GEOTECHNICAL INVESTIGATION REPORT

PRELIMINARY

EIGHT POINT WIND FARM
WIND TURBINES
AND
TRANSMISSION LINE
STEUBEN COUNTY
NEW YORK

PREPARED FOR

EIGHT POINT WIND LLC

700 UNIVERSE BLVD.
JUNO BEACH, FL 33408

Kenney Geotechnical Services

PREPARED BY:

KENNEY GEOTECHNICAL ENGINEERING SERVICES PLLC

September 1, 2017

Revised October 26, 2017

STATE OF NEW YORK
CHRISTOPHER MEAGHER KENNEY
066949
LICENSED PROFESSIONAL ENGINEER

P.O. Box 117 Warners, NY, 13164, Phone (315)-638-2706, Fax (315)-638-1544, www.kenneygeotechnical.com

TABLE OF CONTENTS

P.O. Box 117, Warners, NY, 13164, Phone (315)-638-2706, Fax (315)-638-1544, www.kenneygeotechnical.com

INTRODUCTION

This report presents the findings of the geotechnical investigation performed at accessible wind turbine and transmission line locations during the first mobilization for the proposed Eight Points Wind Farm and Transmission Line. This report presents an analysis of the available geotechnical data and recommendations for the proposed construction. This report has been prepared for NextEra Energy Resources, Inc. (NextEra).

No environmental services are included in this study. No conclusions have been drawn regarding environmental conditions of the site, potential contaminants, potential special treatment or disposal of site materials, or other environmental considerations.

AUTHORIZATION

Our services for this project were authorized by Eight Point Wind LLC Purchase Order 2000239122 dated May 12, 2017. Our scope of work was developed by Sargent and Lundy LLC in the document entitled "Eight Point Wind Substation Geotechnical Investigation Work & Specification Detail", Revision A, dated July 13, 2017.

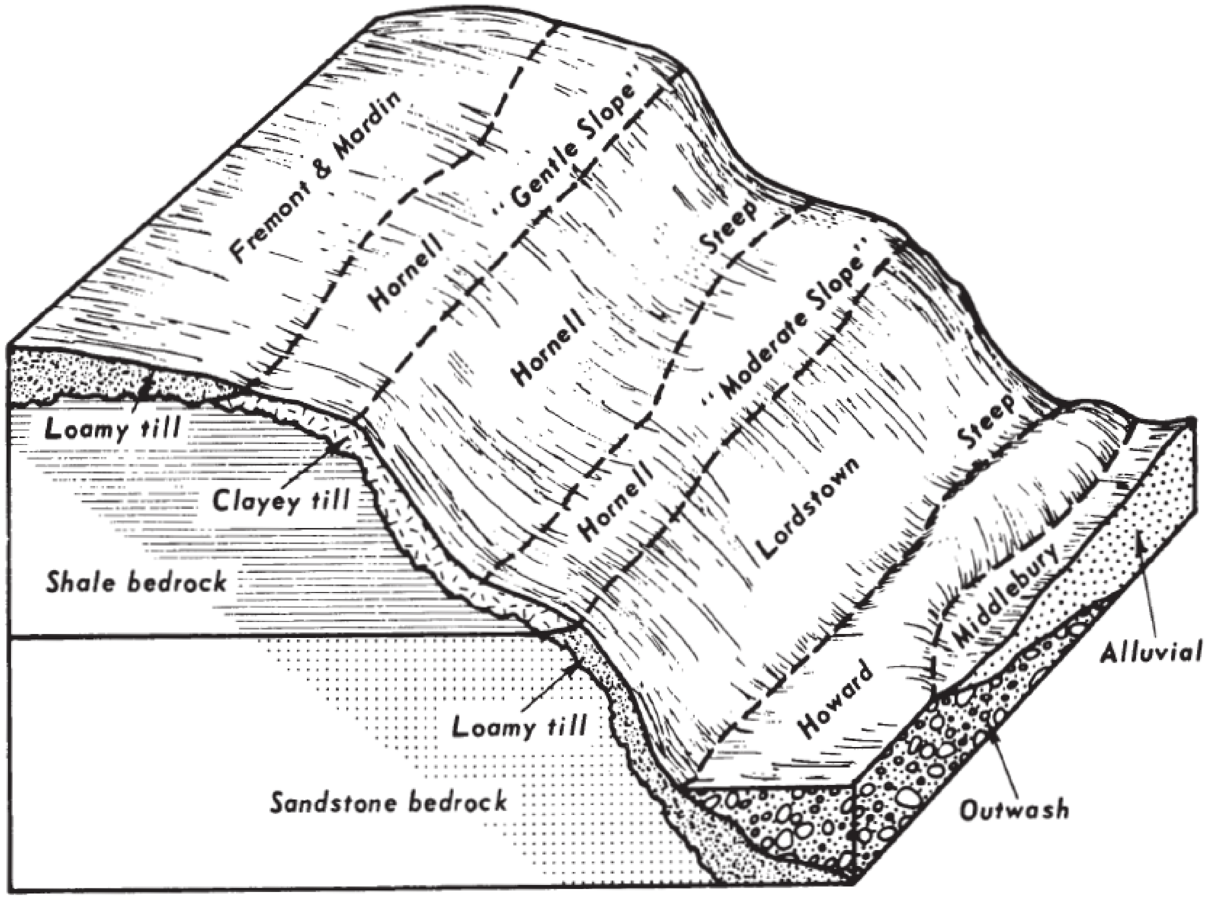
PROJECT DESCRIPTION

The proposed wind farm and transmission line will be constructed over a large portion of Steuben County, New York stretching from the Pennsylvania state line in the south to Hornell in the north (see Figure 1). It is our understanding that the proposed project will consist of twenty-seven 3.43MW GE wind turbine generators, four 2.3 MW GE wind turbine generators, and a transmission line approximately 16.5 miles in length. We further understand that the wind turbine foundations are assumed to consist of typical spread (inverted T) foundations. Transmission poles are assumed to be steel monopole structures, direct-embedded, with an estimated butt diameter of 36 to 60 inches typical. Tangent structures will utilize braced post assemblies in a triangular configuration. Light angle un-guyed structures will have up to an eight degree line deflection. Medium angle structures will have line deflections of ten to forty degree and will be guyed on bisector with one or two guys per phase and on for the shield wires. Dead ends with a deflection angle greater than 40 degrees will be guyed with two guys per phase and one per shield wire.

AREA PHYSIOGRAPHY

The project site is located within south central part of New York State in the glaciated portion of the Allegheny Plateau physiographic section of the Appalachian Plateau physiographic province as seen in Appendix A. Major topographic and geologic features in this area were formed during the last glacial advance and retreat, which ended approximately 12,000 years ago. The site is located just south of the most recent glacial maximum advance.

The project site is a hilly highland area dissected by creeks and rivers. Publically available information suggest soils on most of the uplands formed in glacial till. The valley sections are primarily glacial outwash or alluvial sediments. The following section from the USDA Soil Survey of Steuben County provides a good generalization of typical subsurface conditions.



P.O. Box 117, Warners, NY, 13164, Phone (315)-638-2706, Fax (315)-638-1544, www.kenneygeotechnical.com

The proposed wind turbines will be constructed on upland areas. The transmission line will encounter a wide variation of soil types as it crosses upland areas, slopes, and valley bottoms.

GEOLOGIC CONDITIONS

Publically available geologic mapping suggests that Oswayo and Cattaraugus formation shale, siltstone and sandstone underlies soils at the site. The bedrock may be located within close proximity to the ground surface in many upland areas. The shale and sandstone is typically horizontally bedded with near-vertical orthogonal stress fractures.

The transition to bedrock from the overlying glacial till is chaotic in the project area. During glaciation large sections of rock were moved short distances or not at all but were detached from the bedrock below. When they weathered, they settled and tilted. Sometimes just the layers that are chemically weaker weather (iron rich, mica rich, feldspars or layers that are cemented with calcite). The rock pops open along bedding planes and clay rich minerals swell, mechanically breaking down the rock. This allows more surface area for chemical weathering creating void and allowing sediment from above to wash into the open voids over the past 30-40 thousand years. The result is that soil zones are encountered below what appears to be solid bedrock.

Groundwater aquifers are located in the glacial outwash in the valley areas. Upland areas typically do not have a true water table above a depth of approximately 70 or 80 feet. However upland areas are subject to perched groundwater conditions during wetter periods as infiltrating water becomes trapped within the soil above undisturbed clayey glacial till and bedrock.

Oil and natural gas wells are located in the vicinity of the project site. The local oil and gas wells typically draw from bedrock formations located 4000 to 5000 feet below the ground surface.

SUBSURFACE EXPLORATION

The subsurface exploration program for this phase of investigation was limited to those sites that could be accessed without clearing trees. A total of 24 borings were advanced at wind turbine locations and 9 borings were advanced at transmission line structures for this preliminary report. Table 1 presents a summary of the borings performed to date. The scope and specifications for the drilling program were established by NextEra Energy and Sargent & Lundy, the wind turbine and transmission line designers, respectively. The test boring location, depth, sampling,

P.O. Box 117, Warners, NY, 13164, Phone (315)-638-2706, Fax (315)-638-1544, www.kenneygeotechnical.com

and refusal criteria are summarized in Table 2.

The test borings were advanced to depths of up to 42.1 feet using CME 550 and Geoprobe 7822DT all-terrain drill rigs equipped with an automatic sampling hammer, hollow stem augers, and NQ double-tube diamond core barrels. Standard penetration testing (ASTM D1586) was performed during advancement of the augers through overburden. Coring was performed after auger refusal occurred.

Soil samples obtained during the subsurface investigation were classified by a Geotechnical Engineer using the Unified Soil Classification System. Boring logs documenting the subsurface conditions encountered are attached. The boring logs and related information depict subsurface conditions only at the specific locations and times indicated. Subsurface conditions and water levels at other locations may differ from conditions at the locations where sampling was conducted. The passage of time also may result in changes in the conditions interpreted to exist at the locations where sampling was performed.

SUBSURFACE CONDITIONS ENCOUNTERED

The following interpretation of subsurface conditions is based on our review of the recovered samples, the boring logs, drilling observations, laboratory testing results, and our professional experience

The four primary strata encountered at wind turbine locations during the subsurface investigation included:

- Stratum A- Glaciofluvial Soil
- Stratum B – Glacial Till
- Stratum C – Transition Zone Rock, and
- Stratum D – Bedrock

Stratum A – Glaciofluvial Soil was encountered at the ground surface at some of the transmission line locations and extended to depths of up to 6 feet. This stratum was primarily composed of loose to medium dense silty sand with gravel. Standard Penetration Testing "N" values in this stratum were typically less than 20 blows per foot.

Stratum B – Glacial Till was typically encountered from the ground surface to depths of up to 25 feet and consisted of very stiff to hard silt and lean clay with sand, gravel, cobbles and boulders. With the exception of the uppermost two feet, which was softened by weathering, Standard Penetration Testing "N" values in this stratum typically ranged between 20 to 100 blows per foot.

Stratum C – Transition Zone Rock was encountered at the interface of Strata B and D. This stratum consisted of bedrock that had been altered by glaciation and/or weathering. In some areas the Transition Zone Rock consisted of large slabs of detached competent bedrock with interbedded soil zones. In other areas the Transition Zone Rock consisted of highly weathered bedrock. The detached bedrock typically consisted of the local sandstone and siltstone. The interbedded soil zones typically consisted of red clay with angular green sandstone fragments the size of gravel. The red clay was derived from the weathering of the local red shale. This stratum typically had to be cored for sample recovery. At locations where augers could penetrate into this stratum the Standard Penetration Testing "N" values typically exceeded 100 blow per foot.

Stratum D- Bedrock was encountered below Stratum C. The bedrock encountered consisted of fresh sandstone, siltstone, conglomerate, shale and slate. This stratum was sampled by coring. The recovered bedrock core were typically fresh, medium hard to hard rock with horizontal bedding planes. Photographs of the rock cores are included in the Appendix.

GROUNDWATER CONDITIONS ENCOUNTERED

Groundwater observations during this phase of investigation were limited to water measurement in the augers. Piezometer installation, and long term groundwater observations, were not authorized at this time.

Water was present in the borehole following drilling at some of the locations where rock coring was performed. However, water was introduced into the borehole during coring operations and it is not possible to distinguish between water remaining from coring operations and possible perched groundwater at the transition zone/bedrock interface.

It if our opinion that a true groundwater table was not encountered during the subsurface investigation. Available public data indicates the groundwater table is located in bedrock approximately 70 feet or more below the ground surface in the project area. The depth of groundwater will vary with changes in precipitation patterns and other factors. No long term groundwater monitoring was performed as part of this study.

Glacial till samples recovered during drilling typically exhibited low moisture content and it did not appear that a perched groundwater table was present within the till at the time of drilling. However, the glacial till will have a low in-situ permeability and it is possible that water will collect in backfill surrounded by the till.

LABORATORY TESTING

Laboratory testing was performed upon samples obtained during the geotechnical investigation and included:

- Moisture content (ASTM D2166),
- Particle size analysis (ASTM D422),
- Compaction characteristics (ASTM D698 or ASTM D1557)
- Corrosion series (chloride, sulfate, and pH),
- Unconfined compressive strength (ASTM D2166))
- Atterberg limits (ASTM D4318), and
- Unconfined compressive strength and unit weight (ASTM D2928) for intact rock core specimens.

Test results are attached to this report.

SEISMIC CONDITIONS

The project site is located in an area of relatively low seismic activity. The USGS Seismic Hazards database indicates a 0.74% chance of a magnitude 5.0 earthquake occurring in the next 50 years in the project area. The site has a dense soil cover and will not provide significant amplification of seismic waves.

Geophysical surveys are part of the overall scope of services but were not authorized for this phase of the investigation and no site-specific shear wave velocity data is available. Based upon correlations with Standard Penetration Testing "N" values and New York State Building Code guidelines the available data suggests that **Site Class C** is appropriate**.** The estimated design spectral response acceleration parameters are $\mathbf{S_{DS} = .101g}$ and $\mathbf{S_{D1} = .060g}$. Liquefaction, surface rupture from faulting or lateral spreading is estimated to have a low probability of occurrence given the soil conditions encountered and typical regional seismicity.

SOIL CHEMISTRY

Laboratory corrosion series testing was performed on six site samples. Results are as follows:

P.O. Box 117, Warners, NY, 13164, Phone (315)-638-2706, Fax (315)-638-1544, www.kenneygeotechnical.com

Boring	Depth	pH	Sulfates (ppm)	Chlorides (ppm)
T-4	2-4'	8.1	<50	<50
T-9	0-2'	6.2	<50	<50
T-18	4-6'	7	<50	<50
T-24	4-6'	6.7	<50	<50
T-29	2-4'	6.1	<50	<50
ALT-2	4-6'	5.8	<50	<100

In general, a pH of less than 3.5, a chloride concentration greater than 500 parts per million (ppm), or a sulfate concentration greater than 2000 ppm is considered to be indicative of a corrosive environment for most structures. Based on the test results it appears that standard Type I/II cement may be utilized on this project.

GEOTECHNICAL ANALYSIS

Overview

Based on the subsurface conditions encountered during the investigation performed to date, it appears that the primary geotechnical issues will be:

- Excavation of the glacial till, transition zone rock and bedrock;
- Possible deterioration of the glacial till and transition zone rock upon excavation and exposure to the elements and construction traffic.

The glacial till encountered in the area typically consists of a binder of hard, low-plasticity silty clay that encapsulates particles ranging in size from fine sand to boulders the size of automobiles. The transition zone rock appears to include large slabs of intact medium hard to hard bedrock with weathered seams that are infilled with soil.

The glacial till, transition zone rock and bedrock will provide high bearing strength and good short term excavation stability if left undisturbed. However, the strength of the glacial till and transition zone rock strata will deteriorate if they are allowed to saturate or if they are disturbed by over-excavation. The stability of slopes and excavations in these strata will decrease over time. Typically permanent slopes in the glacial till are graded no more steeply than 33% (18.4 degrees) unless they are reinforced.

P.O. Box 117, Warners, NY, 13164, Phone (315)-638-2706, Fax (315)-638-1544, www.kenneygeotechnical.com

Turbine Foundations

The available information suggests that the wind turbine foundations will be underlain by hard glacial till, transition zone rock with soil infill, and bedrock. It is therefore anticipated that the turbines can utilize a gravity shallow foundation system or a Patrick & Henderson Tensionless Pier (PHTP) foundation system. Design frost depth is four feet in the project area, and foundations must bear below this depth to prevent movement due to frost heave.

The glacial till typically provides high bearing strength and good short term excavation stability if it is left undisturbed. The glacial till contains a significant percentage of silt and clay and loses strength rapidly if saturated and subjected to dynamic loading such as that imparted by construction equipment.

Assuming the foundation excavations are properly managed during construction, a allowable bearing pressure of 5,000 pounds per square foot is appropriate for shallow foundations bearing on undisturbed glacial till. An allowable bearing pressure of 6,500 pounds per square foot is estimated for foundations bearing on Stratum C-Transition Zone Rock materials. An allowable bearing pressure of 10,000 pounds per square foot is estimated for foundations bearing on Stratum D – Bedrock. The turbine foundations excavations must be reviewed by geotechnical personnel to verify these allowable bearing pressures are appropriate during construction.

Settlement estimates will require more detailed information concerning turbine loading and will be prepared by others after the geotechnical investigation is completed. Based upon the borings performed to date, the following geotechnical parameters are suggested for preliminary turbine foundation design:

Stratum	Avg Thickness (ft)	Unit Weight (pcf)	Total Stress		Effective Stress		k (pci)	ε50	Allow. Skin Friction (ksf)	Kp
			ϕ	Cohesion c (psf)	ϕ '	c' (psf)				
Stratum B - Glacial Till	15	135	0	2500	34	300	1000	0.005	1	9
Stratum C - Transition Zone	30	140			32	2500	1000	0.005	6	18
Stratum D - Bedrock	n/a	145			36	3500	2000	0.004	10	32

Transmission Line Monopoles

Drilled shafts and direct embedment monopoles set in grout or concrete can be utilized to support the transmission line structures, although it will be necessary to core through boulders, detached rock slabs, and hard bedrock. It is assumed the drilled shafts will be constructed using temporary steel casing to support the drilled hole above competent rock. Loose material should be removed from the bottom of the drilled shaft prior to the placement of concrete. Dewatering should be performed prior to concrete placement if more than 2 feet of water accumulates in the bottom of the shaft. Concrete should be placed in the shafts the same working day that drilling is completed. A dropchute that extends at least 75% of the length of the drilled shaft should be utilized during concrete placement. The top of the fluid concrete placement must be maintained at least 3 feet above the bottom of the temporary casing as it is being extracted during concrete placement. Reinforcing cages should be supported at the ground surface until the concrete adequately hardens.

Suggested geotechnical design parameters for each of the transmission line sites is presented in a table attached to the end of this report.

The estimated parameters assume proper management of geomaterials during construction.

Access Roads and Earthwork

The glacial soils encountered contain significant percentages of silt and clay, may be saturated during wetter periods, and will be subjected to freeze-thaw cycles during the winter months. The design of unpaved access roads for this project will require careful consideration of these factors. The glacial till loses strength rapidly if saturated and subjected to dynamic loading such as that imparted by construction equipment. Freeze-thaw action will significantly deteriorate access road subgrades composed of glacial till. Construction access roads will deteriorate rapidly without a gravel base and geosynthetic reinforcement. Proper drainage of roads and excavations will be essential to maintaining their stability.

The glacial soils have generally acceptable engineering properties for the proposed construction. However, moisture control of soils will be critical during earthwork for this project. Glacial soils that are exposed to the elements will saturate and lose strength rapidly. Cut slopes in glacial soils will lose strength over time. Cut or fill slopes using the glacial till should be designed for a final grade no greater than 3H:1V (33%).

P.O. Box 117, Warners, NY, 13164, Phone (315)-638-2706, Fax (315)-638-1544, www.kenneygeotechnical.com

We anticipate that temporary excavations can be open cut. Excavation at the site will require large hydraulic excavators with rock teeth. Large hoe rams may be necessary to remove boulders and rock slabs. Smaller excavations in bedrock could require blasting.

Temporary excavation slopes must be evaluated by the Contractor's on-site Responsible Person. We anticipate soil above the groundwater table will be classified as Type B. Type B materials must be graded to slopes no greater than 1:1 (horizontal to vertical). The Contractors on-site Responsible Person should periodically review excavations for signs of movement or distress. Excavation sidewalls should be periodically raked to remove loose particles.

Earthwork must be performed using methods that will result in a stable excavations and fills. Typical temporary earthwork measures such as temporary drainage swales, stabilized haul roads, and the use of protective layers of crushed stone can be employed at this site. It is recommended that earthwork is observed by geotechnical personnel to ensure that all organic material is removed from beneath structures and roadways. Additional recommendations are as follows:

- Strip existing topsoil, pavement, roots and organics from all areas that will receive new construction to establish subgrade.
- Proof-roll exposed slab-on-grade subgrade with a fully loaded dump truck, or accepted alternative equipment, under the observation of geotechnical personnel. Areas that rut, weave, or deflect should be over-excavated and replaced with compacted structural fill (see below for structural fill characteristic requirements).
- Utilize structural fill to raise site grades to the desired elevation. Structural fill should consist of imported granular material conforming to NYSDOT Subbase Course (2" minus), NYSDOT Item 4 or 304.12 aggregate, or approved equal.
- Field moisture contents for structural fill should be maintained within 2 percentage points of the optimum moisture content established by laboratory testing to provide adequate compaction. All fill should be placed in level lifts having a loose thickness no greater than 12 inches and should be compacted with vibratory rollers to at least the following minimum percentages of the Modified Proctor (ASTM D-1557) maximum dry density:

  - Below foundations: 95%
  - Beneath slab-on-grade or access roads: 95%
  - Utility trench backfill: 95%
  - Beneath landscape areas: 90%

P.O. Box 117, Warners, NY, 13164, Phone (315)-638-2706, Fax (315)-638-1544, www.kenneygeotechnical.com

- Beneath sidewalks and exterior slabs: 95%

Bulk samples of proposed structural fill materials should be delivered to our testing laboratory at least two weeks prior to the initiation of earthwork. In-place density testing should be performed at a frequency of one test per 500 square feet per lift in open areas and one test per 25 feet per lift in trenches.

- If the structure is to be constructed during the winter months, adequate frost cover and protection must be provided. Earthwork cannot be performed with frozen material.
- Permanent slopes should be graded no steeper than 3 horizontal: 1 vertical.
- In utility trenches, or other confined areas, small compaction equipment may be necessary such as a vibratory plate, jumping jack or walk-behind vibratory roller. In-place density testing should be performed at a frequency of one test per 25 feet per lift in trenches. Utility trench fill should be placed in level lifts no greater than 8 inches in thickness and should be compacted to at least 95%the Modified Proctor (ASTM D-1557) maximum dry density. Structural fill should consist of imported granular material such as NYSDOT Subbase (2" minus) or approved equal. Adequate frost cover and protection must be provided during winter weather construction. Earthwork cannot be performed with frozen material.

Groundwater Seepage and Management

Groundwater was not encountered during drilling within the anticipated depths of excavation. As previously noted, the glacial till has a low in-situ permeability and a bathtub effect may occur around structures placed and backfilled within the glacial till. We anticipate that temporary dewatering measures, such as sump and pump methods, will be adequate to control groundwater and allow construction to proceed "in the dry". All dewatering discharge should be to a temporary dewatering basin constructed consistent with NYDEC construction stormwater and/or dewatering treatment Best Management Practices (BMPs).

LOCAL SOURCES OF CONSTRUCTION MATERIALS

Concrete for foundations and aggregate for unpaved roadways can be obtained in Allegheny and Steuben Counties. Ready-mix concrete is available in a variety of strengths from:

- Hanson Aggregates, Alfred Station, NY (607) 276-5881
- Coots Concrete, Bath, NY (607) 776-3966

Gravel and crushed stone can also be obtained from these producers. The subbase material most commonly specified in this area is referred to as "Item 4" sand and gravel. This is a crushed gravel or crushed rock product engineered to meet the the gradation NYS DOT Type 2 subbase.

LIMITATIONS

The recommendations presented in this report are predicated on the performance of construction observation and testing by qualified geotechnical personnel. We request continued involvement with this project so that we may assess subsurface conditions exposed during construction to determine if modifications to our recommendations are necessary.

REFERENCES

"Surficial Geologic Map of New York – Central New York Sheet", New York State Museum, 1986.

"Bedrock Map of New York – Central New York Sheet", New York State Museum, 1970.

"Soil Survey of Steuben County", USDA, 1973

"FAD Tools – FAD 5.1 Users Guide", Revision 0, December 2015

"Hazard Analysis Report, Steuben County, New York", Steuben County Office of Emergency Services, April 1, 2014

P.O. Box 117, Warners, NY, 13164, Phone (315)-638-2706, Fax (315)-638-1544, www.kenneygeotechnical.com

TABLE 1

Structure Name (old)	Structure Name (new)	Structure Type	Latitude				Longitude				Horizontal Datum	Site Elevation (AMSL Feet)	Vertical Datum	Structure Height (AGL Feet)
			Deg	Min	Sec	Dir	Deg	Min	Sec	Dir				
1	1	Wind Turbine	42	08	01.107	N	77	43	32.052	E	NAD83	2258	NAVD88	586
2	2	Wind Turbine	42	08	04.347	N	77	42	33.635	E	NAD83	2359	NAVD88	586
3	3	Wind Turbine	42	07	46.200	N	77	43	02.060	E	NAD83	2300	NAVD88	586
4	4	Wind Turbine	42	06	52.906	N	77	43	45.029	E	NAD83	2360	NAVD88	586
5	5	Wind Turbine	42	07	15.607	N	77	43	13.091	E	NAD83	2293	NAVD88	586
6	6	Wind Turbine	42	07	09.058	N	77	42	29.462	E	NAD83	2365	NAVD88	586
7	7	Wind Turbine	42	06	56.110	N	77	42	08.845	E	NAD83	2344	NAVD88	586
8	8	Wind Turbine	42	07	04.246	N	77	41	34.882	E	NAD83	2283	NAVD88	586
9	9	Wind Turbine	42	05	56.367	N	77	43	20.237	E	NAD83	2347	NAVD88	586
10	10	Wind Turbine	42	06	24.134	N	77	42	42.033	E	NAD83	2351	NAVD88	586
11		Wind Turbine	42	06	14.591	N	77	42	01.422	E	NAD83	2279	NAVD88	586
12	11	Wind Turbine	42	06	27.587	N	77	41	18.280	E	NAD83	2317	NAVD88	586
13	12	Wind Turbine	42	06	38.350	N	77	40	49.857	E	NAD83	2350	NAVD88	586
14	13	Wind Turbine	42	06	49.190	N	77	40	21.662	E	NAD83	2302	NAVD88	586
15	14	Wind Turbine	42	05	44.818	N	77	41	05.975	E	NAD83	2328	NAVD88	586
16	15	Wind Turbine	42	05	06.888	N	77	42	27.580	E	NAD83	2251	NAVD88	586
17	16	Wind Turbine	42	04	47.401	N	77	42	31.816	E	NAD83	2396	NAVD88	586
18	17	Wind Turbine	42	04	26.051	N	77	41	18.452	E	NAD83	2274	NAVD88	586
19	18	Wind Turbine	42	02	58.315	N	77	42	13.499	E	NAD83	2282	NAVD88	586
20	19	Wind Turbine	42	03	22.547	N	77	41	08.804	E	NAD83	2340	NAVD88	586
21	20	Wind Turbine	42	02	48.808	N	77	40	22.354	E	NAD83	2279	NAVD88	586
22	21	Wind Turbine	42	02	13.927	N	77	42	02.887	E	NAD83	2304	NAVD88	586
23	22	Wind Turbine	42	02	17.585	N	77	41	22.930	E	NAD83	2346	NAVD88	586
24	23	Wind Turbine	42	02	16.360	N	77	39	53.146	E	NAD83	2344	NAVD88	586
25	24	Wind Turbine	42	01	58.033	N	77	40	37.333	E	NAD83	2279	NAVD88	586
26	25	Wind Turbine	42	01	06.142	N	77	41	18.625	E	NAD83	2268	NAVD88	586
27	26	Wind Turbine	42	00	58.241	N	77	40	18.956	E	NAD83	2266	NAVD88	586
28	27	Wind Turbine	42	00	56.593	N	77	39	48.405	E	NAD83	2269	NAVD88	586
29	28	Wind Turbine	42	01	27.278	N	77	38	26.725	E	NAD83	2267	NAVD88	586
30	29	Wind Turbine	42	00	38.083	N	77	41	23.752	E	NAD83	2272	NAVD88	586
31	30	Wind Turbine	42	00	33.368	N	77	39	31.035	E	NAD83	2238	NAVD88	586
32	31	Wind Turbine	42	00	54.943	N	77	38	18.319	E	NAD83	2261	NAVD88	586
Alt 1	Alt 1	Wind Turbine	42	06	14.324	N	77	43	05.207	E	NAD83	2369	NAVD88	586
Alt 2	Alt 2	Wind Turbine	42	03	46.112	N	77	40	01.628	E	NAD83	2303	NAVD88	586
Alt 3	Alt 3	Wind Turbine	42	03	30.366	N	77	40	14.008	E	NAD83	2178	NAVD88	586
Alt 4	Alt 4	Wind Turbine	42	02	28.381	N	77	40	26.857	E	NAD83	2291	NAVD88	586
SM01	SM01	Met Tower	42	02	08.106	N	77	42	16.074	E	NAD83	2333	NAVD88	

APPENDIX A

TABLE 2: TRANSMISSION LINE LOCATIONS

NOTES:

LAND ACCESS SHALL BE COORDINATED AND FINALIZED WITH NEXTERA.

EASTING AND NORTHING COORDINATES ARE IN NAD 83 - 3102: NEW YORK CENTRAL - U.S. SURVEY FT.

BORING NUMBER	BORING DEPTH (FT.)	ELECTRICAL RESISTIVITY TEST LOCATION	EASTING	NORTHING	LONG.	LAT.	LANDOWNER	PARCEL ID	PARCEL #	LAND AGENT VERIFICATION	NOTES
1	25	YES	529012.329	842046.263	-77.65985363	42.30612395	SCHIEDER, JAMES P	535566	EPT4030		
2	25	YES	529703.579	839301.197	-77.65717058	42.29861631	GUILLAUME BLACK FAMILY	535516	EPT3980		
3	25	YES	530921.232	837767.000	-77.65259913	42.29444901	BOSSARD, WILLIAM W.	535494	EPT3858		
4	25	YES	530217.487	837063.285	-77.65516713	42.29249395	BOSSARD, WILLIAM W.	535492	EPT3956		
5	25	YES	530075.907	834596.840	-77.65557555	42.28572190	BOSSARD, WILLIAM W.	535504	EPT3968		
6	25	YES	529032.011	832033.594	-77.65931314	42.27865301	SPENCER, J. PHILLIP	535576	EPT4040		
7	25	YES	530243.097	830177.196	-77.65475230	42.27360151	AMIDON FAMILY WEALTH TRUST	535488	EPT3952		
8	25	YES	530184.237	828059.026	-77.65487130	42.26778786	AMIDON FAMILY WEALTH TRUST	535488	EPT3952		
9	25	YES	529420.990	827207.609	-77.65765108	42.26542544	AMIDON FAMILY WEALTH TRUST	535479	EPT3943		
10	25	YES	528322.453	827044.228	-77.66170130	42.26493909	O'LENA, MICHAEL	535575	EPT4039		
11	25	YES	528290.520	825639.414	-77.66175356	42.26108359	PERKINS ORVILLE H III & DONNA	535296	EPT2253		
12	25	YES	528303.394	822996.758	-77.66158247	42.25383339	MURRETT JOHN J & KAREN A	535354	EPT2530		
13	25	YES	528229.153	821572.507	-77.66179008	42.24992308	KOCH DAVID, J	535389	EPT2672		
14	25	YES	528164.016	819596.632	-77.66193826	42.24449960	KOCH DAVID, J	535344	EPT2516		
15	25	YES	528079.339	817028.062	-77.66213088	42.23744925	DINEEN WILLIAM	535165	EPT1831		
16	25	YES	526475.970	817074.795	-77.66805310	42.23752164	SHEARER WILLIAM R & NANCY E TRUST	535270	EPT2192		
17	25	YES	526330.896	814192.601	-77.66845326	42.22960868	HAMMER DARRYL & ROBERT G	535235	EPT2075		
18	25	YES	526237.675	812280.005	-77.66870751	42.22435782	MCCORMICK LINDA DINEEN JAMES	535095	EPT1313		
19	25	YES	526179.583	811058.301	-77.66886453	42.22100378	HAMMER DARRYL & ROBERT G	535235	EPT2075		
20	25	YES	525961.883	806856.905	-77.66947056	42.20946875	CHESAPEAKE ENERGY CORPORATION	535088	EPT1298		
21	25	YES	525883.874	805365.654	-77.66968835	42.20537445	CHESAPEAKE ENERGY CORPORATION	535113	EPT1409		
22	25	YES	525850.167	804493.010	-77.66977171	42.20297898	CHESAPEAKE ENERGY CORPORATION	535113	EPT1409		
23	25	YES	525764.028	802262.935	-77.66998473	42.19685727	CAMPBELL TRUST	535172	EPT1838		
24	25	YES	525711.762	800909.807	-77.67011397	42.19314283	CAMPBELL TRUST	535156	EPT1809		
25	25	YES	523461.623	798344.160	-77.67829468	42.18602446	WILLIAMSON CURT R & ROGER	535247	EPT2123		POTENTIAL ENVIRONMENTAL AREA
26	25	YES	522227.463	795901.788	-77.68273167	42.17927973	STRUJO JASMIN & SENADA	602381	EPT5340		
27	25	YES	521443.152	794349.655	-77.68555090	42.17499335	BUCK SAMUEL L & SAMUEL C	602477	EPT5436		
28	25	YES	520947.797	793369.359	-77.68733127	42.17228612	WARNER LIVING TRUST	602478	EPT5437		
29	25	YES	520750.160	792978.243	-77.68804156	42.17120599	WARNER LIVING TRUST	602478	EPT5437		
30	25	YES	520712.399	791843.367	-77.68812665	42.16809087	DUNWORTH DEBORAH A	601988	EPT4947		
31	25	YES	520668.585	790526.595	-77.68822537	42.16447646	LYLE TIMOTHY & RICHARD & ROBIN & DAVID	601958	EPT4917		
32	25	YES	520471.827	786312.208	-77.68874971	42.15290636	MCCAFFREY GEORGE M III ETAL	602484	EPT5443		
33	*50*	YES	521748.946	786231.857	-77.68403677	42.15273118	BAR-B-R FARMS INC	602382	EPT5341		
34	25	YES	523010.889	783624.820	-77.67926021	42.14562270	BAR-B-R FARMS INC	602382	EPT5341		
35	25	YES	523282.412	782044.744	-77.67818443	42.14129694	TEIXEIRA JOHN & JACQUELINE	602012	EPT4971		
36	25	YES	522895.161	781471.460	-77.67958495	42.13971037	HAPEMAN ERIC S	602492	EPT5451		
37	25	YES	522863.020	778523.942	-77.67956395	42.13162201	JENKINS THEODORE & MASTROIANNI ANTHONY	602559	EPT5518		
38	*50*	YES	522744.920	775613.072	-77.67986151	42.12363115	KINNER MARY E	602610	EPT5569		
39	25	YES	520178.576	775630.341	-77.68932085	42.12358775	KINNER MARY E	602610	EPT5569		
40	25	YES	520072.084	774064.555	-77.68963860	42.11928786	KINNER MARY E	602610	EPT5569		
41	25	YES	519903.162	771580.838	-77.69014254	42.11246717	SCIENTIFIC POLYMER PRODUCTS INC	602369	EPT5328		
42	25	YES	519196.313	769795.995	-77.69266184	42.10754486	SCIENTIFIC POLYMER PRODUCTS INC	602256	EPT5215		
43	25	YES	518610.603	768317.034	-77.69474909	42.10346609	SCIENTIFIC POLYMER PRODUCTS INC	602256	EPT5215		

Table 1 - Test Boring Program Summary Eight Points Wind Farm						
Component	Total # Borings	Target Depth (feet)	Minimum Depth (feet)	Max. SPT Interval (feet)	Hollow Stem Auger Refusal Criteria	Rock Coring Criteria (feet)
WTG	36	70	40	5	50 blows/inch for first 6 inches and 50 blow/6 inches thereafter	If rock encountered above a depth of 30 feet, core rock until a depth of 40 feet is achieved. If refusal encountered below a depth of 30 feet, no coring necessary
Transmission Line	42	25' except borings #33 and #37 to 50'	15	5	50 blows/inch for first 6 inches and 50 blow/6 inches thereafter	If rock encountered prior to iarget depth, core rock to a minimum depth of 15 feet and a minimum coring length of 5 feet
Substation	6	30	30	5	50 blows/inch for first 6 inches and 50 blow/6 inches thereafter	If rock encountered prior to target depth, core rock until target depth achieved
Collector	0	0	0	0		
O & M Building	1	20	15	5	50 blows/inch for first 6 inches and 50 blow/6 inches thereafter	If rock encountered prior to target depth, obtain 5 foot rock core

TABLE 3 -WIND TURBINE GEOTECHNICAL SUMMARY		
LOCATION	**BEARING STRATUM AT 8' DEPTH**	**GLACIAL TILL DEPTH BELOW BEARING GRADE**
T-1	HARD GLACIAL TILL	7
T-3	HARD GLACIAL TILL	17
T-4	SANDSTONE	N/A
T-6	SILTSTONE	N/A
T-7	SHALE	N/A
T-9	WEATHERED ROCK	N/A
T-10	WEATHERED ROCK	N/A
T-11	HARD GLACIAL TILL	2
T-14	WEATHERED ROCK	N/A
T-16	WEATHERED ROCK	N/A
T-17	WEATHERED ROCK	N/A
T-18	HARD GLACIAL TILL	7
T-21	HARD GLACIAL TILL	9.2
T-22	WEATHERED ROCK	N/A
T-23	WEATHERED ROCK	N/A
T-24	HARD GLACIAL TILL	7
T-26	HARD GLACIAL TILL	15
T-28	HARD GLACIAL TILL	10
T-30	WEATHERED ROCK	N/A
T-31	WEATHERED ROCK	N/A
ALT-1	WEATHERED ROCK	N/A
ALT-2	HARD GLACIAL TILL	8.5

TABLE 4 -TRANSMISSION LINE GEOTECHNICAL SUMMARY			
LOCATION	GLACIOFLUVIAL SOIL THICKNESS (FEET)	GLACIAL TILL THICKNESS (FEET)	DEPTH TO BEDROCK (FEET)
TL-4	2	8	10
TL-9	6	19+	UNKNOWN
TL-10	2.5	22.5+	UNKNOWN
TL-26	0	25+	UNKNOWN
TL-29	0	3.5	3.5
TL-32	2.5	6	8.5
TL-33	2.5	22.5+	UNKNOWN
TL-43	6	7.5	13.5

Kenney Geotechnical Services
Kenney Geotechnical Services
7246 State Fair Blvd
Baldwinsville, N.Y. 13209
Telephone: 315-638-2706
Fax: 315-638-1544

KEY TO SYMBOLS

CLIENT 8 POINTS WIND, LLC
PROJECT NAME EIGHT POINTS WIND ENERGY PROJECT
PROJECT NUMBER 2017-054
PROJECT LOCATION STEUBEN COUNTY, NY

LITHOLOGIC SYMBOLS (Unified Soil Classification System)

CONGLOMERATE: Conglomerate

ML: USCS Silt

MLG: USCS Gravelly Silt

MLS: USCS Sandy Silt

SANDSTONE: Sandstone

SC: USCS Clayey Sand

SHALE: Shale

SILTSTONE: Siltstone

SLATE: Slate

SM: USCS Silty Sand

SPG: USCS Poorly-graded Gravelly Sand

SWG: USCS Well-graded Gravelly Sand

TILL: Glacial Till

SAMPLER SYMBOLS

Rock Core

Standard Penetration Test

WELL CONSTRUCTION SYMBOLS

ABBREVIATIONS

LL - LIQUID LIMIT (%)
PI - PLASTIC INDEX (%)
W - MOISTURE CONTENT (%)
DD - DRY DENSITY (PCF)
NP - NON PLASTIC
-200 - PERCENT PASSING NO. 200 SIEVE
PP - POCKET PENETROMETER (TSF)

TV - TORVANE
PID - PHOTOIONIZATION DETECTOR
UC - UNCONFINED COMPRESSION
ppm - PARTS PER MILLION
▽ Water Level at Time Drilling, or as Shown
▼ Water Level at End of Drilling, or as Shown
▼ Water Level After 24 Hours, or as Shown

Project: EIGHT POINTS WIND ENERGY PROJECT Project Location: STEUBEN COUNTY, NY Project Number: 2017-054	# Key to Soil Symbols and Terms

TERMS DESCRIBING CONSISTENCY OR CONDITION

COARSE-GRAINED SOILS (major portions retained on No. 200 sieve): includes (1) clean gravel and sands and (2) silty or clayey gravels and sands. Condition is rated according to relative density as determined by laboratory tests or standard penetration resistance tests.

Descriptive Terms	Relative Density	SPT Blow Count
Very loose	0 to 15 %	< 4
Loose	15 to 35 %	4 to 10
Medium dense	35 to 65 %	10 to 30
Dense	65 to 85 %	30 to 50
Very dense	85 to 100 %	> 50

FINE-GRAINED SOILS (major portions passing on No. 200 sieve): includes (1) inorganic and organic silts and clays, (2) gravelly, sandy, or silty clays, and (3) clayey silts. Consistency is rated according to shearing strength, as indicated by penetrometer readings, SPT blow count, or unconfined compression tests.

Descriptive Terms	Unconfined Compressive Strength kPa	SPT Blow Count
Very soft	< 25	< 2
Soft	25 to 50	2 to 4
Medium stiff	50 to 100	4 to 8
Stiff	100 to 200	8 to 15
Very stiff	200 to 400	15 to 30
Hard	> 400	> 30

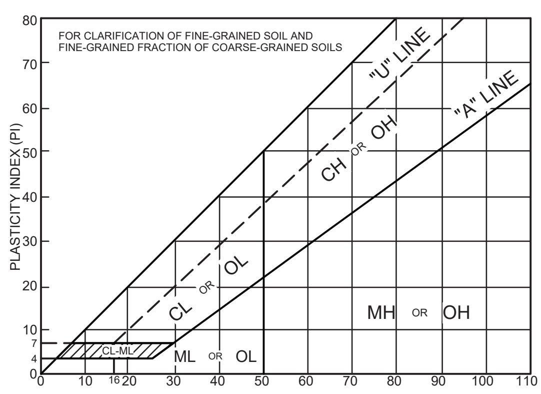
GENERAL NOTES

1. Classifications are based on the United Soil Classification System and include consistency, moisture, and color. Field descriptions have been modified to reflect results of laboratory tests where deemed appropriate.

2. Surface elevations are based on topographic maps and estimated locations.

3. Descriptions on these boring logs apply only at the specific boring locations and at the time the borings were made. They are not guaranteed to be representative of subsurface conditions at other locations or times.

Major Divisions			Group Symbols	Typical Names	Laboratory Classification Criteria	
Coarse-Grained soils (More than half the material is larger than No. 200 sieve size)	Gravels (More than half of coarse fraction is larger than No. 4 sieve size)	Clean gravel (Little or no fines)	GW	Well-graded gravels, gravel-sand mixtures, little or no fines	Determine percentages of sand and gravel from grain size curve, Depending on percentage of fines (fraction smaller than No. 200 sieve) coarse-grained soils are classified as follows: Less than 5 percent....... GW, GP, SW, SP More than 12 percent...... GM, GC, SM, SC 6 to 12 percent...... Borderline case4s requiring dual symbols**	$C_U = \frac{D_{60}}{D_{10}}$ greater than 4; $C_C = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ between 1 and 3
			GP	Poorly-graded gravels, gravel-sand mixtures, little or no fines		Not meeting all gradation requirements for GW
		Gravel with fines (Appreciable amount of fines)	GM* d / u	Silty gravels, gravel-sand-silt mixtures		Atterberg limits below "A" line or P.I. less than 4 — Above "A" line with P.I. between 4 and 7 are border-line cases requiring use of dual symbols
			GC	Clayey gravels, gravel-sand-silt mixtures		Atterberg limits above "A" line or P.I. greater than 7
	Sands (More than half of coarse fraction is smaller than No. 4 sieve size)	Clean sands (Little or no fines)	SW	Well-graded sands, gravelly sands, little or no fines		$C_U = \frac{D_{60}}{D_{10}}$ greater than 6; $C_C = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ between 1 and 3
			SP	Poorly-graded sands, gravelly sands, little or no fines		Not meeting all gradation requirements for SW
		Sands with fines (Appreciable amount of fines)	SM* d / u	Silty sands, sand-silt mixtures		Atterberg limits below "A" line or P.I. less than 4 — Above "A" line with P.I. between 4 and 7 are border-line cases requiring use of dual symbols
			SC	Clayey sands, sand-clay mixtures		Atterberg limits above "A" line or P.I. greater than 7
Fine-Grained soils (More than half the material is smaller than No. 200 sieve size)	Silts and Clays (Liquid limit less than 60)		ML	Inorganic silts and very fine sands, rock floor, silty or clayey fine sands or clayey silts with slight plasticity		
			CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays		
			OL	Organic silts and organic silty clays of low plasticity		
	Silts and Clays (Liquid limit greater than 60)		MH	Inorganic silts, micaceous or disto-maceous fine sandy or silty soils, organic silts		
			CH	Inorganic clays of high plasticity, fat clays		
			OH	Organic clays of medium to high plasticity, organic silts		
	Highly Organic Soils		Pt	Peat and other highly organic soils		



Plasticity Chart

Material		Particle Size mm	Particle Size Sieve sizes
Silt or clay		< 0.074	< #200
Sand	Fine	0.074 to 0.42	#200 to #40
	Medium	0.42 to 2.00	#40 to #10
	Coarse	2.00 to 4.76	#10 to #4
Gravel	Fine	4.76 to 19.1	#4 to 3/4 in.
	Coarse	19.1 to 76.2	3/4 in. to 3 in.
Cobble		76.2 to 304.8	3 in. to 12 in.
Boulders		304.8 to 914.4	12 in. to 36 in.

