandonment Method:
Boring backfilled with 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 Google Earth Pro.

Notes:

WATER LEVEL OBSERVATIONS

▽ *14' BGS at completion of drilling*

▽ *8.5' BGS after pulling augers*

Terracon
15 Marway Cir, Ste 2B
Rochester, NY

Boring Started: 11-06-2020 | Boring Completed: 11-06-2020

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

Project No.: J5205161

BORING LOG NO. CSB-13

PROJECT: Cider Solar

CLIENT: Stantec Consulting Services Inc
Rochester, NY

SITE: Oakland
Genesee County, NY

LOCATION See Exploration Plan

Latitude: 43.0928° Longitude: -78.2718°

Approximate Surface Elev.: 651 (Ft.) +/-

MODEL LAYER	GRAPHIC LOG	DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY ()	FIELD TEST RESULTS	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
1		0.3	651+/-								
		TOPSOIL									
2		**SANDY SILTY CLAY (CL-ML)**, trace gravel, brown, medium stiff to stiff					13	2-3-4-4 N=7	16.5		
					▽		16	6-7-7-11 N=14	17.3		
		4.0	647+/-								
3		**SILTY SAND (SM)**, fine to medium grained. contains trace gravel, brown, medium dense		5			13	6-7-7-9 N=14	18.2		
							20	7-9-9-9 N=18	22.3		
							15	4-7-6-7 N=13	21.6		
				10							
				15			22	6-6-6-10 N=12	12.4		
		18.0	633+/-								
		SANDY SILT (ML), trace gravel with rock/cobble fragments. Contains occaisional clay partings, gray brown, medium dense					23	15-12-12-11 N=24	10.3		
		20.0	631+/-	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 OD Split Barrel Sampler

Abandonment Method:
Boring backfilled with 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 Google Earth Pro.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered at completion of drilling

▽ *3.5' BGS after pulling augers*

Terracon
15 Marway Cir, Ste 2B
Rochester, NY

Boring Started: 11-06-2020 | Boring Completed: 11-06-2020

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

Project No.: J5205161

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL J5205161 CIDER SOLAR - ZBK (12-03-2020).GPJ TERRACON_DATATEMPLATE.GDT 12/11/20

Exhibit A-022

BORING LOG NO. CSB-14

PROJECT: Cider Solar

CLIENT: Stantec Consulting Services Inc
Rochester, NY

SITE: Oakland
Genesee County, NY

LOCATION See Exploration Plan

Latitude: 43.0889° Longitude: -78.2673°

Approximate Surface Elev.: 654 (Ft.) +/-

MODEL LAYER	GRAPHIC LOG	DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY ()	FIELD TEST RESULTS	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
1		0.3	654+/-								
		TOPSOIL									
		SILTY SAND (SM), fine grained, trace clay, brown, loose					16	WOH-3-3-3 N=6	23.6		
							17	4-4-4-7 N=8	27.5		
2				5			18	3-3-5-5 N=8	29.8		
		6.0	648+/-								
		SANDY SILTY CLAY (CL-ML), gray brown, very stiff					16	10-8-8-5 N=16	30.8		
		trace gravel, becomes medium stiff					15	3-1-4-5 N=5	25.1		
		10.0	644+/-	10							
		SANDY SILT (ML), contains trace clay and gravel, brown, medium dense					15	5-5-7-9 N=12	9.3		
3											
		Occasional rock/cobble fragments. becomes dense to very dense		15	▽		11	6-26-31-20 N=57	18.4		
							14	21-15-16-15 N=31	11.1		
		20.0	634+/-	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 OD Split Barrel Sampler

Abandonment Method:
Boring backfilled with 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 Google Earth Pro.

Notes:

WATER LEVEL OBSERVATIONS

▽ *15' BGS at completion of drilling*

Terracon
15 Marway Cir, Ste 2B
Rochester, NY

Boring Started: 11-12-2020 | Boring Completed: 11-12-2020

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

Project No.: J5205161

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL J5205161 CIDER SOLAR - ZBK (12-03-2020).GPJ TERRACON_DATATEMPLATE.GDT 12/11/20

Exhibit A-023

BORING LOG NO. CSB-15

PROJECT: Cider Solar

CLIENT: Stantec Consulting Services Inc
Rochester, NY

SITE: Oakland
Genesee County, NY

LOCATION See Exploration Plan

Latitude: 43.0961° Longitude: -78.2448°

Approximate Surface Elev.: 645 (Ft.) +/-

MODEL LAYER	GRAPHIC LOG	DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY ()	FIELD TEST RESULTS	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
1		0.3	645+/-								
		TOPSOIL									
2		**SANDY SILTY CLAY (CL-ML)**, trace gravel, orange brown, medium stiff					17	2-2-3-3 N=5	18.9		
		2.0	643+/-								
3		**SANDY SILT (ML)**, trace clay and gravel, brown, medium dense					19	4-6-15-16 N=21	9.9		
		Frequent rock/cobble fragments, becomes dense to very dense		5			18	8-19-29-22 N=48	8.5		
							20	26-30-33-41 N=63	8.3		
							21	15-20-26-35 N=46	7.8		
				10			12	25-48-50/2"	5.4		
				15			6	40-50/5"	5.2		
		Becomes gray brown					19	26-22-28-32 N=50	6.4		
		20.0	625+/-	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 OD Split Barrel Sampler

Abandonment Method:
Boring backfilled with 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 Google Earth Pro.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered at completion of drilling

Terracon
15 Marway Cir, Ste 2B
Rochester, NY

Boring Started: 11-12-2020 | Boring Completed: 11-12-2020

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

Project No.: J5205161

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL J5205161 CIDER SOLAR - ZBK (12-03-2020).GPJ TERRACON_DATATEMPLATE.GDT 12/11/20

Exhibit A-024

BORING LOG NO. CSB-16

PROJECT: Cider Solar

CLIENT: Stantec Consulting Services Inc
Rochester, NY

SITE: Oakland
Genesee County, NY

LOCATION See Exploration Plan

Latitude: 43.0916° Longitude: -78.2398°

Approximate Surface Elev.: 655 (Ft.) +/-

MODEL LAYER	GRAPHIC LOG	DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY ()	FIELD TEST RESULTS	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
1		0.4	654.5+/-								
			TOPSOIL								
			SANDY SILT (ML), contains trace clay with occasional rock/cobble fragments, orange brown, medium dense				15	13-6-6-6 N=12	18.7		
			Contains trace gravel, very dense				15	15-19-33-19 N=52	13.1		
		4.0	651+/-								
2			**SANDY SILTY CLAY (CL-ML)**, trace gravel with rock/cobble fragments, orange brown, very stiff to hard	5			16	6-10-9-9 N=19	12.4		
							12	15-18-26-30 N=44	9.9		
				10			17	20-21-24-26 N=45	8.0		
							16	10-17-18-18 N=35	8.4		
					▽						
			Becomes gray brown, frequent rock/cobble fragments	15			17	13-17-19-22 N=36	7.4		
							11	25-36-50/4"	7.7		
		19.3	635.5+/-								
			Sample Spoon Penetration refusal encountered at 19.3 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 OD Split Barrel Sampler

Abandonment Method:
Boring backfilled with 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 Google Earth Pro.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered at completion of drilling

▽ *14.5' BGS after pulling augers*

Terracon
15 Marway Cir, Ste 2B
Rochester, NY

Boring Started: 11-09-2020 | Boring Completed: 11-09-2020

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

Project No.: J5205161

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL J5205161 CIDER SOLAR - ZBK (12-03-2020).GPJ TERRACON_DATATEMPLATE.GDT 12/11/20

Exhibit A-025

BORING LOG NO. CSB-17

PROJECT: Cider Solar

CLIENT: Stantec Consulting Services Inc
Rochester, NY

SITE: Oakland
Genesee County, NY

LOCATION See Exploration Plan

Latitude: 43.0936° Longitude: -78.2149°

Approximate Surface Elev.: 701 (Ft.) +/-

MODEL LAYER	GRAPHIC LOG	DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY ()	FIELD TEST RESULTS	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
1		0.8	700.5+/-								
			TOPSOIL								
			SILTY SAND (SM), trace clay, brown, loose				12	3-2-4-4 N=6	22.4		
			Contains occasional rock/cobble fragments. medium dense				20	6-8-10-11 N=18	11.7		
				5			19	11-11-9-10 N=20	26.1		
			Becomes loose				21	8-5-4-3 N=9	13.0		
							16	4-3-4-4 N=7	15.1		
3			Becomes medium dense	10			24	6-5-5-5 N=10	22.5		
				15							
			Becomes grayish brown with orange weathering stains				20	5-3-10-16 N=13	16.4		
			Becomes dark gray, very dense					31-50-50/4"	12.9		
		19.3	681.5+/-								
			Sample Spoon Penetration refusal encountered at 19.3 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 OD Split Barrel Sampler

Abandonment Method:
Boring backfilled with 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 Google Earth Pro.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered at completion of drilling

Groundwater not encountered after pulling augers

Terracon
15 Marway Cir, Ste 2B
Rochester, NY

Boring Started: 11-02-2020 | Boring Completed: 11-02-2020

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

Project No.: J5205161

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL J5205161 CIDER SOLAR - ZBK (12-03-2020).GPJ TERRACON_DATATEMPLATE.GDT 12/11/20

Exhibit A-026

BORING LOG NO. CSB-18

PROJECT: Cider Solar

CLIENT: Stantec Consulting Services Inc
Rochester, NY

SITE: Oakland
Genesee County, NY

LOCATION See Exploration Plan

Latitude: 43.0949° Longitude: -78.1984°

Approximate Surface Elev.: 709 (Ft.) +/-

MODEL LAYER	GRAPHIC LOG	DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY ()	FIELD TEST RESULTS	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
1		0.6	708.5+/-								
		TOPSOIL									
		SILTY SAND (SM), trace clay and gravel with occasional rock/cobble fragments, orangish brown, loose					15	3-2-3-3 N=5	13.8		
							10	2-2-5-4 N=7	13.2		
		Contains trace gravel. becomes medium dense		5			13	5-5-5-8 N=10	15.5		
							21	10-14-10-10 N=24	10.6		
		8.0	701+/-								
3		**WELL GRADED SAND (SW)**, trace gravel with occasional rock/cobble fragments, orangish brown, medium dense					22	7-8-7-6 N=15	8.6		
		10.0	699+/-	10							
		SILTY SAND (SM), trace clay and gravel with rock/cobble fragments, orangish brown, medium dense					16	5-4-10-20 N=14	11.3		
				15							
							22	6-9-20-30 N=29	8.8		
		18.0	691+/-								
		18.6 **POORLY GRADED SAND WITH GRAVEL (SP)**, occasional rock/cobble fragments, gray brown, very dense	690.5+/-				8.5	12-50/1"	8.6		
		Sample Spoon Penetration refusal encountered at 18.6 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 OD Split Barrel Sampler

Abandonment Method:
Boring backfilled with 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 Google Earth Pro.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered at completion of drilling

Terracon
15 Marway Cir, Ste 2B
Rochester, NY

Boring Started: 10-30-2020 | Boring Completed: 10-30-2020

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

Project No.: J5205161

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL J5205161 CIDER SOLAR - ZBK (12-03-2020).GPJ TERRACON_DATATEMPLATE.GDT 12/11/20

BORING LOG NO. CSB-19

PROJECT: Cider Solar

CLIENT: Stantec Consulting Services Inc
Rochester, NY

SITE: Oakland
Genesee County, NY

LOCATION See Exploration Plan

Latitude: 43.0953° Longitude: -78.1790°

Approximate Surface Elev.: 704 (Ft.) +/-

MODEL LAYER	GRAPHIC LOG	DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY ()	FIELD TEST RESULTS	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
1		0.7	703.5+/-								
			TOPSOIL								
			SANDY SILT (ML), trace gravel with rock/cobble fragments, brown, loose				9.5	WOH-3-3-4 N=6	16.9		
			Becomes dense				21.5	5-16-20-19 N=36	8.4		
			Becomes medium dense	5			19.5	10-12-16-25 N=28	12.4		
		6.0	698+/-								
3			**POORLY GRADED SAND WITH GRAVEL (SP)**, with rock/cobble fragments, brown, very dense				24	25-23-29-32 N=52	5.5		
			Becomes dense				19	15-25-17-20 N=42	9.8		
			Contains trace silt, medium dense	10	▽		15	6-14-13-15 N=27	10.2		
					▽						
		15.0	689+/-	15							
			SILTY SAND WITH GRAVEL (SM), occasional rock/cobble fragments, brown, medium dense				22	12-11-16-18 N=27	9.0		
		18.0	686+/-								
			SILTY SAND (SM), trace gravel with rock/cobble fragments, brown, very dense				20	30-32-50-50/3" N=82	8.1		
		19.8	684+/-								
			Sample Spoon Penetration refusal encountered at 19.8 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 OD Split Barrel Sampler

Abandonment Method:
Boring backfilled with 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 Google Earth Pro.

Notes:

WATER LEVEL OBSERVATIONS

▽ *14' BGS at completion of drilling*

▽ *12' BGS after pulling augers*

Terracon
15 Marway Cir, Ste 2B
Rochester, NY

Boring Started: 10-29-2020 | Boring Completed: 10-29-2020

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

Project No.: J5205161

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL J5205161 CIDER SOLAR - ZBK (12-03-2020).GPJ TERRACON_DATATEMPLATE.GDT 12/11/20

BORING LOG NO. CSB-20

PROJECT: Cider Solar

CLIENT: Stantec Consulting Services Inc
Rochester, NY

SITE: Oakland
Genesee County, NY

LOCATION See Exploration Plan

Latitude: 43.0906° Longitude: -78.1782°

Approximate Surface Elev.: 712 (Ft.) +/-

MODEL LAYER	GRAPHIC LOG	DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY ()	FIELD TEST RESULTS	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
1		0.7	711.5+/-								
			TOPSOIL								
			SANDY SILT (ML), trace gravel with rock/cobble fragments, brown, very loose				10.5	WOH-WOH-3-3 N=3	13.8		
			Becomes medium dense				22.5	6-9-12-15 N=21	12.2		
			Becomes dense	5			22.5	9-20-21-22 N=41	8.9		
							24	23-22-24-25 N=46	8.1		
							24	6-16-29-23 N=45	8.2		
3			Becomes gray brown, becomes very dense	10			24	16-32-48-31 N=80	7.3		
		15.0	697+/-	15							
			SILTY SAND (SM), trace gravel with occasional rock/cobble fragments, gray brown, very dense				21.5	45-32-35-30 N=67	8.0		
		20.0	692+/-	20			24	12-21-32-35 N=53	6.1		
			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 OD Split Barrel Sampler

Abandonment Method:
Boring backfilled with 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 Google Earth Pro.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered at completion of drilling

Terracon
15 Marway Cir, Ste 2B
Rochester, NY

Boring Started: 10-29-2020 | Boring Completed: 10-29-2020

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

Project No.: J5205161

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL J5205161 CIDER SOLAR - ZBK (12-03-2020).GPJ TERRACON_DATATEMPLATE.GDT 12/11/20

Exhibit A-029

BORING LOG NO. CSB-21

PROJECT: Cider Solar

CLIENT: Stantec Consulting Services Inc
Rochester, NY

SITE: Oakland
Genesee County, NY

LOCATION See Exploration Plan

Latitude: 43.0939° Longitude: -78.1593°

Approximate Surface Elev.: 725 (Ft.) +/-

MODEL LAYER	GRAPHIC LOG	DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY ()	FIELD TEST RESULTS	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
1		0.3	725+/-								
			TOPSOIL								
			LEAN CLAY WITH SAND (CL), trace clay and gravel, brown, loose				11	2-3-3-4 N=6	14.4		
							22	3-3-4-4 N=7	14.6	28-14-14	
		4.0	721+/-								
			WELL GRADED SAND WITH SILT (SW-SM), occasional rock/cobble fragments, brown, very loose	5			23	3-2-4-4 N=6	17.9		
			Becomes medium dense				24	3-5-7-9 N=12	17.4		
							22.5	7-10-9-10 N=19	18.6		
2			Contains trace clay	10			24	7-9-9-9 N=18	16.7		
					▽						
				15							
		16.0	709+/-				24	5-9-10-7/5" N=19	11.1		
			SANDY SILTY CLAY (CL-ML), trace gravel with rock/cobble fragments, brown, very stiff to hard								
			Becomes dense				24	7-15-26-31 N=41			
		20.0	705+/-	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 OD Split Barrel Sampler

Abandonment Method:
Boring backfilled with 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 Google Earth Pro.

