MOTT MACDONALD

ConnectGEN

# ConnectGen
# South Ripley Solar Project

## Geotechnical Investigation Report

January 22, 2021

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# Contents

# Executive Summary

Mott MacDonald was retained by ConnectGen, LLC (ConnectGen) to conduct a preliminary geotechnical investigation to support the proposed South Ripley Solar Project in South Ripley, Chautauqua County, New York. Mott MacDonald proposed and completed an investigation program consisting of 50 soil borings (B-SS-1 through B-SS-3, and B-01 through B-47), three rock coring explorations (B-01, B-05 and B-17), electrical resistivity testing at 21 locations, laboratory thermal resistivity testing, and associated laboratory material index testing.

Observations recorded during our investigation program closely matched geologic conditions identified as part of our desktop study, consisting of silt and clay overburden soils underlain by shale bedrock across the project area. Bedrock was inferred within 18 of the 50 borings at depths ranging between 9 and 19 feet below grade. Samples for corrosion testing were collected during our investigation, and testing results indicated a low risk of corrosion to the proposed foundation elements.

Based on the presence of shallow bedrock, it is our opinion that H-Pile post foundations or screw piles (such as Terrasmart) may be utilized to support the proposed solar panels. Installation of H-Pile foundations may require pre-drilling through bedrock to the desired embedment depth. Preliminary design parameters and bearing capacities are provided in **Section 7.2**. All load-bearing concrete foundations should be underlain by at least six inches of compacted structural fill.

It is important to note that the data used for preliminary design capacities within this submission have been estimated from assumed values based on field observations, laboratory testing, and our engineering judgement. A detailed discussion of foundation considerations as well as limited construction recommendations have been provided within **Sections 7 and 8** of this Report.

# 1 Introduction

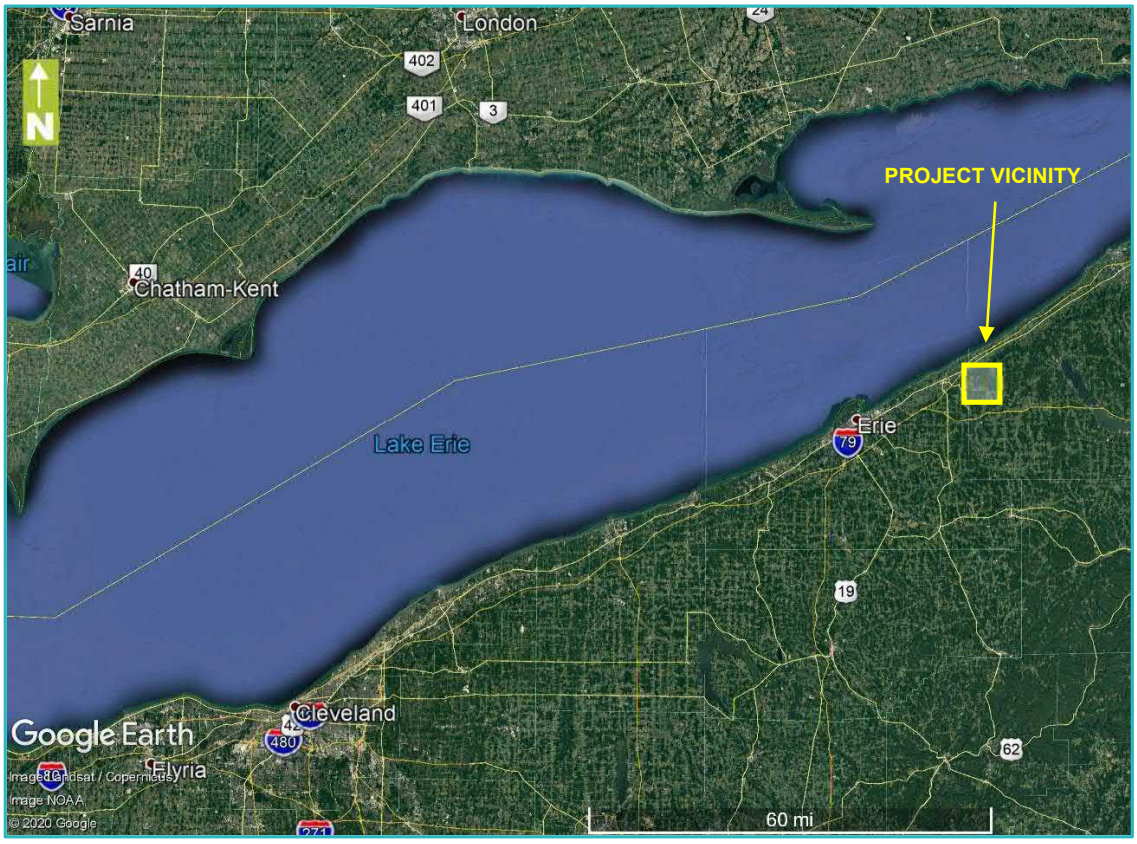
Mott MacDonald was retained by ConnectGen to conduct a geotechnical investigation in support of the proposed South Ripley Project in Chautauqua County, New York. It is our understanding that the proposed South Ripley solar development will consist of several solar arrays, a substation, equipment pads, utility poles, site access roads, and other associated site features.

To guide the design and construction of the proposed solar facility, Mott MacDonald developed and implemented a geotechnical investigation program which encompassed a desktop study of local geologic conditions, soil boring explorations, rock coring explorations, field electrical resistivity testing, laboratory thermal resistivity testing, and laboratory soil and rock material testing.

This Geotechnical Investigation Report (Report) summarizes the information gathered from our investigation program conducted between July 20 and August 11, 2020, to provide project-specific data and preliminary recommendations to assist in the design and construction of the proposed South Ripley Solar Project. An Investigation Location Plan depicting our subsurface explorations is provided in **Appendix A**.

A depiction of the general site vicinity is provided as Figure 1.

**Figure 1 – Project Vicinity Plan**



# 2 Geologic Desktop Study

Prior to our field investigation, Mott MacDonald conducted a desktop study of local geology within the project area using publicly available references including published maps and online geologic databases. Geologic materials reviewed within our study are provided as **Appendix B**.

## 2.1 Surficial Geology

Mott MacDonald reviewed surficial geology mapping provided by the New York State Education Department (NYSED) and observed that the project area is predominantly mapped within the Till and Till Moraine units. These units are generally described as unsorted silts, clays, sands, and gravels. Minor surficial geology units include shallow or exposed bedrock.

Mott MacDonald additionally reviewed surficial soil mapping available from the Natural Resource Conservation Service (NRCS) Web Soil Survey application. NRCS was initially created by the US Department of Agriculture to provide reference information regarding soil characteristics for agricultural purposes, however it also provides preliminary information related to soil chemistry. NRCS identifies the project area to be primarily comprised of the Erie Silt loam unit along with the Langford Silt Loam. It should be noted that NRCS descriptions are generally limited to the upper five (5) feet of overburden. A summary of predominant soil unit properties is provided as Table 1.

**Table 1 – NRCS Soil Properties**

| Soil Unit | Drainage Class | Available Water Storage | Erosion Hazard |
|---|---|---|---|
| Erie Silt Loam | Somewhat Poorly Drained | Very low (~3.0 inches) | Slight |
| Busti Silt Loam | Somewhat Poorly Drained | High (10.0 inches) | Moderate |
| Langford Silt Loam | Moderately Well Drained | Low (~3.8 inches) | Moderate |

### 2.1.1 Predominant Soil Units – Corrosivity Potential

Mott MacDonald notes that NRCS mapping indicates the native soil units generally present a low to moderate risk of corrosion to concrete and a high risk of corrosion to steel. Based on NRCS's preliminary assessment of the material, Mott MacDonald collected samples from three to five feet below grade within the borings listed in Table 2 for corrosivity testing. The results of the testing, completed by ANS Consultants, Inc. (ANS), of South Plainfield, New Jersey are summarized in Table 2 and detailed within **Appendix E**.

**Table 2 – Corrosivity Testing Summary**

| Location ID | pH (average) | Sulfate [mg/kg] | Chloride [mg/kg] | Soil Box (Calculated Resistivity) [Ω/cm] | Redox Potential (average) |
|---|---|---|---|---|---|
| B-01 | 7.16 | 6 | 74 | 9,000 | +27 |
| B-03 | 6.71 | 53 | 40 | TNP | +41 |
| B-04 | 4.54 | 14 | 38 | TNP | +75 |
| B-05 | 6.16 | 15 | 30 | 14,000 | +52 |
| B-06 | 6.68 | 20 | 43 | TNP | +5 |
| B-07 | 6.53 | 18 | 26 | TNP | +11 |
| B-08 | 6.81 | 12 | 32 | 14,500 | +47 |
| B-09 | 6.39 | 8 | 51 | 17,000 | +61 |
| B-10 | 6.81 | 21 | 41 | TNP | -24 |
| B-11 | 7.21 | 23 | 30 | TNP | +21 |
| B-12 | 7.12 | 12 | 80 | TNP | -5 |
| B-14 | 7.04 | 17 | 52 | TNP | +15 |
| B-15 | 7.09 | 12 | 43 | TNP | +18 |
| B-17 | 7.94 | 5 | 36 | 20,000 | +57 |
| B-18 | 7.55 | 5 | 50 | TNP | +71 |
| B-19 | 6.05 | 16 | 45 | TNP | +71 |
| B-21 | 6.37 | 15 | 31 | 19,000 | +35 |
| B-23 | 6.03 | 10 | 47 | TNP | +25 |
| B-25 | 7.02 | 19 | 40 | TNP | +15 |
| B-28 | 7.22 | 21 | 38 | TNP | +10 |
| B-35 | 7.48 | 8 | 53 | 17,000 | +17 |
| B-38 | 7.78 | 13 | 51 | 17,000 | +77 |
| B-39 | 6.84 | 5 | 31 | TNP | +40 |
| B-40 | 7.39 | 15 | 42 | 9,000 | +93 |
| B-42 | 6.9 | 18 | 45 | 23,000 | +32 |
| B-43 | 7.24 | 10 | 30 | 13,000 | +63 |
| B-44 | 7.0 | 12 | 46 | 13,000 | +55 |
| B-46 | 7.39 | 13 | 68 | 11,000 | +15 |
| B-47 | 6.87 | 10 | 55 | 28,000 | +47 |
| B-SS-2 | 6.96 | 16 | 41 | TNP | -12 |
| B-SS-3 | 6.79 | 28 | 70 | TNP | -14 |

*Note: TNP – Test not performed*

The results of the corrosivity testing indicate a low risk of corrosion to the proposed foundation elements. The contractor should confirm these findings within his or her own location-specific investigation and be prepared to consider alternate mix designs, or the implementation of sacrificial thicknesses or protective coatings, as appropriate.

### 2.1.2 Predominant Soil Units –Drainage Characteristics and Organic Content

Based on the findings of our desktop study and subsequent field investigation, it is expected that the organic content of natural soils should be negligible. It is expected that a thin layer of organics (topsoil) will exist near the surface in vegetated areas; however, the extent of this was identified to be minimal (less than six inches) during the geotechnical investigation. It is typical for most

developments that any surficial organics are stripped and appropriately staged on-site for re-use in vegetated areas.

At this time, it is expected that construction may occur on or near slopes greater than 25 percent. The topographic relief and nature of the project area is moderately sloped, with some steeper sloped areas featuring significant vegetation thereby minimizing the concern for appreciable erosion. In addition, proper run-on/run-off control, soil erosion and sediment control, and good housekeeping measures should be implemented during construction, which will limit the erodibility of the native materials. It is expected that the proposed improvements should not impact existing groundwater, aquifer systems, historic slopes and relief, or create hazardous conditions with respect to local geology or landforms.

## 2.2 Bedrock Geology

Review of the "Bedrock Geology Map, Niagara Sheet" prepared by the NYSED indicates that the project area is mapped within the Ellicott and Dexterville Formations which are predominantly composed of shale and siltstone. The depth to bedrock was not publicly noted in available geologic records; however, rock was encountered as shallow as nine feet below grade in some areas of the site during our investigation.

## 2.3 Karst Geology

Ground subsidence, commonly referred to as "sinkholes", is the local downward movement of surface material with little or no horizontal movement. Subsidence is a potential geologic hazard in areas where karst terrain occurs, or where underground mining has taken place. In karst terrain, limestone and dolomite bedrock (carbonate rock formations) are eroded by water and create karst features such as subsurface channels, caves, and sinkholes.

Based on Mott MacDonald's review of available USGS mapping, the bedrock formation beneath the project site is not made up of carbonate rock, which may be susceptible to karst formations. According to USGS' Digital Karst Map Compilation and Database, the project area is not located in an area where karst formations are likely to occur. As observed within our rock coring exploration, shale bedrock was inferred to be the main, underlying formation within this project area. In addition, the development is expected to include shallow concrete and/or post foundations for panels and will limit the amount of earthwork which could impact subsurface drainage pathways with respect to groundwater flow. Based on the above review and our preliminary investigation, there is a low risk of karst geology within the project footprint.

## 2.4 Geologic Impacts

It is our professional opinion that the construction of the proposed solar development will not create significant impacts to the regional geology provided appropriate construction practices and proper soil erosion and sediment control measures are maintained. The potential impacts considered include, but are not limited to, significant soil erosion, detrimental fracturing of bedrock, introduction of slippage or failure planes, and creation of subsurface instability.

# 3 Methodology

## 3.1 Soil Boring Explorations

Mott MacDonald retained Earth Dimensions, Inc., of Elma, New York to advance 50 geotechnical soil borings (B-SS-1 through B-SS-3 and B-01 through B-47), and three rock coring explorations (B-01, B-05 and B-17) throughout the project area between July 20 and August 11, 2020. The typed soil boring logs should be consulted for detailed information, and are provided as **Appendix C**.

### 3.1.1 Methodology

Each soil boring was advanced to 20 feet below ground surface (BGS) or practical refusal, using a track-mounted Diedrich D-50 drill rig to collect samples. All samples were collected with hollow-stem augers utilizing the Standard Penetration Test (SPT) Method, in accordance with ASTM Standard D1586. Soil samples were generally collected continuously within the upper 10 feet of each boring, then in five-foot intervals thereafter to the boring's termination depth.

At select soil boring locations, auger cuttings were collected from roughly two to five feet below grade with the purpose of obtaining bulk soil samples for laboratory thermal resistivity testing and from roughly three to five feet below grade for corrosion testing. As-drilled boring locations are reflected on the Investigation Location Plan provided as **Appendix A**. Upon completion, each borehole was backfilled to its existing grade with soil cuttings. All subsurface explorations were observed and logged by a Mott MacDonald geotechnical representative, under the direction of a Professional Engineer licensed in the State of New York.

## 3.2 Electrical Resistivity Testing

Mott MacDonald conducted Electrical Resistivity Testing (ERTs) at 21 locations within the project site. The ERTs were performed between July 20 and August 11, 2020, at the select locations within the project area for the purpose of obtaining in-situ (field) resistivities to guide electrical design considerations. All ERT's were conducted using a Wenner array with "a" spacings of 2, 5, 10, 25, and 50 feet. All tests were conducted in accordance with ASTM G-57 and IEEE Standard 81. Results of the electrical resistivity testing are provided as **Appendix D**.

# 4 Investigation Results

Based on observations from our subsurface investigation program, Mott MacDonald has summarized the encountered subsurface materials in **Section 4.1** below. It should be noted that this summary depicts a generalized representation of materials encountered, and individual soil boring logs, provided as **Appendix C,** should be referenced for detailed information. Because the data presented is derived from spaced explorations points, soils and bedrock depths may vary slightly between sampling intervals and locations.

## 4.1 Results

The soils encountered during our investigation program were largely consistent between boring locations, generally comprised of low plasticity silts and clays across the project site. Mott MacDonald notes that auger refusal, indicative of bedrock, was encountered within 18 of the 50 soil borings at depths ranging between 9 and 19 feet below grade. A generalized subsurface profile for the project area is provided as Table 3. This profile was established based on our overall observed field observations and is a highly simplified representation of the site's geology. The typed soil boring logs, provided as **Appendix C,** should be consulted for detailed information.

**Table 3 – Generalized Subsurface Profile**

| Material | Average Consistency | Description |
|---|---|---|
| Topsoil | - | Approximately six inches of topsoil containing organic matter was identified at grade within most investigation locations. |
| Silt (ML) | Stiff | Stiff to hard silt was encountered underlying the topsoil within a majority of boring locations. This silt stratum also contained varying amounts of clay, sand, and gravel and no organics. This stratum rendered average pocket penetrometer values of approximately 3.0 tons per square foot (tsf). |
| Clay (CL) | Stiff | Generally, low plasticity clay was encountered underlying the silt layer. This clay contained varying amounts of silt, sand, and gravel, as is typical in glacial till material. Inconsistent layers of poorly-graded sands and gravels were observed throughout this stratum. Clays rendered average pocket penetrometer values of approximately 2.0 tons per square foot (tsf). |
| Shale | Weak | Bedrock was encountered within 18 of the 50 soil borings. Rock cores were taken after our soil boring investigation at locations B-01, B-05, and B-17. The rock was identified as shale in each rock coring exploration. The shale was generally described as gray, fine grained, weak rock with closely spaced discontinuities. |

A pile load testing investigation should be conducted to evaluate the feasibility of driving piles into bedrock in areas where shallow bedrock depths may conflict with calculated pile embedment depths.

### 4.1.1 Groundwater

At the time of our investigation, groundwater was inferred based on the soil's moisture content at depths ranging between 3 and 17 feet below grade. No monitoring wells were installed as part of our investigation scope. Groundwater conditions are ephemeral and may fluctuate due to seasonal and climate influences.

# 5 Laboratory Testing

## 5.1 Soil Index Testing

Representative soil samples collected within our investigation program were submitted to ANS, an accredited geotechnical laboratory for testing of material index properties in accordance with their applicable ASTM standards. A summary of laboratory testing data is provided in Table 4 below. As-received laboratory results have been provided in **Appendix E**.

**Table 4 – Laboratory Testing Summary**

| Boring ID | Sample | Depth (ft) | % Gravel* | | % Sand* | | | % Fines | | Moisture Content (%) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | C | F | C | M | F | Silt | Clay | |
| B-27 | S-5 | 8'-10' | 21.6 | 15.2 | 7.7 | 7.5 | 12.6 | 35.4 | | 11.0 |
| B-37 | S-4 | 6'-8' | 0 | 16 | 7.9 | 11.5 | 18.5 | 46.1 | | 13.8 |
| **Bor.5ing ID** | **Sample** | **Depth (ft)** | **Liquid Limit** | | **Plastic Limit** | | | **Plasticity Index** | | **Moisture Content (%)** |
| B-SS-1 | S-2 | 2-4 | 22.2 | | 16.7 | | | 5.5 | | 17.2 |
| B-SS-3 | S-3 | 4-6 | 29.5 | | 20.3 | | | 9.2 | | 13.3 |
| B-1 | S-4 | 6-8 | 23.1 | | 17.9 | | | 5.2 | | 12.2 |
| B-3 | S-3 | 4-6 | 28.0 | | 18.0 | | | 10.0 | | 11.4 |
| B-4 | S-2 | 2-4 | 28.1 | | 20.5 | | | 7.6 | | 13.0 |
| B-7 | S-3 | 4-6 | 29.1 | | 18.7 | | | 10.4 | | 11.3 |
| B-8 | S-4 | 6-8 | 30.5 | | 20.4 | | | 10.1 | | 18.8 |
| B-10 | S-5 | 8-10 | 25.3 | | 19.8 | | | 5.5 | | 16.5 |
| B-14 | S-3 | 4-6 | 28.9 | | 20.9 | | | 8.0 | | 11.5 |
| B-16 | S-2 | 2-4 | 25.5 | | 18.9 | | | 6.6 | | 13.4 |
| B-17 | S-4 | 6-8 | 25.5 | | 18.2 | | | 7.3 | | 12.5 |
| B-21 | S-5 | 8-10 | 27.2 | | 20.0 | | | 7.5 | | 11.5 |
| B-24 | S-5 | 8-10 | 24.3 | | 19.4 | | | 4.9 | | 8.7 |
| B-25 | S-3 | 4-6 | 25.7 | | 17.8 | | | 7.9 | | 16.9 |
| B-30 | S-3 | 4-6 | 30.1 | | 20.5 | | | 9.6 | | 19.8 |
| B-31 | S-2 | 2-4 | 31.1 | | 21.9 | | | 9.2 | | 15.7 |
| B-35 | S-3 | 4-6 | 24.1 | | 17.4 | | | 6.7 | | 10.7 |
| B-40 | S-5 | 8-10 | 29.3 | | 20.3 | | | 9.0 | | 15.4 |
| B-42 | S-4 | 6-8 | 24.5 | | 17.0 | | | 7.5 | | 12.0 |
| B-44 | S-4 | 6-8 | 27.0 | | 18.8 | | | 8.2 | | 13.6 |
| B-46 | S-3 | 4-6 | 27.8 | | 19.9 | | | 7.9 | | 12.6 |
| B-47 | S-2 | 2-4 | 30.5 | | 21.7 | | | 8.8 | | 18.1 |

*Note: *-% Sand/Gravel described by gradation; "C" – Coarse, "M" – Medium, "F" -- Fine*

## 5.2 Thermal Resistivity Testing

As briefly discussed in **Section 3.1.1**, Mott MacDonald collected native material samples from two to five feet below grade, and delivered these samples to ANS for laboratory testing of Thermal Resistivity. The soil was compacted to 85 percent of its Standard Proctor Density in accordance with ASTM D698, and tested for Thermal Resistivity values in accordance with IEEE Standard 442. Results of the thermal resistivity are provided in Table 5 and as **Appendix F**.

**Table 5 – Soil Thermal Resistivity Results**

| Sample ID | Material Description | Thermal Resistivity Values at Various Moisture Contents | | | | | In-Situ Moisture Content (%) | Maximum Dry Density (lb/ft$^3$) |
|---|---|---|---|---|---|---|---|---|
| | | % Water | % Water | % Water | % Water | % Water | | |
| | | (°C-cm/W) | (°C-cm/W) | (°C-cm/W) | (°C-cm/W) | (°C-cm/W) | | |
| B-01 (3'-5') | Clay | 0.0 | 2.5 | 4.1 | 6.7 | 9.1 | 13.6 | 105.9 |
| | | **284** | **179** | **109** | **96** | **93** | | |
| B-05 (3'-5') | Clay | 0.0 | 2.2 | 5.8 | 8.5 | 11.9 | 13.2 | 100.6 |
| | | **284** | **175** | **116** | **91** | **70** | | |
| B-08 (3'-5') | Clay | 0.0 | 2.6 | 5.6 | 7.9 | 11.0 | 15.6 | 101.0 |
| | | **264** | **155** | **101** | **81** | **57** | | |
| B-09 (3'-5') | Clay | 0.0 | 3.9 | 8.0 | 12.3 | 16.4 | 17.6 | 91.5 |
| | | **347** | **179** | **106** | **88** | **64** | | |
| B-17 (3'-5') | Silt | 0.0 | 2.5 | 4.5 | 6.5 | 9.0 | 17.0 | 104.0 |
| | | **296** | **171** | **111** | **88** | **79** | | |
| B-21 (3'-5') | Silt | 0.0 | 5.1 | 10.6 | 15.1 | 20.9 | 21.2 | 82.0 |
| | | **498** | **245** | **121** | **89** | **75** | | |
| B-35 (3'-5') | Clay | 0.0 | 3.0 | 5.9 | 8.8 | 11.8 | 15.2 | 102.5 |
| | | **194** | **111** | **91** | **77** | **68** | | |
| B-38 (3'-5') | Silt | 0.0 | 1.6 | 3.4 | 5.5 | 6.9 | 11.4 | 107.9 |
| | | **231** | **133** | **87** | **65** | **59** | | |
| B-40 (3'-5') | Silt | 0.0 | 3.0 | 5.4 | 8.5 | 11.5 | 15.1 | 102.0 |
| | | **227** | **161** | **141** | **101** | **80** | | |
| B-42 (3'-5') | Silt | 0.0 | 2.5 | 4.4 | 6.0 | 8.5 | 12.1 | 104.6 |
| | | **434** | **227** | **134** | **110** | **99** | | |
| B-43 (3'-5') | Silt | 0.0 | 2.5 | 4.4 | 6.5 | 9.0 | 11.7 | 108.0 |
| | | **429** | **202** | **90** | **80** | **71** | | |
| B-44 (3'-5') | Silt | 0.0 | 2.7 | 4.5 | 7.0 | 9.0 | 14.3 | 104.9 |
| | | **331** | **162** | **107** | **92** | **86** | | |
| B-46 (3'-5') | Silt | 0.0 | 3.0 | 5.5 | 8.4 | 11.6 | 15.1 | 100.6 |
| | | **228** | **193** | **123** | **105** | **97** | | |
| B-47 (3'-5') | Clay | 0.0 | 2.7 | 5.2 | 8.1 | 10.5 | 13.9 | 104.0 |
| | | **226** | **171** | **106** | **101** | **96** | | |

For design purposes, resistivity values obtained for the in-situ moisture conditions, or drier, should be considered. Our investigation was conducted in July and August, and temperature and water table fluctuations due to seasonal variations should be considered.

# 6 Seismic Setting and Site Classification

Mott MacDonald utilized data obtained from the soil boring explorations to determine the Seismic Site Class for the proposed South Ripley Solar Facility. In accordance with the SPT average N-value method as prescribed in Chapter 20 of the ASCE Standard 7-16 design manual, Site Class D for "Stiff Soil" should be utilized across the project site.

The following Site Class D seismic ground motion values were obtained from the USGS Seismic Hazard Maps, referenced in ASCE 7-16 Standard, for this site:

- 0.2 second spectral response acceleration, $S_S$= 0.104 g
- 1 second spectral response acceleration, $S_1$= 0.039 g
- Maximum spectral acceleration for short periods, $S_{MS}$= 0.167 g
- Maximum spectral acceleration for a 1-second period, $S_{M1}$= 0.093 g
- 5% damped design spectral acceleration at short periods, $S_{DS}$= 0.111 g
- 5% damped design spectral acceleration at 1-second period, $S_{D1}$= 0.062 g

## 6.1 Preliminary Seismic Evaluation

The seismic site class designated above is based on results from our investigation program. Backup data for the ground motion values is provided as **Appendix G**. Based on our observation of subsurface conditions, computed Site Class ratings, and review of USGS's 2014 National Seismic Hazard Map, Mott MacDonald concludes that there is a low risk of significant seismic activity which may impact the proposed solar facility.

## 6.2 Tectonic Site Setting

The site is located within the North American Tectonic plate, far from the hazards of plate boundary tectonics. USGS fault mapping was reviewed and no faults were mapped within 100 miles of the site. The closest fault system, the Clarendon-Linden Fault system, is located approximately 100 miles east of the project site. This fault system is likely the cause of most small and moderate earthquakes in the region.

According to the USGS online earthquake catalog, in the last 50 years there have been 21 earthquakes greater than magnitude 2.5. The closest was magnitude 2.5, approximately 30 miles south west from site in 1990. The strongest earthquake was a 4.5 in 1998 located approximately 50 miles south west of the site.

A 4.5 magnitude earthquake is considered a minor earthquake, unlikely to cause damage. A magnitude 2.5 earthquake is just strong enough to be felt by humans. (*earthquake.usgs.gov)*

**Figure 1 –Earthquakes Magnitude 2.5+ since 1971**

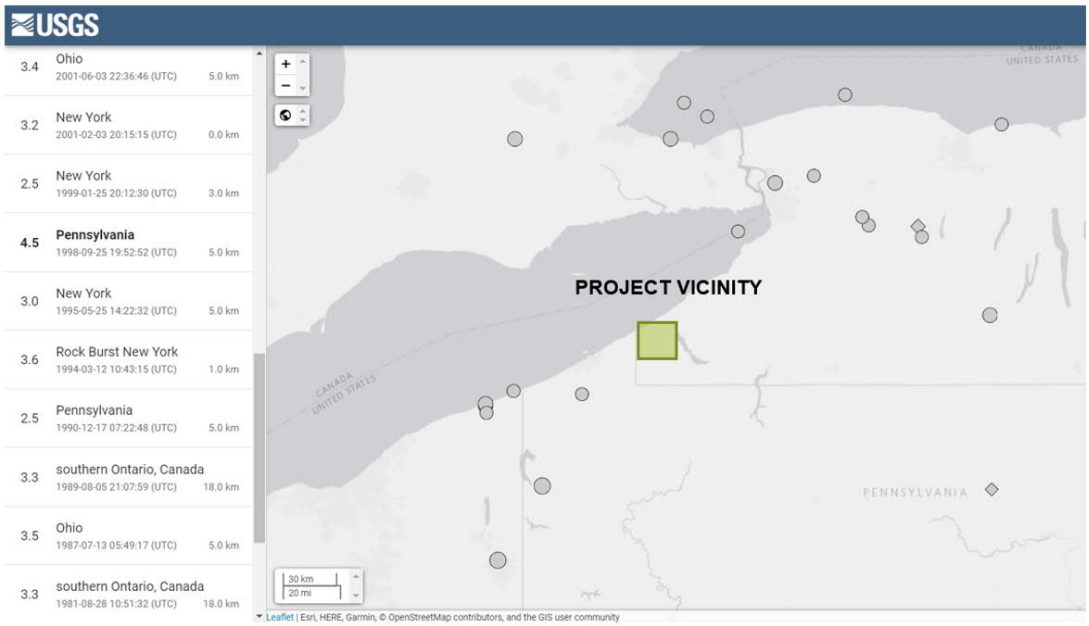
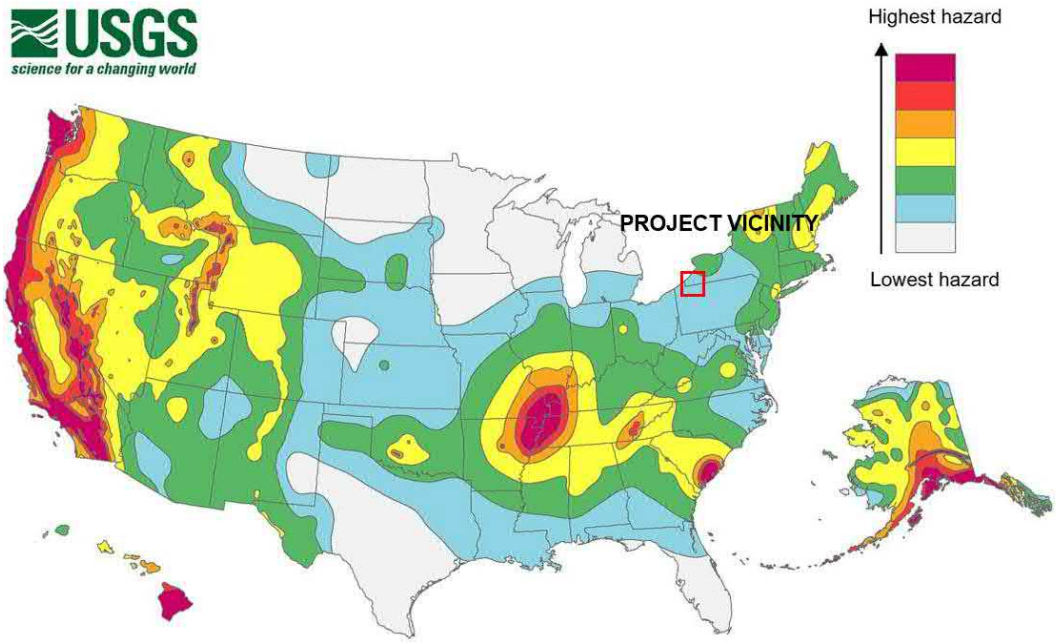



Figure 2 presents the USGS Earthquake Hazard rating. The site location falls within the light blue portion of the map, indicating low hazard. Additionally, due to the great distance to the Atlantic Ocean, the site location is at low risk of tsunami impact.

**Figure 2 – USGS Earthquake Hazard**



# 7 Foundation Considerations

Mott MacDonald anticipates that driven posts such as W6x9 H-piles or screw piles may be used to support the proposed solar panels. Other conventional shallow foundations such as sonotubes, spread footings, or similar systems may also be utilized for equipment pads and associated support structures.

## 7.1 Frost Considerations

Within the Chautauqua County, New York region, frost depth is mapped to exist at approximately 48 inches below grade. We recommend that all structural foundations be founded at 48 inches below grade or deeper to ensure adequate protection from frost conditions which may jeopardize the integrity of subgrade soils and associated substructure.

Small slab or isolated footing foundations supporting minor housekeeping structures with minimal loads and applied pressures (500 pounds per square foot or less) may be founded at shallower depths; however, the contractor should implement measures such as free-draining, granular fill beneath the foundation extending beyond the frost depth, or provide sufficient insulation to protect the concrete slabs from frost heave.

## 7.2 Recommended Soil Parameters

Based on our interpretation of the subsurface conditions observed within our investigation program, supplemented by laboratory testing results, Mott MacDonald recommends that the soil parameters, as depicted within Table 6, be considered for design purposes.

**Table 6 – Recommended Preliminary Soil Parameters**

| Depth | Material | Total Unit Weight | Internal Friction | Cohesion | Allowable Bearing Capacity | Allowable Side Resistance |
|---|---|---|---|---|---|---|
| 0'–4' | Topsoil & Silt & Clay (frost zone) | 100 lb/ft$^3$ | 0° | 500 lb/ft$^2$ | 500 lb/ft$^2$ | - |
| 4'–8' | Upper Silt & Clay (ML/CL) | 110 lb/ft$^3$ | 0° | 1,000 lb/ft$^2$ | 1,500 lb/ft$^2$ | 100 lb/ft$^2$ |
| 8'–12' | Middle Silt & Clay (ML/CL) | 115 lb/ft$^3$ | 0° | 1,500 lb/ft$^2$ | 2,000 lb/ft$^2$ | 150 lb/ft$^2$ |
| 12'–20' | Lower Clay (CL) | 120 lb/ft$^3$ | 0° | 2,000 lb/ft$^2$ | 2,000 lb/ft$^2$ | 225 lb/ft$^2$ |

## 7.3 Pile Loading Due to Frost

Given the location of the project, the potential for frost heave against post foundations is possible. Fine-grained soils, or granular soils with greater than 10 percent fines (such as the silt/clays observed at the site) are frost-susceptible due to the inability of entrapped moisture from infiltrating or evaporating prior to freezing. Trapped moisture will begin to create ice lenses, which will grip the steel posts or embedded structures, followed by ice-jacking due to frost heave. The

phenomenon is more commonly referred to as “adfreeze stress”, which can be considered as an external, upward force applied to the post. The magnitude of the upward force will depend on the depth/thickness of the frost zone, the interface bond stress between embedded structure/material and the surrounding area, and the surface area of the structure/material in contact with this bond stress. Adfreeze is typically evaluated using values provided by the Ontario Ministry of Transport, as presented in the Canadian Foundation Engineering Manual, which provides suggested adfreeze bond values based on material type (such as steel post) and soil type (such as silt and clay).

Based on the type of site soil, sandy silt, the degree of frost susceptibility is very high. An adfreeze value of approximately 14.5 psi (2,100 psf) is recommended for this site. The frost load can be calculated as the product of the adfreezing bond stress, the frost depth of 48 inches, and the perimeter of the pile to be used. It should also be noted that these parameters have been established based on our engineering judgment. A detailed investigation program should be performed to confirm these values prior to construction.

# 8 Construction Recommendations

## 8.1 Excavation

It is anticipated that excavations greater than four feet in depth may be required during construction activities. As such, the contractor should ensure that all excavation openings following local building code requirements, OSHA Standard 1926.651, and all applicable regulations. The contractor should provide adequate drainage at the base of all excavations to maintain the in-place density of subgrade soils and ensure a safe, stable working base. For preliminary benching and excavation design considerations, overburden soils may be considered as “Type B” material in terms of OSHA’s soil classifications and should be sloped no steeper than 1H:1V (horizontal to vertical). OSHA soil classifications should be field determined by the contractor’s “competent person” prior to excavation. Any proposed shoring systems should be designed by the contractor’s “competent person”, be certified by a Professional Engineer licensed in the State of New York and should be submitted to the engineer for review.

### 8.1.1 Rock Removal

Mott MacDonald notes that bedrock was encountered as shallow as nine feet below grade within our investigation program in some areas of the project site. In 18 of 50 of the borings that encountered bedrock it was found to be weathered.

A detailed investigation including pile load testing is recommended to confirm the strength and brittleness of bedrock as well as drivability of proposed steel post foundations.

Unless significant cuts are required, rock removal is expected to be localized (under spread footings or high spots in roadway grading) and should be removeable utilizing a medium sized trackhoe via ripping or with the use of a hoe ram. Blasting is not expected to be required.

## 8.2 Dewatering

Mott MacDonald inferred the presence of groundwater as shallow as three feet below grade at the time of our investigation program, with shallower observed perched water conditions. The contractor should perform their own investigation to confirm these findings and should be prepared to dewater excavations and manage shallow water as needed during construction using pump-and-sump or similar techniques to allow for concrete foundation construction in-the-dry. There are no below grade structures proposed which will require post construction dewatering. Water discharge should be managed in compliance with applicable state and local regulations. The contractor should be sure to grade the surface as necessary to divert stormwater away from open excavation to the extent possible.

## 8.3 Subgrade Preparation

Prior to installation of shallow concrete foundations, Mott MacDonald recommends over-excavating the subgrade by at least six inches, lining the exposed material with a geotextile separation fabric, and bringing the subgrade back up to the design foundation elevation with compacted structural fill as specified within Table 7. Native material beneath the separation fabric should be inspected for unsatisfactory conditions such as standing water, frozen soil, organics, or deleterious materials. Should any unsatisfactory conditions exist within the native subgrade, the unsatisfactory condition should be excavated and replaced prior to placement of the geotextile separation fabric.

**Table 7 – Recommended Gradation of Structural Fill**

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

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

## 8.4 Backfilling and Re-use of Native Soils

The native fine-grained soils on site will likely be difficult to handle, place, and compact without proper moisture conditioning and protection. These soils may be re-used across the project area for fill in landscaped areas; however, they should not be used under or above foundations or load-bearing structures where typically imported structural fill is used. Native material used as backfill for cable trenches should be handled and placed at a moisture content at or above its optimum value to ensure representative thermal properties are maintained.

In areas around and above installed foundations, large utilities, and other buried site features, imported granular material, with less than 15 percent fine-grained content (passing No. 200 Sieve), should be used as general backfill. General backfill material should not be used beneath any load-bearing structures and should be placed in loose lift thicknesses not exceeding 12 inches and be compacted to at least 95 percent of its Modified Proctor Density (ASTM D1557). Soil used as backfill should not be handled when frozen and should be free of organics, deleterious material, or excessive moisture.

In areas beneath foundations, access roads, and load-bearing structures, Mott MacDonald recommends structural fill as described in **Section 8.3** and Table 7.

## 8.5 Presence of Native, Moisture-sensitive Soils

The near-surface site soils contain sufficient fines (i.e., silt/clay) to be moisture-sensitive. Moisture-sensitive soils are easily disturbed in the presence of moisture. Properly prepared subgrade surfaces and compacted fills that contain moisture-sensitive soils can be protected by the following activities:

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

Native soils are likely to have a low shrink/swell potential.

## 8.6 H-Piles

Mott MacDonald anticipates that, as typical with solar farm construction, solar panels may be supported by steel H-Piles, where conditions allow, or via concrete ballast support at grade. Shallow bedrock should be expected during construction however, and as such, pre-drilling may be required prior to installation of H-Piles or similar post foundations. Pile load testing should be conducted to determine drivability of the posts, and should include both axial and lateral testing to confirm their capacities at representative locations prior to full construction. Quantity of piles will need to be determined based on panel loads during final design.

## 8.7 Access Roads

Mott MacDonald understands that an access road will be required to enter and exit the project site as well as provide access to the equipment pad locations. These proposed access roads are expected to be unpaved to accommodate occasional light vehicular traffic such as utility pickup truck or similar vehicle. Mott MacDonald recommends that any additional access roads be constructed with at least eight inches of crushed stone as specified within Table 8.

**Table 8 – Recommended Gradation of Densely Graded Aggregate**

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

Prior to any additional roadway construction, the subgrade should be stripped of vegetation and topsoil, and be proof-rolled with at least three roundtrip passes of a smooth-drum roller with a minimum operating weight of eight tons. The prepared subgrade should be confirmed to maintain a minimum CBR value of 10. If required, additional stabilization may be obtained through chemical treatment of the subgrade including introduction of lime or cement. Crushed stone should be placed in loose lifts not exceeding eight inches in height and be compacted to at least 95 percent of its Modified Proctor Density (ASTM D1557).

## 8.8 Cable Installation

Cables may be installed via ploughing and may utilize trenchless methods (bored, HDD etc.) to cross roadways. Ploughing/direct bury of cables should be feasible but the contractor should be aware that there is the possibility of localized bedrock outcrops or boulders within the soil. Trenchless installation should also be feasible, depending on installation method, length and subsurface conditions at the proposed location, but we recommend further investigation at those locations to determine ground conditions, select installation methods and perform design.

Trenchless installs may employ a variety of methods and can be combined into two general groups, those requiring a fluid (drilling mud) to remove spoils and those using mechanical means such as an auger. Potential risks are different, but all can be mitigated to some degree through good design and construction practice.

Risks of trenchless methods such as HDD that use a drilling fluid to convey spoils back to the surface are inadvertent return of fluid to the surface. Good HDD design should include a “frac out” analysis and evaluation of the drilling methodology to reduce the risk of an inadvertent return.

Bored crossings do not have the risk of inadvertent returns as no drilling mud is used to convey cuttings. However they do have the potential risk of settlement of the ground surface and are only capable of a shorter overall length. Bored crossings are typically limited to less than 200-300 feet depending on size, methodology and ground conditions.

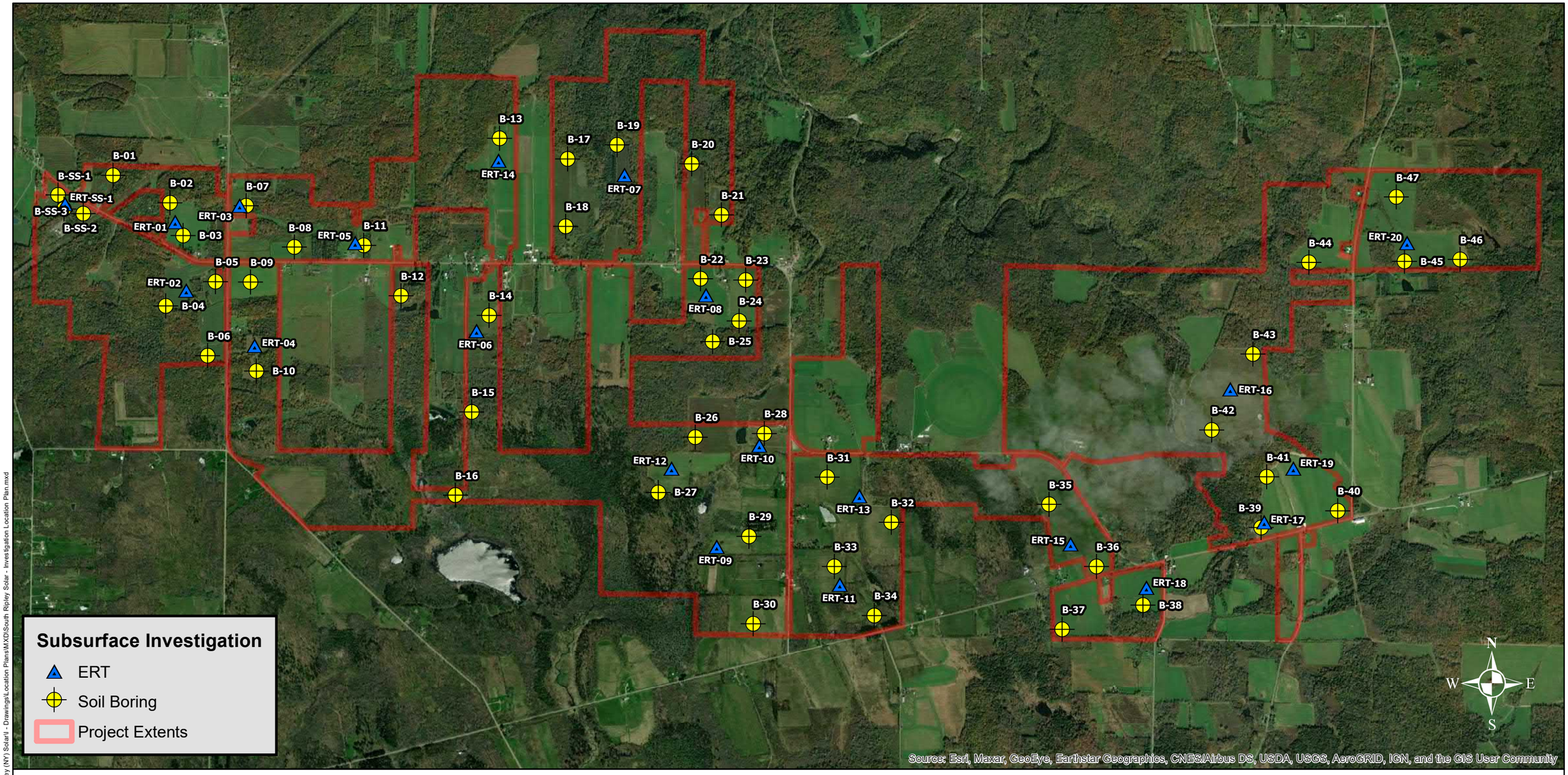
Mitigation strategies for all trenchless crossings should focus on an understanding of ground conditions at the selected bore locations, sound engineering analysis and use of an experienced and competent trenchless contractor.

# 9 Limitations

Mott MacDonald notes that the findings and recommendations presented with this Report are based on a limited investigation program conducted in July and August 2020, laboratory testing, and our engineering judgment. Should further investigations, testing, or revised concept plans reveal new information, Mott MacDonald should be given the opportunity to revise our recommendations as necessary.