* Division of GM and SM groups into subdivisions of d and u are for roads and airfields only. Subdivision is based on Atterberg Limits: suffix d used when L.L. is 23 or less and the P.I. is 6 or less; the suffix is used when L.L. is greater than 26.

** Borderline classifications used for soils possessing characteristics of two groups are designated by combinations of groups symbols. For example; GW-GC, well-graded gravel-sand mixture with clay binder.

Kenney Geotechnical Services

Job No. 2017-054

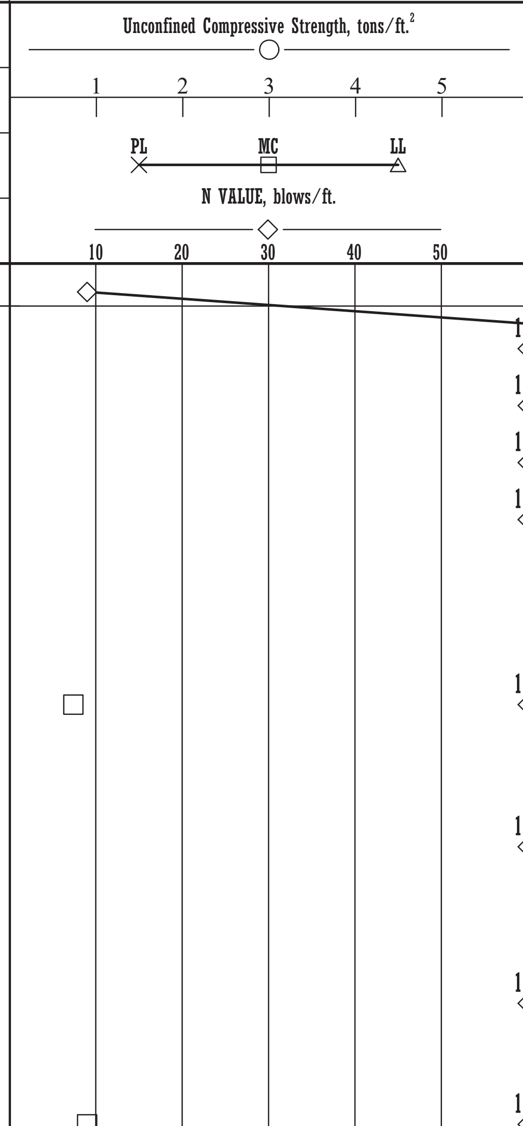
CLIENT: 8 POINTS WIND, LLC	PROJECT: EIGHT POINTS WIND ENERGY PROJECT
ENGINEER: SARGENT AND LUNDY, LLC	LOCATION: STEUBEN COUNTY, NY

BORING NUMBER: ALT-1 Sheet 1 of 1

SURFACE ELEVATION: 2369.0

LATITUDE (degrees): 42.103979 | LONGITUDE (degrees): 77.718113

DEPTH	SAMPLE NO.	DESCRIPTION OF MATERIALS (LABORATORY CLASSIFICATION)	N VALUE, blows/ft.
	1	BROWN STIFF SANDY SILT WITH GRAVEL, MOIST, ORGANICS	
	2	HIGHLY WEATHERED SANDSTONE GRADE IV	100
5.0	3		100
	4		100
	5		100
15.0	6		100
20.0	7		100
25.0	8		100
30.0	9	End of Boring @ 30.5 feet	100



Depth scale: 5.0, 10.0, 15.0, 20.0, 25.0, 30.0, 35.0, 40.0, 45.0

Calibrated Penetrometer Unconfined Compression

WATER LEVEL MEASUREMENTS

DATE	TIME	SAMPLED	CASING	CAVE-IN	WATER
7/14/17	16:00	BCR	30.5	-	DRY
7/14/17	16:30	ACR	-	21.2	DRY

BORING STARTED: 7/14/17	
BORING COMPLETED: 7/14/17	
DRILLER: PW	RIG: CME 550
DRAWN BY: N. MOREHOUSE	APPROVED:

Kenney Geotechnical Services

Job No. 2017-054

CLIENT: 8 POINTS WIND, LLC	PROJECT: EIGHT POINTS WIND ENERGY PROJECT
ENGINEER: SARGENT AND LUNDY, LLC	LOCATION: STEUBEN COUNTY, NY

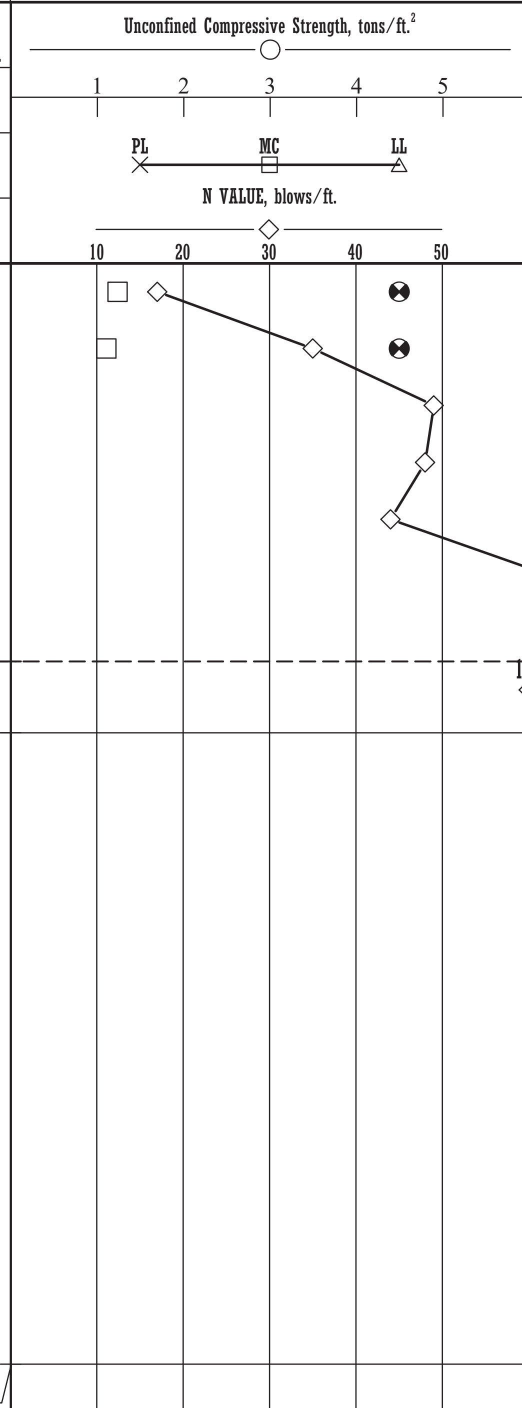
BORING NUMBER: ALT-2 — Sheet 1 of 1

SURFACE ELEVATION: 2302.2

LATITUDE (degrees): 42.062810 — LONGITUDE (degrees): 77.667119

DEPTH	SAMPLE NO.	DESCRIPTION OF MATERIALS (LABORATORY CLASSIFICATION)	REMARKS
	1	GLACIAL TILL CONSISTING OF RED-BROWN VERY STIFF TO HARD SANDY LEAN CLAY WITH GRAVEL, MOIST	
	2		
5.0	3		pH 6.08
	4		
	5		
10.0			
15.0	6	HIGHLY WEATHERED SANDSTONE GRADE IV	
		RUN 1 - 16.5' TO 22.5' RECOVERY = 61.7%. RQD = 15.3% FRESH SANDSTONE NATURAL DISCONTINUITY WITH CLAY INFILL AT ~16.5 FEET	TRANSITIONAL BEDROCK MAY INCLUDE LARGE DISLODGED ROCK SLABS WITH SOIL INFILLS DUE TO WEATHERING
20.0	7		
		RUN 2 - 22.5' TO 27.5' RECOVERY = 40%. RQD = 15% FRESH SANDSTONE NATURAL DISCONTINUITY WITH CLAY INFILL AT ~23.25 FEET	AVERAGE ROCK CORING RATE = 2 MINUTES PER FOOT
25.0	8		
		RUN 3 - 27.5' TO 32.5' RECOVERY = 66%. RQD = 0% FRESH SANDSTONE NATURAL DISCONTINUITY WITH CLAY INFILL AT ~31.5 FEET	
30.0	9		
		RUN 4 - 32.5' TO 37.5' RECOVERY = 80%. RQD = 0% FRESH SANDSTONE	
35.0	10		WATER RETURN AT 35' TO 36' LOSS OF WATER RETURN AT 37' TO 38'
	11	RUN 5 - 37.5' TO 40.5' RECOVERY = 90%. RQD = 6.7% FRESH SANDSTONE	
40.0		FRESH SHALE	
		End of Boring @ 40.5 feet	
45.0			

BCR



Calibrated Penetrometer Unconfined Compression

WATER LEVEL MEASUREMENTS

DATE	TIME	SAMPLED	CASING	CAVE-IN	WATER
6/23/17	10:00	BCR	16		38.8
6/23/17	10:30	ACR	-	7.5	DRY

BORING STARTED: 6/23/17	
BORING COMPLETED: 6/23/17	
DRILLER: PW	RIG: CME 550
DRAWN BY: D. ALLEN	APPROVED:

Kenney Geotechnical Services

Job No. 2017-054

CLIENT: 8 POINTS WIND, LLC	PROJECT: EIGHT POINTS WIND ENERGY PROJECT
ENGINEER: SARGENT AND LUNDY, LLC	LOCATION: STEUBEN COUNTY, NY

BORING NUMBER: T-1 Sheet 1 of 1

SURFACE ELEVATION: 2258.0

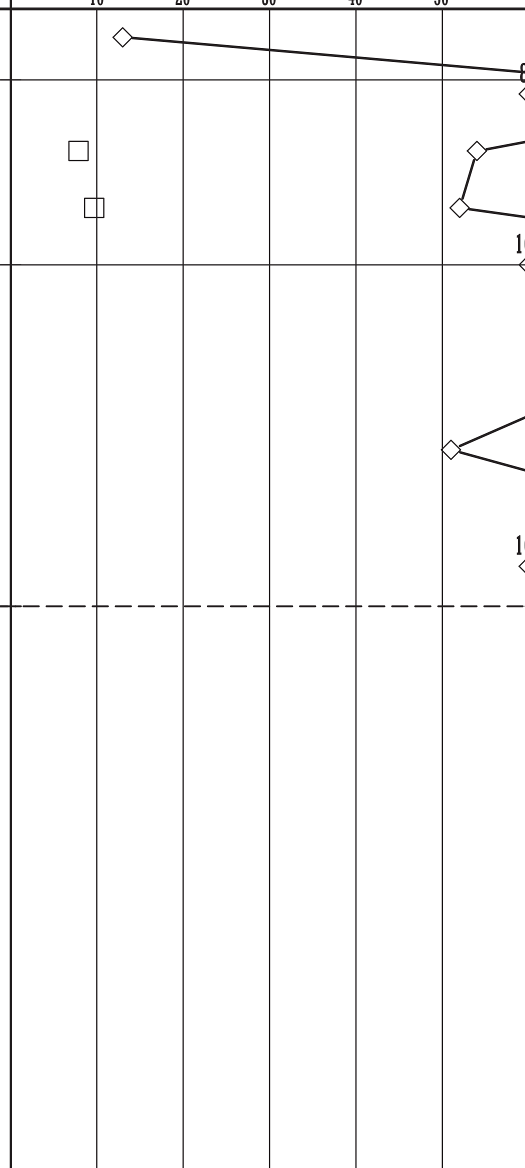
LATITUDE (degrees): 42.133641 LONGITUDE (degrees): 77.725570

Unconfined Compressive Strength, tons/ft.^{2} (1, 2, 3, 4, 5)

PL — MC — LL

N VALUE, blows/ft. (10, 20, 30, 40, 50)

DEPTH	SAMPLE NO.	DESCRIPTION OF MATERIALS (LABORATORY CLASSIFICATION)	N VALUE	REMARKS
	1	TAN MEDIUM DENSE SANDY SILT WITH GRAVEL, MOIST		
	2	GLACIAL TILL CONSISTING OF RED-BROWN HARD SANDY LEAN CLAY WITH GRAVEL, MOIST	89	DRILLER NOTES POSSIBLE COBBLES AND BOULDERS
5.0	3			
	4			
	5		100	
10.0		HIGHLY WEATHERED SANDSTONE GRADE IV		
15.0 (WD)	6			
	7		100	
20.0				
	8	RUN 1 - 21.0' TO 26.0' RECOVERY = 100%. RQD = 45% FRESH SANDSTONE		TRANSITIONAL BEDROCK MAY INCLUDE LARGE DISLODGED ROCK SLABS WITH SOIL INFILLS DUE TO WEATHERING
25.0 (BCR)	9	RUN 2 - 26.0' TO 31.0' RECOVERY = 84%. RQD = 6.7% FRESH SANDSTONE		
30.0	10	RUN 3 - 31.0' TO 36.0' RECOVERY = 50%. RQD = 0% FRESH SANDSTONE		AVERAGE ROCK CORING RATE = 3-4 MINUTES PER FOOT
35.0	11	RUN 4 - 36.0' TO 40.0' RECOVERY = 46%. RQD = 0% FRESH SANDSTONE		
40.0		End of Boring @ 41 feet		
45.0				



Calibrated Penetrometer Unconfined Compression

WATER LEVEL MEASUREMENTS

DATE	TIME	SAMPLED	CASING	CAVE-IN	WATER
7/21/17	07:30	WD	16.5	-	15.5
7/21/17	09:30	BCR	21	-	27
7/21/17	10:30	ACR	-	-	27

BORING STARTED: 7/20/17	
BORING COMPLETED: 7/21/17	
DRILLER: PW	RIG: CME 550
DRAWN BY: N. MOREHOUSE	APPROVED

Kenney Geotechnical Services

Job No. 2017-054

CLIENT: 8 POINTS WIND, LLC	PROJECT: EIGHT POINTS WIND ENERGY PROJECT
ENGINEER: SARGENT AND LUNDY, LLC	LOCATION: STEUBEN COUNTY, NY

BORING NUMBER: T-3 **Sheet 1 of 1**

SURFACE ELEVATION: 2300.0

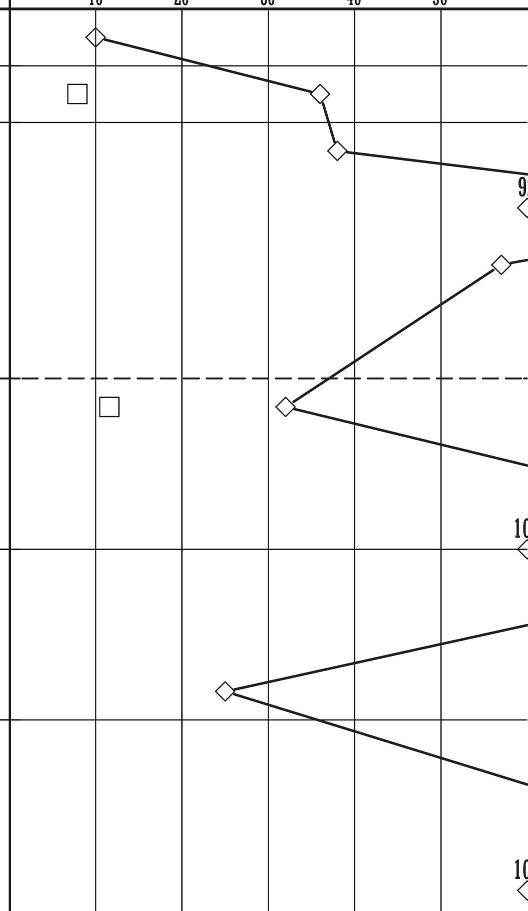
LATITUDE (degrees)	LONGITUDE (degrees)
42.134541	77.717239

Unconfined Compressive Strength, tons/ft.^{2} — 1 2 3 4 5

PL — MC — LL

N VALUE, blows/ft. — 10 20 30 40 50

DEPTH	SAMPLE NO.	DESCRIPTION OF MATERIALS (LABORATORY CLASSIFICATION)	REMARKS
	1	BROWN POORLY GRADED LOOSE GRAVELLY SAND WITH SILT, MOIST	
	2	BROWN HARD SANDY SILT WITH GRAVEL, MOIST	
5.0	3	GLACIAL TILL CONSISTING OF BROWN HARD SANDY SILT WITH GRAVEL, MOIST	
	4		DRILLER NOTES POSSIBLE COBBLES AND BOULDERS
	5		
10.0			
	6	GLACIAL TILL CONSISTING OF BROWN MEDIUM DENSE TO DENSE SILTY SAND WITH GRAVEL, MOIST	
15.0			
	7	HIGHLY WEATHERED SHALE GRADE IV	
20.0			
	9		
25.0		HIGHLY WEATHERED SANDSTONE GRADE IV	
30.0	8		
		End of Boring @ 32 feet	
35.0			
40.0			
45.0			



Calibrated Penetrometer Unconfined Compression

WATER LEVEL MEASUREMENTS

DATE	TIME	SAMPLED	CASING	CAVE-IN	WATER
7/12/17	11:00	BCR	32	-	DRY
7/12/17	11:30	ACR	-	22	DRY

BORING STARTED: 7/12/17	
BORING COMPLETED: 7/12/17	
DRILLER: KGES	RIG: 7822DT
DRAWN BY: D. ALLEN	APPROVED:

LOG A GNGN03 - LOG A GNGN03.GDT - 9/1/17 14:46 - C:\PROGRAM FILES (X86)\GINT\PROJECTS\2017-054 NEXTERA 8 POINTS.GPJ

Kenney Geotechnical Services

Job No. 2017-054

CLIENT	PROJECT
8 POINTS WIND, LLC	EIGHT POINTS WIND ENERGY PROJECT
ENGINEER	**LOCATION**
SARGENT AND LUNDY, LLC	STEUBEN COUNTY, NY

BORING NUMBER: T-4 Sheet 1 of 1

SURFACE ELEVATION: 2360.0

LATITUDE (degrees): 42.114696 LONGITUDE (degrees): 77.729176

Unconfined Compressive Strength, tons/ft.^{2} (1, 2, 3, 4, 5)

PL — MC — LL

N VALUE, blows/ft. (10, 20, 30, 40, 50)

DEPTH	SAMPLE NO.	DESCRIPTION OF MATERIALS (LABORATORY CLASSIFICATION)	N VALUE	REMARKS
	1	BROWN STIFF SANDY SILT WITH GRAVEL, MOIST		
	2	HIGHLY WEATHERED SANDSTONE GRADE IV	100	pH 8.08
5.0	3		100	
	4		100	
	5		100	
10.0	6	RUN 1 - 10.0' TO 15.0' RECOVERY = 100%. RQD = 100% FRESH SANDSTONE		TRANSITIONAL BEDROCK MAY INCLUDE LARGE DISLODGED ROCK SLABS WITH SOIL INFILLS DUE TO WEATHERING
15.0	7	RUN 2 - 15.0' TO 20.0' RECOVERY = 100%. RQD = 6.7% FRESH SANDSTONE		
20.0	8	RUN 3 - 20.0' TO 25.0' RECOVERY = 94%. RQD = 50% FRESH SANDSTONE		AVERAGE ROCK CORING RATE = 2-3 MINUTES PER FOOT
25.0	9	RUN 4 - 25.0' TO 30.0' RECOVERY = 84%. RQD = 0% FRESH SANDSTONE		
30.0	10	RUN 5 - 30.0' TO 35.0' RECOVERY = 66%. RQD = 10% FRESH SHALE		
35.0	11	RUN 6 - 35.0' TO 40.0' RECOVERY = 86% RQD = 8% FRESH SHALE		
40.0		End of Boring @ 40 feet		
45.0				

Calibrated Penetrometer Unconfined Compression

WATER LEVEL MEASUREMENTS

DATE	TIME	SAMPLED	CASING	CAVE-IN	WATER
7/19/17	16:30	BCR	10	-	DRY
7/19/17	17:30	ACR	-	28.7	DRY

BORING STARTED 7/19/17	
BORING COMPLETED 7/19/17	
DRILLER PW	RIG CME 550
DRAWN BY N. MOREHOUSE	APPROVED

Kenney Geotechnical Services

Job No. 2017-054

CLIENT	PROJECT
8 POINTS WIND, LLC	EIGHT POINTS WIND ENERGY PROJECT
ENGINEER	**LOCATION**
SARGENT AND LUNDY, LLC	STEUBEN COUNTY, NY

BORING NUMBER T-5 Sheet 1 of 1

SURFACE ELEVATION 2293.0

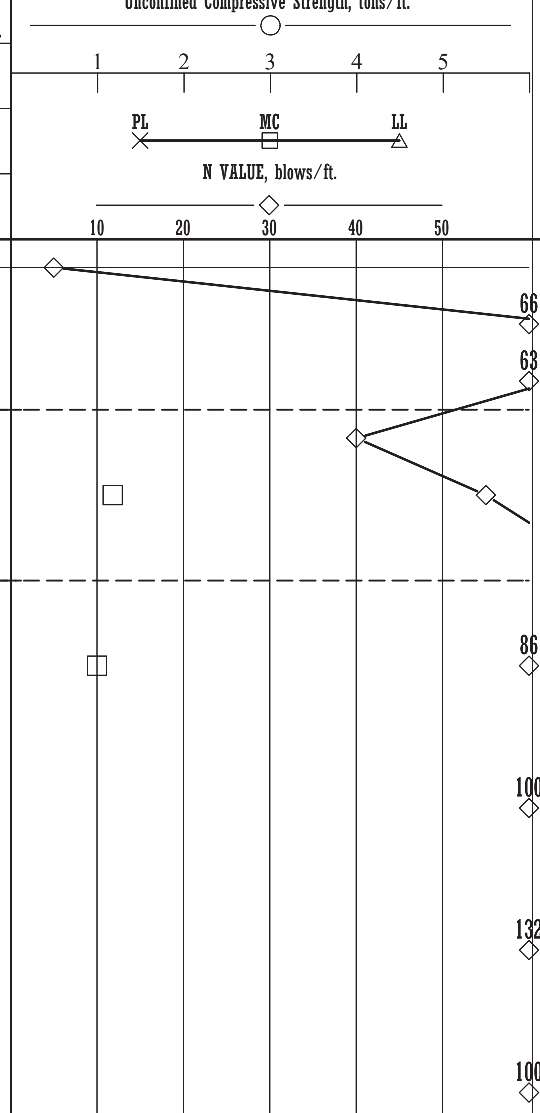
LATITUDE (degrees)	LONGITUDE (degrees)
42.121002	77.720303

DEPTH	SAMPLE NO.	DESCRIPTION OF MATERIALS (LABORATORY CLASSIFICATION)	REMARKS
		BROWN MEDIUM STIFF SILT, MOIST, ORGANICS	
	1	GLACIAL TILL CONSISTING OF BROWN HARD SANDY SILT WITH GRAVEL, MOIST	
	2		DRILLER NOTES POSSIBLE COBBLES AND BOULDERS
5.0	3		
	4	GLACIAL TILL CONSISTING OF RED-BROWN HARD SANDY SILT WITH GRAVEL, MOIST	
	5		
10.0			
		GLACIAL TILL CONSISTING OF GRAY-BROWN HARD SANDY SILT WITH GRAVEL, MOIST	
15.0	6		
20.0	7		
25.0	8		
30.0	9		
		End of Boring @ 30.9 feet	
35.0			
40.0			
45.0			

Unconfined Compressive Strength, tons/ft.^{2}

PL — MC — LL

N VALUE, blows/ft.



Calibrated Penetrometer Unconfined Compression

WATER LEVEL MEASUREMENTS					
DATE	TIME	SAMPLED	CASING	CAVE-IN	WATER
7/19/17	12:00	BCR	30.9	-	DRY
7/19/17	12:15	ACR	-	21.4	DRY

BORING STARTED	7/19/17
BORING COMPLETED	7/19/17
DRILLER PW	RIG CME 550
DRAWN BY D. ALLEN	APPROVED

Kenney Geotechnical Services

Job No. 2017-054

CLIENT: 8 POINTS WIND, LLC	PROJECT: EIGHT POINTS WIND ENERGY PROJECT
ENGINEER: SARGENT AND LUNDY, LLC	LOCATION: STEUBEN COUNTY, NY

BORING NUMBER: T-6 Sheet 1 of 1

SURFACE ELEVATION: 2365.0

LATITUDE (degrees): 42.119183 LONGITUDE (degrees): 77.708184

Unconfined Compressive Strength, tons/ft.^{2} (○) 1 2 3 4 5

PL (×) MC (□) LL (△)

N VALUE, blows/ft. (◇) 10 20 30 40 50

DEPTH	SAMPLE NO.	DESCRIPTION OF MATERIALS (LABORATORY CLASSIFICATION)	REMARKS
	1	BROWN STIFF GRAVELLY SILT WITH SAND, MOIST	
		HIGHLY WEATHERED SHALE GRADE IV	
5.0	2	RUN 1 - 2.5' TO 7.5' RECOVERY = 90%. RQD = 0% FRESH SHALE	TRANSITIONAL BEDROCK MAY INCLUDE LARGE DISLODGED ROCK SLABS WITH SOIL INFILLS DUE TO WEATHERING
10.0	3	RUN 2 - 7.5' TO 12.5' RECOVERY = 88%. RQD = 0% FRESH SHALE	
15.0	4	RUN 3 -12.5' TO 17.5' RECOVERY = 100%. RQD = 13% FRESH SANDSTONE	AVERAGE ROCK CORING RATE = 2-3 MINUTES PER FOOT
20.0	5	RUN 4 - 17.5' TO 22.5' RECOVERY = 48%. RQD = 0% FRESH SANDSTONE	
25.0	6	RUN 5 - 22.5' TO 27.5' RECOVERY = 90%. RQD = 44% FRESH SHALE	
30.0	7	RUN 6 - 27.5' 32.5' RECOVERY = 88%. RQD = 0% FRESH SHALE	
35.0	8	RUN 7 - 32.5' TO 37.5' RECOVERY = 100%. RQD = 45% FRESH SILTSTONE	
40.0	9	RUN 8 - 37' TO' RECOVERY = 87%. RQD = 0% FRESH SILTSTONE	
		End of Boring @ 40.5 feet	
45.0			

WD ▽ BCR ▼

Calibrated Penetrometer Unconfined Compression

WATER LEVEL MEASUREMENTS					
DATE	TIME	SAMPLED	CASING	CAVE-IN	WATER
7/18/17	09:00	WD	20.0	-	18.0
7/18/17	09:30	BCR	40.5	-	28.0
7/18/17	10:00	ACR	-	23	28.0

BORING STARTED: 7/18/17	
BORING COMPLETED: 7/18/17	
DRILLER: PW	RIG: CME 550
DRAWN BY: D. ALLEN	APPROVED:

Kenney Geotechnical Services

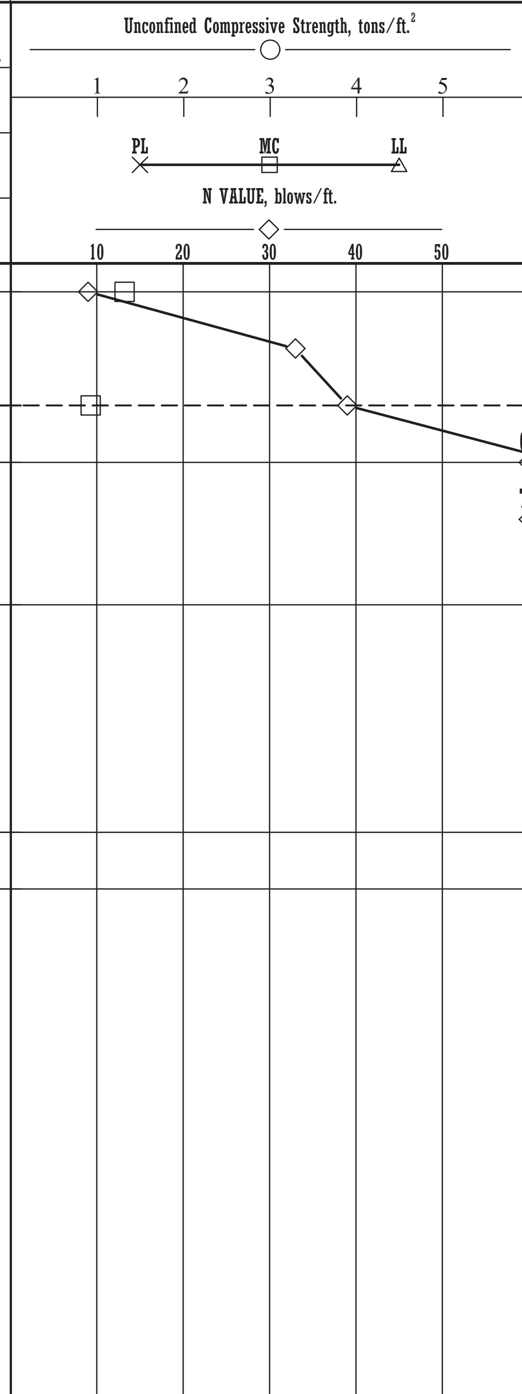
Job No. 2017-054

CLIENT: 8 POINTS WIND, LLC	PROJECT: EIGHT POINTS WIND ENERGY PROJECT
ENGINEER: SARGENT AND LUNDY, LLC	LOCATION: STEUBEN COUNTY, NY

BORING NUMBER: T-7 **Sheet 1 of 1**

SURFACE ELEVATION: 2344.0

LATITUDE (degrees): 42.115586 LONGITUDE (degrees): 77.702457



DEPTH	SAMPLE NO.	DESCRIPTION OF MATERIALS (LABORATORY CLASSIFICATION)	REMARKS
	1	BROWN STIFF GRAVELLY SILT WITH SAND, MOIST, ORGANICS	
	2	GLACIAL TILL CONSISTING OF BROWN HARD CLAYEY SAND WITH GRAVEL, MOIST	
5.0	3	GLACIAL TILL CONSISTING OF RED-BROWN HARD CLAYEY SAND WITH GRAVEL, MOIST	
	4, 5	HIGHLY WEATHERED SHALE GRADE IV	
10.0			
15.0 (WD)	6	RUN 1 - 12.0' TO 17.0' RECOVERY = 100%. RQD = 78% FRESH SANDSTONE	TRANSITIONAL BEDROCK MAY INCLUDE LARGE DISLODGED ROCK SLABS WITH SOIL INFILLS DUE TO WEATHERING
	7	RUN 2 - 17.0' TO 22.0' RECOVERY = 94%. RQD = 34% FRESH SANDSTONE	
20.0		FRESH SHALE	AVERAGE ROCK CORING RATE = 3-4 MINUTES PER FOOT
25.0	8	RUN 3 - 22.0' TO 27.0' RECOVERY = 96%. RQD = 14% FRESH SILTSTONE	
(BCR) 30.0	9	RUN 4 - 27.0' TO 32.0' RECOVERY = 100%. RQD = 41.7% FRESH SILTSTONE	
35.0	10	RUN 5 - 32.0' TO 37.0' RECOVERY = 90%. RQD = 0% FRESH SILTSTONE	
40.0	11	RUN 6 - 32.0' TO 40.0' RECOVERY = 100 %. RQD = 29% FRESH SILTSTONE	
		End of Boring @ 40 feet	
45.0			

Calibrated Penetrometer Unconfined Compression

WATER LEVEL MEASUREMENTS

DATE	TIME	SAMPLED	CASING	CAVE-IN	WATER
7/17/17	09:00	WD	17.0	-	16.0
7/17/17	09:30	BCR	32.0	-	28.0
7/17/17	10:00	ACR	-	21.7	28.0

BORING STARTED: 7/17/17	
BORING COMPLETED: 7/17/17	
DRILLER: PW	RIG: CME 550
DRAWN BY: D. ALLEN	APPROVED:

Kenney Geotechnical Services

Job No. 2017-054

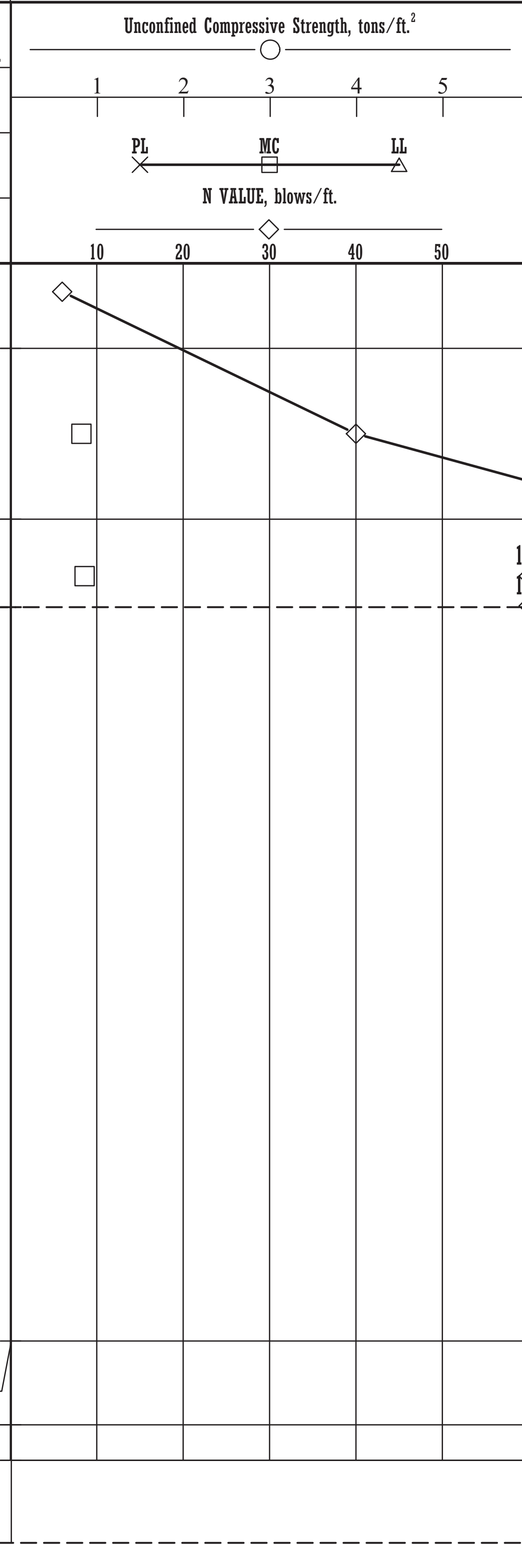
CLIENT	PROJECT
8 POINTS WIND, LLC	EIGHT POINTS WIND ENERGY PROJECT
ENGINEER	**LOCATION**
SARGENT AND LUNDY, LLC	STEUBEN COUNTY, NY

BORING NUMBER: T-9 Sheet 1 of 1

SURFACE ELEVATION: 2346.7

LATITUDE (degrees): 42.098992 | LONGITUDE (degrees): 77.722288

DEPTH	SAMPLE NO.	DESCRIPTION OF MATERIALS (LABORATORY CLASSIFICATION)	REMARKS
0.0	1	BROWN LOOSE GRAVELLY SAND WITH SILT, MOIST	pH 6.22
5.0	2	GLACIAL TILL CONSISTING OF RED-BROWN HARD SANDY LEAN CLAY WITH GRAVEL, MOIST	
10.0	3	HIGHLY WEATHERED SANDSTONE GRADE IV	
	4	RUN 1 - 12.1' TO 17.1' RECOVERY = 50%. RQD = 4.2% FRESH SANDSTONE	TRANSITIONAL BEDROCK MAY INCLUDE LARGE DISLODGED ROCK SLABS WITH SOIL INFILLS DUE TO WEATHERING
15.0	5		
		RUN 2 - 17.1' TO 22.1' RECOVERY = 28%. RQD = 0% FRESH SANDSTONE	
20.0	6		600 GALLONS OF WATER USED WHILE ROCK CORING
		RUN 3 - 22.1' TO 27.1' RECOVERY = 48%. RQD = 0% FRESH SANDSTONE	
25.0	7	NATURAL DISCONTINUITY WITH CLAY INFILL AT ~26.5 FEET	LOSS OF WATER RETURN AT 25.5'
		RUN 4 - 27.1' TO 32.1' RECOVERY = 100%. RQD = 42.5% FRESH SANDSTONE	
30.0	8	NATURAL DISCONTINUITY WITH CLAY INFILL AT ~29.2 FEET	AVERAGE ROCK CORING RATE = 4.1 MINUTES PER FOOT
		RUN 5 - 32.1' TO 37.1' RECOVERY = 100%. RQD = 44.2% FRESH SANDSTONE	
35.0	9	NATURAL DISCONTINUITY WITH CLAY INFILL AT ~32.5 FEET	
		RUN 6 - 37.1' TO 42.1' RECOVERY = 96%. RQD = 61.6% FRESH SANDSTONE	
40.0	10	FRESH CONGLOMERATE	
		FRESH SANDSTONE	
		End of Boring @ 42.1 feet	
45.0			



Calibrated Penetrometer Unconfined Compression

WATER LEVEL MEASUREMENTS					
DATE	TIME	SAMPLED	CASING	CAVE-IN	WATER
6/6/17	13:30	BCR	12.1	-	DRY
6/6/17	13:30	BCR	RECORDED BEFORE ROCK CORING		

BORING STARTED	6/6/17
BORING COMPLETED	6/6/17
DRILLER: KGES	RIG: 7822DT
DRAWN BY: D. ALLEN	APPROVED

LOG A GNGN03 - LOG A GNGN03.GDT - 9/1/17 14:46 - C:\PROGRAM FILES (X86)\GINT\PROJECTS\2017-054 NEXTERA 8 POINTS.GPJ

Kenney Geotechnical Services

Job No. 2017-054

CLIENT: 8 POINTS WIND, LLC	PROJECT: EIGHT POINTS WIND ENERGY PROJECT
ENGINEER: SARGENT AND LUNDY, LLC	LOCATION: STEUBEN COUNTY, NY

BORING NUMBER: **T-10** Sheet 1 of 1

SURFACE ELEVATION: **2351.0**

LATITUDE (degrees)	LONGITUDE (degrees)
42.106704	-77.711676

DESCRIPTION OF MATERIALS (LABORATORY CLASSIFICATION)

Unconfined Compressive Strength, tons/ft.^{2} (1, 2, 3, 4, 5)

PL — MC — LL

N VALUE, blows/ft. (10, 20, 30, 40, 50)

DEPTH	SAMPLE NO.	DESCRIPTION OF MATERIALS	N VALUE	REMARKS
	1	BROWN SILTY SAND WITH GRAVEL AND ORGANCIS, MOIST		
	2	HIGHLY WEATHERED SANDSTONE GRADE IV		
5.0	3		97	
	4		100	
	5		73	
10.0				
		HIGHLY WEATHERED SHALE GRADE IV		
15.0	6		100	
20.0	7		79	
25.0	8		100	
30.0	9		100	REFUSAL CRITERIA MET AT 30.0'
		End of Boring @ 30.3 feet		
35.0				
40.0				
45.0				

BCR WD

Calibrated Penetrometer Unconfined Compression

WATER LEVEL MEASUREMENTS

DATE	TIME	SAMPLED	CASING	CAVE-IN	WATER
7/13/17	15:30	WD	21	-	19
7/13/17	16:00	BCR	30.3	-	17
7/13/17	16:30	ACR	-	6	DRY

BORING STARTED: 7/13/17	
BORING COMPLETED: 7/13/17	
DRILLER: PW	RIG: CME 550
DRAWN BY: N. MOREHOUSE	APPROVED:

Kenney Geotechnical Services

Job No. 2017-054

CLIENT: 8 POINTS WIND, LLC	PROJECT: EIGHT POINTS WIND ENERGY PROJECT
ENGINEER: SARGENT AND LUNDY, LLC	LOCATION: STEUBEN COUNTY, NY

BORING NUMBER: T-11 Sheet 1 of 1

SURFACE ELEVATION: 2317.0

LATITUDE (degrees)	LONGITUDE (degrees)
42.107663	-77.768841

Unconfined Compressive Strength, tons/ft.^{2}: 1 2 3 4 5

PL MC LL

N VALUE, blows/ft.: 10 20 30 40 50

DEPTH	SAMPLE NO.	DESCRIPTION OF MATERIALS (LABORATORY CLASSIFICATION)	N VALUE	REMARKS
	1	BROWN LOOSE SANDY SILT WITH GRAVEL AND ORGANICS, MOIST		
	2	GLACIAL TILL CONSISTING OF BROWN HARD GRAVELLY CLAY WITH SAND AND COBBLES, MOIST	100	
5.0	3		94	
	4		100	
	5		100	
10.0		HIGHLY WEATHERED SHALE GRADE IV, MOIST		
15.0	6		100	
	7		100	
20.0	8	RUN 1 - 20.0' TO 25.0' RECOVERY = 80%. RQD = 38.3% FRESH SANDSTONE NATURAL DICONTINUITY AT 23.8'		TRANSITIONAL BEDROCK MAY INCLUDE LARGE DISLODGED ROCK SLABS WITH SOIL INFILLS DUE TO WEATHERING
25.0 (BCR)	9	RUN 2 - 25.0' TO 30.0' RECOVERY = 84%. RQD = 30% FRESH SANDSTONE		
30.0	10	RUN 3 - 30.0' TO 35.0' RECOVERY = 40%. RQD = 0% FRESH SANDSTONE		AVERAGE ROCK CORING RATE = 3-4 MINUTES PER FOOT
35.0	11	RUN 4 - 30.0' TO 40.0' RECOVERY = 40%. RQD = 0% FRESH SHALE NATURAL DISCONTINUITY AT 36' WITH CLAY INSEAM		
40.0		End of Boring @ 40 feet		
45.0				

Calibrated Penetrometer Unconfined Compression

WATER LEVEL MEASUREMENTS

DATE	TIME	SAMPLED	CASING	CAVE-IN	WATER
7/12/17	15:30	BCR	40	-	26
7/12/17	16:30	ACR	-	31.2	26

BORING STARTED: 7/12/17	
BORING COMPLETED: 7/12/17	
DRILLER: PW	RIG: CME 550
DRAWN BY: N. MOREHOUSE	APPROVED:

Kenney Geotechnical Services

Job No. 2017-054

CLIENT	PROJECT
8 POINTS WIND, LLC	EIGHT POINTS WIND ENERGY PROJECT
ENGINEER	LOCATION
SARGENT AND LUNDY, LLC	STEUBEN COUNTY, NY