Notes:

WATER LEVEL OBSERVATIONS

0' BGS at completion of drilling

▽ *12.5' BGS after pulling augers*

Terracon
15 Marway Cir, Ste 2B
Rochester, NY

Boring Started: 10-28-2020 | Boring Completed: 10-28-2020

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

Project No.: J5205161

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL J5205161 CIDER SOLAR - ZBK (12-03-2020).GPJ TERRACON_DATATEMPLATE.GDT 12/11/20

Exhibit A-030

BORING LOG NO. CSB-22

PROJECT: Cider Solar

CLIENT: Stantec Consulting Services Inc
Rochester, NY

SITE: Oakland
Genesee County, NY

LOCATION See Exploration Plan

Latitude: 43.0804° Longitude: -78.2104°

Approximate Surface Elev.: 746 (Ft.) +/-

MODEL LAYER	GRAPHIC LOG	DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY ()	FIELD TEST RESULTS	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
1		0	746								
		TOPSOIL									
		1.0	745+/-								
2		**SANDY SILTY CLAY (CL-ML)**, trace clay and gravel with occasional rock/cobble fragments, orangish brown, medium stiff					10	3-2-3-3 N=5	14.9		
		Becomes very stiff					23.5	5-6-12-14 N=18	12.4		
		Becomes gray with orange weathering stains		5			20	5-16-20-25 N=36	12.1		
		6.0	740+/-								
3		**SILTY SAND (SM)**, trace gravel with rock/cobble fragments, brown, very dense					21	25-33-50/5"	10.4		
							23	15-33-24-50/5" N=57	12.3		
				10			24	33-36-41-50/5" N=77	8.2		
		Contains trace clay, dense		15			24	14-20-26-33 N=46	13.4		
							24	8-16-20-26 N=36	11.8		
		20.0	726+/-	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 OD Split Barrel Sampler

Abandonment Method:
Boring backfilled with 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 Google Earth Pro.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered at completion of drilling

Terracon
15 Marway Cir, Ste 2B
Rochester, NY

Boring Started: 11-03-2020 | Boring Completed: 11-03-2020

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

Project No.: J5205161

BORING LOG NO. CSB-23

PROJECT: Cider Solar

CLIENT: Stantec Consulting Services Inc
Rochester, NY

SITE: Oakland
Genesee County, NY

LOCATION See Exploration Plan

Latitude: 43.0787° Longitude: -78.2185°

Approximate Surface Elev.: 734 (Ft.) +/-

MODEL LAYER	GRAPHIC LOG	DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY ()	FIELD TEST RESULTS	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
1		0.9	733+/-								
		TOPSOIL									
2		2.0	732+/-				12	2-3-2-5 N=5	10.0		
		SANDY SILTY CLAY (CL-ML), trace gravel with occasional rock/cobble fragments, brown, medium stiff									
3							21	7-8-10-8 N=18	8.5		
		SILTY SAND (SM), trace clay with occasional rock/cobble fragments, brown, medium dense		5			6.5	5-10-12-14 N=22	13.5		
		Becomes dense					24	15-20-24-26 N=44	11.5		
		Becomes medium dense					24	5-10-12-16 N=22	12.3		
		10.0	724+/-	10							
		SILT (ML), trace sand, brown, hard					21	15-21-24-25 N=45	12.6		
		15.0	719+/-	15							
		SILTY SAND (SM), trace gravel with occasional rock/cobble fragments, gray brown, medium dense					22.5	5-10-16-24 N=26	14.2		
		Becomes very dense					24	19-24-25-36 N=49	18.6		
		20.0	714+/-	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 OD Split Barrel Sampler

Abandonment Method:
Boring backfilled with 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 Google Earth Pro.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered at completion of drilling

Terracon
15 Marway Cir, Ste 2B
Rochester, NY

Boring Started: 11-02-2020 | Boring Completed: 11-02-2020

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

Project No.: J5205161

BORING LOG NO. CSB-24

PROJECT: Cider Solar

CLIENT: Stantec Consulting Services Inc
Rochester, NY

SITE: Oakland
Genesee County, NY

LOCATION See Exploration Plan

Latitude: 43.0738° Longitude: -78.2198°

Approximate Surface Elev.: 750 (Ft.) +/-

MODEL LAYER	GRAPHIC LOG	DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY ()	FIELD TEST RESULTS	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
1		0	820+/-								
		TOPSOIL									
		1.0	819+/-								
3		**SANDY SILT (ML)**, trace gravel with rock/cobble fragments, orangish brown, dense to very dense					24	2-3-7-9 N=10	16.3		
							20.5	5-16-17-15 N=33	5.8		
				5			14	9-16-16-26 N=32	6.7		
							24	19-20-31-30 N=51	8.0		
							17	20-21-25-28 N=46	8.4		
				10			22	5-21-26-28 N=47	7.8		
		Contains orange weathering stains		15			6	50/4"	7.7		
		Becomes brown					24	23-20-20-24 N=40	7.7		
		20.0	801+/-	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 OD Split Barrel Sampler

Abandonment Method:
Boring backfilled with 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 Google Earth Pro.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered at completion of drilling

Terracon
15 Marway Cir, Ste 2B
Rochester, NY

Boring Started: 11-03-2020 | Boring Completed: 11-03-2020

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

Project No.: J5205161

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL J5205161 CIDER SOLAR - ZBK (12-03-2020).GPJ TERRACON_DATATEMPLATE.GDT 12/11/20

Exhibit A-033

BORING LOG NO. CSSB-1

PROJECT: Cider Solar

CLIENT: Stantec Consulting Services Inc
Rochester, NY

SITE: Oakland
Genesee County, NY

LOCATION See Exploration Plan

Latitude: 43.1046° Longitude: -78.2173°

Approximate Surface Elev.: 651 (Ft.) +/-

MODEL LAYER	GRAPHIC LOG	DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY ()	FIELD TEST RESULTS	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
1		0.3	651+/-								
			TOPSOIL								
			SILTY SAND WITH GRAVEL (SM), fine to medium coarse grained. trace gravel, brown, loose				19	2-3-5-6 N=8	14.5		
			Occasional rock/cobble fragments. dense to very dense				16	14-22-24-30 N=46	4.5	NP	37
			Trace clay	5			14	23-32-42-30 N=74	9.5		
							19	18-20-37-48 N=57	10.2		
					▽		0	50/1"			
3				10			8	27-50/5"	8.6		
		15.0	636+/-	15			13	18-21-19-20 N=40	7.5		
			SANDY SILT (ML), trace clay with rock/cobble fragments, gray brown, dense to very dense	20							

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

Hammer Type: Automatic

Advancement Method:
4" ID Flush Joint Casing/open hole mud rotary and 2" OD Split Barrel Sampler

Abandonment Method:
Boring backfilled with 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 Google Earth Pro.

Notes:

WATER LEVEL OBSERVATIONS

▽ *8' BGS at completion of drilling*

Terracon
15 Marway Cir, Ste 2B
Rochester, NY

Boring Started: 11-13-2020 | Boring Completed: 11-13-2020

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

Project No.: J5205161

BORING LOG NO. CSSB-1

PROJECT: Cider Solar

CLIENT: Stantec Consulting Services Inc
Rochester, NY

SITE: Oakland
Genesee County, NY

LOCATION See Exploration Plan

Latitude: 43.1046° Longitude: -78.2173°

Approximate Surface Elev.: 651 (Ft.) +/-

DEPTH ELEVATION (Ft.)

MODEL LAYER	GRAPHIC LOG	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY ()	FIELD TEST RESULTS	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
3					16	18-25-28-32 N=53	7.9		
		25			7	20-50/5"	8.0		
		30			3	50/5"	8.0		
		35			16	29-38-39-39 N=77	8.2		
		40			9	13-31-50 N=81	9.1		

SANDY SILT (ML), trace clay with rock/cobble fragments, gray brown, dense to very dense *(continued)*

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

Hammer Type: Automatic

Advancement Method:
4" ID Flush Joint Casing/open hole mud rotary and 2" OD Split Barrel Sampler

Abandonment Method:
Boring backfilled with 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 Google Earth Pro.

Notes:

WATER LEVEL OBSERVATIONS

▽ *8' BGS at completion of drilling*

Terracon
15 Marway Cir, Ste 2B
Rochester, NY

Boring Started: 11-13-2020 | Boring Completed: 11-13-2020

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

Project No.: J5205161

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL J5205161 CIDER SOLAR - ZBK (12-03-2020).GPJ TERRACON_DATATEMPLATE.GDT 12/11/20

BORING LOG NO. CSSB-1

PROJECT: Cider Solar

CLIENT: Stantec Consulting Services Inc
Rochester, NY

SITE: Oakland
Genesee County, NY

MODEL LAYER	GRAPHIC LOG	LOCATION See Exploration Plan Latitude: 43.1046° Longitude: -78.2173° Approximate Surface Elev.: 651 (Ft.) +/- DEPTH / ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY ()	FIELD TEST RESULTS	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
3		**SANDY SILT (ML)**, trace clay with rock/cobble fragments, gray brown, dense to very dense *(continued)*	45		X	0	50			
		48.4 / 602.5+/-			X	0	50/5"	9.7		
		Sample Spoon Penetration refusal encountered at 48.4 Feet								

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

Hammer Type: Automatic

Advancement Method:
4" ID Flush Joint Casing/open hole mud rotary and 2" OD Split Barrel Sampler

Abandonment Method:
Boring backfilled with 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 Google Earth Pro.

Notes:

WATER LEVEL OBSERVATIONS

▽ *8' BGS at completion of drilling*

Terracon
15 Marway Cir, Ste 2B
Rochester, NY

Boring Started: 11-13-2020 | Boring Completed: 11-13-2020

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

Project No.: J5205161

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL J5205161 CIDER SOLAR - ZBK (12-03-2020).GPJ TERRACON_DATATEMPLATE.GDT 12/11/20

BORING LOG NO. CSSB-2

PROJECT: Cider Solar

CLIENT: Stantec Consulting Services Inc
Rochester, NY

SITE: Oakland
Genesee County, NY

LOCATION See Exploration Plan

Latitude: 43.1047° Longitude: -78.2145°

Approximate Surface Elev.: 650 (Ft.) +/-

MODEL LAYER	GRAPHIC LOG	DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY ()	FIELD TEST RESULTS	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
1		0.3	650+/-								
			TOPSOIL								
			SANDY SILT (ML), trace clay, brown, loose to medium dense				13	2-2-5-7 N=7	24.3		
			Trace gravel with rock/cobble fragments				20	6-8-16-16 N=24	9.2		
			Becomes very dense	5	▽		13	20-37-35-50 N=72	9.0		
							4	50/5"	9.9		
			Becoms gray brown in color		▽		10	35-50/5"	8.6		
2				10			10	44-50/5"	8.8		
		15.0	635+/-	15							
			SANDY SILTY CLAY (CL-ML), contains gravel with rock/cobble fragments, gray brown, hard to very hard				14	25-36-50/5"	9.5		
		20.0	630+/-	20							
3			**SANDY SILT (ML)**, trace clay and gravel, gray brown, very dense				9	35-50/5"	7.1		

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

Hammer Type: Automatic

Advancement Method:
4" ID Flush Joint Casing/open hole mud rotary and 2" OD Split Barrel Sampler

Abandonment Method:
Boring backfilled with 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 Google Earth Pro.

Notes:

WATER LEVEL OBSERVATIONS

▽ *7.5' BGS at completion of drilling*

▽ *4' BGS after pulling augers*

Terracon
15 Marway Cir, Ste 2B
Rochester, NY

Boring Started: 11-13-2020 | Boring Completed: 11-13-2020

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

Project No.: J5205161

BORING LOG NO. CSSB-2

PROJECT: Cider Solar

CLIENT: Stantec Consulting Services Inc
Rochester, NY

SITE: Oakland
Genesee County, NY

LOCATION See Exploration Plan

Latitude: 43.1047° Longitude: -78.2145°

Approximate Surface Elev.: 650 (Ft.) +/-

DEPTH | ELEVATION (Ft.)

MODEL LAYER	GRAPHIC LOG	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY ()	FIELD TEST RESULTS	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
3		**SANDY SILT (ML)**, trace clay and gravel, gray brown, very dense *(continued)*							
		Contains rock/cobble fragments							
		25			18	38-50-49-50/5" N=99	8.5		
		30			9	42-50/5"	8.6		
		35			4	50/5"	7.4		
		40			0	50/5"	10.1		
		40.0 / 610+/-							
4		**WEATHERED SHALE**, highly fragmented, dark gray							

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

Hammer Type: Automatic

Advancement Method:
4" ID Flush Joint Casing/open hole mud rotary and 2" OD Split Barrel Sampler

Abandonment Method:
Boring backfilled with 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 Google Earth Pro.

Notes:

WATER LEVEL OBSERVATIONS

7.5' BGS at completion of drilling

4' BGS after pulling augers

Terracon
15 Marway Cir, Ste 2B
Rochester, NY

Boring Started: 11-13-2020 | Boring Completed: 11-13-2020

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

Project No.: J5205161

BORING LOG NO. CSSB-2

PROJECT: Cider Solar

CLIENT: Stantec Consulting Services Inc
Rochester, NY

SITE: Oakland
Genesee County, NY

MODEL LAYER	GRAPHIC LOG	LOCATION See Exploration Plan Latitude: 43.1047° Longitude: -78.2145° Approximate Surface Elev.: 650 (Ft.) +/- DEPTH / ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY ()	FIELD TEST RESULTS	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
4		**WEATHERED SHALE**, highly fragmented, dark gray *(continued)*								
		45.2 / 605+/-	45			0	50/2"			
		Sample Spoon Penetration refusal encountered at 45.2 Feet								

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

Hammer Type: Automatic

Advancement Method:
4" ID Flush Joint Casing/open hole mud rotary and 2" OD Split Barrel Sampler

Abandonment Method:
Boring backfilled with 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 Google Earth Pro.