# Appendices

# A. Investigation Location Plan




P:\Geotechnical References\Projects\ConnectGen - South Ripley (NY) Solar\I - Drawings\Location Plans\MXD\South Ripley Solar - Investigation Location Plan.mxd

IMAGE SOURCE: OGRIP



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Certificate No. 24GA28016600

Client

ConnectGEN

| Rev | Date | Drawn | Description | Ch'k'd | App'd |
|---|---|---|---|---|---|
| 0 | 6/9/2021 | | | | |

0 1,000 2,000 3,000 4,000 Feet

Reference Scale: 1:25,000

Absolute Scale: 1 inch = 2,083 feet

Project Number: 505100267-001

B/O: 1

Total: 1

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|---|---|---|---|---|---|
| Designed | DM | | Eng check | | |
| Drawn | AGW | | Coordination | | |
| Dwg Check | EWP | | Approved | VAS | |

Scale at 11" x 17": AS SHOWN

Status

Rev

Security

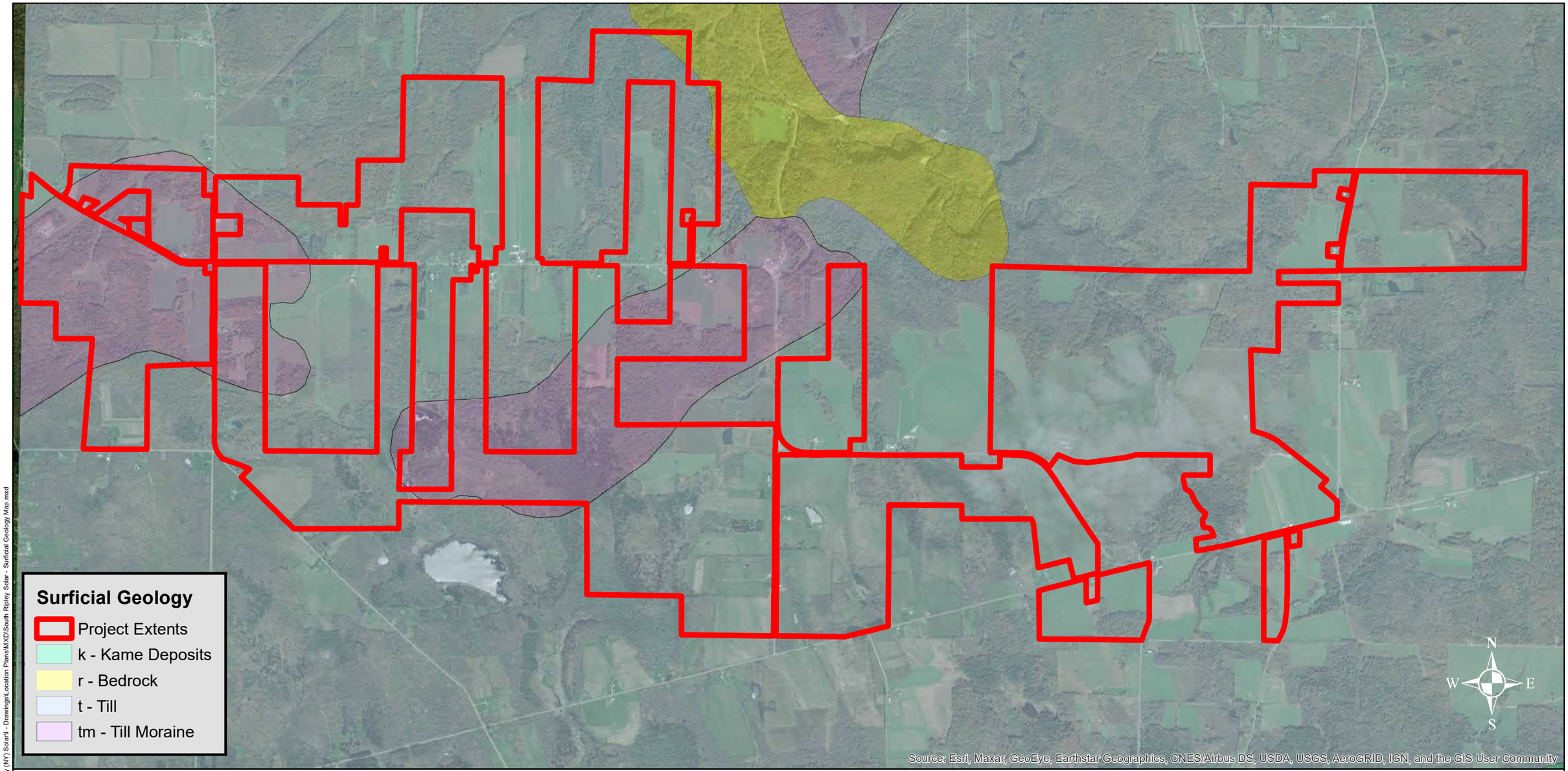
Drawing Number: ILP-1

Title

INVESTIGATION LOCATION PLAN

CONNECTGEN LLC
SOUTH RIPLEY SOLAR
SOUTH RIPLEY, NEW YORK

# B. Geologic References




P:\Geotechnical References\Projects\ConnectGen - South Ripley (NY) Solar\ - Drawings\Location Plans\MXD\South Ripley Solar - Surficial Geology Map.mxd

IMAGE SOURCE: OGRIP



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| Rev | Date | Drawn | Description | Ch'k'd | App'd |
|---|---|---|---|---|---|
| 0 | 6/9/2021 | | | | |

0 1,000 2,000 3,000 4,000 Feet

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| Reference Scale: | 1:25,000 |
| Absolute Scale: | 1 inch = 2,083 feet |
| Project Number | 505100267-001 |
| B/O | 1 |
| Total | 1 |

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| Designed | DM | | Eng check | | |
| Drawn | AGW | | Coordination | | |
| Dwg Check | EWP | | Approved | VAS | |

| Scale at 11" x 17" AS SHOWN | Status | Rev | Security |
|---|---|---|---|

Drawing Number: SGM-1

Title

SURFICIAL GEOLOGY MAP

CONNECTGEN LLC
SOUTH RIPLEY SOLAR
SOUTH RIPLEY, NEW YORK

## Surficial Geology

- Project Extents
- Dct - Ellicott and Dexterville Formations - Shale and Siltstone
- Dcys - Northeast Shale; Shumla Siltstone

N
W E
S

Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



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| Rev | Date | Drawn | Description | Ch'k'd | App'd |
|---|---|---|---|---|---|
| 0 | 6/9/2021 | | | | |

0 1,000 2,000 3,000 4,000 Feet

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|---|---|---|---|---|---|
| Designed | DM | | Eng check | | |
| Drawn | AGW | | Coordination | | |
| Dwg Check | EWP | | Approved | VAS | |

| Reference Scale: | Absolute Scale: | Scale at 11" x 17" | Status | Rev | Security |
|---|---|---|---|---|---|
| 1:25,000 | 1 inch = 2,083 feet | AS SHOWN | | | |

| Project Number | B/O | Total |
|---|---|---|
| 505100267-001 | 1 | 1 |

Drawing Number: SGM-1

Title

SURFICIAL GEOLOGY MAP

CONNECTGEN LLC
SOUTH RIPLEY SOLAR
SOUTH RIPLEY, NEW YORK

P:\Geotechnical References\Projects\ConnectGen - South Ripley (NY) Solar\I - Drawings\Location Plans\MXD\South Ripley Solar - Bedrock Geology Map.mxd

IMAGE SOURCE: OGRIP

United States Department of Agriculture

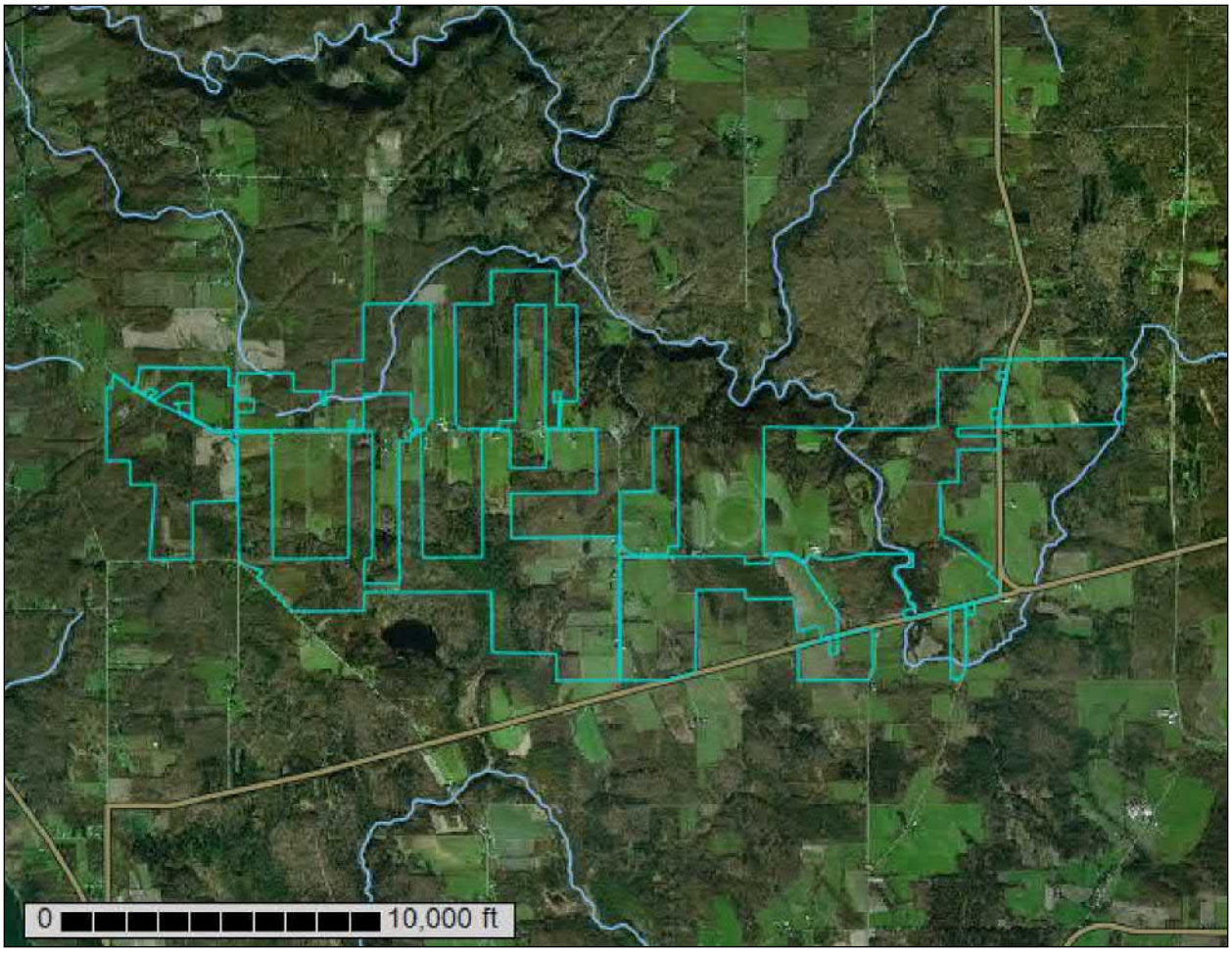
NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

# Custom Soil Resource Report for Chautauqua County, New York, and Erie County, Pennsylvania

## Connect-Gen South Ripley NRCS Report




June 9, 2021

# Preface

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

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

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

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

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

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

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# Contents

# How Soil Surveys Are Made

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

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

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

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

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

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

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

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

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

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

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

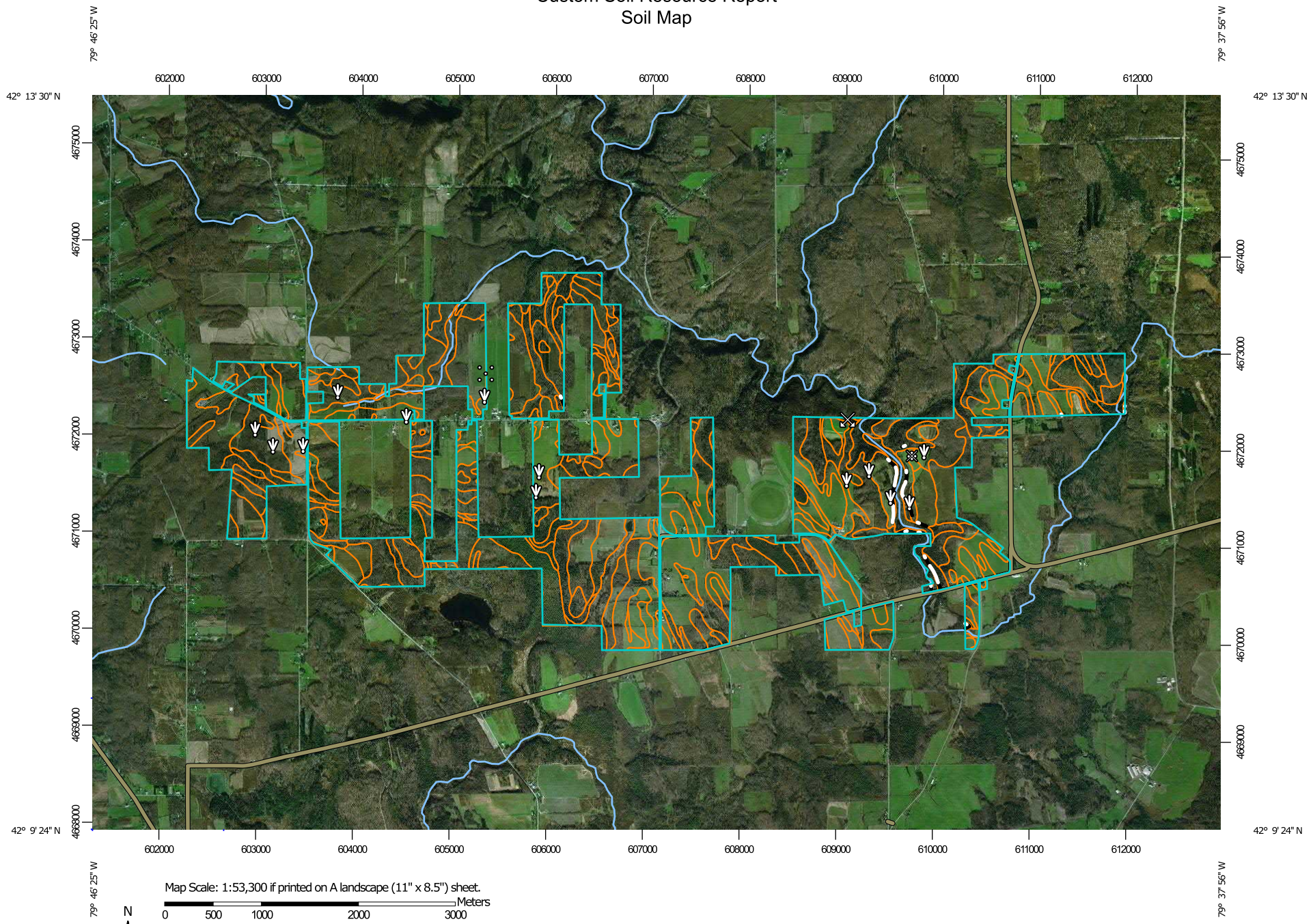
After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

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

# Soil Map

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

# Custom Soil Resource Report
## Soil Map




Map Scale: 1:53,300 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 500 1000 2000 3000

Feet
0 2500 5000 10000 15000

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

## MAP LEGEND

**Area of Interest (AOI)**

- Area of Interest (AOI)

**Soils**

- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

**Special Point Features**

- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

**Water Features**

- Streams and Canals

**Transportation**

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

**Background**

- Aerial Photography

## MAP INFORMATION

The soil surveys that comprise your AOI were mapped at scales ranging from 1:12,000 to 1:15,800.

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

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

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

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

Soil Survey Area: Chautauqua County, New York
Survey Area Data: Version 18, Jun 11, 2020

Soil Survey Area: Erie County, Pennsylvania
Survey Area Data: Version 18, Jun 5, 2020

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

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

Date(s) aerial images were photographed: Dec 31, 2009—May 5, 2016

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background

| MAP LEGEND | MAP INFORMATION |
| --- | --- |
| | imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident. |

# Map Unit Legend

| Map Unit Symbol | Map Unit Name | Acres in AOI | Percent of AOI |
|---|---|---|---|
| Ad | Alden mucky silt loam | 75.8 | 2.2% |
| As | Ashville silt loam | 205.7 | 6.1% |
| BsA | Busti silt loam, 0 to 3 percent slopes | 97.3 | 2.9% |
| BsB | Busti silt loam, 3 to 8 percent slopes | 270.2 | 8.0% |
| BsC | Busti silt loam, 8 to 15 percent slopes | 64.3 | 1.9% |
| Cb | Canandaigua silt loam, loamy substratum | 8.4 | 0.2% |
| Cc | Canandaigua mucky silt loam | 72.8 | 2.2% |
| ChB | Chadakoin silt loam, 3 to 8 percent slopes | 26.8 | 0.8% |
| ChC | Chadakoin silt loam, 8 to 15 percent slopes | 35.1 | 1.0% |
| ChD | Chadakoin silt loam, 15 to 25 percent slopes | 42.9 | 1.3% |
| ChE | Chadakoin silt loam, 25 to 35 percent slopes | 115.7 | 3.4% |
| ChF | Chadakoin silt loam, 35 to 50 percent slopes | 37.2 | 1.1% |
| CkB | Chautauqua silt loam, 3 to 8 percent slopes | 86.7 | 2.6% |
| CkC | Chautauqua silt loam, 8 to 15 percent slopes | 201.2 | 5.9% |
| CkD | Chautauqua silt loam, 15 to 25 percent slopes | 94.8 | 2.8% |
| CnB | Chenango gravelly loam, 3 to 8 percent slopes | 2.6 | 0.1% |
| CnC | Chenango gravelly loam, 8 to 15 percent slopes | 1.9 | 0.1% |
| CoB | Chenango channery loam, fan, 3 to 8 percent slopes | 2.7 | 0.1% |
| DaA | Dalton silt loam, 0 to 3 percent slopes | 12.1 | 0.4% |
| DeC | Darien silt loam, 8 to 15 percent slopes | 28.8 | 0.9% |
| ErA | Erie silt loam, 0 to 3 percent slopes | 122.8 | 3.6% |
| ErB | Erie silt loam, 3 to 8 percent slopes | 759.7 | 22.5% |
| ErC | Erie silt loam, 8 to 15 percent slopes | 15.7 | 0.5% |

| Map Unit Symbol | Map Unit Name | Acres in AOI | Percent of AOI |
|---|---|---|---|
| Fe | Fluvaquents-Udifluvents complex, frequently flooded | 46.9 | 1.4% |
| FmA | Fremont silt loam, 0 to 3 percent slopes | 0.6 | 0.0% |
| FmB | Fremont silt loam, 3 to 8 percent slopes | 3.6 | 0.1% |
| Ho | Holderton silt loam, 0 to 3 percent slopes, occasionally flooded 140 | 0.7 | 0.0% |
| LnB | Langford silt loam, 3 to 8 percent slopes | 348.3 | 10.3% |
| LnC | Langford silt loam, 8 to 15 percent slopes | 330.7 | 9.8% |
| MdC | Mardin channery silt loam, 8 to 15 percent slopes | 8.9 | 0.3% |
| ShB | Schuyler silt loam, 3 to 8 percent slopes | 7.1 | 0.2% |
| ShC | Schuyler silt loam, 8 to 15 percent slopes | 4.4 | 0.1% |
| ToF | Towerville silt loam, 35 to 50 percent slopes | 12.4 | 0.4% |
| VaB | Valois gravelly silt loam, 3 to 8 percent slopes | 1.7 | 0.1% |
| VaC | Valois gravelly silt loam, 8 to 15 percent slopes | 0.8 | 0.0% |
| VoA | Volusia channery silt loam, 0 to 3 percent slopes | 121.8 | 3.6% |
| VoB | Volusia channery silt loam, 3 to 8 percent slopes | 108.6 | 3.2% |
| W | Water | 2.6 | 0.1% |
| **Subtotals for Soil Survey Area** | | **3,380.4** | **100.0%** |
| **Totals for Area of Interest** | | **3,381.3** | **100.0%** |

| Map Unit Symbol | Map Unit Name | Acres in AOI | Percent of AOI |
|---|---|---|---|
| MdD | Mardin silt loam, 15 to 25 percent slopes | 0.1 | 0.0% |
| VlA | Volusia gravelly silt loam, 0 to 3 percent slopes | 0.2 | 0.0% |
| VlB | Volusia gravelly silt loam, 3 to 8 percent slopes | 0.7 | 0.0% |
| **Subtotals for Soil Survey Area** | | **0.9** | **0.0%** |
| **Totals for Area of Interest** | | **3,381.3** | **100.0%** |

# Map Unit Descriptions

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

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

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

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

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

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

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas

shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

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

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

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

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

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

# Chautauqua County, New York

## Ad—Alden mucky silt loam

### Map Unit Setting

*National map unit symbol:* 9qjk
*Elevation:* 300 to 1,500 feet
*Mean annual precipitation:* 39 to 50 inches
*Mean annual air temperature:* 45 to 50 degrees F
*Frost-free period:* 105 to 190 days
*Farmland classification:* Not prime farmland

### Map Unit Composition

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

### Description of Alden

#### Setting

*Landform:* Depressions
*Landform position (two-dimensional):* Toeslope
*Landform position (three-dimensional):* Base slope
*Down-slope shape:* Concave
*Across-slope shape:* Concave
*Parent material:* A silty mantle of local deposition overlying loamy till

#### Typical profile

*H1 - 0 to 9 inches:* mucky silt loam
*H2 - 9 to 35 inches:* silt loam
*H3 - 35 to 72 inches:* gravelly loam

#### Properties and qualities

*Slope:* 0 to 3 percent
*Depth to restrictive feature:* More than 80 inches
*Drainage class:* Very poorly drained
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately low to moderately high (0.06 to 0.57 in/hr)
*Depth to water table:* About 0 inches
*Frequency of flooding:* None
*Frequency of ponding:* Frequent
*Calcium carbonate, maximum content:* 15 percent
*Available water capacity:* High (about 9.1 inches)

#### Interpretive groups

*Land capability classification (irrigated):* None specified
*Land capability classification (nonirrigated):* 5w
*Hydrologic Soil Group:* C/D
*Ecological site:* F139XY011OH - Wet Calcareous Depression
*Hydric soil rating:* Yes

### Minor Components

#### Fremont

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

**Canandaigua**
*Percent of map unit:* 5 percent
*Landform:* Depressions
*Hydric soil rating:* Yes

**Ashville**
*Percent of map unit:* 5 percent
*Landform:* Depressions
*Hydric soil rating:* Yes

**Wayland**
*Percent of map unit:* 5 percent
*Landform:* Flood plains
*Hydric soil rating:* Yes

## As—Ashville silt loam

### Map Unit Setting
*National map unit symbol:* 9qjn
*Elevation:* 590 to 1,970 feet
*Mean annual precipitation:* 39 to 50 inches
*Mean annual air temperature:* 45 to 50 degrees F
*Frost-free period:* 105 to 190 days
*Farmland classification:* Farmland of statewide importance

### Map Unit Composition
*Ashville and similar soils:* 75 percent
*Minor components:* 25 percent
*Estimates are based on observations, descriptions, and transects of the mapunit.*

### Description of Ashville

#### Setting
*Landform:* Depressions
*Landform position (two-dimensional):* Toeslope
*Landform position (three-dimensional):* Base slope
*Down-slope shape:* Concave
*Across-slope shape:* Concave
*Parent material:* Silty local colluvium and in some places the underlying till

#### Typical profile
*H1 - 0 to 9 inches:* silt loam
*H2 - 9 to 36 inches:* silt loam
*H3 - 36 to 72 inches:* gravelly silt loam

#### Properties and qualities
*Slope:* 0 to 3 percent
*Depth to restrictive feature:* More than 80 inches
*Drainage class:* Poorly drained
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately low to moderately high (0.06 to 0.57 in/hr)

*Depth to water table:* About 0 to 12 inches
*Frequency of flooding:* None
*Frequency of ponding:* None
*Calcium carbonate, maximum content:* 15 percent
*Available water capacity:* High (about 9.9 inches)

**Interpretive groups**

*Land capability classification (irrigated):* None specified
*Land capability classification (nonirrigated):* 4w
*Hydrologic Soil Group:* C/D
*Ecological site:* F139XY011OH - Wet Calcareous Depression
*Hydric soil rating:* Yes

**Minor Components**

**Unnamed soils**

*Percent of map unit:* 5 percent
*Landform:* Depressions
*Hydric soil rating:* Yes

**Fremont**

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

**Alden**

*Percent of map unit:* 5 percent
*Landform:* Depressions
*Hydric soil rating:* Yes

**Canandaigua**

*Percent of map unit:* 5 percent
*Landform:* Depressions
*Hydric soil rating:* Yes

**Busti**

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

## BsA—Busti silt loam, 0 to 3 percent slopes

**Map Unit Setting**

*National map unit symbol:* 2vzpv
*Elevation:* 330 to 2,460 feet
*Mean annual precipitation:* 31 to 70 inches
*Mean annual air temperature:* 39 to 52 degrees F
*Frost-free period:* 105 to 215 days
*Farmland classification:* Prime farmland if drained

**Map Unit Composition**

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

### Description of Busti

#### Setting

*Landform:* Hills
*Landform position (two-dimensional):* Footslope, summit
*Landform position (three-dimensional):* Base slope, interfluve
*Down-slope shape:* Concave
*Across-slope shape:* Linear
*Parent material:* Till

#### Typical profile

*Ap - 0 to 8 inches:* silt loam
*Bw1 - 8 to 17 inches:* silt loam
*Bw2 - 17 to 25 inches:* silt loam
*BC - 25 to 33 inches:* gravelly silt loam
*C - 33 to 72 inches:* gravelly silt loam

#### Properties and qualities

*Slope:* 0 to 3 percent
*Depth to restrictive feature:* More than 80 inches
*Drainage class:* Somewhat poorly drained
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately low to moderately high (0.14 to 1.42 in/hr)
*Depth to water table:* About 6 to 18 inches
*Frequency of flooding:* None
*Frequency of ponding:* None
*Maximum salinity:* Nonsaline (0.0 to 1.9 mmhos/cm)
*Available water capacity:* High (about 10.0 inches)

#### Interpretive groups

*Land capability classification (irrigated):* None specified
*Land capability classification (nonirrigated):* 3w
*Hydrologic Soil Group:* C/D
*Ecological site:* F139XY002OH - Moist Calcareous Till Flats
*Hydric soil rating:* No

### Minor Components

#### Fremont

*Percent of map unit:* 5 percent
*Landform:* Hills
*Landform position (two-dimensional):* Footslope, summit
*Landform position (three-dimensional):* Base slope, interfluve
*Down-slope shape:* Concave
*Across-slope shape:* Linear
*Hydric soil rating:* No

#### Chautauqua

*Percent of map unit:* 5 percent
*Landform:* Hills
*Landform position (two-dimensional):* Summit, shoulder
*Landform position (three-dimensional):* Interfluve, side slope
*Down-slope shape:* Convex
*Across-slope shape:* Convex
*Hydric soil rating:* No

**Ashville**

*Percent of map unit:* 5 percent
*Landform:* Depressions
*Landform position (two-dimensional):* Toeslope
*Landform position (three-dimensional):* Base slope
*Down-slope shape:* Concave
*Across-slope shape:* Concave
*Hydric soil rating:* Yes

**Volusia**

*Percent of map unit:* 5 percent
*Landform:* Hills
*Landform position (two-dimensional):* Footslope, summit
*Landform position (three-dimensional):* Base slope, interfluve, side slope
*Down-slope shape:* Concave
*Across-slope shape:* Linear
*Hydric soil rating:* No

## BsB—Busti silt loam, 3 to 8 percent slopes

### Map Unit Setting

*National map unit symbol:* 2vzpw
*Elevation:* 330 to 2,460 feet
*Mean annual precipitation:* 31 to 70 inches
*Mean annual air temperature:* 39 to 52 degrees F
*Frost-free period:* 105 to 215 days
*Farmland classification:* Prime farmland if drained

### Map Unit Composition

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

### Description of Busti

#### Setting

*Landform:* Hills
*Landform position (two-dimensional):* Footslope, summit
*Landform position (three-dimensional):* Base slope, interfluve
*Down-slope shape:* Concave
*Across-slope shape:* Linear
*Parent material:* Till

#### Typical profile

*Ap - 0 to 8 inches:* silt loam
*Bw1 - 8 to 17 inches:* silt loam
*Bw2 - 17 to 25 inches:* silt loam
*BC - 25 to 33 inches:* gravelly silt loam
*C - 33 to 72 inches:* gravelly silt loam

**Properties and qualities**

*Slope:* 3 to 8 percent
*Depth to restrictive feature:* More than 80 inches
*Drainage class:* Somewhat poorly drained
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately low to moderately high (0.14 to 1.42 in/hr)
*Depth to water table:* About 6 to 18 inches
*Frequency of flooding:* None
*Frequency of ponding:* None
*Maximum salinity:* Nonsaline (0.0 to 1.9 mmhos/cm)
*Available water capacity:* High (about 10.0 inches)

**Interpretive groups**

*Land capability classification (irrigated):* None specified
*Land capability classification (nonirrigated):* 3w
*Hydrologic Soil Group:* C/D
*Ecological site:* F139XY002OH - Moist Calcareous Till Flats
*Hydric soil rating:* No

**Minor Components**

**Fremont**

*Percent of map unit:* 5 percent
*Landform:* Hills
*Landform position (two-dimensional):* Footslope, summit
*Landform position (three-dimensional):* Base slope, interfluve
*Down-slope shape:* Concave
*Across-slope shape:* Linear
*Hydric soil rating:* No

**Volusia**

*Percent of map unit:* 5 percent
*Landform:* Hills
*Landform position (two-dimensional):* Footslope, summit
*Landform position (three-dimensional):* Base slope, interfluve, side slope
*Down-slope shape:* Concave
*Across-slope shape:* Linear
*Hydric soil rating:* No

**Chautauqua**

*Percent of map unit:* 5 percent
*Landform:* Hills
*Landform position (two-dimensional):* Backslope, shoulder
*Landform position (three-dimensional):* Interfluve, side slope
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

**Ashville**

*Percent of map unit:* 5 percent
*Landform:* Depressions
*Landform position (two-dimensional):* Toeslope
*Landform position (three-dimensional):* Base slope
*Down-slope shape:* Concave
*Across-slope shape:* Concave
*Hydric soil rating:* Yes

## BsC—Busti silt loam, 8 to 15 percent slopes

### Map Unit Setting

*National map unit symbol:* 2vzpx
*Elevation:* 330 to 2,460 feet
*Mean annual precipitation:* 31 to 70 inches
*Mean annual air temperature:* 39 to 52 degrees F
*Frost-free period:* 105 to 215 days
*Farmland classification:* Farmland of statewide importance

### Map Unit Composition

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

### Description of Busti

#### Setting

*Landform:* Hills
*Landform position (two-dimensional):* Footslope
*Landform position (three-dimensional):* Interfluve, side slope
*Down-slope shape:* Concave
*Across-slope shape:* Linear
*Parent material:* Till

#### Typical profile

*Ap - 0 to 8 inches:* silt loam
*Bw1 - 8 to 17 inches:* silt loam
*Bw2 - 17 to 25 inches:* silt loam
*BC - 25 to 33 inches:* gravelly silt loam
*C - 33 to 72 inches:* gravelly silt loam

#### Properties and qualities

*Slope:* 8 to 15 percent
*Depth to restrictive feature:* More than 80 inches
*Drainage class:* Somewhat poorly drained
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately low to moderately high (0.14 to 1.42 in/hr)
*Depth to water table:* About 6 to 18 inches
*Frequency of flooding:* None
*Frequency of ponding:* None
*Maximum salinity:* Nonsaline (0.0 to 1.9 mmhos/cm)
*Available water capacity:* High (about 10.0 inches)

#### Interpretive groups

*Land capability classification (irrigated):* None specified
*Land capability classification (nonirrigated):* 3w
*Hydrologic Soil Group:* C/D
*Ecological site:* F139XY002OH - Moist Calcareous Till Flats
*Hydric soil rating:* No

**Minor Components**

**Chautauqua**

*Percent of map unit:* 8 percent
*Landform:* Hills
*Landform position (two-dimensional):* Backslope, shoulder
*Landform position (three-dimensional):* Interfluve, side slope
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

**Fremont**

*Percent of map unit:* 6 percent
*Landform:* Hills
*Landform position (two-dimensional):* Footslope
*Landform position (three-dimensional):* Side slope, interfluve
*Down-slope shape:* Concave
*Across-slope shape:* Linear
*Hydric soil rating:* No

**Volusia**

*Percent of map unit:* 6 percent
*Landform:* Hills
*Landform position (two-dimensional):* Footslope
*Landform position (three-dimensional):* Interfluve, side slope
*Down-slope shape:* Concave
*Across-slope shape:* Linear
*Hydric soil rating:* No

## Cb—Canandaigua silt loam, loamy substratum

**Map Unit Setting**

*National map unit symbol:* 9qjw
*Elevation:* 100 to 1,200 feet
*Mean annual precipitation:* 39 to 50 inches
*Mean annual air temperature:* 45 to 50 degrees F
*Frost-free period:* 105 to 190 days
*Farmland classification:* Farmland of statewide importance

**Map Unit Composition**

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

**Description of Canandaigua, Loamy Substratum**

**Setting**

*Landform:* Depressions
*Landform position (two-dimensional):* Toeslope
*Landform position (three-dimensional):* Tread

*Down-slope shape:* Concave
*Across-slope shape:* Concave
*Parent material:* Silty and clayey glaciolacustrine deposits

**Typical profile**

*H1 - 0 to 10 inches:* silt loam
*H2 - 10 to 36 inches:* silt loam
*H3 - 36 to 72 inches:* silt loam

**Properties and qualities**

*Slope:* 0 to 3 percent
*Depth to restrictive feature:* More than 80 inches
*Drainage class:* Poorly drained
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high (0.20 to 0.57 in/hr)
*Depth to water table:* About 0 inches
*Frequency of flooding:* None
*Frequency of ponding:* Frequent
*Calcium carbonate, maximum content:* 15 percent
*Available water capacity:* High (about 11.1 inches)

**Interpretive groups**

*Land capability classification (irrigated):* None specified
*Land capability classification (nonirrigated):* 4w
*Hydrologic Soil Group:* C/D
*Ecological site:* F139XY011OH - Wet Calcareous Depression
*Hydric soil rating:* Yes

**Minor Components**

**Lamson**

*Percent of map unit:* 4 percent
*Landform:* Depressions
*Hydric soil rating:* Yes

**Canadice**

*Percent of map unit:* 4 percent
*Landform:* Depressions
*Hydric soil rating:* Yes

**Niagara**

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

**Ashville**

*Percent of map unit:* 4 percent
*Landform:* Depressions
*Hydric soil rating:* Yes

**Alden**

*Percent of map unit:* 4 percent
*Landform:* Depressions
*Hydric soil rating:* Yes

## Cc—Canandaigua mucky silt loam

### Map Unit Setting

*National map unit symbol:* 9qjx
*Elevation:* 100 to 1,000 feet
*Mean annual precipitation:* 39 to 50 inches
*Mean annual air temperature:* 45 to 50 degrees F
*Frost-free period:* 105 to 190 days
*Farmland classification:* Not prime farmland

### Map Unit Composition

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

### Description of Canandaigua

#### Setting

*Landform:* Depressions
*Landform position (two-dimensional):* Toeslope
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Concave
*Across-slope shape:* Concave
*Parent material:* Silty and clayey glaciolacustrine deposits

#### Typical profile

*H1 - 0 to 10 inches:* mucky silt loam
*H2 - 10 to 36 inches:* silt loam
*H3 - 36 to 72 inches:* silt loam

#### Properties and qualities

*Slope:* 0 to 3 percent
*Depth to restrictive feature:* More than 80 inches
*Drainage class:* Very poorly drained
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high (0.20 to 0.57 in/hr)
*Depth to water table:* About 0 inches
*Frequency of flooding:* None
*Frequency of ponding:* Frequent
*Calcium carbonate, maximum content:* 15 percent
*Available water capacity:* High (about 11.1 inches)

#### Interpretive groups

*Land capability classification (irrigated):* None specified
*Land capability classification (nonirrigated):* 5w
*Hydrologic Soil Group:* C/D
*Ecological site:* F139XY011OH - Wet Calcareous Depression
*Hydric soil rating:* Yes

**Minor Components**

**Canadice**
*Percent of map unit:* 3 percent
*Landform:* Depressions
*Hydric soil rating:* Yes

**Lamson**
*Percent of map unit:* 3 percent
*Landform:* Depressions
*Hydric soil rating:* Yes

**Alden**
*Percent of map unit:* 3 percent
*Landform:* Depressions
*Hydric soil rating:* Yes

**Unnamed soils**
*Percent of map unit:* 3 percent
*Landform:* Depressions
*Hydric soil rating:* Yes

**Palms**
*Percent of map unit:* 3 percent
*Landform:* Marshes, swamps
*Hydric soil rating:* Yes

## ChB—Chadakoin silt loam, 3 to 8 percent slopes

**Map Unit Setting**
*National map unit symbol:* 9qk3
*Elevation:* 800 to 1,800 feet
*Mean annual precipitation:* 39 to 50 inches
*Mean annual air temperature:* 45 to 50 degrees F
*Frost-free period:* 105 to 190 days
*Farmland classification:* All areas are prime farmland

**Map Unit Composition**
*Chadakoin and similar soils:* 80 percent
*Minor components:* 20 percent
*Estimates are based on observations, descriptions, and transects of the mapunit.*

**Description of Chadakoin**

**Setting**
*Landform:* Till plains, drumlinoid ridges, hills
*Landform position (two-dimensional):* Summit
*Landform position (three-dimensional):* Crest
*Down-slope shape:* Convex
*Across-slope shape:* Convex

*Parent material:* Loamy till derived from siltstone, sandstone, and smaller amounts of shale

**Typical profile**

*H1 - 0 to 4 inches:* silt loam
*H2 - 4 to 24 inches:* silt loam
*H3 - 24 to 43 inches:* gravelly loam
*H4 - 43 to 72 inches:* gravelly loam

**Properties and qualities**

*Slope:* 3 to 8 percent
*Depth to restrictive feature:* More than 80 inches
*Drainage class:* Well drained
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high to high (0.20 to 1.98 in/hr)
*Depth to water table:* More than 80 inches
*Frequency of flooding:* None
*Frequency of ponding:* None
*Available water capacity:* Moderate (about 7.0 inches)

**Interpretive groups**

*Land capability classification (irrigated):* None specified
*Land capability classification (nonirrigated):* 2e
*Hydrologic Soil Group:* B
*Ecological site:* F139XY006OH - Moist Till Highlands
*Hydric soil rating:* No

**Minor Components**

**Chenango**

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

**Busti**

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

**Chautauqua**

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

**Schuyler**

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

**Towerville**

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

## ChC—Chadakoin silt loam, 8 to 15 percent slopes

**Map Unit Setting**

*National map unit symbol:* 9qk4

*Elevation:* 800 to 1,800 feet
*Mean annual precipitation:* 39 to 50 inches
*Mean annual air temperature:* 45 to 50 degrees F
*Frost-free period:* 105 to 190 days
*Farmland classification:* Farmland of statewide importance

**Map Unit Composition**

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

**Description of Chadakoin**

**Setting**

*Landform:* Till plains, drumlinoid ridges, hills
*Landform position (two-dimensional):* Shoulder
*Landform position (three-dimensional):* Crest
*Down-slope shape:* Convex
*Across-slope shape:* Convex
*Parent material:* Loamy till derived from siltstone, sandstone, and smaller amounts of shale

**Typical profile**

*H1 - 0 to 4 inches:* silt loam
*H2 - 4 to 24 inches:* silt loam
*H3 - 24 to 43 inches:* gravelly loam
*H4 - 43 to 72 inches:* gravelly loam

**Properties and qualities**

*Slope:* 8 to 15 percent
*Depth to restrictive feature:* More than 80 inches
*Drainage class:* Well drained
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high to high (0.20 to 1.98 in/hr)
*Depth to water table:* More than 80 inches
*Frequency of flooding:* None
*Frequency of ponding:* None
*Available water capacity:* Moderate (about 7.0 inches)

**Interpretive groups**

*Land capability classification (irrigated):* None specified
*Land capability classification (nonirrigated):* 3e
*Hydrologic Soil Group:* B
*Ecological site:* F139XY006OH - Moist Till Highlands
*Hydric soil rating:* No

**Minor Components**

**Towerville**

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

**Valois**

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

**Busti**

*Percent of map unit:* 5 percent

*Hydric soil rating:* No

**Schuyler**

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

**Chautauqua**

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

## ChD—Chadakoin silt loam, 15 to 25 percent slopes

### Map Unit Setting

*National map unit symbol:* 9qk5
*Elevation:* 800 to 1,800 feet
*Mean annual precipitation:* 39 to 50 inches
*Mean annual air temperature:* 45 to 50 degrees F
*Frost-free period:* 105 to 190 days
*Farmland classification:* Not prime farmland

### Map Unit Composition

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

### Description of Chadakoin

#### Setting

*Landform:* Drumlinoid ridges, hills, till plains
*Landform position (two-dimensional):* Backslope
*Landform position (three-dimensional):* Side slope
*Down-slope shape:* Convex
*Across-slope shape:* Convex
*Parent material:* Loamy till derived from siltstone, sandstone, and smaller amounts of shale

#### Typical profile

*H1 - 0 to 4 inches:* silt loam
*H2 - 4 to 24 inches:* silt loam
*H3 - 24 to 43 inches:* gravelly loam
*H4 - 43 to 72 inches:* gravelly loam

#### Properties and qualities

*Slope:* 15 to 25 percent
*Depth to restrictive feature:* More than 80 inches
*Drainage class:* Well drained
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high to high (0.20 to 1.98 in/hr)
*Depth to water table:* More than 80 inches
*Frequency of flooding:* None
*Frequency of ponding:* None

*Available water capacity:* Moderate (about 7.0 inches)

**Interpretive groups**

*Land capability classification (irrigated):* None specified
*Land capability classification (nonirrigated):* 4e
*Hydrologic Soil Group:* B
*Ecological site:* F139XY006OH - Moist Till Highlands
*Hydric soil rating:* No

**Minor Components**

**Busti**

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

**Schuyler**

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

**Towerville**

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

**Chautauqua**

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

**Valois**

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

## ChE—Chadakoin silt loam, 25 to 35 percent slopes

**Map Unit Setting**

*National map unit symbol:* 9qk6
*Elevation:* 800 to 1,800 feet
*Mean annual precipitation:* 39 to 50 inches
*Mean annual air temperature:* 45 to 50 degrees F
*Frost-free period:* 105 to 190 days
*Farmland classification:* Not prime farmland

**Map Unit Composition**

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

**Description of Chadakoin**

**Setting**

*Landform:* Till plains, drumlinoid ridges, hills
*Landform position (two-dimensional):* Backslope
*Landform position (three-dimensional):* Side slope

*Down-slope shape:* Convex
*Across-slope shape:* Convex
*Parent material:* Loamy till derived from siltstone, sandstone, and smaller amounts of shale

**Typical profile**

*H1 - 0 to 4 inches:* silt loam
*H2 - 4 to 24 inches:* silt loam
*H3 - 24 to 43 inches:* gravelly loam
*H4 - 43 to 72 inches:* gravelly loam

**Properties and qualities**

*Slope:* 25 to 35 percent
*Depth to restrictive feature:* More than 80 inches
*Drainage class:* Well drained
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high to high (0.20 to 1.98 in/hr)
*Depth to water table:* More than 80 inches
*Frequency of flooding:* None
*Frequency of ponding:* None
*Available water capacity:* Moderate (about 7.0 inches)

**Interpretive groups**

*Land capability classification (irrigated):* None specified
*Land capability classification (nonirrigated):* 6e
*Hydrologic Soil Group:* B
*Ecological site:* F139XY006OH - Moist Till Highlands
*Hydric soil rating:* No

**Minor Components**

**Valois**

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

**Chautauqua**

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

**Towerville**

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

**Schuyler**

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

**Fluvaquents**

*Percent of map unit:* 2 percent
*Landform:* Flood plains
*Hydric soil rating:* Yes

**Udifluvents**

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

## ChF—Chadakoin silt loam, 35 to 50 percent slopes

### Map Unit Setting

*National map unit symbol:* 9qk7
*Elevation:* 800 to 1,800 feet
*Mean annual precipitation:* 39 to 50 inches
*Mean annual air temperature:* 45 to 50 degrees F
*Frost-free period:* 105 to 190 days
*Farmland classification:* Not prime farmland

### Map Unit Composition

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

### Description of Chadakoin

#### Setting

*Landform:* Drumlinoid ridges, hills, till plains
*Landform position (two-dimensional):* Backslope
*Landform position (three-dimensional):* Side slope
*Down-slope shape:* Convex
*Across-slope shape:* Convex
*Parent material:* Loamy till derived from siltstone, sandstone, and smaller amounts of shale

#### Typical profile

*H1 - 0 to 4 inches:* silt loam
*H2 - 4 to 24 inches:* silt loam
*H3 - 24 to 43 inches:* gravelly loam
*H4 - 43 to 72 inches:* gravelly loam

#### Properties and qualities

*Slope:* 35 to 50 percent
*Depth to restrictive feature:* More than 80 inches
*Drainage class:* Well drained
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high to high (0.20 to 1.98 in/hr)
*Depth to water table:* More than 80 inches
*Frequency of flooding:* None
*Frequency of ponding:* None
*Available water capacity:* Moderate (about 7.0 inches)

#### Interpretive groups

*Land capability classification (irrigated):* None specified
*Land capability classification (nonirrigated):* 7e
*Hydrologic Soil Group:* B
*Ecological site:* F139XY006OH - Moist Till Highlands
*Hydric soil rating:* No

**Minor Components**

**Towerville**
*Percent of map unit:* 7 percent
*Hydric soil rating:* No

**Schuyler**
*Percent of map unit:* 7 percent
*Hydric soil rating:* No

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

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

**Fluvaquents**
*Percent of map unit:* 3 percent
*Landform:* Flood plains
*Hydric soil rating:* Yes

## CkB—Chautauqua silt loam, 3 to 8 percent slopes

**Map Unit Setting**
*National map unit symbol:* 2vzpq
*Elevation:* 330 to 2,460 feet
*Mean annual precipitation:* 31 to 70 inches
*Mean annual air temperature:* 39 to 52 degrees F
*Frost-free period:* 105 to 215 days
*Farmland classification:* All areas are prime farmland

**Map Unit Composition**
*Chautauqua and similar soils:* 80 percent
*Minor components:* 20 percent
*Estimates are based on observations, descriptions, and transects of the mapunit.*

**Description of Chautauqua**

**Setting**
*Landform:* Hills
*Landform position (two-dimensional):* Summit, shoulder
*Landform position (three-dimensional):* Interfluve, side slope
*Down-slope shape:* Convex
*Across-slope shape:* Convex
*Parent material:* Till

**Typical profile**
*Ap - 0 to 8 inches:* silt loam
*Bw1 - 8 to 22 inches:* silt loam

*Bw2 - 22 to 35 inches:* gravelly silt loam
*C - 35 to 72 inches:* gravelly loam

**Properties and qualities**

*Slope:* 3 to 8 percent
*Depth to restrictive feature:* More than 80 inches
*Drainage class:* Moderately well drained
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately low to moderately high (0.14 to 1.42 in/hr)
*Depth to water table:* About 18 to 24 inches
*Frequency of flooding:* None
*Frequency of ponding:* None
*Maximum salinity:* Nonsaline (0.0 to 1.9 mmhos/cm)
*Available water capacity:* High (about 9.8 inches)

**Interpretive groups**

*Land capability classification (irrigated):* None specified
*Land capability classification (nonirrigated):* 2e
*Hydrologic Soil Group:* C/D
*Ecological site:* F139XY006OH - Moist Till Highlands
*Hydric soil rating:* No

**Minor Components**

**Busti**

*Percent of map unit:* 8 percent
*Landform:* Hills
*Landform position (two-dimensional):* Footslope, summit
*Landform position (three-dimensional):* Base slope, interfluve
*Down-slope shape:* Concave
*Across-slope shape:* Linear
*Hydric soil rating:* No

**Langford**

*Percent of map unit:* 7 percent
*Landform:* Hills
*Landform position (two-dimensional):* Summit, shoulder
*Landform position (three-dimensional):* Interfluve, side slope
*Down-slope shape:* Convex
*Across-slope shape:* Convex
*Hydric soil rating:* No

**Chadakoin**

*Percent of map unit:* 5 percent
*Landform:* Hills, drumlinoid ridges, till plains
*Landform position (two-dimensional):* Summit, shoulder
*Landform position (three-dimensional):* Interfluve, side slope, crest
*Down-slope shape:* Convex
*Across-slope shape:* Convex
*Hydric soil rating:* No

## CkC—Chautauqua silt loam, 8 to 15 percent slopes

### Map Unit Setting

*National map unit symbol:* 2vzpr
*Elevation:* 330 to 2,460 feet
*Mean annual precipitation:* 31 to 70 inches
*Mean annual air temperature:* 39 to 52 degrees F
*Frost-free period:* 105 to 215 days
*Farmland classification:* Farmland of statewide importance

### Map Unit Composition

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

### Description of Chautauqua

#### Setting

*Landform:* Hills
*Landform position (two-dimensional):* Shoulder, backslope
*Landform position (three-dimensional):* Interfluve, side slope
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Parent material:* Till

#### Typical profile

*Ap - 0 to 8 inches:* silt loam
*Bw1 - 8 to 22 inches:* silt loam
*Bw2 - 22 to 35 inches:* gravelly silt loam
*C - 35 to 72 inches:* gravelly loam

#### Properties and qualities

*Slope:* 8 to 15 percent
*Depth to restrictive feature:* More than 80 inches
*Drainage class:* Moderately well drained
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately low to moderately high (0.14 to 1.42 in/hr)
*Depth to water table:* About 18 to 24 inches
*Frequency of flooding:* None
*Frequency of ponding:* None
*Maximum salinity:* Nonsaline (0.0 to 1.9 mmhos/cm)
*Available water capacity:* High (about 9.8 inches)

#### Interpretive groups

*Land capability classification (irrigated):* None specified
*Land capability classification (nonirrigated):* 3e
*Hydrologic Soil Group:* C/D
*Ecological site:* F139XY006OH - Moist Till Highlands
*Hydric soil rating:* No

**Minor Components**

**Chadakoin**

*Percent of map unit:* 8 percent
*Landform:* Hills, drumlinoid ridges, till plains
*Landform position (two-dimensional):* Shoulder, summit
*Landform position (three-dimensional):* Interfluve, side slope, crest
*Down-slope shape:* Convex
*Across-slope shape:* Linear, convex
*Hydric soil rating:* No

**Langford**

*Percent of map unit:* 7 percent
*Landform:* Hills
*Landform position (two-dimensional):* Shoulder, backslope
*Landform position (three-dimensional):* Interfluve, side slope
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

**Busti**

*Percent of map unit:* 5 percent
*Landform:* Hills
*Landform position (two-dimensional):* Footslope, summit
*Landform position (three-dimensional):* Base slope, interfluve
*Down-slope shape:* Concave
*Across-slope shape:* Linear
*Hydric soil rating:* No

## CkD—Chautauqua silt loam, 15 to 25 percent slopes

**Map Unit Setting**

*National map unit symbol:* 2vzps
*Elevation:* 330 to 2,460 feet
*Mean annual precipitation:* 31 to 70 inches
*Mean annual air temperature:* 39 to 52 degrees F
*Frost-free period:* 105 to 215 days
*Farmland classification:* Not prime farmland

**Map Unit Composition**

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

**Description of Chautauqua**

**Setting**

*Landform:* Hills
*Landform position (two-dimensional):* Backslope
*Landform position (three-dimensional):* Side slope, head slope