BORING NUMBER: T-14 Sheet 1 of 1

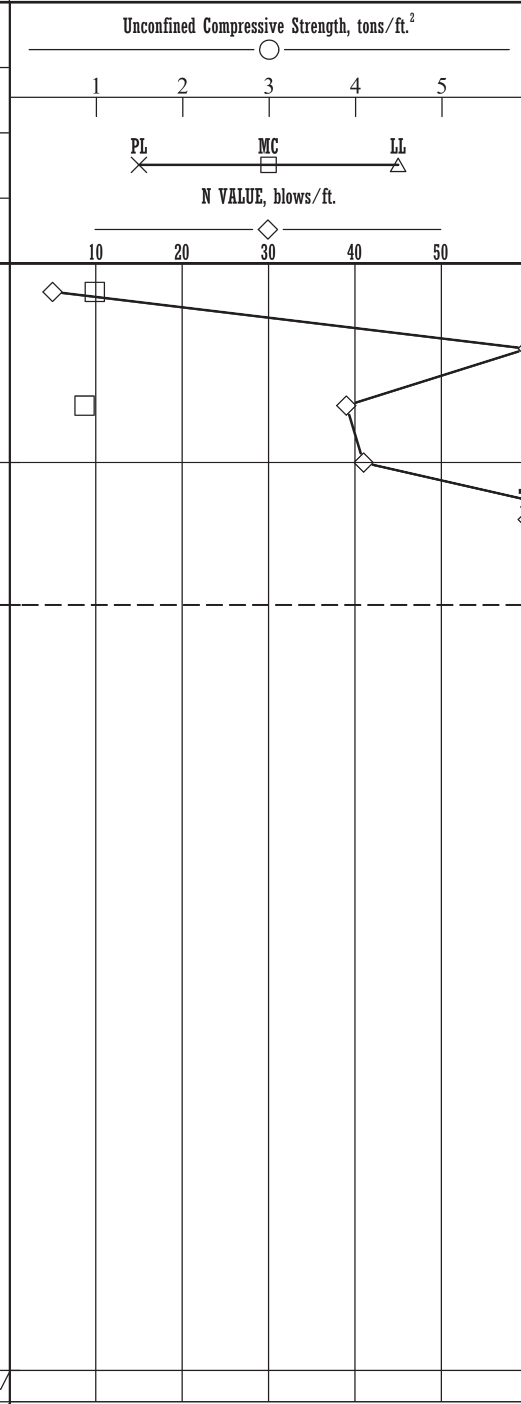
SURFACE ELEVATION: 2327.5

LATITUDE (degrees): 42.095783

LONGITUDE (degrees): 77.684993

DEPTH	SAMPLE NO.	DESCRIPTION OF MATERIALS (LABORATORY CLASSIFICATION)	REMARKS
	1	GLACIAL TILL CONSISTING OF BROWN MEDIUM STIFF TO HARD SANDY SILT WITH GRAVEL, MOIST	
	2		DRILLER NOTES POSSIBLE COBBLES AND BOULDERS
5.0	3		
	4	HIGHLY WEATHERED SANDSTONE GRADE IV	
	5		
10.0			TRANSITIONAL BEDROCK MAY INCLUDE LARGE DISLODGED ROCK SLABS WITH SOIL INFILLS DUE TO WEATHERING
	6	RUN 1 - 12' TO 17' RECOVERY = 82%. RQD = 20.8% FRESH SANDSTONE	
15.0			
	7	RUN 2 - 17' TO 22' RECOVERY = 90%. RQD = 35.8% FRESH SANDSTONE	LOSS OF WATER RETURN AT 15.5'
20.0			
	8	RUN 3 - 22' TO 27' RECOVERY = 100%. RQD = 58.3% FRESH SANDSTONE NATURAL DISCONTINUITY WITH CLAY INFILL AT ~22.4 FEET AND ~23.5 FEET	575 GALLONS OF WATER USED WHILE ROCK CORING
25.0			
	9	RUN 4 - 27' TO 32' RECOVERY = 96%. RQD = 39.2% FRESH SANDSTONE NATURAL DISCONTINUITY WITH CLAY INFILL AT ~29.5 FEET	
30.0			AVERAGE ROCK CORING RATE = 3.5 MINUTES PER FOOT
	10	RUN 5 - 32' TO 37' RECOVERY = 96%. RQD = 58.3% FRESH SANDSTONE	
35.0			
	11	RUN 6 - 32.2' TO 37.2' RECOVERY = 100%. RQD = 63.9% FRESH SANDSTONE	
40.0		FRESH CONGLOMERATE End of Boring @ 40 feet	
45.0			

BCR



Calibrated Penetrometer Unconfined Compression

WATER LEVEL MEASUREMENTS					
DATE	TIME	SAMPLED	CASING	CAVE-IN	WATER
6/5/17	15:00	BCR	40	-	19.3
6/5/17	15:00	ACR	-	11.4	DRY

BORING STARTED	6/5/17
BORING COMPLETED	6/5/17
DRILLER: KGES	RIG: 7822DT
DRAWN BY: D. ALLEN	APPROVED

Kenney Geotechnical Services

Job No. 2017-054

CLIENT	PROJECT
8 POINTS WIND, LLC	EIGHT POINTS WIND ENERGY PROJECT
ENGINEER	**LOCATION**
SARGENT AND LUNDY, LLC	STEUBEN COUNTY, NY

BORING NUMBER: T-16 Sheet 1 of 1

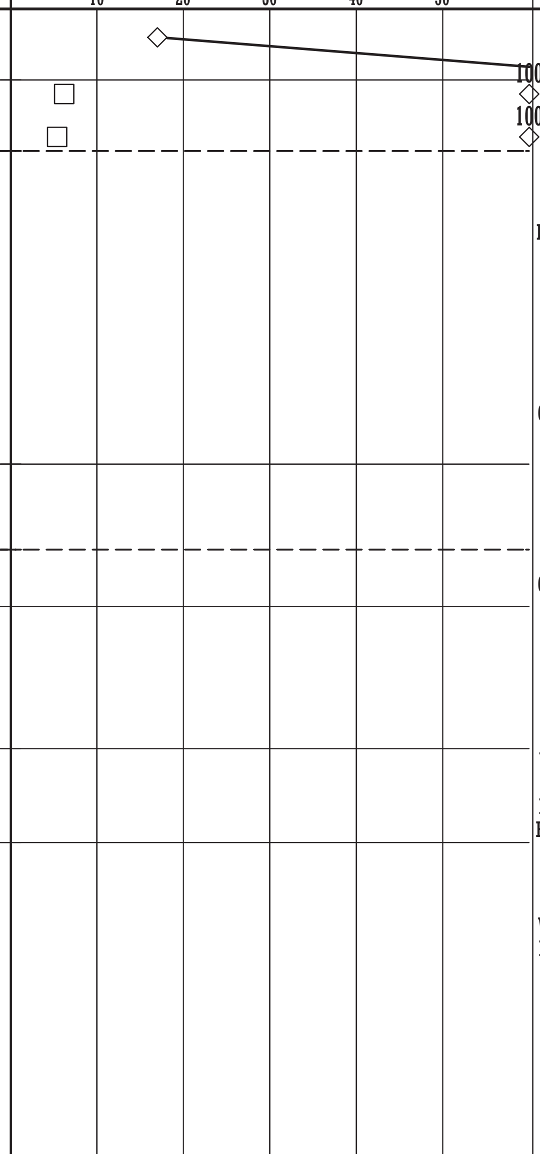
SURFACE ELEVATION: 2396.0

LATITUDE (degrees): 42.079834 LONGITUDE (degrees): 77.708838

Unconfined Compressive Strength, tons/ft.^{2} (1, 2, 3, 4, 5)

PL — MC — LL

N VALUE, blows/ft. (10, 20, 30, 40, 50)



DEPTH	SAMPLE NO.	DESCRIPTION OF MATERIALS (LABORATORY CLASSIFICATION)	REMARKS
	1	GLACIAL TILL CONSISTING OF BROWN HARD SANDY SILT WITH GRAVEL, MOIST	
	2	MODERATELY WEATHERED SANDSTONE GRADE III	
5.0	3, 4	RUN 1 - 5.0' TO 6.0' RECOVERY = 0.0%. RQD = 0% FRESH SANDSTONE	TRANSITIONAL BEDROCK MAY INCLUDE LARGE DISLODGED ROCK SLABS WITH SOIL INFILLS DUE TO WEATHERING
10.0	5	RUN 2 - 6.0' TO 11.0' RECOVERY = 68.0%. RQD = 0% FRESH SANDSTONE	
15.0	6	RUN 3 11.0' TO 16.0' RECOVERY = 100%. RQD = 0% FRESH SANDSTONE NATURAL DISCONTINUITY AT ~10.4 FEET	AVERAGE ROCK CORING RATE = 2.5 MINUTES PER FOOT
	7	RUN 4 - 16.0' TO 21.0' RECOVERY = 70%. RQD = 0% FRESH SHALE	
20.0		HIGHLY WEATHERED SHALE GRADE IV	AVERAGE ROCK CORING RATE = 0.5 MINUTES PER FOOT
25.0 (BCR)	8	RUN 5 - 21.0' TO 26.0' RECOVERY = 80%. RQD = 25% FRESH SANDSTONE NATURAL DISCONTINUITY AT ~23.5 FEET AND ~24.9 FEET	
	9	RUN 6 - 26.0' TO 31.0' RECOVERY = 74%. RQD = 8.3% FRESH SHALE	WATER RETURN AT 26' LOSS OF WATER RETURN AT 27.5'
30.0		FRESH SANDSTONE	
	10	RUN 7 - 31.0' TO 35.0' RECOVERY = 130%. RQD = 49% FRESH SANDSTONE	ROCK SAMPLE WAS RETRIEVED FROM PREVIOUS RUN
35.0	11	RUN 8 - 21.0' TO 26.0' RECOVERY = 62%. RQD = 13.3% FRESH SANDSTONE	
40.0		End of Boring @ 40.5 feet	
45.0			

Calibrated Penetrometer Unconfined Compression

WATER LEVEL MEASUREMENTS

DATE	TIME	SAMPLED	CASING	CAVE-IN	WATER
7/5/17	10:00	BCR	40.5	-	25.1
7/5/17	10:30	ACR	-	5	DRY

BORING STARTED 6/30/17	
BORING COMPLETED 7/5/17	
DRILLER PW	RIG CME 550
DRAWN BY D. ALLEN	APPROVED

Kenney Geotechnical Services

Job No. 2017-054

CLIENT: 8 POINTS WIND, LLC	PROJECT: EIGHT POINTS WIND ENERGY PROJECT
ENGINEER: SARGENT AND LUNDY, LLC	LOCATION: STEUBEN COUNTY, NY

BORING NUMBER: T-17 **Sheet 1 of 1**

SURFACE ELEVATION: 2273.8

LATITUDE (degrees): 42.073903 | LONGITUDE (degrees): 77.688459

Unconfined Compressive Strength, tons/ft.^{2} (1, 2, 3, 4, 5)

PL — MC — LL

N VALUE, blows/ft. (10, 20, 30, 40, 50)

DEPTH	SAMPLE NO.	DESCRIPTION OF MATERIALS (LABORATORY CLASSIFICATION)	REMARKS
	1	MODERATELY WEATHERED SANDSTONE GRADE III	
	2		
5.0			
	3	RUN 1 - 5.5' TO 9.5' RECOVERY = 100%. RQD = 0% FRESH SANDSTONE NATURAL DISCONTINUITY WITH CLAY INFILL AT ~8.6 FEET	TRANSITIONAL BEDROCK MAY INCLUDE LARGE DISLODGED ROCK SLABS WITH SOIL INFILLS DUE TO WEATHERING
10.0	4	RUN 2 - 9.5' TO 14.5' RECOVERY = 68%. RQD = 0% FRESH SANDSTONE	
15.0	5	RUN 3 - 14.5' TO 19.0' RECOVERY = 98%. RQD = 16% FRESH SANDSTONE NATURAL DISCONTINUITY AT ~18.1 FEET	AVERAGE ROCK CORING RATE = 2 MINUTES PER FOOT
20.0	6	RUN 4 - 19.0' TO 24.0' RECOVERY = 100%. RQD = 7.5% FRESH SANDSTONE	
25.0	7	RUN 5 - 24.0' TO 29.0' RECOVERY = 100%. RQD = 33.3% FRESH SANDSTONE NATURAL DISCONTINUITY ~25 FEET AND ~27 FEET	WATER RETURN AT 25' LOSS OF WATER RETURN AT 25.5'
30.0	8	RUN 6 - 29.0' TO 33.5' RECOVERY = 89%. RQD = 74% FRESH SANDSTONE	
35.0 (BCR)	9	RUN 7 - 33.5' TO 38.2' RECOVERY = 106%. RQD = 86% FRESH SANDSTONE	ROCK SAMPLE WAS RETRIEVED FROM PREVIOUS RUN
40.0	10	RUN 8 - 38.2' TO 40.2' RECOVERY = 90%. RQD = 50% FRESH SANDSTONE	WATER RETURN AT 38' LOSS OF WATER RETURN AT 39'
		End of Boring @ 40.2 feet	
45.0			

N value plot: sample 1 ≈ 42; sample 2: 100

Calibrated Penetrometer Unconfined Compression

WATER LEVEL MEASUREMENTS

DATE	TIME	SAMPLED	CASING	CAVE-IN	WATER
6/29/17	10:00	BCR	38.2	-	35.8
6/29/17	10:45	ACR	-	24	DRY

BORING STARTED: 6/28/17	
BORING COMPLETED: 6/29/17	
DRILLER: PW	RIG: CME 550
DRAWN BY: D. ALLEN	APPROVED:

Kenney Geotechnical Services

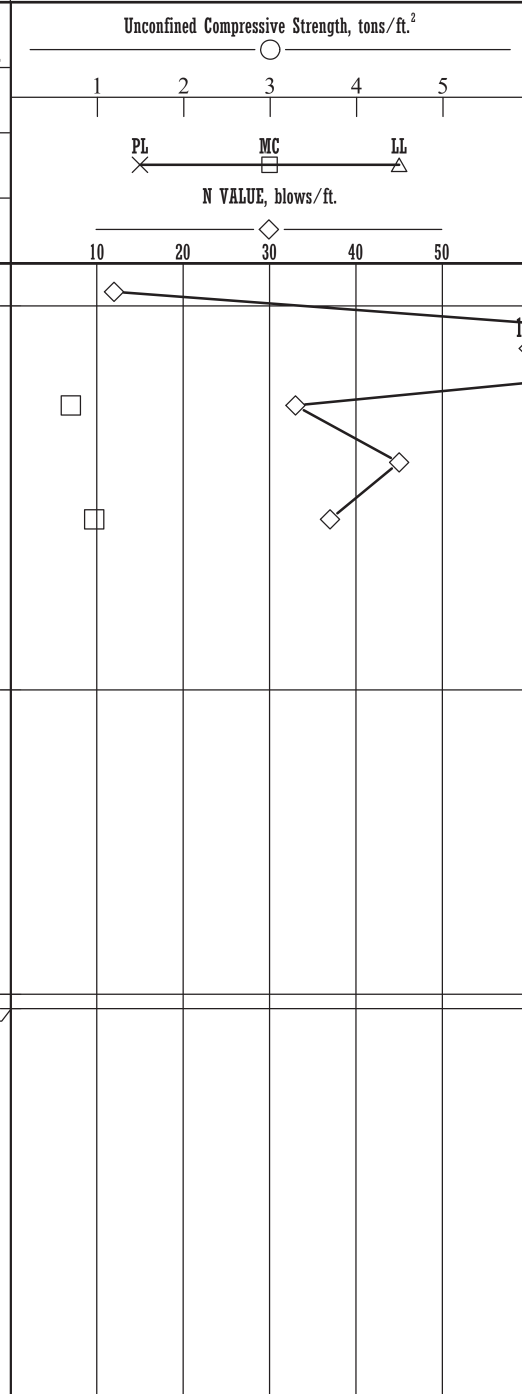
Job No. 2017-054

CLIENT	PROJECT
8 POINTS WIND, LLC	EIGHT POINTS WIND ENERGY PROJECT
ENGINEER	**LOCATION**
SARGENT AND LUNDY, LLC	STEUBEN COUNTY, NY

BORING NUMBER: T-18 Sheet 1 of 1

SURFACE ELEVATION: 2282.0

LATITUDE (degrees): 42.049532 LONGITUDE (degrees): 77.037496



DEPTH	SAMPLE NO.	DESCRIPTION OF MATERIALS (LABORATORY CLASSIFICATION)	REMARKS
	1	BROWN STIFF SANDY SILT WITH GRAVEL, MOIST	
	2	GLACIAL TILL CONSISITNG OF RED-BROWN HARD SANDY LEAN CLAY WITH GRAVEL, MOIST	DRILLER NOTES POSSIBLE COBBLES AND BOULDERS
5.0	3		pH 6.98
	4		
	5		
10.0			
15.0	6	RUN 1 - 15.0' TO 20.0' RECOVERY = 74%. RQD = 18.3% FRESH SANDSTONE NATURAL DISCONTINUITY AT 16.8'	TRANSITIONAL BEDROCK MAY INCLUDE LARGE DISLODGED ROCK SLABS WITH SOIL INFILLS DUE TO WEATHERING
20.0	7	RUN 2 - 20.0' TO 25.0' RECOVERY = 100%. RQD = 43.3% FRESH SANDSTONE NATURAL DISCONTINUITY AT 20.0'	AVERAGE ROCK CORING RATE = 3-4 MINUTES PER FOOT
25.0		FRESH CONGLOMERATE	
	8	RUN 3 - 25.0' TO 30.0' RECOVERY = 50%. RQD = 8.3% FRESH SANDSTONE NATURAL DISCONTINUITY AT 26.2'	
30.0	9	RUN 4 - 30.0' TO 35.0' RECOVERY = 50%. RQD = 10.0% FRESH SANDSTONE	
35.0	10	RUN 5 - 35.0' TO 40.0' RECOVERY 58%. RQD = 44.2% FRESH SANDSTONE NATURAL DISCONTINUITY AT 35.0'	
40.0		End of Boring @ 40 feet	
45.0			

BCR

Calibrated Penetrometer Unconfined Compression

WATER LEVEL MEASUREMENTS

DATE	TIME	SAMPLED	CASING	CAVE-IN	WATER
7/6/17	15:00	BCR	40	-	22.5
7/6/17	15:30	ACR	-	13	DRY

BORING STARTED: 7/6/17	
BORING COMPLETED: 7/6/17	
DRILLER: PW	RIG: CME 550
DRAWN BY: N. MOREHOUSE	APPROVED:

Kenney Geotechnical Services

Job No. 2017-054

CLIENT: 8 POINTS WIND, LLC	PROJECT: EIGHT POINTS WIND ENERGY PROJECT
ENGINEER: SARGENT AND LUNDY, LLC	LOCATION: STEUBEN COUNTY, NY

BORING NUMBER: T-21 Sheet 1 of 1

SURFACE ELEVATION: 2303.7

LATITUDE (degrees): 42.037202 LONGITUDE (degrees): 77.700802

Unconfined Compressive Strength, tons/ft.^{2} (1, 2, 3, 4, 5)

PL — MC — LL

N VALUE, blows/ft. (10, 20, 30, 40, 50)

DEPTH	SAMPLE NO.	DESCRIPTION OF MATERIALS (LABORATORY CLASSIFICATION)	REMARKS
	1	BROWN LOOSE GRAVELLY SAND WITH SILT, MOIST	
	2	GLACIAL TILL CONSISTING OF RED-BROWN HARD SANDY LEAN CLAY WITH GRAVEL, MOIST	
5.0	3		
10.0	4		100 DRILLER NOTES POSSIBLE COBBLES AND BOULDERS
15.0	5		
	6		100
		RUN 1 - 17.2' TO 22.2' RECOVERY = 86%. RQD = 55% FRESH SANDSTONE.	TRANSITIONAL BEDROCK MAY INCLUDE LARGE DISLODGED ROCK SLABS WITH SOIL INFILLS DUE TO WEATHERING
20.0	7		
BCR		RUN 2 - 22.2' TO 27.2' RECOVERY = 100%. RQD = 80% FRESH SANDSTONE.	
25.0	8		LOSS OF WATER RETURN AT 21.0'
		RUN 3 - 27.2' TO 32.2' RECOVERY = 100%. RQD = 70% FRESH SANDSTONE.	600 GALLONS OF WATER USED WHILE ROCK CORING
30.0	9		
		RUN 4 - 32.2' TO 37.2' RECOVERY = 100%. RQD = 76.6% FRESH SANDSTONE.	
35.0	10		AVERAGE ROCK CORING RATE = 3.4 MINUTES PER FOOT
		FRESH CONGLOMERATE	
	11	RUN 5 - 37.2' TO 40.2' RECOVERY = 100%. RQD = 69% FRESH CONGLOMERATE FRESH SANDSTONE	
40.0		End of Boring @ 40.2 feet	
45.0			

Calibrated Penetrometer Unconfined Compression

WATER LEVEL MEASUREMENTS

DATE	TIME	SAMPLED	CASING	CAVE-IN	WATER
6/1/17	13:30	BCR	27.2	-	23.5
6/1/17	13:30	ACR	-	15	DRY

BORING STARTED: 6/1/17	
BORING COMPLETED: 6/1/17	
DRILLER: KGES	RIG: 7822DT
DRAWN BY: D. ALLEN	APPROVED:

Kenney Geotechnical Services

Job No. 2017-054

CLIENT: 8 POINTS WIND, LLC	PROJECT: EIGHT POINTS WIND ENERGY PROJECT
ENGINEER: SARGENT AND LUNDY, LLC	LOCATION: STEUBEN COUNTY, NY

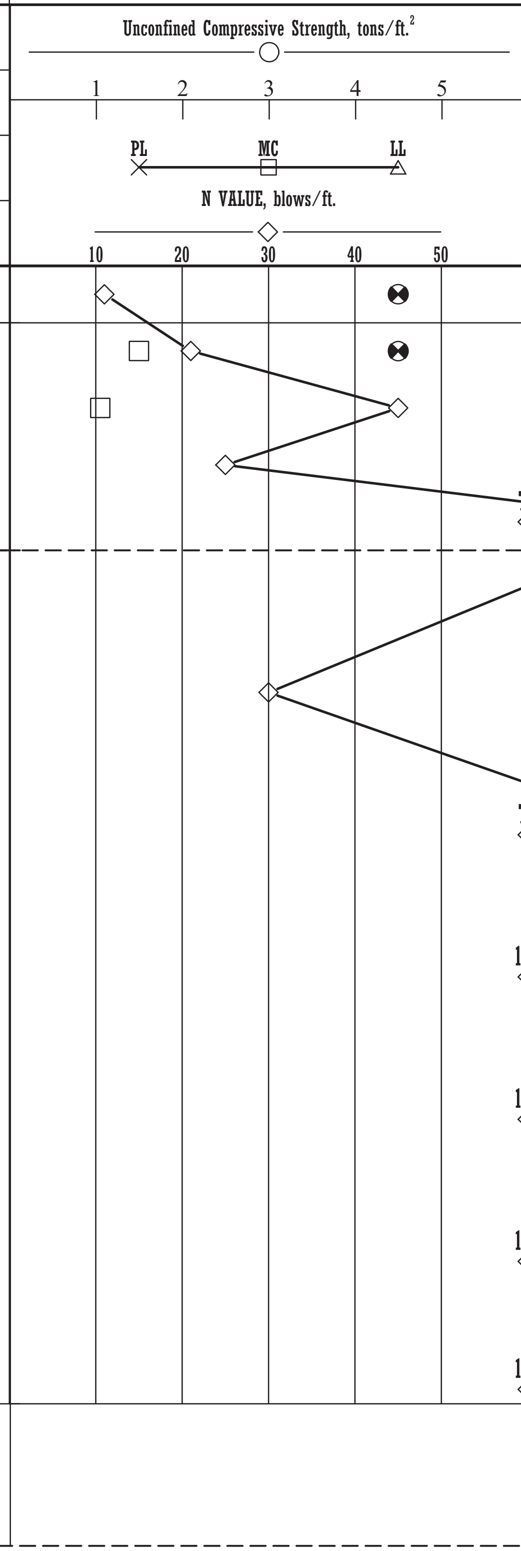
BORING NUMBER: T-22 **Sheet 1 of 1**

SURFACE ELEVATION: 2345.5

LATITUDE (degrees): 42.037202 LONGITUDE (degrees): 77.700802

DEPTH | SAMPLE NO. | SAMPLER TYPE | RECOVERY | GRAPHIC LOG | DESCRIPTION OF MATERIALS (LABORATORY CLASSIFICATION) | REMARKS

DEPTH	SAMPLE NO.	DESCRIPTION OF MATERIALS	REMARKS
	1	BROWN STIFF SANDY SILT WITH GRAVEL, MOIST	
WD	2	GLACIAL TILL CONSISTING OF RED-BROWN MEDIUM DENSE TO VERY DENSE CLAYEY SAND WITH GRAVEL, MOIST	
5.0	3		
	4		DRILLER NOTES POSSIBLE COBBLES AND BOULDERS
	5		
10.0		GLACIAL TILL CONSISTING OF RED-BROWN VERY STIFF TO HARD SANDY LEAN CLAY WITH GRAVEL, MOIST	
ACR 15.0	6		
20.0	7		
25.0	8		
30.0	9		
35.0	10		
40.0	11	End of Boring @ 40 feet	
45.0			



Calibrated Penetrometer Unconfined Compression

WATER LEVEL MEASUREMENTS

DATE	TIME	SAMPLED	CASING	CAVE-IN	WATER
6/22/17	09:30	WD	4	-	3.5
6/22/17	10:00	BCR	40	-	DRY
6/22/17	10:30	ACR	-	32	15.5

BORING STARTED: 6/22/17	
BORING COMPLETED: 6/22/17	
DRILLER: PW	RIG: CME 550
DRAWN BY: D. ALLEN	APPROVED:

LOG A GNGN03 - LOG A GNGN03.GDT - 9/1/17 14:48 - C:\PROGRAM FILES (X86)\GINT\PROJECTS\2017-054 NEXTERA 8 POINTS.GPJ

Kenney Geotechnical Services

Job No. 2017-054

CLIENT: 8 POINTS WIND, LLC	PROJECT: EIGHT POINTS WIND ENERGY PROJECT
ENGINEER: SARGENT AND LUNDY, LLC	LOCATION: STEUBEN COUNTY, NY

BORING NUMBER: T-23 **Sheet 1 of 1**

SURFACE ELEVATION: 2343.6

LATITUDE (degrees): 42.037878 LONGITUDE (degrees): 77.664762

Unconfined Compressive Strength, tons/ft.^{2}: 1 2 3 4 5

PL MC LL

N VALUE, blows/ft.: 10 20 30 40 50

DEPTH	SAMPLE NO.	DESCRIPTION OF MATERIALS (LABORATORY CLASSIFICATION)	N VALUE	REMARKS
	1	GLACIAL TILL CONSISTING OF RED-BROWN VERY STIFF TO HARD SANDY LEAN CLAY WITH GRAVEL, MOIST		BORING OFFSET 7' EAST DUE TO TREES
	2		100	
5.0	3	HIGHLY WEATHERED SANDSTONE GRADE IV	100	
	4		100	
10.0	6	RUN 1 - 6.5' TO 12' RECOVERY = 87.3%. RQD = 0% FRESH SANDSTONE		TRANSITIONAL BEDROCK MAY INCLUDE LARGE DISLODGED ROCK SLABS WITH SOIL INFILLS DUE TO WEATHERING
15.0	7	RUN 2 - 12' TO 17' RECOVERY = 100%. RQD = 28% FRESH SANDSTONE		AVERAGE ROCK CORING RATE = 3 MINUTES PER FOOT
20.0	8	RUN 3 - 17' TO 22' RECOVERY = 0.04%. RQD = 0% COMPLETELY WEATHERED SANDSTONE GRADE V		
25.0	9	RUN 4 - 22' TO 27' RECOVERY = 84%. RQD = 25% FRESH SANDSTONE		
30.0	10	RUN 5 - 27' TO 32' RECOVERY = 98%. RQD = 35.8% FRESH SANDSTONE FRESH CONGLOMERATE FRESH SANDSTONE		
35.0 (BCR)	11	RUN 6 - 32' TO 37' RECOVERY = 80%. RQD = 30.8% FRESH SANDSTONE		
40.0	12	RUN 1 - 37' TO 40.5' RECOVERY = 100%. RQD = 25% FRESH SANDSTONE		WATER RETURN AT 37' LOSS OF WATER RETURN AT 38.5'
45.0		End of Boring @ 40.5 feet		

Calibrated Penetrometer Unconfined Compression

WATER LEVEL MEASUREMENTS

DATE	TIME	SAMPLED	CASING	CAVE-IN	WATER
6/20/17	10:00	BCR	40	-	35.5
6/21/17	11:00	ACR	-	5.4	DRY

BORING STARTED: 6/20/17	
BORING COMPLETED: 6/21/17	
DRILLER: PW	RIG: CME 550
DRAWN BY: D. ALLEN	APPROVED:

Kenney Geotechnical Services

Job No. 2017-054

CLIENT: 8 POINTS WIND, LLC	PROJECT: EIGHT POINTS WIND ENERGY PROJECT
ENGINEER: SARGENT AND LUNDY, LLC	LOCATION: STEUBEN COUNTY, NY

BORING NUMBER: T-24 Sheet 1 of 1

SURFACE ELEVATION: 2278.5

LATITUDE (degrees): 42.032787 LONGITUDE (degrees): 77.677038

Unconfined Compressive Strength, tons/ft.^{2} (1, 2, 3, 4, 5)

PL — MC — LL

N VALUE, blows/ft. (10, 20, 30, 40, 50)

DEPTH	SAMPLE NO.	DESCRIPTION OF MATERIALS (LABORATORY CLASSIFICATION)	N VALUE	REMARKS
	1	BROWN VERY DENSE CLAYEY SAND WITH GRAVEL, MOIST		
	2	GLACIAL TILL CONSISTING OF RED-BROWN VERY STIFF TO HARD SANDY LEAN CLAY WITH GRAVEL, MOIST	71	DRILLER NOTES POSSIBLE COBBLES AND BOULDERS
5.0	3		70	pH 6.75
	4		82	
	5			
10.0				
15.0	6			
	7		100	
20.0	8	RUN 1 - 19.5' TO 23.5' RECOVERY = 87.5%. RQD = 0% FRESH SANDSTONE		TRANSITIONAL BEDROCK MAY INCLUDE LARGE DISLODGED ROCK SLABS WITH SOIL INFILLS DUE TO WEATHERING
25.0	9	RUN 2 - 23.5' TO 27.5' RECOVERY = 87.5%. RQD = 21.9% FRESH SANDSTONE		
30.0	10	RUN 3 - 27.5' TO 32' RECOVERY = 55.6%. RQD = 16.7% FRESH SANDSTONE		AVERAGE ROCK CORING RATE = 2.2 MINUTES PER FOOT
35.0	11	RUN 4 - 32' TO 37.5' RECOVERY = 76.4%. RQD = 30.3% FRESH SANDSTONE NATURAL DISCONTINUITY WITH CLAY INFILL AT ~35 FEET		
40.0	12	RUN 5 - 37.5' TO 40.5' RECOVERY = 83.3%. RQD = 40.3% FRESH SANDSTONE		
		End of Boring @ 40.5 feet		
45.0				

WD BCR

Calibrated Penetrometer Unconfined Compression

WATER LEVEL MEASUREMENTS					
DATE	TIME	SAMPLED	CASING	CAVE-IN	WATER
6/21/17	09:30	WD	37.5	-	33
6/22/17	10:00	BCR	40.5	-	34.5
6/22/17	10:30	ACR	-	9	DRY

BORING STARTED: 6/21/17	
BORING COMPLETED: 6/21/17	
DRILLER: PW	RIG: CME 550
DRAWN BY: D. ALLEN	APPROVED:

Kenney Geotechnical Services

Job No. 2017-054

CLIENT	PROJECT
8 POINTS WIND, LLC	EIGHT POINTS WIND ENERGY PROJECT
ENGINEER	**LOCATION**
SARGENT AND LUNDY, LLC	STEUBEN COUNTY, NY

BORING NUMBER: T-26 Sheet 1 of 1

SURFACE ELEVATION: 2263.0

LATITUDE (degrees): 42.016307 LONGITUDE (degrees): 77.672139

Unconfined Compressive Strength, tons/ft.^{2} (1, 2, 3, 4, 5)

PL MC LL

N VALUE, blows/ft. (10, 20, 30, 40, 50)

DEPTH	SAMPLE NO.	DESCRIPTION OF MATERIALS (LABORATORY CLASSIFICATION)	N VALUE	REMARKS
	1	RED-BROWN VERY STIFF SANDY SILT WITH GRAVEL, MOIST		
	2	GLACIAL TILL CONSISTING OF RED-BROWN HARD SANDY LEAN CLAY WITH GRAVEL, MOIST		
5.0	3			
	4		100	
	5		100	
10.0				
15.0	6	RUN 1 - 13.5' TO 17.5' RECOVERY = 27.5%. RQD = 0% GLACIAL TILL CONSISTING OF RED-BROWN GRAVELLY LEAN CLAY WITH SAND AND COBBLES, MOIST		
	7	GLACIAL TILL CONSISTING OF RED-BROWN HARD GRAVELLY LEAN CLAY WITH SAND AND COBBLES, MOIST	100	
20.0	8		100	
BCR				
25.0	9	RUN 2 - 23.5' TO 27.5' RECOVERY = 53%. RQD = 17% GLACIAL TILL CONSISTING OF RED-BROWN GRAVELLY LEAN CLAY WITH SAND AND COBBLES, MOIST		
30.0	10	RUN 3 - 27.5' TO 30.5' RECOVERY = 67%. RQD = 0% GLACIAL TILL CONSISTING OF RED-BROWN GRAVELLY LEAN CLAY WITH SAND AND COBBLES, MOIST		
	11	GLACIAL TILL CONSISTING OF RED-BROWN HARD GRAVELLY LEAN CLAY WITH SAND AND COBBLES, MOIST	90	
35.0	12		100	REFFUSAL CRITERIA MET AT 36.9'
		End of Boring @ 36.9 feet		
40.0				
45.0				

Calibrated Penetrometer Unconfined Compression

WATER LEVEL MEASUREMENTS

DATE	TIME	SAMPLED	CASING	CAVE-IN	WATER
7/11/17	08:00	BCR	23.5	-	23.0
7/11/17	09:00	ACR	-	9	DRY

BORING STARTED	7/7/17
BORING COMPLETED	7/10/17
DRILLER PW	RIG CME 550
DRAWN BY N. MOREHOUSE	APPROVED

Kenney Geotechnical Services

Job No. 2017-054

CLIENT: 8 POINTS WIND, LLC	PROJECT: EIGHT POINTS WIND ENERGY PROJECT
ENGINEER: SARGENT AND LUNDY, LLC	LOCATION: STEUBEN COUNTY, NY

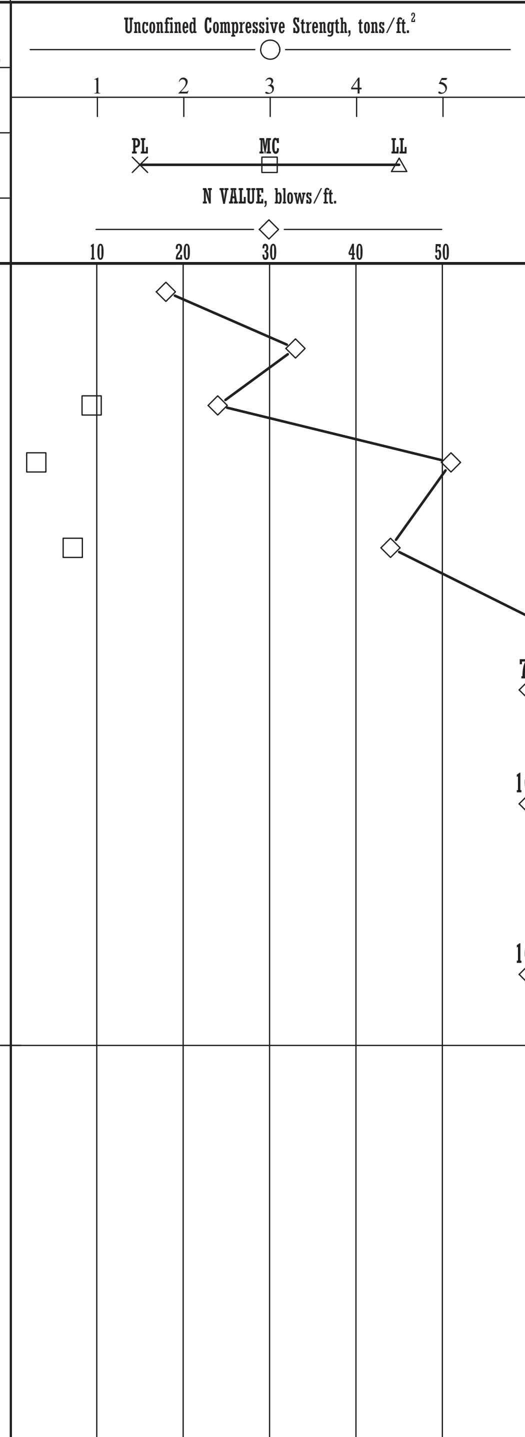
BORING NUMBER: T-28 **Sheet 1 of 1**

SURFACE ELEVATION: 2266.6

LATITUDE (degrees)	LONGITUDE (degrees)
42.024244	77.640757

DEPTH	SAMPLE NO.	DESCRIPTION OF MATERIALS (LABORATORY CLASSIFICATION)	REMARKS
	1	GLACIAL TILL CONSISTING OF RED-BROWN VERY STIFF TO HARD SANDY LEAN CLAY WITH GRAVEL, MOIST	
	2		pH 6.05
5.0	3		
	4		DRILLER NOTES POSSIBLE COBBLES AND BOULDERS
10.0	5		
15.0	6		
	7		
20.0			
25.0	8		TRANSITIONAL BEDROCK MAY INCLUDE LARGE DISLODGED ROCK SLABS WITH SOIL INFILLS DUE TO WEATHERING
30.0	9	RUN 1 - 27.5' TO 32.5' RECOVERY = 70%. RQD = 45% FRESH SANDSTONE	
35.0	10	RUN 2 - 32.5' TO 37.5' RECOVERY = 100%. RQD = 57.5% FRESH SANDSTONE	AVERAGE ROCK CORING RATE = 0.5 MINUTES PER FOOT
40.0	11	RUN 3 - 37.5' TO 41.5' RECOVERY = 100%. RQD = 81.25% FRESH SANDSTONE	WATER RETURN AT 34' LOSS OF WATER RETURN AT 36.5'
45.0		End of Boring @ 41.5 feet	

BCR



Calibrated Penetrometer Unconfined Compression

WATER LEVEL MEASUREMENTS					
DATE	TIME	SAMPLED	CASING	CAVE-IN	WATER
6/20/17	10:00	BCR	41.5	-	36.5
6/20/17	10:30	ACR	-	2.5	DRY

BORING STARTED: 5/31/17	
BORING COMPLETED: 6/20/17	
DRILLER: PW	RIG: CME 550
DRAWN BY: D. ALLEN	APPROVED

Kenney Geotechnical Services

Job No. 2017-054

CLIENT	PROJECT
8 POINTS WIND, LLC	EIGHT POINTS WIND ENERGY PROJECT
ENGINEER	LOCATION
SARGENT AND LUNDY, LLC	STEUBEN COUNTY, NY

BORING NUMBER: T-30 Sheet 1 of 1

SURFACE ELEVATION: 2237.7

LATITUDE (degrees): 42.009269 LONGITUDE (degrees): 77.658621

Unconfined Compressive Strength, tons/ft.^{2}: 1 2 3 4 5

PL MC LL

N VALUE, blows/ft.: 10 20 30 40 50

DEPTH	SAMPLE NO.	DESCRIPTION OF MATERIALS (LABORATORY CLASSIFICATION)	N VALUE	REMARKS
	1	GLACIAL TILL CONSISTING OF BROWN VERY DENSE GRAVELLY SAND WITH SILT, MOIST	100	DRILLER NOTES POSSIBLE COBBLES AND BOULDERS
	2	GLACIAL TILL CONSISTING OF RED-BROWN HARD SANDY LEAN CLAY WITH GRAVEL, MOIST	100	
5.0	3		100	
	4	HIGHLY WEATHERED SHALE GRADE IV	100	
10.0	5		100	
15.0	6	RUN 1 - 12' TO 17' RECOVERY = 82%. RQD = 37.5% FRESH SANDSTONE		TRANSITIONAL BEDROCK MAY INCLUDE LARGE DISLODGED ROCK SLABS WITH SOIL INFILLS DUE TO WEATHERING
20.0	7	RUN 2 - 17' TO 22' RECOVERY = 54%. RQD = 0% FRESH SHALE		LOSS OF WATER RETURN AT 19'
25.0	8	RUN 3 - 22' TO 27' RECOVERY = 100%. RQD = 86.6% FRESH SANDSTONE		590 GALLONS OF WATER USED WHILE ROCK CORING
30.0	9	RUN 4 - 27' TO 32' RECOVERY = 100%. RQD = 55.8% FRESH SANDSTONE		AVERAGE ROCK CORING RATE = 3.7 MINUTES PER FOOT
35.0	10	RUN 5 - 32' TO 37' RECOVERY = 96%. RQD = 70.8% FRESH SANDSTONE		
40.0	11	RUN 6 - 37' TO 40' RECOVERY = 43%. RQD = 13.8% FRESH SANDSTONE.		
		End of Boring @ 40 feet		
45.0				

BCR

Calibrated Penetrometer Unconfined Compression

WATER LEVEL MEASUREMENTS					
DATE	TIME	SAMPLED	CASING	CAVE-IN	WATER
5/31/17	09:00	BCR	40	-	18.1
5/31/17	09:30	ACR	-	7	DRY

BORING STARTED	5/30/17
BORING COMPLETED	5/31/17
DRILLER: KGES	RIG: 7822DT
DRAWN BY: D. ALLEN	APPROVED

LOG A GNGN03 - LOG A GNGN03.GDT - 9/1/17 14:48 - C:\PROGRAM FILES (X86)\GINT\PROJECTS\2017-054 NEXTERA 8 POINTS.GPJ

Kenney Geotechnical Services

Job No. 2017-054

CLIENT: 8 POINTS WIND, LLC	PROJECT: EIGHT POINTS WIND ENERGY PROJECT
ENGINEER: SARGENT AND LUNDY, LLC	LOCATION: STEUBEN COUNTY, NY

BORING NUMBER: T-31 **Sheet 1 of 1**

SURFACE ELEVATION: 2261.0

LATITUDE (degrees): 42.015262 | LONGITUDE (degrees): 77.638421

Unconfined Compressive Strength, tons/ft.^{2} (1, 2, 3, 4, 5)

PL — MC — LL

N VALUE, blows/ft. (10, 20, 30, 40, 50)

DEPTH	SAMPLE NO.	DESCRIPTION OF MATERIALS (LABORATORY CLASSIFICATION)	REMARKS
	1	BROWN STIFF SANDY SILT, MOIST	
	2	GLACIAL TILL CONSISTING OF BROWN HARD SANDY SILT WITH GRAVEL, MOIST	DRILLER NOTES POSSIBLE COBBLES AND BOULDERS
5.0	3	GLACIAL TILL CONSISTING OF RED-BROWN HARD SANDY LEAN CLAY WITH GRAVEL, MOIST	
	4	WEATHERED SANDSTONE GRADE IV	100
10.0	5	RUN 1 - 8.0' TO 12.5' RECOVERY = 58%. RQD = 24% FRESH SANDSTONE	TRANSITIONAL BEDROCK MAY INCLUDE LARGE DISLODGED ROCK SLABS WITH SOIL INFILLS DUE TO WEATHERING
15.0	6	RUN 2 - 12.5' TO 16.2' RECOVERY = 54%. RQD = 0% FRESH SANDSTONE NATURAL DISCONTINUITY AT 13.0' AND CLAY INFILL AT 14.0'	AVERAGE ROCK CORING RATE = 3-4 MINUTES PER FOOT
	7	RUN 3 - 16.2' TO 20.5' RECOVERY = 81%. RQD = 21.3% FRESH SANDSTONE	
20.0		HIGHLY WEATHERED SHALE GRADE IV	
	8	RUN 4 - 20.5' TO 25.5' RECOVERY = 80%. RQD = 25% FRESH SANDSTONE	
		FRESH SHALE	
25.0		HIGHLY WEATHERED SHALE GRADE IV	
	9	RUN 5 - 25.5' TO 30.5' RECOVERY = 84%. RQD = 33% FRESH SANDSTONE	
30.0	10	RUN 6 - 30.5' TO 35.5' RECOVERY = 64%. RQD = 15% FRESH SANDSTONE	
35.0	11	RUN 7 - 35.5' TO 40.5' RECOVERY = 70%. RQD = 0% FRESH SANDSTONE	
		FRESH SHALE	
		FRESH SANDSTONE	
40.0		End of Boring @ 40.5 feet	
45.0			

Calibrated Penetrometer Unconfined Compression

WATER LEVEL MEASUREMENTS

DATE	TIME	SAMPLED	CASING	CAVE-IN	WATER
11/7/17	17:30	BCR	40.5	-	DRY
11/7/17	18:00	ACR	-	31.2	DRY

BORING STARTED: 7/11/17	
BORING COMPLETED: 7/11/17	
DRILLER: PW	RIG: CME 550
DRAWN BY: N. MOREHOUSE	APPROVED:

Kenney Geotechnical Services

Job No. 2017-054

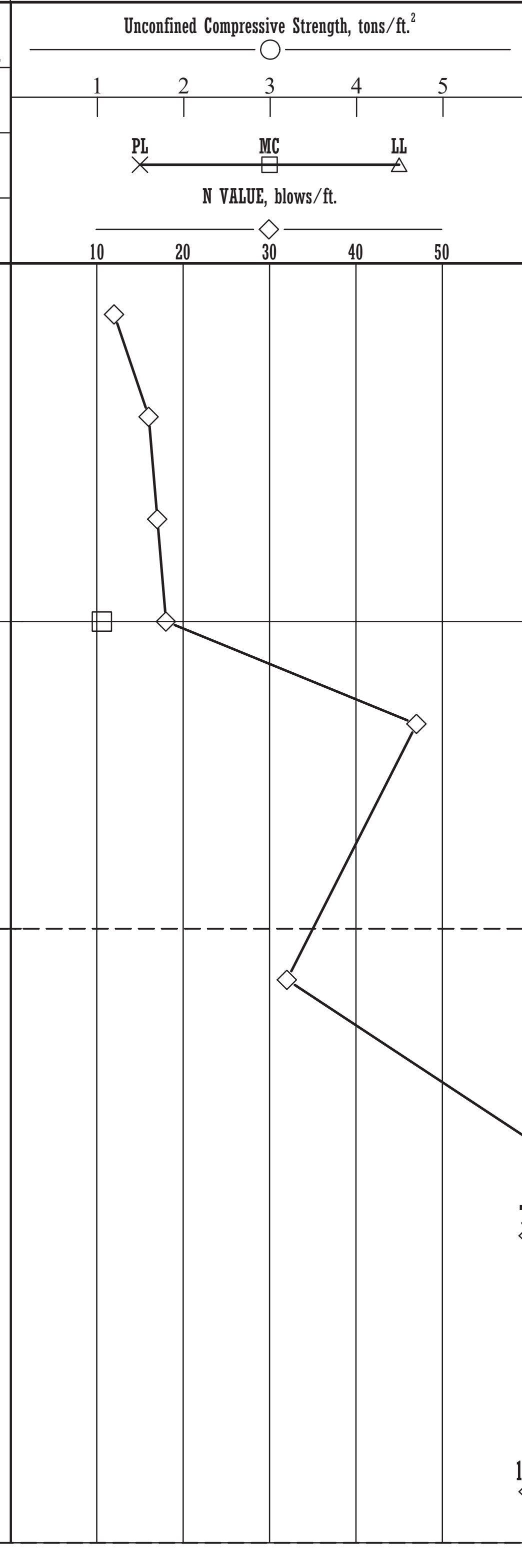
CLIENT: 8 POINTS WIND, LLC	PROJECT: **EIGHT POINTS WIND ENERGY PROJECT**
ENGINEER: **SARGENT AND LUNDY, LLC**	LOCATION: **STEUBEN COUNTY, NY**

BORING NUMBER: TL-3 **Sheet 1 of 1**

SURFACE ELEVATION:

LATITUDE (degrees): LONGITUDE (degrees):

DEPTH (ft)	SAMPLE NO.	DESCRIPTION OF MATERIALS (LABORATORY CLASSIFICATION)	REMARKS
0.0	1	BROWN STIFF TO VERY STIFF SANDY CLAYEY SILT WITH GRAVEL, MOIST	
2.5	2		
5.0	3		
7.0	4	GLACIAL TILL CONSISTING OF VERY STIFF TO HARD GRAVELLY LEAN CLAY WITH SAND, MOIST	DRILLER NOTES POSSIBLE COBBLES AND BOULDERS
	5		
13.0	6	GLACIAL TILL CONSISTING OF HARD SANDY CLAYEY SILT WITH GRAVEL, MOIST	
	7		
	8		
25.0		End of Boring @ 25 feet	



Calibrated Penetrometer Unconfined Compression

WATER LEVEL MEASUREMENTS					
DATE	TIME	SAMPLED	CASING	CAVE-IN	WATER
8/18/17	11:00	BCR	25	-	DRY
8/18/17	11:30	ACR	-	13.8	DRY

BORING STARTED: 8/18/17	
BORING COMPLETED: 8/18/17	
DRILLER: KGES	RIG: 7822DT
DRAWN BY: D. ALLEN	APPROVED:

Kenney Geotechnical Services

Job No. 2017-054

CLIENT: 8 POINTS WIND, LLC	PROJECT: EIGHT POINTS WIND ENERGY PROJECT
ENGINEER: SARGENT AND LUNDY, LLC	LOCATION: STEUBEN COUNTY, NY

BORING NUMBER: TL-4 Sheet 1 of 1

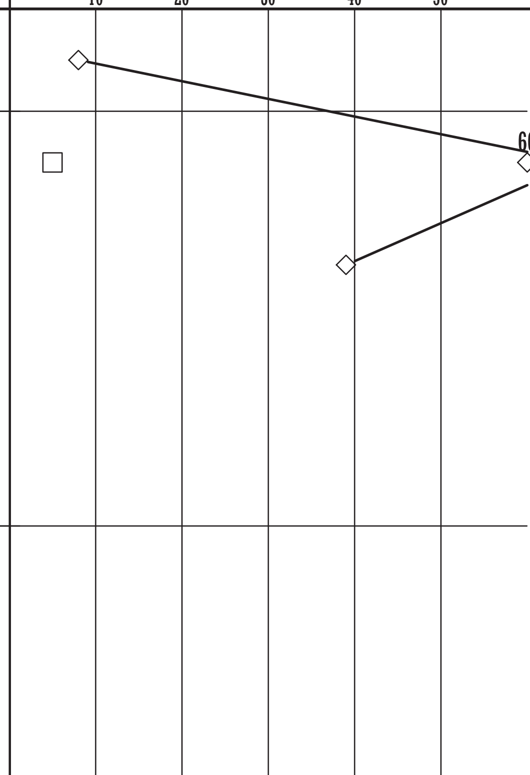
SURFACE ELEVATION:

LATITUDE (degrees): LONGITUDE (degrees):

Unconfined Compressive Strength, tons/ft.^{2} — PL / MC / LL — N VALUE, blows/ft.