Notes:

WATER LEVEL OBSERVATIONS

7.5' BGS at completion of drilling

4' BGS after pulling augers

Terracon
15 Marway Cir, Ste 2B
Rochester, NY

Boring Started: 11-13-2020 | Boring Completed: 11-13-2020

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

Project No.: J5205161

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL J5205161 CIDER SOLAR - ZBK (12-03-2020).GPJ TERRACON_DATATEMPLATE.GDT 12/11/20

TEST PIT LOG NO. CSTP-1

PROJECT: Cider Solar

CLIENT: Stantec Consulting Services Inc
Rochester, NY

SITE: Oakland
Genesee County, NY

LOCATION See Exploration Plan

Latitude: 43.0887° Longitude: -78.2523°

Approximate Surface Elev.: 655 (Ft.) +/-

MODEL LAYER	GRAPHIC LOG	DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
1		0.7	654.5+/-						
3		**TOPSOIL** **SILTY SAND WITH GRAVEL (SM)**, brown		5	▽		8.0	NP	43
		8.0	647+/-						
		Test Pit Terminated at 8 Feet							

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

Advancement Method:
16 inch bucket

Abandonment Method:
Test Pit backfilled with excavated soils 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 Google Earth Pro.

Notes:

WATER LEVEL OBSERVATIONS

▽ *4' While excavating*

Terracon
15 Marway Cir, Ste 2B
Rochester, NY

Test Pit Started: 11-17-2020 | Test Pit Completed: 11-17-2020

Excavator: Backhoe | Operator: T. Wooden

Project No.: J5205161

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL J5205161 CIDER SOLAR - 12-11-2020).GPJ TERRACON_DATATEMPLATE.GDT 12/16/20

Exhibit A-040

TEST PIT LOG NO. CSTP-2

PROJECT: Cider Solar

CLIENT: Stantec Consulting Services Inc
Rochester, NY

SITE: Oakland
Genesee County, NY

LOCATION See Exploration Plan

Latitude: 43.0944° Longitude: -78.2308°

Approximate Surface Elev.: 656 (Ft.) +/-

MODEL LAYER	GRAPHIC LOG	DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
1		**TOPSOIL** 1.0	655+/-						
2		**GRAVELLY SILT (ML)**, brown to gray 4.0	652+/-				27.1	NP	59
		SANDY SILTY CLAY (CL-ML), trace gravel, brown 8.0	648+/-	5	▽				
		Test Pit Terminated at 8 Feet							

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

Advancement Method:
16 inch bucket

Abandonment Method:
Test Pit backfilled with excavated soils 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 Google Earth Pro.

Notes:

WATER LEVEL OBSERVATIONS

▽ *5' While excavating*

Terracon
15 Marway Cir, Ste 2B
Rochester, NY

Test Pit Started: 11-17-2020 | Test Pit Completed: 11-17-2020

Excavator: Backhoe | Operator: T. Wooden

Project No.: J5205161

TEST PIT LOG NO. CSTP-3

PROJECT: Cider Solar

CLIENT: Stantec Consulting Services Inc
Rochester, NY

SITE: Oakland
Genesee County, NY

LOCATION See Exploration Plan

Latitude: 43.0892° Longitude: -78.2067°

Approximate Surface Elev.: 760 (Ft.) +/-

MODEL LAYER	GRAPHIC LOG	DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
1		**TOPSOIL**							
		1.5	758.5+/-						
3		**SANDY SILT (ML)**, light brown		5			15.1	NP	53
		8.0	752+/-						
		Test Pit Terminated at 8 Feet							

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

Advancement Method:
16 inch bucket

Abandonment Method:
Test Pit backfilled with excavated soils 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 Google Earth Pro.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered while excavating

Terracon
15 Marway Cir, Ste 2B
Rochester, NY

Test Pit Started: 11-17-2020 | Test Pit Completed: 11-17-2020

Excavator: Backhoe | Operator: T. Wooden

Project No.: J5205161

TEST PIT LOG NO. CSTP-4

PROJECT: Cider Solar

CLIENT: Stantec Consulting Services Inc
Rochester, NY

SITE: Oakland
Genesee County, NY

LOCATION See Exploration Plan

Latitude: 43.1078° Longitude: -78.1747°

Approximate Surface Elev.: 672 (Ft.) +/-

MODEL LAYER	GRAPHIC LOG	DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
1		**TOPSOIL** 1.0	671+/-						
3		**SILTY SAND (SM)**, brown		5			14.4	NP	45
		8.0	664+/-						
		Test Pit Terminated at 8 Feet							

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

Advancement Method:
16 inch bucket

Abandonment Method:
Test Pit backfilled with excavated soils 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 Google Earth Pro.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered while excavating

Terracon
15 Marway Cir, Ste 2B
Rochester, NY

Test Pit Started: 11-17-2020 | Test Pit Completed: 11-17-2020

Excavator: Backhoe | Operator: T. Wooden

Project No.: J5205161

Test Pit CSTP-1

Test Pit CSTP-2

Exhibit A-045

Test Pit CSTP-3

Test Pit CSTP-4

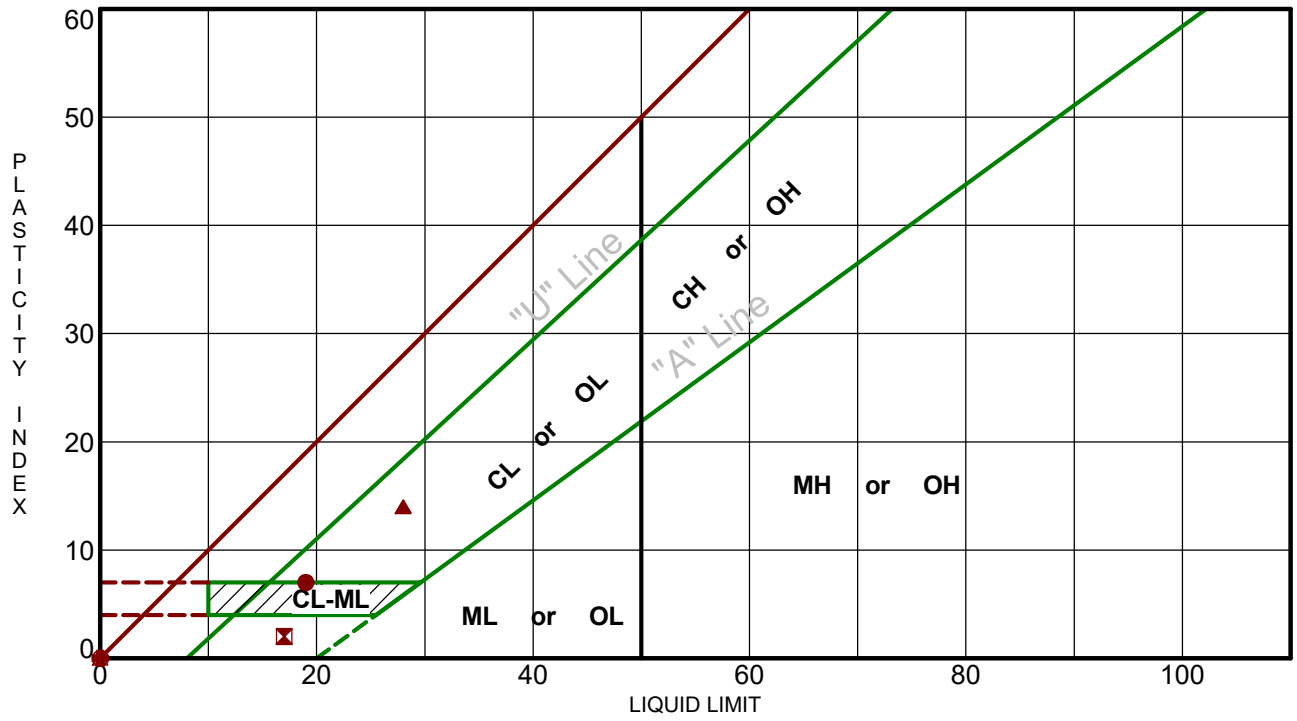
APPENDIX B – LABORATORY TESTING

Contents:

Note: All attachments are one page unless noted above.

ATTERBERG LIMITS RESULTS

ASTM D4318



Boring ID		Depth	LL	PL	PI	Fines	USCS	Description
●	CSB-10	8 - 10	19	12	7		CL-ML	GRAVELLY SILTY CLAY WITH SAND
⊠	CSB-12	8 - 10	17	15	2		CL-ML	SANDY SILTY CLAY WITH GRAVEL
▲	CSB-21	2 - 4	28	14	14		CL	LEAN CLAY WITH SAND
★	CSSB-1	1 - 4	NP	NP	NP	37.1	SM	SILTY SAND with GRAVEL
⊙	CSTP-1	1 - 4	NP	NP	NP	43.0	SM	SILTY SAND with GRAVEL
✿	CSTP-2	1 - 4	NP	NP	NP	58.8	ML	GRAVELLY SILT
○	CSTP-3	1 - 4	NP	NP	NP	52.7	ML	SANDY SILT
△	CSTP-4	1 - 4	NP	NP	NP	45.4	SM	SILTY SAND

PROJECT: Cider Solar

PROJECT NUMBER: J5205161

SITE: Oakland
Genesee County, NY

Terracon
15 Marway Cir, Ste 2B
Rochester, NY

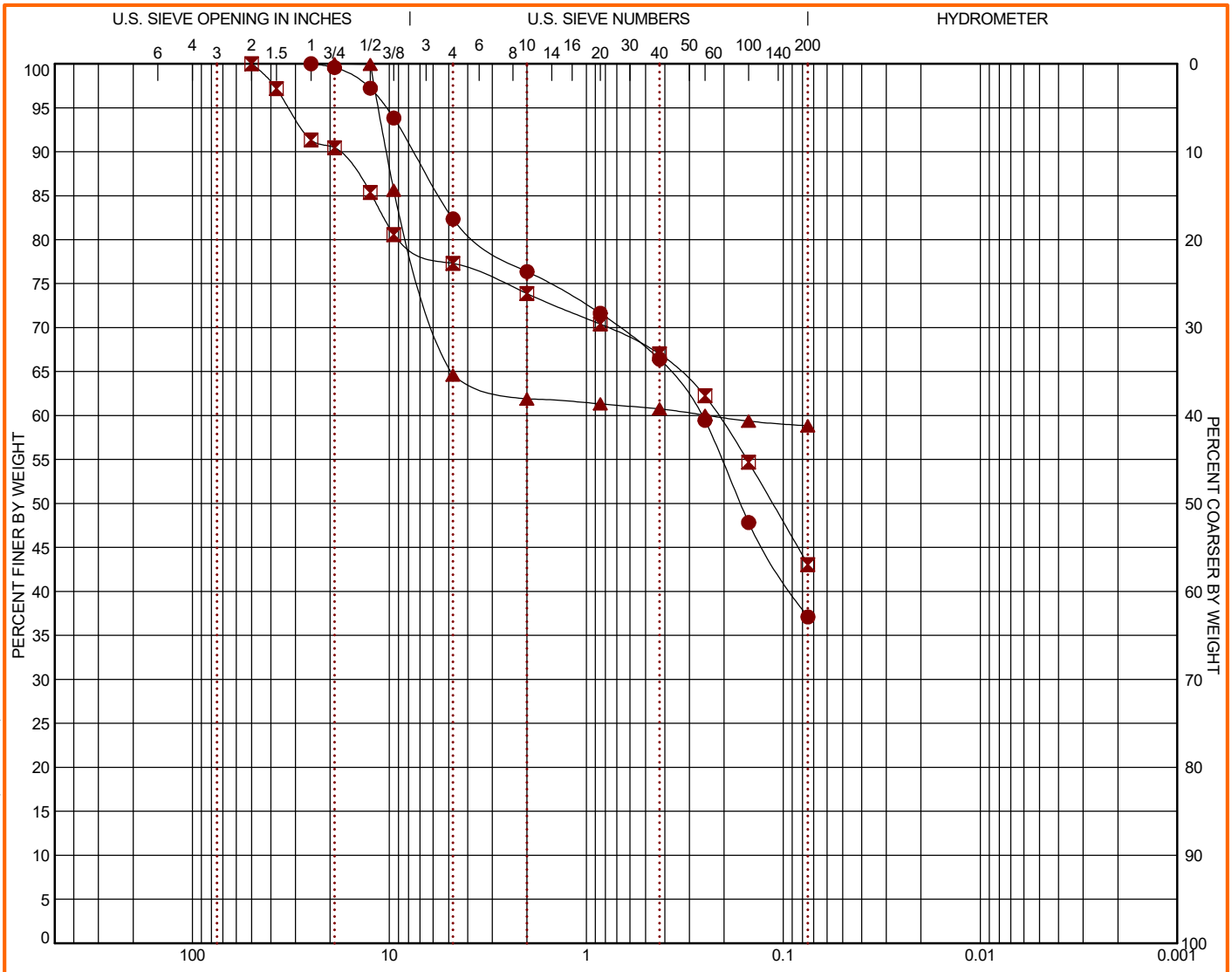
CLIENT: Stantec Consulting Services Inc
Rochester, NY

LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. ATTERBERG LIMITS J5205161 CIDER SOLAR - ZBK (12-03-2020).GPJ TERRACON_DATATEMPLATE.GDT 12/9/20

Exhibit B-001

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
●	CSSB-1	1 - 4	0.0	17.7	45.2		37.1		SM
⊠	CSTP-1	1 - 4	0.0	22.7	34.2		43.0		SM
▲	CSTP-2	1 - 4	0.0	35.4	5.8		58.8		ML

GRAIN SIZE	●	⊠	▲
D_{60}	0.26	0.215	0.241
D_{30}			
D_{10}			

COEFFICIENTS	●	⊠	▲
C_C			
C_U			

●		⊠		▲	
Sieve	% Finer	Sieve	% Finer	Sieve	% Finer
3/4"	99.57	1 1/2"	100.0	1/2"	100.0
1/2"	97.22	1"	97.18	3/8"	99.92
3/8"	93.83	3/4"	91.32	#4	85.63
#4	82.35	1/2"	90.46	#10	64.6
#10	76.36	3/8"	85.36	#20	61.87
#20	71.63	#4	80.59	#40	61.33
#40	66.41	#10	77.29	#60	60.76
#60	59.46	#20	73.86	#100	60.05
#100	47.84	#40	70.4	#200	59.37
#200	37.1	#60	67.02		58.83
	100.0	#100	62.25		
		#200	54.68		
			43.05		