*Down-slope shape:* Concave
*Across-slope shape:* Linear
*Parent material:* Till

**Typical profile**

*Oa - 0 to 2 inches:* highly decomposed plant material
*A - 2 to 3 inches:* silt loam
*BE - 3 to 8 inches:* silt loam
*Bw1 - 8 to 22 inches:* silt loam
*Bw2 - 22 to 35 inches:* gravelly silt loam
*C - 35 to 72 inches:* gravelly loam

**Properties and qualities**

*Slope:* 15 to 25 percent
*Depth to restrictive feature:* More than 80 inches
*Drainage class:* Moderately well drained
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately low to moderately high (0.14 to 1.42 in/hr)
*Depth to water table:* About 18 to 24 inches
*Frequency of flooding:* None
*Frequency of ponding:* None
*Maximum salinity:* Nonsaline (0.0 to 1.9 mmhos/cm)
*Available water capacity:* High (about 9.5 inches)

**Interpretive groups**

*Land capability classification (irrigated):* None specified
*Land capability classification (nonirrigated):* 4e
*Hydrologic Soil Group:* C/D
*Ecological site:* F139XY006OH - Moist Till Highlands
*Hydric soil rating:* No

**Minor Components**

**Chadakoin**

*Percent of map unit:* 10 percent
*Landform:* Hills, drumlinoid ridges, till plains
*Landform position (two-dimensional):* Backslope
*Landform position (three-dimensional):* Side slope, nose slope
*Down-slope shape:* Linear, convex
*Across-slope shape:* Linear, convex
*Hydric soil rating:* No

**Langford**

*Percent of map unit:* 5 percent
*Landform:* Hills
*Landform position (two-dimensional):* Backslope
*Landform position (three-dimensional):* Head slope, side slope
*Down-slope shape:* Concave
*Across-slope shape:* Linear
*Hydric soil rating:* No

**Towerville**

*Percent of map unit:* 5 percent
*Landform:* Hills, ridges
*Landform position (two-dimensional):* Backslope, summit
*Landform position (three-dimensional):* Side slope, nose slope
*Down-slope shape:* Concave

*Across-slope shape:* Linear, convex
*Hydric soil rating:* No

## CnB—Chenango gravelly loam, 3 to 8 percent slopes

### Map Unit Setting

*National map unit symbol:* 9qkg
*Elevation:* 600 to 1,800 feet
*Mean annual precipitation:* 39 to 50 inches
*Mean annual air temperature:* 45 to 50 degrees F
*Frost-free period:* 105 to 190 days
*Farmland classification:* All areas are prime farmland

### Map Unit Composition

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

### Description of Chenango

#### Setting

*Landform:* Valley trains, terraces
*Landform position (two-dimensional):* Summit
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Convex
*Across-slope shape:* Convex
*Parent material:* Gravelly loamy glaciofluvial deposits over sandy and gravelly glaciofluvial deposits, derived mainly from sandstone, shale, and siltstone

#### Typical profile

*H1 - 0 to 6 inches:* gravelly loam
*H2 - 6 to 45 inches:* very gravelly fine sandy loam
*H3 - 45 to 72 inches:* very gravelly loamy sand

#### Properties and qualities

*Slope:* 3 to 8 percent
*Depth to restrictive feature:* More than 80 inches
*Drainage class:* Well drained
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high to high (0.57 to 5.95 in/hr)
*Depth to water table:* More than 80 inches
*Frequency of flooding:* None
*Frequency of ponding:* None
*Calcium carbonate, maximum content:* 1 percent
*Available water capacity:* Low (about 5.4 inches)

#### Interpretive groups

*Land capability classification (irrigated):* None specified
*Land capability classification (nonirrigated):* 2s
*Hydrologic Soil Group:* A
*Ecological site:* F139XY006OH - Moist Till Highlands

*Hydric soil rating:* No

**Minor Components**

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

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

**Unnamed soils**
*Percent of map unit:* 4 percent
*Hydric soil rating:* No

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

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

## CnC—Chenango gravelly loam, 8 to 15 percent slopes

**Map Unit Setting**
*National map unit symbol:* 9qkh
*Elevation:* 600 to 1,800 feet
*Mean annual precipitation:* 39 to 50 inches
*Mean annual air temperature:* 45 to 50 degrees F
*Frost-free period:* 105 to 190 days
*Farmland classification:* Farmland of statewide importance

**Map Unit Composition**
*Chenango and similar soils:* 80 percent
*Minor components:* 20 percent
*Estimates are based on observations, descriptions, and transects of the mapunit.*

**Description of Chenango**

**Setting**
*Landform:* Valley trains, terraces
*Landform position (two-dimensional):* Shoulder
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Convex
*Across-slope shape:* Convex
*Parent material:* Gravelly loamy glaciofluvial deposits over sandy and gravelly glaciofluvial deposits, derived mainly from sandstone, shale, and siltstone

**Typical profile**
*H1 - 0 to 6 inches:* gravelly loam

*H2 - 6 to 45 inches:* very gravelly fine sandy loam
*H3 - 45 to 72 inches:* very gravelly loamy sand

**Properties and qualities**

*Slope:* 8 to 15 percent
*Depth to restrictive feature:* More than 80 inches
*Drainage class:* Well drained
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high to high (0.57 to 5.95 in/hr)
*Depth to water table:* More than 80 inches
*Frequency of flooding:* None
*Frequency of ponding:* None
*Calcium carbonate, maximum content:* 1 percent
*Available water capacity:* Low (about 5.4 inches)

**Interpretive groups**

*Land capability classification (irrigated):* None specified
*Land capability classification (nonirrigated):* 3e
*Hydrologic Soil Group:* A
*Ecological site:* F139XY006OH - Moist Till Highlands
*Hydric soil rating:* No

**Minor Components**

**Unnamed soils**

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

**Tioga**

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

**Pompton**

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

**Allard**

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

**Valois**

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

## CoB—Chenango channery loam, fan, 3 to 8 percent slopes

**Map Unit Setting**

*National map unit symbol:* 9qkm
*Elevation:* 590 to 1,970 feet
*Mean annual precipitation:* 39 to 50 inches
*Mean annual air temperature:* 45 to 50 degrees F
*Frost-free period:* 105 to 190 days

*Farmland classification:* All areas are prime farmland

**Map Unit Composition**

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

**Description of Chenango, Fan**

**Setting**

*Landform:* Alluvial fans
*Landform position (two-dimensional):* Summit
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Convex
*Across-slope shape:* Convex
*Parent material:* Gravelly loamy glaciofluvial deposits over sandy and gravelly glaciofluvial deposits, derived mainly from sandstone, shale, and siltstone

**Typical profile**

*H1 - 0 to 9 inches:* channery loam
*H2 - 9 to 45 inches:* very gravelly fine sandy loam
*H3 - 45 to 72 inches:* very gravelly loamy sand

**Properties and qualities**

*Slope:* 3 to 8 percent
*Depth to restrictive feature:* More than 80 inches
*Drainage class:* Well drained
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high to high (0.57 to 5.95 in/hr)
*Depth to water table:* About 36 to 72 inches
*Frequency of flooding:* None
*Frequency of ponding:* None
*Calcium carbonate, maximum content:* 1 percent
*Available water capacity:* Low (about 5.5 inches)

**Interpretive groups**

*Land capability classification (irrigated):* None specified
*Land capability classification (nonirrigated):* 2s
*Hydrologic Soil Group:* A
*Ecological site:* F139XY006OH - Moist Till Highlands
*Hydric soil rating:* No

**Minor Components**

**Valois**

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

**Middlebury**

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

**Unnamed soils**

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

**Red hook**

*Percent of map unit:* 5 percent

*Hydric soil rating:* No

**Pompton**

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

## DaA—Dalton silt loam, 0 to 3 percent slopes

### Map Unit Setting

*National map unit symbol:* 9qkw
*Elevation:* 590 to 1,970 feet
*Mean annual precipitation:* 39 to 50 inches
*Mean annual air temperature:* 45 to 50 degrees F
*Frost-free period:* 105 to 190 days
*Farmland classification:* Farmland of statewide importance

### Map Unit Composition

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

### Description of Dalton

#### Setting

*Landform:* Till plains, drumlinoid ridges, hills
*Landform position (two-dimensional):* Footslope, summit
*Landform position (three-dimensional):* Base slope, tread
*Down-slope shape:* Concave
*Across-slope shape:* Linear
*Parent material:* A silty mantle of glaciolacustrine deposits over loamy till derived from siltstone, shale, and sandstone

#### Typical profile

*H1 - 0 to 9 inches:* silt loam
*H2 - 9 to 23 inches:* silt loam
*H3 - 23 to 46 inches:* gravelly silt loam
*2C - 46 to 72 inches:* gravelly silt loam

#### Properties and qualities

*Slope:* 0 to 3 percent
*Depth to restrictive feature:* 15 to 36 inches to fragipan
*Drainage class:* Somewhat poorly drained
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately low to moderately high (0.06 to 0.20 in/hr)
*Depth to water table:* About 6 to 18 inches
*Frequency of flooding:* None
*Frequency of ponding:* None
*Available water capacity:* Low (about 4.2 inches)

#### Interpretive groups

*Land capability classification (irrigated):* None specified

*Land capability classification (nonirrigated):* 3w
*Hydrologic Soil Group:* D
*Ecological site:* F139XY006OH - Moist Till Highlands
*Hydric soil rating:* No

**Minor Components**

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

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

**Unnamed soils**
*Percent of map unit:* 4 percent
*Hydric soil rating:* No

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

**Alden**
*Percent of map unit:* 4 percent
*Landform:* Depressions
*Hydric soil rating:* Yes

## DeC—Darien silt loam, 8 to 15 percent slopes

**Map Unit Setting**
*National map unit symbol:* 9ql0
*Elevation:* 590 to 1,970 feet
*Mean annual precipitation:* 39 to 50 inches
*Mean annual air temperature:* 45 to 50 degrees F
*Frost-free period:* 105 to 190 days
*Farmland classification:* Farmland of statewide importance

**Map Unit Composition**
*Darien and similar soils:* 80 percent
*Minor components:* 20 percent
*Estimates are based on observations, descriptions, and transects of the mapunit.*

**Description of Darien**

**Setting**
*Landform:* Drumlinoid ridges, hills, till plains
*Landform position (two-dimensional):* Footslope
*Landform position (three-dimensional):* Base slope
*Down-slope shape:* Concave
*Across-slope shape:* Linear
*Parent material:* Loamy till derived predominantly from calcareous gray shale

**Typical profile**

*H1 - 0 to 9 inches:* silt loam
*H2 - 9 to 31 inches:* gravelly silty clay loam
*H3 - 31 to 72 inches:* gravelly silt loam

**Properties and qualities**

*Slope:* 8 to 15 percent
*Depth to restrictive feature:* More than 80 inches
*Drainage class:* Somewhat poorly drained
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately low to moderately high (0.06 to 0.20 in/hr)
*Depth to water table:* About 6 to 12 inches
*Frequency of flooding:* None
*Frequency of ponding:* None
*Calcium carbonate, maximum content:* 15 percent
*Available water capacity:* Moderate (about 7.4 inches)

**Interpretive groups**

*Land capability classification (irrigated):* None specified
*Land capability classification (nonirrigated):* 3e
*Hydrologic Soil Group:* C/D
*Ecological site:* F139XY002OH - Moist Calcareous Till Flats
*Hydric soil rating:* No

**Minor Components**

**Erie**

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

**Fremont**

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

**Volusia**

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

**Orpark**

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

**Ashville**

*Percent of map unit:* 4 percent
*Landform:* Depressions
*Hydric soil rating:* Yes

## ErA—Erie silt loam, 0 to 3 percent slopes

**Map Unit Setting**

*National map unit symbol:* 2wn3f
*Elevation:* 330 to 2,460 feet

*Mean annual precipitation:* 31 to 70 inches
*Mean annual air temperature:* 39 to 52 degrees F
*Frost-free period:* 105 to 215 days
*Farmland classification:* Farmland of statewide importance

**Map Unit Composition**

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

**Description of Erie**

**Setting**

*Landform:* Hills
*Landform position (two-dimensional):* Footslope, summit
*Landform position (three-dimensional):* Base slope, interfluve
*Down-slope shape:* Concave
*Across-slope shape:* Linear
*Parent material:* Till

**Typical profile**

*Ap - 0 to 9 inches:* silt loam
*E - 9 to 13 inches:* channery silt loam
*Bg - 13 to 15 inches:* channery silt loam
*Bx - 15 to 38 inches:* channery silt loam
*C - 38 to 72 inches:* channery loam

**Properties and qualities**

*Slope:* 0 to 3 percent
*Depth to restrictive feature:* 10 to 21 inches to fragipan
*Drainage class:* Somewhat poorly drained
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately low (0.01 to 0.14 in/hr)
*Depth to water table:* About 7 to 14 inches
*Frequency of flooding:* None
*Frequency of ponding:* None
*Calcium carbonate, maximum content:* 10 percent
*Maximum salinity:* Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
*Available water capacity:* Very low (about 3.0 inches)

**Interpretive groups**

*Land capability classification (irrigated):* None specified
*Land capability classification (nonirrigated):* 3w
*Hydrologic Soil Group:* D
*Ecological site:* F139XY002OH - Moist Calcareous Till Flats
*Hydric soil rating:* No

**Minor Components**

**Ashville**

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

**Fremont**

*Percent of map unit:* 4 percent
*Landform:* Hills
*Landform position (two-dimensional):* Footslope, summit
*Landform position (three-dimensional):* Base slope, interfluve
*Down-slope shape:* Concave
*Across-slope shape:* Linear
*Hydric soil rating:* No

**Busti**

*Percent of map unit:* 4 percent
*Landform:* Hills
*Landform position (two-dimensional):* Footslope, summit
*Landform position (three-dimensional):* Base slope, interfluve
*Down-slope shape:* Concave
*Across-slope shape:* Linear
*Hydric soil rating:* No

**Darien**

*Percent of map unit:* 4 percent
*Landform:* Till plains
*Landform position (two-dimensional):* Summit, footslope
*Landform position (three-dimensional):* Interfluve, base slope
*Down-slope shape:* Concave
*Across-slope shape:* Linear
*Other vegetative classification:* Unnamed (G139XY000OH)
*Hydric soil rating:* No

**Langford**

*Percent of map unit:* 4 percent
*Landform:* Hills
*Landform position (two-dimensional):* Summit, shoulder
*Landform position (three-dimensional):* Interfluve, side slope
*Down-slope shape:* Convex
*Across-slope shape:* Convex
*Hydric soil rating:* No

## ErB—Erie silt loam, 3 to 8 percent slopes

**Map Unit Setting**

*National map unit symbol:* 2wn3j
*Elevation:* 330 to 2,460 feet
*Mean annual precipitation:* 31 to 70 inches
*Mean annual air temperature:* 39 to 52 degrees F
*Frost-free period:* 105 to 215 days
*Farmland classification:* Farmland of statewide importance

**Map Unit Composition**

*Erie and similar soils:* 75 percent
*Minor components:* 25 percent

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

**Description of Erie**

**Setting**

*Landform:* Hills
*Landform position (two-dimensional):* Footslope, summit
*Landform position (three-dimensional):* Base slope, interfluve
*Down-slope shape:* Concave
*Across-slope shape:* Linear
*Parent material:* Till

**Typical profile**

*Ap - 0 to 9 inches:* silt loam
*E - 9 to 13 inches:* channery silt loam
*Bg - 13 to 15 inches:* channery silt loam
*Bx - 15 to 38 inches:* channery silt loam
*C - 38 to 72 inches:* channery loam

**Properties and qualities**

*Slope:* 3 to 8 percent
*Depth to restrictive feature:* 10 to 21 inches to fragipan
*Drainage class:* Somewhat poorly drained
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately low (0.01 to 0.14 in/hr)
*Depth to water table:* About 7 to 14 inches
*Frequency of flooding:* None
*Frequency of ponding:* None
*Calcium carbonate, maximum content:* 10 percent
*Maximum salinity:* Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
*Available water capacity:* Very low (about 3.0 inches)

**Interpretive groups**

*Land capability classification (irrigated):* None specified
*Land capability classification (nonirrigated):* 3w
*Hydrologic Soil Group:* D
*Ecological site:* F139XY002OH - Moist Calcareous Till Flats
*Hydric soil rating:* No

**Minor Components**

**Langford**

*Percent of map unit:* 5 percent
*Landform:* Hills
*Landform position (two-dimensional):* Shoulder, backslope
*Landform position (three-dimensional):* Interfluve, side slope
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

**Ashville**

*Percent of map unit:* 5 percent
*Landform:* Depressions
*Landform position (two-dimensional):* Toeslope
*Landform position (three-dimensional):* Base slope
*Down-slope shape:* Concave
*Across-slope shape:* Concave

*Hydric soil rating:* Yes

**Darien**

*Percent of map unit:* 5 percent
*Landform:* Till plains
*Landform position (two-dimensional):* Summit, footslope
*Landform position (three-dimensional):* Interfluve, base slope
*Down-slope shape:* Concave
*Across-slope shape:* Linear
*Other vegetative classification:* Unnamed (G139XY000OH)
*Hydric soil rating:* No

**Fremont**

*Percent of map unit:* 5 percent
*Landform:* Hills
*Landform position (two-dimensional):* Footslope, summit
*Landform position (three-dimensional):* Base slope, interfluve
*Down-slope shape:* Concave
*Across-slope shape:* Linear
*Hydric soil rating:* No

**Busti**

*Percent of map unit:* 5 percent
*Landform:* Hills
*Landform position (two-dimensional):* Footslope, summit
*Landform position (three-dimensional):* Base slope, interfluve
*Down-slope shape:* Concave
*Across-slope shape:* Linear
*Hydric soil rating:* No

## ErC—Erie silt loam, 8 to 15 percent slopes

### Map Unit Setting

*National map unit symbol:* 2wn3l
*Elevation:* 330 to 2,460 feet
*Mean annual precipitation:* 31 to 70 inches
*Mean annual air temperature:* 39 to 52 degrees F
*Frost-free period:* 105 to 215 days
*Farmland classification:* Farmland of statewide importance

### Map Unit Composition

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

### Description of Erie

#### Setting

*Landform:* Hills
*Landform position (two-dimensional):* Footslope
*Landform position (three-dimensional):* Side slope, interfluve

*Down-slope shape:* Concave
*Across-slope shape:* Linear
*Parent material:* Till

**Typical profile**

*Ap - 0 to 9 inches:* silt loam
*E - 9 to 13 inches:* channery silt loam
*Bg - 13 to 15 inches:* channery silt loam
*Bx - 15 to 38 inches:* channery silt loam
*C - 38 to 72 inches:* channery loam

**Properties and qualities**

*Slope:* 8 to 15 percent
*Depth to restrictive feature:* 10 to 21 inches to fragipan
*Drainage class:* Somewhat poorly drained
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately low (0.01 to 0.14 in/hr)
*Depth to water table:* About 7 to 14 inches
*Frequency of flooding:* None
*Frequency of ponding:* None
*Calcium carbonate, maximum content:* 10 percent
*Maximum salinity:* Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
*Available water capacity:* Very low (about 3.0 inches)

**Interpretive groups**

*Land capability classification (irrigated):* None specified
*Land capability classification (nonirrigated):* 3e
*Hydrologic Soil Group:* D
*Ecological site:* F139XY002OH - Moist Calcareous Till Flats
*Hydric soil rating:* No

**Minor Components**

**Busti**

*Percent of map unit:* 5 percent
*Landform:* Hills
*Landform position (two-dimensional):* Footslope
*Landform position (three-dimensional):* Side slope, interfluve
*Down-slope shape:* Concave
*Across-slope shape:* Linear
*Hydric soil rating:* No

**Fremont**

*Percent of map unit:* 5 percent
*Landform:* Hills
*Landform position (two-dimensional):* Footslope
*Landform position (three-dimensional):* Side slope, interfluve
*Down-slope shape:* Concave
*Across-slope shape:* Linear
*Hydric soil rating:* No

**Ashville**

*Percent of map unit:* 5 percent
*Landform:* Depressions
*Landform position (two-dimensional):* Toeslope
*Landform position (three-dimensional):* Base slope
*Down-slope shape:* Concave

*Across-slope shape:* Concave
*Hydric soil rating:* Yes

**Langford**

*Percent of map unit:* 5 percent
*Landform:* Hills
*Landform position (two-dimensional):* Backslope
*Landform position (three-dimensional):* Head slope, side slope
*Down-slope shape:* Concave
*Across-slope shape:* Linear
*Hydric soil rating:* No

**Darien**

*Percent of map unit:* 5 percent
*Landform:* Till plains, drumlinoid ridges, hills
*Landform position (two-dimensional):* Footslope
*Landform position (three-dimensional):* Base slope
*Down-slope shape:* Concave
*Across-slope shape:* Linear
*Hydric soil rating:* No

## Fe—Fluvaquents-Udifluvents complex, frequently flooded

### Map Unit Setting

*National map unit symbol:* 9ql8
*Elevation:* 100 to 3,000 feet
*Mean annual precipitation:* 39 to 50 inches
*Mean annual air temperature:* 45 to 50 degrees F
*Frost-free period:* 105 to 190 days
*Farmland classification:* Not prime farmland

### Map Unit Composition

*Fluvaquents and similar soils:* 55 percent
*Udifluvents and similar soils:* 30 percent
*Minor components:* 15 percent
*Estimates are based on observations, descriptions, and transects of the mapunit.*

### Description of Fluvaquents

#### Setting

*Landform:* Flood plains
*Landform position (two-dimensional):* Toeslope
*Landform position (three-dimensional):* Dip
*Down-slope shape:* Concave
*Across-slope shape:* Concave
*Parent material:* Alluvium with highly variable texture

#### Typical profile

*H1 - 0 to 5 inches:* gravelly silt loam
*H2 - 5 to 70 inches:* very gravelly silt loam

**Properties and qualities**

*Slope:* 0 to 3 percent
*Depth to restrictive feature:* More than 80 inches
*Drainage class:* Poorly drained
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately low to very high (0.06 to 19.98 in/hr)
*Depth to water table:* About 0 inches
*Frequency of flooding:* FrequentNone
*Frequency of ponding:* Frequent
*Calcium carbonate, maximum content:* 15 percent
*Available water capacity:* Moderate (about 6.1 inches)

**Interpretive groups**

*Land capability classification (irrigated):* None specified
*Land capability classification (nonirrigated):* 5w
*Hydrologic Soil Group:* A/D
*Ecological site:* F139XY009OH - Wet Floodplain
*Hydric soil rating:* Yes

## Description of Udifluvents

**Setting**

*Landform:* Flood plains
*Landform position (two-dimensional):* Summit
*Landform position (three-dimensional):* Talf
*Down-slope shape:* Concave
*Across-slope shape:* Convex
*Parent material:* Alluvium with a wide range of texture

**Typical profile**

*H1 - 0 to 4 inches:* gravelly silt loam
*H2 - 4 to 70 inches:* very gravelly loam

**Properties and qualities**

*Slope:* 0 to 5 percent
*Depth to restrictive feature:* More than 80 inches
*Drainage class:* Moderately well drained
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately low to very high (0.06 to 19.98 in/hr)
*Depth to water table:* About 24 to 72 inches
*Frequency of flooding:* FrequentNone
*Frequency of ponding:* None
*Calcium carbonate, maximum content:* 15 percent
*Available water capacity:* Low (about 5.9 inches)

**Interpretive groups**

*Land capability classification (irrigated):* None specified
*Land capability classification (nonirrigated):* 5w
*Hydrologic Soil Group:* A
*Ecological site:* F139XY008OH - Moist Floodplain
*Hydric soil rating:* No

## Minor Components

**Teel**

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

**Wayland**
*Percent of map unit:* 5 percent
*Landform:* Flood plains
*Hydric soil rating:* Yes

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

## FmA—Fremont silt loam, 0 to 3 percent slopes

### Map Unit Setting
*National map unit symbol:* 2vzr6
*Elevation:* 330 to 2,460 feet
*Mean annual precipitation:* 31 to 70 inches
*Mean annual air temperature:* 39 to 52 degrees F
*Frost-free period:* 105 to 180 days
*Farmland classification:* Prime farmland if drained

### Map Unit Composition
*Fremont and similar soils:* 80 percent
*Minor components:* 20 percent
*Estimates are based on observations, descriptions, and transects of the mapunit.*

### Description of Fremont

#### Setting
*Landform:* Hills
*Landform position (two-dimensional):* Footslope, summit
*Landform position (three-dimensional):* Base slope, interfluve
*Down-slope shape:* Concave
*Across-slope shape:* Linear
*Parent material:* Till

#### Typical profile
*Ap - 0 to 8 inches:* silt loam
*Bw1 - 8 to 16 inches:* silt loam
*Bw2 - 16 to 30 inches:* channery silt loam
*BC - 30 to 34 inches:* channery silty clay loam
*C - 34 to 72 inches:* channery silt loam

#### Properties and qualities
*Slope:* 0 to 3 percent
*Depth to restrictive feature:* More than 80 inches
*Drainage class:* Somewhat poorly drained
*Capacity of the most limiting layer to transmit water (Ksat):* Very low to moderately low (0.00 to 0.14 in/hr)
*Depth to water table:* About 6 to 18 inches
*Frequency of flooding:* None

*Frequency of ponding:* None
*Maximum salinity:* Nonsaline (0.0 to 1.9 mmhos/cm)
*Available water capacity:* High (about 10.5 inches)

**Interpretive groups**

*Land capability classification (irrigated):* None specified
*Land capability classification (nonirrigated):* 3w
*Hydrologic Soil Group:* D
*Ecological site:* F139XY006OH - Moist Till Highlands
*Hydric soil rating:* No

**Minor Components**

**Ashville**

*Percent of map unit:* 8 percent
*Landform:* Depressions
*Landform position (two-dimensional):* Toeslope
*Landform position (three-dimensional):* Base slope
*Down-slope shape:* Concave
*Across-slope shape:* Concave
*Hydric soil rating:* Yes

**Volusia**

*Percent of map unit:* 7 percent
*Landform:* Hills, mountains
*Landform position (two-dimensional):* Footslope, summit
*Landform position (three-dimensional):* Base slope, interfluve, side slope
*Down-slope shape:* Concave
*Across-slope shape:* Linear
*Hydric soil rating:* No

**Orpark**

*Percent of map unit:* 5 percent
*Landform:* Till plains, ridges, benches
*Landform position (two-dimensional):* Summit, shoulder, footslope
*Landform position (three-dimensional):* Interfluve, crest, base slope
*Down-slope shape:* Convex, concave
*Across-slope shape:* Convex, linear
*Hydric soil rating:* No

## FmB—Fremont silt loam, 3 to 8 percent slopes

**Map Unit Setting**

*National map unit symbol:* 2vzrc
*Elevation:* 330 to 2,460 feet
*Mean annual precipitation:* 31 to 70 inches
*Mean annual air temperature:* 39 to 52 degrees F
*Frost-free period:* 105 to 180 days
*Farmland classification:* Farmland of statewide importance

**Map Unit Composition**

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

**Description of Fremont**

**Setting**

*Landform:* Hills
*Landform position (two-dimensional):* Footslope, summit
*Landform position (three-dimensional):* Base slope, interfluve
*Down-slope shape:* Concave
*Across-slope shape:* Linear
*Parent material:* Till

**Typical profile**

*Ap - 0 to 8 inches:* silt loam
*Bw1 - 8 to 16 inches:* silt loam
*Bw2 - 16 to 30 inches:* channery silt loam
*BC - 30 to 34 inches:* channery silty clay loam
*C - 34 to 72 inches:* channery silt loam

**Properties and qualities**

*Slope:* 3 to 8 percent
*Depth to restrictive feature:* More than 80 inches
*Drainage class:* Somewhat poorly drained
*Capacity of the most limiting layer to transmit water (Ksat):* Very low to moderately low (0.00 to 0.14 in/hr)
*Depth to water table:* About 6 to 18 inches
*Frequency of flooding:* None
*Frequency of ponding:* None
*Maximum salinity:* Nonsaline (0.0 to 1.9 mmhos/cm)
*Available water capacity:* High (about 10.5 inches)

**Interpretive groups**

*Land capability classification (irrigated):* None specified
*Land capability classification (nonirrigated):* 3w
*Hydrologic Soil Group:* D
*Ecological site:* F139XY006OH - Moist Till Highlands
*Hydric soil rating:* No

**Minor Components**

**Ashville**

*Percent of map unit:* 5 percent
*Landform:* Depressions
*Landform position (two-dimensional):* Toeslope
*Landform position (three-dimensional):* Base slope
*Down-slope shape:* Concave
*Across-slope shape:* Concave
*Hydric soil rating:* Yes

**Volusia**

*Percent of map unit:* 5 percent
*Landform:* Hills, mountains
*Landform position (two-dimensional):* Footslope, summit

*Landform position (three-dimensional):* Base slope, interfluve, side slope
*Down-slope shape:* Concave
*Across-slope shape:* Linear
*Hydric soil rating:* No

**Orpark**

*Percent of map unit:* 5 percent
*Landform:* Till plains, ridges, benches
*Landform position (two-dimensional):* Shoulder, backslope, footslope
*Landform position (three-dimensional):* Crest, nose slope, base slope
*Down-slope shape:* Convex, concave
*Across-slope shape:* Linear
*Hydric soil rating:* No

**Schuyler**

*Percent of map unit:* 5 percent
*Landform:* Hills
*Landform position (two-dimensional):* Shoulder, backslope
*Landform position (three-dimensional):* Interfluve, side slope
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

## Ho—Holderton silt loam, 0 to 3 percent slopes, occasionally flooded 140

### Map Unit Setting

*National map unit symbol:* 2rw9q
*Elevation:* 160 to 1,970 feet
*Mean annual precipitation:* 31 to 68 inches
*Mean annual air temperature:* 43 to 52 degrees F
*Frost-free period:* 105 to 180 days
*Farmland classification:* Prime farmland if drained

### Map Unit Composition

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

### Description of Holderton

#### Setting

*Landform:* Flood plains
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Parent material:* Loamy alluvium derived from sedimentary rock

#### Typical profile

*Ap - 0 to 10 inches:* silt loam
*Bw1 - 10 to 18 inches:* loam
*Bw2 - 18 to 35 inches:* fine sandy loam

*C1 - 35 to 42 inches:* sandy loam
*C2 - 42 to 72 inches:* gravelly loamy coarse sand

**Properties and qualities**

*Slope:* 0 to 3 percent
*Depth to restrictive feature:* More than 80 inches
*Drainage class:* Somewhat poorly drained
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately low to high (0.14 to 14.17 in/hr)
*Depth to water table:* About 6 to 18 inches
*Frequency of flooding:* OccasionalNone
*Frequency of ponding:* None
*Calcium carbonate, maximum content:* 1 percent
*Maximum salinity:* Nonsaline (0.0 to 1.9 mmhos/cm)
*Available water capacity:* Moderate (about 7.7 inches)

**Interpretive groups**

*Land capability classification (irrigated):* None specified
*Land capability classification (nonirrigated):* 3w
*Hydrologic Soil Group:* B/D
*Ecological site:* F139XY008OH - Moist Floodplain
*Hydric soil rating:* No

**Minor Components**

**Middlebury**

*Percent of map unit:* 10 percent
*Landform:* Flood plains
*Landform position (two-dimensional):* Summit
*Landform position (three-dimensional):* Talf
*Down-slope shape:* Concave
*Across-slope shape:* Convex
*Hydric soil rating:* No

**Wayland**

*Percent of map unit:* 5 percent
*Landform:* Flood plains
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* Yes

## LnB—Langford silt loam, 3 to 8 percent slopes

**Map Unit Setting**

*National map unit symbol:* 2ywp7
*Elevation:* 330 to 2,460 feet
*Mean annual precipitation:* 31 to 70 inches
*Mean annual air temperature:* 39 to 52 degrees F
*Frost-free period:* 105 to 215 days
*Farmland classification:* Farmland of statewide importance

**Map Unit Composition**

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

**Description of Langford**

**Setting**

*Landform:* Hills
*Landform position (two-dimensional):* Summit, shoulder
*Landform position (three-dimensional):* Interfluve, side slope
*Down-slope shape:* Convex
*Across-slope shape:* Convex
*Parent material:* Till

**Typical profile**

*Ap - 0 to 9 inches:* silt loam
*Bw - 9 to 17 inches:* channery silt loam
*E - 17 to 21 inches:* channery loam
*Bx - 21 to 48 inches:* channery silt loam
*C - 48 to 72 inches:* channery silt loam

**Properties and qualities**

*Slope:* 3 to 8 percent
*Surface area covered with cobbles, stones or boulders:* 0.0 percent
*Depth to restrictive feature:* 15 to 28 inches to fragipan
*Drainage class:* Moderately well drained
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately low (0.01 to 0.14 in/hr)
*Depth to water table:* About 14 to 24 inches
*Frequency of flooding:* None
*Frequency of ponding:* None
*Calcium carbonate, maximum content:* 10 percent
*Maximum salinity:* Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
*Available water capacity:* Low (about 3.8 inches)

**Interpretive groups**

*Land capability classification (irrigated):* None specified
*Land capability classification (nonirrigated):* 2e
*Hydrologic Soil Group:* D
*Hydric soil rating:* No

**Minor Components**

**Erie**

*Percent of map unit:* 10 percent
*Landform:* Hills
*Landform position (two-dimensional):* Summit, footslope
*Landform position (three-dimensional):* Base slope, interfluve
*Down-slope shape:* Concave
*Across-slope shape:* Linear
*Hydric soil rating:* No

**Chautauqua**

*Percent of map unit:* 5 percent
*Landform:* Hills

*Landform position (two-dimensional):* Summit, shoulder
*Landform position (three-dimensional):* Interfluve, side slope
*Down-slope shape:* Convex
*Across-slope shape:* Convex
*Ecological site:* F139XY006OH - Moist Till Highlands
*Hydric soil rating:* No

## LnC—Langford silt loam, 8 to 15 percent slopes

### Map Unit Setting

*National map unit symbol:* 2ywp8
*Elevation:* 330 to 2,460 feet
*Mean annual precipitation:* 31 to 70 inches
*Mean annual air temperature:* 39 to 52 degrees F
*Frost-free period:* 105 to 215 days
*Farmland classification:* Farmland of statewide importance

### Map Unit Composition

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

### Description of Langford

#### Setting

*Landform:* Hills
*Landform position (two-dimensional):* Shoulder, backslope
*Landform position (three-dimensional):* Interfluve, side slope
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Parent material:* Till

#### Typical profile

*Ap - 0 to 9 inches:* silt loam
*Bw - 9 to 17 inches:* channery silt loam
*E - 17 to 21 inches:* channery loam
*Bx - 21 to 48 inches:* channery silt loam
*C - 48 to 72 inches:* channery silt loam

#### Properties and qualities

*Slope:* 8 to 15 percent
*Surface area covered with cobbles, stones or boulders:* 0.0 percent
*Depth to restrictive feature:* 15 to 28 inches to fragipan
*Drainage class:* Moderately well drained
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately low (0.01 to 0.14 in/hr)
*Depth to water table:* About 14 to 24 inches
*Frequency of flooding:* None
*Frequency of ponding:* None
*Calcium carbonate, maximum content:* 10 percent

*Maximum salinity:* Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
*Available water capacity:* Low (about 3.8 inches)

**Interpretive groups**

*Land capability classification (irrigated):* None specified
*Land capability classification (nonirrigated):* 3e
*Hydrologic Soil Group:* D
*Hydric soil rating:* No

**Minor Components**

**Erie**

*Percent of map unit:* 10 percent
*Landform:* Hills
*Landform position (two-dimensional):* Footslope, summit
*Landform position (three-dimensional):* Base slope, interfluve
*Down-slope shape:* Concave
*Across-slope shape:* Linear
*Hydric soil rating:* No

**Chautauqua**

*Percent of map unit:* 5 percent
*Landform:* Hills
*Landform position (two-dimensional):* Backslope, shoulder
*Landform position (three-dimensional):* Interfluve, side slope
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Ecological site:* F139XY006OH - Moist Till Highlands
*Hydric soil rating:* No

## MdC—Mardin channery silt loam, 8 to 15 percent slopes

**Map Unit Setting**

*National map unit symbol:* 2srhj
*Elevation:* 330 to 2,460 feet
*Mean annual precipitation:* 31 to 70 inches
*Mean annual air temperature:* 39 to 52 degrees F
*Frost-free period:* 105 to 180 days
*Farmland classification:* Farmland of statewide importance

**Map Unit Composition**

*Mardin and similar soils:* 88 percent
*Minor components:* 12 percent
*Estimates are based on observations, descriptions, and transects of the mapunit.*

**Description of Mardin**

**Setting**

*Landform:* Hills, mountains
*Landform position (two-dimensional):* Shoulder, backslope
*Landform position (three-dimensional):* Interfluve, side slope

*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Parent material:* Loamy till

**Typical profile**

*Ap - 0 to 8 inches:* channery silt loam
*BE - 8 to 12 inches:* channery silt loam
*Bw1 - 12 to 16 inches:* channery silt loam
*Bw2 - 16 to 20 inches:* channery silt loam
*Bx1 - 20 to 36 inches:* channery silt loam
*Bx2 - 36 to 57 inches:* channery silt loam
*C - 57 to 72 inches:* channery silt loam

**Properties and qualities**

*Slope:* 8 to 15 percent
*Surface area covered with cobbles, stones or boulders:* 0.0 percent
*Depth to restrictive feature:* 14 to 26 inches to fragipan
*Drainage class:* Moderately well drained
*Capacity of the most limiting layer to transmit water (Ksat):* Very low to moderately low (0.00 to 0.14 in/hr)
*Depth to water table:* About 13 to 24 inches
*Frequency of flooding:* None
*Frequency of ponding:* None
*Available water capacity:* Low (about 3.6 inches)

**Interpretive groups**

*Land capability classification (irrigated):* None specified
*Land capability classification (nonirrigated):* 3e
*Hydrologic Soil Group:* D
*Hydric soil rating:* No

**Minor Components**

**Bath**

*Percent of map unit:* 5 percent
*Landform:* Hills, mountains
*Landform position (two-dimensional):* Backslope
*Landform position (three-dimensional):* Nose slope, side slope
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

**Volusia**

*Percent of map unit:* 5 percent
*Landform:* Hills, mountains
*Landform position (two-dimensional):* Footslope, summit
*Landform position (three-dimensional):* Base slope, interfluve, side slope
*Down-slope shape:* Concave
*Across-slope shape:* Linear
*Hydric soil rating:* No

**Lordstown**

*Percent of map unit:* 2 percent
*Landform:* Mountains, hills
*Landform position (two-dimensional):* Backslope
*Landform position (three-dimensional):* Mountaintop, side slope, nose slope
*Down-slope shape:* Linear

*Across-slope shape:* Linear
*Hydric soil rating:* No

## ShB—Schuyler silt loam, 3 to 8 percent slopes

### Map Unit Setting

*National map unit symbol:* 2wn1z
*Elevation:* 330 to 2,460 feet
*Mean annual precipitation:* 31 to 70 inches
*Mean annual air temperature:* 39 to 52 degrees F
*Frost-free period:* 105 to 180 days
*Farmland classification:* All areas are prime farmland

### Map Unit Composition

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

### Description of Schuyler

#### Setting

*Landform:* Hills
*Landform position (two-dimensional):* Summit, shoulder
*Landform position (three-dimensional):* Interfluve, side slope
*Down-slope shape:* Convex
*Across-slope shape:* Convex
*Parent material:* Till

#### Typical profile

*Ap - 0 to 7 inches:* silt loam
*Bw1 - 7 to 15 inches:* silt loam
*Bw2 - 15 to 38 inches:* channery silty clay loam
*C - 38 to 72 inches:* channery silty clay loam

#### Properties and qualities

*Slope:* 3 to 8 percent
*Depth to restrictive feature:* More than 80 inches
*Drainage class:* Moderately well drained
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately low to moderately high (0.01 to 1.42 in/hr)
*Depth to water table:* About 16 to 24 inches
*Frequency of flooding:* None
*Frequency of ponding:* None
*Maximum salinity:* Nonsaline (0.0 to 1.9 mmhos/cm)
*Available water capacity:* High (about 9.0 inches)

#### Interpretive groups

*Land capability classification (irrigated):* None specified
*Land capability classification (nonirrigated):* 2e
*Hydrologic Soil Group:* C/D
*Ecological site:* F139XY006OH - Moist Till Highlands

*Hydric soil rating:* No

**Minor Components**

**Mardin**

*Percent of map unit:* 5 percent
*Landform:* Mountains, hills
*Landform position (two-dimensional):* Summit, shoulder
*Landform position (three-dimensional):* Interfluve, side slope
*Down-slope shape:* Convex
*Across-slope shape:* Convex
*Hydric soil rating:* No

**Fremont**

*Percent of map unit:* 5 percent
*Landform:* Hills
*Landform position (two-dimensional):* Footslope, summit
*Landform position (three-dimensional):* Base slope, interfluve
*Down-slope shape:* Concave
*Across-slope shape:* Linear
*Hydric soil rating:* No

**Towerville**

*Percent of map unit:* 5 percent
*Landform:* Hills
*Landform position (two-dimensional):* Shoulder, backslope
*Landform position (three-dimensional):* Crest, nose slope
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

## ShC—Schuyler silt loam, 8 to 15 percent slopes

**Map Unit Setting**

*National map unit symbol:* 2wn20
*Elevation:* 330 to 2,460 feet
*Mean annual precipitation:* 31 to 70 inches
*Mean annual air temperature:* 39 to 52 degrees F
*Frost-free period:* 105 to 180 days
*Farmland classification:* Farmland of statewide importance

**Map Unit Composition**

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

**Description of Schuyler**

**Setting**

*Landform:* Hills
*Landform position (two-dimensional):* Backslope, shoulder

*Landform position (three-dimensional):* Interfluve, side slope
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Parent material:* Till

**Typical profile**

*Ap - 0 to 7 inches:* silt loam
*Bw1 - 7 to 15 inches:* silt loam
*Bw2 - 15 to 38 inches:* channery silty clay loam
*C - 38 to 72 inches:* channery silty clay loam

**Properties and qualities**

*Slope:* 8 to 15 percent
*Depth to restrictive feature:* More than 80 inches
*Drainage class:* Moderately well drained
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately low to moderately high (0.01 to 1.42 in/hr)
*Depth to water table:* About 16 to 24 inches
*Frequency of flooding:* None
*Frequency of ponding:* None
*Maximum salinity:* Nonsaline (0.0 to 1.9 mmhos/cm)
*Available water capacity:* High (about 9.0 inches)

**Interpretive groups**

*Land capability classification (irrigated):* None specified
*Land capability classification (nonirrigated):* 3e
*Hydrologic Soil Group:* C/D
*Ecological site:* F139XY006OH - Moist Till Highlands
*Hydric soil rating:* No

**Minor Components**

**Towerville**

*Percent of map unit:* 5 percent
*Landform:* Hills
*Landform position (two-dimensional):* Backslope
*Landform position (three-dimensional):* Side slope, nose slope
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

**Fremont**

*Percent of map unit:* 5 percent
*Landform:* Hills
*Landform position (two-dimensional):* Footslope, summit
*Landform position (three-dimensional):* Base slope, interfluve
*Down-slope shape:* Concave
*Across-slope shape:* Linear
*Hydric soil rating:* No

**Mardin**

*Percent of map unit:* 5 percent
*Landform:* Hills, mountains
*Landform position (two-dimensional):* Shoulder, backslope
*Landform position (three-dimensional):* Interfluve, side slope
*Down-slope shape:* Linear
*Across-slope shape:* Linear

*Hydric soil rating:* No

## ToF—Towerville silt loam, 35 to 50 percent slopes

### Map Unit Setting

*National map unit symbol:* 9qn6
*Elevation:* 1,000 to 1,800 feet
*Mean annual precipitation:* 39 to 50 inches
*Mean annual air temperature:* 45 to 50 degrees F
*Frost-free period:* 105 to 190 days
*Farmland classification:* Not prime farmland

### Map Unit Composition

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

### Description of Towerville

#### Setting

*Landform:* Ridges, hills
*Landform position (two-dimensional):* Summit
*Landform position (three-dimensional):* Side slope
*Down-slope shape:* Concave
*Across-slope shape:* Convex
*Parent material:* Loamy till derived mainly from shale, siltstone, and smaller amounts of sandstone

#### Typical profile

*H1 - 0 to 12 inches:* silt loam
*H2 - 12 to 22 inches:* channery silt loam
*H3 - 22 to 30 inches:* channery silt loam
*H4 - 30 to 34 inches:* unweathered bedrock

#### Properties and qualities

*Slope:* 35 to 50 percent
*Depth to restrictive feature:* 20 to 40 inches to lithic bedrock
*Drainage class:* Moderately well drained
*Capacity of the most limiting layer to transmit water (Ksat):* Very low to moderately high (0.00 to 0.20 in/hr)
*Depth to water table:* About 18 to 24 inches
*Frequency of flooding:* None
*Frequency of ponding:* None
*Available water capacity:* Low (about 4.5 inches)

#### Interpretive groups

*Land capability classification (irrigated):* None specified
*Land capability classification (nonirrigated):* 7e
*Hydrologic Soil Group:* C/D
*Ecological site:* F139XY007OH - Shallow Acidic Slopes
*Hydric soil rating:* No

**Minor Components**

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

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

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

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

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

## VaB—Valois gravelly silt loam, 3 to 8 percent slopes

**Map Unit Setting**
*National map unit symbol:* 9qnf
*Elevation:* 600 to 1,750 feet
*Mean annual precipitation:* 39 to 50 inches
*Mean annual air temperature:* 45 to 50 degrees F
*Frost-free period:* 105 to 190 days
*Farmland classification:* All areas are prime farmland

**Map Unit Composition**
*Valois and similar soils:* 85 percent
*Minor components:* 15 percent
*Estimates are based on observations, descriptions, and transects of the mapunit.*

**Description of Valois**

**Setting**
*Landform:* Lateral moraines, end moraines, valley sides
*Landform position (two-dimensional):* Summit
*Landform position (three-dimensional):* Crest
*Down-slope shape:* Convex
*Across-slope shape:* Convex
*Parent material:* Loamy till derived mainly from sandstone, siltstone, and shale

**Typical profile**
*H1 - 0 to 6 inches:* gravelly silt loam
*H2 - 6 to 45 inches:* gravelly loam
*H3 - 45 to 72 inches:* very gravelly sandy loam

**Properties and qualities**

*Slope:* 3 to 8 percent
*Depth to restrictive feature:* More than 80 inches
*Drainage class:* Well drained
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high to high (0.57 to 1.98 in/hr)
*Depth to water table:* More than 80 inches
*Frequency of flooding:* None
*Frequency of ponding:* None
*Calcium carbonate, maximum content:* 2 percent
*Available water capacity:* Low (about 5.9 inches)

**Interpretive groups**

*Land capability classification (irrigated):* None specified
*Land capability classification (nonirrigated):* 2e
*Hydrologic Soil Group:* B
*Ecological site:* F139XY006OH - Moist Till Highlands
*Hydric soil rating:* No

**Minor Components**

**Mardin**

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

**Unnamed soils**

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

**Chautauqua**

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

**Chenango**

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

**Pompton**

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

## VaC—Valois gravelly silt loam, 8 to 15 percent slopes

**Map Unit Setting**

*National map unit symbol:* 9qng
*Elevation:* 600 to 1,750 feet
*Mean annual precipitation:* 39 to 50 inches
*Mean annual air temperature:* 45 to 50 degrees F
*Frost-free period:* 105 to 190 days
*Farmland classification:* Farmland of statewide importance

**Map Unit Composition**

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

**Description of Valois**

**Setting**

*Landform:* Valley sides, lateral moraines, end moraines
*Landform position (two-dimensional):* Shoulder
*Landform position (three-dimensional):* Crest
*Down-slope shape:* Convex
*Across-slope shape:* Convex
*Parent material:* Loamy till derived mainly from sandstone, siltstone, and shale

**Typical profile**

*H1 - 0 to 6 inches:* gravelly silt loam
*H2 - 6 to 45 inches:* gravelly loam
*H3 - 45 to 72 inches:* very gravelly sandy loam

**Properties and qualities**

*Slope:* 8 to 15 percent
*Depth to restrictive feature:* More than 80 inches
*Drainage class:* Well drained
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high to high (0.57 to 1.98 in/hr)
*Depth to water table:* More than 80 inches
*Frequency of flooding:* None
*Frequency of ponding:* None
*Calcium carbonate, maximum content:* 2 percent
*Available water capacity:* Low (about 5.9 inches)

**Interpretive groups**

*Land capability classification (irrigated):* None specified
*Land capability classification (nonirrigated):* 3e
*Hydrologic Soil Group:* B
*Ecological site:* F139XY006OH - Moist Till Highlands
*Hydric soil rating:* No