DEPTH	SAMPLE NO.	DESCRIPTION OF MATERIALS (LABORATORY CLASSIFICATION)	REMARKS
0.0 – 2.0	1	BROWN MEDIUM STIFF SANDY CLAYEY SILT WITH GRAVEL, MOIST	
2.0 – 10.1	2, 3	GLACIAL TILL CONSISTING OF BROWN HARD SANDY SILT WITH GRAVEL, MOIST	DRILLER NOTES POSSIBLE COBBLES AND BOULDERS
10.1 – 15.1	4	RUN 1 - 10.1' TO 15.1' RECOVERY = 100%. RQD = 0% FRESH SANDSTONE	TRANSITIONAL BEDROCK MAY INCLUDE LARGE DISLODGED ROCK SLABS WITH SOIL INFILLS DUE TO WEATHERING AVERAGE ROCK CORING RATE = 2-4 MINUTES PER FOOT

End of Boring @ 15.1 feet



Calibrated Penetrometer Unconfined Compression

WATER LEVEL MEASUREMENTS

DATE	TIME	SAMPLED	CASING	CAVE-IN	WATER
8/17/17	11:00	BCR	15.1	-	DRY
8/17/17	11:30	ACR	-	11.5	DRY

BORING STARTED	8/17/17
BORING COMPLETED	8/17/17
DRILLER: KGES	RIG: 7822DT
DRAWN BY: D. ALLEN	APPROVED:

Kenney Geotechnical Services

Job No. 2017-054

CLIENT	PROJECT
8 POINTS WIND, LLC	EIGHT POINTS WIND ENERGY PROJECT
ENGINEER	**LOCATION**
SARGENT AND LUNDY, LLC	STEUBEN COUNTY, NY

BORING NUMBER: TL-9 **Sheet 1 of 1**

SURFACE ELEVATION

LATITUDE (degrees) | LONGITUDE (degrees)

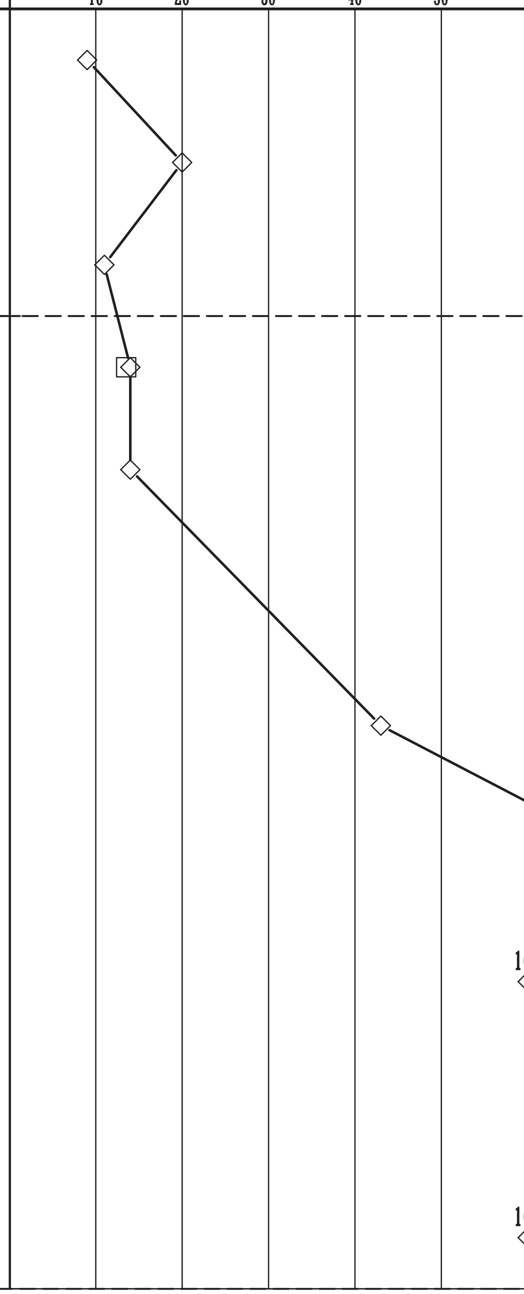
Unconfined Compressive Strength, tons/ft.^{2} (1, 2, 3, 4, 5)

PL — MC — LL

N VALUE, blows/ft. (10, 20, 30, 40, 50)

DEPTH	SAMPLE NO.	SAMPLER TYPE	RECOVERY	GRAPHIC LOG	DESCRIPTION OF MATERIALS (LABORATORY CLASSIFICATION)	REMARKS
0.0–6.0	1, 2, 3				GLACIAL TILL CONSISTING OF BROWN STIFF TO VERY STIFF SANDY CLAYEY SILT WITH GRAVEL, MOIST	
6.0–25.0	4, 5, 6, 7, 8				GLACIAL TILL CONSISTING OF GRAY-BROWN STIFF TO HARD SANDY CLAYEY SILT WITH GRAVEL, MOIST	DRILLER NOTES POSSIBLE COBBLES AND BOULDERS

Depth scale: 2.5, 5.0, 7.5, 10.0, 12.5, 15.0, 17.5, 20.0, 22.5, 25.0



End of Boring @ 25 feet

Calibrated Penetrometer Unconfined Compression

WATER LEVEL MEASUREMENTS					
DATE	TIME	SAMPLED	CASING	CAVE-IN	WATER
8/16/17	11:00	BCR	25	-	DRY
8/16/17	11:30	ACR	-	12	DRY

BORING STARTED 8/16/17	
BORING COMPLETED 8/16/17	
DRILLER KGES	RIG 7822DT
DRAWN BY D. ALLEN	APPROVED

Kenney Geotechnical Services

Job No. 2017-054

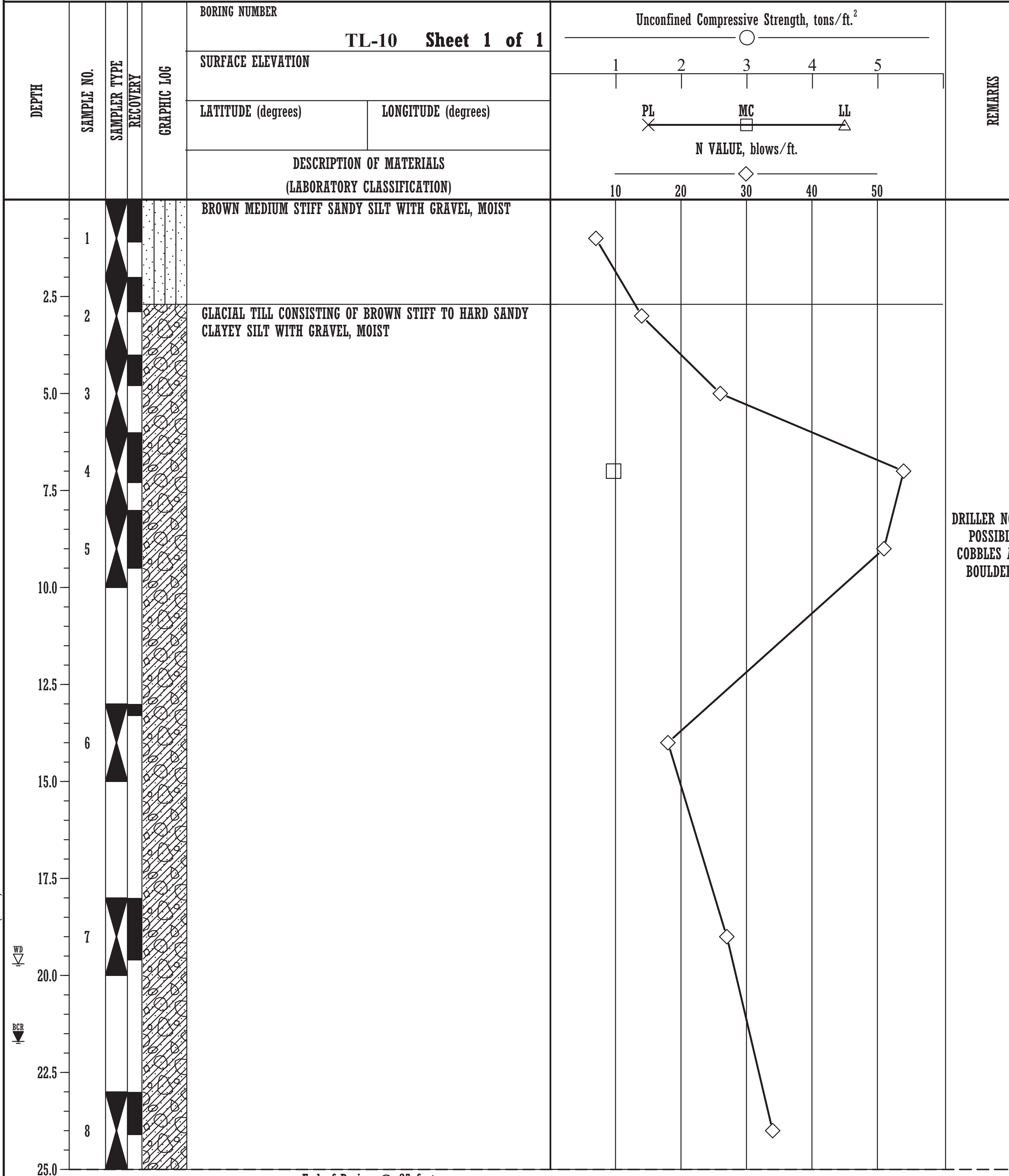
CLIENT: 8 POINTS WIND, LLC	PROJECT: EIGHT POINTS WIND ENERGY PROJECT
ENGINEER: SARGENT AND LUNDY, LLC	LOCATION: STEUBEN COUNTY, NY

BORING NUMBER: TL-10 **Sheet 1 of 1**

SURFACE ELEVATION:

LATITUDE (degrees): LONGITUDE (degrees):

DEPTH	SAMPLE NO.	DESCRIPTION OF MATERIALS (LABORATORY CLASSIFICATION)	REMARKS
0.0–2.5	1	BROWN MEDIUM STIFF SANDY SILT WITH GRAVEL, MOIST	
2.5–25.0	2, 3, 4, 5, 6, 7, 8	GLACIAL TILL CONSISTING OF BROWN STIFF TO HARD SANDY CLAYEY SILT WITH GRAVEL, MOIST	DRILLER NOTES POSSIBLE COBBLES AND BOULDERS



End of Boring @ 25 feet

Calibrated Penetrometer Unconfined Compression

WATER LEVEL MEASUREMENTS

DATE	TIME	SAMPLED	CASING	CAVE-IN	WATER
8/10/17	09:00	WD	20	-	19.7
8/10/17	09:30	BCR	25	-	21.7
8/10/17	10:00	ACR	-	13.6	DRY

BORING STARTED: 8/10/17	
BORING COMPLETED: 8/10/17	
DRILLER: KGES	RIG: 7822DT
DRAWN BY: D. ALLEN	APPROVED:

Kenney Geotechnical Services

Job No. 2017-054

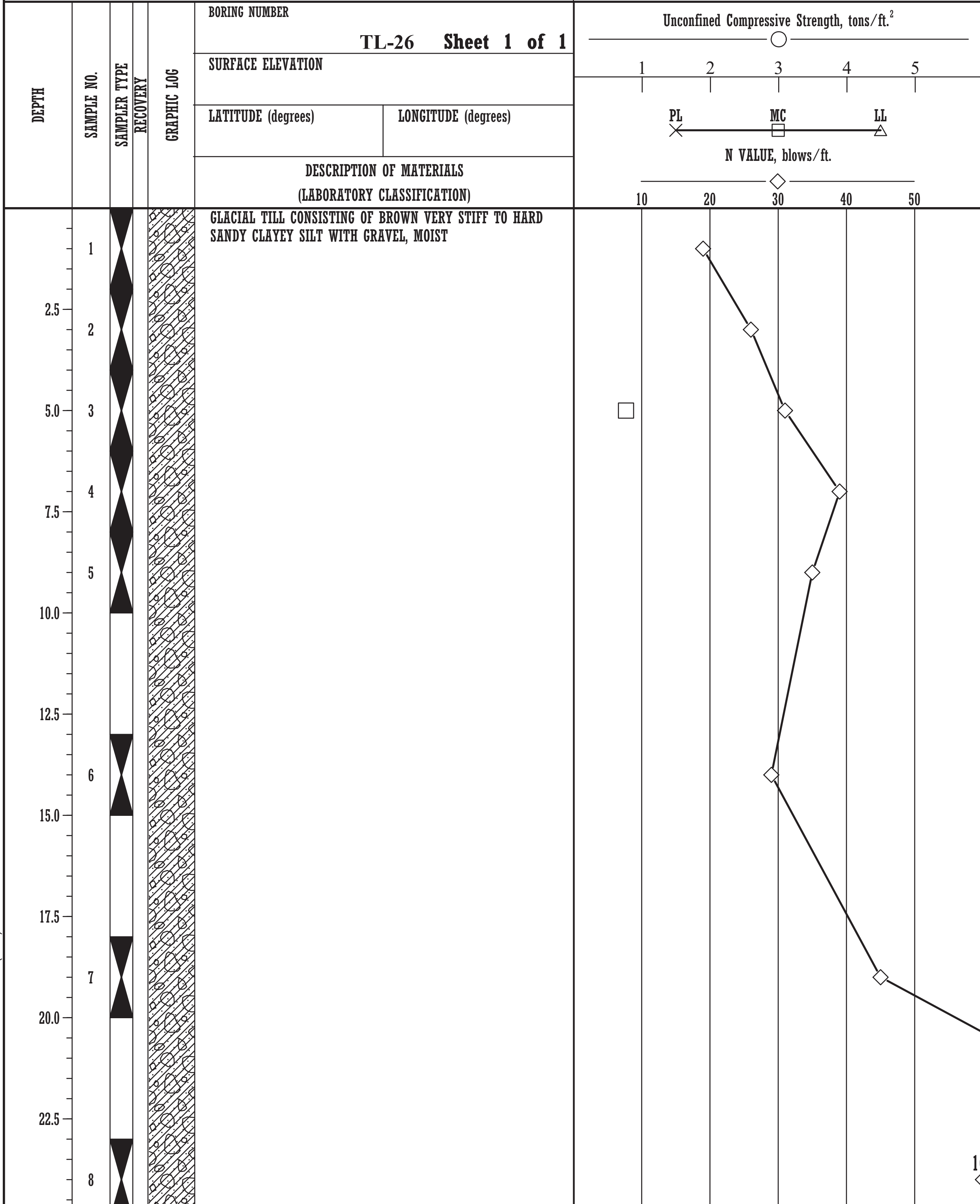
CLIENT	PROJECT
8 POINTS WIND, LLC	EIGHT POINTS WIND ENERGY PROJECT
ENGINEER: SARGENT AND LUNDY, LLC	LOCATION: STEUBEN COUNTY, NY

BORING NUMBER: TL-26 **Sheet 1 of 1**

SURFACE ELEVATION

LATITUDE (degrees) | LONGITUDE (degrees)

DEPTH	SAMPLE NO.	SAMPLER TYPE	RECOVERY	GRAPHIC LOG	DESCRIPTION OF MATERIALS (LABORATORY CLASSIFICATION)	REMARKS
0.0–25.0	1, 2, 3, 4, 5, 6, 7, 8				GLACIAL TILL CONSISTING OF BROWN VERY STIFF TO HARD SANDY CLAYEY SILT WITH GRAVEL, MOIST	DRILLER NOTES POSSIBLE COBBLES AND BOULDERS



End of Boring @ 25 feet

Calibrated Penetrometer Unconfined Compression

WATER LEVEL MEASUREMENTS					
DATE	TIME	SAMPLED	CASING	CAVE-IN	WATER
8/11/17	11:00	BCR	25	-	DRY
8/11/17	11:30	ACR	-	14.7	DRY

BORING STARTED: 8/11/17	
BORING COMPLETED: 8/11/17	
DRILLER: KGES	RIG: 7822DT
DRAWN BY: D. ALLEN	APPROVED

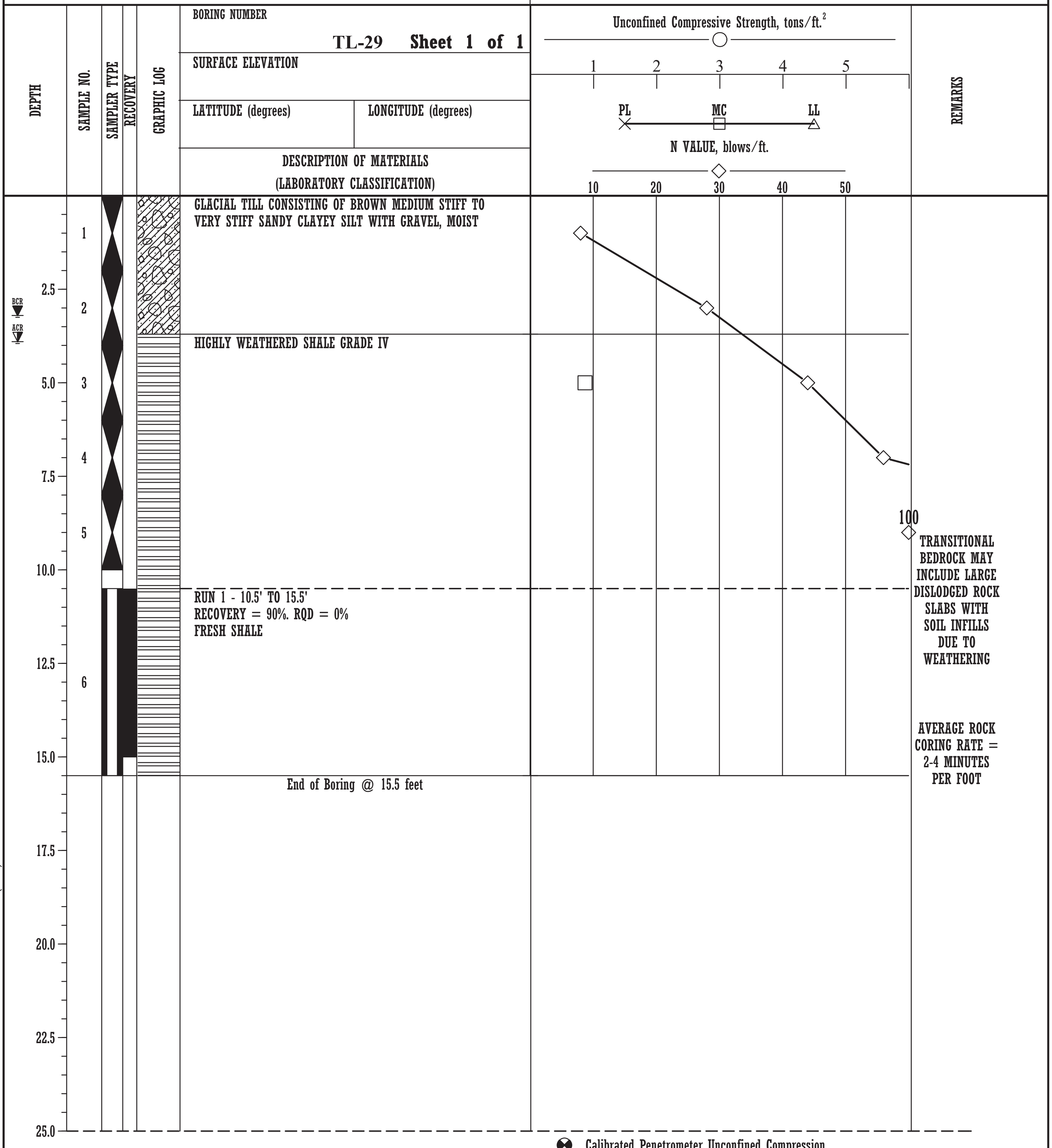
Kenney Geotechnical Services — **Job No. 2017-054**

CLIENT: 8 POINTS WIND, LLC	PROJECT: EIGHT POINTS WIND ENERGY PROJECT
ENGINEER: SARGENT AND LUNDY, LLC	LOCATION: STEUBEN COUNTY, NY

BORING NUMBER: TL-29 Sheet 1 of 1

SURFACE ELEVATION

LATITUDE (degrees) | LONGITUDE (degrees)



LOG A GNGN03 - LOG A GNGN03.GDT - 9/1/17 15:16 - C:\PROGRAM FILES (X86)\GINT\PROJECTS\2017-054 NEXTERA 8 POINTS.GPJ

WATER LEVEL MEASUREMENTS

DATE	TIME	SAMPLED	CASING	CAVE-IN	WATER
8/10/17	11:00	BCR	15.5	-	3.2
8/10/17	23:30	ACR	-	7.1	3.9

BORING STARTED: 8/10/17	
BORING COMPLETED: 8/10/17	
DRILLER: KGES	RIG: 7822DT
DRAWN BY: D. ALLEN	APPROVED:

Kenney Geotechnical Services

Job No. 2017-054

CLIENT: 8 POINTS WIND, LLC	PROJECT: EIGHT POINTS WIND ENERGY PROJECT
ENGINEER: SARGENT AND LUNDY, LLC	LOCATION: STEUBEN COUNTY, NY

BORING NUMBER: TL-32 **Sheet 1 of 1**

SURFACE ELEVATION

LATITUDE (degrees) LONGITUDE (degrees)

Unconfined Compressive Strength, tons/ft.^{2} (1, 2, 3, 4, 5)

PL MC LL

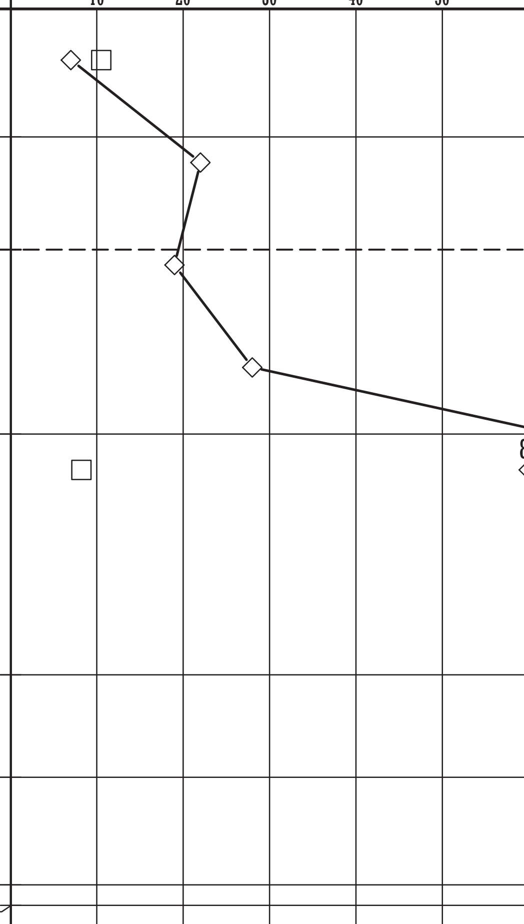
N VALUE, blows/ft. (10, 20, 30, 40, 50)

DEPTH	SAMPLE NO.	DESCRIPTION OF MATERIALS (LABORATORY CLASSIFICATION)	REMARKS
0.0–2.5	1	BROWN MEDIUM STIFF TO VERY STIFF SANDY SILT, MOIST	
2.5–4.7	2	GLACIAL TILL CONSISTING OF BROWN VERY STIFF SANDY SILT WITH CLAY GRAVEL, MOIST	
4.7–8.3	3, 4	GLACIAL TILL CONSISTING OF GRAY-BROWN VERY STIFF SANDY LEAN CLAY WITH GRAVEL, MOIST	
8.3–13.0	5	MODERATELY WEATHERED SANDSTONE GRADE III	TRANSITIONAL BEDROCK MAY INCLUDE LARGE DISLODGED ROCK SLABS WITH SOIL INFILLS DUE TO WEATHERING
13.0–15.0	6	RUN 1 - 13.0' TO 18.0' RECOVERY = 100%. RQD = 34.2% FRESH CONGLOMERATE	
15.0–17.2		FRESH SANDSTONE	
17.2–17.5		FRESH SHALE	AVERAGE ROCK CORING RATE = 2-4 MINUTES PER FOOT
17.5–18.0		FRESH SANDSTONE	

End of Boring @ 18 feet

Depth scale: 2.5, 5.0, 7.5, 10.0, 12.5, 15.0, 17.5, 20.0, 22.5, 25.0

BCR ACR



Calibrated Penetrometer Unconfined Compression

WATER LEVEL MEASUREMENTS					
DATE	TIME	SAMPLED	CASING	CAVE-IN	WATER
8/10/17	13:30	BCR	18	-	3.3
8/10/17	14:00	ACR	-	10.1	4.8

BORING STARTED: 8/10/17	
BORING COMPLETED: 8/10/17	
DRILLER: KGES	RIG: 7822DT
DRAWN BY: D. ALLEN	APPROVED

Kenney Geotechnical Services

Job No. 2017-054

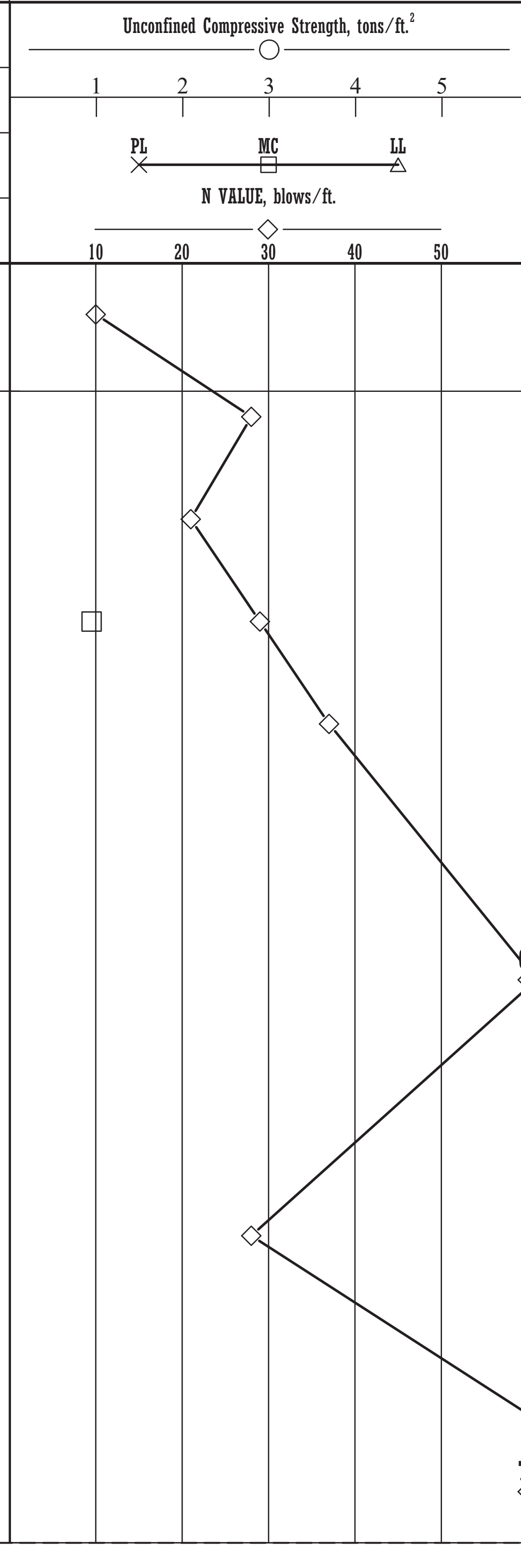
CLIENT	PROJECT
8 POINTS WIND, LLC	EIGHT POINTS WIND ENERGY PROJECT
ENGINEER	**LOCATION**
SARGENT AND LUNDY, LLC	STEUBEN COUNTY, NY

BORING NUMBER: TL-33 **Sheet 1 of 1**

SURFACE ELEVATION

LATITUDE (degrees) | LONGITUDE (degrees)

DEPTH	SAMPLE NO.	SAMPLER TYPE / RECOVERY / GRAPHIC LOG	DESCRIPTION OF MATERIALS (LABORATORY CLASSIFICATION)	REMARKS
0.0–2.5	1		BROWN STIFF SANDY SILT WITH GRAVEL, MOIST	
2.5	2		GLACIAL TILL CONSISTING OF BROWN VERY STIFF TO HARD SANDY LEAN CLAY WITH GRAVEL, MOIST	
5.0	3			
7.5	4			
	5			
10.0				DRILLER NOTES POSSIBLE COBBLES AND BOULDERS
12.5				
15.0	6			
17.5				
20.0	7			
22.5				
25.0	8		End of Boring @ 25 feet	



Calibrated Penetrometer Unconfined Compression

WATER LEVEL MEASUREMENTS					
DATE	TIME	SAMPLED	CASING	CAVE-IN	WATER
8/9/17	09:30	BCR	25	-	DRY
8/9/17	10:00	ACR	-	13.2	DRY

BORING STARTED 8/9/17	
BORING COMPLETED 8/9/17	
DRILLER KGES	RIG 7822DT
DRAWN BY D. ALLEN	APPROVED

Kenney Geotechnical Services

Job No. 2017-054

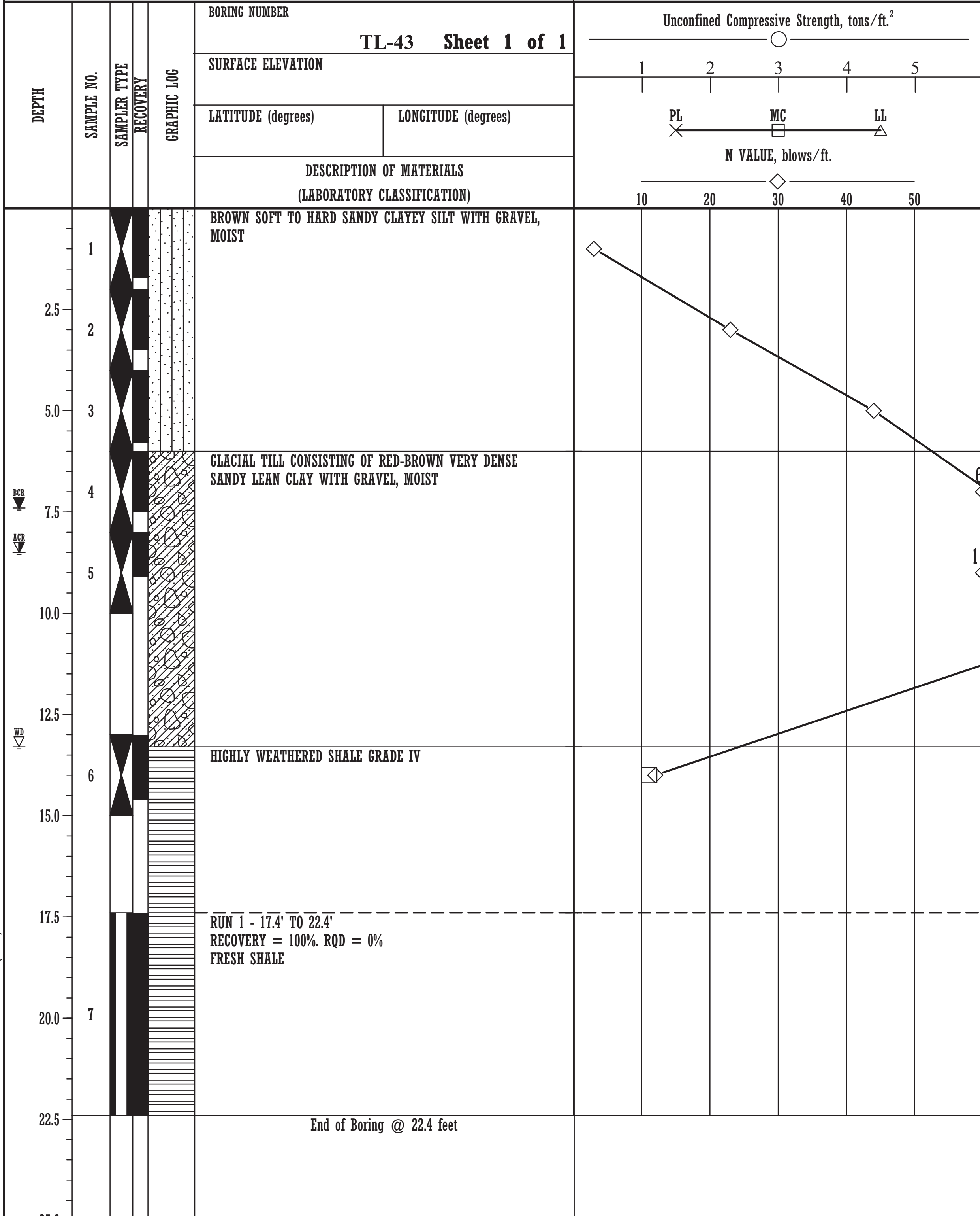
CLIENT: 8 POINTS WIND, LLC	PROJECT: EIGHT POINTS WIND ENERGY PROJECT
ENGINEER: SARGENT AND LUNDY, LLC	LOCATION: STEUBEN COUNTY, NY

BORING NUMBER: TL-43 Sheet 1 of 1

SURFACE ELEVATION

LATITUDE (degrees) | LONGITUDE (degrees)

DEPTH	SAMPLE NO.	DESCRIPTION OF MATERIALS (LABORATORY CLASSIFICATION)	REMARKS
0.0–6.0	1, 2, 3	BROWN SOFT TO HARD SANDY CLAYEY SILT WITH GRAVEL, MOIST	
6.0–13.3	4, 5	GLACIAL TILL CONSISTING OF RED-BROWN VERY DENSE SANDY LEAN CLAY WITH GRAVEL, MOIST	DRILLER NOTES POSSIBLE COBBLES AND BOULDERS
13.3–17.4	6	HIGHLY WEATHERED SHALE GRADE IV	
17.4–22.4	7	RUN 1 - 17.4' TO 22.4' RECOVERY = 100%. RQD = 0% FRESH SHALE	TRANSITIONAL BEDROCK MAY INCLUDE LARGE DISLODGED ROCK SLABS WITH SOIL INFILLS DUE TO WEATHERING AVERAGE ROCK CORING RATE = 2-4 MINUTES PER FOOT
		End of Boring @ 22.4 feet	



Calibrated Penetrometer Unconfined Compression

WATER LEVEL MEASUREMENTS					
DATE	TIME	SAMPLED	CASING	CAVE-IN	WATER
8/9/17	11:00	WD	15	-	13.3
8/9/17	11:30	BCR	22.4	-	7.4
8/9/17	12:00	ACR	-	12.8	8.5

BORING STARTED: 8/9/17	
BORING COMPLETED: 8/9/17	
DRILLER: KGES	RIG: 7822DT
DRAWN BY: D. ALLEN	APPROVED:

Kenney Geotechnical Services
7246 State Fair Blvd
Baldwinsville, N.Y. 13209
Telephone: 315-638-2706
Fax: 315-638-1544

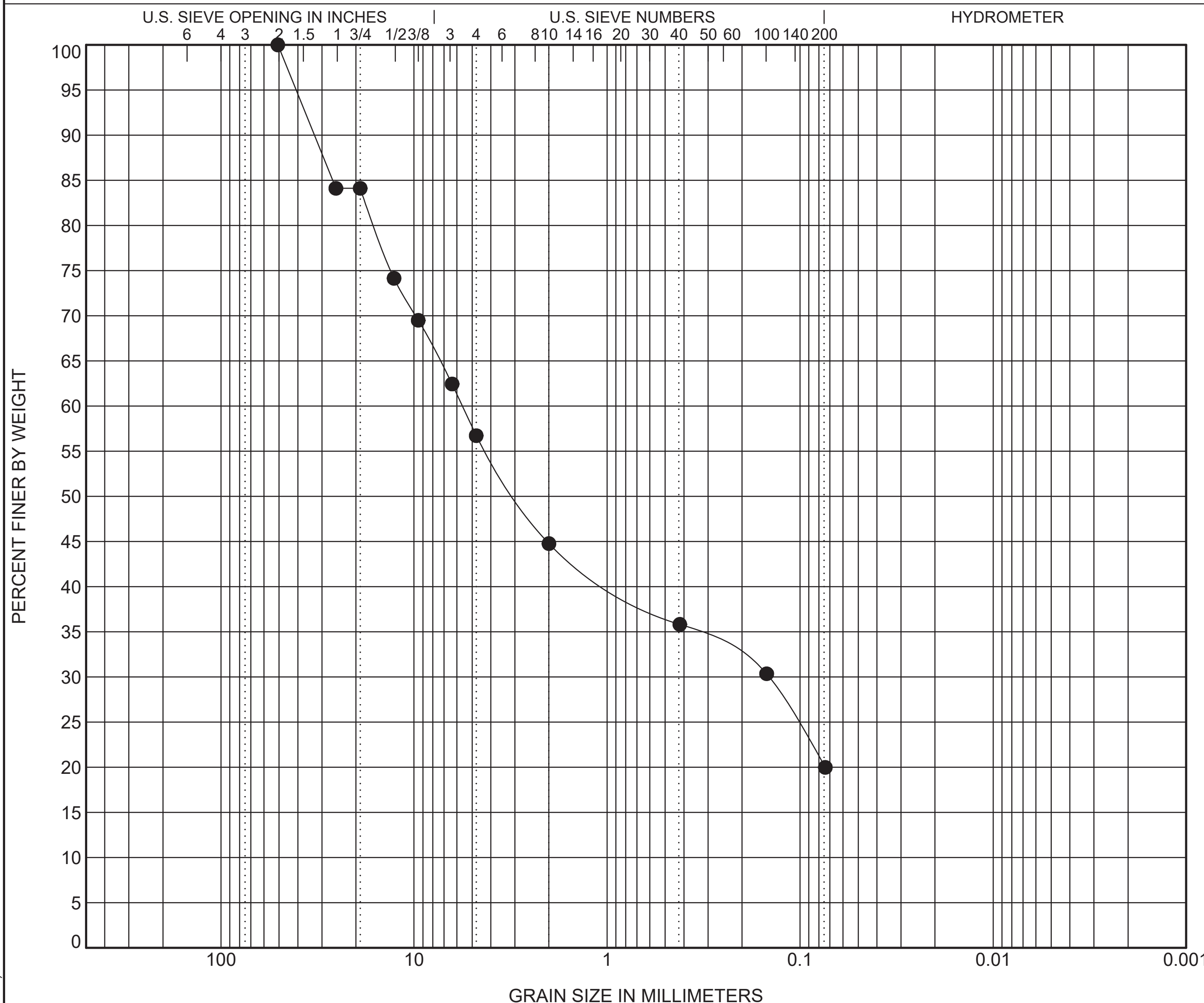
GRAIN SIZE DISTRIBUTION

CLIENT NEXTERA ENERGY

PROJECT NAME EIGHT POINTS WIND ENERGY PROJECT

PROJECT NUMBER 2017-054

PROJECT LOCATION STEUBEN COUNTY, NY



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification	LL	PL	PI	Cc	Cu
●	ALT-1	15.3	**SANDY GRAVEL WITH SILT (GWS)**					