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

REMARKS	
●	
⊠	
▲	

PROJECT: Cider Solar

PROJECT NUMBER: J5205161

SITE: Oakland
Genesee County, NY

Terracon
15 Marway Cir, Ste 2B
Rochester, NY

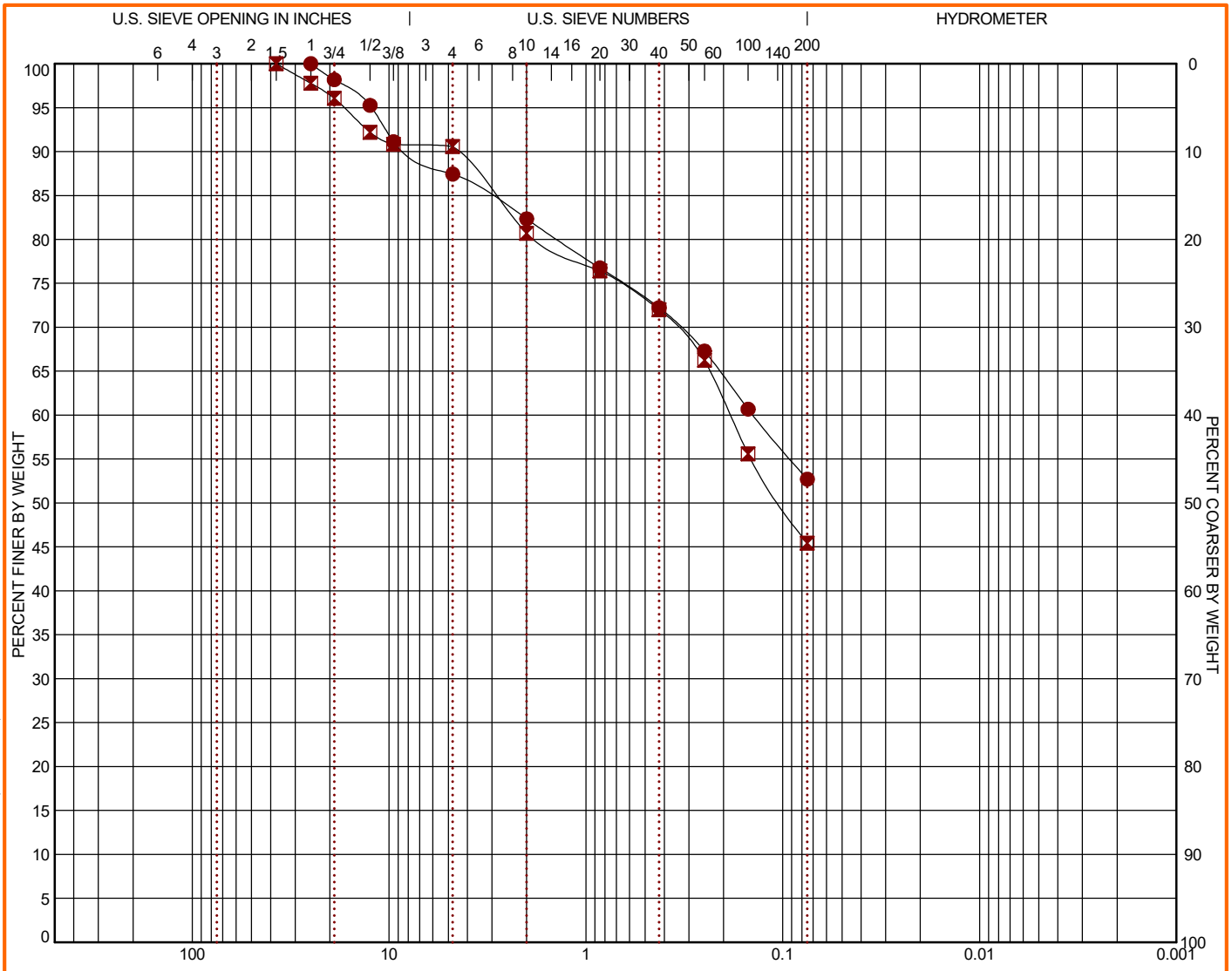
CLIENT: Stantec Consulting Services Inc
Rochester, NY

LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GRAIN SIZE: USCS 1 J5205161 CIDER SOLAR - ZBK (12-03-2020).GPJ TERRACON_DATATEMPLATE.GDT 12/9/20

Exhibit B-002

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
●	CSTP-3	1 - 4	0.0	12.6	34.7		52.7		ML
⊠	CSTP-4	1 - 4	0.0	9.4	45.1		45.4		SM

GRAIN SIZE	●	⊠	
D_{60}	0.141	0.185	
D_{30}			
D_{10}			

COEFFICIENTS	●	⊠	
C_C			
C_U			

●		⊠			
Sieve	% Finer	Sieve	% Finer	Sieve	% Finer
1"	100.0	1"	100.0		
3/4"	98.18	3/4"	97.77		
1/2"	95.26	1/2"	96.05		
3/8"	91.12	3/8"	92.2		
#4	87.43	#4	90.82		
#10	82.34	#10	90.57		
#20	76.76	#20	80.68		
#40	72.24	#40	76.41		
#60	67.29	#60	72.01		
#100	60.68	#100	66.24		
#200	52.71	#200	55.58		
			45.43		

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

REMARKS	
●	
⊠	

PROJECT: Cider Solar

PROJECT NUMBER: J5205161

SITE: Oakland
Genesee County, NY

Terracon
15 Marway Cir, Ste 2B
Rochester, NY

CLIENT: Stantec Consulting Services Inc
Rochester, NY

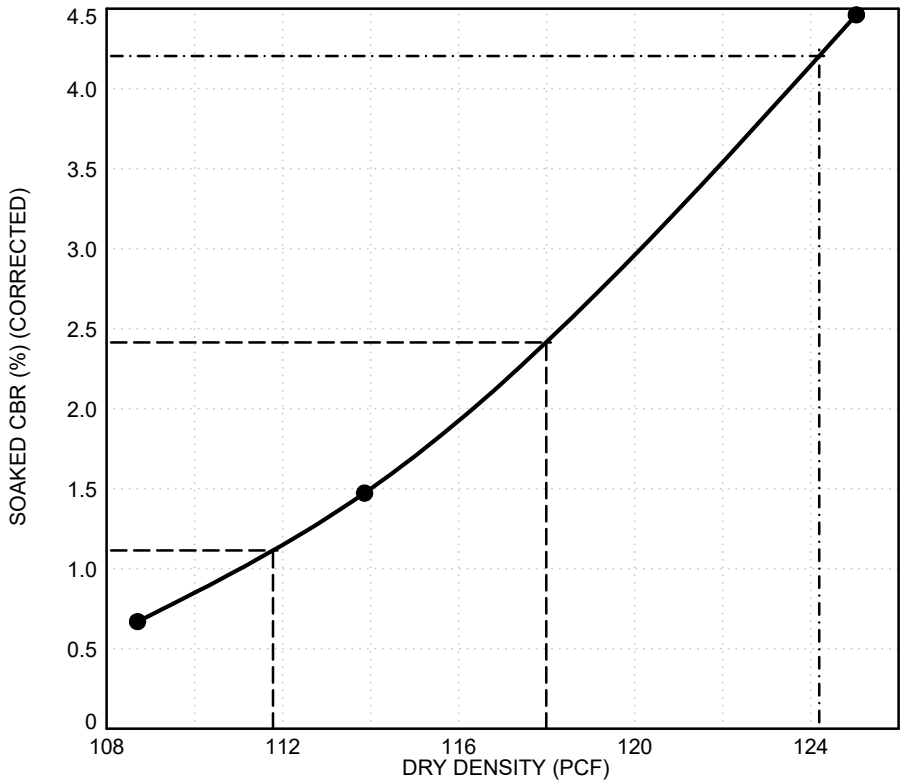
GRAIN SIZE: USCS 1 J5205161 CIDER SOLAR - ZBK (12-03-2020).GPJ TERRACON_DATATEMPLATE.GDT 12/9/20

LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT.

Exhibit B-003

CALIFORNIA BEARING RATIO

ASTM D1883-07[2]



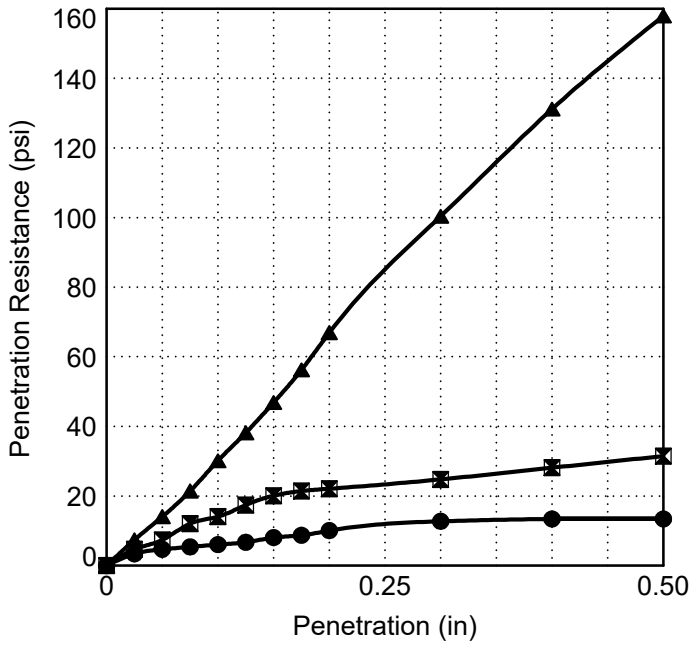
Source of Material: **CSTP-1 1-4 feet**

Description of Material: **SILTY SAND with GRAVEL(SM)**

Remarks:

Corrected Percent Fines: **43.0 %**

Atterberg Limits: LL **NP** PL **NP** PI **NP**



Sample No.	1	2	3
Sample Condition	Soaked		
Compaction Method	ASTM 698A		
Maximum Dry Density, (pcf)	124.2	124.2	124.2
Optimum Moisture Content, (%)	10.4	10.4	10.4
Dry Density before Soaking, (pcf)	108.70	113.86	125.04
Moisture Content, (%)			
After Compaction	8.5	8.5	8.5
Top 1" After Soaking	9.7	14.6	14.3
Surcharge,. (lbs)	10.00	10.00	10.00
Swell, (%)	0.02	0.44	0.48
Bearing Ratio, (%)	0.7	1.5	4.5

Dry Density @ 90% 111.8 pcf

Dry Density @ 95% 118.0 pcf

Dry Density @ 100% 124.2 pcf

CBR @ 90% Density 1.1

CBR @ 95% Density 2.4

CBR @ 100% Density 4.2

PROJECT: Cider Solar - Genesee County NY

PROJECT NUMBER: J5205161

SITE: Fisher Rd
Oakfield, NY

Terracon
15 Marway Cir, Ste 2B
Rochester, NY

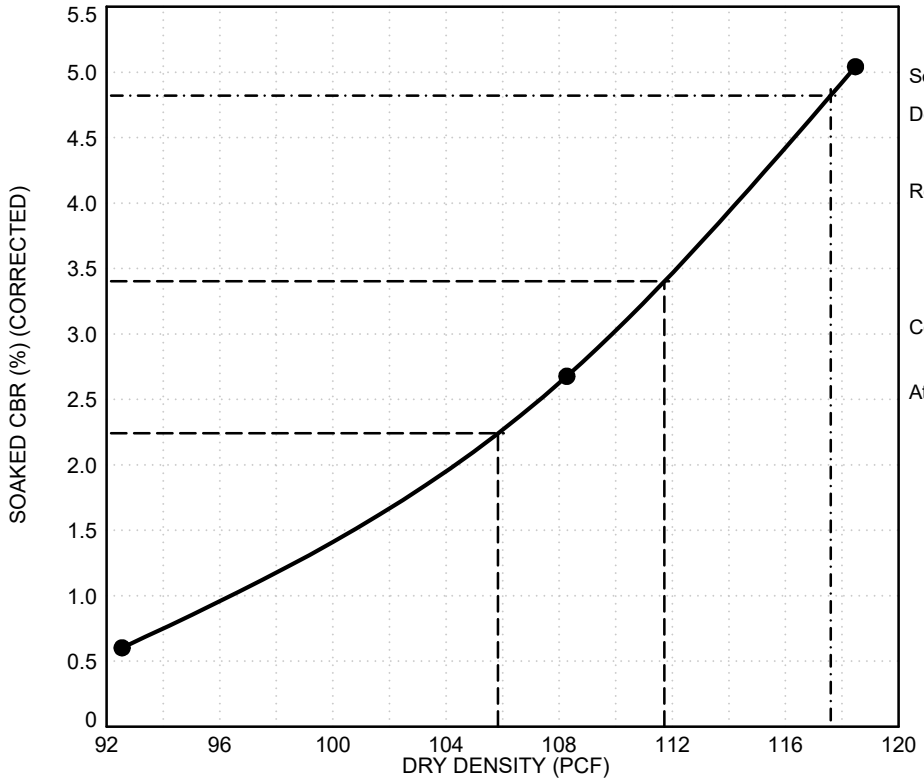
CLIENT: Stantec Consulting Services Inc
Rochester, NY

LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. CBR 3PT REPORT J5205161 CIDER SOLAR CHECKED OUT- GEN (11-30-2020).GPJ TERRACON_DATATEMPLATE.GDT 12/8/20

Exhibit B-004

CALIFORNIA BEARING RATIO

ASTM D1883-07[2]



Source of Material **CSTP-3 1- 4 feet**

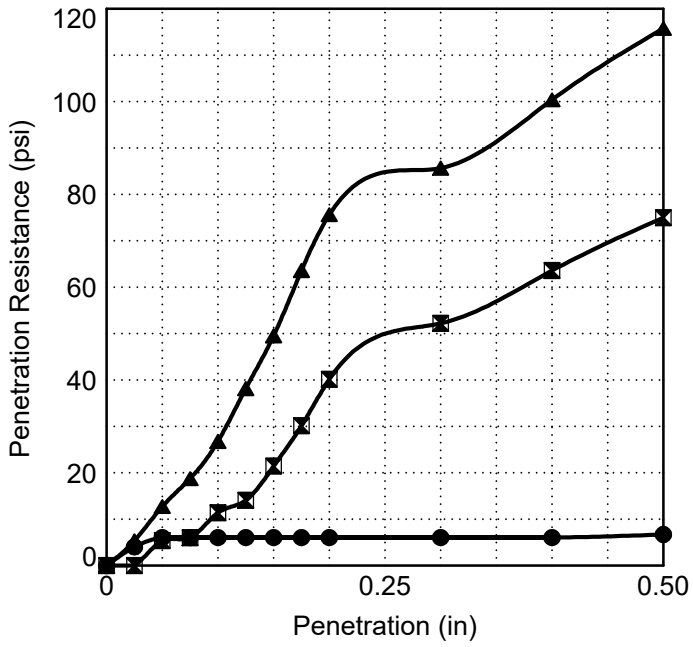
Description of Material **SANDY SILT(ML)**

Remarks:

Corrected Percent Fines **52.7 %**

Atterberg Limits

LL	PL	PI
NP	**NP**	**NP**



Sample No.	1	2	3
Sample Condition	Soaked		
Compaction Method	ASTM 698A		
Maximum Dry Density, (pcf)	117.6	117.6	117.6
Optimum Moisture Content, (%)	11.8	11.8	11.8
Dry Density before Soaking, (pcf)	92.55	108.27	118.47
Moisture Content, (%)			
After Compaction	11.3	11.3	11.3
Top 1" After Soaking	19.8	18.8	19.2
Surcharge,. (lbs)	10.00	10.00	10.00
Swell, (%)	0.72	1.07	0.76
Bearing Ratio, (%)	0.4	2.7	5.0