**Minor Components**

**Chenango**

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

**Chautauqua**

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

**Unnamed soils**

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

**Mardin**

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

**Pompton**

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

## VoA—Volusia channery silt loam, 0 to 3 percent slopes

### Map Unit Setting

*National map unit symbol:* 2srfc
*Elevation:* 330 to 2,460 feet
*Mean annual precipitation:* 31 to 70 inches
*Mean annual air temperature:* 39 to 52 degrees F
*Frost-free period:* 105 to 180 days
*Farmland classification:* Farmland of statewide importance

### Map Unit Composition

*Volusia and similar soils:* 90 percent
*Minor components:* 10 percent
*Estimates are based on observations, descriptions, and transects of the mapunit.*

### Description of Volusia

#### Setting

*Landform:* Hills, mountains
*Landform position (two-dimensional):* Footslope, summit
*Landform position (three-dimensional):* Base slope, interfluve, side slope
*Down-slope shape:* Concave
*Across-slope shape:* Linear
*Parent material:* Loamy till derived from interbedded sedimentary rock

#### Typical profile

*Ap - 0 to 9 inches:* channery silt loam
*Bw - 9 to 15 inches:* channery silt loam
*Eg - 15 to 17 inches:* channery silt loam
*Bx1 - 17 to 29 inches:* channery loam
*Bx2 - 29 to 54 inches:* channery loam
*C - 54 to 72 inches:* channery silt loam

#### Properties and qualities

*Slope:* 0 to 3 percent
*Surface area covered with cobbles, stones or boulders:* 0.0 percent
*Depth to restrictive feature:* 10 to 22 inches to fragipan
*Drainage class:* Somewhat poorly drained
*Capacity of the most limiting layer to transmit water (Ksat):* Very low to moderately low (0.00 to 0.14 in/hr)
*Depth to water table:* About 6 to 18 inches
*Frequency of flooding:* None
*Frequency of ponding:* None
*Calcium carbonate, maximum content:* 5 percent
*Available water capacity:* Very low (about 3.0 inches)

**Interpretive groups**

*Land capability classification (irrigated):* None specified
*Land capability classification (nonirrigated):* 3w
*Hydrologic Soil Group:* D
*Ecological site:* F140XY024NY - Moist Dense Till
*Hydric soil rating:* No

**Minor Components**

**Mardin**

*Percent of map unit:* 5 percent
*Landform:* Hills, mountains
*Landform position (two-dimensional):* Summit, shoulder
*Landform position (three-dimensional):* Interfluve, side slope
*Down-slope shape:* Convex
*Across-slope shape:* Convex
*Hydric soil rating:* No

**Chippewa**

*Percent of map unit:* 5 percent
*Landform:* Depressions
*Landform position (two-dimensional):* Toeslope
*Landform position (three-dimensional):* Base slope
*Down-slope shape:* Concave
*Across-slope shape:* Concave
*Hydric soil rating:* Yes

## VoB—Volusia channery silt loam, 3 to 8 percent slopes

**Map Unit Setting**

*National map unit symbol:* 2srfh
*Elevation:* 330 to 2,460 feet
*Mean annual precipitation:* 31 to 70 inches
*Mean annual air temperature:* 39 to 52 degrees F
*Frost-free period:* 105 to 180 days
*Farmland classification:* Farmland of statewide importance

**Map Unit Composition**

*Volusia and similar soils:* 90 percent
*Minor components:* 10 percent
*Estimates are based on observations, descriptions, and transects of the mapunit.*

**Description of Volusia**

**Setting**

*Landform:* Mountains, hills
*Landform position (two-dimensional):* Footslope, summit
*Landform position (three-dimensional):* Base slope, interfluve, side slope
*Down-slope shape:* Concave
*Across-slope shape:* Linear

*Parent material:* Loamy till derived from interbedded sedimentary rock

**Typical profile**

*Ap - 0 to 9 inches:* channery silt loam
*Bw - 9 to 15 inches:* channery silt loam
*Eg - 15 to 17 inches:* channery silt loam
*Bx1 - 17 to 29 inches:* channery loam
*Bx2 - 29 to 54 inches:* channery loam
*C - 54 to 72 inches:* channery silt loam

**Properties and qualities**

*Slope:* 3 to 8 percent
*Surface area covered with cobbles, stones or boulders:* 0.0 percent
*Depth to restrictive feature:* 10 to 22 inches to fragipan
*Drainage class:* Somewhat poorly drained
*Capacity of the most limiting layer to transmit water (Ksat):* Very low to moderately low (0.00 to 0.14 in/hr)
*Depth to water table:* About 6 to 18 inches
*Frequency of flooding:* None
*Frequency of ponding:* None
*Calcium carbonate, maximum content:* 5 percent
*Available water capacity:* Very low (about 3.0 inches)

**Interpretive groups**

*Land capability classification (irrigated):* None specified
*Land capability classification (nonirrigated):* 3w
*Hydrologic Soil Group:* D
*Ecological site:* F140XY024NY - Moist Dense Till
*Hydric soil rating:* No

**Minor Components**

**Mardin**

*Percent of map unit:* 5 percent
*Landform:* Hills, mountains
*Landform position (two-dimensional):* Shoulder, backslope
*Landform position (three-dimensional):* Interfluve, side slope
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

**Chippewa**

*Percent of map unit:* 5 percent
*Landform:* Depressions
*Landform position (two-dimensional):* Toeslope
*Landform position (three-dimensional):* Base slope
*Down-slope shape:* Concave
*Across-slope shape:* Concave
*Hydric soil rating:* Yes

## W—Water

### Map Unit Setting

*National map unit symbol:* 9qnq
*Mean annual precipitation:* 39 to 50 inches
*Mean annual air temperature:* 45 to 50 degrees F
*Frost-free period:* 105 to 190 days
*Farmland classification:* Not prime farmland

### Map Unit Composition

*Water:* 100 percent
*Estimates are based on observations, descriptions, and transects of the mapunit.*

# Erie County, Pennsylvania

## MdD—Mardin silt loam, 15 to 25 percent slopes

### Map Unit Setting

*National map unit symbol:* 2rg8v
*Elevation:* 600 to 1,800 feet
*Mean annual precipitation:* 37 to 49 inches
*Mean annual air temperature:* 46 to 48 degrees F
*Frost-free period:* 120 to 160 days
*Farmland classification:* Not prime farmland

### Map Unit Composition

*Mardin and similar soils:* 83 percent
*Minor components:* 17 percent
*Estimates are based on observations, descriptions, and transects of the mapunit.*

### Description of Mardin

#### Setting

*Landform:* Drumlinoid ridges, hills
*Landform position (two-dimensional):* Summit
*Landform position (three-dimensional):* Crest
*Down-slope shape:* Concave
*Across-slope shape:* Convex
*Parent material:* Loamy till derived mainly from acid sedimentary rock

#### Typical profile

*Ap - 0 to 10 inches:* silt loam
*Bw - 10 to 21 inches:* silt loam
*Bx - 21 to 37 inches:* gravelly loam
*C - 37 to 81 inches:* gravelly loam

#### Properties and qualities

*Slope:* 15 to 25 percent
*Depth to restrictive feature:* 16 to 28 inches to fragipan
*Drainage class:* Moderately well drained
*Runoff class:* Very high
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately low to moderately high (0.06 to 0.20 in/hr)
*Depth to water table:* About 15 to 28 inches
*Frequency of flooding:* None
*Frequency of ponding:* None
*Calcium carbonate, maximum content:* 15 percent
*Available water capacity:* Very low (about 2.8 inches)

#### Interpretive groups

*Land capability classification (irrigated):* None specified
*Land capability classification (nonirrigated):* 4e
*Hydrologic Soil Group:* D
*Ecological site:* F139XY006OH - Moist Till Highlands
*Hydric soil rating:* No

### Minor Components

#### Valois

*Percent of map unit:* 12 percent
*Landform:* Kames, kame moraines, end moraines
*Landform position (two-dimensional):* Summit
*Landform position (three-dimensional):* Crest
*Down-slope shape:* Convex
*Across-slope shape:* Convex
*Hydric soil rating:* No

#### Venango

*Percent of map unit:* 5 percent
*Landform:* Ground moraines
*Landform position (two-dimensional):* Shoulder, summit
*Landform position (three-dimensional):* Interfluve
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

## VIA—Volusia gravelly silt loam, 0 to 3 percent slopes

### Map Unit Setting

*National map unit symbol:* 2rhrr
*Elevation:* 300 to 1,800 feet
*Mean annual precipitation:* 37 to 49 inches
*Mean annual air temperature:* 46 to 52 degrees F
*Frost-free period:* 120 to 185 days
*Farmland classification:* Farmland of statewide importance

### Map Unit Composition

*Volusia and similar soils:* 90 percent
*Minor components:* 10 percent
*Estimates are based on observations, descriptions, and transects of the mapunit.*

### Description of Volusia

#### Setting

*Landform:* Ground moraines
*Landform position (two-dimensional):* Summit, shoulder
*Landform position (three-dimensional):* Interfluve
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Parent material:* Till

#### Typical profile

*Ap - 0 to 10 inches:* gravelly silt loam
*Bw - 10 to 17 inches:* channery silt loam
*Bx - 17 to 60 inches:* channery silt loam
*C - 60 to 80 inches:* channery silt loam

**Properties and qualities**

*Slope:* 0 to 3 percent
*Depth to restrictive feature:* 10 to 22 inches to fragipan
*Drainage class:* Somewhat poorly drained
*Runoff class:* Very high
*Capacity of the most limiting layer to transmit water (Ksat):* Very low to moderately high (0.00 to 0.20 in/hr)
*Depth to water table:* About 6 to 18 inches
*Frequency of flooding:* None
*Frequency of ponding:* None
*Available water capacity:* Very low (about 2.1 inches)

**Interpretive groups**

*Land capability classification (irrigated):* None specified
*Land capability classification (nonirrigated):* 3w
*Hydrologic Soil Group:* D
*Ecological site:* F139XY006OH - Moist Till Highlands
*Hydric soil rating:* No

**Minor Components**

**Alden**

*Percent of map unit:* 10 percent
*Landform:* Depressions on ground moraines
*Landform position (two-dimensional):* Summit
*Landform position (three-dimensional):* Dip
*Down-slope shape:* Concave
*Across-slope shape:* Concave
*Hydric soil rating:* Yes

## VlB—Volusia gravelly silt loam, 3 to 8 percent slopes

**Map Unit Setting**

*National map unit symbol:* 2rhrs
*Elevation:* 300 to 1,800 feet
*Mean annual precipitation:* 38 to 50 inches
*Mean annual air temperature:* 44 to 52 degrees F
*Frost-free period:* 120 to 185 days
*Farmland classification:* Farmland of statewide importance

**Map Unit Composition**

*Volusia and similar soils:* 92 percent
*Minor components:* 8 percent
*Estimates are based on observations, descriptions, and transects of the mapunit.*

**Description of Volusia**

**Setting**

*Landform:* Ground moraines
*Landform position (two-dimensional):* Backslope, summit

*Landform position (three-dimensional):* Interfluve, base slope, head slope, side slope
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Parent material:* Till

**Typical profile**

*Ap - 0 to 6 inches:* gravelly silt loam
*Bw - 6 to 17 inches:* channery silt loam
*Bx - 17 to 60 inches:* channery silt loam

**Properties and qualities**

*Slope:* 3 to 8 percent
*Depth to restrictive feature:* 10 to 22 inches to fragipan
*Drainage class:* Somewhat poorly drained
*Runoff class:* Very high
*Capacity of the most limiting layer to transmit water (Ksat):* Very low to moderately high (0.00 to 0.20 in/hr)
*Depth to water table:* About 6 to 18 inches
*Frequency of flooding:* None
*Frequency of ponding:* None
*Available water capacity:* Very low (about 2.1 inches)

**Interpretive groups**

*Land capability classification (irrigated):* None specified
*Land capability classification (nonirrigated):* 3w
*Hydrologic Soil Group:* D
*Ecological site:* F139XY006OH - Moist Till Highlands
*Hydric soil rating:* No

**Minor Components**

**Alden**

*Percent of map unit:* 8 percent
*Landform:* Depressions on ground moraines
*Landform position (two-dimensional):* Summit
*Landform position (three-dimensional):* Dip
*Down-slope shape:* Concave
*Across-slope shape:* Concave
*Hydric soil rating:* Yes

# Soil Information for All Uses

## Suitabilities and Limitations for Use

The Suitabilities and Limitations for Use section includes various soil interpretations displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual map unit components. This aggregation process is defined for each interpretation.

## Building Site Development

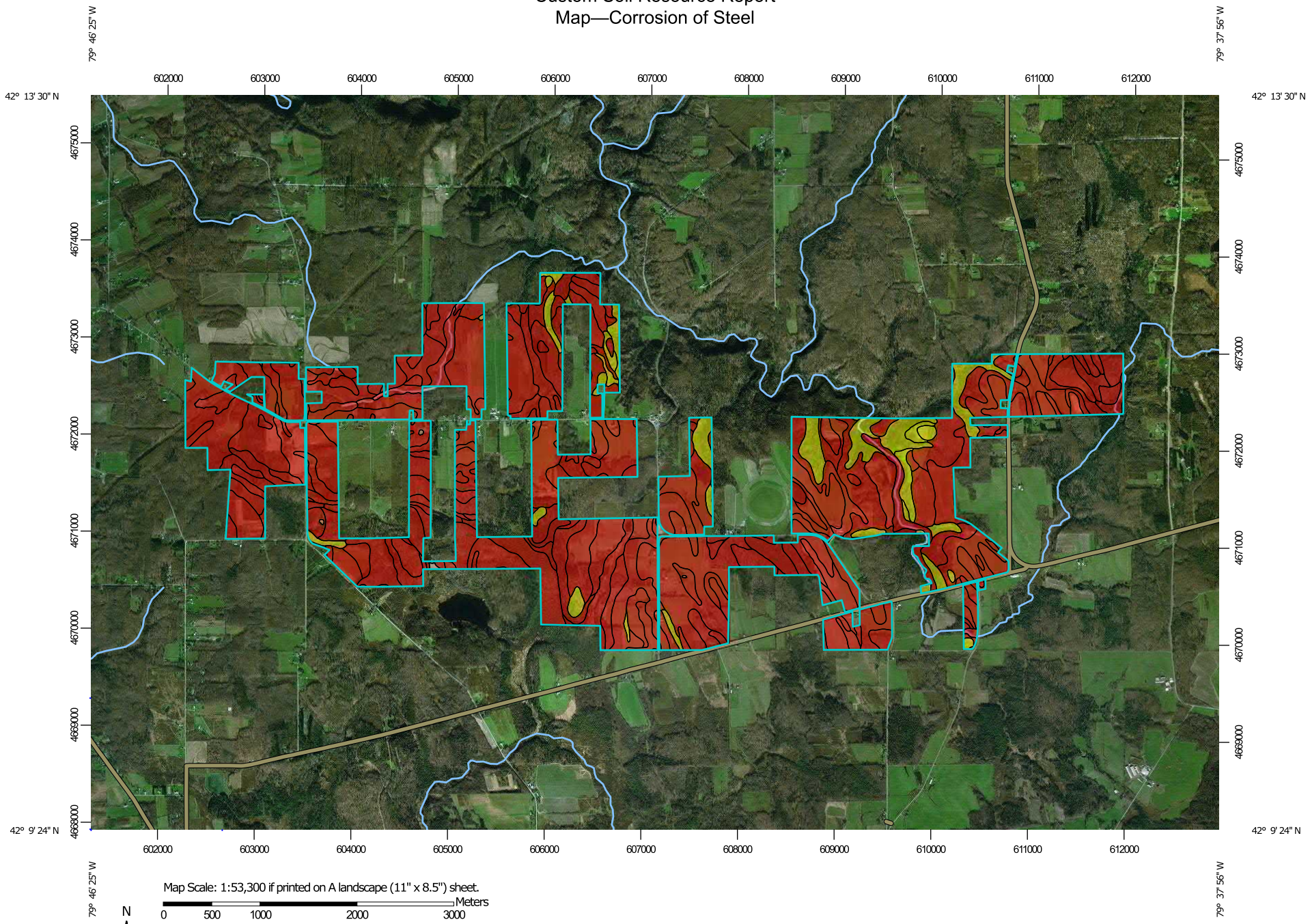
Building site development interpretations are designed to be used as tools for evaluating soil suitability and identifying soil limitations for various construction purposes. As part of the interpretation process, the rating applies to each soil in its described condition and does not consider present land use. Example interpretations can include corrosion of concrete and steel, shallow excavations, dwellings with and without basements, small commercial buildings, local roads and streets, and lawns and landscaping.

### Corrosion of Steel

"Risk of corrosion" pertains to potential soil-induced electrochemical or chemical action that corrodes or weakens uncoated steel. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. Special site examination and design may be needed if the combination of factors results in a severe hazard of corrosion. The steel in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than the steel in installations that are entirely within one kind of soil or within one soil layer.

The risk of corrosion is expressed as "low," "moderate," or "high."

# Custom Soil Resource Report
## Map—Corrosion of Steel



## MAP LEGEND

**Area of Interest (AOI)**

Area of Interest (AOI)

**Soils**

**Soil Rating Polygons**

High

Moderate

Low

Not rated or not available

**Soil Rating Lines**

High

Moderate

Low

Not rated or not available

**Soil Rating Points**

High

Moderate

Low

Not rated or not available

**Water Features**

Streams and Canals

**Transportation**

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

**Background**

Aerial Photography

## MAP INFORMATION

The soil surveys that comprise your AOI were mapped at scales ranging from 1:12,000 to 1:15,800.

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

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

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

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

Soil Survey Area: Chautauqua County, New York
Survey Area Data: Version 18, Jun 11, 2020

Soil Survey Area: Erie County, Pennsylvania
Survey Area Data: Version 18, Jun 5, 2020

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

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

Date(s) aerial images were photographed: Dec 31, 2009—May 5, 2016

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background

## MAP LEGEND

## MAP INFORMATION

imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

## Table—Corrosion of Steel

| Map unit symbol | Map unit name | Rating | Acres in AOI | Percent of AOI |
|---|---|---|---|---|
| Ad | Alden mucky silt loam | High | 75.8 | 2.2% |
| As | Ashville silt loam | High | 205.7 | 6.1% |
| BsA | Busti silt loam, 0 to 3 percent slopes | High | 97.3 | 2.9% |
| BsB | Busti silt loam, 3 to 8 percent slopes | High | 270.2 | 8.0% |
| BsC | Busti silt loam, 8 to 15 percent slopes | High | 64.3 | 1.9% |
| Cb | Canandaigua silt loam, loamy substratum | High | 8.4 | 0.2% |
| Cc | Canandaigua mucky silt loam | High | 72.8 | 2.2% |
| ChB | Chadakoin silt loam, 3 to 8 percent slopes | Moderate | 26.8 | 0.8% |
| ChC | Chadakoin silt loam, 8 to 15 percent slopes | Moderate | 35.1 | 1.0% |
| ChD | Chadakoin silt loam, 15 to 25 percent slopes | Moderate | 42.9 | 1.3% |
| ChE | Chadakoin silt loam, 25 to 35 percent slopes | Moderate | 115.7 | 3.4% |
| ChF | Chadakoin silt loam, 35 to 50 percent slopes | Moderate | 37.2 | 1.1% |
| CkB | Chautauqua silt loam, 3 to 8 percent slopes | High | 86.7 | 2.6% |
| CkC | Chautauqua silt loam, 8 to 15 percent slopes | High | 201.2 | 5.9% |
| CkD | Chautauqua silt loam, 15 to 25 percent slopes | High | 94.8 | 2.8% |
| CnB | Chenango gravelly loam, 3 to 8 percent slopes | Moderate | 2.6 | 0.1% |
| CnC | Chenango gravelly loam, 8 to 15 percent slopes | Moderate | 1.9 | 0.1% |
| CoB | Chenango channery loam, fan, 3 to 8 percent slopes | Moderate | 2.7 | 0.1% |
| DaA | Dalton silt loam, 0 to 3 percent slopes | High | 12.1 | 0.4% |
| DeC | Darien silt loam, 8 to 15 percent slopes | High | 28.8 | 0.9% |
| ErA | Erie silt loam, 0 to 3 percent slopes | High | 122.8 | 3.6% |
| ErB | Erie silt loam, 3 to 8 percent slopes | High | 759.7 | 22.5% |
| ErC | Erie silt loam, 8 to 15 percent slopes | High | 15.7 | 0.5% |

| Map unit symbol | Map unit name | Rating | Acres in AOI | Percent of AOI |
|---|---|---|---|---|
| Fe | Fluvaquents-Udifluvents complex, frequently flooded | High | 46.9 | 1.4% |
| FmA | Fremont silt loam, 0 to 3 percent slopes | High | 0.6 | 0.0% |
| FmB | Fremont silt loam, 3 to 8 percent slopes | High | 3.6 | 0.1% |
| Ho | Holderton silt loam, 0 to 3 percent slopes, occasionally flooded 140 | High | 0.7 | 0.0% |
| LnB | Langford silt loam, 3 to 8 percent slopes | High | 348.3 | 10.3% |
| LnC | Langford silt loam, 8 to 15 percent slopes | High | 330.7 | 9.8% |
| MdC | Mardin channery silt loam, 8 to 15 percent slopes | High | 8.9 | 0.3% |
| ShB | Schuyler silt loam, 3 to 8 percent slopes | High | 7.1 | 0.2% |
| ShC | Schuyler silt loam, 8 to 15 percent slopes | High | 4.4 | 0.1% |
| ToF | Towerville silt loam, 35 to 50 percent slopes | High | 12.4 | 0.4% |
| VaB | Valois gravelly silt loam, 3 to 8 percent slopes | Moderate | 1.7 | 0.1% |
| VaC | Valois gravelly silt loam, 8 to 15 percent slopes | Moderate | 0.8 | 0.0% |
| VoA | Volusia channery silt loam, 0 to 3 percent slopes | High | 121.8 | 3.6% |
| VoB | Volusia channery silt loam, 3 to 8 percent slopes | High | 108.6 | 3.2% |
| W | Water | | 2.6 | 0.1% |
| **Subtotals for Soil Survey Area** | | | **3,380.4** | **100.0%** |
| **Totals for Area of Interest** | | | **3,381.3** | **100.0%** |

| Map unit symbol | Map unit name | Rating | Acres in AOI | Percent of AOI |
|---|---|---|---|---|
| MdD | Mardin silt loam, 15 to 25 percent slopes | High | 0.1 | 0.0% |
| VlA | Volusia gravelly silt loam, 0 to 3 percent slopes | High | 0.2 | 0.0% |
| VlB | Volusia gravelly silt loam, 3 to 8 percent slopes | High | 0.7 | 0.0% |
| **Subtotals for Soil Survey Area** | | | **0.9** | **0.0%** |
| **Totals for Area of Interest** | | | **3,381.3** | **100.0%** |

### Rating Options—Corrosion of Steel

*Aggregation Method:* Dominant Condition

*Component Percent Cutoff: None Specified*

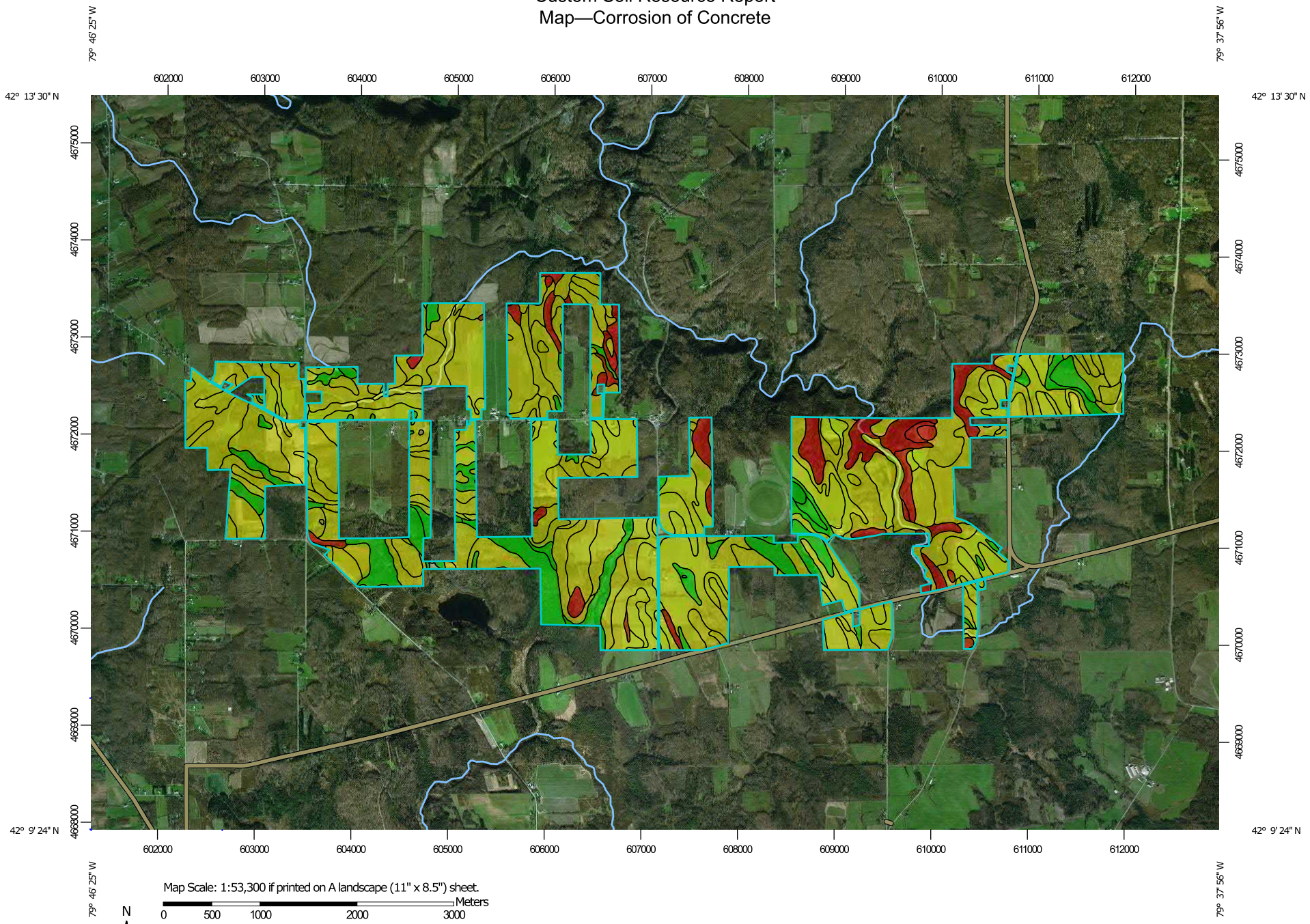
*Tie-break Rule:* Higher

## Corrosion of Concrete

"Risk of corrosion" pertains to potential soil-induced electrochemical or chemical action that corrodes or weakens concrete. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors results in a severe hazard of corrosion. The concrete in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than the concrete in installations that are entirely within one kind of soil or within one soil layer.

The risk of corrosion is expressed as "low," "moderate," or "high."

# Custom Soil Resource Report
## Map—Corrosion of Concrete




Map Scale: 1:53,300 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 500 1000 2000 3000

Feet
0 2500 5000 10000 15000

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

## MAP LEGEND

**Area of Interest (AOI)**

Area of Interest (AOI)

**Soils**

**Soil Rating Polygons**

High

Moderate

Low

Not rated or not available

**Soil Rating Lines**

High

Moderate

Low

Not rated or not available

**Soil Rating Points**

High

Moderate

Low

Not rated or not available

**Water Features**

Streams and Canals

**Transportation**

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

**Background**

Aerial Photography

## MAP INFORMATION

The soil surveys that comprise your AOI were mapped at scales ranging from 1:12,000 to 1:15,800.

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

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

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

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

Soil Survey Area: Chautauqua County, New York
Survey Area Data: Version 18, Jun 11, 2020

Soil Survey Area: Erie County, Pennsylvania
Survey Area Data: Version 18, Jun 5, 2020

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

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

Date(s) aerial images were photographed: Dec 31, 2009—May 5, 2016

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background

## MAP LEGEND

## MAP INFORMATION

imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

## Table—Corrosion of Concrete

| Map unit symbol | Map unit name | Rating | Acres in AOI | Percent of AOI |
|---|---|---|---|---|
| Ad | Alden mucky silt loam | Low | 75.8 | 2.2% |
| As | Ashville silt loam | Low | 205.7 | 6.1% |
| BsA | Busti silt loam, 0 to 3 percent slopes | Moderate | 97.3 | 2.9% |
| BsB | Busti silt loam, 3 to 8 percent slopes | Moderate | 270.2 | 8.0% |
| BsC | Busti silt loam, 8 to 15 percent slopes | Moderate | 64.3 | 1.9% |
| Cb | Canandaigua silt loam, loamy substratum | Low | 8.4 | 0.2% |
| Cc | Canandaigua mucky silt loam | Low | 72.8 | 2.2% |
| ChB | Chadakoin silt loam, 3 to 8 percent slopes | High | 26.8 | 0.8% |
| ChC | Chadakoin silt loam, 8 to 15 percent slopes | High | 35.1 | 1.0% |
| ChD | Chadakoin silt loam, 15 to 25 percent slopes | High | 42.9 | 1.3% |
| ChE | Chadakoin silt loam, 25 to 35 percent slopes | High | 115.7 | 3.4% |
| ChF | Chadakoin silt loam, 35 to 50 percent slopes | High | 37.2 | 1.1% |
| CkB | Chautauqua silt loam, 3 to 8 percent slopes | Moderate | 86.7 | 2.6% |
| CkC | Chautauqua silt loam, 8 to 15 percent slopes | Moderate | 201.2 | 5.9% |
| CkD | Chautauqua silt loam, 15 to 25 percent slopes | Moderate | 94.8 | 2.8% |
| CnB | Chenango gravelly loam, 3 to 8 percent slopes | High | 2.6 | 0.1% |
| CnC | Chenango gravelly loam, 8 to 15 percent slopes | High | 1.9 | 0.1% |
| CoB | Chenango channery loam, fan, 3 to 8 percent slopes | High | 2.7 | 0.1% |
| DaA | Dalton silt loam, 0 to 3 percent slopes | Moderate | 12.1 | 0.4% |
| DeC | Darien silt loam, 8 to 15 percent slopes | Low | 28.8 | 0.9% |
| ErA | Erie silt loam, 0 to 3 percent slopes | Moderate | 122.8 | 3.6% |
| ErB | Erie silt loam, 3 to 8 percent slopes | Moderate | 759.7 | 22.5% |
| ErC | Erie silt loam, 8 to 15 percent slopes | Moderate | 15.7 | 0.5% |

| Map unit symbol | Map unit name | Rating | Acres in AOI | Percent of AOI |
|---|---|---|---|---|
| Fe | Fluvaquents-Udifluvents complex, frequently flooded | Moderate | 46.9 | 1.4% |
| FmA | Fremont silt loam, 0 to 3 percent slopes | Moderate | 0.6 | 0.0% |
| FmB | Fremont silt loam, 3 to 8 percent slopes | Moderate | 3.6 | 0.1% |
| Ho | Holderton silt loam, 0 to 3 percent slopes, occasionally flooded 140 | Moderate | 0.7 | 0.0% |
| LnB | Langford silt loam, 3 to 8 percent slopes | Moderate | 348.3 | 10.3% |
| LnC | Langford silt loam, 8 to 15 percent slopes | Moderate | 330.7 | 9.8% |
| MdC | Mardin channery silt loam, 8 to 15 percent slopes | High | 8.9 | 0.3% |
| ShB | Schuyler silt loam, 3 to 8 percent slopes | Moderate | 7.1 | 0.2% |
| ShC | Schuyler silt loam, 8 to 15 percent slopes | Moderate | 4.4 | 0.1% |
| ToF | Towerville silt loam, 35 to 50 percent slopes | Moderate | 12.4 | 0.4% |
| VaB | Valois gravelly silt loam, 3 to 8 percent slopes | High | 1.7 | 0.1% |
| VaC | Valois gravelly silt loam, 8 to 15 percent slopes | High | 0.8 | 0.0% |
| VoA | Volusia channery silt loam, 0 to 3 percent slopes | Moderate | 121.8 | 3.6% |
| VoB | Volusia channery silt loam, 3 to 8 percent slopes | Moderate | 108.6 | 3.2% |
| W | Water | | 2.6 | 0.1% |
| **Subtotals for Soil Survey Area** | | | **3,380.4** | **100.0%** |
| **Totals for Area of Interest** | | | **3,381.3** | **100.0%** |

| Map unit symbol | Map unit name | Rating | Acres in AOI | Percent of AOI |
|---|---|---|---|---|
| MdD | Mardin silt loam, 15 to 25 percent slopes | Moderate | 0.1 | 0.0% |
| VlA | Volusia gravelly silt loam, 0 to 3 percent slopes | Moderate | 0.2 | 0.0% |
| VlB | Volusia gravelly silt loam, 3 to 8 percent slopes | Moderate | 0.7 | 0.0% |
| **Subtotals for Soil Survey Area** | | | **0.9** | **0.0%** |
| **Totals for Area of Interest** | | | **3,381.3** | **100.0%** |

### Rating Options—Corrosion of Concrete

*Aggregation Method:* Dominant Condition

*Component Percent Cutoff: None Specified*

*Tie-break Rule:* Higher

# Land Management

Land management interpretations are tools designed to guide the user in evaluating existing conditions in planning and predicting the soil response to various land management practices, for a variety of land uses, including cropland, forestland, hayland, pastureland, horticulture, and rangeland. Example interpretations include suitability for a variety of irrigation practices, log landings, haul roads and major skid trails, equipment operability, site preparation, suitability for hand and mechanical planting, potential erosion hazard associated with various practices, and ratings for fencing and waterline installation.

## Erosion Hazard (Off-Road, Off-Trail)

The ratings in this interpretation indicate the hazard of soil loss from off-road and off-trail areas after disturbance activities that expose the soil surface. The ratings are based on slope, soil erosion factor K, and an index of rainfall erosivity (R). The soil loss is caused by sheet or rill erosion in off-road or off-trail areas where 50 to 75 percent of the surface has been exposed by logging, grazing, mining, or other kinds of disturbance.

The ratings are both verbal and numerical. The hazard is described as "slight," "moderate," "severe," or "very severe." A rating of "slight" indicates that erosion is unlikely under ordinary climatic conditions; "moderate" indicates that some erosion is likely and that erosion-control measures may be needed; "severe" indicates that erosion is very likely and that erosion-control measures, including revegetation of bare areas, are advised; and "very severe" indicates that significant erosion is expected, loss of soil productivity and off-site damage are likely, and erosion-control measures are costly and generally impractical.

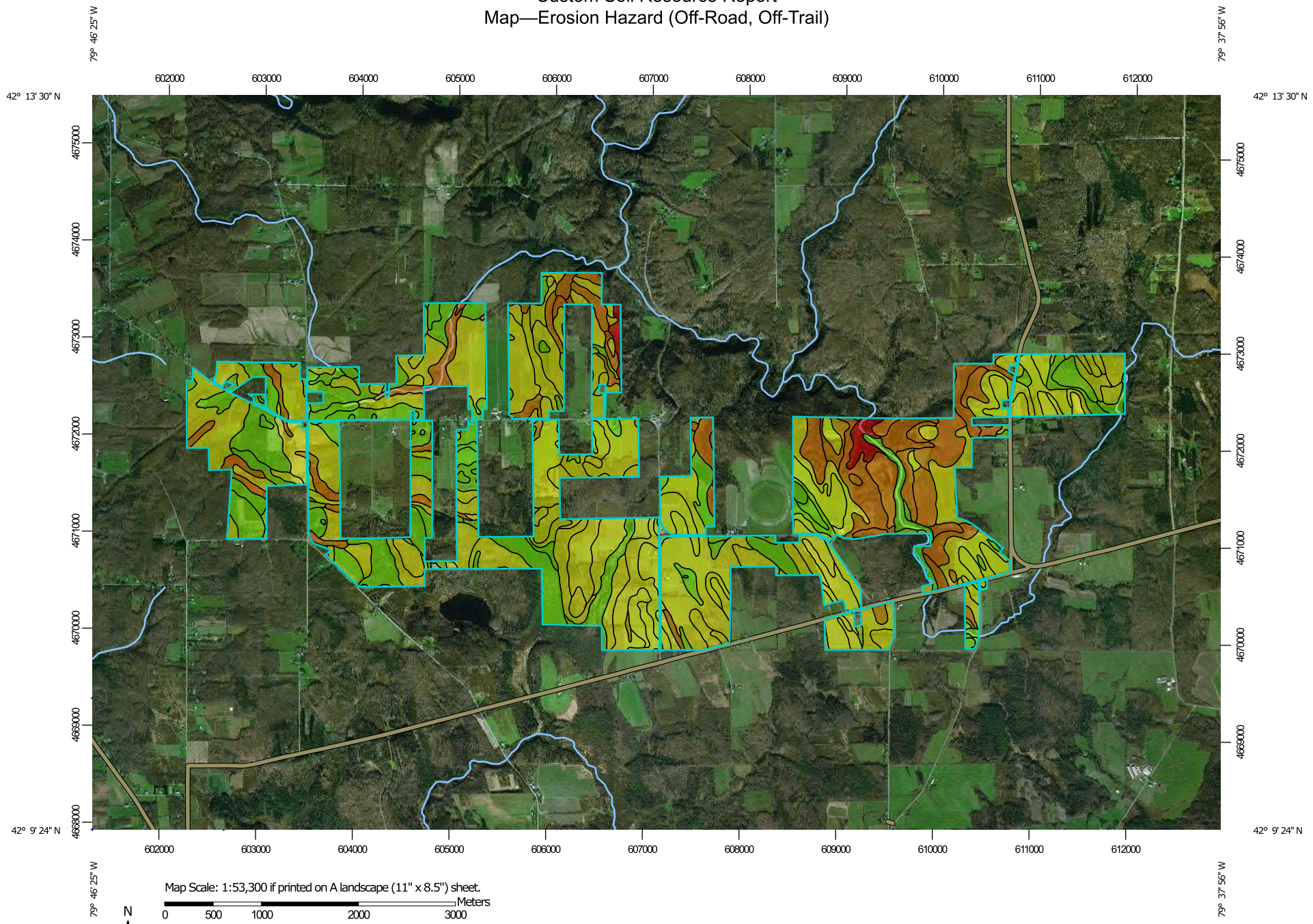
Numerical ratings indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the specified aspect of forestland management (1.00) and the point at which the soil feature is not a limitation (0.00).

The map unit components listed for each map unit in the accompanying Summary by Map Unit table in Web Soil Survey or the Aggregation Report in Soil Data Viewer are determined by the aggregation method chosen. An aggregated rating class is shown for each map unit. The components listed for each map unit are only those that have the same rating class as listed for the map unit. The percent composition

of each component in a particular map unit is presented to help the user better understand the percentage of each map unit that has the rating presented.

Other components with different ratings may be present in each map unit. The ratings for all components, regardless of the map unit aggregated rating, can be viewed by generating the equivalent report from the Soil Reports tab in Web Soil Survey or from the Soil Data Mart site. Onsite investigation may be needed to validate these interpretations and to confirm the identity of the soil on a given site.

# Custom Soil Resource Report
## Map—Erosion Hazard (Off-Road, Off-Trail)




Map Scale: 1:53,300 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 500 1000 2000 3000

Feet
0 2500 5000 10000 15000

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

## MAP LEGEND

**Area of Interest (AOI)**
- Area of Interest (AOI)

**Soils**

**Soil Rating Polygons**
- Very severe
- Severe
- Moderate
- Slight
- Not rated or not available

**Soil Rating Lines**
- Very severe
- Severe
- Moderate
- Slight
- Not rated or not available

**Soil Rating Points**
- Very severe
- Severe
- Moderate
- Slight
- Not rated or not available

**Water Features**
- Streams and Canals

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

**Background**
- Aerial Photography

## MAP INFORMATION

The soil surveys that comprise your AOI were mapped at scales ranging from 1:12,000 to 1:15,800.

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

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

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

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

Soil Survey Area: Chautauqua County, New York
Survey Area Data: Version 18, Jun 11, 2020

Soil Survey Area: Erie County, Pennsylvania
Survey Area Data: Version 18, Jun 5, 2020

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

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

Date(s) aerial images were photographed: Dec 31, 2009—May 5, 2016

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background

## MAP LEGEND

## MAP INFORMATION

imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

## Tables—Erosion Hazard (Off-Road, Off-Trail)

| Map unit symbol | Map unit name | Rating | Component name (percent) | Rating reasons (numeric values) | Acres in AOI | Percent of AOI |
|---|---|---|---|---|---|---|
| Ad | Alden mucky silt loam | Slight | Alden (80%) | | 75.8 | 2.2% |
| As | Ashville silt loam | Slight | Ashville (75%) | | 205.7 | 6.1% |
| BsA | Busti silt loam, 0 to 3 percent slopes | Slight | Busti (80%) | | 97.3 | 2.9% |
| | | | Volusia (5%) | | | |
| | | | Fremont (5%) | | | |
| | | | Ashville (5%) | | | |
| BsB | Busti silt loam, 3 to 8 percent slopes | Moderate | Busti (80%) | Surface kw times slope times R index (0.31) | 270.2 | 8.0% |
| | | | Fremont (5%) | Surface kw times slope times R index (0.31) | | |
| | | | Volusia (5%) | Surface kw times slope times R index (0.04) | | |
| BsC | Busti silt loam, 8 to 15 percent slopes | Severe | Busti (80%) | Surface kw times slope times R index (0.79) | 64.3 | 1.9% |
| | | | Chautauqua (8%) | Surface kw times slope times R index (0.82) | | |
| | | | Fremont (6%) | Surface kw times slope times R index (0.79) | | |
| Cb | Canandaigua silt loam, loamy substratum | Slight | Canandaigua, loamy substratum (80%) | | 8.4 | 0.2% |
| Cc | Canandaigua mucky silt loam | Slight | Canandaigua (85%) | | 72.8 | 2.2% |
| ChB | Chadakoin silt loam, 3 to 8 percent slopes | Moderate | Chadakoin (80%) | Surface kw times slope times R index (0.31) | 26.8 | 0.8% |
| ChC | Chadakoin silt loam, 8 to 15 percent slopes | Severe | Chadakoin (75%) | Surface kw times slope times R index (0.79) | 35.1 | 1.0% |
| ChD | Chadakoin silt loam, 15 to 25 percent slopes | Severe | Chadakoin (80%) | Surface kw times slope times R index (0.90) | 42.9 | 1.3% |
| ChE | Chadakoin silt loam, 25 to 35 percent slopes | Severe | Chadakoin (80%) | Surface kw times slope times R index (0.98) | 115.7 | 3.4% |
| ChF | Chadakoin silt loam, 35 to 50 percent slopes | Very Severe | Chadakoin (75%) | Surface kw times slope times R index (1.00) | 37.2 | 1.1% |

| Map unit symbol | Map unit name | Rating | Component name (percent) | Rating reasons (numeric values) | Acres in AOI | Percent of AOI |
|---|---|---|---|---|---|---|
| CkB | Chautauqua silt loam, 3 to 8 percent slopes | Moderate | Chautauqua (80%) | Surface kw times slope times R index (0.44) | 86.7 | 2.6% |
| | | | Langford (7%) | Surface kw times slope times R index (0.06) | | |
| | | | Chadakoin (5%) | Surface kw times slope times R index (0.31) | | |
| CkC | Chautauqua silt loam, 8 to 15 percent slopes | Severe | Chautauqua (80%) | Surface kw times slope times R index (0.82) | 201.2 | 5.9% |
| | | | Chadakoin (8%) | Surface kw times slope times R index (0.79) | | |
| CkD | Chautauqua silt loam, 15 to 25 percent slopes | Severe | Chautauqua (80%) | Surface kw times slope times R index (0.98) | 94.8 | 2.8% |
| | | | Chadakoin (10%) | Surface kw times slope times R index (0.90) | | |
| | | | Towerville (5%) | Surface kw times slope times R index (0.87) | | |
| | | | Langford (5%) | Surface kw times slope times R index (0.87) | | |
| CnB | Chenango gravelly loam, 3 to 8 percent slopes | Slight | Chenango (80%) | | 2.6 | 0.1% |
| CnC | Chenango gravelly loam, 8 to 15 percent slopes | Moderate | Chenango (80%) | Surface kw times slope times R index (0.25) | 1.9 | 0.1% |
| CoB | Chenango channery loam, fan, 3 to 8 percent slopes | Slight | Chenango, fan (75%) | | 2.7 | 0.1% |
| DaA | Dalton silt loam, 0 to 3 percent slopes | Slight | Dalton (80%) | | 12.1 | 0.4% |
| DeC | Darien silt loam, 8 to 15 percent slopes | Moderate | Darien (80%) | Surface kw times slope times R index (0.75) | 28.8 | 0.9% |
| ErA | Erie silt loam, 0 to 3 percent slopes | Slight | Erie (80%) | | 122.8 | 3.6% |
| | | | Busti (4%) | | | |
| | | | Fremont (4%) | | | |
| | | | Ashville (4%) | | | |
| | | | Darien (4%) | | | |

| Map unit symbol | Map unit name | Rating | Component name (percent) | Rating reasons (numeric values) | Acres in AOI | Percent of AOI |
|---|---|---|---|---|---|---|
| ErB | Erie silt loam, 3 to 8 percent slopes | Moderate | Erie (75%) | Surface kw times slope times R index (0.44) | 759.7 | 22.5% |
| | | | Fremont (5%) | Surface kw times slope times R index (0.31) | | |
| | | | Langford (5%) | Surface kw times slope times R index (0.67) | | |
| | | | Busti (5%) | Surface kw times slope times R index (0.31) | | |
| ErC | Erie silt loam, 8 to 15 percent slopes | Severe | Erie (75%) | Surface kw times slope times R index (0.82) | 15.7 | 0.5% |
| | | | Fremont (5%) | Surface kw times slope times R index (0.79) | | |
| | | | Busti (5%) | Surface kw times slope times R index (0.79) | | |
| | | | Langford (5%) | Surface kw times slope times R index (0.87) | | |
| Fe | Fluvaquents-Udifluvents complex, frequently flooded | Slight | Fluvaquents (55%) | | 46.9 | 1.4% |
| | | | Udifluvents (30%) | | | |
| FmA | Fremont silt loam, 0 to 3 percent slopes | Slight | Fremont (80%) | | 0.6 | 0.0% |
| | | | Ashville (8%) | | | |
| | | | Volusia (7%) | | | |
| FmB | Fremont silt loam, 3 to 8 percent slopes | Moderate | Fremont (80%) | Surface kw times slope times R index (0.31) | 3.6 | 0.1% |
| | | | Volusia (5%) | Surface kw times slope times R index (0.27) | | |
| | | | Orpark (5%) | Surface kw times slope times R index (0.75) | | |
| Ho | Holderton silt loam, 0 to 3 percent slopes, occasionally flooded 140 | Slight | Holderton (85%) | | 0.7 | 0.0% |
| | | | Middlebury (10%) | | | |
| | | | Wayland (5%) | | | |
| LnB | Langford silt loam, 3 to 8 percent slopes | Moderate | Langford (85%) | Surface kw times slope times R index (0.06) | 348.3 | 10.3% |

| Map unit symbol | Map unit name | Rating | Component name (percent) | Rating reasons (numeric values) | Acres in AOI | Percent of AOI |
|---|---|---|---|---|---|---|
| | | | Chautauqua (5%) | Surface kw times slope times R index (0.44) | | |
| LnC | Langford silt loam, 8 to 15 percent slopes | Moderate | Langford (85%) | Surface kw times slope times R index (0.67) | 330.7 | 9.8% |
| | | | Erie (10%) | Surface kw times slope times R index (0.44) | | |
| MdC | Mardin channery silt loam, 8 to 15 percent slopes | Moderate | Mardin (88%) | Surface kw times slope times R index (0.52) | 8.9 | 0.3% |
| | | | Volusia (5%) | Surface kw times slope times R index (0.04) | | |
| ShB | Schuyler silt loam, 3 to 8 percent slopes | Moderate | Schuyler (85%) | Surface kw times slope times R index (0.31) | 7.1 | 0.2% |
| | | | Towerville (5%) | Surface kw times slope times R index (0.75) | | |
| ShC | Schuyler silt loam, 8 to 15 percent slopes | Severe | Schuyler (85%) | Surface kw times slope times R index (0.79) | 4.4 | 0.1% |
| | | | Towerville (5%) | Surface kw times slope times R index (0.87) | | |
| ToF | Towerville silt loam, 35 to 50 percent slopes | Severe | Towerville (75%) | Surface kw times slope times R index (0.99) | 12.4 | 0.4% |
| VaB | Valois gravelly silt loam, 3 to 8 percent slopes | Moderate | Valois (85%) | Surface kw times slope times R index (0.06) | 1.7 | 0.1% |
| VaC | Valois gravelly silt loam, 8 to 15 percent slopes | Moderate | Valois (75%) | Surface kw times slope times R index (0.67) | 0.8 | 0.0% |
| VoA | Volusia channery silt loam, 0 to 3 percent slopes | Slight | Volusia (90%) | | 121.8 | 3.6% |
| | | | Mardin (5%) | | | |
| | | | Chippewa (5%) | | | |
| VoB | Volusia channery silt loam, 3 to 8 percent slopes | Moderate | Volusia (90%) | Surface kw times slope times R index (0.04) | 108.6 | 3.2% |
| | | | Mardin (5%) | Surface kw times slope times R index (0.52) | | |
| W | Water | Not rated | Water (100%) | | 2.6 | 0.1% |
| **Subtotals for Soil Survey Area** | | | | | **3,380.4** | **100.0%** |
| **Totals for Area of Interest** | | | | | **3,381.3** | **100.0%** |

| Map unit symbol | Map unit name | Rating | Component name (percent) | Rating reasons (numeric values) | Acres in AOI | Percent of AOI |
|---|---|---|---|---|---|---|
| MdD | Mardin silt loam, 15 to 25 percent slopes | Severe | Mardin (83%) | Surface kw times slope times R index (0.93) | 0.1 | 0.0% |
| | | | Valois (12%) | Surface kw times slope times R index (0.93) | | |
| | | | Venango (5%) | Surface kw times slope times R index (0.78) | | |
| VlA | Volusia gravelly silt loam, 0 to 3 percent slopes | Slight | Volusia (90%) | | 0.2 | 0.0% |
| | | | Alden (10%) | | | |
| VlB | Volusia gravelly silt loam, 3 to 8 percent slopes | Slight | Volusia (92%) | | 0.7 | 0.0% |
| | | | Alden (8%) | | | |
| **Subtotals for Soil Survey Area** | | | | | **0.9** | **0.0%** |
| **Totals for Area of Interest** | | | | | **3,381.3** | **100.0%** |

| Rating | Acres in AOI | Percent of AOI |
|---|---|---|
| Moderate | 1,983.9 | 58.7% |
| Slight | 771.0 | 22.8% |
| Severe | 586.6 | 17.3% |
| Very Severe | 37.2 | 1.1% |
| Null or Not Rated | 2.6 | 0.1% |
| **Totals for Area of Interest** | **3,381.3** | **100.0%** |

## Rating Options—Erosion Hazard (Off-Road, Off-Trail)

*Aggregation Method:* Dominant Condition

*Component Percent Cutoff: None Specified*

*Tie-break Rule:* Higher

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# C. Soil Boring Logs

MOTT MACDONALD

# SOIL BORING LOG

BORING NO.: **B-01**
Page **1** of **1**

| | | | |
|---|---|---|---|
| **Project:** | South Ripley Solar | **Project No.:** | 505100267-001 |
| **Location:** | South Ripley, NY | **Project Mgr:** | Eric Pauli |
| **Client:** | ConnectGen | **Field Eng. Staff:** | Diego Melgar |
| **Drilling Co.:** | Earth Dimensions, Inc. | **Date/Time Started:** | July 20, 2020 at 2:45 pm |
| **Driller/Helper:** | Brian B. /Harold Kleever | **Date/Time Finished:** | July 20, 2020 at 3:30 pm |

**Elevation:** Grade ft. **Vertical Datum:**

**Boring Location:** See Boring Location Plan

**Coord.:** **Lat:** 42.199705° **Long:** -79.755868°

**Horizontal Datum:** NAD 1983

| Item | Casing | Sampler | Core Barrel |
|---|---|---|---|
| Type | HSA | SS | NQ |
| Length | 5 ft | 2 ft | - in |
| Inside Dia. (in.) | 4.25 | 1.375 | 1.875 |
| Hammer Wt. (lb.) | 140 | 140 | - |
| Hammer Fall (in.) | 30 | 30 | - |

**Rig Make & Model:** Diedrich D-50

☐ Truck ☐ Tripod ☐ Cat-Head
☐ ATV ☐ Geoprobe ☑ Winch
☑ Track ☐ Air Track ☐ Roller Bit
☐ Skid ☐ _____ ☑ Cutting Head

**Hammer Type**
☐ Safety
☑ Doughnut
☐ Automatic
☐ _____

**Drilling Fluid**
☐ Bentonite
☐ Polymer
☐ Water
☑ None

**Drill Rod Size:**

**Casing Advance**
Hollow Stem Auger

| Depth/ Elev. (ft) | Sample No. / Interval (ft) | Rec. (in) | Sample Blows per 6" | Stratum Graphic | USCS Group Symbol | Visual - Manual Identification & Description (Density/consistency, color, Group Name, constituents, particle size, structure, moisture, optional descriptions, geologic interpretation, Symbol) | Field Tests: Dilatancy | Toughness | Plasticity | Dry Strength | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | S-1 0.0'- 2.0' 0.4'-' | 20 | 2 3 5 6 | | | 0.4 Top 5" - TOPSOIL | - | - | - | - | |
| | | | | | CL | Medium stiff, brown CLAY, little fine Sand, little Silt, dry (CL) | - | M | L | H | PP = 1.0 tsf TV = N/A |
| | S-2 2.0'- 4.0' | 24 | 6 8 7 10 | | CL | Very stiff, brown CLAY, some coarse to fine Sand, trace fine Gravel, moist (CL) | - | M | L | M | PP = 2.5 tsf TV = 0.5 tsf |
| 5 | S-3 4.0'- 6.0' | 24 | 8 8 9 10 | | CL | Very stiff, brown CLAY, some Sand, trace fine Gravel, trace Silt, moist (CL) | - | M | L | L | PP = 4.0 tsf TV = 1.0 tsf |
| | S-4 6.0'- 8.0' | 24 | 5 10 13 27 | | CL | Very stiff, brown CLAY, some coarse to fine Gravel, some coarse to fine Sand, moist (CL) | - | M | L | H | PP = 2.0 tsf TV = N/A |
| | S-5 8.0'- 10.0' | 5 | 50/5" | | CL | Hard, brown CLAY, some coarse to fine Gravel, some coarse to fine Sand, dry (CL) | - | M | L | H | PP = 3.5 tsf TV = N/A |
| 10 | | | | | | 10.5 | | | | | |
| | | | | | | Auger refusal at 10.5 feet BGS. Top of Rock at 10.5 feet BGS. See Rock Coring Log. | | | | | |
| 15 | | | | | | | | | | | |

**Water Level Data**

| Date | Time | Elapsed Time (hr) | Depth in feet to: Bot. of Casing | Bottom of Hole | Water |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

**Sample Type**

**O** Open End Rod
**T** Thin-Wall Tube
**U** Undisturbed Sample
**SS** Split Spoon Sample
**G** Grab Sample

**Notes:**

No groundwater encountered during subsurface investigation.