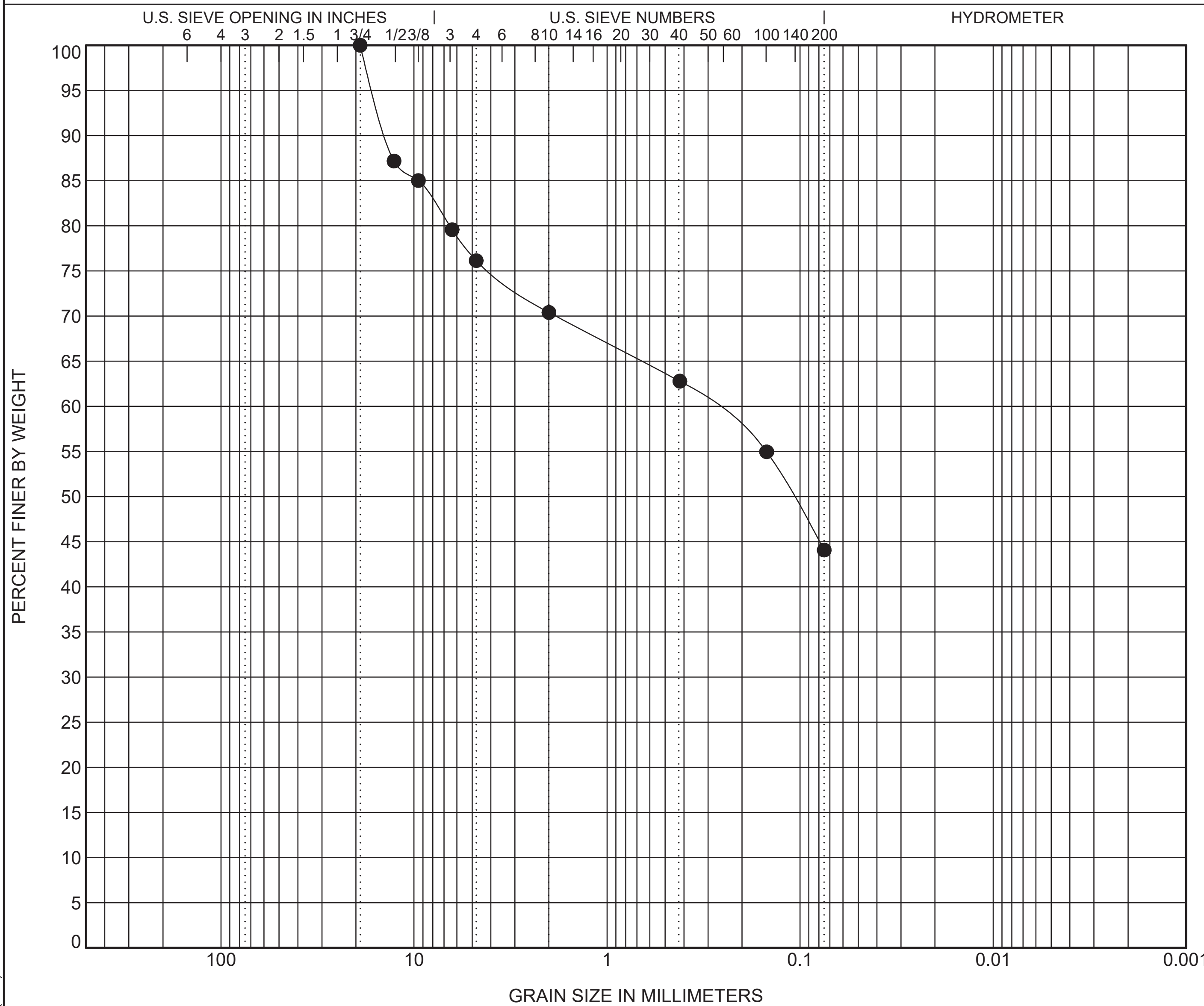
	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	ALT-1	15.3	50.8	5.615	0.145		43.3	36.5	20.2	

Kenney Geotechnical Services
7246 State Fair Blvd
Baldwinsville, N.Y. 13209
Telephone: 315-638-2706
Fax: 315-638-1544

GRAIN SIZE DISTRIBUTION

CLIENT NEXTERA ENERGY **PROJECT NAME** EIGHT POINTS WIND ENERGY PROJECT

PROJECT NUMBER 2017-054 **PROJECT LOCATION** STEUBEN COUNTY, NY



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification		Classification	LL	PL	PI	Cc	Cu
● ALT-2	2.0	**SANDY LEAN CLAY WITH GRAVEL (CLS)**					

Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● ALT-2	2.0	**19**	**0.29**			**23.9**	**32.1**	**44.1**	

Kenney Geotechnical Services
7246 State Fair Blvd
Baldwinsville, N.Y. 13209
Telephone: 315-638-2706
Fax: 315-638-1544

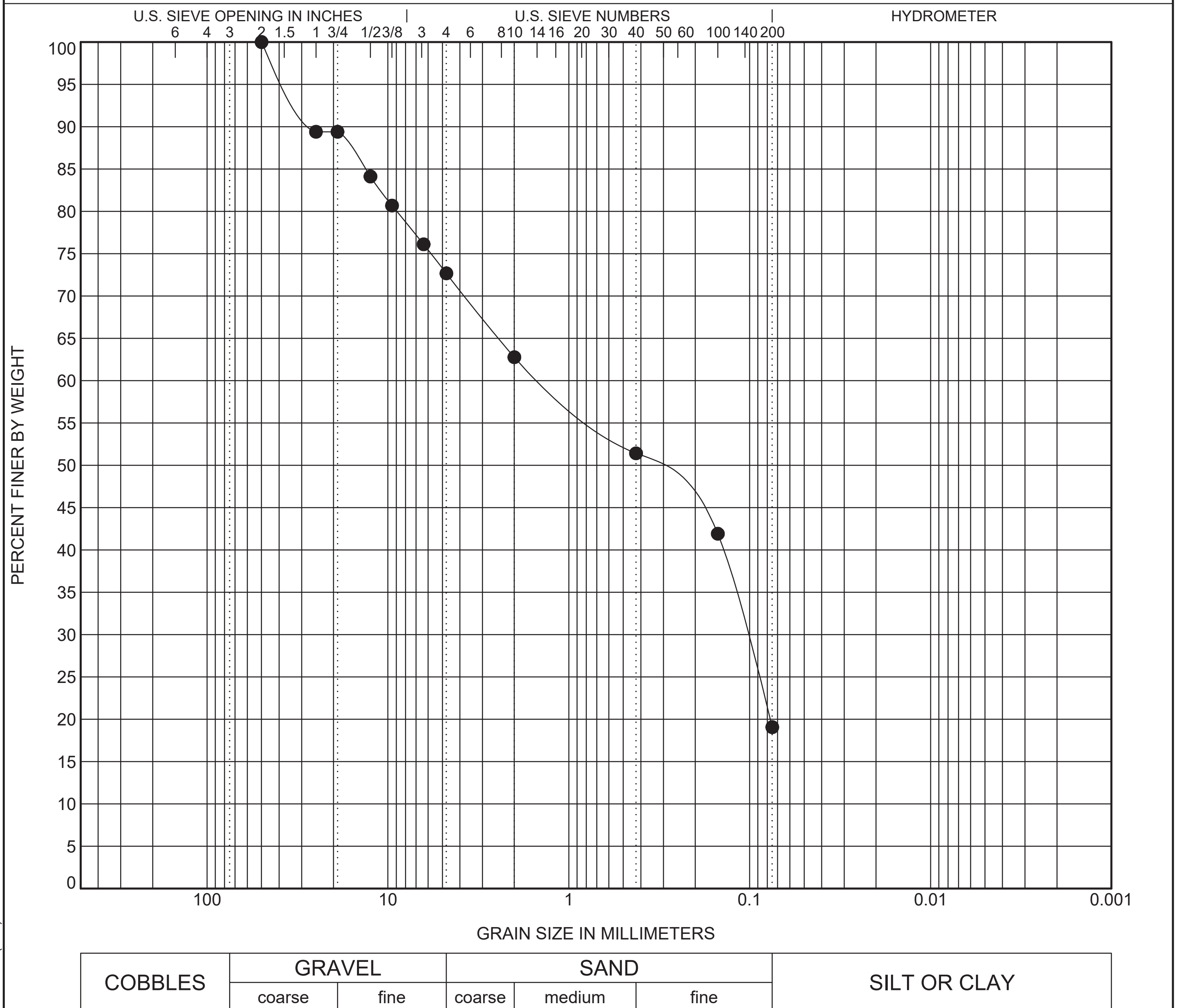
GRAIN SIZE DISTRIBUTION

CLIENT 8 POINTS WIND, LLC

PROJECT NAME EIGHT POINTS WIND ENERGY PROJECT

PROJECT NUMBER 2017-054

PROJECT LOCATION STEUBEN COUNTY, NY



Specimen Identification			Classification	LL	PL	PI	Cc	Cu
●	T-1	7.0	**GRAVELLY SAND WITH SILT (SWG) - SANDSTONE**					

Specimen Identification			D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	T-1	7.0	**50**	**1.371**	**0.105**		**27.3**	**53.6**	**19.1**	

GRAIN SIZE - GINT STD US LAB.GDT - 9/1/17 14:54 - C:\PROGRAM FILES (X86)\GINT\PROJECTS\2017-054 NEXTERA 8 POINTS.GPJ

Kenney Geotechnical Services
7246 State Fair Blvd
Baldwinsville, N.Y. 13209
Telephone: 315-638-2706
Fax: 315-638-1544

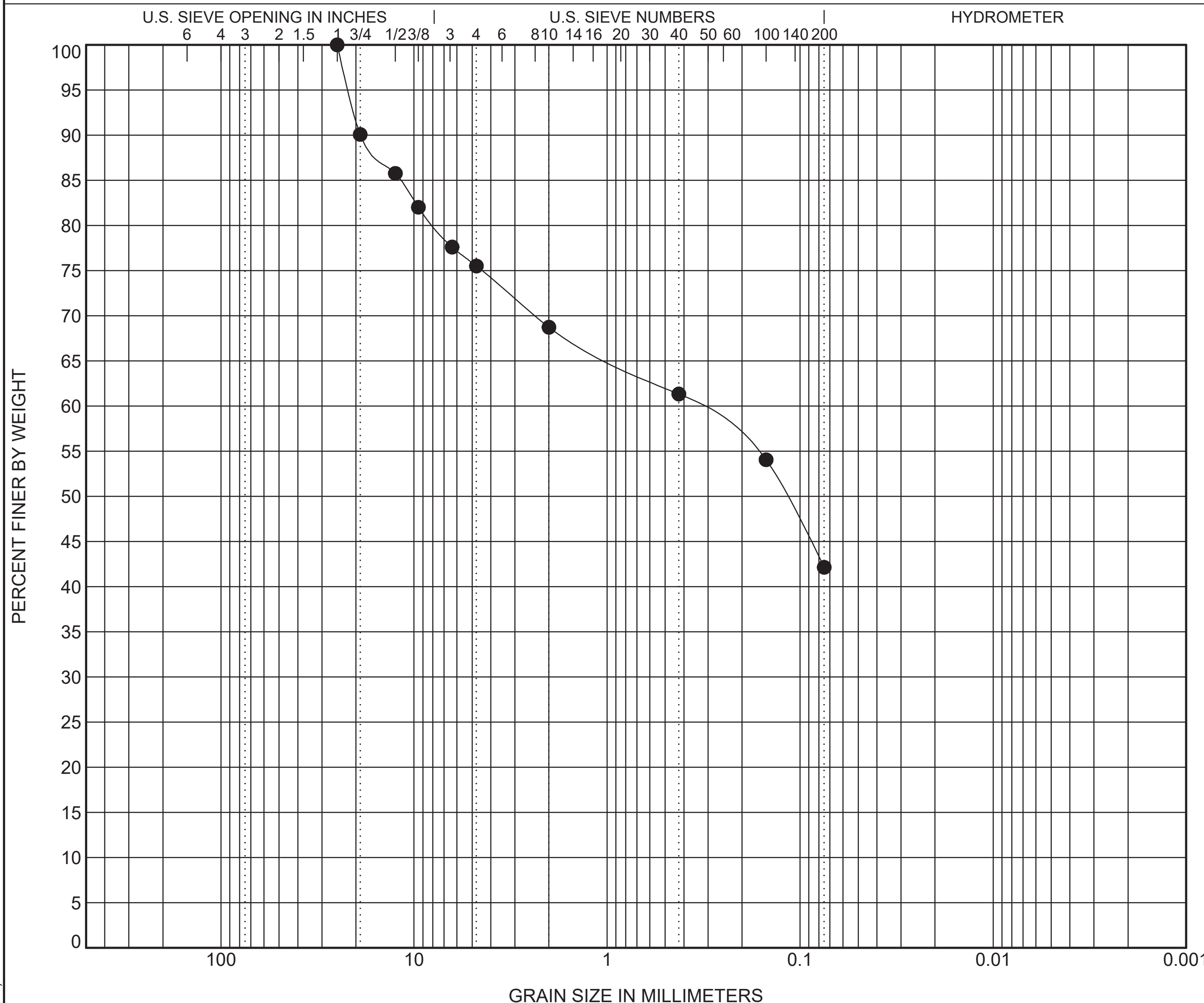
GRAIN SIZE DISTRIBUTION

CLIENT 8 POINTS WIND, LLC

PROJECT NAME EIGHT POINTS WIND ENERGY PROJECT

PROJECT NUMBER 2017-054

PROJECT LOCATION STEUBEN COUNTY, NY



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification		Classification	LL	PL	PI	Cc	Cu
● T-3	3.0	SANDY SILT WITH GRAVEL (MLS)					

Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● T-3	3.0	25	0.351			24.5	33.4	42.1	

Kenney Geotechnical Services
7246 State Fair Blvd
Baldwinsville, N.Y. 13209
Telephone: 315-638-2706
Fax: 315-638-1544

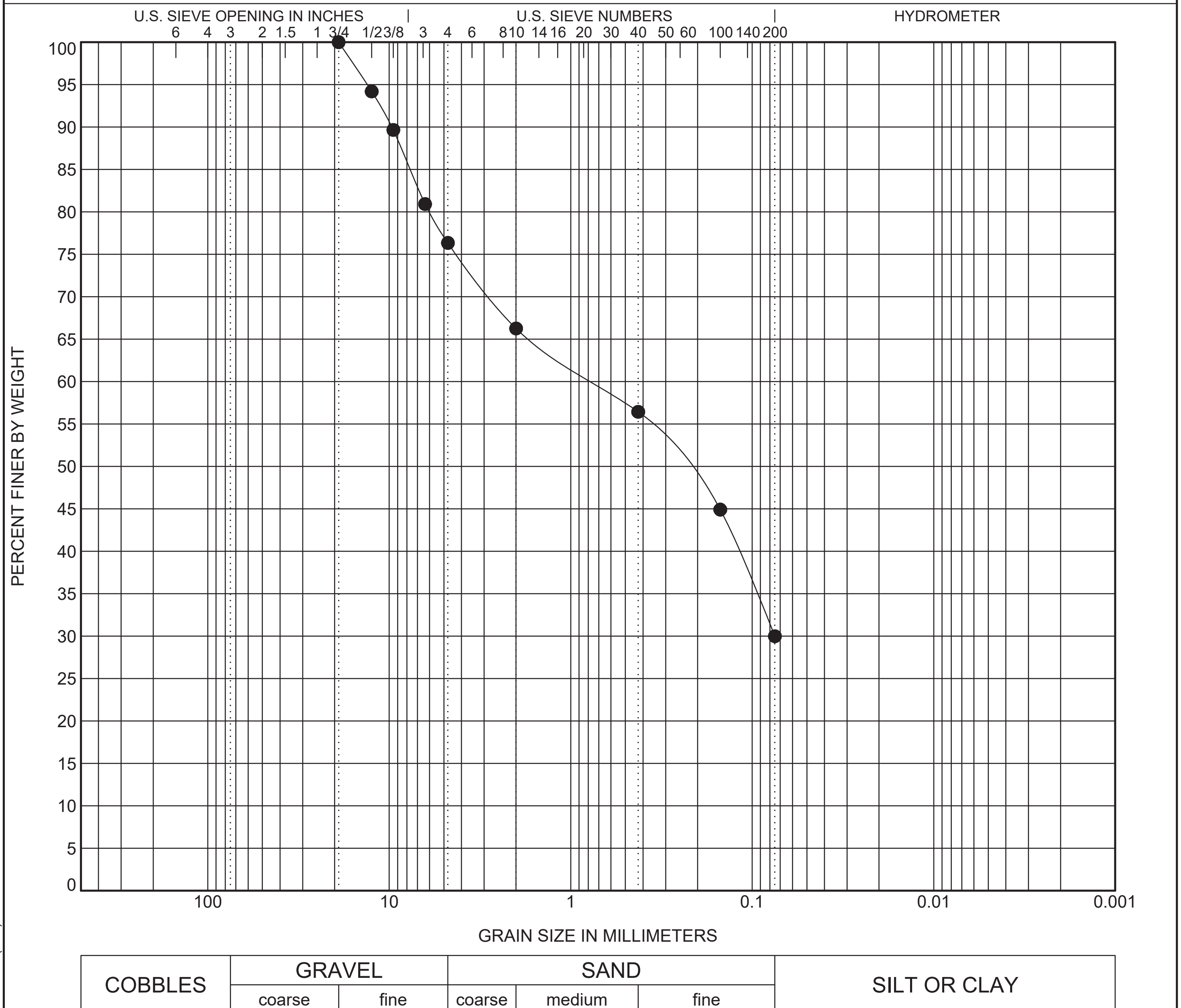
GRAIN SIZE DISTRIBUTION

CLIENT 8 POINTS WIND, LLC

PROJECT NAME EIGHT POINTS WIND ENERGY PROJECT

PROJECT NUMBER 2017-054

PROJECT LOCATION STEUBEN COUNTY, NY



Specimen Identification		Classification	LL	PL	PI	Cc	Cu
● T-3	14.0	**SILTY SAND WITH GRAVEL (SM)**					

Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● T-3	14.0	19	0.746	0.075		23.7	46.3	30.0	

Kenney Geotechnical Services
7246 State Fair Blvd
Baldwinsville, N.Y. 13209
Telephone: 315-638-2706
Fax: 315-638-1544

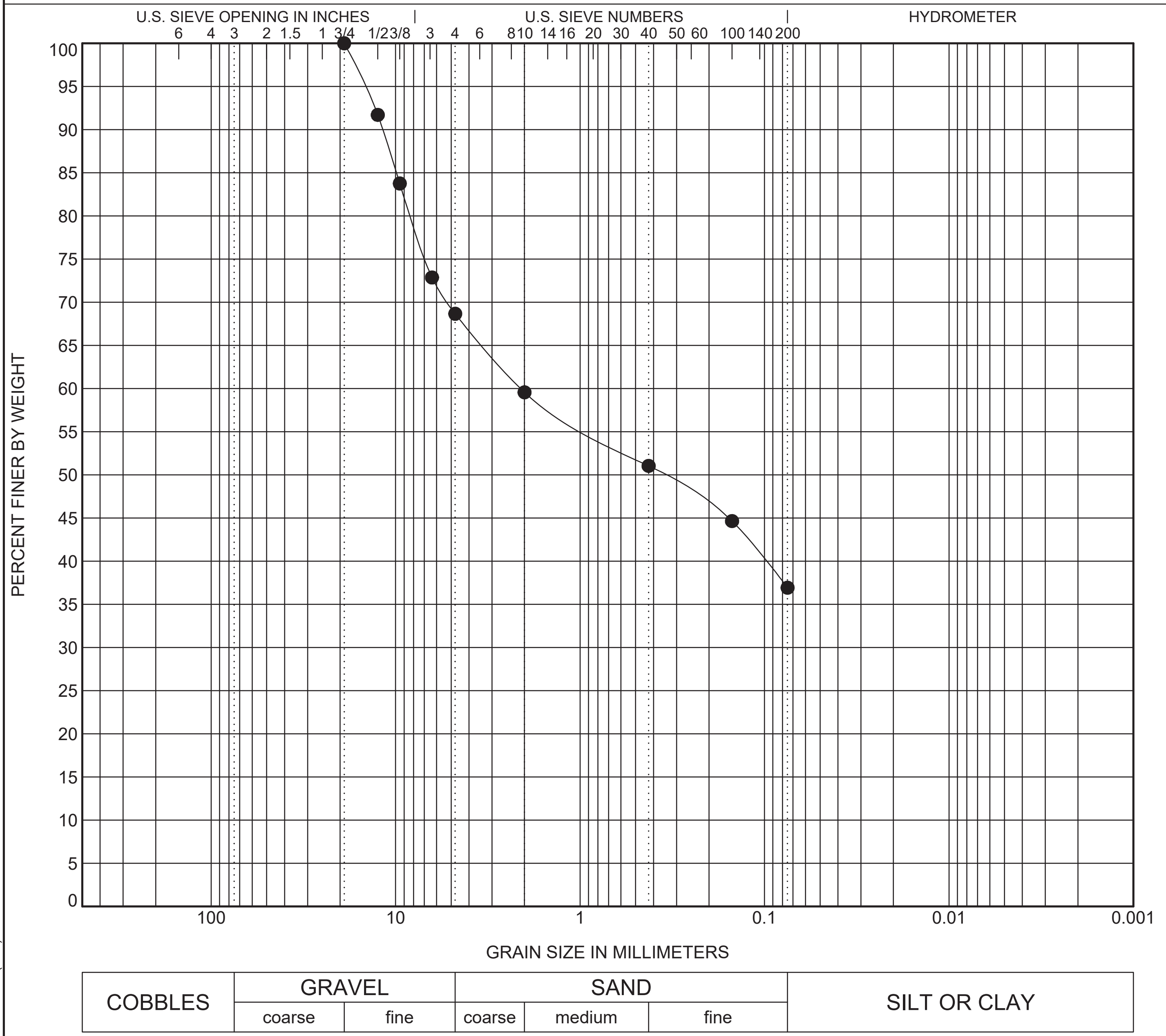
GRAIN SIZE DISTRIBUTION

CLIENT 8 POINTS WIND, LLC

PROJECT NAME EIGHT POINTS WIND ENERGY PROJECT

PROJECT NUMBER 2017-054

PROJECT LOCATION STEUBEN COUNTY, NY



Specimen Identification		Classification	LL	PL	PI	Cc	Cu
● T-4	1.0	**SANDY SILT WITH GRAVEL (MLS)**					

Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● T-4	1.0	19	2.085			31.3	31.7	36.9	

Kenney Geotechnical Services
7246 State Fair Blvd
Baldwinsville, N.Y. 13209
Telephone: 315-638-2706
Fax: 315-638-1544

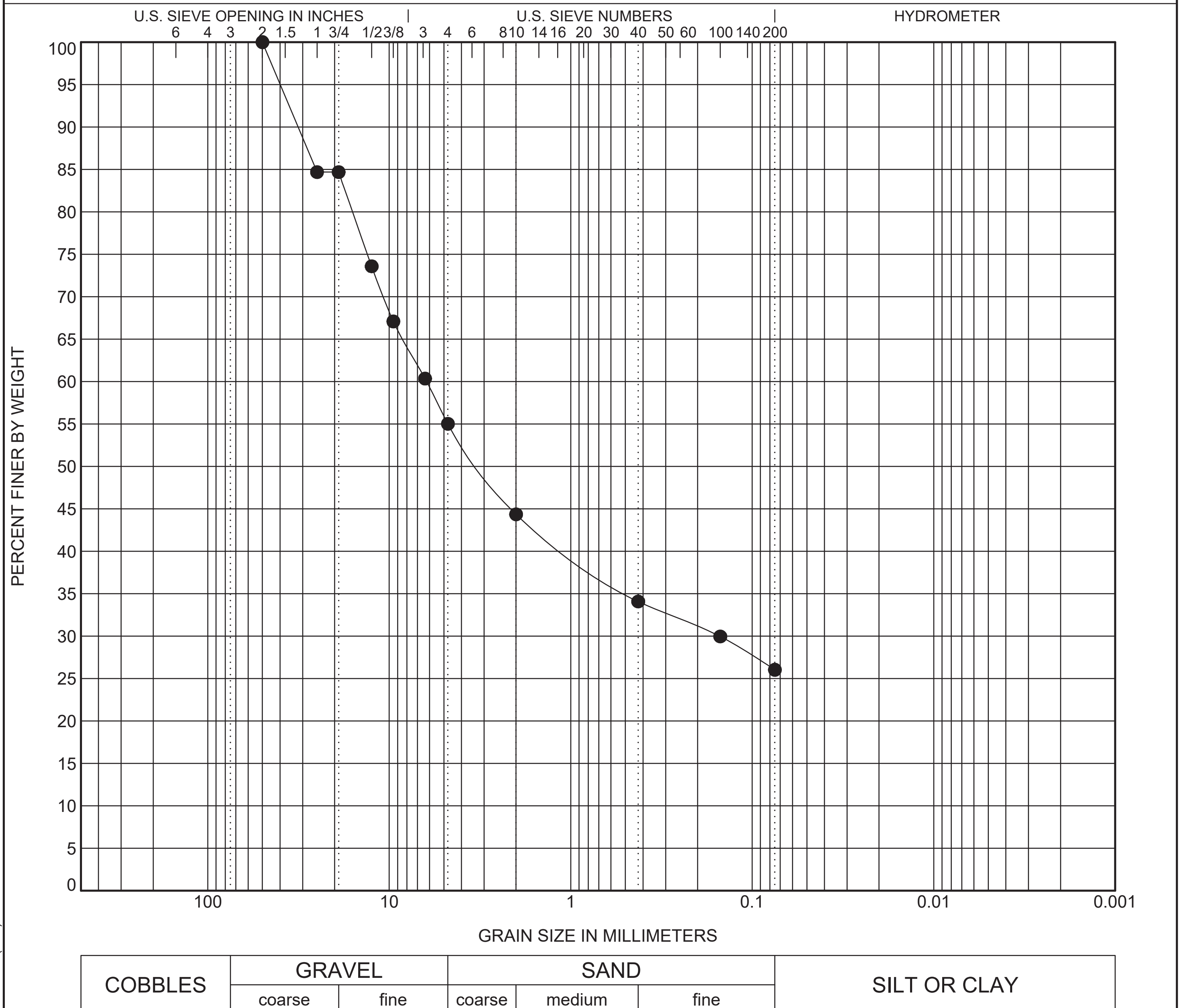
GRAIN SIZE DISTRIBUTION

CLIENT 8 POINTS WIND, LLC

PROJECT NAME EIGHT POINTS WIND ENERGY PROJECT

PROJECT NUMBER 2017-054

PROJECT LOCATION STEUBEN COUNTY, NY



Specimen Identification		Classification	LL	PL	PI	Cc	Cu
● T-4	7.0	**SANDY GRAVEL WITH SILT (GWS) - SANDSTONE**					

Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● T-4	7.0	**50**	**6.23**	**0.152**		**45.0**	**29.0**	**26.0**	

GRAIN SIZE - GINT STD US LAB.GDT - 9/1/17 14:56 - C:\PROGRAM FILES (X86)\GINT\PROJECTS\2017-054 NEXTERA 8 POINTS.GPJ

Kenney Geotechnical Services
7246 State Fair Blvd
Baldwinsville, N.Y. 13209
Telephone: 315-638-2706
Fax: 315-638-1544

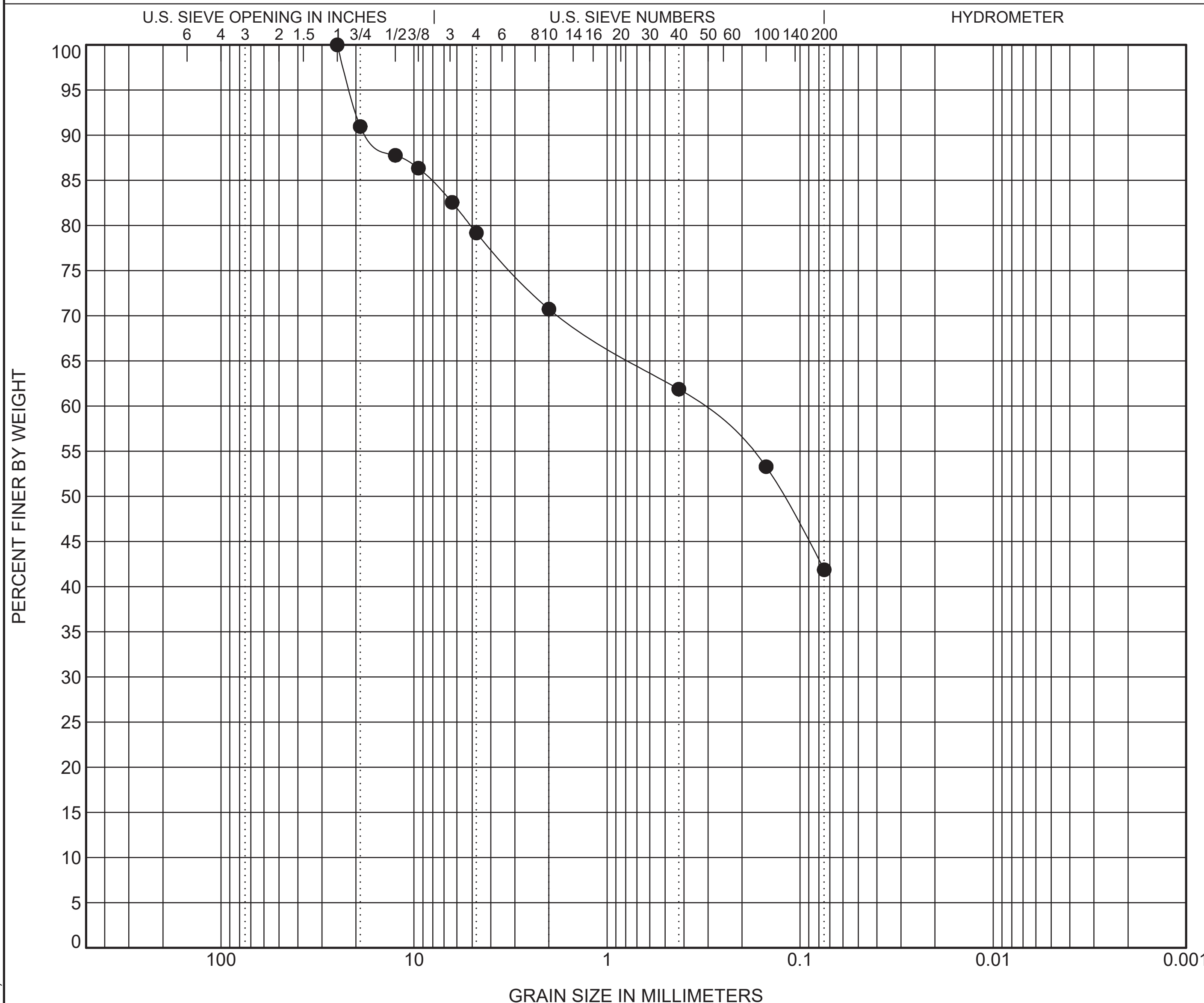
GRAIN SIZE DISTRIBUTION

CLIENT 8 POINTS WIND, LLC

PROJECT NAME EIGHT POINTS WIND ENERGY PROJECT

PROJECT NUMBER 2017-054

PROJECT LOCATION STEUBEN COUNTY, NY



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification	LL	PL	PI	Cc	Cu
●	T-5	15.0	**SANDY SILT WITH GRAVEL (MLS)**					

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	T-5	15.0	25	0.339			20.8	37.3	41.9	

GRAIN SIZE - GINT STD US LAB.GDT - 9/1/17 14:56 - C:\PROGRAM FILES (X86)\GINT\PROJECTS\2017-054 NEXTERA 8 POINTS.GPJ

Kenney Geotechnical Services
7246 State Fair Blvd
Baldwinsville, N.Y. 13209
Telephone: 315-638-2706
Fax: 315-638-1544

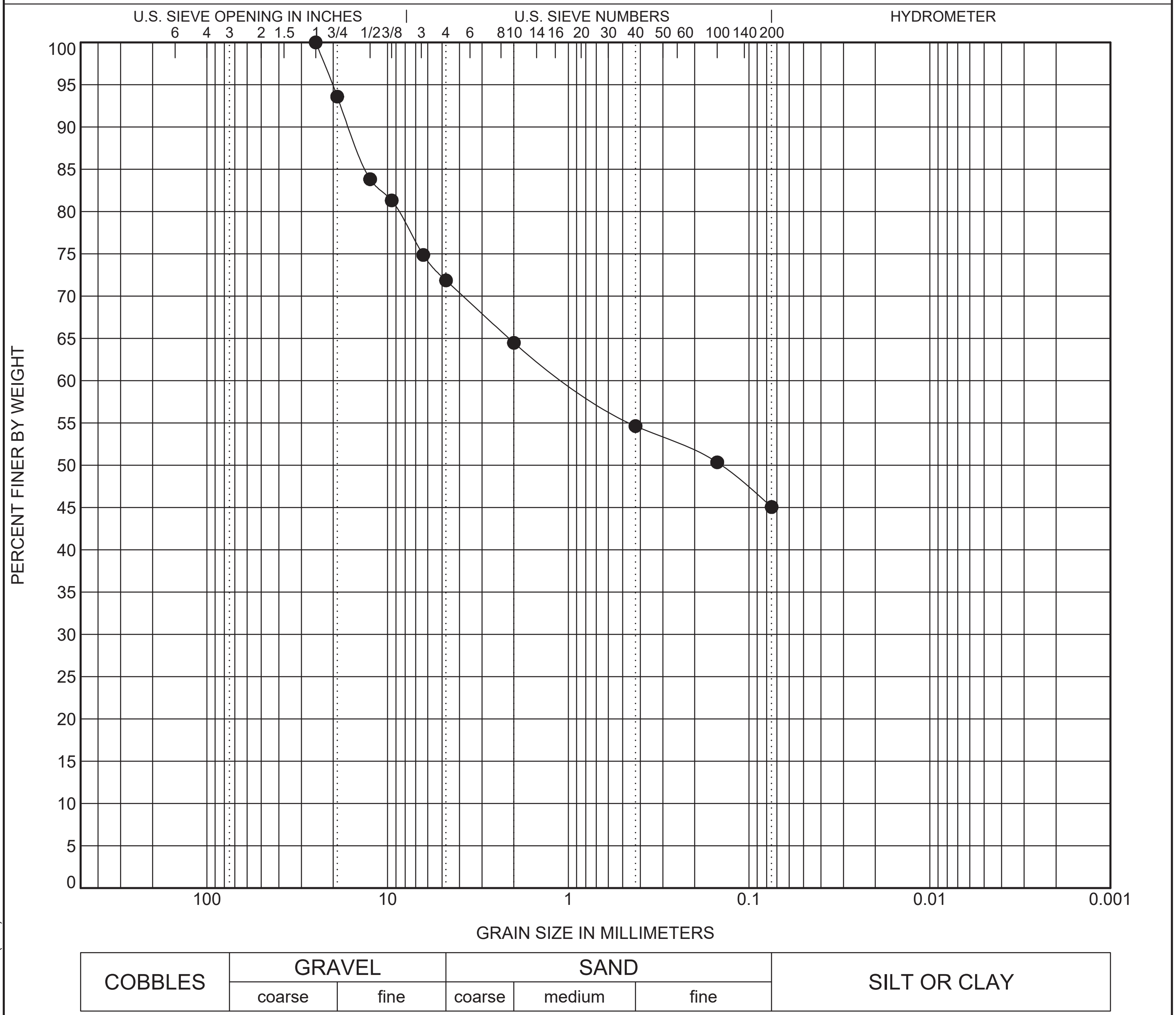
GRAIN SIZE DISTRIBUTION

CLIENT 8 POINTS WIND, LLC

PROJECT NAME EIGHT POINTS WIND ENERGY PROJECT

PROJECT NUMBER 2017-054

PROJECT LOCATION STEUBEN COUNTY, NY



Specimen Identification		Classification	LL	PL	PI	Cc	Cu
● T-6	1.0	GRAVELLY SILT WITH SAND (MLG) - SHALE					

Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● T-6	1.0	25	0.989			28.1	26.8	45.1	

Kenney Geotechnical Services
7246 State Fair Blvd
Baldwinsville, N.Y. 13209
Telephone: 315-638-2706
Fax: 315-638-1544

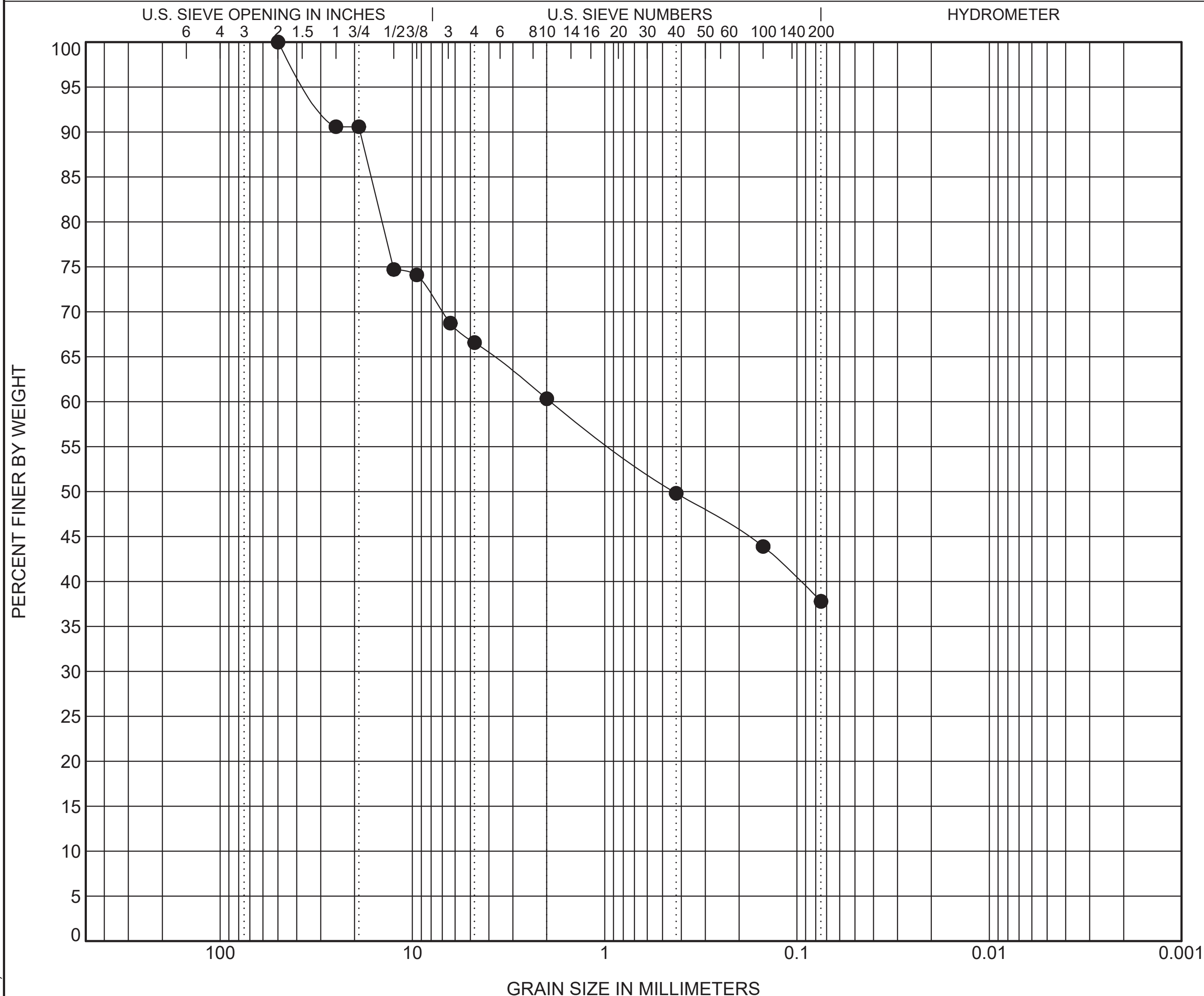
GRAIN SIZE DISTRIBUTION

CLIENT 8 POINTS WIND, LLC

PROJECT NAME EIGHT POINTS WIND ENERGY PROJECT

PROJECT NUMBER 2017-054

PROJECT LOCATION STEUBEN COUNTY, NY



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification		Classification	LL	PL	PI	Cc	Cu
● T-7	1.0	**GRAVELLY SILT WITH SAND (MLG)**					

Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● T-7	1.0	**50**	**1.905**			**33.4**	**28.8**	**37.8**	

Kenney Geotechnical Services
7246 State Fair Blvd
Baldwinsville, N.Y. 13209
Telephone: 315-638-2706
Fax: 315-638-1544

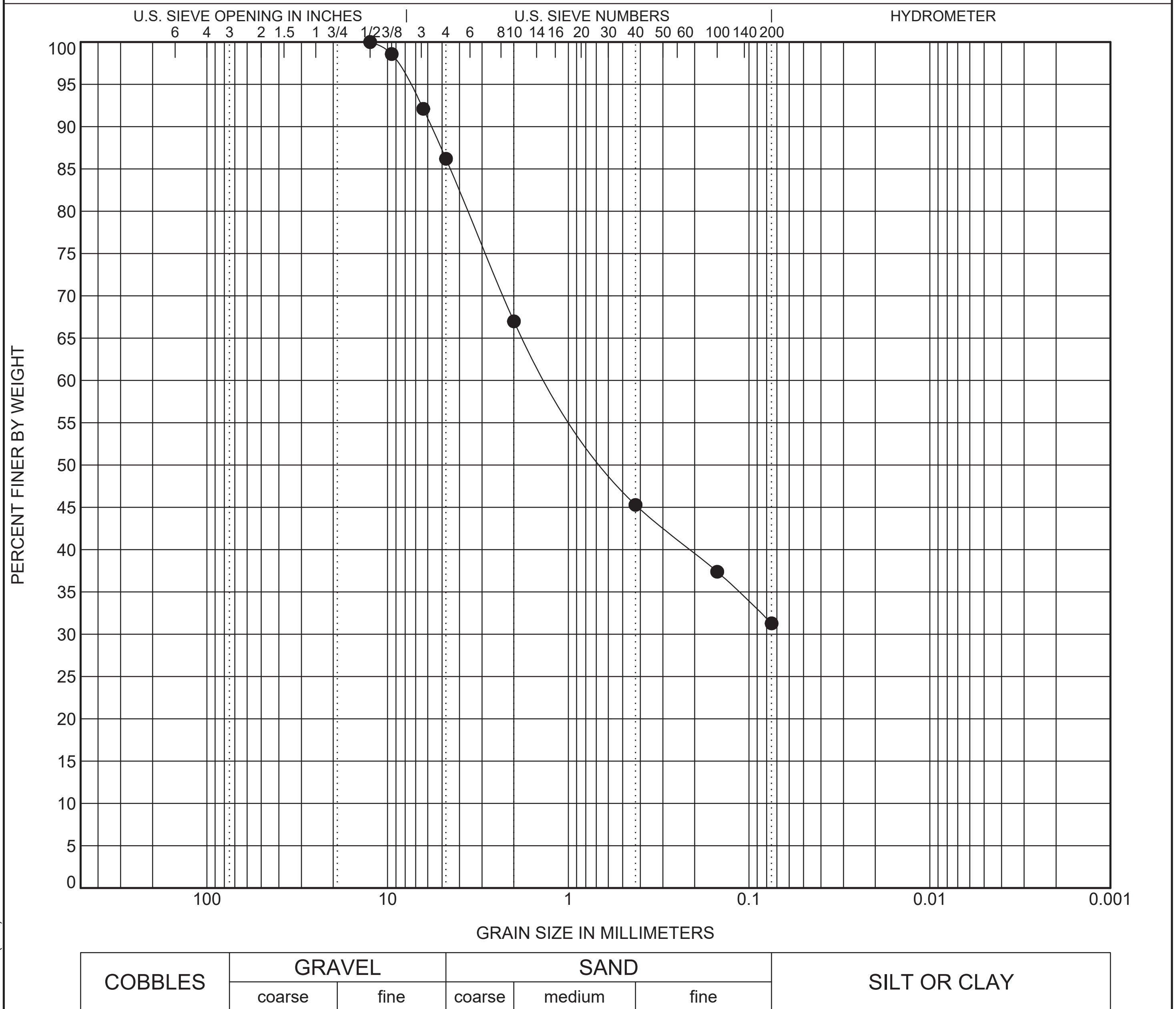
GRAIN SIZE DISTRIBUTION

CLIENT 8 POINTS WIND, LLC

PROJECT NAME EIGHT POINTS WIND ENERGY PROJECT

PROJECT NUMBER 2017-054

PROJECT LOCATION STEUBEN COUNTY, NY



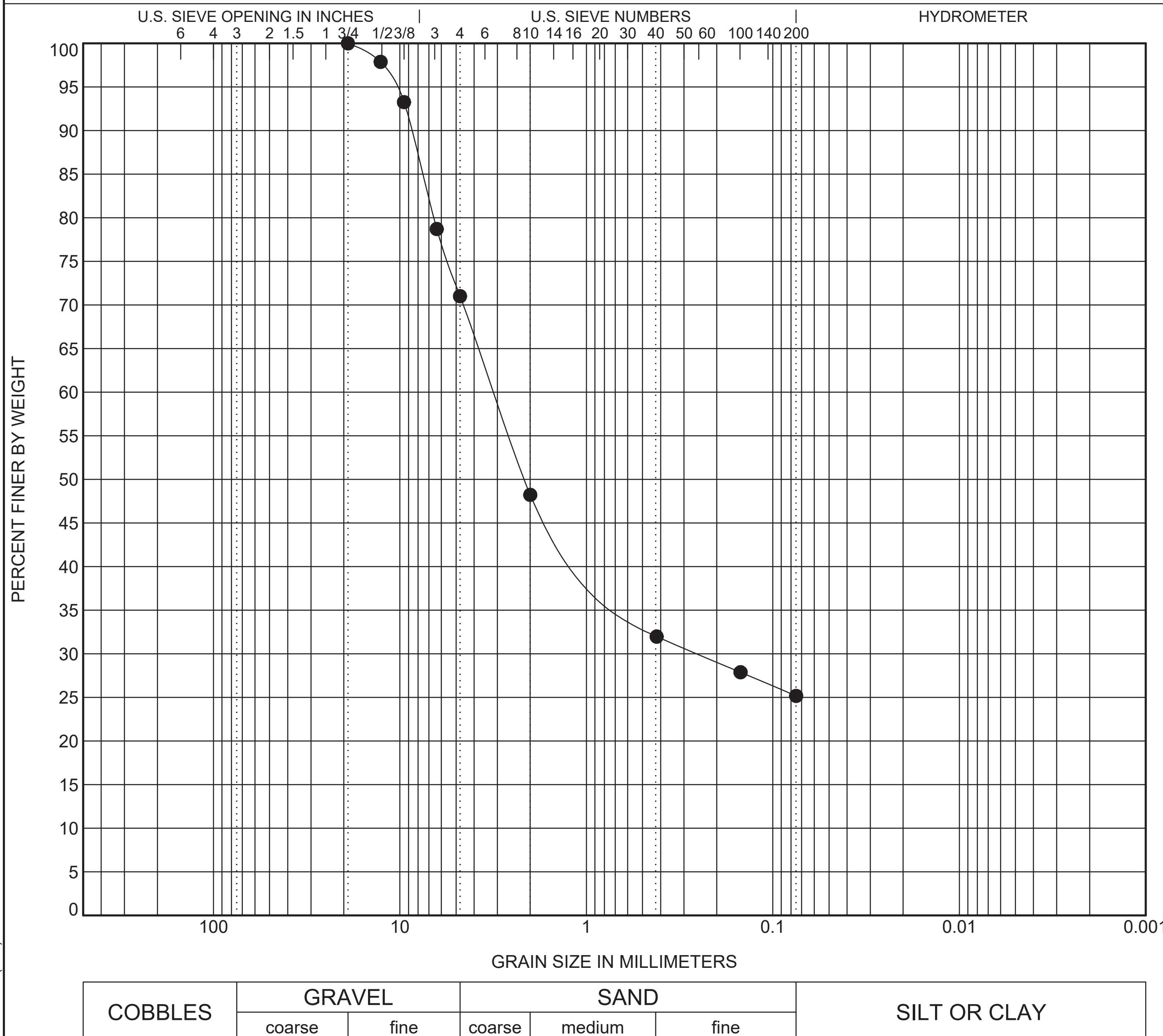
Specimen Identification		Classification	LL	PL	PI	Cc	Cu
● T-7	5.0	**CLAYEY SAND WITH GRAVEL (SC)**					

Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● T-7	5.0	**12.5**	**1.215**			**13.8**	**54.9**	**31.3**	

Kenney Geotechnical Services
7246 State Fair Blvd
Baldwinsville, N.Y. 13209
Telephone: 315-638-2706
Fax: 315-638-1544

GRAIN SIZE DISTRIBUTION

CLIENT NEXTERA ENERGY
PROJECT NAME EIGHT POINTS WIND ENERGY PROJECT
PROJECT NUMBER 2017-054
PROJECT LOCATION STEUBEN COUNTY, NY



Specimen Identification		Classification	LL	PL	PI	Cc	Cu
● T-10	24.7	**GRAVELLY SAND WITH SILT (SWG)**					

Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● T-10	24.7	19	3.131	0.255		29.1	45.8	25.2	

Kenney Geotechnical Services
7246 State Fair Blvd
Baldwinsville, N.Y. 13209
Telephone: 315-638-2706
Fax: 315-638-1544

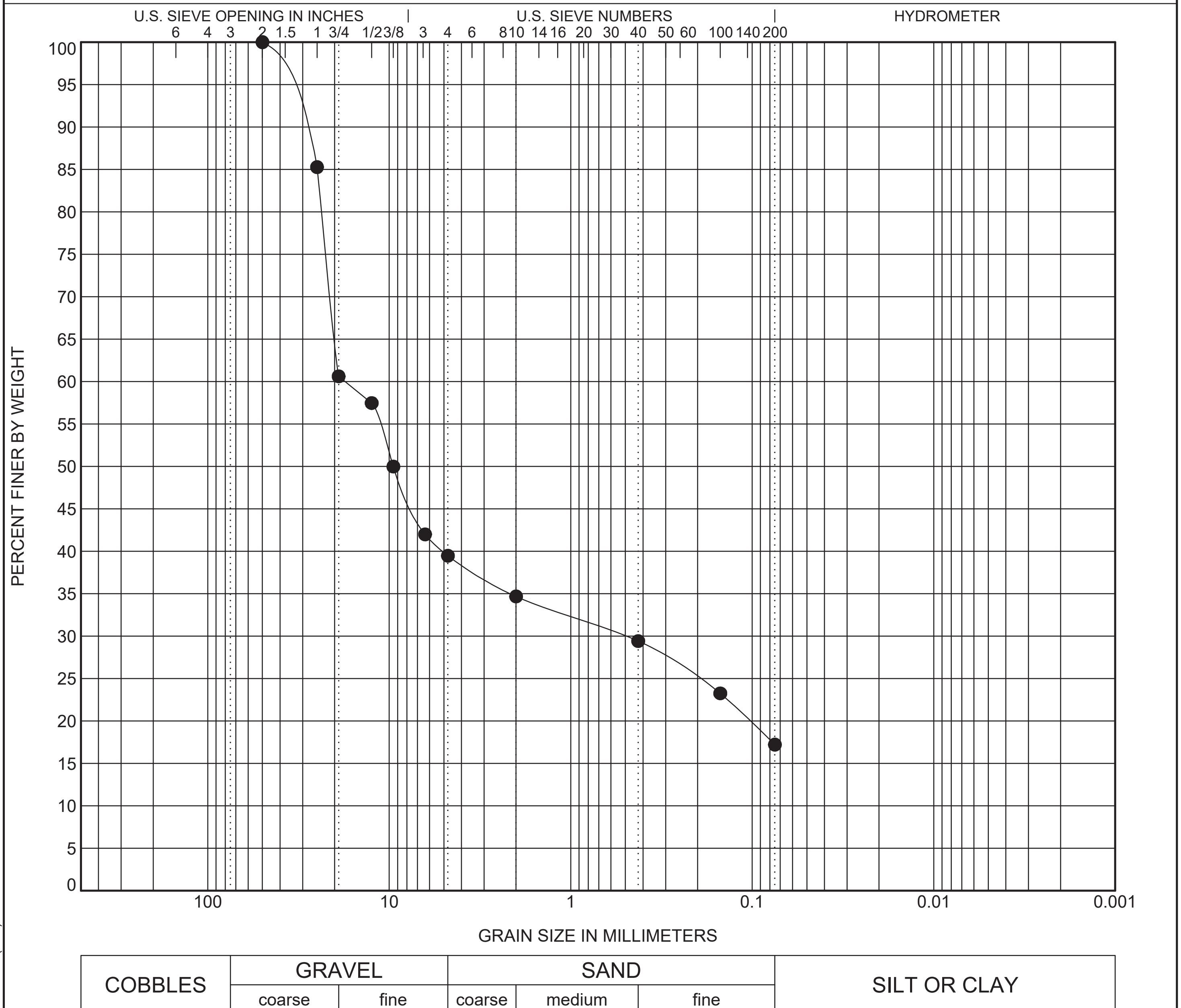
GRAIN SIZE DISTRIBUTION

CLIENT 8 POINTS WIND, LLC

PROJECT NAME EIGHT POINTS WIND ENERGY PROJECT

PROJECT NUMBER 2017-054

PROJECT LOCATION STEUBEN COUNTY, NY



Specimen Identification		Classification	LL	PL	PI	Cc	Cu
● T-16	3.0	**SANDY GRAVEL WITH SILT (GWS) -SANDSTONE**					

Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● T-16	3.0	**50**	**17.512**	**0.505**		**60.5**	**22.3**	**17.2**	

GRAIN SIZE - GINT STD US LAB.GDT - 9/1/17 14:59 - C:\PROGRAM FILES (X86)\GINT\PROJECTS\2017-054 NEXTERA 8 POINTS.GPJ

Kenney Geotechnical Services
7246 State Fair Blvd
Baldwinsville, N.Y. 13209
Telephone: 315-638-2706
Fax: 315-638-1544

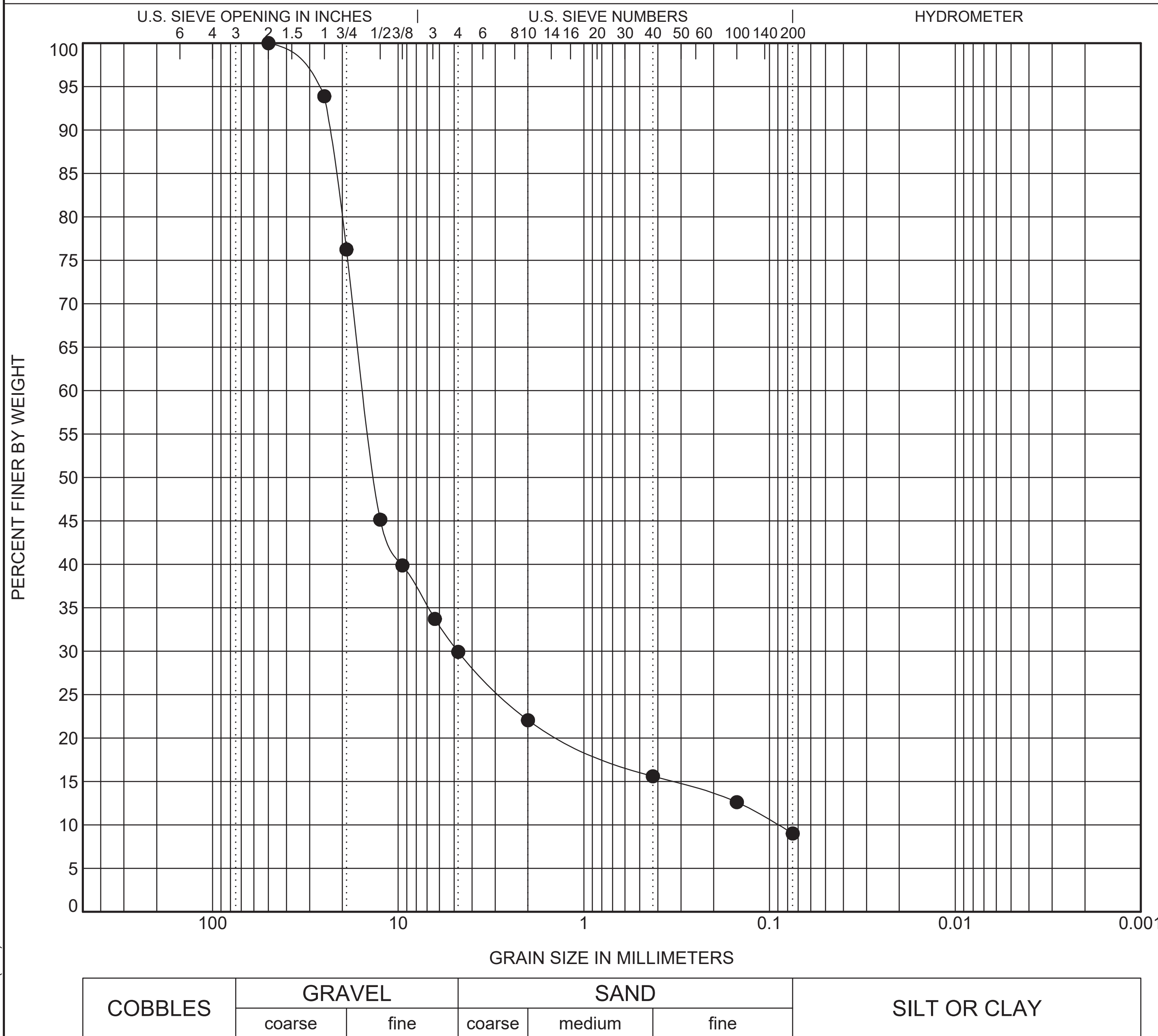
GRAIN SIZE DISTRIBUTION

CLIENT 8 POINTS WIND, LLC

PROJECT NAME EIGHT POINTS WIND ENERGY PROJECT

PROJECT NUMBER 2017-054

PROJECT LOCATION STEUBEN COUNTY, NY



Specimen Identification		Classification	LL	PL	PI	Cc	Cu
● T-17	1.0	**SANDY GRAVEL (GPS) - SANDSTONE**				16.49	168.24

Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● T-17	1.0	50	15.268	4.779	0.091	70.1	20.9	9.0	

Kenney Geotechnical Services
7246 State Fair Blvd
Baldwinsville, N.Y. 13209
Telephone: 315-638-2706
Fax: 315-638-1544

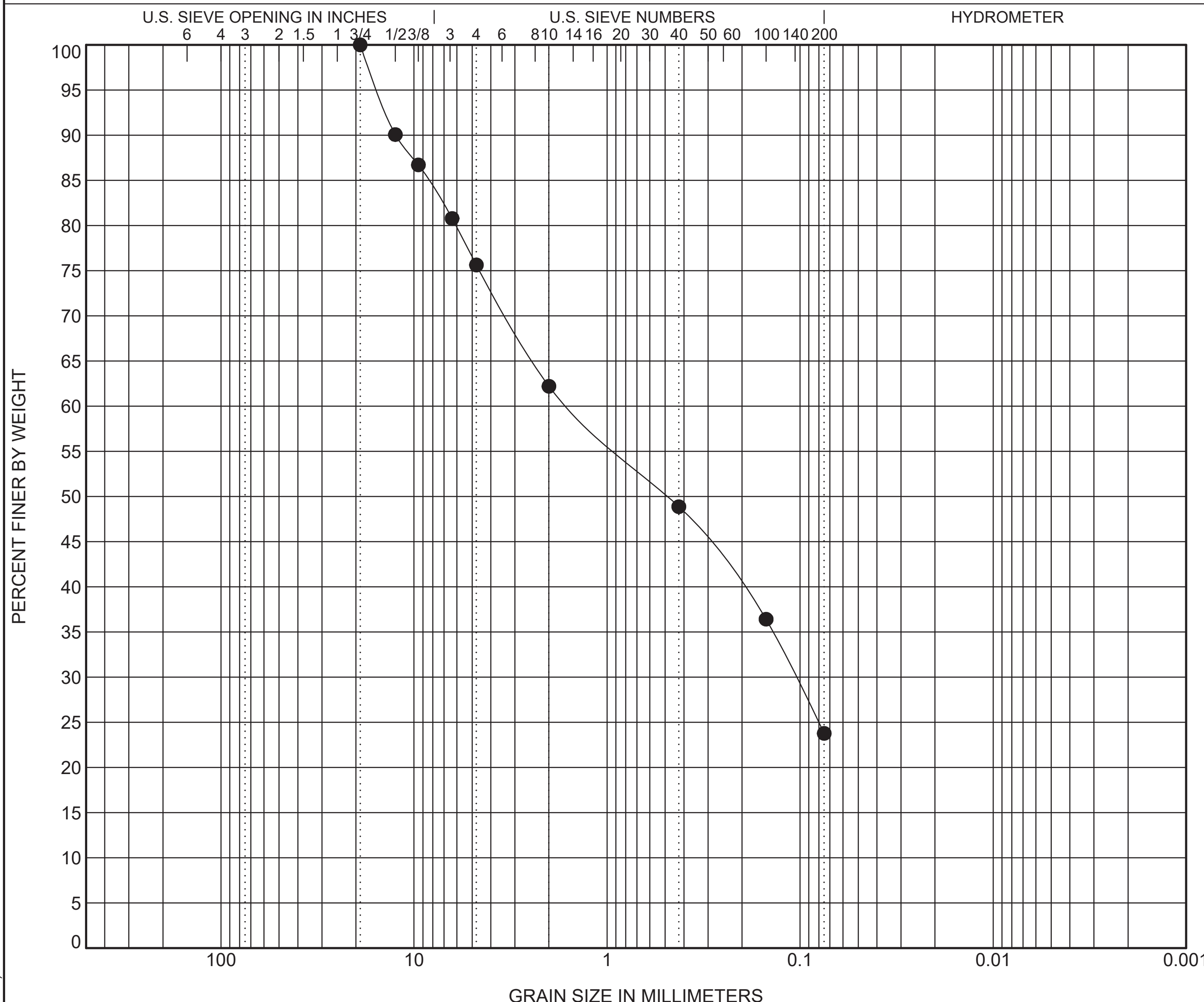
GRAIN SIZE DISTRIBUTION

CLIENT NEXTERA ENERGY

PROJECT NAME EIGHT POINTS WIND ENERGY PROJECT

PROJECT NUMBER 2017-054

PROJECT LOCATION STEUBEN COUNTY, NY



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification		Classification	LL	PL	PI	Cc	Cu
● T-18	9.0	**GRAVELLY SAND WITH CLAY (SWG)**					

Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● T-18	9.0	19	1.548	0.106		24.4	51.9	23.8	

Kenney Geotechnical Services
7246 State Fair Blvd
Baldwinsville, N.Y. 13209
Telephone: 315-638-2706
Fax: 315-638-1544

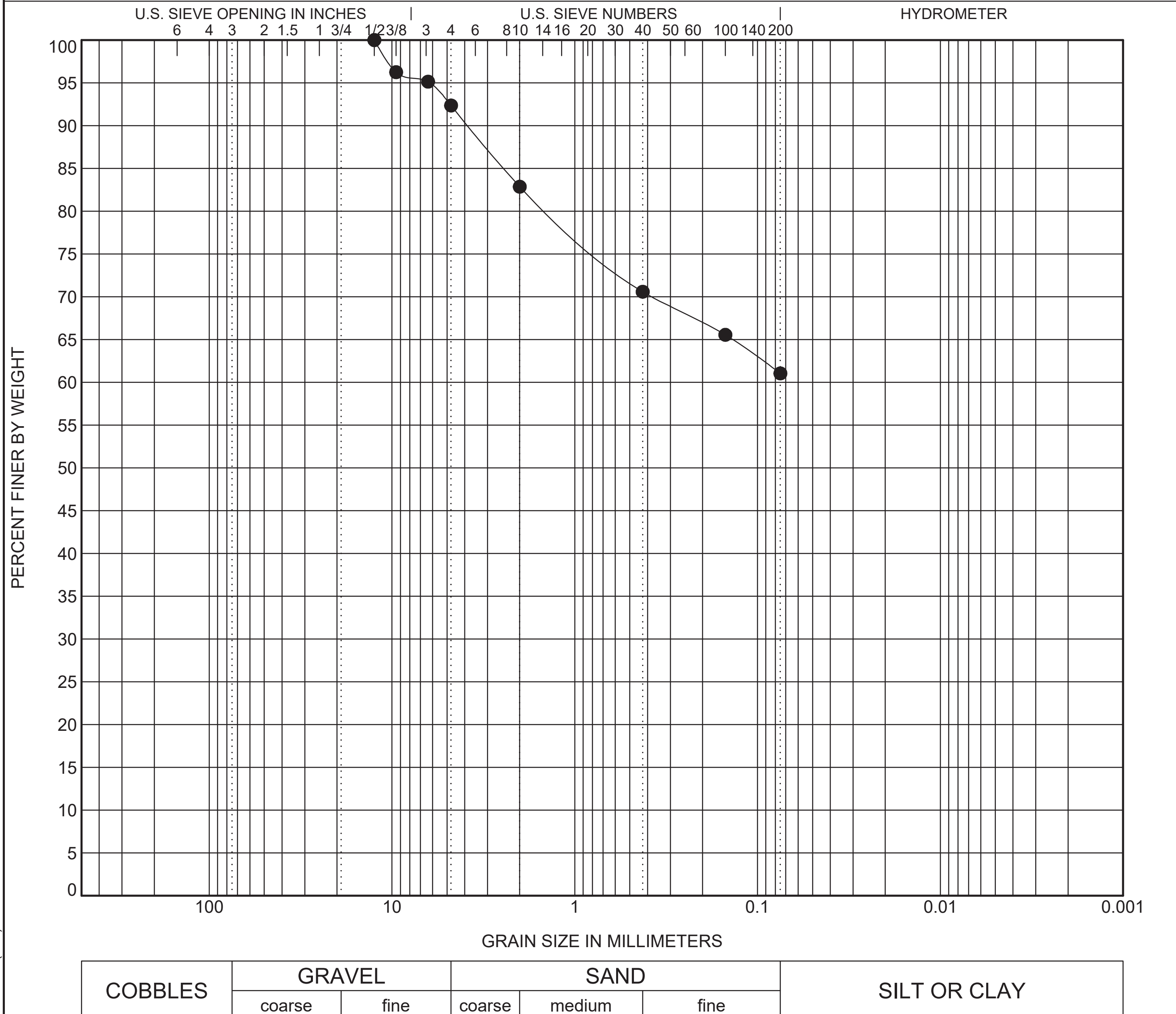
GRAIN SIZE DISTRIBUTION

CLIENT 8 POINTS WIND, LLC

PROJECT NAME EIGHT POINTS WIND ENERGY PROJECT

PROJECT NUMBER 2017-054

PROJECT LOCATION STEUBEN COUNTY, NY



Specimen Identification		Classification	LL	PL	PI	Cc	Cu
● T-21	5.0	**SANDY LEAN CLAY (CLS)**					

Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● T-21	5.0	12.5				7.6	31.3	61.0	

Kenney Geotechnical Services
7246 State Fair Blvd
Baldwinsville, N.Y. 13209
Telephone: 315-638-2706
Fax: 315-638-1544

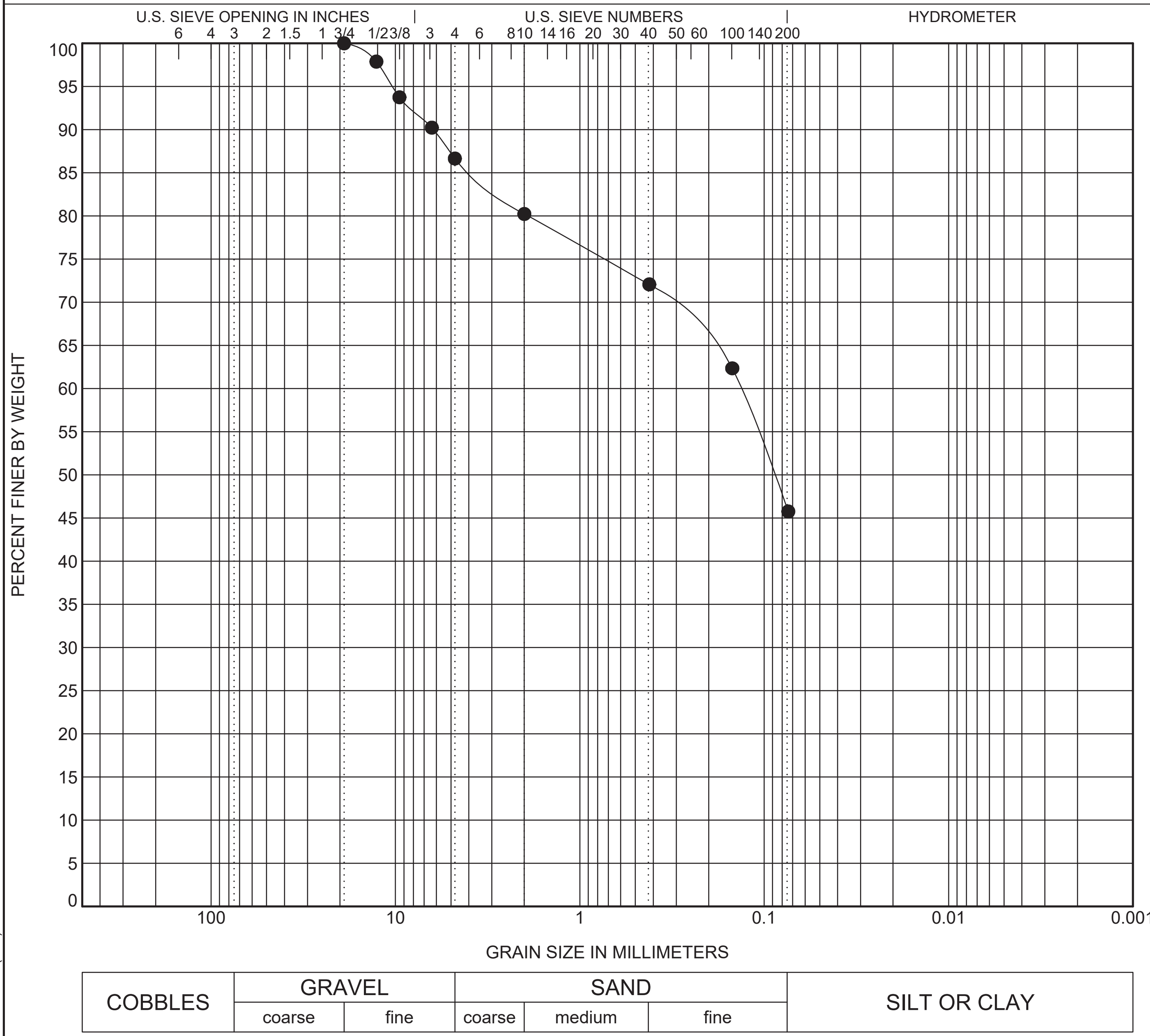
GRAIN SIZE DISTRIBUTION

CLIENT NEXTERA ENERGY

PROJECT NAME EIGHT POINTS WIND ENERGY PROJECT

PROJECT NUMBER 2017-054

PROJECT LOCATION STEUBEN COUNTY, NY



Specimen Identification		Classification	LL	PL	PI	Cc	Cu
● T-22	2.0	**SANDY SILT (MLS)**					

Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● T-22	2.0	19	0.135			13.4	40.6	46.1	

Kenney Geotechnical Services
7246 State Fair Blvd
Baldwinsville, N.Y. 13209
Telephone: 315-638-2706
Fax: 315-638-1544

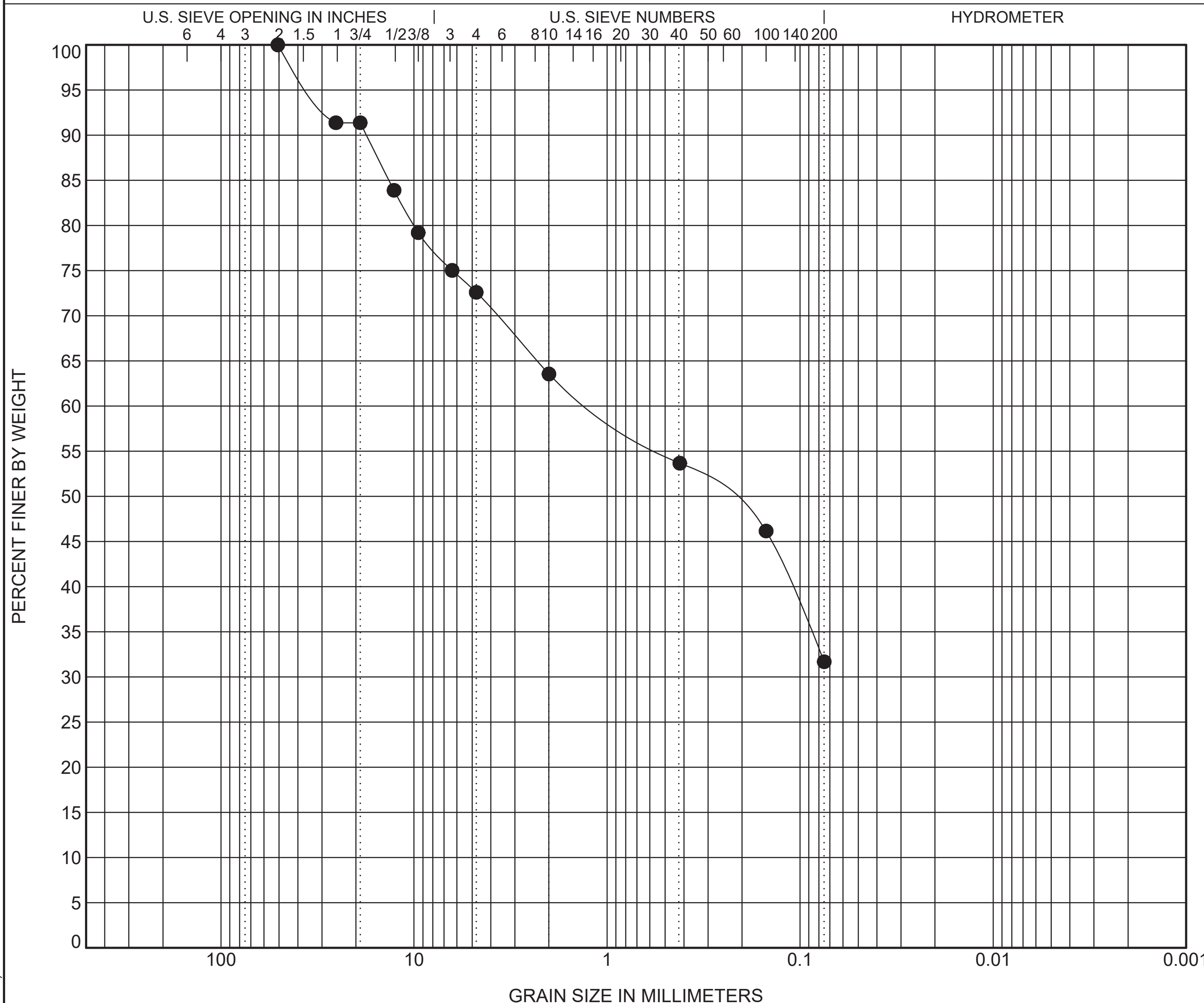
GRAIN SIZE DISTRIBUTION

CLIENT NEXTERA ENERGY

PROJECT NAME EIGHT POINTS WIND ENERGY PROJECT

PROJECT NUMBER 2017-054

PROJECT LOCATION STEUBEN COUNTY, NY



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification		Classification	LL	PL	PI	Cc	Cu
● T-22	4.0	**CLAYEY SAND WITH GRAVEL (SC)**					

Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● T-22	4.0	**50.8**	**1.142**			**27.4**	**40.9**	**31.7**	

GRAIN SIZE - GINT STD US LAB.GDT - 8/29/17 15:13 - C:\PROGRAM FILES (X86)\GINT\PROJECTS\2017-054 NEXTERA 8 POINTS.GPJ

Kenney Geotechnical Services
7246 State Fair Blvd
Baldwinsville, N.Y. 13209
Telephone: 315-638-2706
Fax: 315-638-1544

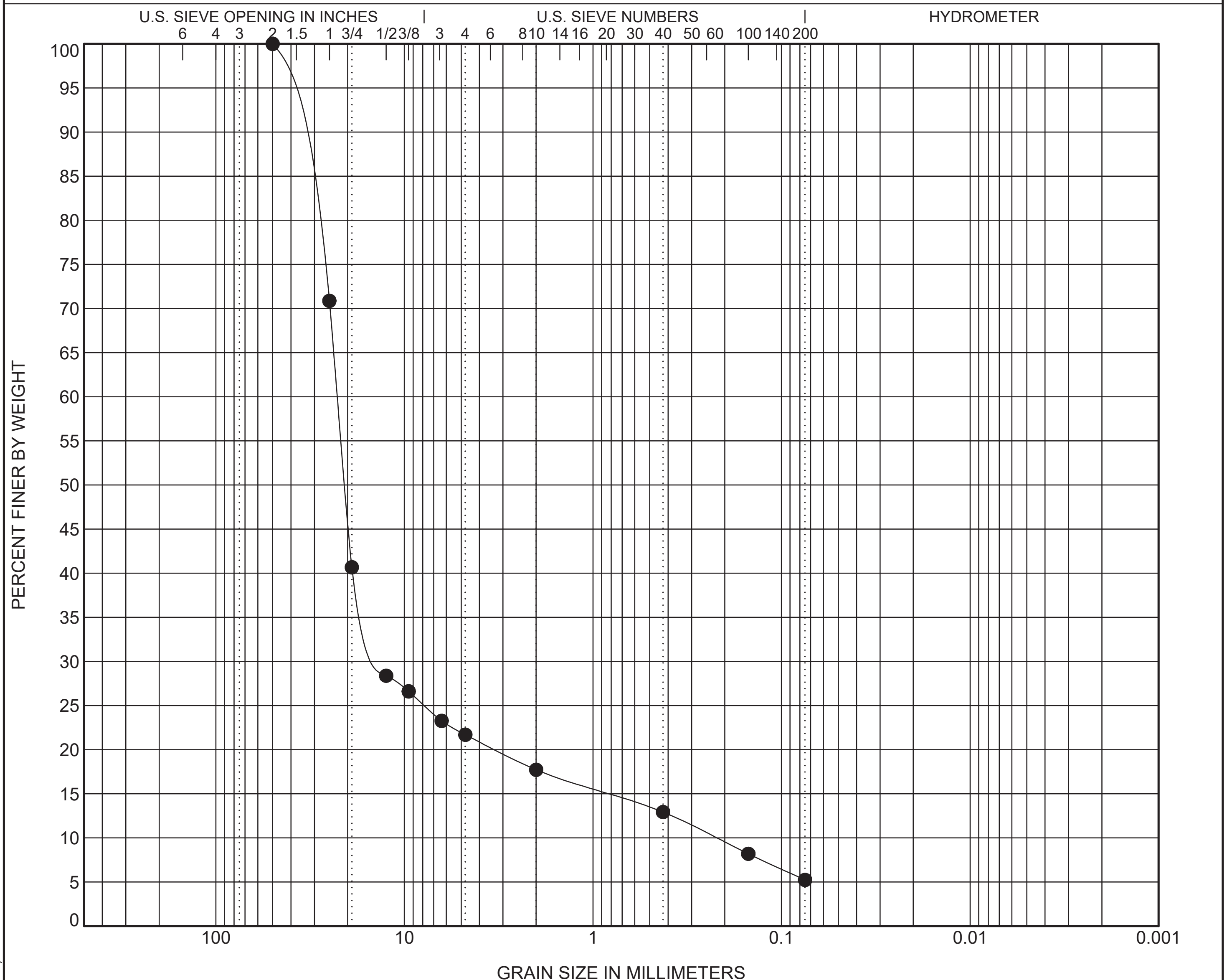
GRAIN SIZE DISTRIBUTION

CLIENT 8 POINTS WIND, LLC

PROJECT NAME EIGHT POINTS WIND ENERGY PROJECT

PROJECT NUMBER 2017-054

PROJECT LOCATION STEUBEN COUNTY, NY



Specimen Identification		Classification	LL	PL	PI	Cc	Cu
● T-23	1.0	**POORLY GRADED GRAVEL (GP) - SANDSTONE**				**34.54**	**101.50**

Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● T-23	1.0	**50**	**22.649**	**13.212**	**0.223**	**78.3**	**16.5**	**5.2**	

Kenney Geotechnical Services
7246 State Fair Blvd
Baldwinsville, N.Y. 13209
Telephone: 315-638-2706
Fax: 315-638-1544

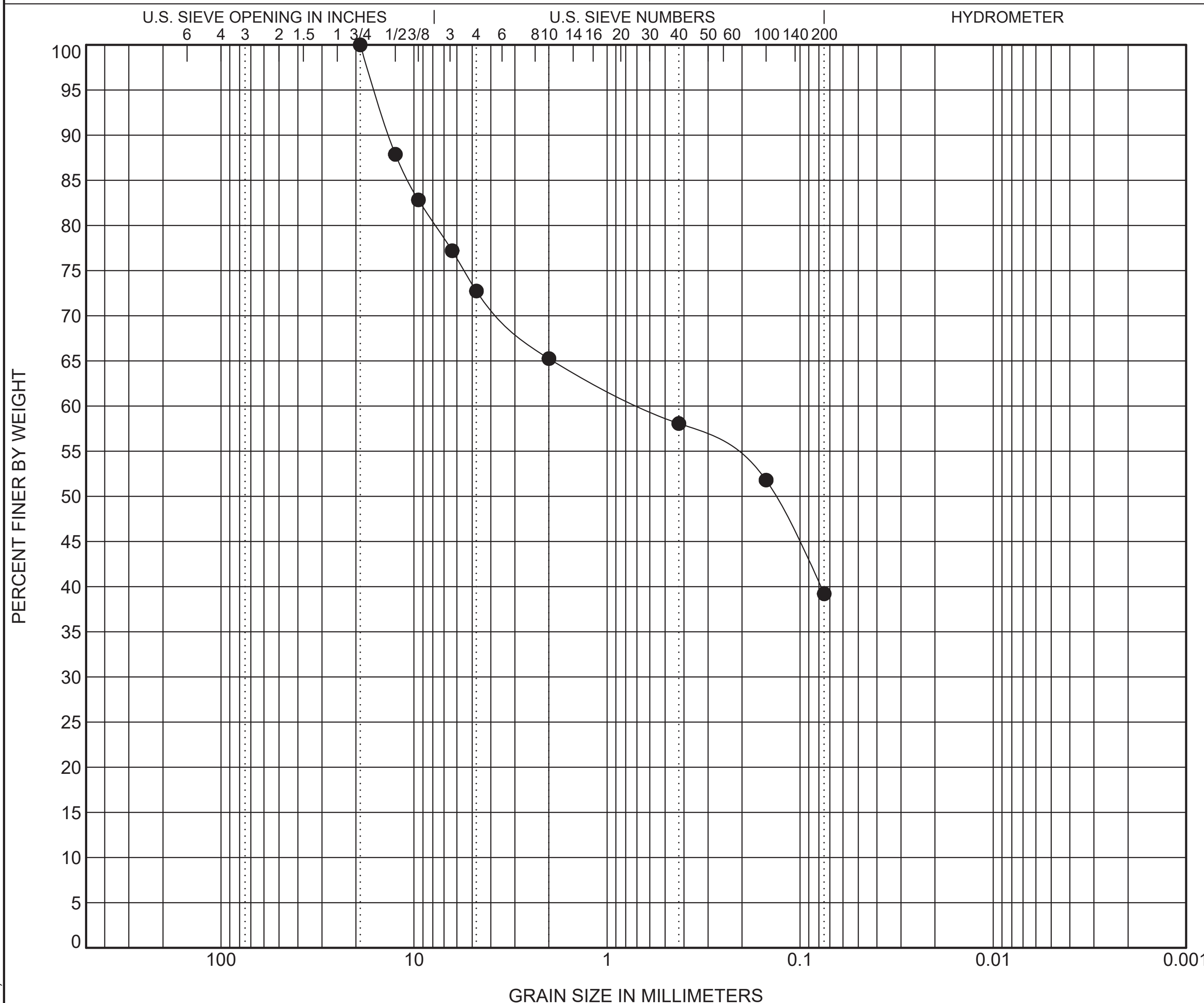
GRAIN SIZE DISTRIBUTION

CLIENT 8 POINTS WIND, LLC

PROJECT NAME EIGHT POINTS WIND ENERGY PROJECT

PROJECT NUMBER 2017-054

PROJECT LOCATION STEUBEN COUNTY, NY



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification	LL	PL	PI	Cc	Cu
●	T-24	7.0	**SANDY LEAN CLAY WITH GRAVEL (CLS)**					

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	T-24	7.0	**19**	**0.645**			**27.3**	**33.5**	**39.2**	

Kenney Geotechnical Services
7246 State Fair Blvd
Baldwinsville, N.Y. 13209
Telephone: 315-638-2706
Fax: 315-638-1544

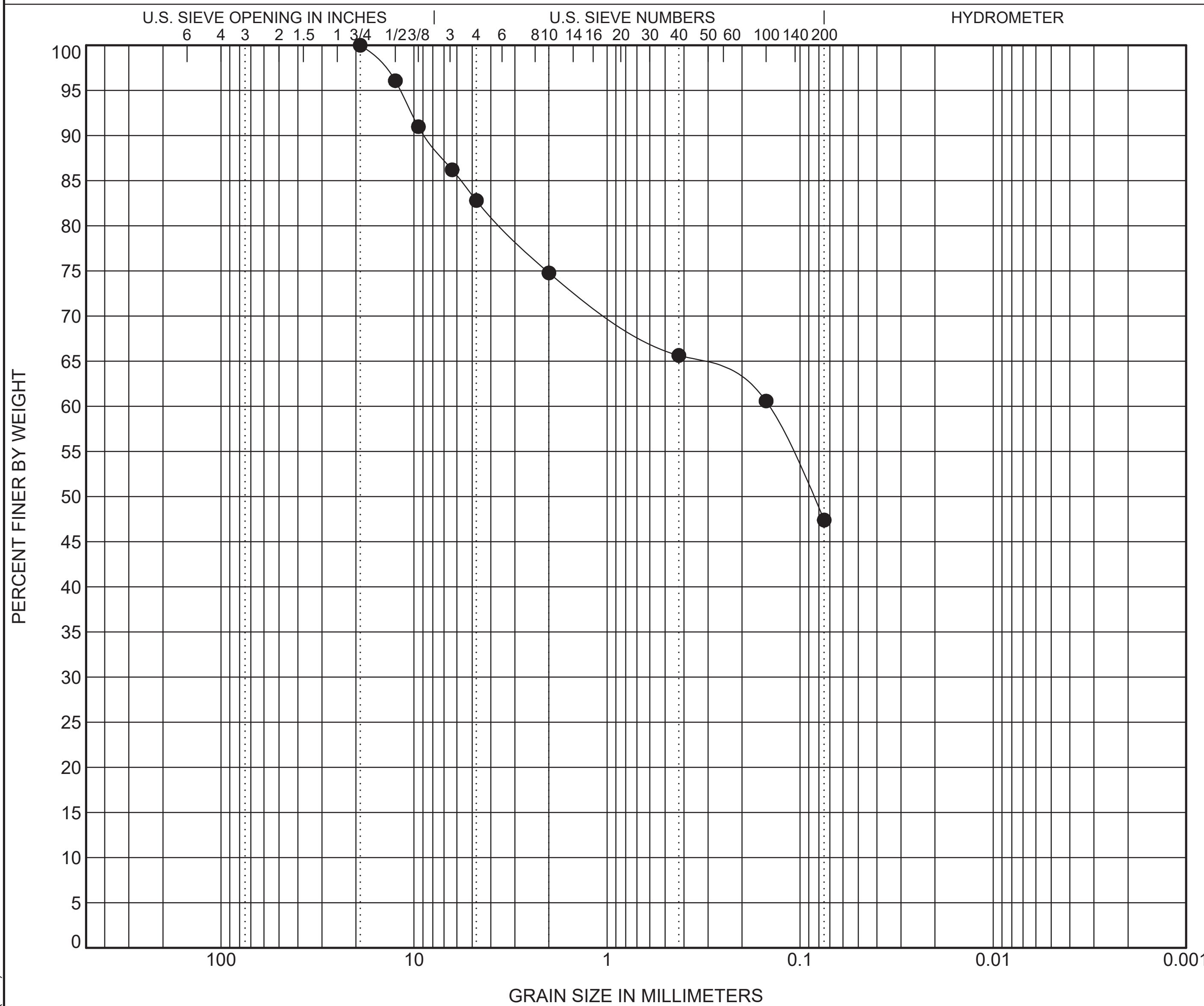
GRAIN SIZE DISTRIBUTION

CLIENT NEXTERA ENERGY

PROJECT NAME EIGHT POINTS WIND ENERGY PROJECT

PROJECT NUMBER 2017-054

PROJECT LOCATION STEUBEN COUNTY, NY



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification		Classification	LL	PL	PI	Cc	Cu
● T-28	7.0	**SANDY LEAN CLAY WITH GRAVEL (CLS)**					

Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● T-28	7.0	19	0.145			17.2	35.4	47.4	

GRAIN SIZE - GINT STD US LAB.GDT - 8/29/17 15:13 - C:\PROGRAM FILES (X86)\GINT\PROJECTS\2017-054 NEXTERA 8 POINTS.GPJ

Kenney Geotechnical Services
7246 State Fair Blvd
Baldwinsville, N.Y. 13209
Telephone: 315-638-2706
Fax: 315-638-1544