Dry Density @ 90% 105.8 pcf

Dry Density @ 95% 111.7 pcf

Dry Density @ 100% 117.6 pcf

CBR @ 90% Density 2.2

CBR @ 95% Density 3.4

CBR @ 100% Density 4.8

PROJECT: Cider Solar - Genesee County NY

PROJECT NUMBER: J5205161

SITE: Fisher Rd
Oakfield, NY

Terracon
15 Marway Cir, Ste 2B
Rochester, NY

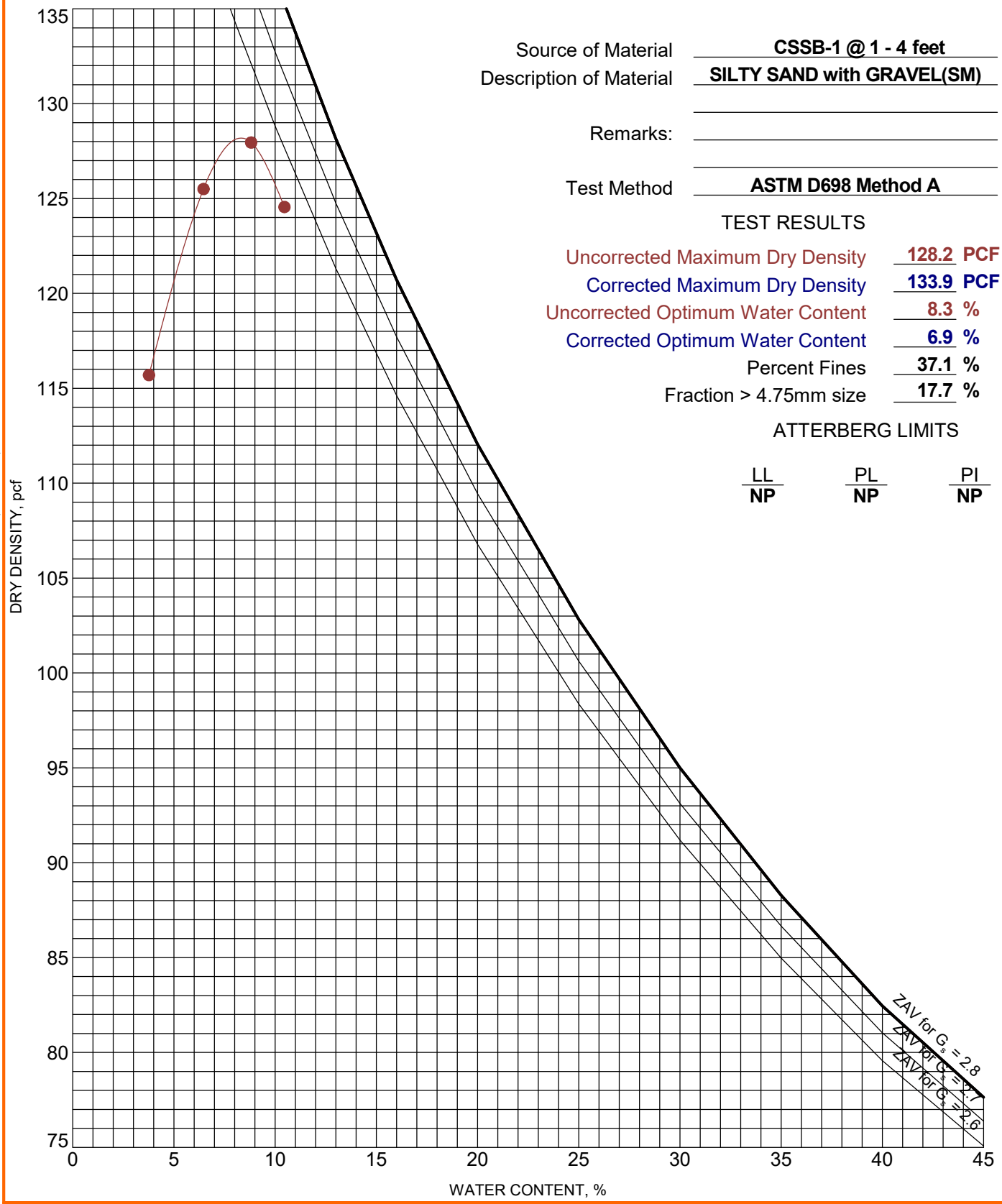
CLIENT: Stantec Consulting Services Inc
Rochester, NY

LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. CBR 3PT REPORT J5205161 CIDER SOLAR CHECKED OUT- GEN (11-30-2020).GPJ TERRACON_DATATEMPLATE.GDT 12/7/20

Exhibit B-005

MOISTURE-DENSITY RELATIONSHIP

ASTM D698/D1557



Source of Material	**CSSB-1 @ 1 - 4 feet**
Description of Material	**SILTY SAND with GRAVEL(SM)**
Remarks:	
Test Method	**ASTM D698 Method A**

TEST RESULTS

Uncorrected Maximum Dry Density	**128.2 PCF**
Corrected Maximum Dry Density	**133.9 PCF**
Uncorrected Optimum Water Content	**8.3 %**
Corrected Optimum Water Content	**6.9 %**
Percent Fines	**37.1 %**
Fraction > 4.75mm size	**17.7 %**

ATTERBERG LIMITS

LL	PL	PI
NP	**NP**	**NP**

PROJECT: Cider Solar - Genesee County NY

PROJECT NUMBER: J5205161

SITE: Fisher Rd
Oakfield, NY

Terracon
15 Marway Cir, Ste 2B
Rochester, NY

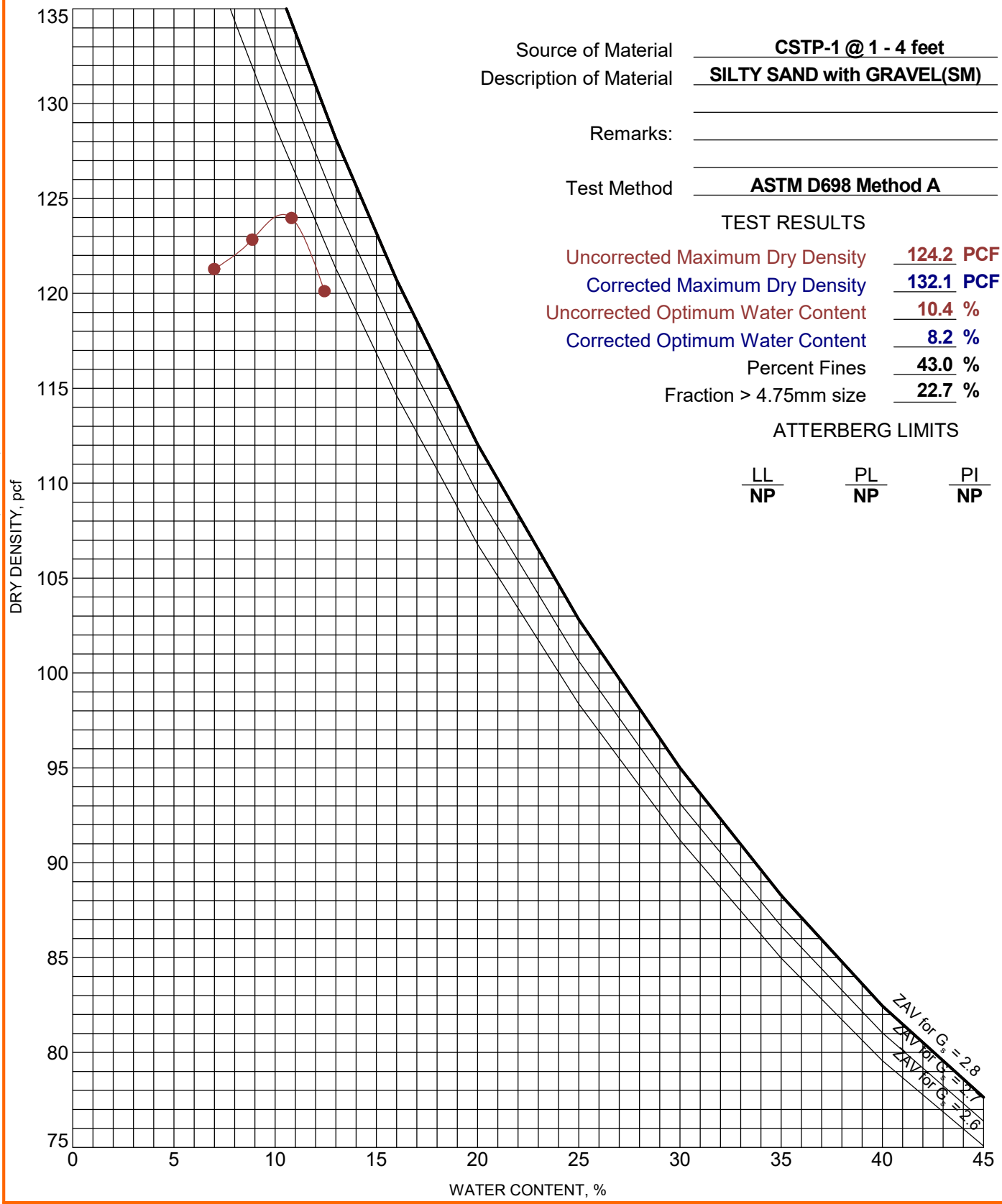
CLIENT: Stantec Consulting Services Inc
Rochester, NY

LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. COMPACTION - V2 J5205161 CIDER SOLAR CHECKED OUT- GEN (11-30-2020).GPJ TERRACON_DATATEMPLATE.GDT 12/9/20

Exhibit B-006

MOISTURE-DENSITY RELATIONSHIP

ASTM D698/D1557



Source of Material	**CSTP-1 @ 1 - 4 feet**
Description of Material	**SILTY SAND with GRAVEL(SM)**
Remarks:	
Test Method	**ASTM D698 Method A**

TEST RESULTS

Uncorrected Maximum Dry Density	**124.2** PCF
Corrected Maximum Dry Density	**132.1** PCF
Uncorrected Optimum Water Content	**10.4** %
Corrected Optimum Water Content	**8.2** %
Percent Fines	**43.0** %
Fraction > 4.75mm size	**22.7** %

ATTERBERG LIMITS

LL	PL	PI
NP	**NP**	**NP**

PROJECT: Cider Solar - Genesee County NY

PROJECT NUMBER: J5205161

SITE: Fisher Rd
Oakfield, NY

Terracon
15 Marway Cir, Ste 2B
Rochester, NY

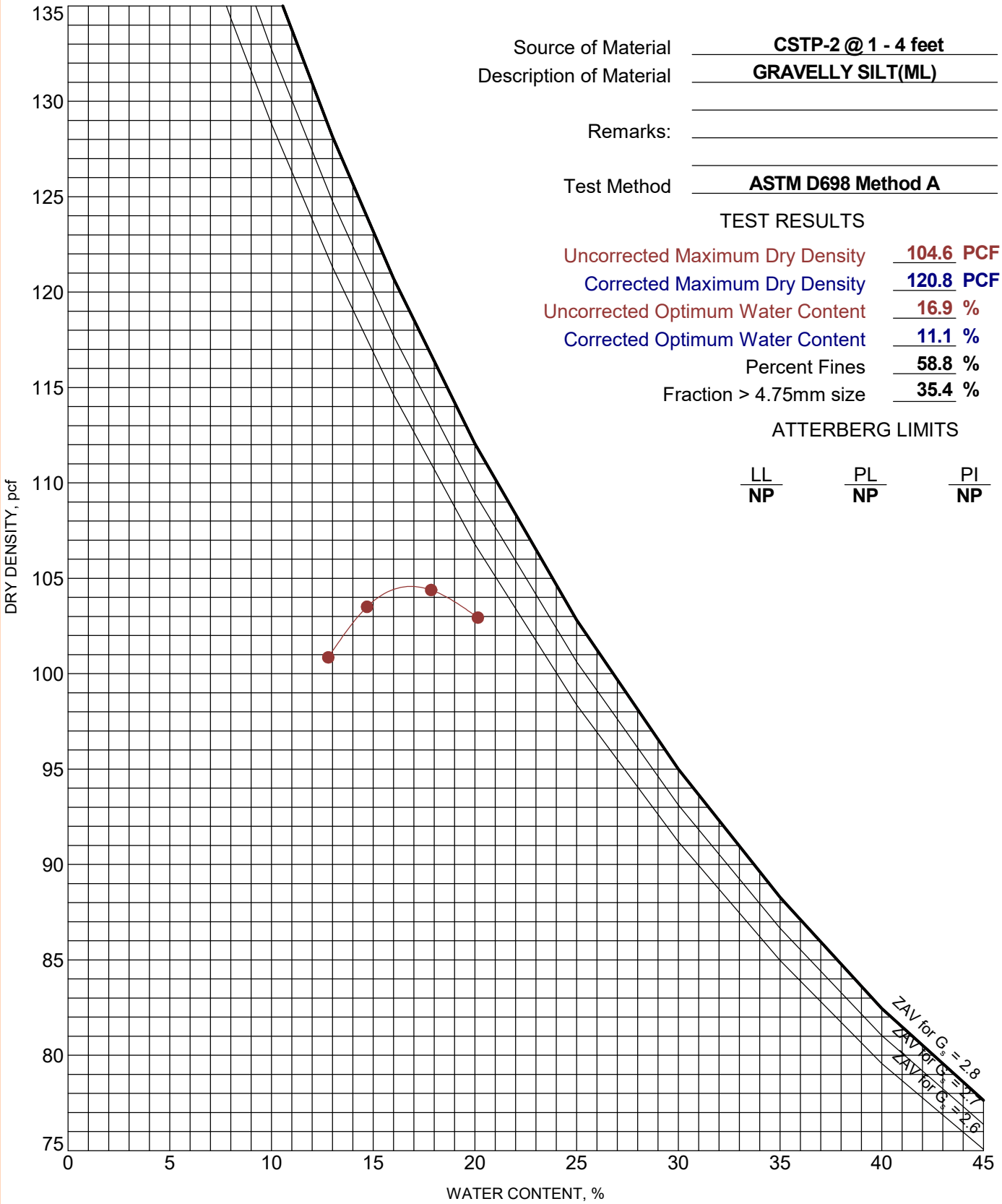
CLIENT: Stantec Consulting Services Inc
Rochester, NY

LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. COMPACTION - V2 J5205161 CIDER SOLAR CHECKED OUT- GEN (11-30-2020).GPJ TERRACON_DATATEMPLATE.GDT 12/9/20

Exhibit B-007

MOISTURE-DENSITY RELATIONSHIP

ASTM D698/D1557



Source of Material	**CSTP-2 @ 1 - 4 feet**
Description of Material	**GRAVELLY SILT(ML)**
Remarks:	
Test Method	**ASTM D698 Method A**

TEST RESULTS

Uncorrected Maximum Dry Density	**104.6**	**PCF**
Corrected Maximum Dry Density	**120.8**	**PCF**
Uncorrected Optimum Water Content	**16.9**	**%**
Corrected Optimum Water Content	**11.1**	**%**
Percent Fines	**58.8**	**%**
Fraction > 4.75mm size	**35.4**	**%**