Boring No.: **B-01**

**Field Test Legend:**
Dilatancy: N - None S - Slow R - Rapid
Toughness: L - Low M - Medium H - High
Plasticity: NP - Non-Plastic L - Low M - Medium H - High
Dry Strength: N - None L - Low M - Medium H - High VH - Very High

NOTES: 1.) "ppd" denotes soil sample average diametral pocket penetrometer reading. 2.) "ppa" denotes soil sample average axial pocket penetrometer reading.
3.) Maximum Particle Size is determined by direct observation within limitations of sampler size. 4.) Soil identifications and field tests based on visual-manual methods per ASTM D2488.

MOTT MACDONALD

# CORE BORING LOG

BORING NO.: **B-01**

Page **1** of **1**

| | | | |
|---|---|---|---|
| **Project:** | South Ripley Solar | **Project No.:** | 505100267-001 |
| **Location:** | South Ripley, NY | **Project Mgr:** | Eric Pauli |
| **Client:** | ConnectGen | **Field Eng. Staff:** | Diego Melgar |
| **Drilling Co.:** | Earth Dimensions, Inc. | **Date/Time Started:** | July 20, 2020 at 2:45 pm |
| **Driller/Helper:** | Brian B. /Harold Kleever | **Date/Time Finished:** | July 20, 2020 at 3:30 pm |

**Elevation:** Grade ft. **Vertical Datum:**

**Boring Location:** See Boring Location Plan

**Coord.:** **Lat:** 42.199705° **Long:** -79.755868°

| Item | Casing | Core Barrel | Core Bit |
|---|---|---|---|
| Type | HSA | NQ | Imp. Diamond |
| Length | 5 ft | 5 ft | 6 in |
| Inside Dia. (in.) | 4.25 | 1.875 | 1.875 |

**Horizontal Datum:** NAD 1983

**Rig Make & Model:** Diedrich D-50

**Drilling Method:** Wireline

| Depth/ Elev. (ft) | Avg Core Rate (min /ft) | Depth (ft) | Run/ (Box) No. | Rec (in. / %) | RQD (in / %) | Rock Core Hard. | Rock Core Weath | Stratum Graphic | Visual Identification, Description and Remarks (Rock type, colour, texture, weathering, field strength, discontinuity spacing, optional additional geological observations) | Depth (ft.) | Discontinuities Type | Dip | Rgh | Wea | Aper | Infill | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | SEE TEST BORING LOG FOR OVERBURDEN DETAILS | | | | | | | | |
| | 2.29 | 10.5 | | | | | | | SHALE, gray, fine grained, moderately weathered, weak, very close to moderately spaced discontinuities 10.5' - 15.5' Highly Fractured throughout | | | | | | | | Augered to 10.5 feet BGS and began coring. Soft Silt inclusions throughout core run. |
| | 1.25 | | | | | | | | | 11.50 | J | 20 | P,R | DG | | ML | |
| | | | | | | | | | | 11.90 | J | 30 | P,R | DG | | ML | |
| | 1.39 | | R-1 | 44 73% | 15 24% | R2 | M | | | | | | | | | | |
| | 2.11 | | | | | | | | | 13.20 | J | 20 | P,R | DS | | Fe | |
| 15 | 1.20 | 15.5 | | | | | | | 15.5 | | | | | | | | |
| | | | | | | | | | End of Boring at 15.5 feet BGS. Borehole backfilled with soil cuttings. | | | | | | | | |
| 20 | | | | | | | | | | | | | | | | | |
| 25 | | | | | | | | | | | | | | | | | |
| 30 | | | | | | | | | | | | | | | | | |

**Water Level Data**

| Date | Time | Elapsed Time (hr) | Depth in feet to: Bot. of Casing | Bottom of Hole | Water |
|---|---|---|---|---|---|
| | | - | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

**Notes:**

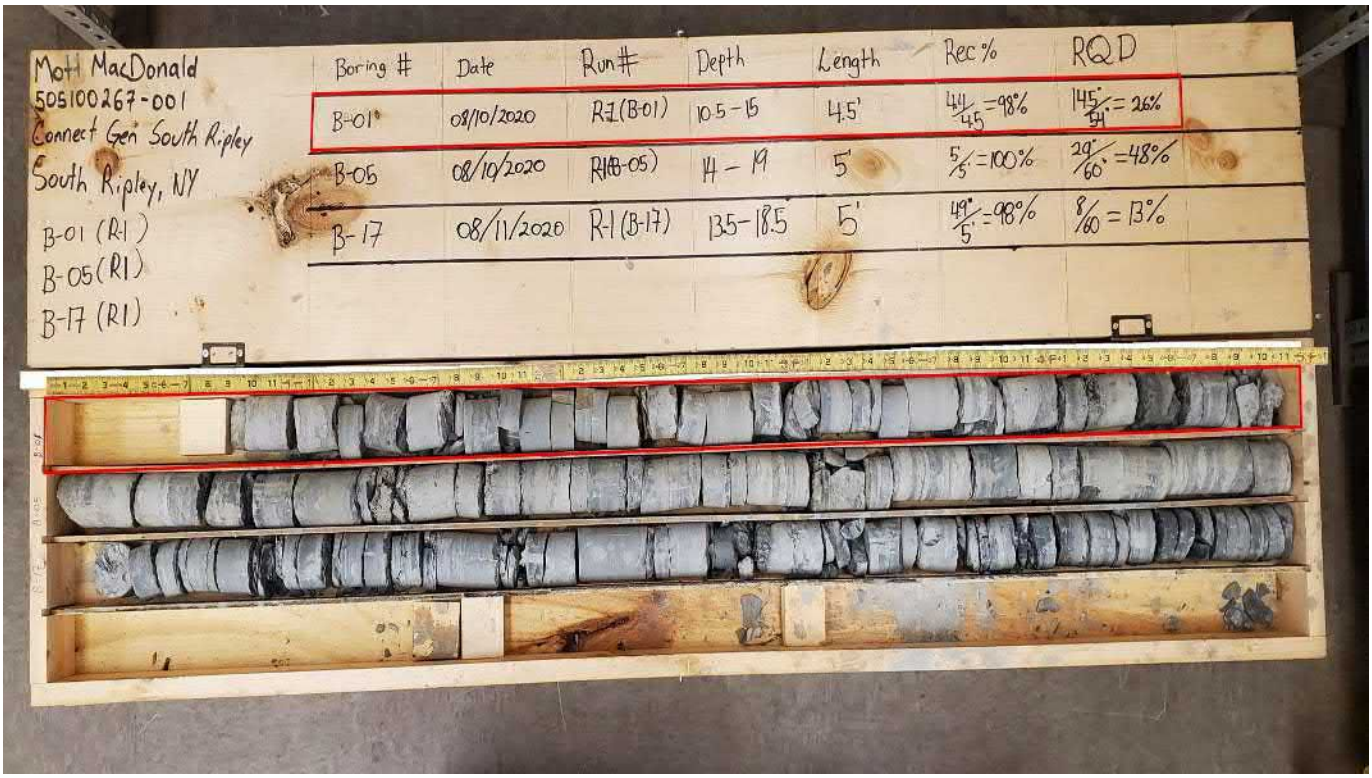


Figure B-01.1
B-01 Box 1 R1 Dry


Figure B-01.2
B-01 Box 1 R1 Wet

| | | |
|---|---|---|
| MOTT MACDONALD M M | **South Ripley Solar**<br>**Rock Core Photographs** | **BORING NO.:**<br>B-01 |

MOTT MACDONALD

# SOIL BORING LOG

BORING NO.: **B-02**
Page **1** of **1**

| | | | |
|---|---|---|---|
| **Project:** | South Ripley Solar | **Project No.:** | 505100267-001 |
| **Location:** | South Ripley, NY | **Project Mgr:** | Eric Pauli |
| **Client:** | ConnectGen | **Field Eng. Staff:** | Diego Melgar |
| **Drilling Co.:** | Earth Dimensions, Inc. | **Date/Time Started:** | July 21, 2020 at 7:20 am |
| **Driller/Helper:** | Brian B. /Harold Kleever | **Date/Time Finished:** | July 21, 2020 at 8:02 am |

**Elevation:** Grade ft. **Vertical Datum:** | **Boring Location:** See Boring Location Plan | **Coord.:** **Lat:** 42.198136° **Long:** -79.751372° | **Horizontal Datum:** NAD 1983

| Item | Casing | Sampler | Core Barrel |
|---|---|---|---|
| Type | HSA | SS | - |
| Length | 5 ft | 2 ft | - |
| Inside Dia. (in.) | 4.25 | 1.375 | - |
| Hammer Wt. (lb.) | 140 | 140 | - |
| Hammer Fall (in.) | 30 | 30 | - |

**Rig Make & Model:** Diedrich D-50

| | | | |
|---|---|---|---|
| ☐ Truck | ☐ Tripod | ☐ Cat-Head | |
| ☐ ATV | ☐ Geoprobe | ☑ Winch | |
| ☑ Track | ☐ Air Track | ☐ Roller Bit | |
| ☐ Skid | ☐ _____ | ☑ Cutting Head | |

**Hammer Type**: ☐ Safety ☑ Doughnut ☐ Automatic ☐ _____

**Drilling Fluid**: ☐ Bentonite ☐ Polymer ☐ Water ☑ None

**Drill Rod Size:**

**Casing Advance**: Hollow Stem Auger

| Depth/ Elev. (ft) | Sample No. / Interval (ft) | Rec. (in) | Sample Blows per 6" | Stratum Graphic | USCS Group Symbol | Visual - Manual Identification & Description (Density/consistency, color, Group Name, constituents, particle size, structure, moisture, optional descriptions, geologic interpretation, Symbol) | Field Tests: Dilatancy | Toughness | Plasticity | Dry Strength | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | S-1 | 21 | 2 | | | Top 7" - TOPSOIL | - | - | - | - | |
| | 0.0'- 2.0' | | 5 | | | 0.6 | | | | | |
| | 0.6'-' | | 3 | | CL | Stiff, brown CLAY, some fine Sand, little fine Gravel, little Silt, dry (CL) | - | M | L | M | PP = 2.0 tsf<br>TV = 2.0 tsf |
| | | | 10 | | | | | | | | |
| | S-2 | 22 | 13 | | CL | Very stiff, light brown CLAY, little coarse to fine Sand, little fine Gravel, dry (CL) | - | M | L | VH | PP > 4.5 tsf<br>TV = 1.5 tsf<br>Mottling observed on Clay. |
| | 2.0'- 4.0' | | 11 | | | | | | | | |
| | | | 15 | | | | | | | | |
| | | | 38 | | | | | | | | |
| | S-3 | 23 | 10 | | CL | Very stiff, light brown CLAY, little coarse to fine Sand, little Silt, trace fine Gravel, dry (CL) | N | M | L | VH | PP = 4.5 tsf<br>TV = 2.5 tsf |
| | 4.0'- 6.0' | | 10 | | | | | | | | |
| 5 | | | 13 | | | | | | | | |
| | | | 18 | | | | | | | | |
| | S-4 | 9 | 13 | | CL | Hard, light brown CLAY, some coarse to fine Gravel, little Sand, little Silt, dry (CL) | N | M | L | VH | PP > 4.5 tsf<br>TV = 2.0 tsf<br>Fractured Shale fragments observed from 6 to 8 feet BGS. |
| | 6.0'- 8.0' | | 50/5" | | | | | | | | |
| | S-5 | 5 | 50/5" | | CL | Hard, light brown CLAY, some fine Gravel, little Sand, trace Silt, dry (CL) | N | M | L | VH | PP > 4.5 tsf<br>TV = 1.5 tsf<br>Weathered Shale fragments observed from 8 to 8.5 feet BGS. |
| | 8.0'- 8.5' | | | | | 8.5 | | | | | |
| | | | | | | Auger refusal at 8.5 feet BGS.<br>End of Boring at 8.5 feet BGS.<br>Borehole backfilled with soil cuttings. | | | | | |
| 10 | | | | | | | | | | | |
| 15 | | | | | | | | | | | |

**Water Level Data**

| Date | Time | Elapsed Time (hr) | Depth in feet to: Bot. of Casing | Bottom of Hole | Water |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

**Sample Type**

| | |
|---|---|
| **O** | Open End Rod |
| **T** | Thin-Wall Tube |
| **U** | Undisturbed Sample |
| **SS** | Split Spoon Sample |
| **G** | Grab Sample |

**Notes:**

No groundwater encountered during subsurface investigation.

Boring No.: **B-02**

**Field Test Legend:**
Dilatancy: N - None S - Slow R - Rapid
Toughness: L - Low M - Medium H - High
Plasticity: NP - Non-Plastic L - Low M - Medium H - High
Dry Strength: N - None L - Low M - Medium H - High VH - Very High

NOTES: 1.) "ppd" denotes soil sample average diametral pocket penetrometer reading. 2.) "ppa" denotes soil sample average axial pocket penetrometer reading.
3.) Maximum Particle Size is determined by direct observation within limitations of sampler size. 4.) Soil identifications and field tests based on visual-manual methods per ASTM D2488.

MOTT MACDONALD

# SOIL BORING LOG

BORING NO.: **B-03**
Page **1** of **1**

| | | | |
|---|---|---|---|
| **Project:** | South Ripley Solar | **Project No.:** | 505100267-001 |
| **Location:** | South Ripley, NY | **Project Mgr:** | Eric Pauli |
| **Client:** | ConnectGen | **Field Eng. Staff:** | Diego Melgar |
| **Drilling Co.:** | Earth Dimensions, Inc. | **Date/Time Started:** | July 21, 2020 at 8:15 am |
| **Driller/Helper:** | Brian B. /Harold Kleever | **Date/Time Finished:** | July 21, 2020 at 9:05 am |

**Elevation:** Grade ft. **Vertical Datum:** | **Boring Location:** See Boring Location Plan | **Coord.:** **Lat:** 42.196256° **Long:** -79.750305° | **Horizontal Datum:** NAD 1983

| Item | Casing | Sampler | Core Barrel |
|---|---|---|---|
| Type | HSA | SS | - |
| Length | 5 ft | 2 ft | - |
| Inside Dia. (in.) | 4.25 | 1.375 | - |
| Hammer Wt. (lb.) | 140 | 140 | - |
| Hammer Fall (in.) | 30 | 30 | - |

**Rig Make & Model:** Diedrich D-50

| | | | | |
|---|---|---|---|---|
| ☐ Truck | ☐ Tripod | ☐ Cat-Head | **Hammer Type** | **Drilling Fluid** |
| ☐ ATV | ☐ Geoprobe | ☑ Winch | ☐ Safety | ☐ Bentonite |
| ☑ Track | ☐ Air Track | ☐ Roller Bit | ☑ Doughnut | ☐ Polymer |
| ☐ Skid | ☐ _____ | ☑ Cutting Head | ☐ Automatic | ☐ Water |
| | | | ☐ _____ | ☑ None |

**Drill Rod Size:** | **Casing Advance:** Hollow Stem Auger

| Depth/ Elev. (ft) | Sample No. / Interval (ft) | Rec. (in) | Sample Blows per 6" | Stratum Graphic | USCS Group Symbol | Visual - Manual Identification & Description (Density/consistency, color, Group Name, constituents, particle size, structure, moisture, optional descriptions, geologic interpretation, Symbol) | Field Tests: Dilatancy | Toughness | Plasticity | Dry Strength | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | S-1 0.0'- 2.0' | 16 | 1<br>2<br>29<br>40 | | | Top 7" - TOPSOIL<br>0.6 | - | - | - | - | Mudstone and Shale fragments observed from 0 to 2 feet BGS. |
| | | | | | GC | Dense, grayish brown fine GRAVEL, some Clay, some fine Sand, little Silt, dry (GC)<br>2.0 | | | | | |
| | S-2 2.0'- 4.0' | 19 | 14<br>9<br>13<br>27 | | CL | Very stiff, light brown CLAY, some coarse to fine Sand, little coarse to fine Gravel, trace Silt, dry (CL) | S | M | L | VH | PP > 4.5 tsf<br>TV = 2.5 tsf |
| 5 | S-3 4.0'- 6.0' | 24 | 19<br>21<br>29<br>31 | | CL | Hard, light brown CLAY, some fine Gravel, some coarse to fine Sand, trace Silt, dry (CL) | S | M | L | H | PP = 4.5 tsf<br>TV = 1.0 tsf |
| | S-4 6.0'- 8.0' | 24 | 13<br>24<br>25<br>49 | | CL | Hard, light brown CLAY, some coarse to fine Gravel, little coarse to fine Sand, trace Silt, dry (CL) | N | M | L | M | PP = 4.5 tsf<br>TV = N/A |
| | S-5 8.0'- 10.0' | 8 | 14<br>50/5" | | CL | Hard, light brown CLAY, some fine Gravel, little coarse to fine Sand, trace Silt, dry (CL)<br>10.0 | N | M | L | L | PP = 3.5 tsf<br>TV = 1.0 tsf |
| 10 | | | | | | Auger refusal at 10 feet BGS.<br>End of Boring at 10 feet BGS.<br>Borehole backfilled with soil cuttings. | | | | | |
| 15 | | | | | | | | | | | |

**Water Level Data**

| Date | Time | Elapsed Time (hr) | Depth in feet to: Bot. of Casing | Bottom of Hole | Water |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

**Sample Type**

| | |
|---|---|
| **O** | Open End Rod |
| **T** | Thin-Wall Tube |
| **U** | Undisturbed Sample |
| **SS** | Split Spoon Sample |
| **G** | Grab Sample |

**Notes:**
No groundwater encountered during subsurface investigation.

Boring No.: **B-03**

**Field Test Legend:**
Dilatancy: N - None S - Slow R - Rapid
Toughness: L - Low M - Medium H - High
Plasticity: NP - Non-Plastic L - Low M - Medium H - High
Dry Strength: N - None L - Low M - Medium H - High VH - Very High

NOTES: 1.) "ppd" denotes soil sample average diametral pocket penetrometer reading. 2.) "ppa" denotes soil sample average axial pocket penetrometer reading.
3.) Maximum Particle Size is determined by direct observation within limitations of sampler size. 4.) Soil identifications and field tests based on visual-manual methods per ASTM D2488.

MOTT MACDONALD

# SOIL BORING LOG

BORING NO.: **B-04**
Page **1** of **1**

| | | | |
|---|---|---|---|
| **Project:** | South Ripley Solar | **Project No.:** | 505100267-001 |
| **Location:** | South Ripley, NY | **Project Mgr:** | Eric Pauli |
| **Client:** | ConnectGen | **Field Eng. Staff:** | Diego Melgar |
| **Drilling Co.:** | Earth Dimensions, Inc. | **Date/Time Started:** | July 21, 2020 at 9:40 am |
| **Driller/Helper:** | Brian B. /Harold Kleever | **Date/Time Finished:** | July 21, 2020 at 10:33 am |

**Elevation:** Grade ft. **Vertical Datum:**

**Boring Location:** See Boring Location Plan

**Coord.:** **Lat:** 42.192140° **Long:** -79.751582°

**Horizontal Datum:** NAD 1983

| Item | Casing | Sampler | Core Barrel |
|---|---|---|---|
| Type | HSA | SS | - |
| Length | 5 ft | 2 ft | - |
| Inside Dia. (in.) | 4.25 | 1.375 | - |
| Hammer Wt. (lb.) | 140 | 140 | - |
| Hammer Fall (in.) | 30 | 30 | - |

**Rig Make & Model:** Diedrich D-50

☐ Truck ☐ Tripod ☐ Cat-Head
☐ ATV ☐ Geoprobe ☑ Winch
☑ Track ☐ Air Track ☐ Roller Bit
☐ Skid ☐ _____ ☑ Cutting Head

**Hammer Type**
☐ Safety
☑ Doughnut
☐ Automatic
☐ _____

**Drilling Fluid**
☐ Bentonite
☐ Polymer
☐ Water
☑ None

**Drill Rod Size:**

**Casing Advance**
Hollow Stem Auger

| Depth/ Elev. (ft) | Sample No. / Interval (ft) | Rec. (in) | Sample Blows per 6" | Stratum Graphic | USCS Group Symbol | Visual - Manual Identification & Description (Density/consistency, color, Group Name, constituents, particle size, structure, moisture, optional descriptions, geologic interpretation, Symbol) | Field Tests: Dilatancy | Toughness | Plasticity | Dry Strength | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | S-1<br>0.0'- 2.0'<br>0.6'-' | 22 | 1<br>2<br>6<br>7 | | | Top 7" - TOPSOIL<br>0.6 | - | - | - | - | |
| | | | | | CL | Stiff, grayish brown CLAY, little fine Sand, moist (CL) | - | M | L | - | PP = 3.5 tsf<br>TV = 2.0 tsf |
| | S-2<br>2.0'- 4.0' | 24 | 10<br>10<br>9<br>9 | | CL | Very stiff, dark brown to brown CLAY, some coarse to fine Sand, trace fine Gravel, trace Silt, moist (CL) | - | M | L | - | PP = 3.5 tsf<br>TV = 0.5 tsf |
| 5 | S-3<br>4.0'- 6.0' | 24 | 3<br>3<br>6<br>8 | | CL | Stiff, brown CLAY, little coarse to fine Sand, trace fine Gravel, trace Silt, moist (CL) | - | M | L | - | PP = 2.0 tsf<br>TV = 1.0 tsf |
| | S-4<br>6.0'- 8.0' | 22 | 5<br>6<br>13<br>15 | | CL | Very stiff, brown to light brown CLAY, some coarse to fine Sand, little fine Gravel, moist (CL) | - | M | L | - | PP = 4.0 tsf<br>TV = 1.5 tsf |
| | S-5<br>8.0'- 10.0' | 20 | 7<br>14<br>17<br>24 | | CL | Hard, brown to light gray CLAY, some coarse to fine Gravel, little fine Sand, moist (CL) | - | M | L | - | PP = 2.5 tsf<br>TV = 0.5 tsf |
| 10 | | | | | | | | | | | |
| ▽ | S-6<br>13.0'- 15.0' | 17 | 5<br>5<br>7<br>9 | | CL | Stiff, brown to gray CLAY, some coarse to fine Sand, little fine Gravel, trace Silt, moist (CL) | - | M | L | - | PP = 2.0 tsf<br>TV = 1.0 tsf<br>Wet Sand pocket observed from 13 to 15 feet BGS. |
| 15 | | | | | | | | | | | |
| | S-7<br>18.0'- 20.0' | 24 | 7<br>10<br>11<br>16 | | CL | Very stiff, gray CLAY, little fine Gravel, little coarse to fine Sand, trace Silt, moist (CL) | - | M | L | - | Wet Sand pocket observed from 18 to 20 feet BGS. |
| | | | | | | End of Boring at 20 feet BGS.<br>20.0 Borehole backfilled with soil cuttings. | | | | | |

**Water Level Data**

| Date | Time | Elapsed Time (hr) | Depth in feet to: Bot. of Casing | Bottom of Hole | Water |
|---|---|---|---|---|---|
| 7/21/20 | 10:33 | - | 13.0 | 15.0 | 13 |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

**Sample Type**

**O** Open End Rod
**T** Thin-Wall Tube
**U** Undisturbed Sample
**SS** Split Spoon Sample
**G** Grab Sample

**Notes:**

No groundwater encountered during subsurface investigation.

Boring No.: **B-04**

**Field Test Legend:**
Dilatancy: N - None S - Slow R - Rapid
Toughness: L - Low M - Medium H - High
Plasticity: NP - Non-Plastic L - Low M - Medium H - High
Dry Strength: N - None L - Low M - Medium H - High VH - Very High

NOTES: 1.) "ppd" denotes soil sample average diametral pocket penetrometer reading. 2.) "ppa" denotes soil sample average axial pocket penetrometer reading.
3.) Maximum Particle Size is determined by direct observation within limitations of sampler size. 4.) Soil identifications and field tests based on visual-manual methods per ASTM D2488.

MOTT MACDONALD

# SOIL BORING LOG

BORING NO.: **B-05**
Page **1** of **1**

| | | | |
|---|---|---|---|
| **Project:** | South Ripley Solar | **Project No.:** | 505100267-001 |
| **Location:** | South Ripley, NY | **Project Mgr:** | Eric Pauli |
| **Client:** | ConnectGen | **Field Eng. Staff:** | Diego Melgar |
| **Drilling Co.:** | Earth Dimensions, Inc. | **Date/Time Started:** | July 21, 2020 at 10:50 am |
| **Driller/Helper:** | Brian B. /Harold Kleever | **Date/Time Finished:** | July 21, 2020 at 11:36 am |

**Elevation:** Grade ft. **Vertical Datum:** | **Boring Location:** See Boring Location Plan | **Coord.:** **Lat:** 42.193593° **Long:** -79.747878° | **Horizontal Datum:** NAD 1983

| Item | Casing | Sampler | Core Barrel |
|---|---|---|---|
| Type | HSA | SS | NQ |
| Length | 5 ft | 2 ft | - in |
| Inside Dia. (in.) | 4.25 | 1.375 | 1.875 |
| Hammer Wt. (lb.) | 140 | 140 | - |
| Hammer Fall (in.) | 30 | 30 | - |

**Rig Make & Model:** Diedrich D-50

| | | | |
|---|---|---|---|
| ☐ Truck | ☐ Tripod | ☐ Cat-Head | |
| ☐ ATV | ☐ Geoprobe | ☑ Winch | |
| ☑ Track | ☐ Air Track | ☐ Roller Bit | |
| ☐ Skid | ☐ _____ | ☑ Cutting Head | |

**Hammer Type**: ☐ Safety ☑ Doughnut ☐ Automatic ☐ _____

**Drilling Fluid**: ☐ Bentonite ☐ Polymer ☐ Water ☑ None

**Drill Rod Size:**

**Casing Advance**: Hollow Stem Auger

| Depth/ Elev. (ft) | Sample No. / Interval (ft) | Rec. (in) | Sample Blows per 6" | Stratum Graphic | USCS Group Symbol | Visual - Manual Identification & Description (Density/consistency, color, Group Name, constituents, particle size, structure, moisture, optional descriptions, geologic interpretation, Symbol) | Field Tests: Dilatancy | Toughness | Plasticity | Dry Strength | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | S-1 0.0'- 2.0' 0.3'-' | 17 | 1 2 5 7 | | CL | 0.3 Top 4" - TOPSOIL<br>Medium stiff, brown CLAY, some Silt, some fine Sand, moist (CL) | - - | - M | - L | - L | PP = 1.5 tsf<br>TV = 0.5 tsf |
| | S-2 2.0'- 4.0' | 24 | 6 7 8 8 | | CL | Very stiff, dark brown to brown CLAY, some coarse to fine Sand, little fine Gravel, trace Silt, moist (CL) | - | M | L | - | PP = 4.0 tsf<br>TV = 1.5 tsf |
| 5 | S-3 4.0'- 6.0' | 22 | 4 5 4 6 | | CL | Stiff, dark brown CLAY, some fine Sand, little fine Gravel, moist (CL) | - | M | L | - | PP = 2.5 tsf<br>TV = 0.25 tsf |
| | S-4 6.0'- 8.0' | 14 | 7 43 50/6" | | CL | Hard, light brown CLAY, some Silt, some coarse to fine Gravel, little Sand, dry (CL) | - | M | L | - | PP = 2.0 tsf<br>TV = 1.5 tsf<br>Split spoon refusal at 7.5 feet BGS.<br>Weathered stone at bottom of spoon. |
| 10 | S-5 8.0'- 8.8' | 8 | 31 50/3" | | CL | Hard, brown CLAY, some fine Sand, little fine Gravel, dry (CL) | - | M | L | L | PP = 1.8 tsf<br>TV = 1.6 tsf<br>Auger refusal at 8.8 feet BGS on 7/21/2020, likely cobble or boulder. |
| | S-6 13.0'- 14.0' | 2 | 50/3" | | CL | Hard, gray CLAY, some Silt, some coarse to fine Gravel, wet (CL)<br>14.0 | N | M | L | N | Returned to B-05 on 8/10/2020 and hit auger refusal at 14 feet BGS. |
| 15 | 14.0'-' | | | | | Auger refusal at 14 feet BGS.<br>Top of Rock at 14 feet BGS.<br>See Rock Coring Log. | - | - | - | - | Began coring at 14 feet BGS. |

**Water Level Data**

| Date | Time | Elapsed Time (hr) | Depth in feet to: Bot. of Casing | Bottom of Hole | Water |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

**Sample Type**

- **O** Open End Rod
- **T** Thin-Wall Tube
- **U** Undisturbed Sample
- **SS** Split Spoon Sample
- **G** Grab Sample

**Notes:**

PP = Pocket Penetrometer
TV = Torvane
No groundwater encountered during subsurface investigation.

Boring No.: **B-05**

**Field Test Legend:**
Dilatancy: N - None S - Slow R - Rapid
Toughness: L - Low M - Medium H - High
Plasticity: NP - Non-Plastic L - Low M - Medium H - High
Dry Strength: N - None L - Low M - Medium H - High VH - Very High

NOTES: 1.) "ppd" denotes soil sample average diametral pocket penetrometer reading. 2.) "ppa" denotes soil sample average axial pocket penetrometer reading.
3.) Maximum Particle Size is determined by direct observation within limitations of sampler size. 4.) Soil identifications and field tests based on visual-manual methods per ASTM D2488.

MOTT MACDONALD

# CORE BORING LOG

BORING NO.: **B-05**

Page **1** of **1**

| | | | |
|---|---|---|---|
| **Project:** | South Ripley Solar | **Project No.:** | 505100267-001 |
| **Location:** | South Ripley, NY | **Project Mgr:** | Eric Pauli |
| **Client:** | ConnectGen | **Field Eng. Staff:** | Diego Melgar |
| **Drilling Co.:** | Earth Dimensions, Inc. | **Date/Time Started:** | July 21, 2020 at 10:50 am |
| **Driller/Helper:** | Brian B. /Harold Kleever | **Date/Time Finished:** | July 21, 2020 at 11:36 am |

| **Elevation:** Grade ft. | | **Vertical Datum:** | | **Boring Location:** See Boring Location Plan | **Coord.:** **Lat:** 42.193593° **Long:** -79.747878° |
|---|---|---|---|---|---|
| **Item** | **Casing** | **Core Barrel** | **Core Bit** | | |
| **Type** | HSA | NQ | Imp. Diamond | **Horizontal Datum:** NAD 1983 | **Drilling Method:** Wireline |
| **Length** | 5 ft | 5 ft | 6 in | **Rig Make & Model:** Diedrich D-50 | |
| **Inside Dia. (in.)** | 4.25 | 1.875 | 1.875 | | |

| Depth/ Elev. (ft) | Avg Core Rate (min /ft) | Depth (ft) | Run/ (Box) No. | Rec (in. / %) | RQD (in / %) | Rock Core Hard. | Rock Core Weath | Stratum Graphic | Visual Identification, Description and Remarks (Rock type, colour, texture, weathering, field strength, discontinuity spacing, optional additional geological observations) | Depth (ft.) | Discontinuities Type | Dip | Rgh | Wea | Aper | Infill | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | SEE TEST BORING LOG FOR OVERBURDEN DETAILS | | (See Legend for Rock Description System) | | | | | | |
| 15 | 3.00 | 14.0 | | | | | | | SHALE, gray, very fine to fine grained, moderately weathered, weak, very close to moderately spaced discontinuities | | | | | | | | |
| | 1.45 | | | | | | | | | 15.00 | J | 10 | P,R | DG | CA | CL | |
| | 2.30 | | R-1 | 60 100% | 29 48% | R2 | M | | | 16.40 | J | 20 | P,R | DG | CA | ML | |
| | 2.30 | | | | | | | | | 17.70 | J | 30 | P,R | DG | MW | ML | |
| | 3.00 | 19.0 | | | | | | | 19.0 | | | | | | | | |
| 20 | | | | | | | | | End of Boring at 19 feet BGS. Borehole backfilled with soil cuttings. | | | | | | | | |
| 25 | | | | | | | | | | | | | | | | | |
| 30 | | | | | | | | | | | | | | | | | |

**Water Level Data**

| Date | Time | Elapsed Time (hr) | Depth in feet to: Bot. of Casing | Bottom of Hole | Water |
|---|---|---|---|---|---|
| | | - | | | |
| | | | | | |
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| | | | | | |
| | | | | | |

**Notes:**

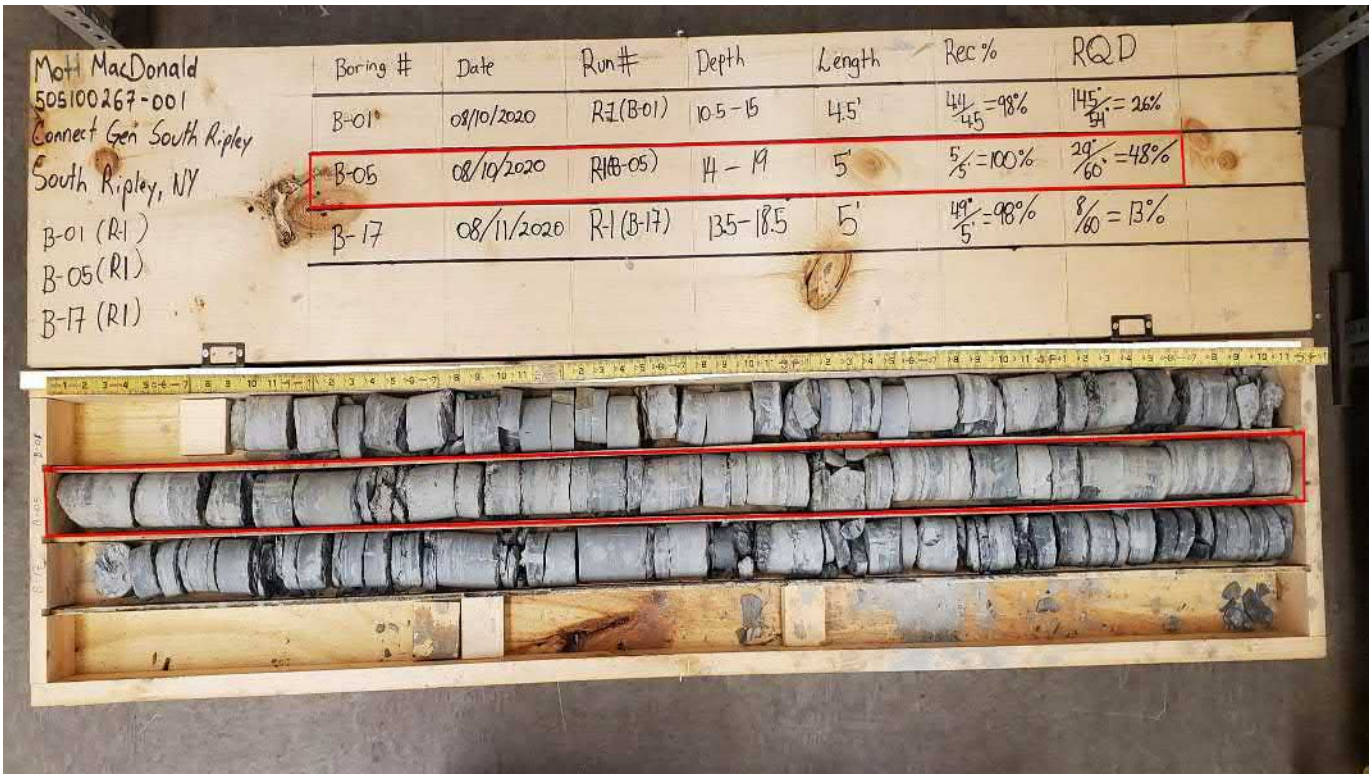


Figure B-05.1
B-05 Box 1 R1 Dry


Figure B-05.2
B-05 Box 1 R1 Wet

| | | |
|---|---|---|
| MOTT MACDONALD | **South Ripley Solar**<br>**Rock Core Photographs** | **BORING NO.:**<br>B-05 |

MOTT MACDONALD

# SOIL BORING LOG

BORING NO.: **B-06**
Page **1** of **1**

| | | | |
|---|---|---|---|
| **Project:** | South Ripley Solar | **Project No.:** | 505100267-001 |
| **Location:** | South Ripley, NY | **Project Mgr:** | Eric Pauli |
| **Client:** | ConnectGen | **Field Eng. Staff:** | Diego Melgar |
| **Drilling Co.:** | Earth Dimensions, Inc. | **Date/Time Started:** | July 21, 2020 at 2:30 pm |
| **Driller/Helper:** | Brian B. /Harold Kleever | **Date/Time Finished:** | July 21, 2020 at 3:30 pm |

**Elevation:** Grade ft. **Vertical Datum:**

**Boring Location:** Offset 40 feet West.

**Coord.:** **Lat:** 42.189268° **Long:** -79.748259°

**Horizontal Datum:** NAD 1983

| Item | Casing | Sampler | Core Barrel |
|---|---|---|---|
| Type | HSA | SS | - |
| Length | 5 ft | 2 ft | - |
| Inside Dia. (in.) | 4.25 | 1.375 | - |
| Hammer Wt. (lb.) | 140 | 140 | - |
| Hammer Fall (in.) | 30 | 30 | - |

**Rig Make & Model:** Diedrich D-50

☐ Truck ☐ Tripod ☐ Cat-Head
☐ ATV ☐ Geoprobe ☑ Winch
☑ Track ☐ Air Track ☐ Roller Bit
☐ Skid ☐ _____ ☑ Cutting Head

**Hammer Type**
☐ Safety
☑ Doughnut
☐ Automatic
☐ _____

**Drilling Fluid**
☐ Bentonite
☐ Polymer
☐ Water
☑ None

**Drill Rod Size:**

**Casing Advance**
Hollow Stem Auger

| Depth/ Elev. (ft) | Sample No. / Interval (ft) | Rec. (in) | Sample Blows per 6" | Stratum Graphic | USCS Group Symbol | Visual - Manual Identification & Description (Density/consistency, color, Group Name, constituents, particle size, structure, moisture, optional descriptions, geologic interpretation, Symbol) | Field Tests: Dilatancy | Toughness | Plasticity | Dry Strength | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | S-1 0.0'- 2.0' | 14 | 2 1 5 7 | | | Top 7" - TOPSOIL | - | - | - | - | |
| | 0.6'- | | | | CL | 0.6 Medium stiff, dark brown CLAY, trace Silt, moist (CL) | - | M | L | - | PP = 0.5 tsf TV = 0.25 tsf |
| | S-2 2.0'- 4.0' | 24 | 5 5 4 5 | | CL | Stiff, brown CLAY, some coarse to fine Sand, little fine Gravel, moist (CL) | N | M | L | - | PP = 1.0 tsf TV = 1.5 tsf |
| | S-3 4.0'- 6.0' | 13 | 4 6 14 13 | | CL | Very stiff, dark brown to gray CLAY, some coarse to fine Gravel, little coarse to fine Sand, trace Silt, moist (CL) | N | M | L | - | PP = 1.0 tsf TV = N/A |
| 5 | S-4 6.0'- 8.0' | 24 | 5 8 11 15 | | CL | Very stiff, dark grayish brown CLAY, little Sand, trace fine Gravel, moist (CL) | N | M | L | - | PP > 4.5 tsf TV = 2.0 tsf |
| ▽ | S-5 8.0'- 10.0' | 24 | 6 8 11 16 | | CL | Very stiff, brown CLAY, some coarse to fine Sand, some fine Gravel, moist (CL) | N | M | L | - | PP = 3.25 tsf TV = 3.0 tsf Bottom of sample is observed to be wet. |
| 10 | | | | | | 11.5 | | | | | |
| | S-6 13.0'- 15.0' | 14 | 12 16 19 21 | | SM | Dense, light gray to light brown SAND, some Silt, some Clay, some coarse to fine Gravel, wet (SM) | - | - | - | - | |
| 15 | | | | | | 16.5 | | | | | |
| | S-7 18.0'- 19.1' | 14 | 45 46 50/1" | | CL | Hard, brown CLAY, some Silt, some coarse to fine Gravel, trace fine Sand, wet (CL) | - | M | L | - | |
| | | | | | | 19.1 End of Boring at 19.1 feet BGS. Borehole backfilled with soil cuttings. | | | | | |

**Water Level Data**

| Date | Time | Elapsed Time (hr) | Depth in feet to: Bot. of Casing | Bottom of Hole | Water |
|---|---|---|---|---|---|
| 7/21/20 | 15:30 | 0:00 | | 19.1 | 7 |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

**Sample Type**

**O** Open End Rod
**T** Thin-Wall Tube
**U** Undisturbed Sample
**SS** Split Spoon Sample
**G** Grab Sample

**Notes:**

PP = Pocket Penetrometer
TV = Torvane

Boring No.: **B-06**

**Field Test Legend:**
Dilatancy: N - None S - Slow R - Rapid
Toughness: L - Low M - Medium H - High
Plasticity: NP - Non-Plastic L - Low M - Medium H - High
Dry Strength: N - None L - Low M - Medium H - High VH - Very High

NOTES: 1.) "ppd" denotes soil sample average diametral pocket penetrometer reading. 2.) "ppa" denotes soil sample average axial pocket penetrometer reading.
3.) Maximum Particle Size is determined by direct observation within limitations of sampler size. 4.) Soil identifications and field tests based on visual-manual methods per ASTM D2488.