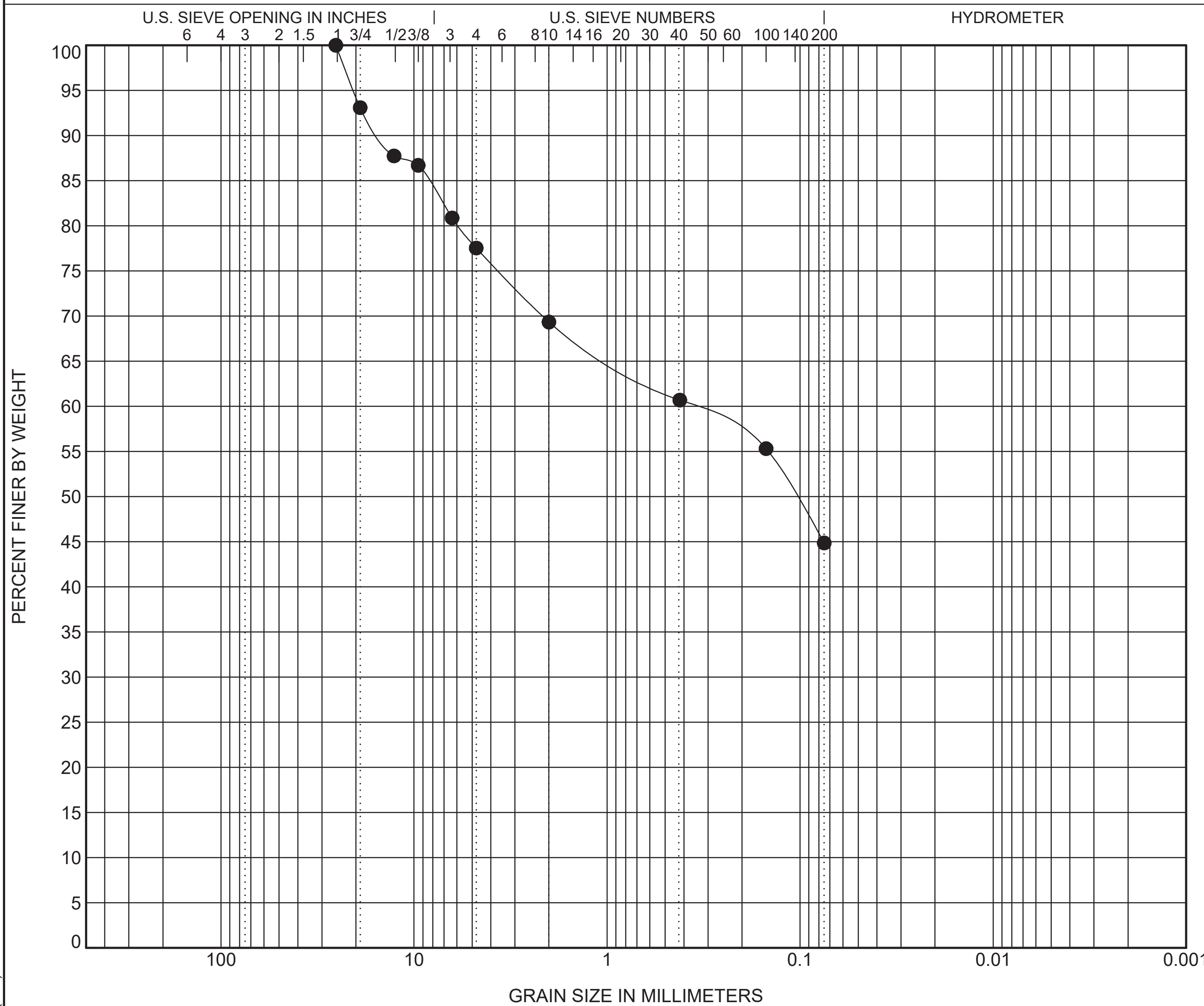
GRAIN SIZE DISTRIBUTION

CLIENT NEXTERA ENERGY

PROJECT NAME EIGHT POINTS WIND ENERGY PROJECT

PROJECT NUMBER 2017-054

PROJECT LOCATION STEUBEN COUNTY, NY



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification		Classification	LL	PL	PI	Cc	Cu
● T-28	9.0	**SANDY LEAN CLAY WITH GRAVEL (CLS)**					

Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● T-28	9.0	25.4	0.368			22.5	32.7	44.9	

GRAIN SIZE - GINT STD US LAB.GDT - 8/29/17 15:14 - C:\PROGRAM FILES (X86)\GINT\PROJECTS\2017-054 NEXTERA 8 POINTS.GPJ

Kenney Geotechnical Services
7246 State Fair Blvd
Baldwinsville, N.Y. 13209
Telephone: 315-638-2706
Fax: 315-638-1544

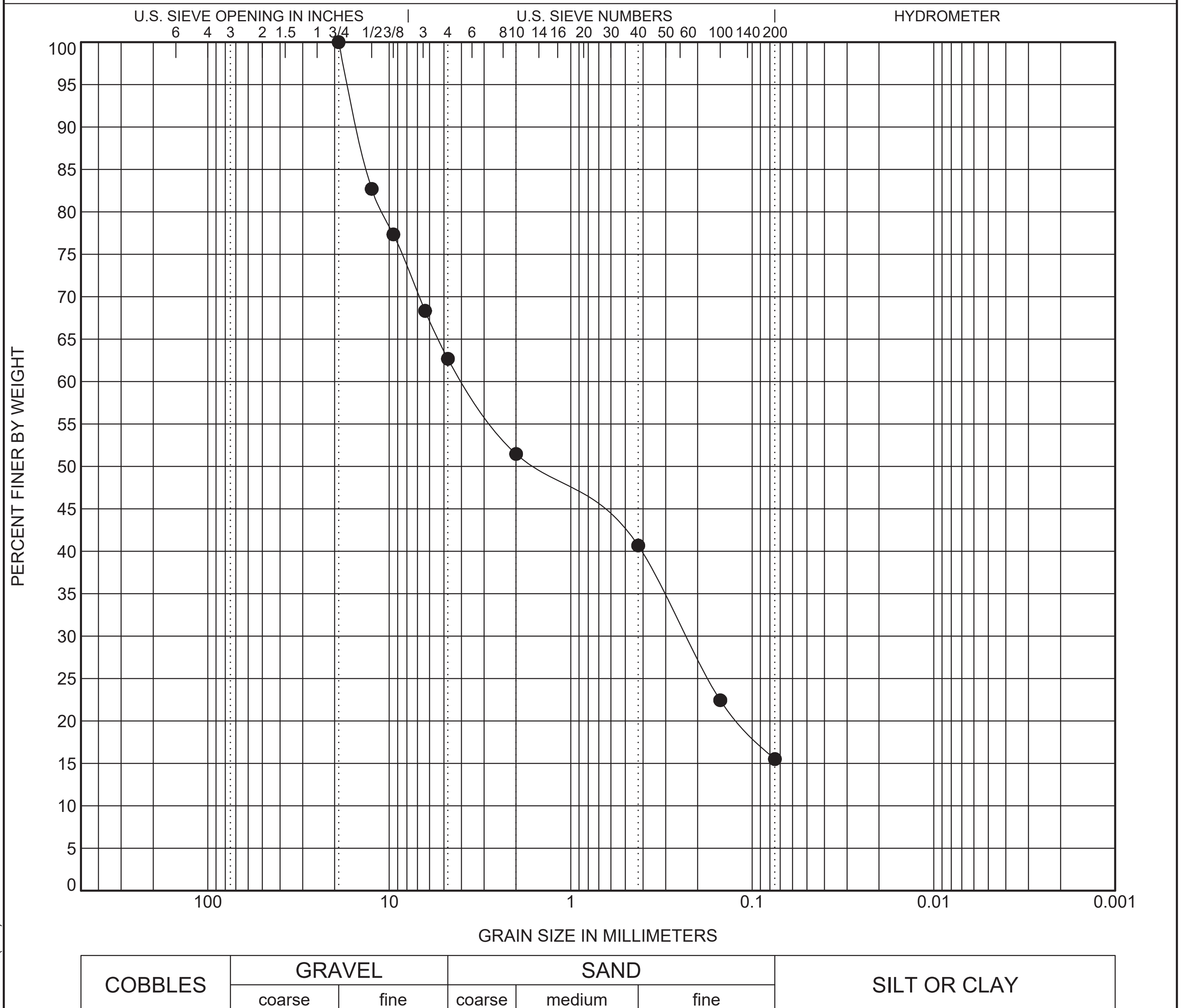
GRAIN SIZE DISTRIBUTION

CLIENT 8 POINTS WIND, LLC

PROJECT NAME EIGHT POINTS WIND ENERGY PROJECT

PROJECT NUMBER 2017-054

PROJECT LOCATION STEUBEN COUNTY, NY



Specimen Identification			Classification	LL	PL	PI	Cc	Cu
●	**T-30**	**1.0**	**GRAVELLY SAND WITH SILT (SWG) - SANDSTONE**					

Specimen Identification			D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**T-30**	**1.0**	**19**	**3.861**	**0.231**		**37.3**	**47.2**	**15.5**	

Kenney Geotechnical Services
7246 State Fair Blvd
Baldwinsville, N.Y. 13209
Telephone: 315-638-2706
Fax: 315-638-1544

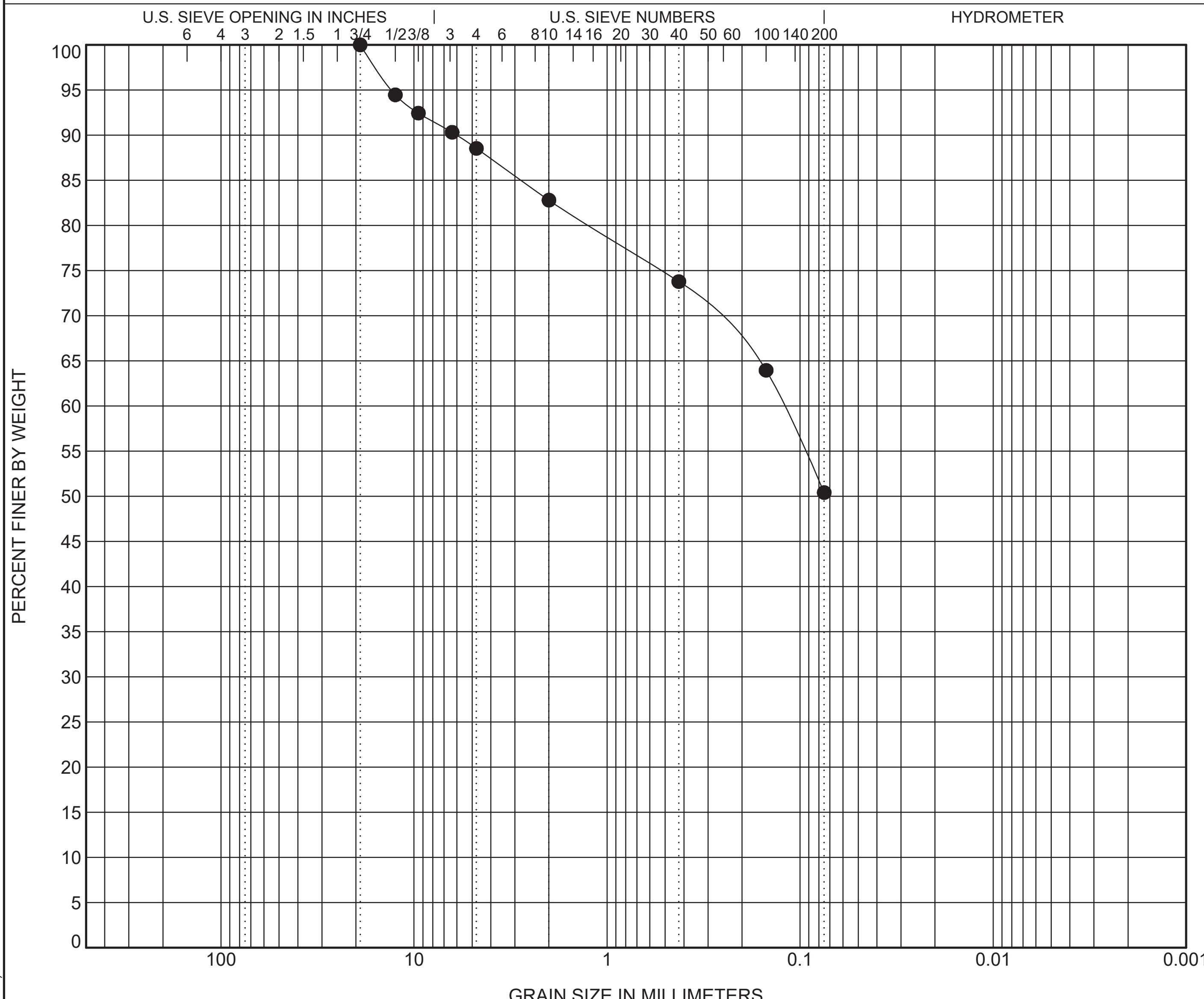
GRAIN SIZE DISTRIBUTION

CLIENT NEXTERA ENERGY

PROJECT NAME EIGHT POINTS WIND ENERGY PROJECT

PROJECT NUMBER 2017-054

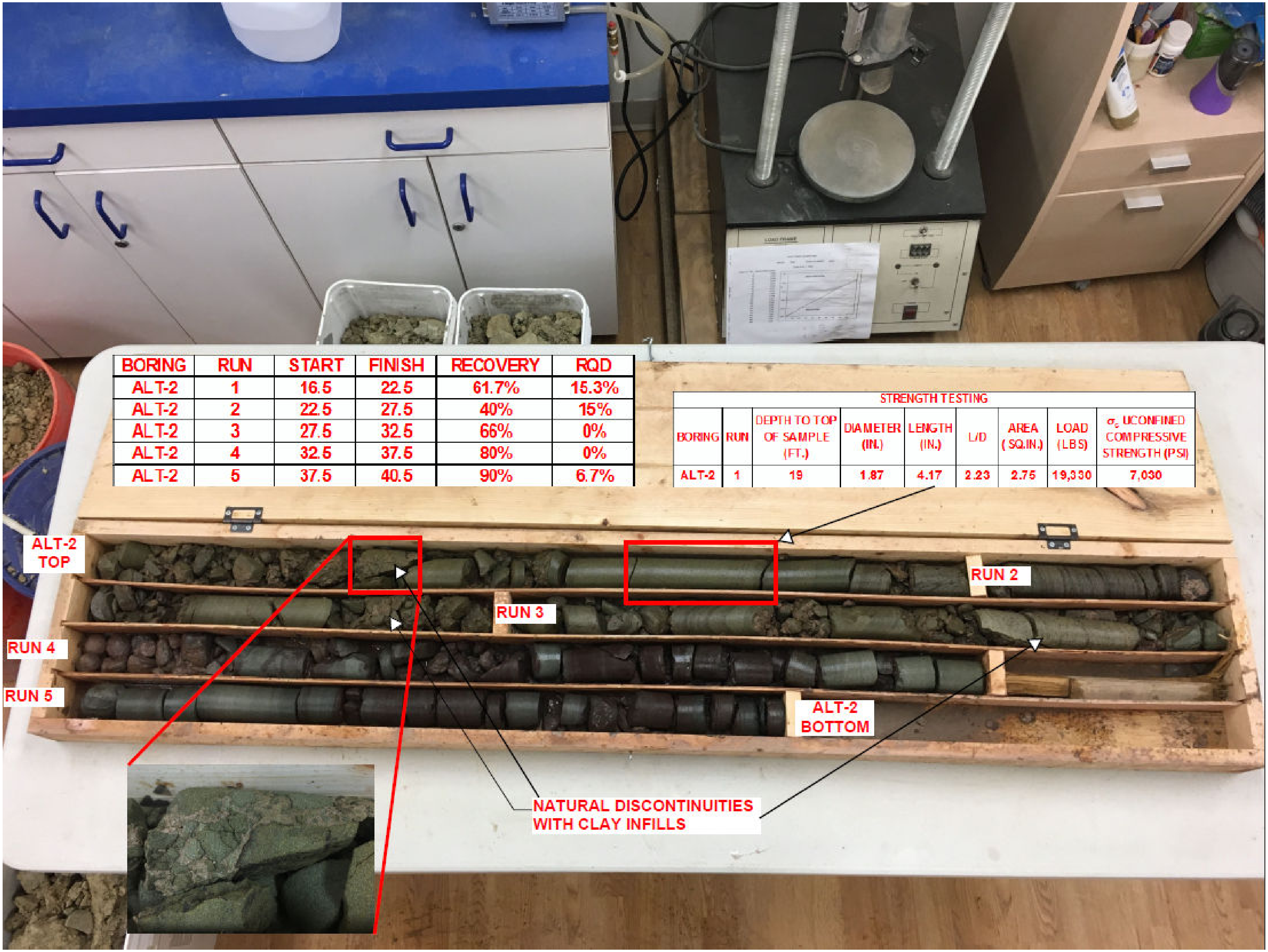
PROJECT LOCATION STEUBEN COUNTY, NY



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification	LL	PL	PI	Cc	Cu
●	T-31	1.0	**SANDY SILT (MLS)**					

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	T-31	1.0	19	0.123			11.5	38.1	50.4	



BORING	RUN	START	FINISH	RECOVERY	RQD
ALT-2	1	16.5	22.5	61.7%	15.3%
ALT-2	2	22.5	27.5	40%	15%
ALT-2	3	27.5	32.5	66%	0%
ALT-2	4	32.5	37.5	80%	0%
ALT-2	5	37.5	40.5	90%	6.7%

STRENGTH TESTING								
BORING	RUN	DEPTH TO TOP OF SAMPLE (FT.)	DIAMETER (IN.)	LENGTH (IN.)	L/D	AREA (SQ.IN.)	LOAD (LBS)	σ_c UCONFINED COMPRESSIVE STRENGTH (PSI)
ALT-2	1	19	1.87	4.17	2.23	2.75	19,330	7,030

BORING	RUN	START	FINISH	RECOVERY	RQD
TL-43	1	17.4	22.4	100%	0%
TL-32	1	13.0	18.0	100%	34.2%
TL-29	1	10.5	15.5	90%	0%
TL-4	1	10.1	15.1	100%	0%

BORING	RUN	START	FINISH	RECOVERY	RQD
TL-43	1	17.4	22.4	100%	0%
TL-32	1	13.0	18.0	100%	34.2%
TL-29	1	10.5	15.5	90%	0%
TL-4	1	10.1	15.1	100%	0%

BORING	RUN	START	FINISH	RECOVERY	RQD
T-1	1	21.0	26.0	100%	45.0%
T-1	2	26.0	31.0	84%	0%
T-1	3	31.0	36.0	50%	0%
T-1	4	36.0	41.0	46%	0%

STRENGTH TESTING								
BORING	RUN	DEPTH TO TOP OF SAMPLE	DIAMETER (IN.)	LENGTH (IN.)	L/D	AREA (SQ.IN.)	LOAD (LBS)	Σ_C UNCONFINED COMPRESSIVE STRENGTH (PSI)
T-1	1	21	1.97	4.41	2.24	3.05	32,330	10,600

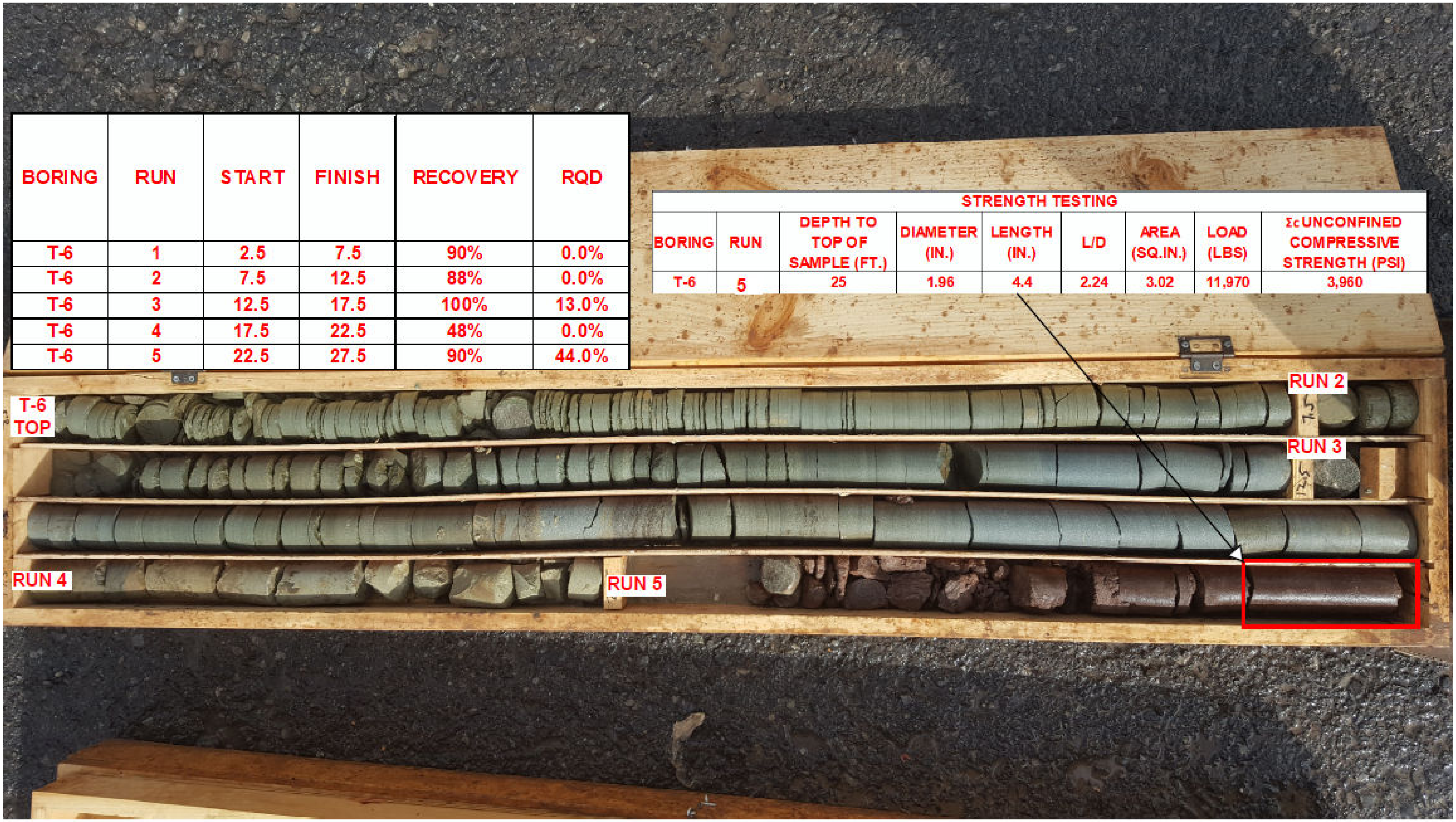
BORING	RUN	START	FINISH	RECOVERY	RQD
T-4	1	10.0	15.0	100%	0.0%
T-4	2	15.0	20.0	100%	6.7%
T-4	3	20.0	25.0	94%	46.7%
T-4	4	25.0	30.0	84%	0.0%

STRENGTH TESTING								
BORING	RUN	DEPTH TO TOP OF SAMPLE (FT.)	DIAMETER (IN.)	LENGT H (IN.)	L/D	AREA (SQ.IN.)	LOAD (LBS)	Σc UNCONFINED COMPRESSIVE STRENGTH (PSI)
RUN 2	3	22.1	1.97	4.43	2.25	3.05	34,740	11,380

BORING	RUN	START	FINISH	RECOVERY	RQD
BORING	RUN	START	FINISH	RECOVERY	RQD
T-4	5	30.0	35.0	66%	6.7%
T-4	6	35.0	40.0	88%	6.7%

BORING	RUN	START	FINISH	RECOVERY	RQD
T-6	1	2.5	7.5	90%	0.0%
T-6	2	7.5	12.5	88%	0.0%
T-6	3	12.5	17.5	100%	13.0%
T-6	4	17.5	22.5	48%	0.0%
T-6	5	22.5	27.5	90%	44.0%

STRENGTH TESTING								
BORING	RUN	DEPTH TO TOP OF SAMPLE (FT.)	DIAMETER (IN.)	LENGTH (IN.)	L/D	AREA (SQ.IN.)	LOAD (LBS)	Σ_c UNCONFINED COMPRESSIVE STRENGTH (PSI)
T-6	5	25	1.96	4.4	2.24	3.02	11,970	3,960



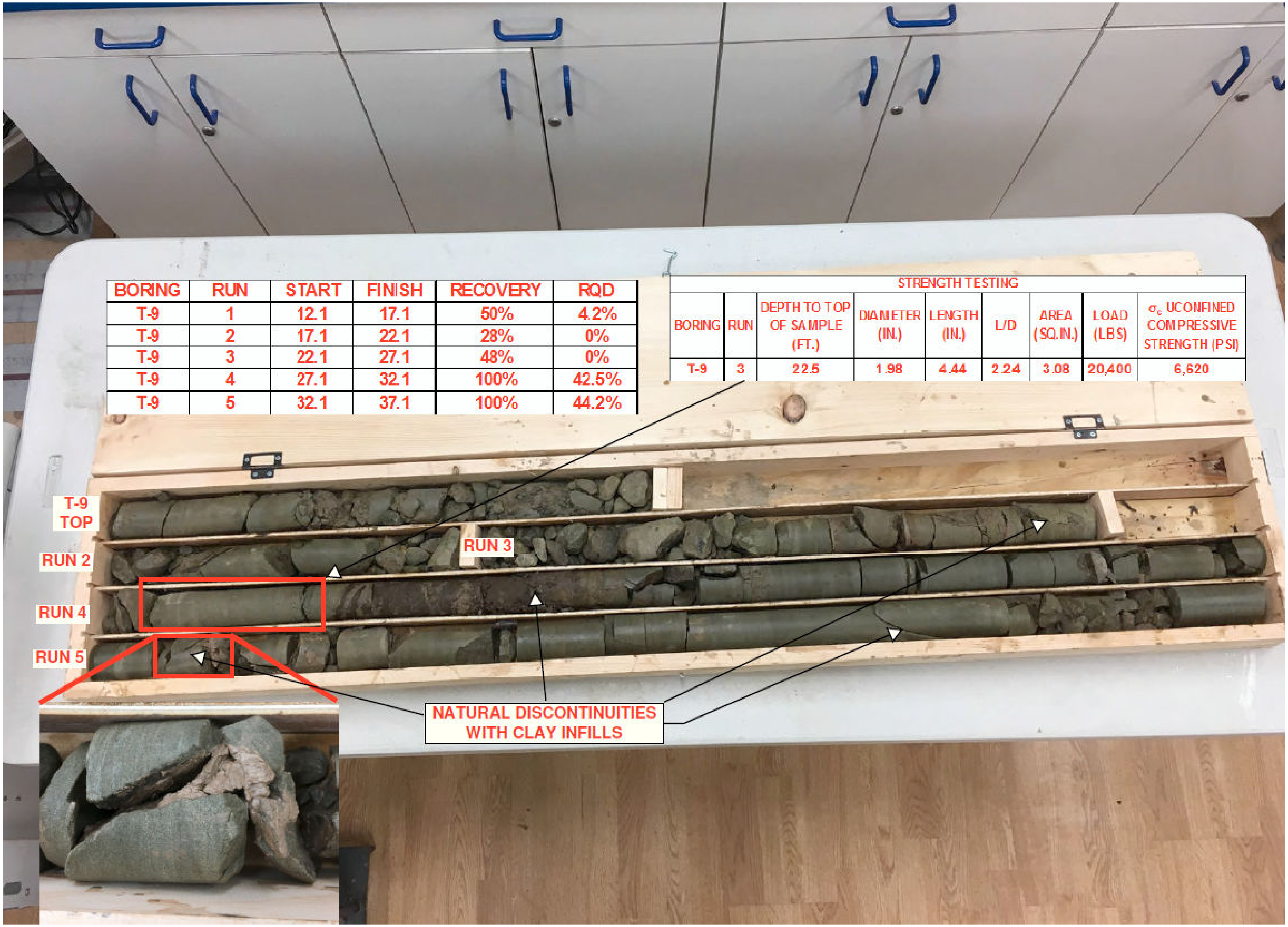
BORING	RUN	START	FINISH	RECOVERY	RQD
T-6	6	27.5	32.5	88%	0.0%
T-6	7	32.5	37.5	100%	45.0%
T-6	8	37.5	40.5	87%	0.0%

BORING	RUN	START	FINISH	RECOVERY	RQD
T-7	1	12.0	17.0	100%	78.3%
T-7	2	17.0	22.0	94%	34.0%
T-7	3	22.0	27.0	96%	14.0%
T-7	4	27.0	32.0	100%	41.7%

STRENGTH TESTING

BORING	RUN	DEPTH TO TOP OF SAMPLE (FT.)	DIAMETER (IN.)	LENGTH (IN.)	L/D	AREA (SQ.IN.)	LOAD (LBS)	Σ_c UNCONFINED COMPRESSIVE STRENGTH (PSI)
T-7	1	13.5	1.97	4.42	2.24	3.05	40,280	13,210

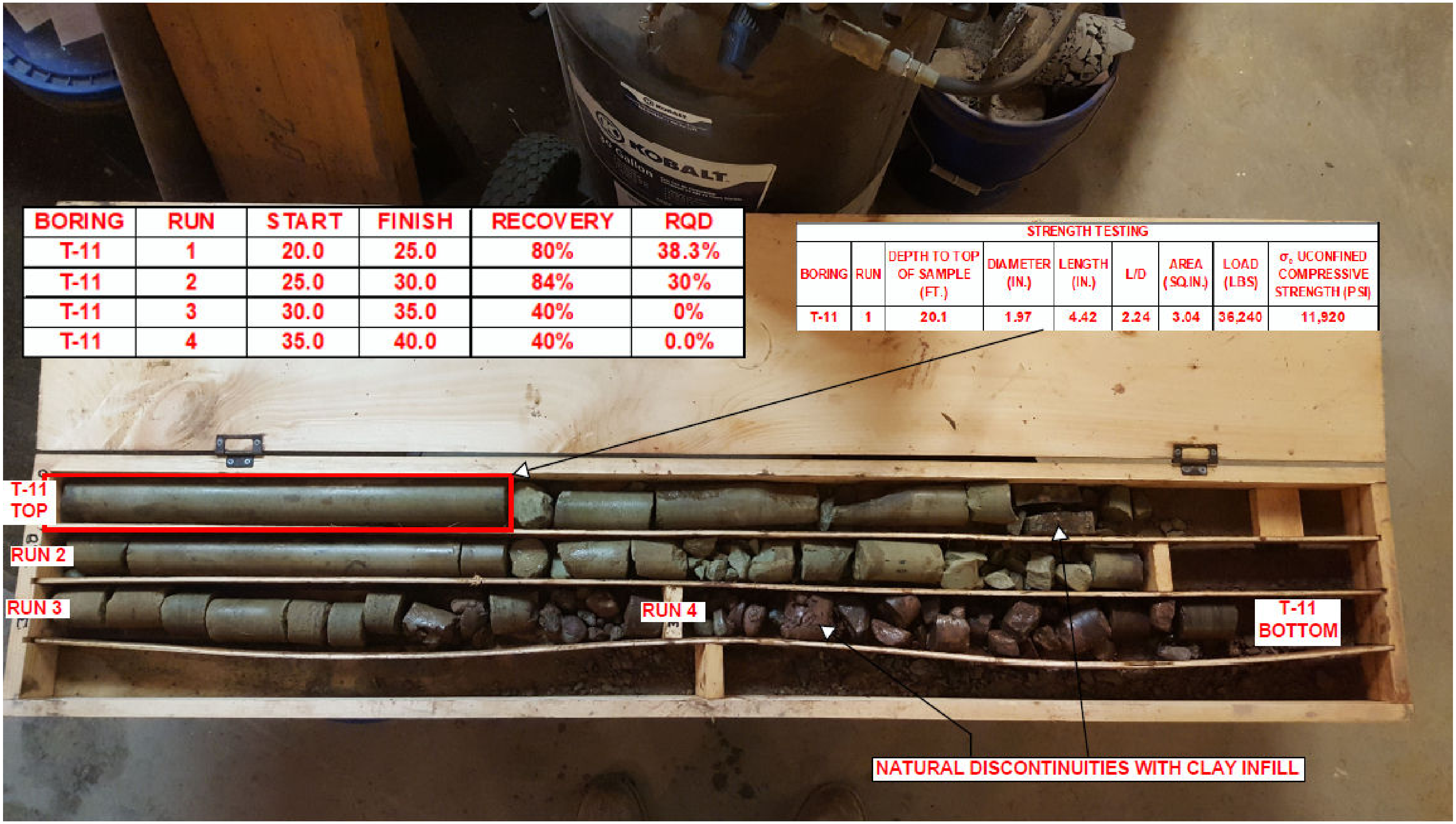
BORING	RUN	START	FINISH	RECOVERY	RQD
T-7	5	32.0	37.0	90%	0.0%
T-7	6	37.0	40.0	100%	29.0%



BORING	RUN	START	FINISH	RECOVERY	RQD
T-9	1	12.1	17.1	50%	4.2%
T-9	2	17.1	22.1	28%	0%
T-9	3	22.1	27.1	48%	0%
T-9	4	27.1	32.1	100%	42.5%
T-9	5	32.1	37.1	100%	44.2%

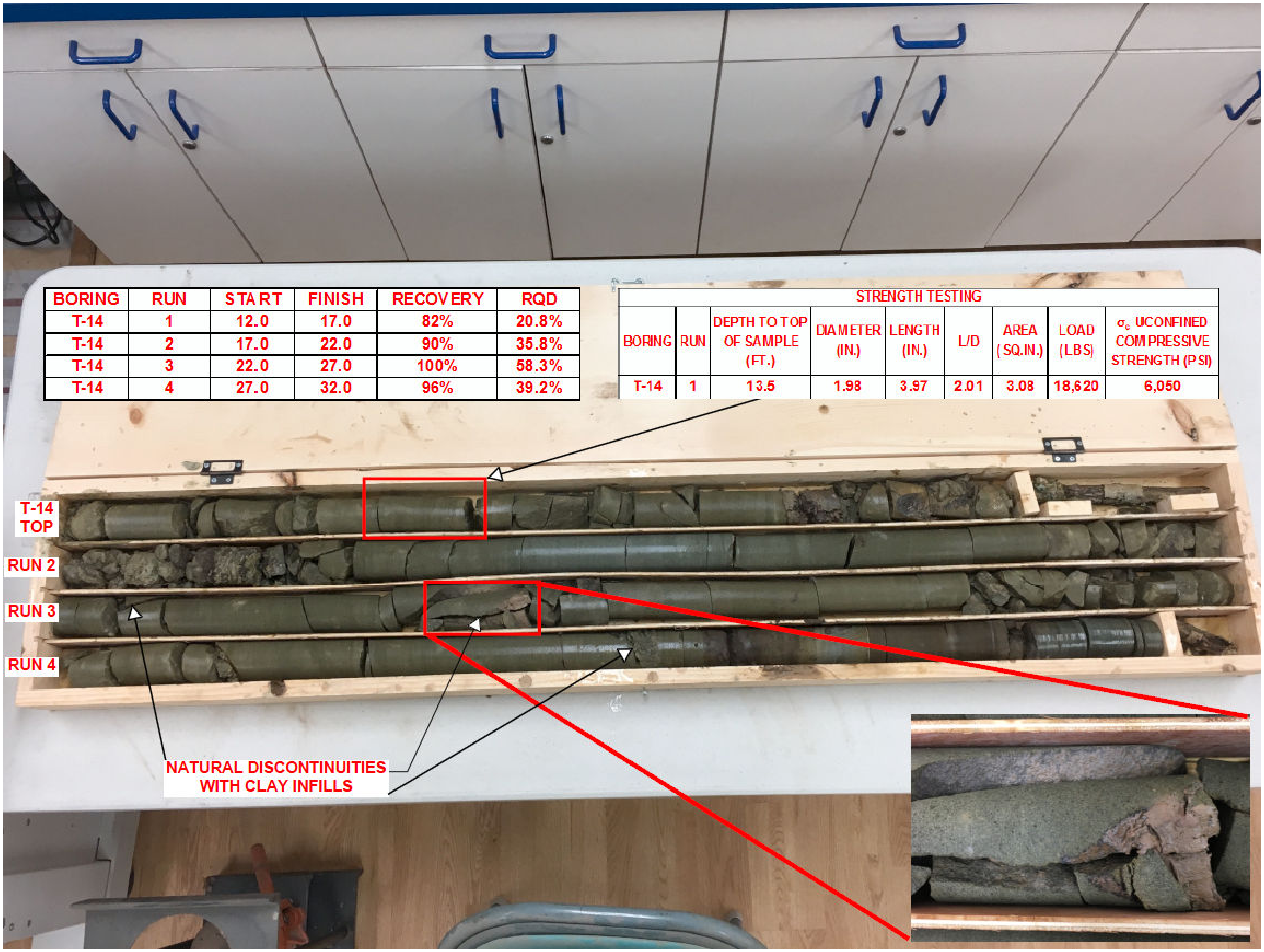
STRENGTH TESTING								
BORING	RUN	DEPTH TO TOP OF SAMPLE (FT.)	DIAMETER (IN.)	LENGTH (IN.)	L/D	AREA (SQ.IN.)	LOAD (LBS)	σ_c UCONFINED COMPRESSIVE STRENGTH (PSI)
T-9	3	22.5	1.98	4.44	2.24	3.08	20,400	6,620

BORING	RUN	START	FINISH	RECOVERY	RQD
T-14	5	32.0	37.0	96%	58.3%
T-14	6	37.0	40.0	100%	63.9%
T-9	6	37.1	42.1	96%	61.6%



BORING	RUN	START	FINISH	RECOVERY	RQD
T-11	1	20.0	25.0	80%	38.3%
T-11	2	25.0	30.0	84%	30%
T-11	3	30.0	35.0	40%	0%
T-11	4	35.0	40.0	40%	0.0%

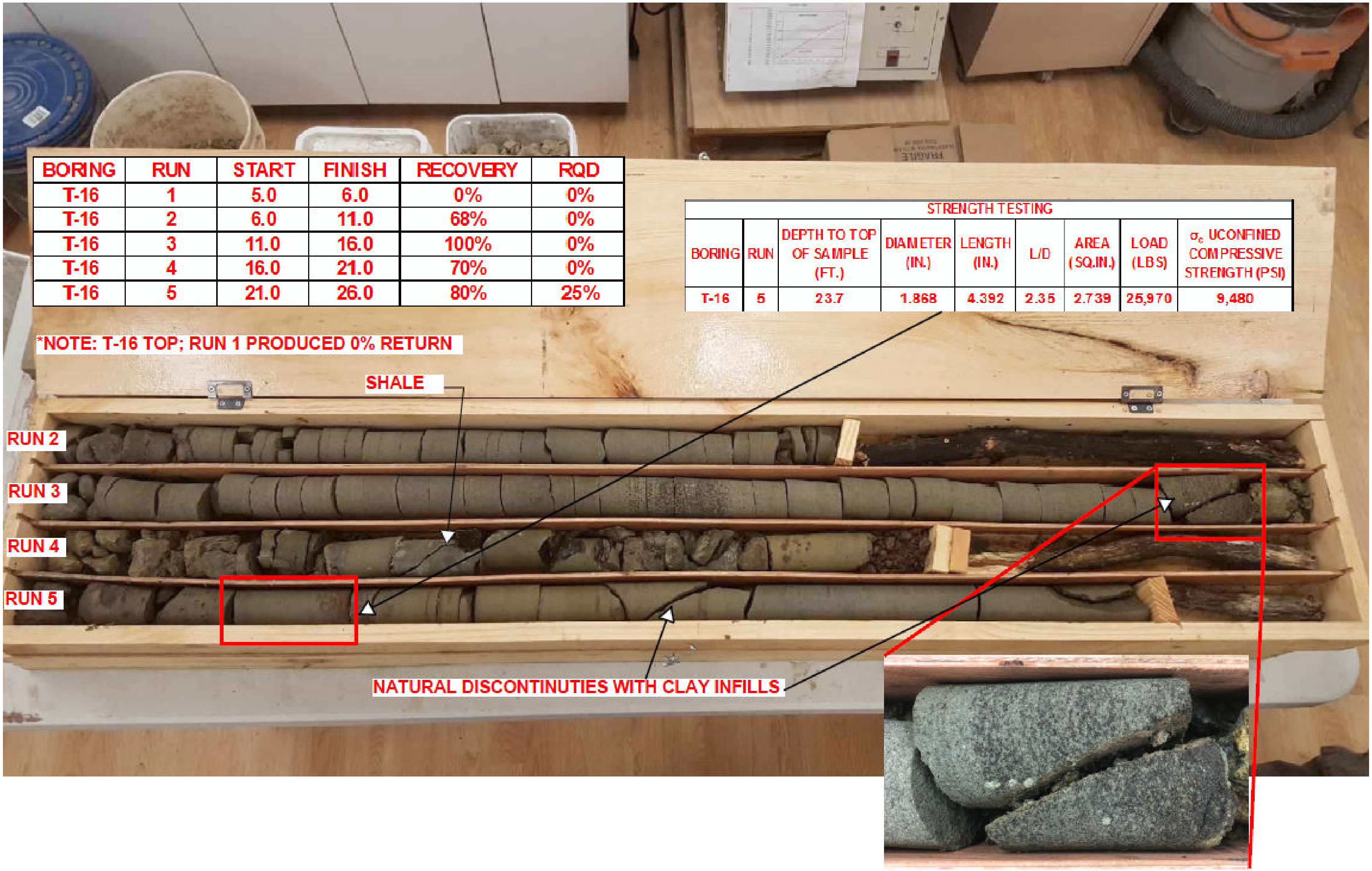
STRENGTH TESTING								
BORING	RUN	DEPTH TO TOP OF SAMPLE (FT.)	DIAMETER (IN.)	LENGTH (IN.)	L/D	AREA (SQ.IN.)	LOAD (LBS)	σ_c UCONFINED COMPRESSIVE STRENGTH (PSI)
T-11	1	20.1	1.97	4.42	2.24	3.04	36,240	11,920



BORING	RUN	START	FINISH	RECOVERY	RQD
T-14	1	12.0	17.0	82%	20.8%
T-14	2	17.0	22.0	90%	35.8%
T-14	3	22.0	27.0	100%	58.3%
T-14	4	27.0	32.0	96%	39.2%

STRENGTH TESTING								
BORING	RUN	DEPTH TO TOP OF SAMPLE (FT.)	DIAMETER (IN.)	LENGTH (IN.)	L/D	AREA (SQ.IN.)	LOAD (LBS)	σ_c UCONFINED COMPRESSIVE STRENGTH (PSI)
T-14	1	13.5	1.98	3.97	2.01	3.08	18,620	6,050

BORING	RUN	START	FINISH	RECOVERY	RQD
T-14	5	32.0	37.0	96%	58.3%
T-14	6	37.0	40.0	100%	63.9%
T-9	6	37.1	42.1	96%	61.6%

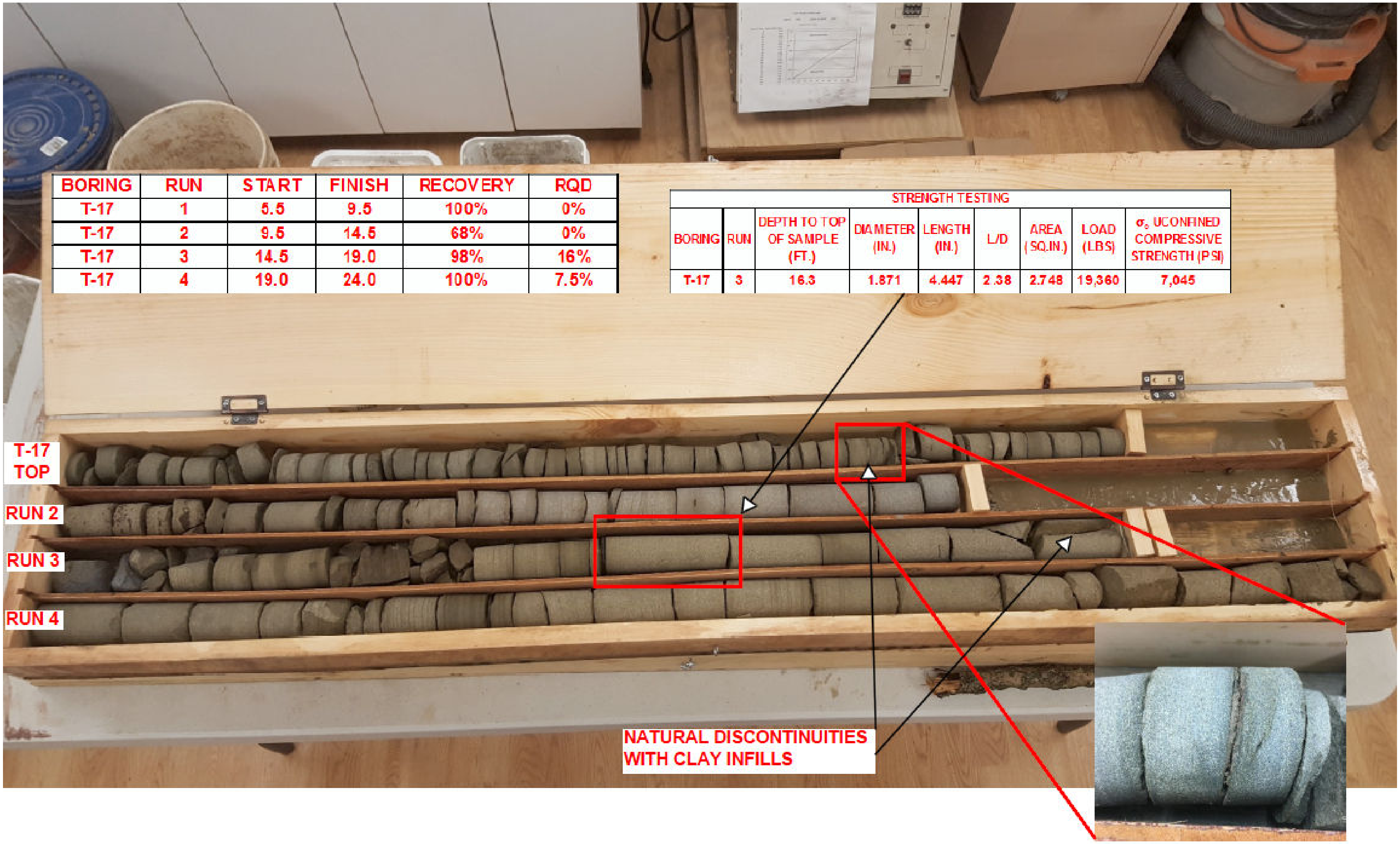


BORING	RUN	START	FINISH	RECOVERY	RQD
T-16	1	5.0	6.0	0%	0%
T-16	2	6.0	11.0	68%	0%
T-16	3	11.0	16.0	100%	0%
T-16	4	16.0	21.0	70%	0%
T-16	5	21.0	26.0	80%	25%