ATTERBERG LIMITS

LL	PL	PI
NP	**NP**	**NP**

PROJECT: Cider Solar - Genesee County NY

PROJECT NUMBER: J5205161

SITE: Fisher Rd
Oakfield, NY

Terracon
15 Marway Cir, Ste 2B
Rochester, NY

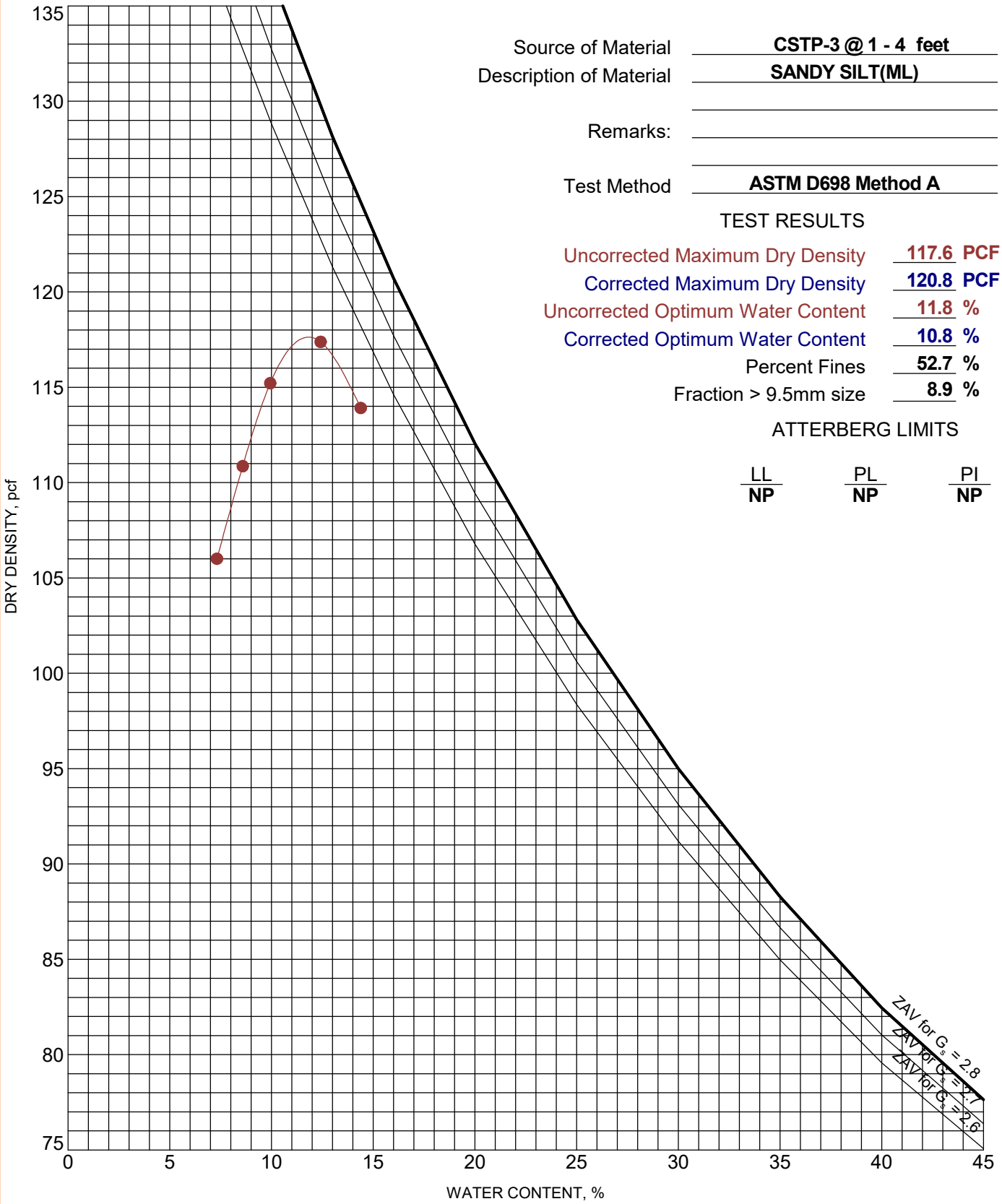
CLIENT: Stantec Consulting Services Inc
Rochester, NY

LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. COMPACTION - V2 J5205161 CIDER SOLAR CHECKED OUT- GEN (11-30-2020).GPJ TERRACON_DATATEMPLATE.GDT 12/9/20

Exhibit B-008

MOISTURE-DENSITY RELATIONSHIP

ASTM D698/D1557



Source of Material	**CSTP-3 @ 1 - 4 feet**
Description of Material	**SANDY SILT(ML)**
Remarks:	
Test Method	**ASTM D698 Method A**

TEST RESULTS

Uncorrected Maximum Dry Density	**117.6**	**PCF**
Corrected Maximum Dry Density	**120.8**	**PCF**
Uncorrected Optimum Water Content	**11.8**	**%**
Corrected Optimum Water Content	**10.8**	**%**
Percent Fines	**52.7**	**%**
Fraction > 9.5mm size	**8.9**	**%**

ATTERBERG LIMITS

LL	PL	PI
NP	**NP**	**NP**

PROJECT: Cider Solar - Genesee County NY

PROJECT NUMBER: J5205161

SITE: Fisher Rd
Oakfield, NY

Terracon
15 Marway Cir, Ste 2B
Rochester, NY

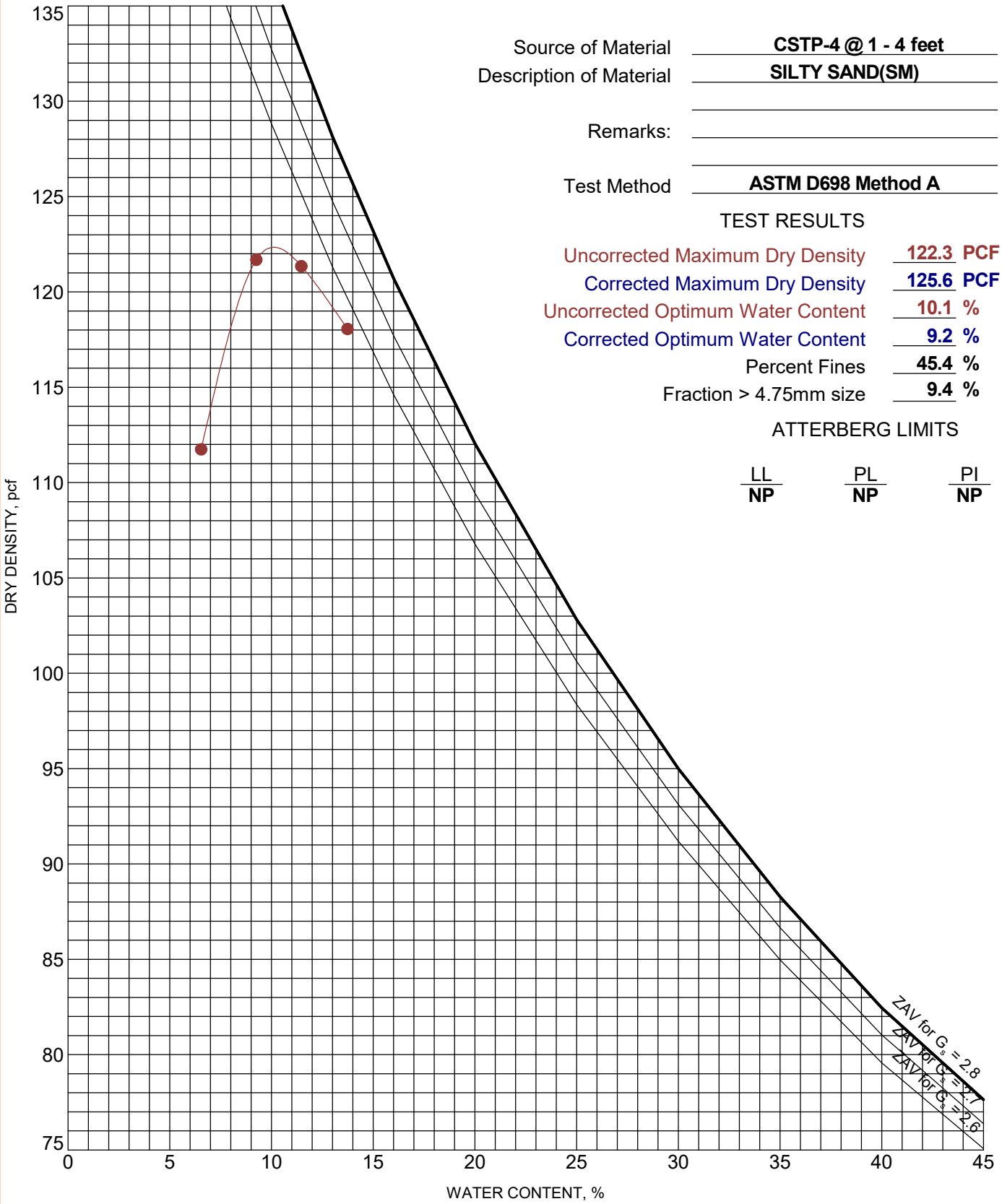
CLIENT: Stantec Consulting Services Inc
Rochester, NY

LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. COMPACTION - V2 J5205161 CIDER SOLAR CHECKED OUT- GEN (11-30-2020).GPJ TERRACON_DATATEMPLATE.GDT 12/9/20

Exhibit B-009

MOISTURE-DENSITY RELATIONSHIP

ASTM D698/D1557



Source of Material	**CSTP-4 @ 1 - 4 feet**
Description of Material	**SILTY SAND(SM)**
Remarks:	
Test Method	**ASTM D698 Method A**

TEST RESULTS

Uncorrected Maximum Dry Density	**122.3**	**PCF**
Corrected Maximum Dry Density	**125.6**	**PCF**
Uncorrected Optimum Water Content	**10.1**	**%**
Corrected Optimum Water Content	**9.2**	**%**
Percent Fines	**45.4**	**%**
Fraction > 4.75mm size	**9.4**	**%**

ATTERBERG LIMITS

LL	PL	PI
NP	**NP**	**NP**

PROJECT: Cider Solar - Genesee County NY

PROJECT NUMBER: J5205161

SITE: Fisher Rd
Oakfield, NY

Terracon
15 Marway Cir, Ste 2B
Rochester, NY

CLIENT: Stantec Consulting Services Inc
Rochester, NY

LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. COMPACTION - V2 J5205161 CIDER SOLAR CHECKED OUT- GEN (11-30-2020).GPJ TERRACON_DATATEMPLATE.GDT 12/9/20

Exhibit B-010

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

Terracon GeoReport

Client
Stantec Consulting Services Inc
Rochester, NY

Project
Cider Solar - Genesee County NY

Sample Submitted By: Terracon (J5) **Date Received:** 11/30/2020 **Lab No.: 20-1245**

Results of Corrosion Analysis

Sample Number	--	--
Sample Location	CSTP-2	CSTP-4
Sample Depth (ft.)	1.0-4.0	1.0-4.0
pH Analysis, ASTM G 51	8.31	7.83
Water Soluble Sulfate (SO4), ASTM C 1580 (ppm)	127	43
Sulfides, AWWA 4500-S D, (mg/kg)	Nil	Nil
Chlorides, ASTM D 512, (ppm)	45	45
Red-Ox, ASTM G 200, (mV)	+685	+689
Total Salts, AWWA 2540, (mg/kg)	1294	615
Resistivity (Saturated), ASTM G 187, (ohm-cm)	1541	5729

Analyzed By: Trisha Campo
Chemist

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

December 18, 2020

Terracon Consultants – NY, Inc.
15 Marway Circle, Suite 2B
Rochester, New York 14624
Attn: Kyle P. Lemcke, E.I.T.

Re: Thermal Analysis of Native Soil Samples
Cider Solar – Genesee County, NY (PO No. J5205161)

The following is the report of thermal dryout characterization tests conducted on the two (2) soil samples from the referenced project sent to our laboratory.

Thermal Resistivity Tests: The samples were tested at the higher of either the optimum or as received moisture content and 85% of the maximum dry density ***provided by Terracon.*** 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 and 2.**

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

Sample ID	Description (Terracon)	Thermal Resistivity (°C-cm/W)		Moisture Content (%)	Dry Density (lb/ft^3)
		Wet	Dry		
CCSB-1 @ 1'-4'	Silty sand with gravel	55	115	7	114
CSTP-1 @ 1'-4'	Silty sand with gravel	54	140	12	112

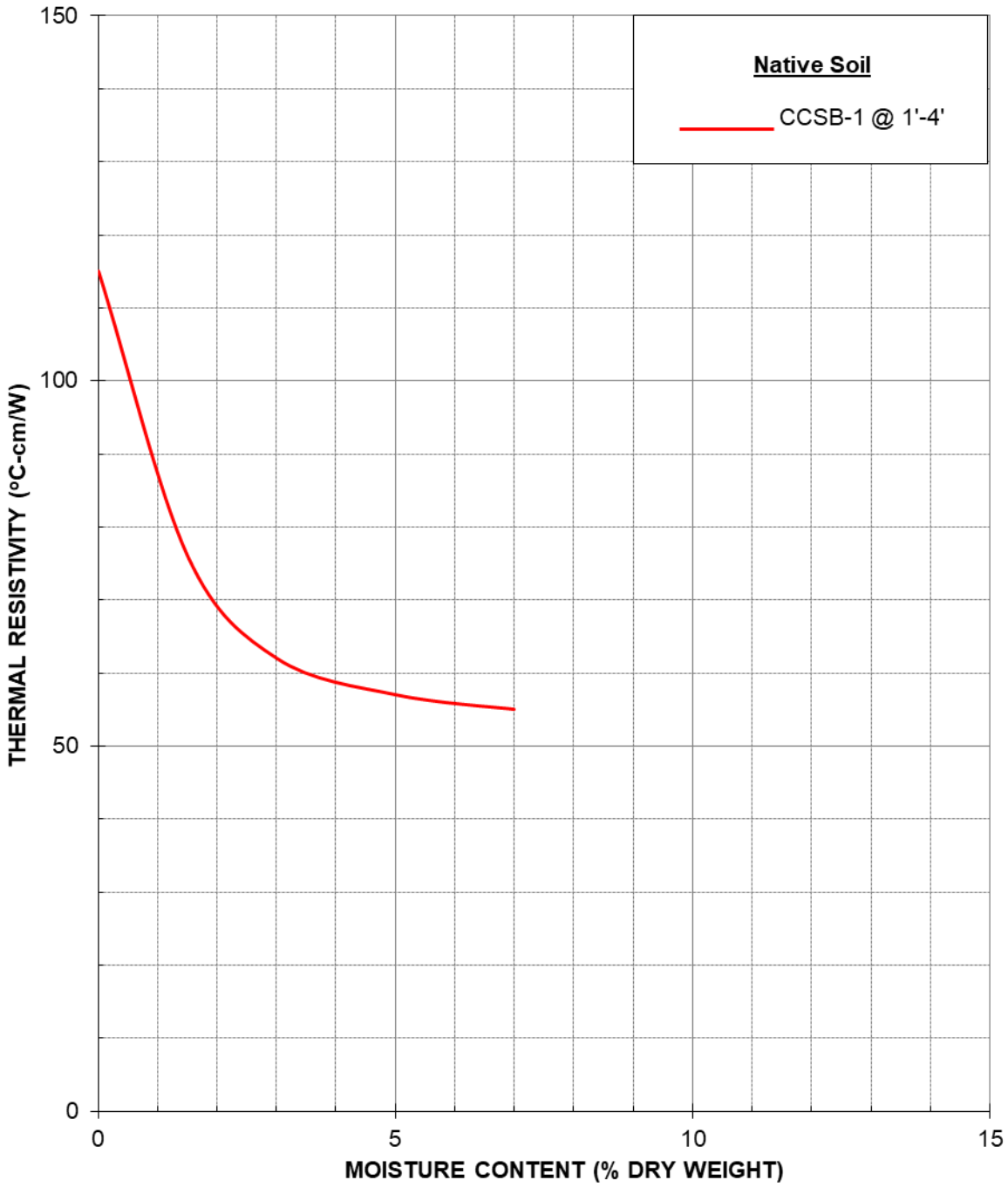
Comments: The thermal characteristic depicted in the dryout curves apply for the samples at their respective test dry density.