MOTT MACDONALD

# SOIL BORING LOG

BORING NO.: **B-07**
Page **1** of **1**

| | | | |
|---|---|---|---|
| **Project:** | South Ripley Solar | **Project No.:** | 505100267-001 |
| **Location:** | South Ripley, NY | **Project Mgr:** | Eric Pauli |
| **Client:** | ConnectGen | **Field Eng. Staff:** | Diego Melgar |
| **Drilling Co.:** | Earth Dimensions, Inc. | **Date/Time Started:** | July 22, 2020 at 9:10 am |
| **Driller/Helper:** | Brian B. /Harold Kleever | **Date/Time Finished:** | July 22, 2020 at 10:00 am |

**Elevation:** Grade ft. **Vertical Datum:** | **Boring Location:** Offset 20 feet Southwest | **Coord.:** **Lat:** 42.198027° **Long:** -79.745396° | **Horizontal Datum:** NAD 1983

| Item | Casing | Sampler | Core Barrel |
|---|---|---|---|
| Type | HSA | SS | - |
| Length | 5 ft | 2 ft | - |
| Inside Dia. (in.) | 4.25 | 1.375 | - |
| Hammer Wt. (lb.) | 140 | 140 | - |
| Hammer Fall (in.) | 30 | 30 | - |

**Rig Make & Model:** Diedrich D-50

☐ Truck ☐ Tripod ☐ Cat-Head
☐ ATV ☐ Geoprobe ☑ Winch
☑ Track ☐ Air Track ☐ Roller Bit
☐ Skid ☐ _____ ☑ Cutting Head

**Hammer Type**: ☐ Safety ☑ Doughnut ☐ Automatic ☐ _____

**Drilling Fluid**: ☐ Bentonite ☐ Polymer ☐ Water ☑ None

**Drill Rod Size:**

**Casing Advance**: Hollow Stem Auger

| Depth/ Elev. (ft) | Sample No. / Interval (ft) | Rec. (in) | Sample Blows per 6" | Stratum Graphic | USCS Group Symbol | Visual - Manual Identification & Description (Density/consistency, color, Group Name, constituents, particle size, structure, moisture, optional descriptions, geologic interpretation, Symbol) | Field Tests: Dilatancy | Toughness | Plasticity | Dry Strength | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | S-1 0.0'- 2.0' 0.3'-' | 16 | 1 2 3 4 | | CL | 0.3 Top 3" - TOPSOIL<br>Medium stiff, gray CLAY, some fine Sand, little Silt, moist (CL) | - N | - - | - M | - - | PP = 2.5 tsf<br>TV = 1.0 tsf |
| | S-2 2.0'- 4.0' | 16 | 3 2 2 3 | | CL | Medium stiff, grayish brown CLAY, little fine Sand, trace Silt, wet (CL) | N | L | M | - | PP = 2.0 tsf<br>TV = 2.15 tsf |
| 5 | S-3 4.0'- 6.0' | 14.5 | 5 8 7 8 | | CL | Very stiff, grayish dark brown CLAY, little fine Sand, trace fine Gravel, trace Silt, moist (CL) | N | M | L | - | PP > 4.5 tsf<br>TV = 0.5 tsf |
| | S-4 6.0'- 8.0' | 20 | 6 10 11 10 | | CL | Very stiff, grayish brown CLAY, some Silt, little coarse to fine Sand, trace fine Gravel, moist (CL) | N | M | H | - | PP > 4.5 tsf<br>TV = 0.5 tsf |
| 10 | S-5 8.0'- 10.0' | 18 | 8 11 12 14 | | CL | Very stiff, grayish brown CLAY, little Silt, little coarse to fine Gravel, trace fine Sand, moist (CL) | N | M | H | - | PP > 4.5 tsf |
| | S-6 13.0'- 15.0' | 20 | 17 19 15 22 | | CL | Hard, brownish gray CLAY, some coarse to fine Gravel, little Silt, trace coarse to fine Sand, wet (CL) | N | M | H | - | PP = 4.5 tsf<br>TV = 2.25 tsf<br>Large amount of Gravel recovered. |
| 15 ▽ | S-7 18.0'- 20.0' | 20 | 11 11 21 29 | | CL | Hard, brownish gray CLAY, little Silt, little coarse to fine Gravel, trace fine Sand, wet (CL)<br>End of Boring at 20 feet BGS.<br>20.0 Borehole backfilled with soil cuttings. | N | H | H | - | PP > 4.5 tsf<br>TV = 2.0 tsf |

**Water Level Data**

| Date | Time | Elapsed Time (hr) | Depth in feet to: Bot. of Casing | Bottom of Hole | Water |
|---|---|---|---|---|---|
| 7/22/20 | 9:50 | 0:00 | | 20.0 | 16 |

**Sample Type**

- **O** Open End Rod
- **T** Thin-Wall Tube
- **U** Undisturbed Sample
- **SS** Split Spoon Sample
- **G** Grab Sample

**Notes:**
PP = Pocket Penetrometer
TV = Torvane

Boring No.: **B-07**

**Field Test Legend:**
Dilatancy: N - None S - Slow R - Rapid
Toughness: L - Low M - Medium H - High
Plasticity: NP - Non-Plastic L - Low M - Medium H - High
Dry Strength: N - None L - Low M - Medium H - High VH - Very High

NOTES: 1.) "ppd" denotes soil sample average diametral pocket penetrometer reading. 2.) "ppa" denotes soil sample average axial pocket penetrometer reading.
3.) Maximum Particle Size is determined by direct observation within limitations of sampler size. 4.) Soil identifications and field tests based on visual-manual methods per ASTM D2488.

MOTT MACDONALD

# SOIL BORING LOG

BORING NO.: **B-08**
Page **1** of **1**

| | | | |
|---|---|---|---|
| **Project:** | South Ripley Solar | **Project No.:** | 505100267-001 |
| **Location:** | South Ripley, NY | **Project Mgr:** | Eric Pauli |
| **Client:** | ConnectGen | **Field Eng. Staff:** | Diego Melgar |
| **Drilling Co.:** | Earth Dimensions, Inc. | **Date/Time Started:** | July 22, 2020 at 10:15 am |
| **Driller/Helper:** | Brian B. /Harold Kleever | **Date/Time Finished:** | July 22, 2020 at 11:35 am |

**Elevation:** Grade ft. **Vertical Datum:**

**Boring Location:** See Boring Location Plan

**Coord.:** **Lat:** 42.195676° **Long:** -79.741586°

**Horizontal Datum:** NAD 1983

| Item | Casing | Sampler | Core Barrel |
|---|---|---|---|
| Type | HSA | SS | - |
| Length | 5 ft | 2 ft | - |
| Inside Dia. (in.) | 4.25 | 1.375 | - |
| Hammer Wt. (lb.) | 140 | 140 | - |
| Hammer Fall (in.) | 30 | 30 | - |

**Rig Make & Model:** Diedrich D-50

☐ Truck ☐ Tripod ☐ Cat-Head
☐ ATV ☐ Geoprobe ☑ Winch
☑ Track ☐ Air Track ☐ Roller Bit
☐ Skid ☐ _____ ☑ Cutting Head

**Hammer Type**
☐ Safety
☑ Doughnut
☐ Automatic
☐ _____

**Drilling Fluid**
☐ Bentonite
☐ Polymer
☐ Water
☑ None

**Drill Rod Size:**

**Casing Advance**
Hollow Stem Auger

| Depth/ Elev. (ft) | Sample No. / Interval (ft) | Rec. (in) | Sample Blows per 6" | Stratum Graphic | USCS Group Symbol | Visual - Manual Identification & Description (Density/consistency, color, Group Name, constituents, particle size, structure, moisture, optional descriptions, geologic interpretation, Symbol) | Field Tests: Dilatancy | Toughness | Plasticity | Dry Strength | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | S-1 0.0'- 2.0' 0.3'-' | 17 | 2 3 4 3 | | CL | 0.3 Top 4" - TOPSOIL<br>Medium stiff, grayish brown CLAY, some coarse to fine Sand, trace fine Gravel, moist (CL) | - N | - M | - L | - - | PP = 3.5 tsf TV = 1.0 tsf |
| | S-2 2.0'- 4.0' | 23 | 6 5 5 7 | | CL | Stiff, light brown CLAY, trace fine Sand, trace fine Gravel, trace Silt, moist (CH) | N | M | L | - | PP = 2.0 tsf TV = 1.15 tsf |
| 5 | S-3 4.0'- 6.0' | 21 | 5 7 7 8 | | CL | Stiff, light brown CLAY, some fine Sand, little fine Gravel, trace Silt, moist (CH) | N | M | L | M | PP = 3.0 tsf TV = 1.0 tsf |
| | S-4 6.0'- 8.0' | 20 | 11 11 16 20 | | CL | Very stiff, brownish gray SILT, some Clay, little coarse to fine Gravel, trace coarse to fine Sand, dry (CL) | N | M | L | H | PP = 3.5 tsf TV = N/A |
| 10 | S-5 8.0'- 10.0' | 24 | 14 19 17 24 | | CL | Hard, gray CLAY, some Silt, little fine Gravel, trace fine Sand, dry (CH) | N | M | L | H | PP = 3.5 tsf TV = N/A |
| | S-6 13.0'- 15.0' | 24 | 13 12 12 14 | | CL | Very stiff, gray CLAY, some Silt, little coarse to fine Sand, little fine Gravel, dry (CH) | N | M | L | M | PP = 4.0 tsf TV = N/A |
| 15 | | | | | | 16.5 | | | | | |
| | S-7 18.0'- 20.0' | 24 | 9 13 10 12 | | ML | Very stiff, gray SILT, some Clay, little fine Sand, little fine Gravel, moist (ML) | N | H | L | - | PP > 4.5 tsf |
| | | | | | | End of Boring at 20 feet BGS.<br>20.0 Borehole backfilled with soil cuttings. | | | | | |

**Water Level Data**

| Date | Time | Elapsed Time (hr) | Depth in feet to: Bot. of Casing | Bottom of Hole | Water |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

**Sample Type**

**O** Open End Rod
**T** Thin-Wall Tube
**U** Undisturbed Sample
**SS** Split Spoon Sample
**G** Grab Sample

**Notes:**

PP = Pocket Penetrometer
TV = Torvane

Boring No.: **B-08**

**Field Test Legend:**
Dilatancy: N - None S - Slow R - Rapid
Toughness: L - Low M - Medium H - High
Plasticity: NP - Non-Plastic L - Low M - Medium H - High
Dry Strength: N - None L - Low M - Medium H - High VH - Very High

NOTES: 1.) "ppd" denotes soil sample average diametral pocket penetrometer reading. 2.) "ppa" denotes soil sample average axial pocket penetrometer reading.
3.) Maximum Particle Size is determined by direct observation within limitations of sampler size. 4.) Soil identifications and field tests based on visual-manual methods per ASTM D2488.

MOTT MACDONALD

# SOIL BORING LOG

BORING NO.: **B-09**
Page **1** of **1**

| | | | |
|---|---|---|---|
| **Project:** | South Ripley Solar | **Project No.:** | 505100267-001 |
| **Location:** | South Ripley, NY | **Project Mgr:** | Eric Pauli |
| **Client:** | ConnectGen | **Field Eng. Staff:** | Diego Melgar |
| **Drilling Co.:** | Earth Dimensions, Inc. | **Date/Time Started:** | July 21, 2020 at 12:50 pm |
| **Driller/Helper:** | Brian B. /Harold Kleever | **Date/Time Finished:** | July 21, 2020 at 1:55 pm |

**Elevation:** Grade ft. **Vertical Datum:** | **Boring Location:** See Boring Location Plan | **Coord.:** **Lat:** 42.193594° **Long:** -79.744977° | **Horizontal Datum:** NAD 1983

| Item | Casing | Sampler | Core Barrel |
|---|---|---|---|
| Type | HSA | SS | - |
| Length | 5 ft | 2 ft | - |
| Inside Dia. (in.) | 4.25 | 1.375 | - |
| Hammer Wt. (lb.) | 140 | 140 | - |
| Hammer Fall (in.) | 30 | 30 | - |

**Rig Make & Model:** Diedrich D-50

| | | | |
|---|---|---|---|
| ☐ Truck | ☐ Tripod | ☐ Cat-Head | |
| ☐ ATV | ☐ Geoprobe | ☑ Winch | |
| ☑ Track | ☐ Air Track | ☐ Roller Bit | |
| ☐ Skid | ☐ _____ | ☑ Cutting Head | |

**Hammer Type**: ☐ Safety ☑ Doughnut ☐ Automatic ☐ _____

**Drilling Fluid**: ☐ Bentonite ☐ Polymer ☐ Water ☑ None

**Drill Rod Size:**

**Casing Advance**: Hollow Stem Auger

| Depth/ Elev. (ft) | Sample No. / Interval (ft) | Rec. (in) | Sample Blows per 6" | Stratum Graphic | USCS Group Symbol | Visual - Manual Identification & Description (Density/consistency, color, Group Name, constituents, particle size, structure, moisture, optional descriptions, geologic interpretation, Symbol) | Field Tests: Dilatancy | Toughness | Plasticity | Dry Strength | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | S-1 0.0'- 2.0' 0.4'-' | 20 | WOH 3 5 5 | | | 0.4 Top 5" - TOPSOIL | - | - | - | - | |
| | | | | | CL | Stiff, grayish brown CLAY, some Silt, little fine Sand, moist (CL) | - | M | L | - | PP = 2.0 tsf TV = 0.5 tsf |
| | S-2 2.0'- 4.0' | 15 | 6 4 4 5 | | CL | Stiff, brown CLAY, little fine Sand, trace fine Gravel, moist (CL) | N | M | L | - | PP = 2.0 tsf TV = 0.5 tsf |
| 5 | S-3 4.0'- 6.0' | 21 | 4 4 6 5 | | CL | Stiff, brown CLAY, some coarse to fine Sand, little fine Gravel, moist (CL) | N | M | L | - | PP = 1.5 tsf TV = 1.25 tsf |
| | S-4 6.0'- 8.0' | 24 | 6 7 7 12 | | CL | Stiff, grayish brown CLAY, some coarse to fine Sand, little fine Gravel, trace Silt, moist (CL) | N | M | L | - | PP = 2.25 tsf TV = 1.75 tsf |
| | S-5 8.0'- 10.0' | 24 | 5 7 8 10 | | CL | Very stiff, brown CLAY, some fine Gravel, little fine Sand, trace Silt, moist (CL) | N | M | L | - | PP = 3.5 tsf TV = 0.5 tsf |
| 10 | | | | | | | | | | | |
| | S-6 13.0'- 15.0' | 16 | 6 27 26 27 | | CL | Hard, dark brown to gray CLAY, some coarse to fine Sand, some Silt, little fine Gravel, dry (CL) | N | M | L | - | PP = 4.0 tsf TV = 0.5 tsf Weathered rock at the bottom of spoon. |
| 15 | | | | | | | | | | | |
| | S-7 18.0'- 20.0' | 18 | 13 19 22 26 | | CL | Hard, brown to gray CLAY, some coarse to fine Sand, some Silt, little fine Gravel, dry (CL) | N | M | L | M | PP = 4.0 tsf TV = N/A |
| | | | | | | End of Boring at 20 feet BGS. | | | | | |
| | | | | | | 20.0 Borehole backfilled with soil cuttings. | | | | | |

**Water Level Data**

| Date | Time | Elapsed Time (hr) | Depth in feet to: Bot. of Casing | Bottom of Hole | Water |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

**Sample Type**

- **O** Open End Rod
- **T** Thin-Wall Tube
- **U** Undisturbed Sample
- **SS** Split Spoon Sample
- **G** Grab Sample

**Notes:**

PP = Pocket Penetrometer
TV = Torvane
No groundwater encountered during subsurface investigation.

Boring No.: **B-09**

**Field Test Legend:**
Dilatancy: N - None S - Slow R - Rapid
Toughness: L - Low M - Medium H - High
Plasticity: NP - Non-Plastic L - Low M - Medium H - High
Dry Strength: N - None L - Low M - Medium H - High VH - Very High

NOTES: 1.) "ppd" denotes soil sample average diametral pocket penetrometer reading. 2.) "ppa" denotes soil sample average axial pocket penetrometer reading.
3.) Maximum Particle Size is determined by direct observation within limitations of sampler size. 4.) Soil identifications and field tests based on visual-manual methods per ASTM D2488.

MOTT MACDONALD

# SOIL BORING LOG

BORING NO.: **B-10**
Page **1** of **1**

| | | | |
|---|---|---|---|
| **Project:** | South Ripley Solar | **Project No.:** | 505100267-001 |
| **Location:** | South Ripley, NY | **Project Mgr:** | Eric Pauli |
| **Client:** | ConnectGen | **Field Eng. Staff:** | Diego Melgar |
| **Drilling Co.:** | Earth Dimensions, Inc. | **Date/Time Started:** | July 22, 2020 at 7:20 am |
| **Driller/Helper:** | Brian B. /Harold Kleever | **Date/Time Finished:** | July 22, 2020 at 8:15 am |

**Elevation:** Grade ft. **Vertical Datum:**

**Boring Location:** See Boring Location Plan

**Coord.:** **Lat:** 42.188424° **Long:** -79.744437°

**Horizontal Datum:** NAD 1983

| Item | Casing | Sampler | Core Barrel |
|---|---|---|---|
| Type | HSA | SS | - |
| Length | 5 ft | 2 ft | - |
| Inside Dia. (in.) | 4.25 | 1.375 | - |
| Hammer Wt. (lb.) | 140 | 140 | - |
| Hammer Fall (in.) | 30 | 30 | - |

**Rig Make & Model:** Diedrich D-50

☐ Truck ☐ Tripod ☐ Cat-Head
☐ ATV ☐ Geoprobe ☑ Winch
☑ Track ☐ Air Track ☐ Roller Bit
☐ Skid ☐ _____ ☑ Cutting Head

**Hammer Type**
☐ Safety
☑ Doughnut
☐ Automatic
☐ _____

**Drilling Fluid**
☐ Bentonite
☐ Polymer
☐ Water
☑ None

**Drill Rod Size:**

**Casing Advance**
Hollow Stem Auger

| Depth/ Elev. (ft) | Sample No. / Interval (ft) | Rec. (in) | Sample Blows per 6" | Stratum Graphic | USCS Group Symbol | Visual - Manual Identification & Description (Density/consistency, color, Group Name, constituents, particle size, structure, moisture, optional descriptions, geologic interpretation, Symbol) | Field Tests: Dilatancy | Toughness | Plasticity | Dry Strength | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | S-1 0.0'- 2.0' 0.3'-' | 17 | 1 2 5 7 | | CL | 0.3 Top 4" - TOPSOIL<br>Medium stiff, grayish brown CLAY, little fine Sand, little Silt, trace fine Gravel, dry (CL) | - N | - M | - L | - L | PP = 4.0 tsf TV = 0.5 tsf |
| | S-2 2.0'- 4.0' | 20 | 6 7 6 7 | | CL | Stiff, grayish brown CLAY, little fine Sand, little fine Gravel, wet (CL) | N | M | L | - | PP = 4.5 tsf TV = 0.5 tsf |
| 5 | S-3 4.0'- 6.0' | 19 | 3 4 6 6 | | CL | Medium stiff, grayish brown CLAY, little Silt, little fine Sand, trace fine Gravel, wet (CL) | N | M | L | - | PP = 2.5 tsf TV = 0.25 tsf |
| | S-4 6.0'- 8.0' | 18 | 3 5 7 8 | | SC | 6.0<br>Medium dense, brown SAND, some Clay, little Silt, trace fine Gravel, wet (SC) | - | H | NP | - | |
| 10 ▽ | S-5 8.0'- 10.0' | 12 | 5 6 6 5 | | CL | 8.0<br>Very stiff, grayish brown CLAY, little Silt, little coarse to fine Sand, trace coarse to fine Gravel, moist (CL) | N | M | L | - | PP = 4.5 tsf<<CR>TV = 0.5 tsf |
| | S-6 13.0'- 15.0' | 23 | 16 17 12 13 | | CL | Very stiff, gray CLAY, trace fine Sand, trace coarse to fine Gravel, moist (CL) | N | M | L | - | PP = 4.0 tsf TV = 2.25 tsf |
| 15 | | | | | | 16.5 | | | | | |
| | S-7 18.0'- 20.0' | 18 | 17 17 19 37 | | ML | Hard, gray SILT, some coarse to fine Gravel, little fine Sand, little Clay, wet (ML) | N | H | L | - | PP = 4.5 tsf TV = 0.5 tsf |
| | | | | | | End of Boring at 20 feet BGS.<br>20.0 Borehole backfilled with soil cuttings. | | | | | |

**Water Level Data**

| Date | Time | Elapsed Time (hr) | Depth in feet to: Bot. of Casing | Bottom of Hole | Water |
|---|---|---|---|---|---|
| 7/22/20 | 8:15 | - | | 20.0 | 10 |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

**Sample Type**

**O** Open End Rod
**T** Thin-Wall Tube
**U** Undisturbed Sample
**SS** Split Spoon Sample
**G** Grab Sample

**Notes:**
PP = Pocket Penetrometer
TV = Torvane

Boring No.: **B-10**

**Field Test Legend:**
Dilatancy: N - None S - Slow R - Rapid
Toughness: L - Low M - Medium H - High
Plasticity: NP - Non-Plastic L - Low M - Medium H - High
Dry Strength: N - None L - Low M - Medium H - High VH - Very High

NOTES: 1.) "ppd" denotes soil sample average diametral pocket penetrometer reading. 2.) "ppa" denotes soil sample average axial pocket penetrometer reading.
3.) Maximum Particle Size is determined by direct observation within limitations of sampler size. 4.) Soil identifications and field tests based on visual-manual methods per ASTM D2488.

MOTT MACDONALD

# SOIL BORING LOG

BORING NO.: **B-11**
Page **1** of **1**

| | | | |
|---|---|---|---|
| **Project:** | South Ripley Solar | **Project No.:** | 505100267-001 |
| **Location:** | South Ripley, NY | **Project Mgr:** | Eric Pauli |
| **Client:** | ConnectGen | **Field Eng. Staff:** | Diego Melgar |
| **Drilling Co.:** | Earth Dimensions, Inc. | **Date/Time Started:** | July 22, 2020 at 12:46 pm |
| **Driller/Helper:** | Brian B. /Harold Kleever | **Date/Time Finished:** | July 22, 2020 at 1:35 pm |

**Elevation:** Grade ft. **Vertical Datum:** | **Boring Location:** See Boring Location Plan | **Coord.:** **Lat:** 42.195826° **Long:** -79.736165° | **Horizontal Datum:** NAD 1983

| Item | Casing | Sampler | Core Barrel |
|---|---|---|---|
| Type | HSA | SS | - |
| Length | 5 ft | 2 ft | - |
| Inside Dia. (in.) | 4.25 | 1.375 | - |
| Hammer Wt. (lb.) | 140 | 140 | - |
| Hammer Fall (in.) | 30 | 30 | - |

**Rig Make & Model:** Diedrich D-50

☐ Truck ☐ Tripod ☐ Cat-Head
☐ ATV ☐ Geoprobe ☑ Winch
☑ Track ☐ Air Track ☐ Roller Bit
☐ Skid ☐ _____ ☑ Cutting Head

**Hammer Type:** ☐ Safety ☑ Doughnut ☐ Automatic ☐ _____

**Drilling Fluid:** ☐ Bentonite ☐ Polymer ☐ Water ☑ None

**Drill Rod Size:**

**Casing Advance:** Hollow Stem Auger

| Depth/ Elev. (ft) | Sample No. / Interval (ft) | Rec. (in) | Sample Blows per 6" | Stratum Graphic | USCS Group Symbol | Visual - Manual Identification & Description (Density/consistency, color, Group Name, constituents, particle size, structure, moisture, optional descriptions, geologic interpretation, Symbol) | Field Tests: Dilatancy | Toughness | Plasticity | Dry Strength | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | S-1 0.0'- 2.0' 0.4'-' | 18 | 2 5 5 8 | | | 0.4 Top 5" - TOPSOIL | - | - | - | - | |
| | | | | | CL | Stiff, brown CLAY, some Silt, little coarse to fine Sand, moist (CL) | N | M | L | - | PP > 4.5 tsf TV = N/A |
| | S-2 2.0'- 4.0' | 22 | 8 6 6 7 | | CL | Stiff, brown CLAY, some Silt, trace coarse to fine Sand, trace fine Gravel, moist (CL) | N | M | L | - | PP = 4.0 tsf TV = N/A |
| | S-3 4.0'- 6.0' | 21 | 5 6 6 8 | | CL | Stiff, brown CLAY, little Silt, trace fine Sand, trace fine Gravel, moist (CL) | R | M | L | - | PP = 3.0 tsf TV = N/A |
| 5 | S-4 6.0'- 8.0' | 24 | 6 8 12 10 | | CL | Very stiff, brownish gray CLAY, some Silt, some fine Sand, trace fine Gravel, moist (CL) | R | M | L | - | PP = 3.0 tsf TV = N/A |
| | S-5 8.0'- 10.0' | 18 | 5 6 8 9 | | ML | 8.0 Stiff, gray SILT, trace Clay, little fine Sand, moist (ML) | R | L | L | - | PP = 2.25 tsf |
| 10 | | | | | | | | | | | |
| | S-6 13.0'- 15.0' | 3 | 20 17 10 12 | | ML | Very stiff, brown SILT, some Clay, little fine Sand, trace fine Gravel, moist (ML) | N | L | L | - | PP = 1.5 tsf |
| 15 | | | | | | 16.5 | | | | | |
| | S-7 18.0'- 20.0' | 10 | 3 4 4 5 | | CL | Stiff, gray CLAY, little Silt, moist (CL) | - | M | L | - | PP = 1.0 tsf |
| | | | | | | End of Boring at 20 feet BGS. 20.0 Borehole backfilled with soil cuttings. | | | | | |

**Water Level Data**

| Date | Time | Elapsed Time (hr) | Depth in feet to: Bot. of Casing | Bottom of Hole | Water |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

**Sample Type**

**O** Open End Rod
**T** Thin-Wall Tube
**U** Undisturbed Sample
**SS** Split Spoon Sample
**G** Grab Sample

**Notes:**

PP = Pocket Penetrometer
TV = Torvane
No groundwater encountered during subsurface investigation.

Boring No.: **B-11**

**Field Test Legend:**
Dilatancy: N - None S - Slow R - Rapid
Toughness: L - Low M - Medium H - High
Plasticity: NP - Non-Plastic L - Low M - Medium H - High
Dry Strength: N - None L - Low M - Medium H - High VH - Very High

NOTES: 1.) "ppd" denotes soil sample average diametral pocket penetrometer reading. 2.) "ppa" denotes soil sample average axial pocket penetrometer reading.
3.) Maximum Particle Size is determined by direct observation within limitations of sampler size. 4.) Soil identifications and field tests based on visual-manual methods per ASTM D2488.

MOTT MACDONALD

# SOIL BORING LOG

BORING NO.: **B-12**
Page **1** of **1**

| | | | |
|---|---|---|---|
| **Project:** | South Ripley Solar | **Project No.:** | 505100267-001 |
| **Location:** | South Ripley, NY | **Project Mgr:** | Eric Pauli |
| **Client:** | ConnectGen | **Field Eng. Staff:** | Diego Melgar |
| **Drilling Co.:** | Earth Dimensions, Inc. | **Date/Time Started:** | July 22, 2020 at 2:00 pm |
| **Driller/Helper:** | Brian B. /Harold Kleever | **Date/Time Finished:** | July 22, 2020 at 2:53 pm |

**Elevation:** Grade ft. **Vertical Datum:** | **Boring Location:** See Boring Location Plan | **Coord.:** **Lat:** 42.192916° **Long:** -79.733182° | **Horizontal Datum:** NAD 1983

| Item | Casing | Sampler | Core Barrel |
|---|---|---|---|
| Type | HSA | SS | - |
| Length | 5 ft | 2 ft | - |
| Inside Dia. (in.) | 4.25 | 1.375 | - |
| Hammer Wt. (lb.) | 140 | 140 | - |
| Hammer Fall (in.) | 30 | 30 | - |

**Rig Make & Model:** Diedrich D-50

☐ Truck ☐ Tripod ☐ Cat-Head
☐ ATV ☐ Geoprobe ☑ Winch
☑ Track ☐ Air Track ☐ Roller Bit
☐ Skid ☐ _____ ☑ Cutting Head

**Hammer Type:** ☐ Safety ☑ Doughnut ☐ Automatic ☐ _____

**Drilling Fluid:** ☐ Bentonite ☐ Polymer ☐ Water ☑ None

**Drill Rod Size:**

**Casing Advance:** Hollow Stem Auger

| Depth/ Elev. (ft) | Sample No. / Interval (ft) | Rec. (in) | Sample Blows per 6" | Stratum Graphic | USCS Group Symbol | Visual - Manual Identification & Description (Density/consistency, color, Group Name, constituents, particle size, structure, moisture, optional descriptions, geologic interpretation, Symbol) | Field Tests: Dilatancy | Toughness | Plasticity | Dry Strength | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | S-1 0.0'- 2.0' | 18 | 1 1 4 8 | | | 0.5 Top 6" - TOPSOIL | N | H | L | M | PP = 0.5 tsf |
| | | | | | ML | Medium stiff, brown SILT, some Clay, little fine Sand, dry (ML) | | | | | |
| | S-2 2.0'- 4.0' | 24 | 7 8 9 11 | | ML | Very stiff, dark brown SILT, some Clay, little coarse to fine Sand, trace fine Gravel, dry (ML) | N | H | L | M | PP = 1.5 tsf |
| | S-3 4.0'- 6.0' | 12 | 8 9 7 7 | | ML | Very stiff, brown SILT, some Clay, little fine Sand, moist (ML) | N | L | L | M | PP = 1.5 tsf |
| 5 | S-4 6.0'- 8.0' | 22 | 5 9 7 7 | | ML | Very stiff, dark brown SILT, some Clay, some coarse to fine Sand, little coarse to fine Gravel, moist (ML) | N | H | L | - | PP = 1.5 tsf |
| | S-5 8.0'- 10.0' | 17 | 4 3 9 11 | | CL | 8.0 Medium stiff, brown CLAY, some coarse to fine Sand, some Silt, trace fine Gravel, wet (CL) | N | M | L | - | PP = 2.5 tsf |
| 10 | | | | | | 11.5 | | | | | |
| | S-6 13.0'- 15.0' | 11 | 2 2 3 4 | | SC | Loose, brown coarse to fine SAND, some Clay, some Silt, trace fine Gravel, wet (SC) | - | - | NP | - | |
| 15 ▽ | | | | | | 16.5 | | | | | |
| | S-7 18.0'- 20.0' | 18 | 4 2 3 4 | | CL | Medium stiff, brownish gray CLAY, some Silt, some fine Sand, trace fine Gravel, wet (CL) | N | M | L | - | PP = 7.5 tsf |
| | | | | | | End of Boring at 20 feet BGS. 20.0 Borehole backfilled with soil cuttings. | | | | | |

**Water Level Data**

| Date | Time | Elapsed Time (hr) | Depth in feet to: Bot. of Casing | Bottom of Hole | Water |
|---|---|---|---|---|---|
| 7/22/20 | 14:53 | 0:00 | | 20.0 | 15 |

**Sample Type**

**O** Open End Rod
**T** Thin-Wall Tube
**U** Undisturbed Sample
**SS** Split Spoon Sample
**G** Grab Sample

**Notes:**
PP = Pocket Penetrometer
TV = Torvane

Boring No.: **B-12**

**Field Test Legend:**
Dilatancy: N - None S - Slow R - Rapid
Toughness: L - Low M - Medium H - High
Plasticity: NP - Non-Plastic L - Low M - Medium H - High
Dry Strength: N - None L - Low M - Medium H - High VH - Very High

NOTES: 1.) "ppd" denotes soil sample average diametral pocket penetrometer reading. 2.) "ppa" denotes soil sample average axial pocket penetrometer reading.
3.) Maximum Particle Size is determined by direct observation within limitations of sampler size. 4.) Soil identifications and field tests based on visual-manual methods per ASTM D2488.

MOTT MACDONALD

# SOIL BORING LOG

BORING NO.: **B-13**
Page **1** of **1**

| | | | |
|---|---|---|---|
| **Project:** | South Ripley Solar | **Project No.:** | 505100267-001 |
| **Location:** | South Ripley, NY | **Project Mgr:** | Eric Pauli |
| **Client:** | ConnectGen | **Field Eng. Staff:** | Diego Melgar |
| **Drilling Co.:** | Earth Dimensions, Inc. | **Date/Time Started:** | July 22, 2020 at 7:20 am |
| **Driller/Helper:** | Brian B. /Harold Kleever | **Date/Time Finished:** | July 22, 2020 at 8:30 am |

**Elevation:** Grade ft. **Vertical Datum:**

**Boring Location:** See Boring Location Plan

**Coord.:** **Lat:** 42.202152° **Long:** -79.725624°

**Horizontal Datum:** NAD 1983

| Item | Casing | Sampler | Core Barrel |
|---|---|---|---|
| Type | HSA | SS | - |
| Length | 5 ft | 2 ft | - |
| Inside Dia. (in.) | 4.25 | 1.375 | - |
| Hammer Wt. (lb.) | 140 | 140 | - |
| Hammer Fall (in.) | 30 | 30 | - |

**Rig Make & Model:** Diedrich D-50

☐ Truck ☐ Tripod ☐ Cat-Head
☐ ATV ☐ Geoprobe ☑ Winch
☑ Track ☐ Air Track ☐ Roller Bit
☐ Skid ☐ _____ ☑ Cutting Head

**Hammer Type**
☐ Safety
☑ Doughnut
☐ Automatic
☐ _____

**Drilling Fluid**
☐ Bentonite
☐ Polymer
☐ Water
☑ None

**Drill Rod Size:**

**Casing Advance**
Hollow Stem Auger

| Depth/ Elev. (ft) | Sample No. / Interval (ft) | Rec. (in) | Sample Blows per 6" | Stratum Graphic | USCS Group Symbol | Visual - Manual Identification & Description (Density/consistency, color, Group Name, constituents, particle size, structure, moisture, optional descriptions, geologic interpretation, Symbol) | Field Tests: Dilatancy | Toughness | Plasticity | Dry Strength | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | S-1 0.0'- 2.0' 0.5'-' | 18 | 2 4 6 11 | | | 0.5 Top 6" - TOPSOIL | - | - | - | - | |
| | | | | | ML | Medium stiff, grayish brown SILT, some Clay, little coarse to fine Sand, moist (ML) | S | L | L | - | PP = 1.75 tsf |
| | S-2 2.0'- 4.0' | 21 | 8 8 8 9 | | ML | Very stiff, light brown SILT, some Clay, little coarse to fine Sand, little coarse to fine Gravel, moist (MH) | N | L | L | - | PP = 4.5 tsf |
| 5 | S-3 4.0'- 6.0' | 22 | 3 4 8 8 | | ML | Medium stiff, brownish gray SILT, some Clay, little fine Sand, trace fine Gravel, moist (ML) | N | L | L | - | PP = 2.0 tsf |
| | S-4 6.0'- 8.0' | 22 | 8 16 27 35 | | ML | Hard, grayish brown SILT, some coarse to fine Sand, little Clay, little coarse to fine Gravel, moist (ML) | S | L | L | - | PP = 1.5 tsf Fractured rock recovered. |
| | S-5 8.0'- 10.0' | 24 | 12 43 42 50/4" | | ML | Hard, grayish brown SILT, some coarse to fine Sand, little Clay, trace coarse to fine Gravel, moist (ML) | S | L | L | - | PP = 2.25 tsf |
| 10 | | | | | | | | | | | |
| | S-6 13.0'- 15.0' | 18 | 36 21 50/3" | | ML | Hard, light brown to light gray SILT, some coarse to fine Gravel, little Clay, trace fine Sand, dry (MH) | N | L | L | M | PP = 3.0 tsf Soft Shale fragments recovered at 13 feet BGS. |
| 15 | | | | | | 15.0 Auger refusal at 15 feet BGS. End of Boring at 15 feet BGS. Borehole backfilled with soil cuttings. | | | | | |

**Water Level Data**

| Date | Time | Elapsed Time (hr) | Depth in feet to: Bot. of Casing | Bottom of Hole | Water |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

**Sample Type**

**O** Open End Rod
**T** Thin-Wall Tube
**U** Undisturbed Sample
**SS** Split Spoon Sample
**G** Grab Sample

**Notes:**

PP = Pocket Penetrometer
TV = Torvane
No groundwater encountered during subsurface investigation.

Boring No.: **B-13**

**Field Test Legend:**
Dilatancy: N - None S - Slow R - Rapid
Toughness: L - Low M - Medium H - High
Plasticity: NP - Non-Plastic L - Low M - Medium H - High
Dry Strength: N - None L - Low M - Medium H - High VH - Very High

NOTES: 1.) "ppd" denotes soil sample average diametral pocket penetrometer reading. 2.) "ppa" denotes soil sample average axial pocket penetrometer reading.
3.) Maximum Particle Size is determined by direct observation within limitations of sampler size. 4.) Soil identifications and field tests based on visual-manual methods per ASTM D2488.

MOTT MACDONALD

# SOIL BORING LOG

BORING NO.: **B-14**
Page **1** of **1**

| | | | |
|---|---|---|---|
| **Project:** | South Ripley Solar | **Project No.:** | 505100267-001 |
| **Location:** | South Ripley, NY | **Project Mgr:** | Eric Pauli |
| **Client:** | ConnectGen | **Field Eng. Staff:** | Diego Melgar |
| **Drilling Co.:** | Earth Dimensions, Inc. | **Date/Time Started:** | July 24, 2020 at 10:50 am |
| **Driller/Helper:** | Brian B. /Harold Kleever | **Date/Time Finished:** | July 24, 2020 at 11:45 am |

**Elevation:** Grade ft. **Vertical Datum:** | **Boring Location:** See Boring Location Plan | **Coord.:** **Lat:** 42.191841° **Long:** -79.726277° | **Horizontal Datum:** NAD 1983

| Item | Casing | Sampler | Core Barrel |
|---|---|---|---|
| Type | HW | SS | - |
| Length | 5 ft | 2 ft | - |
| Inside Dia. (in.) | 4 | 1.375 | - |
| Hammer Wt. (lb.) | 140 | 140 | - |
| Hammer Fall (in.) | 30 | 30 | - |

**Rig Make & Model:** Diedrich D-50

| | | | |
|---|---|---|---|
| ☐ Truck | ☐ Tripod | ☐ Cat-Head | |
| ☐ ATV | ☐ Geoprobe | ☑ Winch | |
| ☑ Track | ☐ Air Track | ☐ Roller Bit | |
| ☐ Skid | ☐ _____ | ☑ Cutting Head | |

**Hammer Type**: ☐ Safety ☑ Doughnut ☐ Automatic ☐ _____

**Drilling Fluid**: ☐ Bentonite ☐ Polymer ☐ Water ☑ None

**Drill Rod Size:**

**Casing Advance**: Hollow Stem Auger

| Depth/ Elev. (ft) | Sample No. / Interval (ft) | Rec. (in) | Sample Blows per 6" | Stratum Graphic | USCS Group Symbol | Visual - Manual Identification & Description (Density/consistency, color, Group Name, constituents, particle size, structure, moisture, optional descriptions, geologic interpretation, Symbol) | Field Tests: Dilatancy | Toughness | Plasticity | Dry Strength | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | S-1 0.0'- 2.0' 0.3'-' | 17.5 | 1 3 5 6 | | CL | 0.3 Top 3" - TOPSOIL<br>Stiff, dark brown CLAY, some Silt, little coarse to fine Sand, trace fine Gravel, moist (CL) | - S | - M | - L | - - | PP = 2.75 tsf |
| | S-2 2.0'- 4.0' | 22 | 3 5 7 6 | | CL | Stiff, dark brown CLAY, some Silt, little coarse to fine Sand, trace fine Gravel, moist (CL) | S | M | L | - | PP = 4.5 tsf |
| 5 | S-3 4.0'- 6.0' | 22 | 4 6 6 8 | | CL | Stiff, brown CLAY, some Silt, trace fine Sand, trace fine Gravel, moist (CL) | N | M | L | - | PP = 2.25 tsf |
| | S-4 6.0'- 8.0' | 22 | 5 5 9 10 | | ML | 6.0<br>Stiff, brown SILT, some Clay, little fine Sand, trace coarse to fine Gravel, moist (ML) | S | L | L | - | PP = 2.5 tsf |
| 10 | S-5 8.0'- 10.0' | 24 | 6 8 12 14 | | ML | Very stiff, brown SILT, some fine Sand, little coarse to fine Gravel, little Clay, moist (ML) | R | L | L | - | PP = 4.0 tsf |
| | | | | | | 11.5 | | | | | |
| | S-6 13.0'- 15.0' | 16 | 5 12 15 16 | | SM | Medium dense, brown coarse to fine SAND, some Silt, little Clay, little fine Gravel, wet (SM) | - | - | - | - | |
| 15 | | | | | | | | | | | |
| | S-7 18.0'- 20.0' | 13 | 12 14 15 14 | | SM | Medium dense, gray coarse to fine SAND, little Silt, little fine Gravel, trace Clay, wet (SM) | - | - | - | - | |
| | | | | | | End of Boring at 20 feet BGS.<br>20.0 Borehole backfilled with soil cuttings. | | | | | |

**Water Level Data**

| Date | Time | Elapsed Time (hr) | Depth in feet to: Bot. of Casing | Bottom of Hole | Water |
|---|---|---|---|---|---|
| 7/24/20 | 11:45 | 0:00 | | 20.0 | 3 |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

**Sample Type**

| | |
|---|---|
| **O** | Open End Rod |
| **T** | Thin-Wall Tube |
| **U** | Undisturbed Sample |
| **SS** | Split Spoon Sample |
| **G** | Grab Sample |

**Notes:**
PP = Pocket Penetrometer

Boring No.: **B-14**

**Field Test Legend:**
Dilatancy: N - None S - Slow R - Rapid
Toughness: L - Low M - Medium H - High
Plasticity: NP - Non-Plastic L - Low M - Medium H - High
Dry Strength: N - None L - Low M - Medium H - High VH - Very High

NOTES: 1.) "ppd" denotes soil sample average diametral pocket penetrometer reading. 2.) "ppa" denotes soil sample average axial pocket penetrometer reading.
3.) Maximum Particle Size is determined by direct observation within limitations of sampler size. 4.) Soil identifications and field tests based on visual-manual methods per ASTM D2488.

MOTT MACDONALD

# SOIL BORING LOG

BORING NO.: **B-15**
Page **1** of **1**

| | | | |
|---|---|---|---|
| **Project:** | South Ripley Solar | **Project No.:** | 505100267-001 |
| **Location:** | South Ripley, NY | **Project Mgr:** | Eric Pauli |
| **Client:** | ConnectGen | **Field Eng. Staff:** | Diego Melgar |
| **Drilling Co.:** | Earth Dimensions, Inc. | **Date/Time Started:** | July 24, 2020 at 9:40 am |
| **Driller/Helper:** | Brian B. /Harold Kleever | **Date/Time Finished:** | July 24, 2020 at 10:25 am |

**Elevation:** Grade ft. **Vertical Datum:** | **Boring Location:** See Boring Location Plan | **Coord.:** **Lat:** 42.186209° **Long:** -79.727528° | **Horizontal Datum:** NAD 1983

| Item | Casing | Sampler | Core Barrel |
|---|---|---|---|
| Type | HSA | SS | - |
| Length | 5 ft | 2 ft | - |
| Inside Dia. (in.) | 4.25 | 1.375 | - |
| Hammer Wt. (lb.) | 140 | 140 | - |
| Hammer Fall (in.) | 30 | 30 | - |

**Rig Make & Model:** Diedrich D-50

| | | | |
|---|---|---|---|
| ☐ Truck | ☐ Tripod | ☐ Cat-Head | |
| ☐ ATV | ☐ Geoprobe | ☑ Winch | |
| ☑ Track | ☐ Air Track | ☐ Roller Bit | |
| ☐ Skid | ☐ _____ | ☑ Cutting Head | |

**Hammer Type**: ☐ Safety ☑ Doughnut ☐ Automatic ☐ _____

**Drilling Fluid**: ☐ Bentonite ☐ Polymer ☐ Water ☑ None

**Drill Rod Size:**

**Casing Advance**: Hollow Stem Auger

| Depth/ Elev. (ft) | Sample No. / Interval (ft) | Rec. (in) | Sample Blows per 6" | Stratum Graphic | USCS Group Symbol | Visual - Manual Identification & Description (Density/consistency, color, Group Name, constituents, particle size, structure, moisture, optional descriptions, geologic interpretation, Symbol) | Field Tests: Dilatancy | Toughness | Plasticity | Dry Strength | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | S-1 0.0'- 2.0' 0.3'-' | 17 | 2 3 3 9 | | ML | 0.3 Top 4" - TOPSOIL<br>Medium stiff, brown SILT, some Clay, little fine Sand, moist (ML) | - N | - L | - L | - - | PP = 1.25 tsf |
| | S-2 2.0'- 4.0' | 24 | 4 12 15 11 | | ML | Very stiff, light brown SILT, some fine Sand, little Clay, little coarse to fine Gravel, dry (ML) | N | L | L | L | PP > 4.5 tsf |
| 5 | S-3 4.0'- 6.0' | 24 | 5 7 7 8 | | ML | Stiff, brown SILT, some coarse to fine Sand, little coarse to fine Gravel, trace Clay, moist (ML) | N | L | L | - | PP = 2.0 tsf |
| | S-4 6.0'- 8.0' | 13 | 4 3 6 4 | | ML | Stiff, light brown SILT, some Clay, some coarse to fine Gravel, little fine Sand, wet (ML) | S | L | L | - | PP = 1.25 tsf |
| | S-5 8.0'- 10.0' | 15 | 3 3 6 6 | | ML | Stiff, light brown SILT, some coarse to fine Sand, little Clay, little coarse to fine Gravel, moist (ML) | N | L | L | - | PP = 2.0 tsf |
| 10 | | | | | | 11.5 | | | | | |
| | S-6 13.0'- 15.0' | 13 | 12 13 15 9 | | CL | Very stiff, gray CLAY, some Silt, little coarse to fine Sand, little coarse to fine Gravel, wet (CL) | S | M | L | - | PP = 1.0 tsf |
| 15 | | | | | | | | | | | |
| | S-7 18.0'- 20.0' | 21 | 7 7 11 16 | | CL | Very stiff, gray CLAY, some Silt, little fine Gravel, trace coarse to fine Sand, moist (CL) | N | M | L | - | PP = 4.0 tsf |
| | | | | | | End of Boring at 20 feet BGS.<br>20.0 Borehole backfilled with soil cuttings. | | | | | |

**Water Level Data**

| Date | Time | Elapsed Time (hr) | Depth in feet to: Bot. of Casing | Bottom of Hole | Water |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

**Sample Type**

| | |
|---|---|
| **O** | Open End Rod |
| **T** | Thin-Wall Tube |
| **U** | Undisturbed Sample |
| **SS** | Split Spoon Sample |
| **G** | Grab Sample |

**Notes:**
PP = Pocket Penetrometer
No groundwater encountered during subsurface investigation.

Boring No.: **B-15**

**Field Test Legend:**
Dilatancy: N - None S - Slow R - Rapid
Toughness: L - Low M - Medium H - High
Plasticity: NP - Non-Plastic L - Low M - Medium H - High
Dry Strength: N - None L - Low M - Medium H - High VH - Very High

NOTES: 1.) "ppd" denotes soil sample average diametral pocket penetrometer reading. 2.) "ppa" denotes soil sample average axial pocket penetrometer reading.
3.) Maximum Particle Size is determined by direct observation within limitations of sampler size. 4.) Soil identifications and field tests based on visual-manual methods per ASTM D2488.

MOTT MACDONALD

# SOIL BORING LOG

BORING NO.: **B-16**
Page **1** of **1**

| | | | |
|---|---|---|---|
| **Project:** | South Ripley Solar | **Project No.:** | 505100267-001 |
| **Location:** | South Ripley, NY | **Project Mgr:** | Eric Pauli |
| **Client:** | ConnectGen | **Field Eng. Staff:** | Diego Melgar |
| **Drilling Co.:** | Earth Dimensions, Inc. | **Date/Time Started:** | July 24, 2020 at 8:10 am |
| **Driller/Helper:** | Brian B. /Harold Kleever | **Date/Time Finished:** | July 24, 2020 at 8:50 am |

**Elevation:** Grade ft. **Vertical Datum:** | **Boring Location:** See Boring Location Plan | **Coord.:** **Lat:** 42.181355° **Long:** -79.728725° | **Horizontal Datum:** NAD 1983

| Item | Casing | Sampler | Core Barrel |
|---|---|---|---|
| Type | HSA | SS | - |
| Length | 5 ft | 2 ft | - |
| Inside Dia. (in.) | 4.25 | 1.375 | - |
| Hammer Wt. (lb.) | 140 | 140 | - |
| Hammer Fall (in.) | 30 | 30 | - |

**Rig Make & Model:** Diedrich D-50

☐ Truck ☐ Tripod ☐ Cat-Head
☐ ATV ☐ Geoprobe ☑ Winch
☑ Track ☐ Air Track ☐ Roller Bit
☐ Skid ☐ _____ ☑ Cutting Head

**Hammer Type:** ☐ Safety ☑ Doughnut ☐ Automatic ☐ _____

**Drilling Fluid:** ☐ Bentonite ☐ Polymer ☐ Water ☑ None

**Drill Rod Size:**

**Casing Advance:** Hollow Stem Auger

| Depth/ Elev. (ft) | Sample No. / Interval (ft) | Rec. (in) | Sample Blows per 6" | Stratum Graphic | USCS Group Symbol | Visual - Manual Identification & Description (Density/consistency, color, Group Name, constituents, particle size, structure, moisture, optional descriptions, geologic interpretation, Symbol) | Field Tests: Dilatancy | Toughness | Plasticity | Dry Strength | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | S-1 0.0'- 2.0' 0.4'-' | 20 | 1 2 4 9 | | | 0.4 Top 5" - TOPSOIL | - | - | - | - | |
| | | | | | ML | Medium stiff, dark brown SILT, some Clay, some coarse to fine Sand, trace fine Gravel, moist (ML) | N | L | L | - | PP = 1.75 tsf |
| | S-2 2.0'- 4.0' | 22 | 6 8 7 6 | | ML | Very stiff, grayish brown SILT, some fine Sand, some Clay, trace fine Gravel, moist (ML) | S | L | L | - | PP = 1.75 tsf |
| | S-3 4.0'- 6.0' | 17.5 | 4 4 7 11 | | ML | Stiff, brown SILT, some coarse to fine Sand, some Clay, trace fine Gravel, moist (ML) | S | L | L | - | PP = 0.75 tsf |
| 5 | | | | | | 6.0 | | | | | |
| | S-4 6.0'- 8.0' | 16 | 5 4 6 12 | | SM | Medium dense, brown coarse to fine SAND, some Silt, trace Clay, trace fine Gravel, wet (SM) | N | - | NP | - | |
| | S-5 8.0'- 10.0' | 14 | 14 12 8 6 | | SM | Medium dense, brown fine SAND, some Silt, little fine Gravel, trace Clay, wet (SM) | S | - | NP | - | PP = 1.25 tsf |
| 10 | | | | | | 11.5 | | | | | |
| | S-6 13.0'- 15.0' | 24 | 9 12 16 17 | | CL | Very stiff, brown CLAY, some Silt, little fine Sand, trace fine Gravel, moist (CL) | S | L | L | - | PP > 4.5 tsf Mottling observed on Clay material at 13 feet BGS. |
| 15 | | | | | | | | | | | |
| | S-7 18.0'- 20.0' | 23 | 10 11 13 16 | | CL | Very stiff, gray CLAY, some Silt, little fine Sand, trace fine Gravel, moist (CL) | S | M | L | - | PP > 4.5 tsf |
| | | | | | | End of Boring at 20 feet BGS. Borehole backfilled with soil cuttings. 20.0 | | | | | |

**Water Level Data**

| Date | Time | Elapsed Time (hr) | Depth in feet to: Bot. of Casing | Bottom of Hole | Water |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

**Sample Type**

**O** Open End Rod
**T** Thin-Wall Tube
**U** Undisturbed Sample
**SS** Split Spoon Sample
**G** Grab Sample

**Notes:**

PP = Pocket Penetrometer
No groundwater encountered during subsurface investigation but wet sampels indicate the water table was encountered.