STRENGTH TESTING								
BORING	RUN	DEPTH TO TOP OF SAMPLE (FT.)	DIAMETER (IN.)	LENGTH (IN.)	L/D	AREA (SQ.IN.)	LOAD (LBS)	σ_c UCONFINED COMPRESSIVE STRENGTH (PSI)
T-16	5	23.7	1.868	4.392	2.35	2.739	25,970	9,480

BORING	RUN	START	FINISH	RECOVERY	RQD
T-16	6	26.0	31.0	74%	8.3%
T-16	7	31.0	35.0	130%	49%
T-16	8	35.0	40.5	62%	13.3%

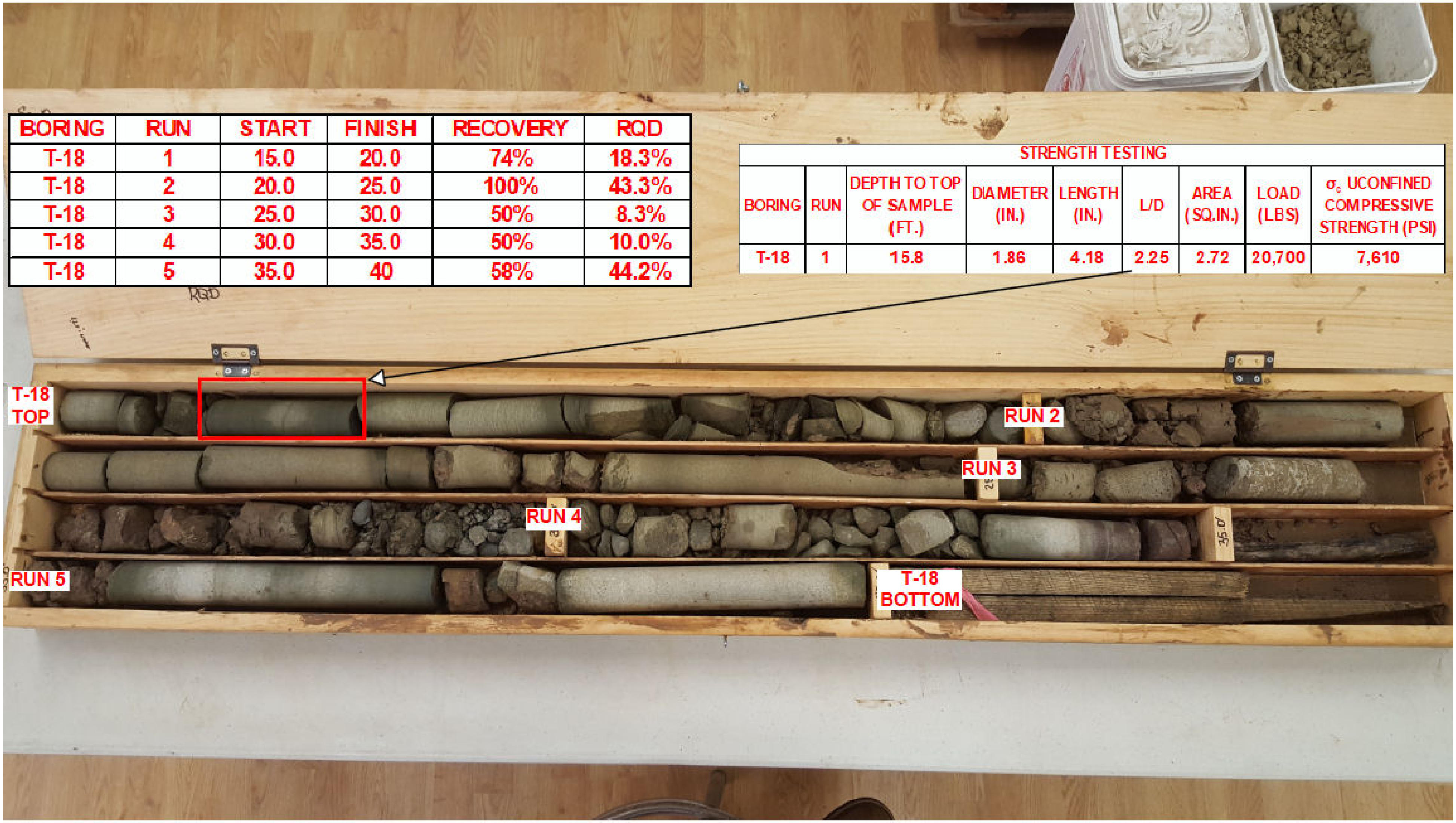
*NOTE: RUN 7; ROCK SAMPLE WAS RETRIEVED
FROM PREVIOUS SAMPLE
RUN 6
RUN 7
RUN 8
T-16
BOTTOM



BORING	RUN	START	FINISH	RECOVERY	RQD
T-17	1	5.5	9.5	100%	0%
T-17	2	9.5	14.5	68%	0%
T-17	3	14.5	19.0	98%	16%
T-17	4	19.0	24.0	100%	7.5%

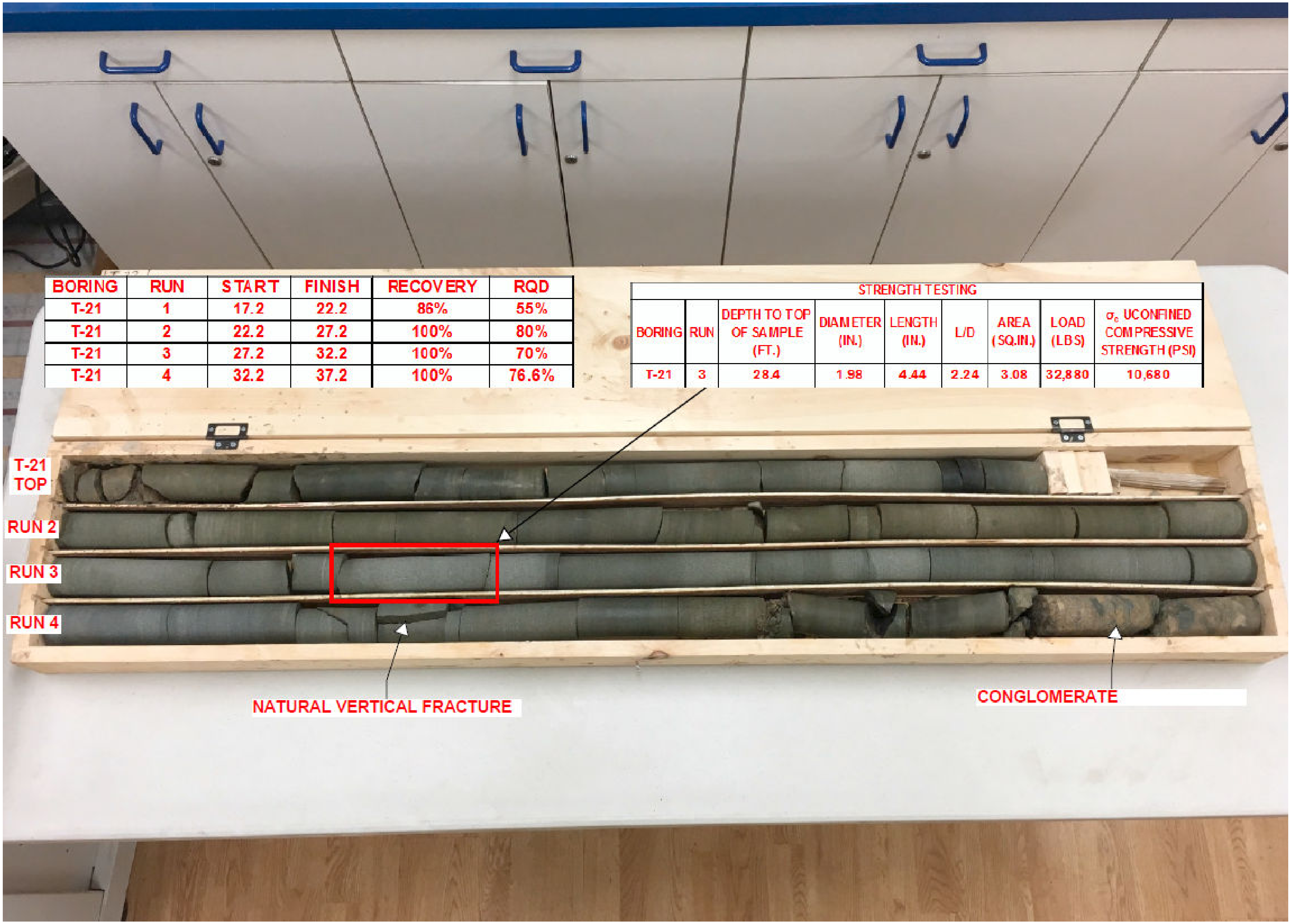
STRENGTH TESTING								
BORING	RUN	DEPTH TO TOP OF SAMPLE (FT.)	DIAMETER (IN.)	LENGTH (IN.)	L/D	AREA (SQ.IN.)	LOAD (LBS)	σ_c UCONFINED COMPRESSIVE STRENGTH (PSI)
T-17	3	16.3	1.871	4.447	2.38	2.748	19,360	7,045

BORING	RUN	START	FINISH	RECOVERY	RQD
T-17	5	24.0	29.0	100%	33.3%
T-17	6	29.0	33.5	89%	74%
T-17	7	33.5	38.2	106%	86%
T-17	8	38.2	40.2	90%	50%



BORING	RUN	START	FINISH	RECOVERY	RQD
T-18	1	15.0	20.0	74%	18.3%
T-18	2	20.0	25.0	100%	43.3%
T-18	3	25.0	30.0	50%	8.3%
T-18	4	30.0	35.0	50%	10.0%
T-18	5	35.0	40	58%	44.2%

STRENGTH TESTING								
BORING	RUN	DEPTH TO TOP OF SAMPLE (FT.)	DIAMETER (IN.)	LENGTH (IN.)	L/D	AREA (SQ.IN.)	LOAD (LBS)	σ_c UCONFINED COMPRESSIVE STRENGTH (PSI)
T-18	1	15.8	1.86	4.18	2.25	2.72	20,700	7,610



BORING	RUN	START	FINISH	RECOVERY	RQD
T-21	1	17.2	22.2	86%	55%
T-21	2	22.2	27.2	100%	80%
T-21	3	27.2	32.2	100%	70%
T-21	4	32.2	37.2	100%	76.6%

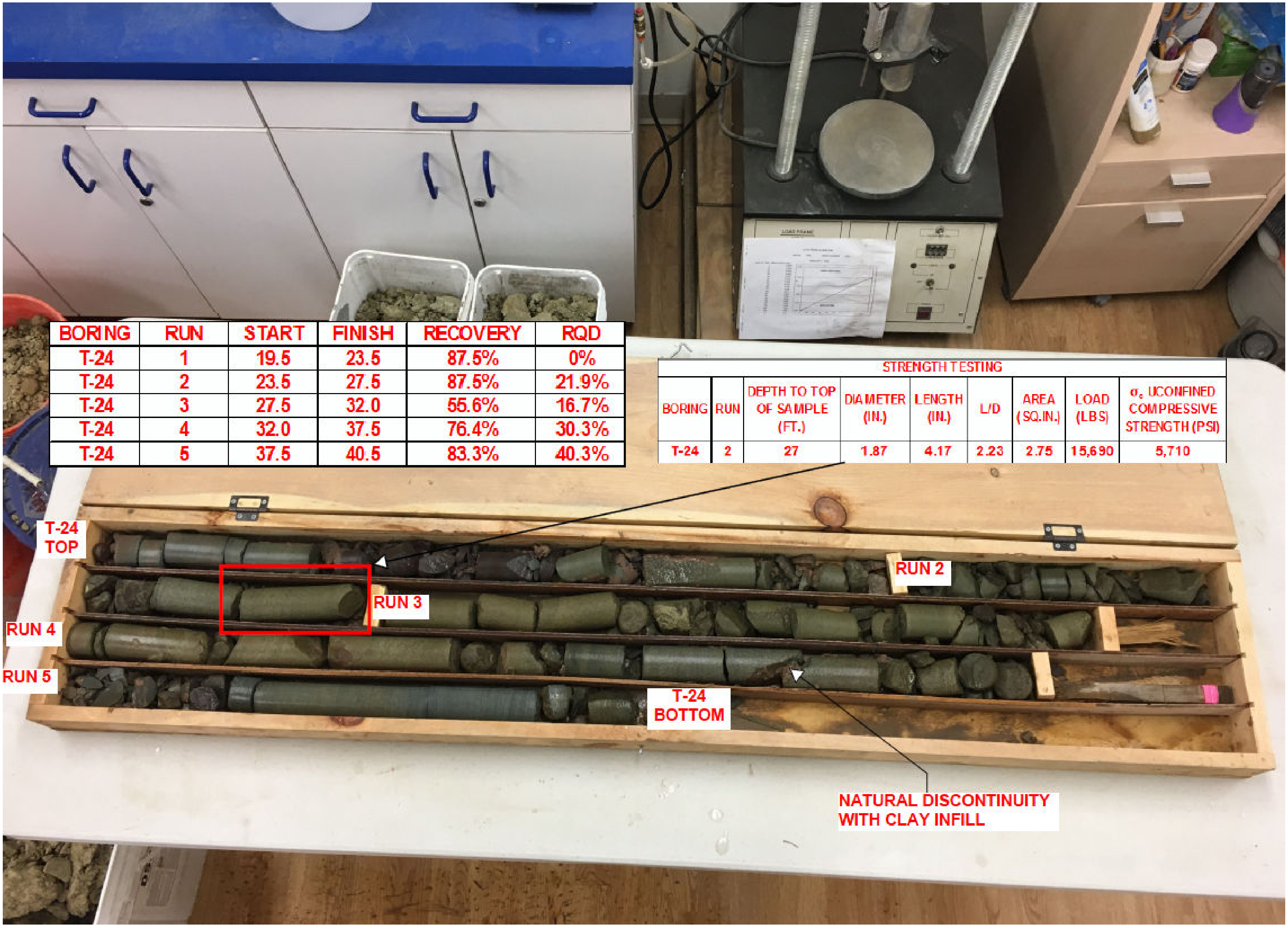
STRENGTH TESTING								
BORING	RUN	DEPTH TO TOP OF SAMPLE (FT.)	DIAMETER (IN.)	LENGTH (IN.)	L/D	AREA (SQ.IN.)	LOAD (LBS)	σ_c UCONFINED COMPRESSIVE STRENGTH (PSI)
T-21	3	28.4	1.98	4.44	2.24	3.08	32,880	10,680

BORING	RUN	START	FINISH	RECOVERY	RQD
T-30	5	32.0	37.0	96%	70.8%
T-30	6	37.0	40.0	43%	13.8%
T-21	5	37.2	40.2	100%	69%

BORING	RUN	START	FINISH	RECOVERY	RQD
T-23	1	6.5	12.0	87.3%	0%
T-23	2	12.0	17.0	100%	28%
T-23	3	17.0	22.0	0.04%	0%
T-23	4	22.0	27.0	84%	25%
T-23	5	27.0	32.0	98%	35.8%

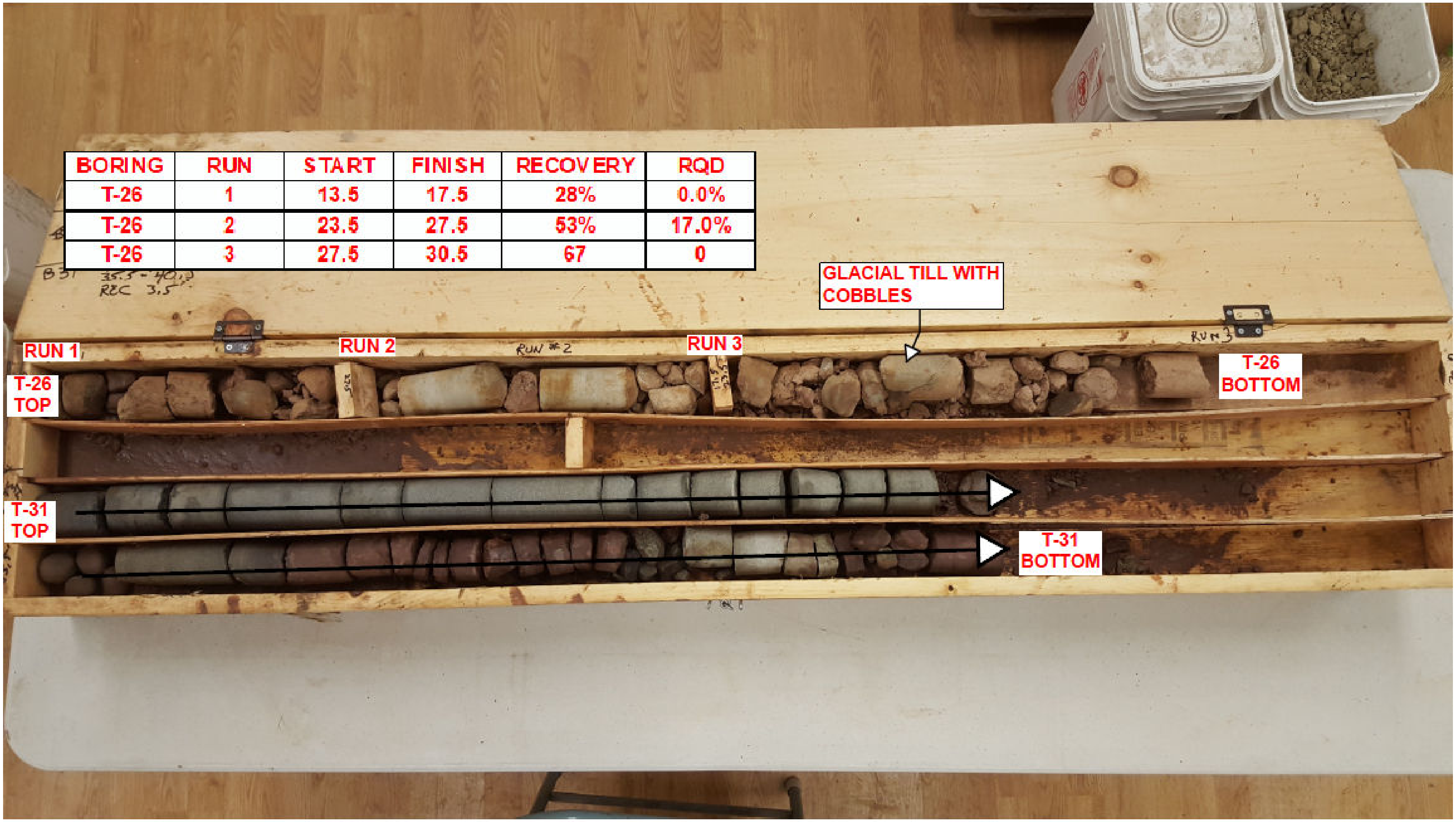
STRENGTH TESTING								
BORING	RUN	DEPTH TO TOP OF SAMPLE (FT.)	DIAMETER (IN.)	LENGTH (IN.)	L/D	AREA (SQ.IN.)	LOAD (LBS)	σ_c UCONFINED COMPRESSIVE STRENGTH (PSI)
T-23	2	19.8	1.87	4.18	2.24	2.75	23,150	8,420

BORING	RUN	START	FINISH	RECOVERY	RQD
T-23	6	32.0	37.0	80%	30.8%
T-23	7	37.0	40.5	100%	25%

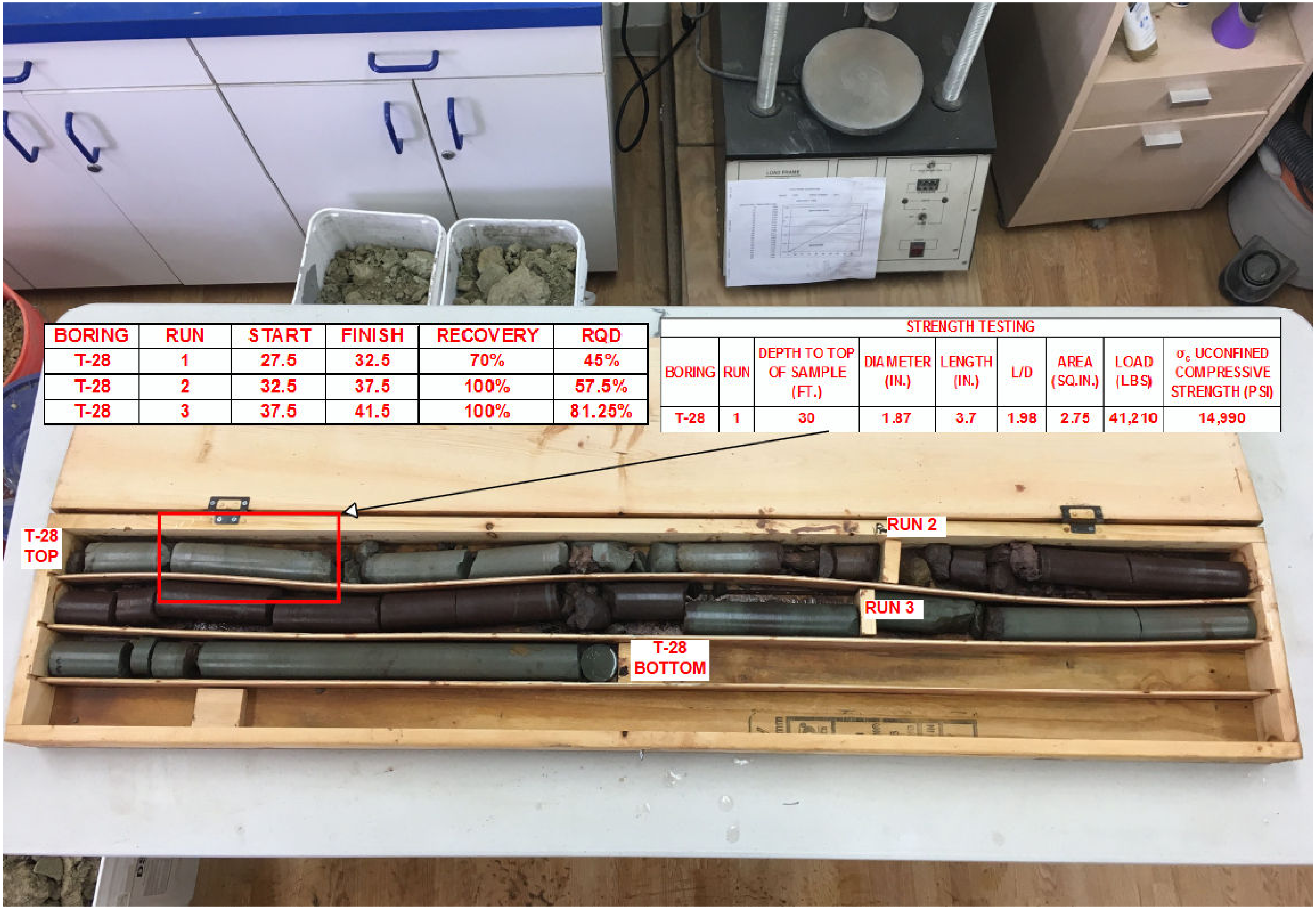


BORING	RUN	START	FINISH	RECOVERY	RQD
T-24	1	19.5	23.5	87.5%	0%
T-24	2	23.5	27.5	87.5%	21.9%
T-24	3	27.5	32.0	55.6%	16.7%
T-24	4	32.0	37.5	76.4%	30.3%
T-24	5	37.5	40.5	83.3%	40.3%

STRENGTH TESTING								
BORING	RUN	DEPTH TO TOP OF SAMPLE (FT.)	DIAMETER (IN.)	LENGTH (IN.)	L/D	AREA (SQ.IN.)	LOAD (LBS)	σ_c UCONFINED COMPRESSIVE STRENGTH (PSI)
T-24	2	27	1.87	4.17	2.23	2.75	15,690	5,710



BORING	RUN	START	FINISH	RECOVERY	RQD
T-26	1	13.5	17.5	28%	0.0%
T-26	2	23.5	27.5	53%	17.0%
T-26	3	27.5	30.5	67	0



BORING	RUN	START	FINISH	RECOVERY	RQD
T-28	1	27.5	32.5	70%	45%
T-28	2	32.5	37.5	100%	57.5%
T-28	3	37.5	41.5	100%	81.25%

STRENGTH TESTING

BORING	RUN	DEPTH TO TOP OF SAMPLE (FT.)	DIAMETER (IN.)	LENGTH (IN.)	L/D	AREA (SQ.IN.)	LOAD (LBS)	σ_c UCONFINED COMPRESSIVE STRENGTH (PSI)
T-28	1	30	1.87	3.7	1.98	2.75	41,210	14,990

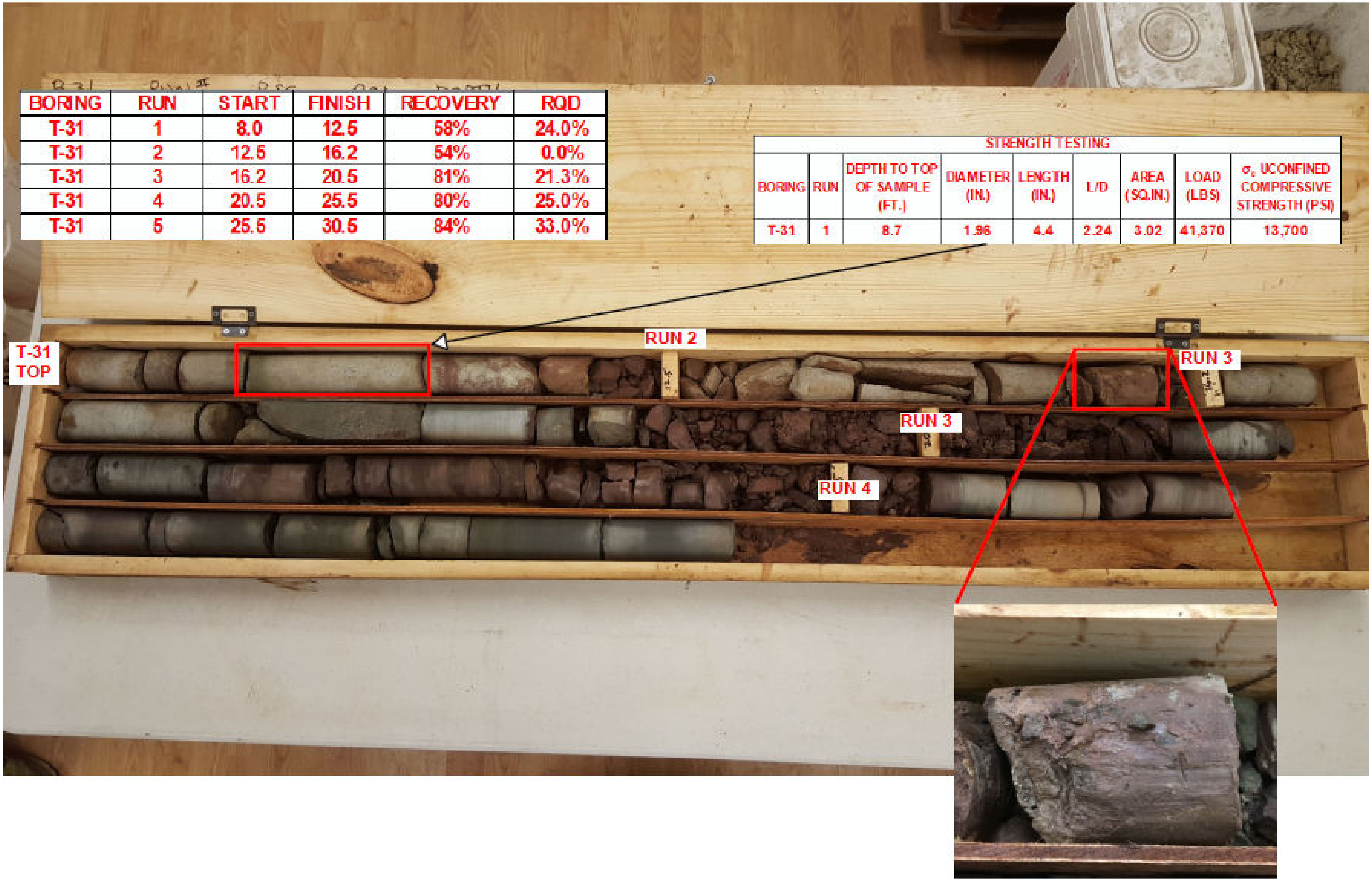
BORING	RUN	START	FINISH	RECOVERY	RQD
T-30	1	12.0	17.0	82%	37.5%
T-30	2	17.0	22.0	54%	0%
T-30	3	22.0	27.0	100%	86.6%
T-30	4	27.0	32.0	100%	55.8%

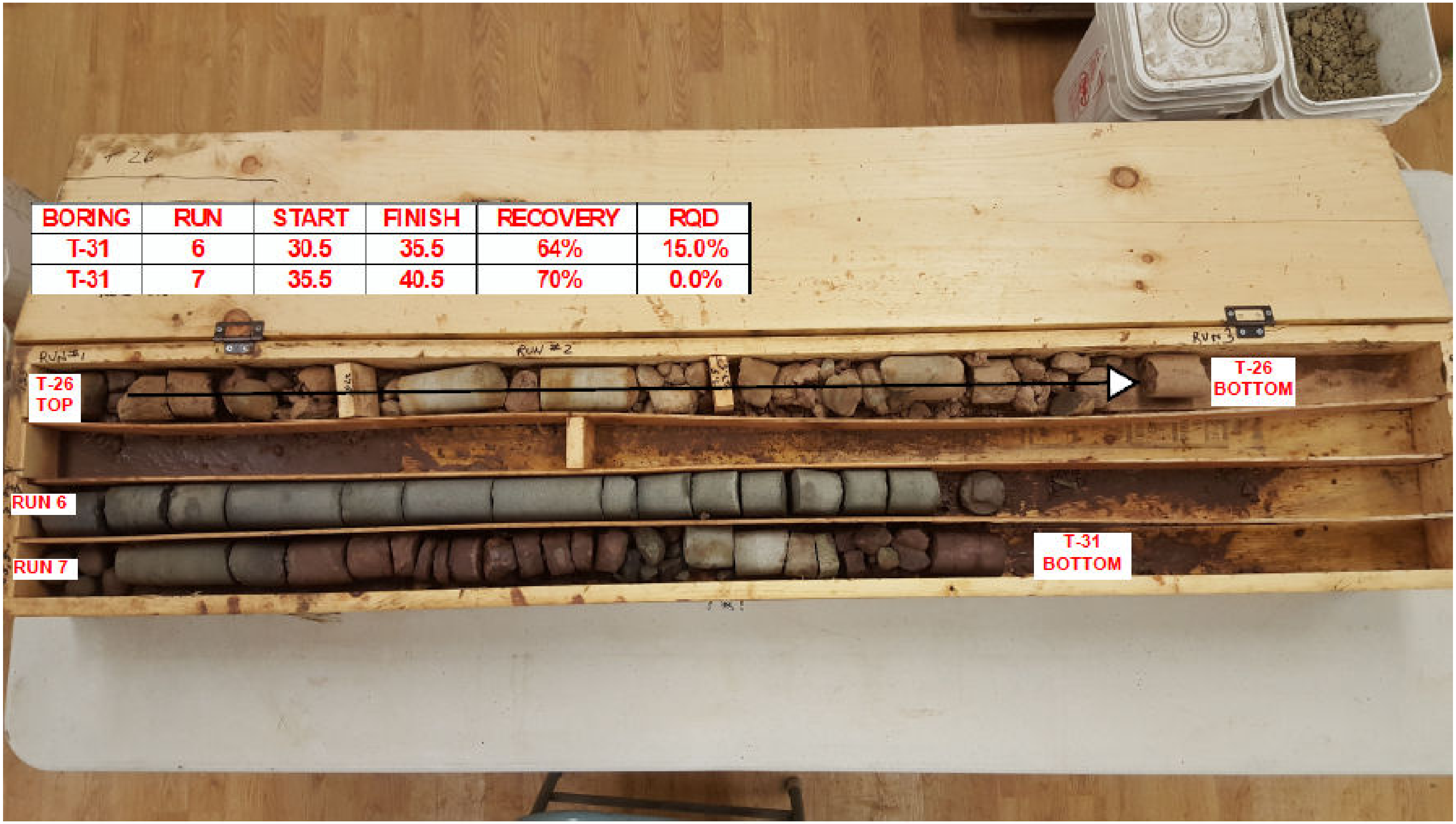
STRENGTH TESTING								
BORING	RUN	DEPTH TO TOP OF SAMPLE (FT.)	DIAMETER (IN.)	LENGTH (IN.)	L/D	AREA (SQ.IN.)	LOAD (LBS)	σ_c UCONFINED COMPRESSIVE STRENGTH (PSI)
T-30	1	13	1.97	4.41	2.24	3.05	31,600	10,360

BORING	RUN	START	FINISH	RECOVERY	RQD
T-30	5	32.0	37.0	96%	70.8%
T-30	6	37.0	40.0	43%	13.8%
T-21	5	37.2	40.2	100%	69%

BORING	RUN	START	FINISH	RECOVERY	RQD
T-31	1	8.0	12.5	58%	24.0%
T-31	2	12.5	16.2	54%	0.0%
T-31	3	16.2	20.5	81%	21.3%
T-31	4	20.5	25.5	80%	25.0%
T-31	5	25.5	30.5	84%	33.0%

STRENGTH TESTING								
BORING	RUN	DEPTH TO TOP OF SAMPLE (FT.)	DIAMETER (IN.)	LENGTH (IN.)	L/D	AREA (SQ.IN.)	LOAD (LBS)	σ_c UCONFINED COMPRESSIVE STRENGTH (PSI)
T-31	1	8.7	1.96	4.4	2.24	3.02	41,370	13,700





BORING	RUN	START	FINISH	RECOVERY	RQD
T-31	6	30.5	35.5	64%	15.0%
T-31	7	35.5	40.5	70%	0.0%

BORING	RUN	START	FINISH	RECOVERY	RQD
TL-43	1	17.4	22.4	100%	0%
TL-32	1	13.0	18.0	100%	34.2%
TL-29	1	10.5	15.5	90%	0%
TL-4	1	10.1	15.1	100%	0%

STRENGTH TESTING								
BORING	RUN	DEPTH TO TOP OF SAMPLE (FT.)	DIAMETER (IN.)	LENGTH (IN.)	L/D	AREA (SQ.IN.)	LOAD (LBS)	σ_c UNCONFINED COMPRESSIVE STRENGTH (PSI)
TL-32	1	16.1	1.98	4.42	2.23	3.08	32,010	10,390

BORING	RUN	START	FINISH	RECOVERY	RQD
TL-43	1	17.4	22.4	100%	0%
TL-32	1	13.0	18.0	100%	34.2%
TL-29	1	10.5	15.5	90%	0%
TL-4	1	10.1	15.1	100%	0%

Geotechnical Parameters for Deep Foundations - Transmission Line Structures

Boring	TL-3		Ultimate		Allowable		Total Stress		Static		
Soil	Depth	Avg N	Skin Friction (psf)	End Bearing Pressure (psf)	Skin Friction (psf)	End Bearing Pressure (psf)	Internal Angle of Friction ϕ (degrees)	Cohesion, c (psf)	Lateral Subgrade Modulus, k (pci)	Strain ε_{50}	MFAD Deformation Modulus E_D (ksi)
Sandy ML-CL	0-4	14	800	ignore	400	ignore	-	1750	500	0.007	1
Sandy ML-CL	4'-7'	16	1000	12000	500	6000	-	2000	500	0.007	1.3
Gravelly CL	7'-13'	47	2000	30000	1000	15000	-	5000	1000	0.005	3.5
Sandy ML-CL	13'-18'	32	1500	24000	750	12000	-	4000	1000	0.005	2.5
Sandy ML-CL	18'-25'	88	1500	36000	750	18000	-	6000	2000	0.004	7

Boring	TL-4		Ultimate		Allowable		Total Stress		Static		
Soil	Depth	Avg N	Skin Friction (psf)	End Bearing Pressure (psf)	Skin Friction (psf)	End Bearing Pressure (psf)	Internal Angle of Friction ϕ (degrees)	Cohesion, c (psf)	Lateral Subgrade Modulus, k (pci)	Strain ε_{50}	MFAD Deformation Modulus E_D (ksi)
Sandy ML	0-4	8	ignore	ignore	ignore	ignore	30	ignore	25	-	0.8
Sandy ML	4'-10'	52	1000	12000	500	6000	40	-	275	-	3
				Rock Mass Rating (RMR76)							
Rock	Depth	qu (ksi)	RQD	qu (ksi)	RQD	Jt Space	Jt Cond	GW	Orient	RMR76	MFAD Deformation Modulus ED (ksi)
Sandstone	10'-25'	1.5	0	1	3	5	0	7	-7	9	42

Boring	TL-9		Ultimate		Allowable		Total Stress		Static		
Soil	Depth	Avg N	Skin Friction (psf)	End Bearing Pressure (psf)	Skin Friction (psf)	End Bearing Pressure (psf)	Internal Angle of Friction ϕ (degrees)	Cohesion, c (psf)	Lateral Subgrade Modulus, k (pci)	Strain ε_{50}	MFAD Deformation Modulus E_D (ksi)
Sandy ML-CL	0-4	14	800	ignore	400	ignore	-	1750	500	0.007	1
Sandy ML-CL	4'-8'	12	650	9000	325	4500	-	1500	500	0.007	0.9
Sandy ML-CL	8'-18'	42	1000	30000	500	15000	-	5000	1000	0.005	2.5
Sandy ML-CL	18'-25'	100	1500	36000	750	18000	-	6000	2000	0.004	7

Boring	TL-10		Ultimate		Allowable		Total Stress		Static		
Soil	Depth	Avg N	Skin Friction (psf)	End Bearing Pressure (psf)	Skin Friction (psf)	End Bearing Pressure (psf)	Internal Angle of Friction ϕ (degrees)	Cohesion, c (psf)	Lateral Subgrade Modulus, k (pci)	Strain ε_{50}	MFAD Deformation Modulus E_D (ksi)
Sandy ML	0-2.5	8	ignore	ignore	ignore	ignore	30	ignore	25	-	0.8
Sandy ML-CL	2.5'-4'	12	650	ignore	325	ignore	-	1500	500	0.007	0.9
Sandy ML-CL	4'-6'	26	1000	19200	500	9600	-	3200	1000	0.005	2
Sandy ML-CL	6'-10'	51	2000	30000	1000	15000	-	5000	1000	0.005	3.5
Sandy ML-CL	10-25'	27	1000	19200	500	9600	-	3200	1000	0.005	2

Boring	TL-26		Ultimate		Allowable		Total Stress		Static		
Soil	Depth	Avg N	Skin Friction (psf)	End Bearing Pressure (psf)	Skin Friction (psf)	End Bearing Pressure (psf)	Internal Angle of Friction ϕ (degrees)	Cohesion, c (psf)	Lateral Subgrade Modulus, k (pci)	Strain ε_{50}	MFAD Deformation Modulus E_D (ksi)
Sandy ML-CL	0-4	19	900	ignore	450	ignore	-	2200	500	0.007	1.5
Sandy ML-CL	4'-14'	32	1500	24000	750	12000	-	4000	1000	0.005	2.5
Sandy ML-CL	14'-20'	36	1500	25200	750	12600	-	4200	1000	0.005	2.9
Sandy ML-CL	20'-25'	100	1500	36000	750	18000	-	6000	2000	0.004	7

Boring	TL-29		Ultimate		Allowable		Total Stress		Static		
Soil	Depth	Avg N	Skin Friction (psf)	End Bearing Pressure (psf)	Skin Friction (psf)	End Bearing Pressure (psf)	Internal Angle of Friction ϕ (degrees)	Cohesion, c (psf)	Lateral Subgrade Modulus, k (pci)	Strain ε_{50}	MFAD Deformation Modulus E_D (ksi)
Sandy ML	0-4	18	ignore	ignore	ignore	ignore	30	ignore	25	-	0.8
HW Shale	4'-10.5'	66	1500	12000	750	6000	-	5500	2000	0.004	5

				Rock Mass Rating (RMR76)							MFAD
Rock	**Depth**	**qu (ksi)**	**RQD**	**qu (ksi)**	**RQD**	**Jt Space**	**Jt Cond**	**GW**	**Orient**	**RMR76**	**Deformation**
Shale	10'-25'	1.5	0	1	3	5	0	7	-7	9	42

Boring	**TL-32**		**Ultimate**		**Allowable**		**Total Stress**		**Static Lateral Subgrade Modulus, k (pci)**		
Soil	**Depth**	**Avg N**	**Skin Friction (psf)**	**End Bearing Pressure (psf)**	**Skin Friction (psf)**	**End Bearing Pressure (psf)**	**Internal Angle of Friction ϕ (degrees)**	**Cohesion, c (psf)**		**Strain ε_{50}**	**MFAD Deformation Modulus E_D (ksi)**
Sandy ML	0-4	15	800	ignore	400	ignore	-	1800	500	0.007	1.5
Sandy ML-CL	4'-8'	23	950	12000	475	6000	40	3000	1000	0.005	1.8
				Rock Mass Rating (RMR76)							**MFAD**
Rock	**Depth**	**qu (ksi)**	**RQD**	**qu (ksi)**	**RQD**	**Jt Space**	**Jt Cond**	**GW**	**Orient**	**RMR76**	**Deformation**
W. Sandstone	8-13'	1.5	0	1	3	5	0	7	-7	9	42
Sandstone	13-25'	3	34	4	3	5	0	7	-7	46	1016

Boring	**TL-33**		**Ultimate**		**Allowable**		**Total Stress**		**Static Lateral Subgrade Modulus, k (pci)**		
Soil	**Depth**	**Avg N**	**Skin Friction (psf)**	**End Bearing Pressure (psf)**	**Skin Friction (psf)**	**End Bearing Pressure (psf)**	**Internal Angle of Friction ϕ (degrees)**	**Cohesion, c (psf)**		**Strain ε_{50}**	**MFAD Deformation Modulus E_D (ksi)**
Sandy ML	0-4	10	800	ignore	400	ignore	-	1200	500	0.007	0.7
Sandy CL	4'-12'	29	1000	19200	500	9600	-	3200	1000	0.005	2
Sandy CL	12'-25'	55	2000	30000	1000	15000	-	5000	1000	0.005	4

Boring	**TL-43**		**Ultimate**		**Allowable**		**Total Stress**		**Static Lateral Subgrade Modulus, k (pci)**		
Soil	**Depth**	**Avg N**	**Skin Friction (psf)**	**End Bearing Pressure (psf)**	**Skin Friction (psf)**	**End Bearing Pressure (psf)**	**Internal Angle of Friction ϕ (degrees)**	**Cohesion, c (psf)**		**Strain ε_{50}**	**MFAD Deformation Modulus E_D (ksi)**
Sandy ML-CL	0-4	13	700	ignore	350	ignore	-	1500	500	0.007	0.9
Sandy CL	4'-17.5'	62	1500	12000	750	6000	-	5500	2000	0.004	5
				Rock Mass Rating (RMR76)							**MFAD**
Rock	**Depth**	**qu (ksi)**	**RQD**	**qu (ksi)**	**RQD**	**Jt Space**	**Jt Cond**	**GW**	**Orient**	**RMR76**	**Deformation**
Sandstone	17.5-25'	1.5	0	1	3	5	0	7	-7	9	42