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

Geotherm USA

Deepak Parmar

THERMAL DRYOUT CURVE

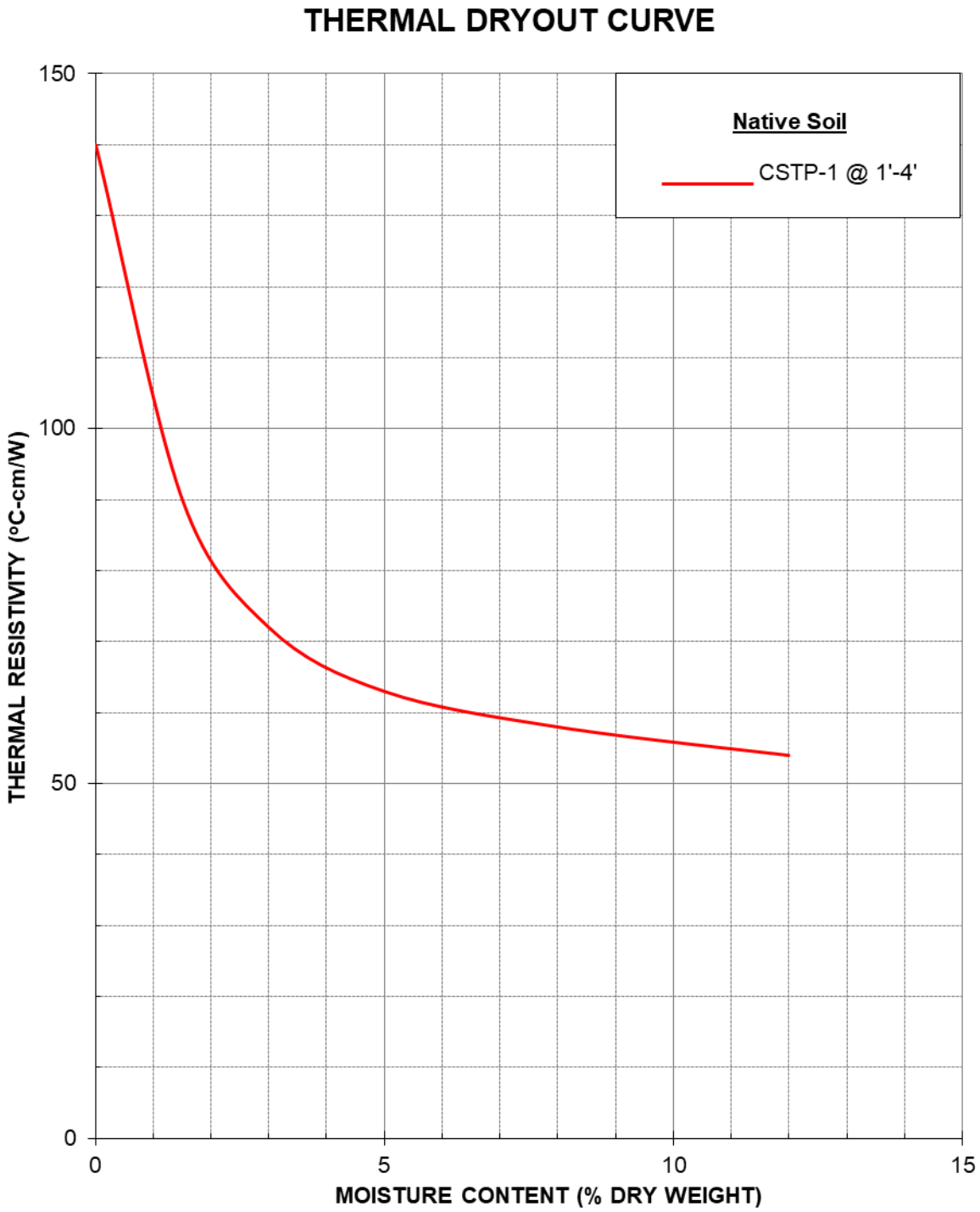


Terracon Consultants – NY, Inc. (PO No. J5205161)

Thermal Analysis of Native Soil

Cider Solar – Genesee County, NY

December 2020 **Figure 1**



Terracon Consultants – NY, Inc. (PO No. J5205161)

Thermal Analysis of Native Soil

Cider Solar – Genesee County, NY

December 2020 **Figure 2**

APPENDIX C – FIELD SOIL ELECTRICAL RESISTIVITY

Contents:

Note: All attachments are one page unless noted above.

FIELD SOIL ELCTRICTRICAL RESISITIVITY TEST LOCATIONS

Cider Solar Site ■ Genesee County, NY
Terracon Project No. J5205161

Terracon GeoReport

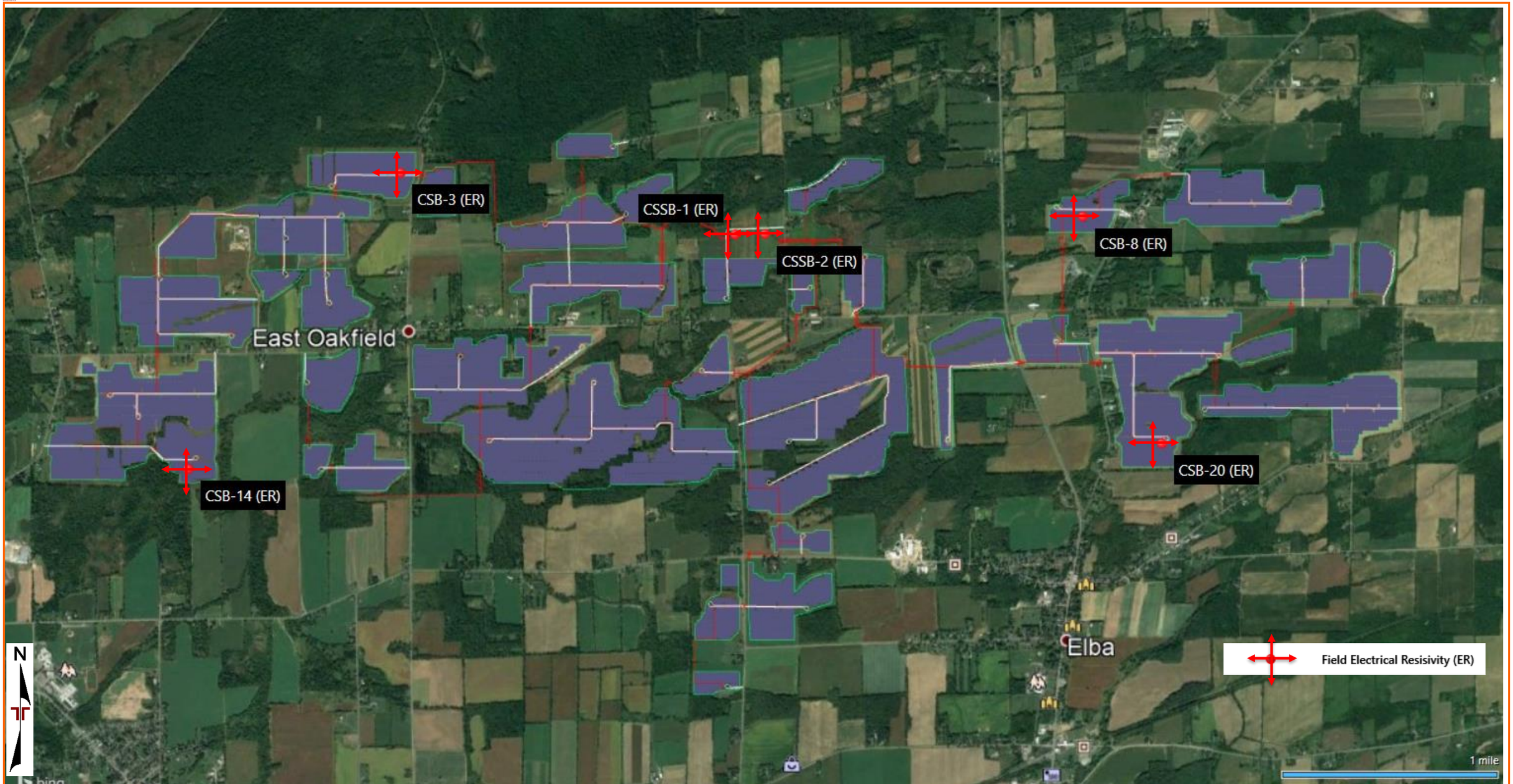


DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

MAP PROVIDED BY USGS

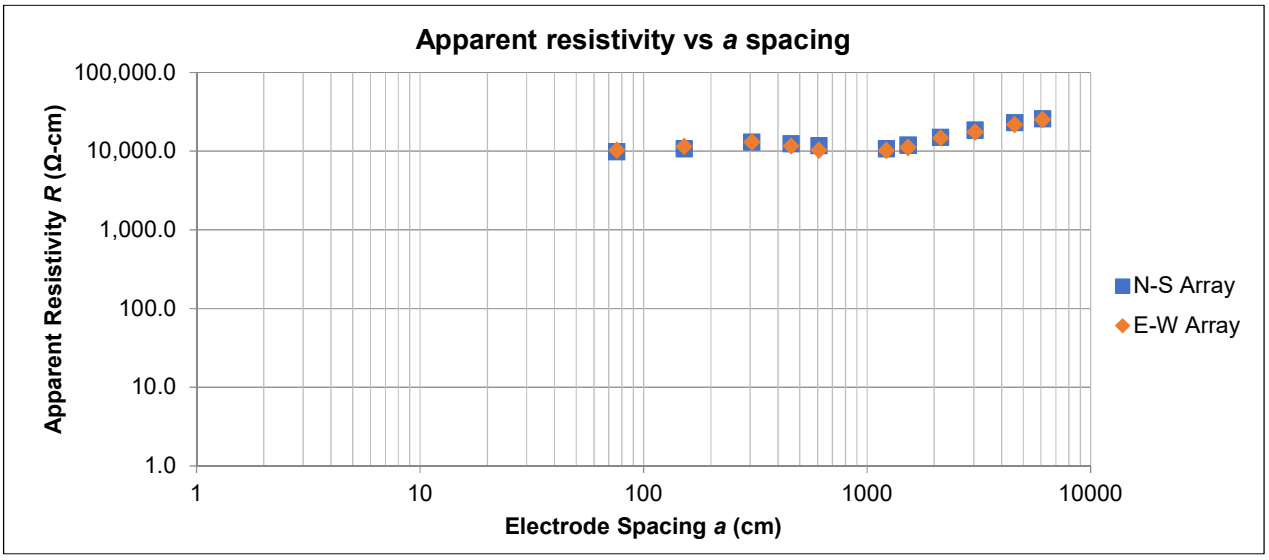
Exhibit C-001

FIELD ELECTRICAL RESISTIVITY TEST DATA
Proposed Cider Solar ■ Genesee County, New York
Terracon Project No.J5205161

Array Loc.	**CSSB-1** (43.1045^0, -78.2153^0)		
Instrument	Mini-Res Resistivity Meter	**Weather**	Sunny, 60 degrees Fahrenheit
Serial #	SN-306	**Ground Cond.**	Moist
Cal. Check	April 19, 2021	**Tested By**	Tyler Wooden & ChrisAnne Ross
Test Date	November 20, 2020	**Method**	Wenner 4-pin (ASTM G57-06 (2012); IEEE 81-2012)
Notes & Conflicts	Open grass field		

Apparent resistivity ρ is calculated as : $$\rho = \frac{4\pi aR}{1 + \frac{2a}{\sqrt{a^2+4b^2}} - \frac{a}{\sqrt{a^2+b^2}}}$$

Electrode Spacing *a*		Electrode Depth *b*		N-S Test		E-W Test	
(feet)	(centimeters)	(inches)	(centimeters)	Measured Resistance *R*	Apparent Resistivity ρ	Measured Resistance *R*	Apparent Resistivity ρ
				Ω	(Ω-cm)	Ω	(Ω-cm)
2.5	76	6	15	19.20	9760	20.20	10270
5	152	6	15	10.99	10670	11.79	11450
10	305	12	30	6.68	13020	6.69	13040
15	457	12	30	4.31	12450	4.02	11620
20	610	12	30	3.04	11680	2.67	10280
40	1219	12	30	1.40	10730	1.33	10170
50	1524	12	30	1.25	11950	1.16	11140
70	2134	12	30	1.11	14930	1.10	14690
100	3048	12	30	0.97	18550	0.91	17480
150	4572	12	30	0.80	23000	0.76	21790
200	6096	12	30	0.67	25790	0.66	25260



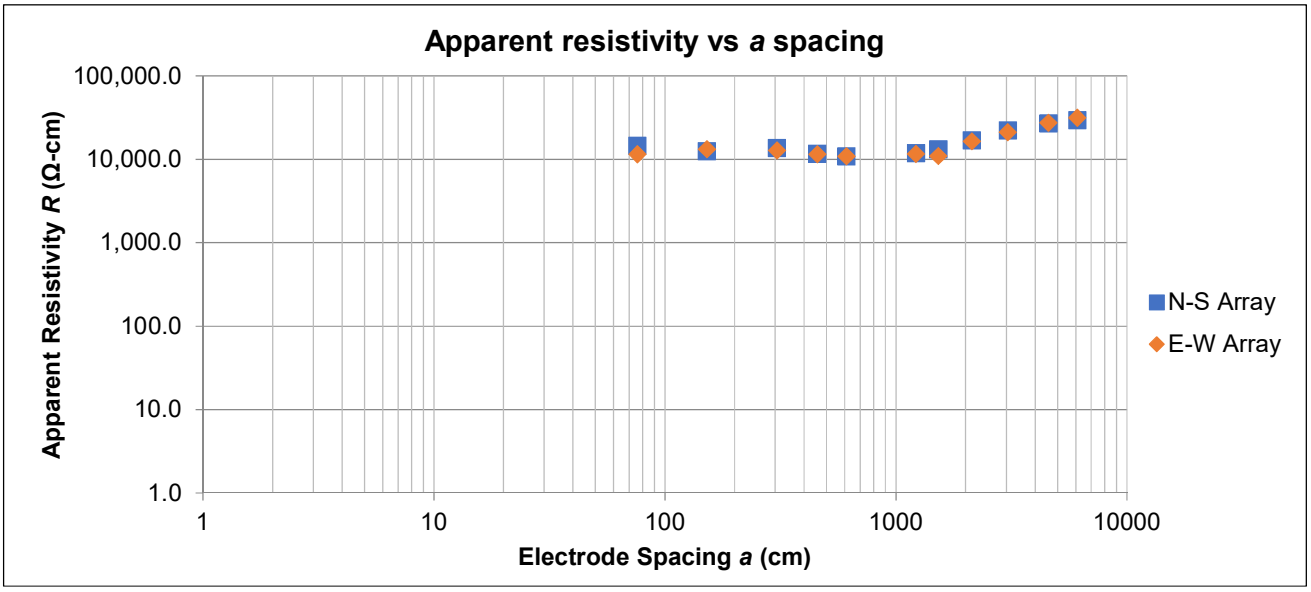
FIELD ELECTRICAL RESISTIVITY TEST DATA

Proposed Cider Solar ■ Genesee County, New York
November 20, 2020 ■ Terracon Project No.J5205161