Boring No.: **B-16**

**Field Test Legend:**
Dilatancy: N - None S - Slow R - Rapid
Toughness: L - Low M - Medium H - High
Plasticity: NP - Non-Plastic L - Low M - Medium H - High
Dry Strength: N - None L - Low M - Medium H - High VH - Very High

NOTES: 1.) "ppd" denotes soil sample average diametral pocket penetrometer reading. 2.) "ppa" denotes soil sample average axial pocket penetrometer reading.
3.) Maximum Particle Size is determined by direct observation within limitations of sampler size. 4.) Soil identifications and field tests based on visual-manual methods per ASTM D2488.

MOTT MACDONALD

# SOIL BORING LOG

BORING NO.: **B-17**
Page **1** of **1**

| | | | |
|---|---|---|---|
| **Project:** | South Ripley Solar | **Project No.:** | 505100267-001 |
| **Location:** | South Ripley, NY | **Project Mgr:** | Eric Pauli |
| **Client:** | ConnectGen | **Field Eng. Staff:** | Diego Melgar |
| **Drilling Co.:** | Earth Dimensions, Inc. | **Date/Time Started:** | July 23, 2020 at 9:30 am |
| **Driller/Helper:** | Brian B. /Harold Kleever | **Date/Time Finished:** | July 23, 2020 at 10:30 am |

**Elevation:** Grade ft. **Vertical Datum:** | **Boring Location:** See Boring Location Plan | **Coord.:** **Lat:** 42.201018° **Long:** -79.720274° | **Horizontal Datum:** NAD 1983

| Item | Casing | Sampler | Core Barrel |
|---|---|---|---|
| Type | HSA | SS | NQ |
| Length | 5 ft | 2 ft | - in |
| Inside Dia. (in.) | 4.25 | 1.375 | 1.875 |
| Hammer Wt. (lb.) | 140 | 140 | - |
| Hammer Fall (in.) | 30 | 30 | - |

**Rig Make & Model:** Diedrich D-50

☐ Truck ☐ Tripod ☐ Cat-Head
☐ ATV ☐ Geoprobe ☑ Winch
☑ Track ☐ Air Track ☐ Roller Bit
☐ Skid ☐ _____ ☑ Cutting Head

**Hammer Type:** ☐ Safety ☑ Doughnut ☐ Automatic ☐ _____

**Drilling Fluid:** ☐ Bentonite ☐ Polymer ☐ Water ☑ None

**Drill Rod Size:**

**Casing Advance:** Hollow Stem Auger

| Depth/ Elev. (ft) | Sample No. / Interval (ft) | Rec. (in) | Sample Blows per 6" | Stratum Graphic | USCS Group Symbol | Visual - Manual Identification & Description (Density/consistency, color, Group Name, constituents, particle size, structure, moisture, optional descriptions, geologic interpretation, Symbol) | Field Tests: Dilatancy | Toughness | Plasticity | Dry Strength | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | S-1 0.0'- 2.0' 0.3'-' | 21 | 2 4 8 12 | | ML | 0.3 Top 4" - TOPSOIL<br>Stiff, brown SILT, some Clay, little coarse to fine Sand, trace fine Gravel, moist (ML) | - N | - L | - L | - L | PP = 3.5 tsf |
| | S-2 2.0'- 4.0' | 21 | 20 16 21 19 | | ML | Hard, brown SILT, some coarse to fine Sand, little Clay, moist (ML) | - | L | L | - | PP = 3.0 tsf |
| 5 | S-3 4.0'- 6.0' | 18 | 8 7 10 15 | | CL | 4.0<br>Very stiff, brown CLAY, some Silt, little coarse to fine Sand, trace fine Gravel, moist (CL) | S | M | L | - | PP = 3.75 tsf |
| | S-4 6.0'- 8.0' | 23 | 13 25 30 50/3" | | CL | Hard, brown CLAY, some Silt, little coarse to fine Gravel, trace fine Sand, dry (CL) | N | M | L | L | PP = 4.0 tsf |
| 10 | S-5 8.0'- 10.0' | 14 | 47 36 50/3" | | ML | 8.0<br>Hard, reddish brown SILT, some coarse to fine Sand, little fine Gravel, little Clay, dry (ML) | - | L | NP | L | PP = 0.5 tsf |
| | 12.0'-' | | | | | | - | - | - | - | Auger refusal at 12 feet on 7/23/2020. Possible cobble or boulder. |
| 15 | 13.5'-' | | | | | 13.5<br>Auger refusal at 13.5 feet BGS.<br>Top of Rock at 13.5 feet BGS.<br>See Rock Coring Log. | - | - | - | - | Returned to B-17 on 8/11/2020 and hit auger refusal at 13.5 feet BGS. Began coring at 13.5 feet BGS. |

**Water Level Data**

| Date | Time | Elapsed Time (hr) | Depth in feet to: Bot. of Casing | Bottom of Hole | Water |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

**Sample Type**

**O** Open End Rod
**T** Thin-Wall Tube
**U** Undisturbed Sample
**SS** Split Spoon Sample
**G** Grab Sample

**Notes:**

PP = Pocket Penetrometer
TV = Torvane
No groundwater encountered during subsurface investigation.

Boring No.: **B-17**

**Field Test Legend:**
Dilatancy: N - None S - Slow R - Rapid
Toughness: L - Low M - Medium H - High
Plasticity: NP - Non-Plastic L - Low M - Medium H - High
Dry Strength: N - None L - Low M - Medium H - High VH - Very High

NOTES: 1.) "ppd" denotes soil sample average diametral pocket penetrometer reading. 2.) "ppa" denotes soil sample average axial pocket penetrometer reading.
3.) Maximum Particle Size is determined by direct observation within limitations of sampler size. 4.) Soil identifications and field tests based on visual-manual methods per ASTM D2488.

MOTT MACDONALD

# CORE BORING LOG

BORING NO.: **B-17**

Page **1** of **1**

| | | | |
|---|---|---|---|
| **Project:** | South Ripley Solar | **Project No.:** | 505100267-001 |
| **Location:** | South Ripley, NY | **Project Mgr:** | Eric Pauli |
| **Client:** | ConnectGen | **Field Eng. Staff:** | Diego Melgar |
| **Drilling Co.:** | Earth Dimensions, Inc. | **Date/Time Started:** | July 23, 2020 at 9:30 am |
| **Driller/Helper:** | Brian B. /Harold Kleever | **Date/Time Finished:** | July 23, 2020 at 10:30 am |

**Elevation:** Grade ft. **Vertical Datum:**

**Boring Location:** See Boring Location Plan

**Coord.:** **Lat:** 42.201018° **Long:** -79.720274°

| **Item** | **Casing** | **Core Barrel** | **Core Bit** |
|---|---|---|---|
| **Type** | HSA | NQ | Imp. Diamond |
| **Length** | 5 ft | 5 ft | 6 in |
| **Inside Dia. (in.)** | 4.25 | 1.875 | 1.875 |

**Horizontal Datum:** NAD 1983

**Rig Make & Model:** Diedrich D-50

**Drilling Method:** Wireline

| Depth/ Elev. (ft) | Avg Core Rate (min /ft) | Depth (ft) | Run/ (Box) No. | Rec (in. / %) | RQD (in / %) | Rock Core Hard. | Rock Core Weath | Stratum Graphic | Visual Identification, Description and Remarks (Rock type, colour, texture, weathering, field strength, discontinuity spacing, optional additional geological observations) | Depth (ft.) | Discontinuities Type | Dip | Rgh | Wea | Aper | Infill | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | SEE TEST BORING LOG FOR OVERBURDEN DETAILS | | (See Legend for Rock Description System) | | | | | | |
| | 2.35 | 13.5 | | | | | | | SHALE, gray, very fine to fine grained, moderately weathered, weak, very close to close spaced discontinuities | 14.20 | J | 10 | P,R | DG | VT | ML | Silt inclusions observed throughout core run. |
| 15 | 2.00 | | | | | | | | | 15.00 | J | 5 | P,R | DG | VT | CL | |
| | 1.35 | | R-1 | 59 98% | 8 13% | R1 | M | | | 16.00 | J | 10 | P,R | DG | CA | CL | |
| | | | | | | | | | | 16.20 | J | 10 | P,R | DG | VT | ML | |
| | 1.48 | | | | | | | | | 16.80 | J | 5 | P,R | DG | VT | ML | |
| | 2.29 | 18.5 | | | | | | | 18.5 | | | | | | | | |
| | | | | | | | | | End of Boring at 18.5 feet BGS. Borehole backfilled with soil cuttings. | | | | | | | | |
| 20 | | | | | | | | | | | | | | | | | |
| 25 | | | | | | | | | | | | | | | | | |
| 30 | | | | | | | | | | | | | | | | | |

**Water Level Data**

| Date | Time | Elapsed Time (hr) | Depth in feet to: Bot. of Casing | Bottom of Hole | Water |
|---|---|---|---|---|---|
| | | - | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

**Notes:**

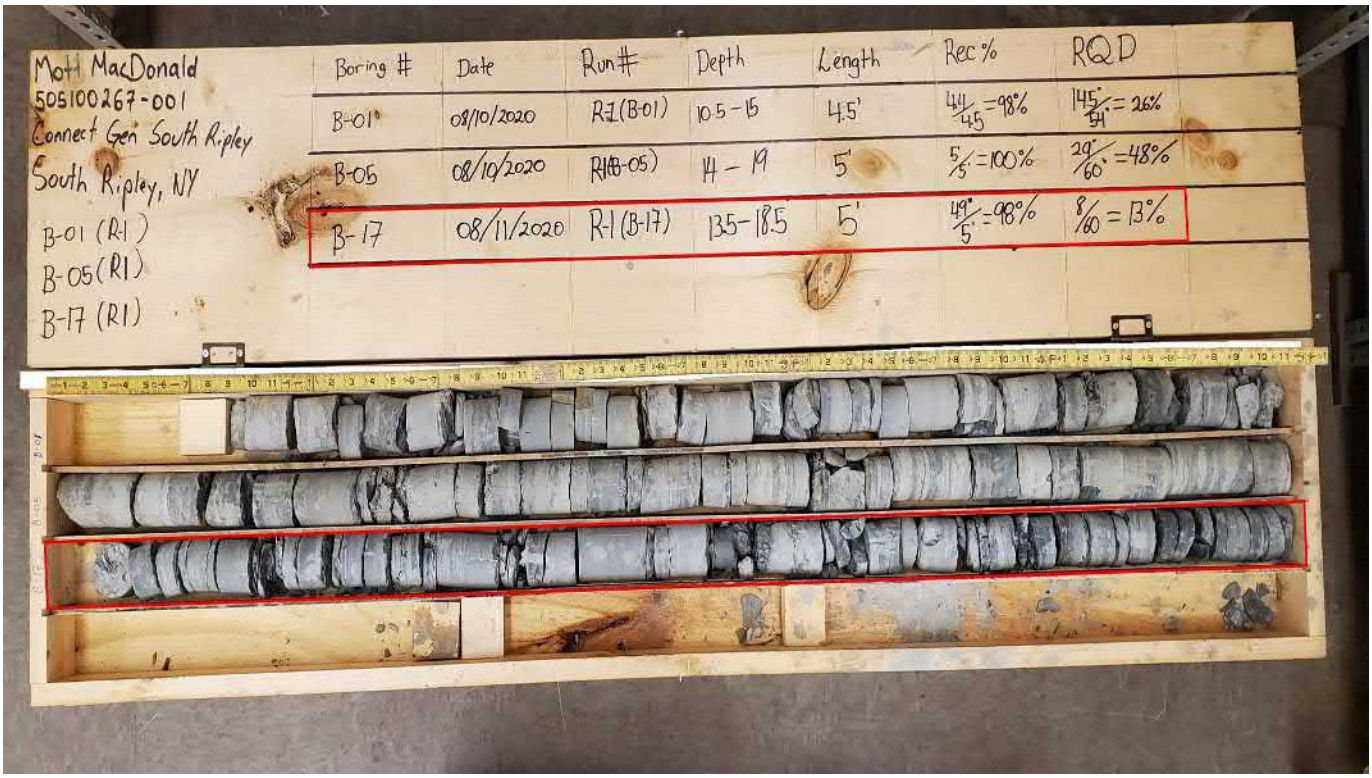


Figure B-17.1
B-17 Box 1 R1 Dry


Figure B-17.2
B-17 Box 1 R1 Wet

| | | |
|---|---|---|
| MOTT MACDONALD | **South Ripley Solar**<br>**Rock Core Photographs** | **BORING NO.:**<br>B-17 |

MOTT MACDONALD

# SOIL BORING LOG

BORING NO.: **B-18**
Page **1** of **1**

| | | | |
|---|---|---|---|
| **Project:** | South Ripley Solar | **Project No.:** | 505100267-001 |
| **Location:** | South Ripley, NY | **Project Mgr:** | Eric Pauli |
| **Client:** | ConnectGen | **Field Eng. Staff:** | Diego Melgar |
| **Drilling Co.:** | Earth Dimensions, Inc. | **Date/Time Started:** | July 23, 2020 at 11:02 am |
| **Driller/Helper:** | Brian B. /Harold Kleever | **Date/Time Finished:** | July 23, 2020 at 12:02 am |

**Elevation:** Grade ft. **Vertical Datum:** | **Boring Location:** See Boring Location Plan | **Coord.:** **Lat:** 42.197076° **Long:** -79.720356° | **Horizontal Datum:** NAD 1983

| Item | Casing | Sampler | Core Barrel |
|---|---|---|---|
| Type | HSA | SS | - |
| Length | 5 ft | 2 ft | - |
| Inside Dia. (in.) | 4.25 | 1.375 | - |
| Hammer Wt. (lb.) | 140 | 140 | - |
| Hammer Fall (in.) | 30 | 30 | - |

**Rig Make & Model:** Diedrich D-50

| | | | |
|---|---|---|---|
| ☐ Truck | ☐ Tripod | ☐ Cat-Head | |
| ☐ ATV | ☐ Geoprobe | ☑ Winch | |
| ☑ Track | ☐ Air Track | ☐ Roller Bit | |
| ☐ Skid | ☐ _____ | ☑ Cutting Head | |

**Hammer Type**: ☐ Safety ☑ Doughnut ☐ Automatic ☐ _____

**Drilling Fluid**: ☐ Bentonite ☐ Polymer ☐ Water ☑ None

**Drill Rod Size:**

**Casing Advance**: Hollow Stem Auger

| Depth/ Elev. (ft) | Sample No. / Interval (ft) | Rec. (in) | Sample Blows per 6" | Stratum Graphic | USCS Group Symbol | Visual - Manual Identification & Description (Density/consistency, color, Group Name, constituents, particle size, structure, moisture, optional descriptions, geologic interpretation, Symbol) | Field Tests: Dilatancy | Toughness | Plasticity | Dry Strength | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | S-1 0.0'- 2.0' 0.3'-' | 19 | 1 3 6 7 | | ML | 0.3 Top 4" - TOPSOIL<br>Stiff, brown SILT, some fine Sand, trace Clay, trace fine Gravel, moist (ML) | N | L | M | - | PP = 3.5 tsf |
| | S-2 2.0'- 4.0' | 19 | 5 5 5 5 | | ML | Stiff, light brown SILT, some coarse to fine Sand, some Clay, trace fine Gravel, moist (ML) | N | L | M | - | PP > 4.5 tsf |
| | S-3 4.0'- 6.0' | 17 | 6 8 10 11 | | CL | 4.0<br>Very stiff, brown CLAY, little fine Sand, little Silt, trace fine Gravel, moist (CL) | N | M | L | - | PP = 2.75 tsf |
| 5 | S-4 6.0'- 8.0' | 24 | 10 14 13 16 | | CL | Very stiff, light brown CLAY, some Silt, little fine Gravel, trace fine Sand, dry (CL) | N | M | L | VH | PP = 2.25 tsf |
| | S-5 8.0'- 10.0' | 24 | 7 13 29 41 | | CL | Hard, dark brown CLAY, some Silt, little coarse to fine Sand, trace coarse to fine Gravel, moist (CL) | N | M | L | VH | PP > 4.5 tsf<br>Weathered bedrock recovered at bottom of split spoon. |
| 10 | | | | | | 11.5 | | | | | |
| | S-6 13.0'- 15.0' | 24 | 14 18 24 29 | | ML | Hard, light gray SILT, some coarse to fine Sand, some coarse to fine Gravel, little Clay, dry (ML) | - | H | L | VH | PP = 4.5 tsf |
| 15 | | | | | | 16.5 | | | | | |
| ▽ | S-7 18.0'- 20.0' | 14 | 6 23 30 25 | | GC | Very dense, light gray coarse to fine GRAVEL, some Clay, trace Silt, trace fine Sand, wet (GC) | - | - | - | - | |
| | | | | | | End of Boring at 20 feet BGS.<br>20.0 Borehole backfilled with soil cuttings. | | | | | |

**Water Level Data**

| Date | Time | Elapsed Time (hr) | Depth in feet to: Bot. of Casing | Bottom of Hole | Water |
|---|---|---|---|---|---|
| 7/23/20 | 11:02 | 0:00 | | 20.0 | 17 |

**Sample Type**

| | |
|---|---|
| **O** | Open End Rod |
| **T** | Thin-Wall Tube |
| **U** | Undisturbed Sample |
| **SS** | Split Spoon Sample |
| **G** | Grab Sample |

**Notes:**
PP = Pocket Penetrometer

Boring No.: **B-18**

**Field Test Legend:**
Dilatancy: N - None S - Slow R - Rapid
Toughness: L - Low M - Medium H - High
Plasticity: NP - Non-Plastic L - Low M - Medium H - High
Dry Strength: N - None L - Low M - Medium H - High VH - Very High

NOTES: 1.) "ppd" denotes soil sample average diametral pocket penetrometer reading. 2.) "ppa" denotes soil sample average axial pocket penetrometer reading.
3.) Maximum Particle Size is determined by direct observation within limitations of sampler size. 4.) Soil identifications and field tests based on visual-manual methods per ASTM D2488.

MOTT MACDONALD

# SOIL BORING LOG

BORING NO.: **B-19**
Page **1** of **1**

| | | | |
|---|---|---|---|
| **Project:** | South Ripley Solar | **Project No.:** | 505100267-001 |
| **Location:** | South Ripley, NY | **Project Mgr:** | Eric Pauli |
| **Client:** | ConnectGen | **Field Eng. Staff:** | Diego Melgar |
| **Drilling Co.:** | Earth Dimensions, Inc. | **Date/Time Started:** | July 23, 2020 at 1:45 pm |
| **Driller/Helper:** | Brian B. /Harold Kleever | **Date/Time Finished:** | July 23, 2020 at 2:35 pm |

**Elevation:** Grade ft. **Vertical Datum:** | **Boring Location:** See Boring Location Plan | **Coord.:** **Lat:** 42.201863° **Long:** -79.716425° | **Horizontal Datum:** NAD 1983

| Item | Casing | Sampler | Core Barrel |
|---|---|---|---|
| Type | HSA | SS | - |
| Length | 5 ft | 2 ft | - |
| Inside Dia. (in.) | 4.25 | 1.375 | - |
| Hammer Wt. (lb.) | 140 | 140 | - |
| Hammer Fall (in.) | 30 | 30 | - |

**Rig Make & Model:** Diedrich D-50

☐ Truck ☐ Tripod ☐ Cat-Head
☐ ATV ☐ Geoprobe ☑ Winch
☑ Track ☐ Air Track ☐ Roller Bit
☐ Skid ☐ _____ ☑ Cutting Head

**Hammer Type:** ☐ Safety ☑ Doughnut ☐ Automatic ☐ _____

**Drilling Fluid:** ☐ Bentonite ☐ Polymer ☐ Water ☑ None

**Drill Rod Size:**

**Casing Advance:** Hollow Stem Auger

| Depth/ Elev. (ft) | Sample No. / Interval (ft) | Rec. (in) | Sample Blows per 6" | Stratum Graphic | USCS Group Symbol | Visual - Manual Identification & Description (Density/consistency, color, Group Name, constituents, particle size, structure, moisture, optional descriptions, geologic interpretation, Symbol) | Field Tests: Dilatancy | Toughness | Plasticity | Dry Strength | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | S-1 0.0'- 2.0' 0.2'-' | 17 | 2 3 5 7 | | CL | 0.2 Top 2" - TOPSOIL<br>Stiff, brown CLAY, little Silt, trace fine Sand, dry (CL) | - N | - M | - L | - H | PP = 4.0 tsf |
| | S-2 2.0'- 4.0' | 20 | 6 9 11 13 | | CL | Very stiff, brown CLAY, little Silt, trace fine Sand, dry (CL) | N | M | L | VH | PP > 4.5 tsf |
| 5 | S-3 4.0'- 6.0' | 24 | 6 6 9 12 | | CL | Very stiff, brown CLAY, some Silt, trace fine Sand, trace coarse to fine Gravel, dry (CL) | N | M | L | VH | PP > 4.5 tsf |
| | S-4 6.0'- 8.0' | 24 | 3 8 11 16 | | CL | Very stiff, brown CLAY, little Silt, trace fine Sand, trace fine Gravel, dry (CL) | N | M | L | H | PP = 3.25 tsf |
| | S-5 8.0'- 10.0' | 24 | 4 9 13 18 | | CL | Very stiff, brown CLAY, little Silt, trace fine Sand, trace fine Gravel, dry (CL) | N | M | L | H | PP > 4.5 tsf |
| 10 | | | | | | 11.5 | | | | | |
| | S-6 13.0'- 15.0' | 24 | 5 12 12 10 | | ML | Very stiff, gray SILT, some Clay, little coarse to fine Gravel, little fine Sand, dry (ML) | S | H | M | H | PP = 1.0 tsf |
| 15 | | | | | | | | | | | |
| | S-7 18.0'- 20.0' | 20 | 11 21 32 36 | | ML | Hard, gray SILT, little fine Sand, little fine Gravel, trace Clay, wet (ML) | N | - | NP | - | PP = 0.75 tsf |
| | | | | | | End of Boring at 20 feet BGS.<br>20.0 Borehole backfilled with soil cuttings. | | | | | |

**Water Level Data**

| Date | Time | Elapsed Time (hr) | Depth in feet to: Bot. of Casing | Bottom of Hole | Water |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

**Sample Type**

**O** Open End Rod
**T** Thin-Wall Tube
**U** Undisturbed Sample
**SS** Split Spoon Sample
**G** Grab Sample

**Notes:**
PP = Pocket Penetrometer
No groundwater encountered during subsurface investigation.

Boring No.: **B-19**

**Field Test Legend:**
Dilatancy: N - None S - Slow R - Rapid
Toughness: L - Low M - Medium H - High
Plasticity: NP - Non-Plastic L - Low M - Medium H - High
Dry Strength: N - None L - Low M - Medium H - High VH - Very High

NOTES: 1.) "ppd" denotes soil sample average diametral pocket penetrometer reading. 2.) "ppa" denotes soil sample average axial pocket penetrometer reading.
3.) Maximum Particle Size is determined by direct observation within limitations of sampler size. 4.) Soil identifications and field tests based on visual-manual methods per ASTM D2488.

MOTT MACDONALD

# SOIL BORING LOG

BORING NO.: **B-20**
Page **1** of **1**

| | | | |
|---|---|---|---|
| **Project:** | South Ripley Solar | **Project No.:** | 505100267-001 |
| **Location:** | South Ripley, NY | **Project Mgr:** | Eric Pauli |
| **Client:** | ConnectGen | **Field Eng. Staff:** | Diego Melgar |
| **Drilling Co.:** | Earth Dimensions, Inc. | **Date/Time Started:** | July 27, 2020 at 7:20 am |
| **Driller/Helper:** | Brian B. /Harold Kleever | **Date/Time Finished:** | July 27, 2020 at 8:15 am |

**Elevation:** Grade ft. **Vertical Datum:** | **Boring Location:** See Boring Location Plan | **Coord.:** **Lat:** 42.200811° **Long:** -79.710560° | **Horizontal Datum:** NAD 1983

| Item | Casing | Sampler | Core Barrel |
|---|---|---|---|
| Type | HSA | SS | - |
| Length | 5 ft | 2 ft | - |
| Inside Dia. (in.) | 4.25 | 1.375 | - |
| Hammer Wt. (lb.) | 140 | 140 | - |
| Hammer Fall (in.) | 30 | 30 | - |

**Rig Make & Model:** Diedrich D-50

| | | | |
|---|---|---|---|
| ☐ Truck | ☐ Tripod | ☐ Cat-Head | |
| ☐ ATV | ☐ Geoprobe | ☑ Winch | |
| ☑ Track | ☐ Air Track | ☐ Roller Bit | |
| ☐ Skid | ☐ _____ | ☑ Cutting Head | |

**Hammer Type**: ☐ Safety ☑ Doughnut ☐ Automatic ☐ _____

**Drilling Fluid**: ☐ Bentonite ☐ Polymer ☐ Water ☑ None

**Drill Rod Size:**

**Casing Advance**: Hollow Stem Auger

| Depth/ Elev. (ft) | Sample No. / Interval (ft) | Rec. (in) | Sample Blows per 6" | Stratum Graphic | USCS Group Symbol | Visual - Manual Identification & Description (Density/consistency, color, Group Name, constituents, particle size, structure, moisture, optional descriptions, geologic interpretation, Symbol) | Field Tests: Dilatancy | Toughness | Plasticity | Dry Strength | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | S-1 0.0'- 2.0' 0.3'-' | 16 | 2 4 8 8 | | CL | 0.3 Top 3" - TOPSOIL<br>Stiff, light brown CLAY, some Silt, little fine Sand, trace fine Gravel, dry (CL) | - N | - M | - L | - L | PP = 3.0 tsf TV = 0.25 tsf |
| | S-2 2.0'- 4.0' | 22 | 6 8 10 8 | | CL | Very stiff, brown CLAY, some Silt, little fine Sand, dry (CL) | N | M | L | M | PP = 4.0 tsf TV = 0.50 tsf |
| 5 | S-3 4.0'- 6.0' | 20 | 5 5 5 5 | | CL | Stiff, brown CLAY, some coarse to fine Sand, little Silt, trace fine Gravel, moist (CL) | N | M | L | - | PP > 4.5 tsf TV = 2.0 tsf |
| | S-4 6.0'- 8.0' | 23 | 6 12 19 20 | | ML | 6.0<br>Hard, brown SILT, some fine Sand, little Clay, trace fine Gravel, moist (ML) | S | M | M | - | PP = 3.5 tsf TV = 2.0 tsf |
| 10 | S-5 8.0'- 10.0' | 6 | 9 20 19 16 | | CL | 8.0<br>Hard, brown CLAY, some Silt, little fine Gravel, little fine Sand, moist (CL) | - | M | L | - | PP = 1.0 tsf |
| 15 | S-6 13.0'- 15.0' | 24 | 7 10 13 18 | | CL | Very stiff, gray CLAY, some Silt, dry (CL) | N | M | L | H | PP = 3.75 tsf |
| | S-7 18.0'- 20.0' | 24 | 9 10 17 20 | | CL | Very stiff, dark gray CLAY, some Silt, dry (CL) | N | M | L | H | 1-inch of wet Sand recovered at 20 feet BGS. |
| | | | | | | End of Boring at 20 feet BGS.<br>20.0 Borehole backfilled with soil cuttings. | | | | | |

**Water Level Data**

| Date | Time | Elapsed Time (hr) | Depth in feet to: Bot. of Casing | Bottom of Hole | Water |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

**Sample Type**

| | |
|---|---|
| **O** | Open End Rod |
| **T** | Thin-Wall Tube |
| **U** | Undisturbed Sample |
| **SS** | Split Spoon Sample |
| **G** | Grab Sample |

**Notes:**
PP = Pocket Penetrometer
TV = Torvane
No ground water encountered during subsurface investigation.

Boring No.: **B-20**

**Field Test Legend:**
Dilatancy: N - None S - Slow R - Rapid
Toughness: L - Low M - Medium H - High
Plasticity: NP - Non-Plastic L - Low M - Medium H - High
Dry Strength: N - None L - Low M - Medium H - High VH - Very High

NOTES: 1.) "ppd" denotes soil sample average diametral pocket penetrometer reading. 2.) "ppa" denotes soil sample average axial pocket penetrometer reading.
3.) Maximum Particle Size is determined by direct observation within limitations of sampler size. 4.) Soil identifications and field tests based on visual-manual methods per ASTM D2488.

MOTT MACDONALD

# SOIL BORING LOG

BORING NO.: **B-21**
Page **1** of **1**

| | | | |
|---|---|---|---|
| **Project:** | South Ripley Solar | **Project No.:** | 505100267-001 |
| **Location:** | South Ripley, NY | **Project Mgr:** | Eric Pauli |
| **Client:** | ConnectGen | **Field Eng. Staff:** | Diego Melgar |
| **Drilling Co.:** | Earth Dimensions, Inc. | **Date/Time Started:** | |
| **Driller/Helper:** | Brian B. /Harold Kleever | **Date/Time Finished:** | |

**Elevation:** Grade ft. **Vertical Datum:** | **Boring Location:** See Boring Location Plan | **Coord.:** **Lat:** 42.197866° **Long:** -79.708183° | **Horizontal Datum:** NAD 1983

| Item | Casing | Sampler | Core Barrel |
|---|---|---|---|
| Type | HSA | SS | - |
| Length | 5 ft | 2 ft | - |
| Inside Dia. (in.) | 4.25 | 1.375 | - |
| Hammer Wt. (lb.) | 140 | 140 | - |
| Hammer Fall (in.) | 30 | 30 | - |

**Rig Make & Model:** Diedrich D-50

☐ Truck ☐ Tripod ☐ Cat-Head
☐ ATV ☐ Geoprobe ☑ Winch
☑ Track ☐ Air Track ☐ Roller Bit
☐ Skid ☐ _____ ☑ Cutting Head

**Hammer Type:** ☐ Safety ☑ Doughnut ☐ Automatic ☐ _____

**Drilling Fluid:** ☐ Bentonite ☐ Polymer ☐ Water ☑ None

**Drill Rod Size:**

**Casing Advance:** Hollow Stem Auger

| Depth/ Elev. (ft) | Sample No. / Interval (ft) | Rec. (in) | Sample Blows per 6" | Stratum Graphic | USCS Group Symbol | Visual - Manual Identification & Description (Density/consistency, color, Group Name, constituents, particle size, structure, moisture, optional descriptions, geologic interpretation, Symbol) | Field Tests: Dilatancy | Toughness | Plasticity | Dry Strength | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | S-1 0.0'- 2.0' 0.3'-' | 18 | 1 2 5 7 | | ML | 0.3 Top 4" - TOPSOIL<br>Medium stiff, brown SILT, some Clay, trace fine Sand, moist (ML) | - N | - L | - L | - - | PP = 1.75 tsf |
| | S-2 2.0'- 4.0' | 24 | 4 5 5 7 | | CL | 2.0<br>Stiff, dark brown CLAY, little Silt, little fine Sand, trace fine Gravel, moist (CL) | S | M | L | - | PP = 3.0 tsf |
| 5 | S-3 4.0'- 6.0' | 22 | 3 6 5 5 | | CL | Stiff, brown CLAY, little Silt, little coarse to fine Gravel, trace fine Sand, moist (CL) | N | M | L | - | PP = 2.75 tsf |
| | S-4 6.0'- 8.0' | 19 | 4 5 7 13 | | CL | Very stiff, brown Silty CLAY, little coarse to fine Sand, trace fine Gravel, moist (CL) | N | M | L | - | PP = 1.75 tsf |
| | S-5 8.0'- 10.0' | 24 | 7 9 13 20 | | CL | Very stiff, brown Silty CLAY, little coarse to fine Sand, trace fine Gravel, moist (CL) | N | M | L | H | PP > 4.5 tsf |
| 10 | | | | | | | | | | | |
| | S-6 13.0'- 15.0' | 24 | 4 6 12 17 | | CL | Very stiff, gray CLAY, some Silt, little fine Sand, trace fine Gravel, moist (CL) | N | L | H | - | PP = 3.5 tsf |
| 15 | | | | | | 16.5 | | | | | |
| | S-7 18.0'- 20.0' | 20 | 21 26 36 34 | | SM | Very dense, light gray to brown SAND, some Silt, some Clay, trace fine Gravel, dry (SM) | - | - | NP | N | |
| | | | | | | End of Boring at 20 feet BGS.<br>20.0 Borehole backfilled with soil cuttings. | | | | | |

**Water Level Data**

| Date | Time | Elapsed Time (hr) | Depth in feet to: Bot. of Casing | Bottom of Hole | Water |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

**Sample Type**

**O** Open End Rod
**T** Thin-Wall Tube
**U** Undisturbed Sample
**SS** Split Spoon Sample
**G** Grab Sample

**Notes:**
PP = Pocket Penetrometer
No groundwater encountered during subsurface investigation.

Boring No.: **B-21**

**Field Test Legend:**
Dilatancy: N - None S - Slow R - Rapid
Toughness: L - Low M - Medium H - High
Plasticity: NP - Non-Plastic L - Low M - Medium H - High
Dry Strength: N - None L - Low M - Medium H - High VH - Very High

NOTES: 1.) "ppd" denotes soil sample average diametral pocket penetrometer reading. 2.) "ppa" denotes soil sample average axial pocket penetrometer reading.
3.) Maximum Particle Size is determined by direct observation within limitations of sampler size. 4.) Soil identifications and field tests based on visual-manual methods per ASTM D2488.

MOTT MACDONALD

# SOIL BORING LOG

BORING NO.: **B-22**
Page **1** of **1**

| | | | |
|---|---|---|---|
| **Project:** | South Ripley Solar | **Project No.:** | 505100267-001 |
| **Location:** | South Ripley, NY | **Project Mgr:** | Eric Pauli |
| **Client:** | ConnectGen | **Field Eng. Staff:** | Diego Melgar |
| **Drilling Co.:** | Earth Dimensions, Inc. | **Date/Time Started:** | July 27, 2020 at 8:55 am |
| **Driller/Helper:** | Brian B. /Harold Kleever | **Date/Time Finished:** | July 27, 2020 at 9:55 am |

**Elevation:** Grade ft. **Vertical Datum:** | **Boring Location:** See Boring Location Plan | **Coord.:** **Lat:** 42.194130° **Long:** -79.709753° | **Horizontal Datum:** NAD 1983

| Item | Casing | Sampler | Core Barrel |
|---|---|---|---|
| Type | HSA | SS | - |
| Length | 5 ft | 2 ft | - |
| Inside Dia. (in.) | 4.25 | 1.375 | - |
| Hammer Wt. (lb.) | 140 | 140 | - |
| Hammer Fall (in.) | 30 | 30 | - |

**Rig Make & Model:** Diedrich D-50

| | | | |
|---|---|---|---|
| ☐ Truck | ☐ Tripod | ☐ Cat-Head | |
| ☐ ATV | ☐ Geoprobe | ☑ Winch | |
| ☑ Track | ☐ Air Track | ☐ Roller Bit | |
| ☐ Skid | ☐ _____ | ☑ Cutting Head | |

**Hammer Type**: ☐ Safety ☑ Doughnut ☐ Automatic ☐ _____

**Drilling Fluid**: ☐ Bentonite ☐ Polymer ☐ Water ☑ None

**Drill Rod Size:**

**Casing Advance**: Hollow Stem Auger

| Depth/ Elev. (ft) | Sample No. / Interval (ft) | Rec. (in) | Sample Blows per 6" | Stratum Graphic | USCS Group Symbol | Visual - Manual Identification & Description (Density/consistency, color, Group Name, constituents, particle size, structure, moisture, optional descriptions, geologic interpretation, Symbol) | Field Tests: Dilatancy | Toughness | Plasticity | Dry Strength | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | S-1 0.0'- 2.0' 0.3'-' | 17 | 2 2 4 6 | | ML | 0.3 Top 3" - TOPSOIL<br>Medium stiff, dark brown SILT, some Clay, little fine Sand, dry (ML) | - N | - L | - L | - M | PP > 4.5 tsf<br>TV = N/A |
| | S-2 2.0'- 4.0' | 24 | 5 6 6 7 | | ML | Stiff, brown SILT, some Clay, little fine Sand, trace fine Gravel, moist (ML) | N | L | L | - | PP = 2.0 tsf |
| 5 | S-3 4.0'- 6.0' | 24 | 3 2 4 5 | | CL | 4.0<br>Medium stiff, brown CLAY, some Silt, little coarse to fine Sand, trace coarse to fine Gravel, moist (CL) | N | M | L | - | PP = 2.5 tsf |
| ▽ | S-4 6.0'- 8.0' | 17.5 | 4 5 5 4 | | CL | Stiff, brown CLAY, some Silt, some coarse to fine Sand, trace coarse to fine Gravel, wet (CL) | N | M | L | - | PP = 2.25 tsf |
| | S-5 8.0'- 10.0' | 20 | 9 12 16 14 | | ML | 8.0<br>Very stiff, light brown SILT, some fine Sand, some fine Gravel, little Clay, wet (ML) | S | L | L | - | PP = 1.0 tsf |
| 10 | | | | | | | | | | | |
| | S-6 13.0'- 15.0' | 24 | 16 18 19 21 | | ML | Hard, light brownish gray SILT, some Clay, little coarse to fine Sand, little coarse to fine Gravel, wet (ML) | N | L | L | - | PP = 3.75 tsf |
| 15 | | | | | | | | | | | |
| | S-7 18.0'- 20.0' | 18.5 | 15 15 22 30 | | ML | Hard, gray SILT, some Clay, some coarse to fine Sand, trace coarse to fine Gravel, wet (ML) | N | L | L | - | PP > 4.5 tsf |
| | | | | | | End of Boring at 20 feet BGS.<br>20.0 Borehole backfilled with soil cuttings. | | | | | |

**Water Level Data**

| Date | Time | Elapsed Time (hr) | Depth in feet to: Bot. of Casing | Bottom of Hole | Water |
|---|---|---|---|---|---|
| 7/27/20 | 9:55 | - | | 20.0 | 6 |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

**Sample Type**

| | |
|---|---|
| **O** | Open End Rod |
| **T** | Thin-Wall Tube |
| **U** | Undisturbed Sample |
| **SS** | Split Spoon Sample |
| **G** | Grab Sample |

**Notes:**
PP = Pocket Penetrometer
TV = Torvane

Boring No.: **B-22**

**Field Test Legend:**
Dilatancy: N - None S - Slow R - Rapid
Toughness: L - Low M - Medium H - High
Plasticity: NP - Non-Plastic L - Low M - Medium H - High
Dry Strength: N - None L - Low M - Medium H - High VH - Very High

NOTES: 1.) "ppd" denotes soil sample average diametral pocket penetrometer reading. 2.) "ppa" denotes soil sample average axial pocket penetrometer reading.
3.) Maximum Particle Size is determined by direct observation within limitations of sampler size. 4.) Soil identifications and field tests based on visual-manual methods per ASTM D2488.

MOTT MACDONALD

# SOIL BORING LOG

BORING NO.: **B-23**
Page **1** of **1**

| | | | |
|---|---|---|---|
| **Project:** | South Ripley Solar | **Project No.:** | 505100267-001 |
| **Location:** | South Ripley, NY | **Project Mgr:** | Eric Pauli |
| **Client:** | ConnectGen | **Field Eng. Staff:** | Diego Melgar |
| **Drilling Co.:** | Earth Dimensions, Inc. | **Date/Time Started:** | July 27, 2020 at 12:50 pm |
| **Driller/Helper:** | Brian B. /Harold Kleever | **Date/Time Finished:** | July 27, 2020 at 1:44 pm |

**Elevation:** Grade ft. **Vertical Datum:** | **Boring Location:** See Boring Location Plan | **Coord.:** **Lat:** 42.194096° **Long:** -79.706230° | **Horizontal Datum:** NAD 1983

| Item | Casing | Sampler | Core Barrel |
|---|---|---|---|
| Type | HSA | SS | - |
| Length | 5 ft | 2 ft | - |
| Inside Dia. (in.) | 4.25 | 1.375 | - |
| Hammer Wt. (lb.) | 140 | 140 | - |
| Hammer Fall (in.) | 30 | 30 | - |

**Rig Make & Model:** Diedrich D-50

☐ Truck ☐ Tripod ☐ Cat-Head
☐ ATV ☐ Geoprobe ☑ Winch
☑ Track ☐ Air Track ☐ Roller Bit
☐ Skid ☐ _____ ☑ Cutting Head

**Hammer Type:** ☐ Safety ☑ Doughnut ☐ Automatic ☐ _____

**Drilling Fluid:** ☐ Bentonite ☐ Polymer ☐ Water ☑ None

**Drill Rod Size:**

**Casing Advance:** Hollow Stem Auger

| Depth/ Elev. (ft) | Sample No. / Interval (ft) | Rec. (in) | Sample Blows per 6" | Stratum Graphic | USCS Group Symbol | Visual - Manual Identification & Description (Density/consistency, color, Group Name, constituents, particle size, structure, moisture, optional descriptions, geologic interpretation, Symbol) | Field Tests: Dilatancy | Toughness | Plasticity | Dry Strength | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 0.3 Top 4" - TOPSOIL | - | - | - | - | |
| | S-1 0.0'- 2.0' 0.3'-' | 22 | 1 2 4 7 | | CL | Medium stiff, brown CLAY, some Silt, trace fine Sand, trace fine Gravel, moist (CL) | S | M | L | - | PP = 1.5 tsf |
| | S-2 2.0'- 4.0' | 24 | 6 6 10 12 | | CL | Very stiff, brown CLAY, some Silt, trace fine Gravel, dry (CL) | S | M | L | H | PP > 4.5 tsf |
| 5 | S-3 4.0'- 6.0' | 24 | 6 7 10 14 | | CL | Very stiff, brown CLAY, some Silt, trace fine Sand, dry (CL) | S | M | L | M | PP > 4.5 tsf |
| | S-4 6.0'- 8.0' | 24 | 5 8 11 13 | | CL | Very stiff, brown CLAY, some Silt, trace coarse to fine Sand, trace fine Gravel, dry (CL) | N | M | L | M | PP > 4.5 tsf |
| | S-5 8.0'- 10.0' | 24 | 9 7 10 14 | | CL | Very stiff, brown CLAY, some Silt, trace fine Sand, trace fine Gravel, dry (CL) | N | M | L | H | PP > 4.5 tsf |
| 10 | | | | | | | | | | | |
| | S-6 13.0'- 15.0' | 24 | 6 5 7 10 | | CL | Stiff, gray CLAY, some Silt, trace fine Gravel, trace coarse to fine Sand, dry (CL) | N | M | L | H | PP = 3.5 tsf |
| 15 | | | | | | | | | | | |
| | | | | | | 16.5 | | | | | |
| | S-7 18.0'- 20.0' | 18 | 8 17 33 21 | | ML | Hard, brown SILT, some coarse to fine Sand, some coarse to fine Gravel, little Clay, moist (ML) | N | H | L | - | PP = 4.5 tsf |
| | | | | | | End of Boring at 20 feet BGS. | | | | | |
| | | | | | | 20.0 Borehole backfilled with soil cuttings. | | | | | |

**Water Level Data**

| Date | Time | Elapsed Time (hr) | Depth in feet to: Bot. of Casing | Bottom of Hole | Water |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

**Sample Type**

**O** Open End Rod
**T** Thin-Wall Tube
**U** Undisturbed Sample
**SS** Split Spoon Sample
**G** Grab Sample

**Notes:**
PP = Pocket Penetrometer

Boring No.: **B-23**

**Field Test Legend:**
Dilatancy: N - None S - Slow R - Rapid
Toughness: L - Low M - Medium H - High
Plasticity: NP - Non-Plastic L - Low M - Medium H - High
Dry Strength: N - None L - Low M - Medium H - High VH - Very High

NOTES: 1.) "ppd" denotes soil sample average diametral pocket penetrometer reading. 2.) "ppa" denotes soil sample average axial pocket penetrometer reading.
3.) Maximum Particle Size is determined by direct observation within limitations of sampler size. 4.) Soil identifications and field tests based on visual-manual methods per ASTM D2488.

MOTT MACDONALD

# SOIL BORING LOG

BORING NO.: **B-24**
Page **1** of **1**

| | | | |
|---|---|---|---|
| **Project:** | South Ripley Solar | **Project No.:** | 505100267-001 |
| **Location:** | South Ripley, NY | **Project Mgr:** | Eric Pauli |
| **Client:** | ConnectGen | **Field Eng. Staff:** | Diego Melgar |
| **Drilling Co.:** | Earth Dimensions, Inc. | **Date/Time Started:** | July 27, 2020 at 2:00 pm |
| **Driller/Helper:** | Brian B. /Harold Kleever | **Date/Time Finished:** | July 27, 2020 at 3:05 pm |

**Elevation:** Grade ft. **Vertical Datum:** | **Boring Location:** See Boring Location Plan | **Coord.:** **Lat:** 42.191714° **Long:** -79.706700° | **Horizontal Datum:** NAD 1983

| Item | Casing | Sampler | Core Barrel |
|---|---|---|---|
| Type | HSA | SS | - |
| Length | 5 ft | 2 ft | - |
| Inside Dia. (in.) | 4.25 | 1.375 | - |
| Hammer Wt. (lb.) | 140 | 140 | - |
| Hammer Fall (in.) | 30 | 30 | - |

**Rig Make & Model:** Diedrich D-50

| | | | |
|---|---|---|---|
| ☐ Truck | ☐ Tripod | ☐ Cat-Head | |
| ☐ ATV | ☐ Geoprobe | ☑ Winch | |
| ☑ Track | ☐ Air Track | ☐ Roller Bit | |
| ☐ Skid | ☐ _____ | ☑ Cutting Head | |

**Hammer Type**: ☐ Safety ☑ Doughnut ☐ Automatic ☐ _____

**Drilling Fluid**: ☐ Bentonite ☐ Polymer ☐ Water ☑ None

**Drill Rod Size:**

**Casing Advance**: Hollow Stem Auger

| Depth/ Elev. (ft) | Sample No. / Interval (ft) | Rec. (in) | Sample Blows per 6" | Stratum Graphic | USCS Group Symbol | Visual - Manual Identification & Description (Density/consistency, color, Group Name, constituents, particle size, structure, moisture, optional descriptions, geologic interpretation, Symbol) | Field Tests: Dilatancy | Toughness | Plasticity | Dry Strength | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | S-1 0.0'- 2.0' 0.6'-' | 22 | 1 3 5 6 | | | Top 8" - TOPSOIL 0.6 | - | - | - | - | |
| | | | | | CL | Stiff, light brown CLAY, some Silt, little coarse to fine Sand, trace fine Gravel, dry (CL) 2.0 | N | L | L | L | PP = 2.5 tsf |
| | S-2 2.0'- 4.0' | 20 | 6 7 8 12 | | ML | Very stiff, brown SILT, some Clay, some coarse to fine Sand, trace fine Gravel, moist (ML) | S | L | L | - | PP = 3.0 tsf |
| 5 | S-3 4.0'- 6.0' | 22 | 4 5 5 4 | | ML | Stiff, brown SILT, some fine Sand, little Clay, little fine Gravel, moist (ML) | S | L | L | - | PP = 3.0 tsf |
| | S-4 6.0'- 8.0' | 16 | 6 10 19 24 | | ML | Very stiff, brown SILT, some fine Sand, trace coarse to fine Gravel, trace Clay, moist (ML) | R | L | L | - | PP = 1.25 tsf |
| | S-5 8.0'- 10.0' | 10 | 14 25 50/5" | | ML | Hard, brown SILT, some fine Sand, little coarse to fine Gravel, trace Clay, dry (ML) | - | - | - | - | PP = 0.25 tsf |
| 10 | | | | | | | | | | | |
| | S-6 13.0'- 15.0' | 15 | 18 47 50/4" | | ML | Hard, gray SILT, some fine Sand, trace fine Gravel, dry (ML) | - | - | NP | L | PP = 1.5 tsf |
| 15 | | | | | | 16.5 | | | | | |
| | S-7 18.0'- 18.9' | 18 | 38 50/5" | | GM | Hard, gray coarse to fine GRAVEL, some Silt, little Clay, trace coarse to fine Sand, dry (GM) 18.9 | - | - | NP | H | PP = N/A |
| | | | | | | End of Boring at 18.9 feet BGS. Borehole backfilled with soil cuttings. | | | | | |

**Water Level Data**

| Date | Time | Elapsed Time (hr) | Depth in feet to: Bot. of Casing | Bottom of Hole | Water |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

**Sample Type**

| | |
|---|---|
| **O** | Open End Rod |
| **T** | Thin-Wall Tube |
| **U** | Undisturbed Sample |
| **SS** | Split Spoon Sample |
| **G** | Grab Sample |

**Notes:**
PP = Pocket Penetrometer
No groundwater encountered during subsurface investigation.

Boring No.: **B-24**

**Field Test Legend:**
Dilatancy: N - None S - Slow R - Rapid
Toughness: L - Low M - Medium H - High
Plasticity: NP - Non-Plastic L - Low M - Medium H - High
Dry Strength: N - None L - Low M - Medium H - High VH - Very High

NOTES: 1.) "ppd" denotes soil sample average diametral pocket penetrometer reading. 2.) "ppa" denotes soil sample average axial pocket penetrometer reading.
3.) Maximum Particle Size is determined by direct observation within limitations of sampler size. 4.) Soil identifications and field tests based on visual-manual methods per ASTM D2488.