Array Loc.	**CSSB-2** (43.1022^0, -78.2156^0)		
Instrument	Mini-Res Resistivity Meter	**Weather**	Sunny, 60 degrees Fahrenheit
Serial #	SN-306	**Ground Cond.**	Moist
Cal. Check	April 19, 2021	**Tested By**	Tyler Wooden & ChrisAnne Ross
Test Date	November 20, 2020	**Method**	Wenner 4-pin (ASTM G57-06 (2012); IEEE 81-2012)
Notes & Conflicts	Open grass field		

Apparent resistivity ρ is calculated as : $\rho = \dfrac{4\pi aR}{1 + \dfrac{2a}{\sqrt{a^2+4b^2}} - \dfrac{a}{\sqrt{a^2+b^2}}}$

Electrode Spacing *a*		Electrode Depth *b*		N-S Test		E-W Test	
(feet)	(centimeters)	(inches)	(centimeters)	Measured Resistance *R*	Apparent Resistivity ρ	Measured Resistance *R*	Apparent Resistivity ρ
				Ω	(Ω-cm)	Ω	(Ω-cm)
2.5	76	6	15	28.70	14590	22.60	11490
5	152	6	15	12.87	12500	13.57	13170
10	305	12	30	7.01	13650	6.54	12730
15	457	12	30	4.05	11700	3.97	11480
20	610	12	30	2.82	10850	2.82	10860
40	1219	12	30	1.55	11880	1.51	11610
50	1524	12	30	1.38	13210	1.14	10930
70	2134	12	30	1.25	16830	1.23	16480
100	3048	12	30	1.15	22090	1.11	21200
150	4572	12	30	0.94	27050	0.95	27340
200	6096	12	30	0.77	29430	0.82	31420



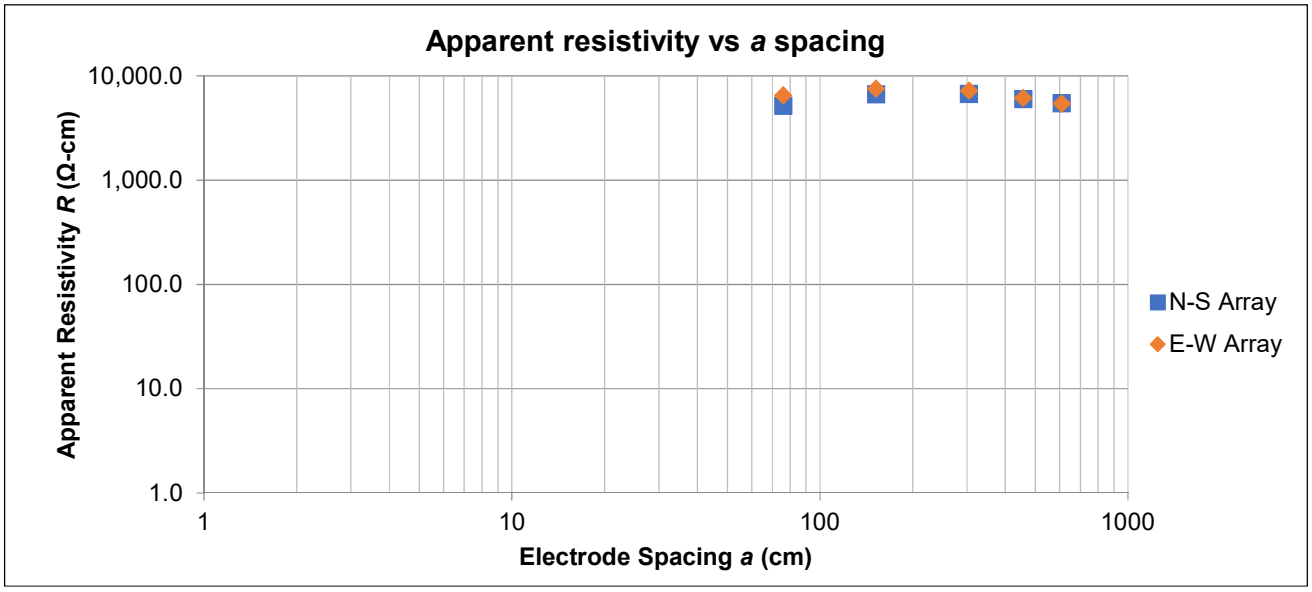
FIELD ELECTRICAL RESISTIVITY TEST DATA

Proposed Cider Solar ■ Genesee County, New York
November 20, 2020 ■ Terracon Project No.J5205161

Array Loc.	**CSB-3** (43.1102^0, -78.2470^0)		
Instrument	Mini-Res Resistivity Meter	**Weather**	Sunny, 60 degrees Fahrenheit
Serial #	SN-306	**Ground Cond.**	Moist
Cal. Check	April 19, 2021	**Tested By**	Tyler Wooden & ChrisAnne Ross
Test Date	November 20, 2020	**Method**	Wenner 4-pin (ASTM G57-06 (2012); IEEE 81-2012)
Notes & Conflicts	Corn Field		

Apparent resistivity ρ is calculated as : $\rho = \dfrac{4\pi aR}{1 + \dfrac{2a}{\sqrt{a^2+4b^2}} - \dfrac{a}{\sqrt{a^2+b^2}}}$

Electrode Spacing *a*		Electrode Depth *b*		N-S Test		E-W Test	
(feet)	(centimeters)	(inches)	(centimeters)	Measured Resistance *R*	Apparent Resistivity ρ	Measured Resistance *R*	Apparent Resistivity ρ
				Ω	(Ω-cm)	Ω	(Ω-cm)
2.5	76	6	15	10.21	5190	12.77	6490
5	152	6	15	6.87	6670	7.75	7530
10	305	12	30	3.43	6690	3.70	7200
15	457	12	30	2.08	6010	2.12	6130
20	610	12	30	1.42	5460	1.41	5430



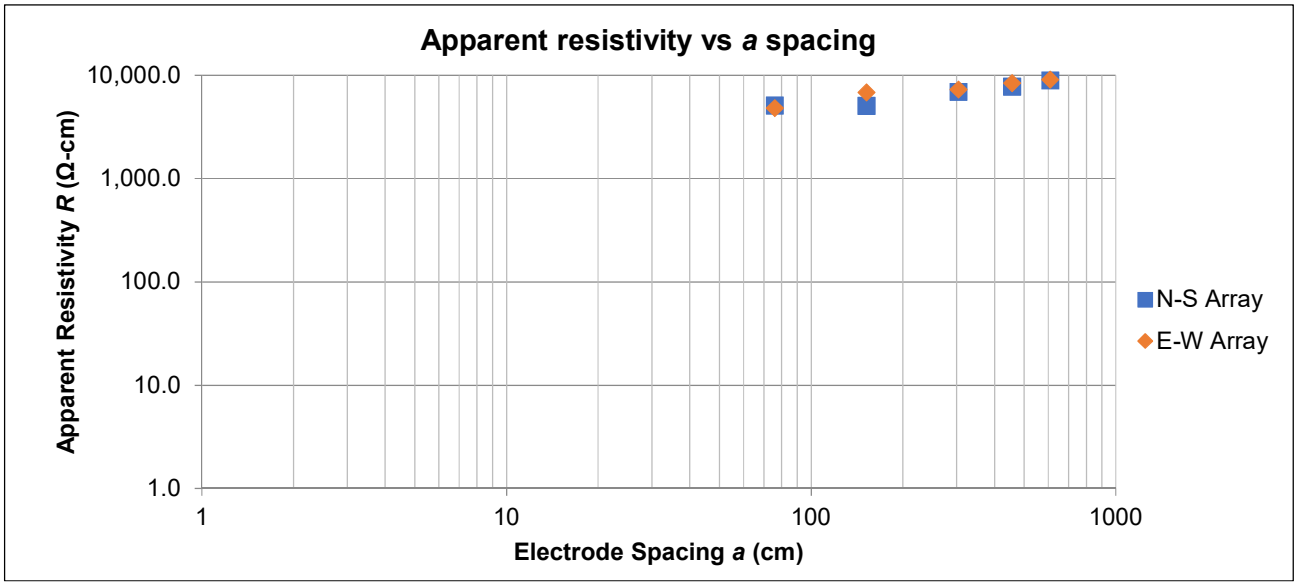
FIELD ELECTRICAL RESISTIVITY TEST DATA

Proposed Cider Solar ■ Genesee County, New York
November 20, 2020 ■ Terracon Project No.J5205161

Array Loc.	**CSB-8** (43.1059^0, -78.1854^0)		
Instrument	Mini-Res Resistivity Meter	**Weather**	Sunny, 55 degrees Fahrenheit
Serial #	SN-306	**Ground Cond.**	Moist
Cal. Check	April 19, 2021	**Tested By**	Tyler Wooden & ChrisAnne Ross
Test Date	November 20, 2020	**Method**	Wenner 4-pin (ASTM G57-06 (2012); IEEE 81-2012)
Notes & Conflicts	Disked corn field		

Apparent resistivity ρ is calculated as : $\rho = \dfrac{4\pi a R}{1 + \dfrac{2a}{\sqrt{a^2+4b^2}} - \dfrac{a}{\sqrt{a^2+b^2}}}$

Electrode Spacing *a*		Electrode Depth *b*		N-S Test		E-W Test	
(feet)	(centimeters)	(inches)	(centimeters)	Measured Resistance *R*	Apparent Resistivity ρ	Measured Resistance *R*	Apparent Resistivity ρ
				Ω	(Ω-cm)	Ω	(Ω-cm)
2.5	76	6	15	10.06	5110	9.46	4810
5	152	6	15	5.22	5070	7.05	6850
10	305	12	30	3.56	6940	3.75	7310
15	457	12	30	2.69	7770	2.92	8450
20	610	12	30	2.31	8910	2.37	9110



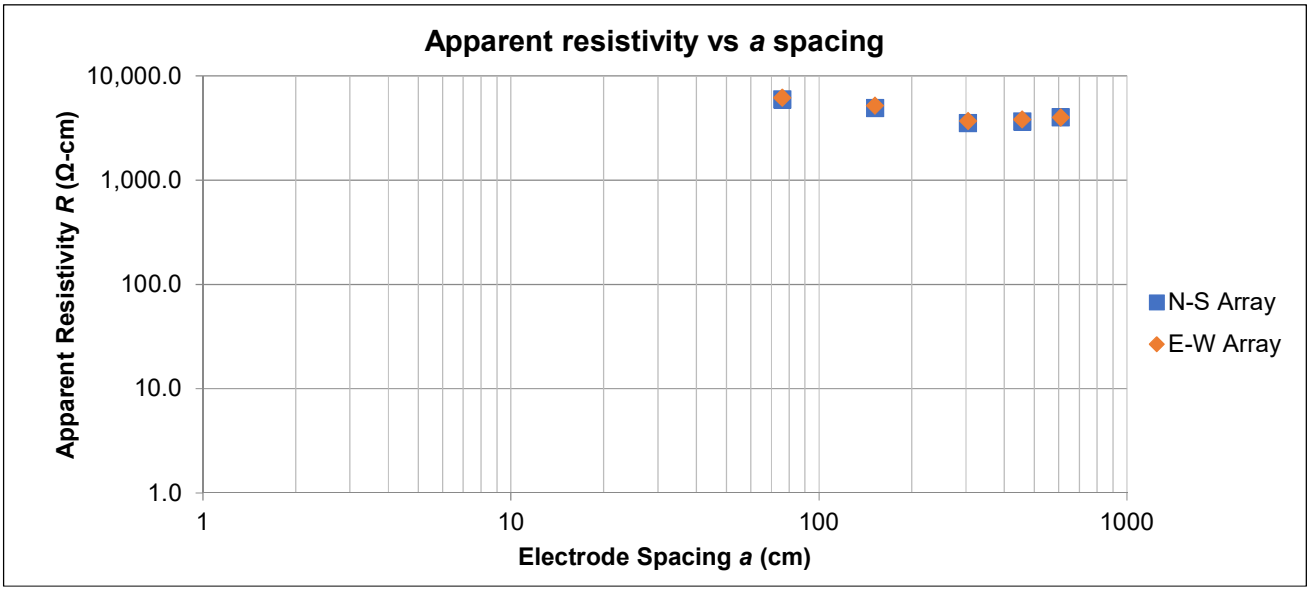
FIELD ELECTRICAL RESISTIVITY TEST DATA

Proposed Cider Solar ■ Genesee County, New York
November 20, 2020 ■ Terracon Project No.J5205161

Array Loc.	**CSB-14** (43.0889^0, -78.2674^0)		
Instrument	Mini-Res Resistivity Meter	**Weather**	Sunny, 60 degrees Fahrenheit
Serial #	SN-306	**Ground Cond.**	Moist
Cal. Check	April 19, 2021	**Tested By**	Tyler Wooden & ChrisAnne Ross
Test Date	November 20, 2020	**Method**	Wenner 4-pin (ASTM G57-06 (2012); IEEE 81-2012)
Notes & Conflicts	Cut Corn Field		

Apparent resistivity ρ is calculated as : $\rho = \dfrac{4\pi aR}{1 + \dfrac{2a}{\sqrt{a^2+4b^2}} - \dfrac{a}{\sqrt{a^2+b^2}}}$

Electrode Spacing *a*		Electrode Depth *b*		N-S Test		E-W Test	
(feet)	(centimeters)	(inches)	(centimeters)	Measured Resistance *R*	Apparent Resistivity ρ	Measured Resistance *R*	Apparent Resistivity ρ
				Ω	(Ω-cm)	Ω	(Ω-cm)
2.5	76	6	15	11.69	5940	12.13	6170
5	152	6	15	5.06	4910	5.33	5180
10	305	12	30	1.81	3520	1.89	3680
15	457	12	30	1.26	3640	1.32	3820
20	610	12	30	1.04	4010	1.04	4000



FIELD ELECTRICAL RESISTIVITY TEST DATA

Proposed Cider Solar ■ Genesee County, New York
November 20, 2020 ■ Terracon Project No.J5205161

Array Loc.	**CSB-20** (43.0906^0, -78.1783^0)		
Instrument	Mini-Res Resistivity Meter	**Weather**	Sunny, 55 degrees Fahrenheit
Serial #	SN-306	**Ground Cond.**	Moist
Cal. Check	April 19, 2021	**Tested By**	Tyler Wooden & ChrisAnne Ross
Test Date	November 20, 2020	**Method**	Wenner 4-pin (ASTM G57-06 (2012); IEEE 81-2012)
Notes & Conflicts	Disked corn field		

Apparent resistivity ρ is calculated as : $\rho = \dfrac{4\pi a R}{1 + \dfrac{2a}{\sqrt{a^2+4b^2}} - \dfrac{a}{\sqrt{a^2+b^2}}}$

Electrode Spacing *a*		Electrode Depth *b*		N-S Test		E-W Test	
(feet)	(centimeters)	(inches)	(centimeters)	Measured Resistance *R*	Apparent Resistivity ρ	Measured Resistance *R*	Apparent Resistivity ρ
				Ω	(Ω-cm)	Ω	(Ω-cm)
2.5	76	6	15	23.90	12150	24.90	12650
5	152	6	15	11.36	11030	7.03	6820
10	305	12	30	4.51	8780	4.65	9050
15	457	12	30	2.74	7940	2.84	8210
20	610	12	30	2.17	8340	2.10	8090