MOTT MACDONALD

# SOIL BORING LOG

BORING NO.: **B-25**
Page **1** of **1**

| | | | |
|---|---|---|---|
| **Project:** | South Ripley Solar | **Project No.:** | 505100267-001 |
| **Location:** | South Ripley, NY | **Project Mgr:** | Eric Pauli |
| **Client:** | ConnectGen | **Field Eng. Staff:** | Diego Melgar |
| **Drilling Co.:** | Earth Dimensions, Inc. | **Date/Time Started:** | July 27, 2020 at 10:15 am |
| **Driller/Helper:** | Brian B. /Harold Kleever | **Date/Time Finished:** | July 27, 2020 at 11:10 am |

**Elevation:** Grade ft. **Vertical Datum:** | **Boring Location:** Offset 10 feet North. | **Coord.:** **Lat:** 42.190486° **Long:** -79.708745° | **Horizontal Datum:** NAD 1983

| Item | Casing | Sampler | Core Barrel |
|---|---|---|---|
| Type | HSA | SS | - |
| Length | 5 ft | 2 ft | - |
| Inside Dia. (in.) | 4.25 | 1.375 | - |
| Hammer Wt. (lb.) | 140 | 140 | - |
| Hammer Fall (in.) | 30 | 30 | - |

**Rig Make & Model:** Diedrich D-50

| | | | |
|---|---|---|---|
| ☐ Truck | ☐ Tripod | ☐ Cat-Head | |
| ☐ ATV | ☐ Geoprobe | ☑ Winch | |
| ☑ Track | ☐ Air Track | ☐ Roller Bit | |
| ☐ Skid | ☐ _____ | ☑ Cutting Head | |

**Hammer Type**: ☐ Safety ☑ Doughnut ☐ Automatic ☐ _____

**Drilling Fluid**: ☐ Bentonite ☐ Polymer ☐ Water ☑ None

**Drill Rod Size:**

**Casing Advance**: Hollow Stem Auger

| Depth/ Elev. (ft) | Sample No. / Interval (ft) | Rec. (in) | Sample Blows per 6" | Stratum Graphic | USCS Group Symbol | Visual - Manual Identification & Description (Density/consistency, color, Group Name, constituents, particle size, structure, moisture, optional descriptions, geologic interpretation, Symbol) | Field Tests: Dilatancy | Toughness | Plasticity | Dry Strength | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | S-1 0.0'- 2.0' 0.5'-' | 14 | 1 2 3 3 | | | 0.5 Top 6" - TOPSOIL | - | - | - | - | |
| | | | | | CL | Medium stiff, dark brown CLAY, some Silt, little fine Sand, trace fine Gravel, dry (CL) | S | M | L | L | PP = 3.75 tsf |
| | S-2 2.0'- 4.0' | 20 | 4 7 7 9 | | CL | Stiff, brown CLAY, some Silt, little fine Sand, trace fine Gravel, moist (CL) | N | M | L | - | PP = 4.0 tsf |
| | S-3 4.0'- 6.0' | 24 | 5 7 7 9 | | CL | Stiff, brown CLAY, some Silt, little fine Sand, trace fine Gravel, moist (CL) | N | M | L | - | PP = 4.5 tsf Mottling observed son sample at 4 feet BGS. |
| 5 | S-4 6.0'- 8.0' | 24 | 8 10 11 17 | | CL | Very stiff, brown CLAY, little Silt, little fine Sand, trace fine Gravel, moist (CL) | N | M | L | - | PP > 4.5 tsf |
| | S-5 8.0'- 10.0' | 12 | 10 12 13 15 | | GC | 8.0 Medium dense, brown coarse to fine Gravel, some coarse to fine Sand, some Clay, little Silt, wet (GC) | N | H | L | - | PP > 4.5 tsf |
| 10 | | | | | | 11.5 | | | | | |
| | S-6 13.0'- 15.0' | 14 | 18 16 13 14 | | ML | Very stiff, brown to gray SILT, some coarse to fine Sand, some coarse to fine Gravel, trace Clay, moist (ML) | R | - | NP | - | PP = 2.5 tsf Weathered bedrock recovered at 13 feet BGS. |
| 15 | | | | | | 16.5 | | | | | |
| | S-7 18.0'- 20.0' | 24 | 10 9 11 15 | | CL | Very stiff, gray CLAY, some Silt, little fine Sand, trace coarse to fine Gravel, moist (CL) | N | M | L | - | |
| | | | | | | 20.0 End of Boring at 20 feet BGS. Borehole backfilled with soil cuttings. | | | | | |

**Water Level Data**

| Date | Time | Elapsed Time (hr) | Depth in feet to: Bot. of Casing | Bottom of Hole | Water |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

**Sample Type**

| | |
|---|---|
| **O** | Open End Rod |
| **T** | Thin-Wall Tube |
| **U** | Undisturbed Sample |
| **SS** | Split Spoon Sample |
| **G** | Grab Sample |

**Notes:**
PP = Pocket Penetrometer
No groundwater encountered during subsurface investigation.

Boring No.: **B-25**

**Field Test Legend:**
Dilatancy: N - None S - Slow R - Rapid
Toughness: L - Low M - Medium H - High
Plasticity: NP - Non-Plastic L - Low M - Medium H - High
Dry Strength: N - None L - Low M - Medium H - High VH - Very High

NOTES: 1.) "ppd" denotes soil sample average diametral pocket penetrometer reading. 2.) "ppa" denotes soil sample average axial pocket penetrometer reading.
3.) Maximum Particle Size is determined by direct observation within limitations of sampler size. 4.) Soil identifications and field tests based on visual-manual methods per ASTM D2488.

MOTT MACDONALD

# SOIL BORING LOG

BORING NO.: **B-26**
Page **1** of **1**

| | | | |
|---|---|---|---|
| **Project:** | South Ripley Solar | **Project No.:** | 505100267-001 |
| **Location:** | South Ripley, NY | **Project Mgr:** | Eric Pauli |
| **Client:** | ConnectGen | **Field Eng. Staff:** | Diego Melgar |
| **Drilling Co.:** | Earth Dimensions, Inc. | **Date/Time Started:** | July 28, 2020 at 10:55 am |
| **Driller/Helper:** | Brian B. /Harold Kleever | **Date/Time Finished:** | July 28, 2020 at 11:46 am |

**Elevation:** Grade ft. **Vertical Datum:** | **Boring Location:** See Boring Location Plan | **Coord.:** **Lat:** 42.184917° **Long:** -79.710005° | **Horizontal Datum:** NAD 1983

| Item | Casing | Sampler | Core Barrel |
|---|---|---|---|
| Type | HSA | SS | - |
| Length | 5 ft | 2 ft | - |
| Inside Dia. (in.) | 4.25 | 1.375 | - |
| Hammer Wt. (lb.) | 140 | 140 | - |
| Hammer Fall (in.) | 30 | 30 | - |

**Rig Make & Model:** Diedrich D-50

| | | | |
|---|---|---|---|
| ☐ Truck | ☐ Tripod | ☐ Cat-Head | ☐ Safety |
| ☐ ATV | ☐ Geoprobe | ☑ Winch | ☑ Doughnut |
| ☑ Track | ☐ Air Track | ☐ Roller Bit | ☐ Automatic |
| ☐ Skid | ☐ _____ | ☑ Cutting Head | ☐ _____ |

**Hammer Type**

**Drilling Fluid**
☐ Bentonite
☐ Polymer
☐ Water
☑ None

**Drill Rod Size:**

**Casing Advance**
Hollow Stem Auger

| Depth/ Elev. (ft) | Sample No. / Interval (ft) | Rec. (in) | Sample Blows per 6" | Stratum Graphic | USCS Group Symbol | Visual - Manual Identification & Description (Density/consistency, color, Group Name, constituents, particle size, structure, moisture, optional descriptions, geologic interpretation, Symbol) | Field Tests: Dilatancy | Toughness | Plasticity | Dry Strength | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | S-1 0.0'- 2.0' 0.3'-' | 18 | 2 2 3 4 | | ML | 0.3 Top 3" - TOPSOIL<br>Medium stiff, brown SILT, some Clay, trace fine Gravel, trace fine Sand, dry (ML) | - N | - L | - L | - L | PP = 1.25 tsf |
| | S-2 2.0'- 4.0' | 20 | 7 7 7 7 | | ML | Stiff, brown SILT, some Clay, little coarse to fine Sand, trace fine Gravel, moist (ML) | N | L | L | L | PP = 1.25 tsf |
| 5 | S-3 4.0'- 6.0' | 16 | 4 6 5 7 | | ML | Stiff, brown SILT, some fine Sand, little Clay, trace fine Gravel, moist (ML) | N | L | L | - | PP = 1.25 tsf |
| | S-4 6.0'- 8.0' | 19 | 5 6 7 6 | | SM | 6.0<br>Medium dense, brown fine SAND, some Silt, trace Clay, trace fine Gravel, moist (SM) | S | L | NP | - | |
| 10 | S-5 8.0'- 10.0' | 18 | 4 4 12 23 | | ML | 8.0<br>Very stiff, brown SILT, some coarse to fine Sand, little Clay, trace fine Gravel, wet (ML) | S | L | L | - | PP = 1.25 tsf |
| | | | | | | 11.5 | | | | | |
| 15 | S-6 13.0'- 15.0' | 22 | 20 40 32 50/5" | | CL | Hard, brown CLAY, some Silt, some fine Sand, trace fine Gravel, dry (CL) | N | H | L | - | PP = 2.75 tsf |
| | | | | | | 16.5 | | | | | |
| | S-7 18.0'- 19.4' | 17 | 12 43 50/5" | | ML | Hard, gray SILT, some fine Sand, trace fine Gravel, trace Clay, dry (ML) | - | L | L | - | |
| | | | | | | 19.4<br>End of Boring at 19.4 feet BGS.<br>Borehole backfilled with soil cuttings. | | | | | |

**Water Level Data**

| Date | Time | Elapsed Time (hr) | Depth in feet to: Bot. of Casing | Bottom of Hole | Water |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

**Sample Type**

| | |
|---|---|
| **O** | Open End Rod |
| **T** | Thin-Wall Tube |
| **U** | Undisturbed Sample |
| **SS** | Split Spoon Sample |
| **G** | Grab Sample |

**Notes:**
PP = Pocket Penetrometer
No groundwater encountered during subsurface investigation.

Boring No.: **B-26**

**Field Test Legend:**
Dilatancy: N - None S - Slow R - Rapid
Toughness: L - Low M - Medium H - High
Plasticity: NP - Non-Plastic L - Low M - Medium H - High
Dry Strength: N - None L - Low M - Medium H - High VH - Very High

NOTES: 1.) "ppd" denotes soil sample average diametral pocket penetrometer reading. 2.) "ppa" denotes soil sample average axial pocket penetrometer reading.
3.) Maximum Particle Size is determined by direct observation within limitations of sampler size. 4.) Soil identifications and field tests based on visual-manual methods per ASTM D2488.

MOTT MACDONALD

# SOIL BORING LOG

BORING NO.: **B-27**
Page **1** of **1**

| | | | |
|---|---|---|---|
| **Project:** | South Ripley Solar | **Project No.:** | 505100267-001 |
| **Location:** | South Ripley, NY | **Project Mgr:** | Eric Pauli |
| **Client:** | ConnectGen | **Field Eng. Staff:** | Diego Melgar |
| **Drilling Co.:** | Earth Dimensions, Inc. | **Date/Time Started:** | July 28, 2020 at 1:30 pm |
| **Driller/Helper:** | Brian B. /Harold Kleever | **Date/Time Finished:** | July 28, 2020 at 2:15 pm |

**Elevation:** Grade ft. **Vertical Datum:** | **Boring Location:** See Boring Location Plan | **Coord.:** **Lat:** 42.181664° **Long:** -79.712841° | **Horizontal Datum:** NAD 1983

| Item | Casing | Sampler | Core Barrel |
|---|---|---|---|
| Type | HSA | SS | - |
| Length | 5 ft | 2 ft | - |
| Inside Dia. (in.) | 4.25 | 1.375 | - |
| Hammer Wt. (lb.) | 140 | 140 | - |
| Hammer Fall (in.) | 30 | 30 | - |

**Rig Make & Model:** Diedrich D-50

| | | | |
|---|---|---|---|
| ☐ Truck | ☐ Tripod | ☐ Cat-Head | ☐ Safety |
| ☐ ATV | ☐ Geoprobe | ☑ Winch | ☑ Doughnut |
| ☑ Track | ☐ Air Track | ☐ Roller Bit | ☐ Automatic |
| ☐ Skid | ☐ _____ | ☑ Cutting Head | ☐ _____ |

**Hammer Type**

**Drilling Fluid**: ☐ Bentonite ☐ Polymer ☐ Water ☑ None

**Drill Rod Size:**

**Casing Advance**: Hollow Stem Auger

| Depth/ Elev. (ft) | Sample No. / Interval (ft) | Rec. (in) | Sample Blows per 6" | Stratum Graphic | USCS Group Symbol | Visual - Manual Identification & Description (Density/consistency, color, Group Name, constituents, particle size, structure, moisture, optional descriptions, geologic interpretation, Symbol) | Field Tests: Dilatancy | Toughness | Plasticity | Dry Strength | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | S-1 0.0'- 2.0' 0.3'-' | 20 | 2 1 2 7 | | ML | 0.3 Top 4" - TOPSOIL<br>Soft, brown SILT. some Clay, little fine Sand, trace fine Gravel, dry (ML) | - N | - L | - L | - L | PP = 1.0 tsf |
| | S-2 2.0'- 4.0' | 19 | 6 4 5 4 | | ML | Stiff, brown SILT, some Clay, little fine Sand, little fine Gravel, dry (ML) | N | L | L | L | PP = 0.25 tsf |
| 5 | S-3 4.0'- 6.0' | 19 | 2 2 2 2 | | CL | 4.0<br>Medium stiff, brown CLAY, some Silt, little coarse to fine Gravel, trace fine Sand, moist (CL) | N | M | L | - | PP = 1.0 tsf |
| | S-4 6.0'- 8.0' | 6 | 2 2 1 2 | | CL | Soft, brown CLAY, some Silt, some coarse to fine Sand, trace fine Gravel, wet (CL) | R | M | L | - | PP = 1.25 tsf |
| ▽ | S-5 8.0'- 10.0' | 9 | 2 5 9 8 | | SC | 8.0<br>Medium dense, brown coarse to fine SAND, some coarse to fine Gravel, little Clay, little Silt, wet (SC) | - | - | - | - | |
| 10 | | | | | | 11.5 | | | | | |
| | S-6 13.0'- 15.0' | 20 | 9 25 34 50/5" | | ML | Hard, brown SILT, some fine Sand, little Clay, trace fine Gravel, wet (ML) | N | L | L | - | PP = 1.75 tsf |
| 15 | | | | | | | | | | | |
| | S-7 18.0'- 18.9' | 16 | 41 50/5" | | ML | Hard, brown SILT, some Sand, little Clay, little coarse to fine Gravel, wet (ML)<br>18.9 | N | L | L | L | |
| | | | | | | End of Boring at 18.9 feet BGS.<br>Borehole backfilled with soil cuttings. | | | | | |

**Water Level Data**

| Date | Time | Elapsed Time (hr) | Depth in feet to: Bot. of Casing | Bottom of Hole | Water |
|---|---|---|---|---|---|
| 7/28/20 | 14:15 | - | 5.0 | 18.9 | 8 |

**Sample Type**

- **O** Open End Rod
- **T** Thin-Wall Tube
- **U** Undisturbed Sample
- **SS** Split Spoon Sample
- **G** Grab Sample

**Notes:**
PP = Pocket Penetrometer
No groundwater encountered during subsurface investigation.

Boring No.: **B-27**

**Field Test Legend:**
Dilatancy: N - None S - Slow R - Rapid
Toughness: L - Low M - Medium H - High
Plasticity: NP - Non-Plastic L - Low M - Medium H - High
Dry Strength: N - None L - Low M - Medium H - High VH - Very High

NOTES: 1.) "ppd" denotes soil sample average diametral pocket penetrometer reading. 2.) "ppa" denotes soil sample average axial pocket penetrometer reading.
3.) Maximum Particle Size is determined by direct observation within limitations of sampler size. 4.) Soil identifications and field tests based on visual-manual methods per ASTM D2488.

MOTT MACDONALD

# SOIL BORING LOG

BORING NO.: **B-28**
Page **1** of **1**

| | | | |
|---|---|---|---|
| **Project:** | South Ripley Solar | **Project No.:** | 505100267-001 |
| **Location:** | South Ripley, NY | **Project Mgr:** | Eric Pauli |
| **Client:** | ConnectGen | **Field Eng. Staff:** | Diego Melgar |
| **Drilling Co.:** | Earth Dimensions, Inc. | **Date/Time Started:** | July 28, 2020 at 9:30 am |
| **Driller/Helper:** | Brian B. /Harold Kleever | **Date/Time Finished:** | July 28, 2020 at 10:30 am |

**Elevation:** Grade ft. **Vertical Datum:** | **Boring Location:** See Boring Location Plan | **Coord.:** **Lat:** 42.185178° **Long:** -79.704606° | **Horizontal Datum:** NAD 1983

| Item | Casing | Sampler | Core Barrel |
|---|---|---|---|
| Type | HSA | SS | - |
| Length | 5 ft | 2 ft | - |
| Inside Dia. (in.) | 4.25 | 1.375 | - |
| Hammer Wt. (lb.) | 140 | 140 | - |
| Hammer Fall (in.) | 30 | 30 | - |

**Rig Make & Model:** Diedrich D-50

| | | | |
|---|---|---|---|
| ☐ Truck | ☐ Tripod | ☐ Cat-Head | |
| ☐ ATV | ☐ Geoprobe | ☑ Winch | |
| ☑ Track | ☐ Air Track | ☐ Roller Bit | |
| ☐ Skid | ☐ _____ | ☑ Cutting Head | |

**Hammer Type**: ☐ Safety ☑ Doughnut ☐ Automatic ☐ _____

**Drilling Fluid**: ☐ Bentonite ☐ Polymer ☐ Water ☑ None

**Drill Rod Size:**

**Casing Advance**: Hollow Stem Auger

| Depth/ Elev. (ft) | Sample No. / Interval (ft) | Rec. (in) | Sample Blows per 6" | Stratum Graphic | USCS Group Symbol | Visual - Manual Identification & Description (Density/consistency, color, Group Name, constituents, particle size, structure, moisture, optional descriptions, geologic interpretation, Symbol) | Field Tests: Dilatancy | Toughness | Plasticity | Dry Strength | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | S-1 0.0'- 2.0' 0.3'-' | 18 | 2 3 3 3 | | CL | 0.3 Top 4" - TOPSOIL<br>Medium stiff, brown CLAY, some Silt, little fine Sand, dry (CL) | - S | - M | - L | - L | PP = 0.75 tsf |
| | S-2 2.0'- 4.0' | 15 | 6 8 7 8 | | ML | 2.0<br>Stiff, brown SILT, some Clay, some fine Sand, little coarse to fine Gravel, dry (ML) | S | L | M | L | PP = 1.25 tsf |
| 5 | S-3 4.0'- 6.0' | 18 | 9 6 5 5 | | SM | 4.0<br>Medium dense, brown coarse to fine SAND, some Silt, little Clay, trace coarse to fine Gravel, moist (SM) | - | - | - | - | |
| | S-4 6.0'- 8.0' | 17 | 5 2 2 6 | | ML | 6.0<br>Medium stiff, brown SILT, some fine Sand, little Clay, little coarse to fine Gravel, wet (ML) | R | L | L | - | PP = 0.75 tsf |
| 10 | S-5 8.0'- 10.0' | 16 | 11 11 16 22 | | ML | Very stiff, brown SILT, some coarse to fine Sand, little fine Gravel, trace Clay, wet (ML) | R | L | L | - | PP = 2.25 tsf |
| | | | | | | 11.5 | | | | | |
| | S-6 13.0'- 15.0' | 15 | 17 30 39 43 | | SM | Very dense, brown coarse to fine SAND, some Silt, little coarse to fine Gravel, trace Clay, wet (SM) | R | L | NP | - | |
| 15 | | | | | | | | | | | |
| | S-7 18.0'- 20.0' | 20 | 24 37 47 39 | | SM | Very dense, brown coarse to fine SAND, some Silt, little Clay, little coarse to fine Gravel, wet (SM) | R | L | L | - | |
| | | | | | | End of Boring at 20 feet BGS.<br>20.0 Borehole backfilled with soil cuttings. | | | | | |

**Water Level Data**

| Date | Time | Elapsed Time (hr) | Depth in feet to: Bot. of Casing | Bottom of Hole | Water |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

**Sample Type**

- **O** Open End Rod
- **T** Thin-Wall Tube
- **U** Undisturbed Sample
- **SS** Split Spoon Sample
- **G** Grab Sample

**Notes:**
PP = Pocket Penetrometer

Boring No.: **B-28**

**Field Test Legend:**
Dilatancy: N - None S - Slow R - Rapid
Toughness: L - Low M - Medium H - High
Plasticity: NP - Non-Plastic L - Low M - Medium H - High
Dry Strength: N - None L - Low M - Medium H - High VH - Very High

NOTES: 1.) "ppd" denotes soil sample average diametral pocket penetrometer reading. 2.) "ppa" denotes soil sample average axial pocket penetrometer reading.
3.) Maximum Particle Size is determined by direct observation within limitations of sampler size. 4.) Soil identifications and field tests based on visual-manual methods per ASTM D2488.

MOTT MACDONALD

# SOIL BORING LOG

BORING NO.: **B-29**
Page **1** of **1**

| | | | |
|---|---|---|---|
| **Project:** | South Ripley Solar | **Project No.:** | 505100267-001 |
| **Location:** | South Ripley, NY | **Project Mgr:** | Eric Pauli |
| **Client:** | ConnectGen | **Field Eng. Staff:** | Diego Melgar |
| **Drilling Co.:** | Earth Dimensions, Inc. | **Date/Time Started:** | July 28, 2020 at 3:00 pm |
| **Driller/Helper:** | Brian B. /Harold Kleever | **Date/Time Finished:** | July 28, 2020 at 4:05 pm |

**Elevation:** Grade ft. **Vertical Datum:** | **Boring Location:** See Boring Location Plan | **Coord.:** **Lat:** 42.179180° **Long:** -79.705694° | **Horizontal Datum:** NAD 1983

| Item | Casing | Sampler | Core Barrel |
|---|---|---|---|
| Type | HSA | SS | - |
| Length | 5 ft | 2 ft | - |
| Inside Dia. (in.) | 4.25 | 1.375 | - |
| Hammer Wt. (lb.) | 140 | 140 | - |
| Hammer Fall (in.) | 30 | 30 | - |

**Rig Make & Model:** Diedrich D-50

| | | | |
|---|---|---|---|
| ☐ Truck | ☐ Tripod | ☐ Cat-Head | |
| ☐ ATV | ☐ Geoprobe | ☑ Winch | |
| ☑ Track | ☐ Air Track | ☐ Roller Bit | |
| ☐ Skid | ☐ _____ | ☑ Cutting Head | |

**Hammer Type**: ☐ Safety ☑ Doughnut ☐ Automatic ☐ _____

**Drilling Fluid**: ☐ Bentonite ☐ Polymer ☐ Water ☑ None

**Drill Rod Size:**

**Casing Advance**: Hollow Stem Auger

| Depth/ Elev. (ft) | Sample No. / Interval (ft) | Rec. (in) | Sample Blows per 6" | Stratum Graphic | USCS Group Symbol | Visual - Manual Identification & Description (Density/consistency, color, Group Name, constituents, particle size, structure, moisture, optional descriptions, geologic interpretation, Symbol) | Field Tests: Dilatancy | Toughness | Plasticity | Dry Strength | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | S-1 0.0'- 2.0' 0.5'-' | 17 | 2 3 5 8 | | ML | 0.5 Top 6" - TOPSOIL<br>Stiff, dark brown SILT, little Clay, little fine Sand, trace fine Gravel, dry (ML) | N | L | M | L | PP = 1.25 tsf |
| | S-2 2.0'- 4.0' | 21 | 10 8 12 11 | | CL | 2.0<br>Very stiff, brown CLAY, some Silt, little coarse to fine Sand, trace fine Gravel, dry (CL) | N | M | L | L | PP = 2.5 tsf |
| 5 | S-3 4.0'- 6.0' | 16 | 6 4 3 5 | | CL | Medium stiff, brown CLAY, some Silt, little fine Sand, little fine Gravel, moist (CL) | S | M | L | - | PP = 1.75 tsf |
| | S-4 6.0'- 8.0' | 19 | 5 4 5 4 | | ML | 6.0<br>Stiff, brown SILT, some coarse to fine Sand, little Clay, trace coarse to fine Gravel, moist (ML) | S | L | M | - | PP = 2.5 tsf |
| 10 | S-5 8.0'- 10.0' | 17 | 2 3 14 22 | | SM | 8.0<br>Medium dense, brown coarse to fine SAND, some Silt, little Clay, trace fine Gravel, wet (SM) | R | - | NP | - | |
| | | | | | | 11.5 | | | | | |
| 15 | S-6 13.0'- 15.0' | 24 | 14 23 35 48 | | ML | Hard, brown SILT, some fine Sand, little Clay, trace fine Gravel, moist (ML) | S | L | L | - | PP = 2.75 tsf |
| | S-7 18.0'- 18.5' | 2 | 50/5" | | ML | 18.5 Hard, brown SILT, some fine Sand, little Clay, trace fine Gravel, moist (ML)<br>End of Boring at 18.5 feet BGS.<br>Borehole backfilled with soil cuttings. | S | L | L | - | PP = 0.25 tsf |

**Water Level Data**

| Date | Time | Elapsed Time (hr) | Depth in feet to: Bot. of Casing | Bottom of Hole | Water |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

**Sample Type**

| | |
|---|---|
| **O** | Open End Rod |
| **T** | Thin-Wall Tube |
| **U** | Undisturbed Sample |
| **SS** | Split Spoon Sample |
| **G** | Grab Sample |

**Notes:**
PP = Pocket Penetrometer
No groundwater encountered during subsurface investigation.

Boring No.: **B-29**

**Field Test Legend:**
Dilatancy: N - None S - Slow R - Rapid
Toughness: L - Low M - Medium H - High
Plasticity: NP - Non-Plastic L - Low M - Medium H - High
Dry Strength: N - None L - Low M - Medium H - High VH - Very High

NOTES: 1.) "ppd" denotes soil sample average diametral pocket penetrometer reading. 2.) "ppa" denotes soil sample average axial pocket penetrometer reading.
3.) Maximum Particle Size is determined by direct observation within limitations of sampler size. 4.) Soil identifications and field tests based on visual-manual methods per ASTM D2488.

MOTT MACDONALD

# SOIL BORING LOG

BORING NO.: **B-30**
Page **1** of **1**

| | | | |
|---|---|---|---|
| **Project:** | South Ripley Solar | **Project No.:** | 505100267-001 |
| **Location:** | South Ripley, NY | **Project Mgr:** | Eric Pauli |
| **Client:** | ConnectGen | **Field Eng. Staff:** | Diego Melgar |
| **Drilling Co.:** | Earth Dimensions, Inc. | **Date/Time Started:** | July 29, 2020 at 7:40 am |
| **Driller/Helper:** | Brian B. /Harold Kleever | **Date/Time Finished:** | July 29, 2020 at 8:25 am |

**Elevation:** Grade ft. **Vertical Datum:** | **Boring Location:** See Boring Location Plan | **Coord.:** **Lat:** 42.174098° **Long:** -79.705272° | **Horizontal Datum:** NAD 1983

| Item | Casing | Sampler | Core Barrel |
|---|---|---|---|
| Type | HSA | SS | - |
| Length | 5 ft | 2 ft | - |
| Inside Dia. (in.) | 4.25 | 1.375 | - |
| Hammer Wt. (lb.) | 140 | 140 | - |
| Hammer Fall (in.) | 30 | 30 | - |

**Rig Make & Model:** Diedrich D-50

| | | | |
|---|---|---|---|
| ☐ Truck | ☐ Tripod | ☐ Cat-Head | |
| ☐ ATV | ☐ Geoprobe | ☑ Winch | |
| ☑ Track | ☐ Air Track | ☐ Roller Bit | |
| ☐ Skid | ☐ _____ | ☑ Cutting Head | |

**Hammer Type**: ☐ Safety ☑ Doughnut ☐ Automatic ☐ _____

**Drilling Fluid**: ☐ Bentonite ☐ Polymer ☐ Water ☑ None

**Drill Rod Size:**

**Casing Advance**: Hollow Stem Auger

| Depth/ Elev. (ft) | Sample No. / Interval (ft) | Rec. (in) | Sample Blows per 6" | Stratum Graphic | USCS Group Symbol | Visual - Manual Identification & Description (Density/consistency, color, Group Name, constituents, particle size, structure, moisture, optional descriptions, geologic interpretation, Symbol) | Field Tests: Dilatancy | Toughness | Plasticity | Dry Strength | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | S-1 0.0'- 2.0' 0.3'-' | 16 | 2 2 6 4 | | ML | 0.3 Top 4" - TOPSOIL<br>Stiff, light brown SILT, some fine Sand, little Clay, trace fine Gravel, dry (ML) | - S | - L | - L | - L | PP = 1.75 tsf |
| | S-2 2.0'- 4.0' | 24 | 9 12 17 16 | | ML | Very stiff, light brown SILT, some coarse to fine Sand, little Clay, trace fine Gravel, dry (ML) | N | L | L | L | PP = 3.75 tsf |
| 5 | S-3 4.0'- 6.0' | 24 | 6 7 6 8 | | CL | 4.0<br>Stiff, grayish brown Silty CLAY, little fine Sand, dry (CL) | S | M | L | M | PP = 3.75 tsf |
| | S-4 6.0'- 8.0' | 20 | 4 7 10 12 | | CL | Stiff, grayish brown Silty CLAY, little fine Sand, dry (CL) | S | M | L | - | PP = 2.25 tsf |
| 10 | S-5 8.0'- 10.0' | 20 | 8 8 11 13 | | CL | Very stiff, brown CLAY, some Silt, trace fine Sand, moist (CL) | S | M | L | - | PP = 2.0 tsf |
| | | | | | | 11.5 | | | | | |
| | S-6 13.0'- 15.0' | 22 | 10 17 37 50/4" | | ML | Hard, brown SILT, some Clay, some coarse to fine Sand, trace fine Gravel, moist (ML) | N | L | L | - | PP = 3.25 tsf |
| 15 | | | | | | | | | | | |
| | S-7 18.0'- 18.6' | 7 | 37 50/2" | | ML | Hard, grayish brown SILT, some Clay, little fine Sand, trace fine Gravel, moist (ML)<br>18.6 End of Boring at 18.6 feet BGS.<br>Borehole backfilled with soil cuttings. | N | L | L | - | PP = 1.5 tsf |

**Water Level Data**

| Date | Time | Elapsed Time (hr) | Depth in feet to: Bot. of Casing | Bottom of Hole | Water |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

**Sample Type**

| | |
|---|---|
| **O** | Open End Rod |
| **T** | Thin-Wall Tube |
| **U** | Undisturbed Sample |
| **SS** | Split Spoon Sample |
| **G** | Grab Sample |

**Notes:**
PP = Pocket Penetrometer
No groundwater encountered during subsurface investigation.

Boring No.: **B-30**

**Field Test Legend:**
Dilatancy: N - None S - Slow R - Rapid
Toughness: L - Low M - Medium H - High
Plasticity: NP - Non-Plastic L - Low M - Medium H - High
Dry Strength: N - None L - Low M - Medium H - High VH - Very High

NOTES: 1.) "ppd" denotes soil sample average diametral pocket penetrometer reading. 2.) "ppa" denotes soil sample average axial pocket penetrometer reading.
3.) Maximum Particle Size is determined by direct observation within limitations of sampler size. 4.) Soil identifications and field tests based on visual-manual methods per ASTM D2488.

MOTT MACDONALD

# SOIL BORING LOG

BORING NO.: **B-31**
Page **1** of **1**

| | | | |
|---|---|---|---|
| **Project:** | South Ripley Solar | **Project No.:** | 505100267-001 |
| **Location:** | South Ripley, NY | **Project Mgr:** | Eric Pauli |
| **Client:** | ConnectGen | **Field Eng. Staff:** | Diego Melgar |
| **Drilling Co.:** | Earth Dimensions, Inc. | **Date/Time Started:** | July 29, 2020 at 9:15 am |
| **Driller/Helper:** | Brian B. /Harold Kleever | **Date/Time Finished:** | July 29, 2020 at 10:20 am |

**Elevation:** Grade ft. **Vertical Datum:** | **Boring Location:** See Boring Location Plan | **Coord.:** **Lat:** 42.182686° **Long:** -79.699632° | **Horizontal Datum:** NAD 1983

| Item | Casing | Sampler | Core Barrel |
|---|---|---|---|
| Type | HSA | SS | - |
| Length | 5 ft | 2 ft | - |
| Inside Dia. (in.) | 4.25 | 1.375 | - |
| Hammer Wt. (lb.) | 140 | 140 | - |
| Hammer Fall (in.) | 30 | 30 | - |

**Rig Make & Model:** Diedrich D-50

| | | | |
|---|---|---|---|
| ☐ Truck | ☐ Tripod | ☐ Cat-Head | ☐ Safety |
| ☐ ATV | ☐ Geoprobe | ☑ Winch | ☑ Doughnut |
| ☑ Track | ☐ Air Track | ☐ Roller Bit | ☐ Automatic |
| ☐ Skid | ☐ _____ | ☑ Cutting Head | ☐ _____ |

**Hammer Type**

**Drilling Fluid**: ☐ Bentonite ☐ Polymer ☐ Water ☑ None

**Drill Rod Size:**

**Casing Advance**: Hollow Stem Auger

| Depth/ Elev. (ft) | Sample No. / Interval (ft) | Rec. (in) | Sample Blows per 6" | Stratum Graphic | USCS Group Symbol | Visual - Manual Identification & Description (Density/consistency, color, Group Name, constituents, particle size, structure, moisture, optional descriptions, geologic interpretation, Symbol) | Field Tests: Dilatancy | Toughness | Plasticity | Dry Strength | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | S-1 0.0'- 2.0' 0.4'-' | 18 | 2 3 3 4 | | | 0.4 Top 5" - TOPSOIL | - | - | - | - | |
| | | | | | CL | Medium stiff, grayish brown CLAY, some Silt, trace fine Sand, trace fine Gravel, dry (CL) | N | M | L | L | PP = 1.25 tsf |
| | S-2 2.0'- 4.0' | 18 | 4 3 2 5 | | CL | Medium stiff, brown CLAY, some Silt, little fine Sand, trace coarse to fine Gravel, moist (CL) | S | M | L | - | PP = 0.75 tsf |
| | | | | | | 4.0 | | | | | |
| 5 ▽ | S-3 4.0'- 6.0' | 11 | 2 2 2 4 | | ML | Medium stiff, brown SILT, some Clay, little coarse to fine Sand, trace coarse to fine Gravel, moist (ML) | S | L | L | - | PP = 1.0 tsf |
| | S-4 6.0'- 8.0' | 20.5 | 3 5 6 10 | | ML | Stiff, brown SILT, some Clay, little fine Sand, trace coarse to fine Gravel, moist (ML) | S | L | L | - | PP = 0.75 tsf |
| | S-5 8.0'- 10.0' | 20.5 | 10 14 25 33 | | ML | Hard, brownish gray SILT, little Clay, little fine Sand, trace fine Gravel, dry (ML) | - | L | L | H | PP > 4.5 tsf Mottling observed on recovery. |
| 10 | | | | | | | | | | | |
| | | | | | | 11.5 | | | | | |
| | S-6 13.0'- 15.0' | 14 | 22 46 50/2" | | SM | Very dense, brown coarse to fine SAND, some Silt, little coarse to fine Gravel, little Clay, wet (SM) | N | - | NP | - | |
| 15 | | | | | | | | | | | |
| | | | | | | 16.5 | | | | | |
| | S-7 18.0'- 20.0' | 20 | 12 38 44 47 | | ML | Hard, gray SILT, some fine Sand, some Clay, trace fine Gravel, wet (ML) | S | L | L | - | PP = 3.5 tsf |
| | | | | | | End of Boring at 20 feet BGS. | | | | | |
| | | | | | | 20.0 Borehole backfilled with soil cuttings. | | | | | |

**Water Level Data**

| Date | Time | Elapsed Time (hr) | Depth in feet to: Bot. of Casing | Bottom of Hole | Water |
|---|---|---|---|---|---|
| 7/29/20 | 10:20 | - | | 20.0 | 5 |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

**Sample Type**

- **O** Open End Rod
- **T** Thin-Wall Tube
- **U** Undisturbed Sample
- **SS** Split Spoon Sample
- **G** Grab Sample

**Notes:**
PP = Pocket Penetrometer

Boring No.: **B-31**

**Field Test Legend:**
Dilatancy: N - None S - Slow R - Rapid
Toughness: L - Low M - Medium H - High
Plasticity: NP - Non-Plastic L - Low M - Medium H - High
Dry Strength: N - None L - Low M - Medium H - High VH - Very High

NOTES: 1.) "ppd" denotes soil sample average diametral pocket penetrometer reading. 2.) "ppa" denotes soil sample average axial pocket penetrometer reading.
3.) Maximum Particle Size is determined by direct observation within limitations of sampler size. 4.) Soil identifications and field tests based on visual-manual methods per ASTM D2488.

MOTT MACDONALD

# SOIL BORING LOG

BORING NO.: **B-32**
Page **1** of **1**

| | | | |
|---|---|---|---|
| **Project:** | South Ripley Solar | **Project No.:** | 505100267-001 |
| **Location:** | South Ripley, NY | **Project Mgr:** | Eric Pauli |
| **Client:** | ConnectGen | **Field Eng. Staff:** | Diego Melgar |
| **Drilling Co.:** | Earth Dimensions, Inc. | **Date/Time Started:** | July 29, 2020 at 10:45 am |
| **Driller/Helper:** | Brian B. /Harold Kleever | **Date/Time Finished:** | July 29, 2020 at 11:50 am |

**Elevation:** Grade ft. **Vertical Datum:** | **Boring Location:** See Boring Location Plan | **Coord.:** **Lat:** 42.180103° **Long:** -79.694561° | **Horizontal Datum:** NAD 1983

| Item | Casing | Sampler | Core Barrel |
|---|---|---|---|
| Type | HSA | SS | - |
| Length | 5 ft | 2 ft | - |
| Inside Dia. (in.) | 4.25 | 1.375 | - |
| Hammer Wt. (lb.) | 140 | 140 | - |
| Hammer Fall (in.) | 30 | 30 | - |

**Rig Make & Model:** Diedrich D-50

☐ Truck ☐ Tripod ☐ Cat-Head
☐ ATV ☐ Geoprobe ☑ Winch
☑ Track ☐ Air Track ☐ Roller Bit
☐ Skid ☐ _____ ☑ Cutting Head

**Hammer Type:** ☐ Safety ☑ Doughnut ☐ Automatic ☐ _____

**Drilling Fluid:** ☐ Bentonite ☐ Polymer ☐ Water ☑ None

**Drill Rod Size:**

**Casing Advance:** Hollow Stem Auger

| Depth/ Elev. (ft) | Sample No. / Interval (ft) | Rec. (in) | Sample Blows per 6" | Stratum Graphic | USCS Group Symbol | Visual - Manual Identification & Description (Density/consistency, color, Group Name, constituents, particle size, structure, moisture, optional descriptions, geologic interpretation, Symbol) | Field Tests: Dilatancy | Toughness | Plasticity | Dry Strength | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | S-1 0.0'- 2.0' 0.3'-' | 18 | 2 2 5 4 | | CL | 0.3 Top 4" - TOPSOIL<br>Medium stiff, reddish brown CLAY, some Silt, trace fine Sand, trace fine Gravel, dry (CL) | - N | - L | - H | - L | PP = 2.5 tsf |
| | S-2 2.0'- 4.0' | 17 | 4 5 7 3 | | ML | 2.0<br>Stiff, reddish brown to gray SILT, some Clay, little coarse to fine Sand, trace fine Gravel, moist (ML) | N | L | L | - | PP = 4.25 tsf |
| 5 | S-3 4.0'- 6.0' | 7 | 7 12 7 4 | | ML | Very stiff, brown SILT, some fine Sand, little Clay, trace fine Gravel, moist (ML) | S | L | L | - | PP = 0.75 tsf |
| | S-4 6.0'- 8.0' | 20 | 3 5 21 10 | | ML | Very stiff, brown SILT, some Clay, little fine Sand, trace fine Gravel, moist (ML) | S | L | L | - | PP = 1.25 tsf |
| | S-5 8.0'- 10.0' | 24 | 13 27 23 28 | | ML | Hard, brown SILT, some fine Sand, little Clay, trace fine Gravel, moist (ML) | S | L | L | - | PP = 2.75 tsf |
| 10 | | | | | | | | | | | |
| | S-6 13.0'- 15.0' | 4 | 28 50/4" | | ML | Hard, brown SILT, some Clay, some coarse to fine Gravel, little fine Sand, moist (ML) | - | L | L | - | Not enough recovery to perform pocket penetrometer field test. |
| 15 | | | | | | | | | | | |
| | S-7 18.0'- 20.0' | 20 | 32 47 39 41 | | ML | Hard, gray SILT, some Clay, little fine Gravel, trace Sand, dry (ML) | N | L | L | M | PP > 4.5 tsf |
| | | | | | | End of Boring at 20 feet BGS.<br>20.0 Borehole backfilled with soil cuttings. | | | | | |

**Water Level Data**

| Date | Time | Elapsed Time (hr) | Depth in feet to: Bot. of Casing | Bottom of Hole | Water |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

**Sample Type**

**O** Open End Rod
**T** Thin-Wall Tube
**U** Undisturbed Sample
**SS** Split Spoon Sample
**G** Grab Sample

**Notes:**
PP = Pocket Penetrometer
No groundwater encountered during subsurface investigation.

Boring No.: **B-32**

**Field Test Legend:**
Dilatancy: N - None S - Slow R - Rapid
Toughness: L - Low M - Medium H - High
Plasticity: NP - Non-Plastic L - Low M - Medium H - High
Dry Strength: N - None L - Low M - Medium H - High VH - Very High

NOTES: 1.) "ppd" denotes soil sample average diametral pocket penetrometer reading. 2.) "ppa" denotes soil sample average axial pocket penetrometer reading.
3.) Maximum Particle Size is determined by direct observation within limitations of sampler size. 4.) Soil identifications and field tests based on visual-manual methods per ASTM D2488.

MOTT MACDONALD

# SOIL BORING LOG

BORING NO.: **B-33**
Page **1** of **1**

| | | | |
|---|---|---|---|
| **Project:** | South Ripley Solar | **Project No.:** | 505100267-001 |
| **Location:** | South Ripley, NY | **Project Mgr:** | Eric Pauli |
| **Client:** | ConnectGen | **Field Eng. Staff:** | Diego Melgar |
| **Drilling Co.:** | Earth Dimensions, Inc. | **Date/Time Started:** | July 29, 2020 at 12:50 pm |
| **Driller/Helper:** | Brian B. /Harold Kleever | **Date/Time Finished:** | July 29, 2020 at 3:05 pm |

**Elevation:** Grade ft. **Vertical Datum:** | **Boring Location:** See Boring Location Plan | **Coord.:** **Lat:** 42.177500° **Long:** -79.698985° | **Horizontal Datum:** NAD 1983

| Item | Casing | Sampler | Core Barrel |
|---|---|---|---|
| Type | HSA | SS | - |
| Length | 5 ft | 2 ft | - |
| Inside Dia. (in.) | 4.25 | 1.375 | - |
| Hammer Wt. (lb.) | 140 | 140 | - |
| Hammer Fall (in.) | 30 | 30 | - |

**Rig Make & Model:** Diedrich D-50

| | | | |
|---|---|---|---|
| ☐ Truck | ☐ Tripod | ☐ Cat-Head | ☐ Safety |
| ☐ ATV | ☐ Geoprobe | ☑ Winch | ☑ Doughnut |
| ☑ Track | ☐ Air Track | ☐ Roller Bit | ☐ Automatic |
| ☐ Skid | ☐ _____ | ☑ Cutting Head | ☐ _____ |

**Hammer Type**

**Drilling Fluid**
☐ Bentonite
☐ Polymer
☐ Water
☑ None

**Drill Rod Size:**

**Casing Advance**
Hollow Stem Auger

| Depth/ Elev. (ft) | Sample No. / Interval (ft) | Rec. (in) | Sample Blows per 6" | Stratum Graphic | USCS Group Symbol | Visual - Manual Identification & Description (Density/consistency, color, Group Name, constituents, particle size, structure, moisture, optional descriptions, geologic interpretation, Symbol) | Field Tests: Dilatancy | Toughness | Plasticity | Dry Strength | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | S-1 0.0'- 2.0' 0.4'-' | 20 | 2 2 5 5 | | | 0.4 Top 5" - TOPSOIL | - | - | - | - | |
| | | | | | ML | Medium stiff, brown SILT, some fine Sand, trace Clay, trace fine Gravel, dry (ML) | - | L | L | - | PP = N/A |
| | S-2 2.0'- 4.0' | 16 | 5 6 5 7 | | ML | Stiff, brown SILT, some fine Sand, little Clay, trace coarse to fine Gravel, moist (ML) | N | L | L | - | PP = 2.5 tsf |
| | S-3 4.0'- 6.0' | 18 | 2 3 3 3 | | ML | Medium stiff, light brown SILT, some Clay, little fine Sand, trace fine Gravel, moist (ML) | N | L | L | - | PP = 1.25 tsf |
| 5 | | | | | | 6.0 | | | | | |
| | S-4 6.0'- 8.0' | 20 | 2 8 10 17 | | CL | Very stiff, brown CLAY, some Silt, trace fine Sand, trace coarse to fine Gravel, moist (CL) | N | M | L | - | PP > 4.5 tsf |
| | S-5 8.0'- 10.0' | 22 | 6 13 16 18 | | CL | Very stiff, brownish gray CLAY, some Silt, trace fine Sand, trace fine Gravel, moist (CL) | N | M | L | - | PP > 4.5 tsf |
| 10 | | | | | | 11.5 | | | | | |
| | S-6 13.0'- 15.0' | 24 | 19 31 35 31 | | ML | Hard, light gray SILT, some Clay, little fine Sand, trace fine Gravel, dry (ML) | N | L | L | M | PP = 1.5 tsf |
| 15 | | | | | | 16.5 | | | | | |
| | S-7 18.0'- 20.0' | 24 | 11 23 29 28 | | CL | Hard, gray CLAY, some Silt, little fine Sand, trace fine Gravel, dry (CL) | N | M | L | H | PP = 4.5 tsf |
| | | | | | | End of Boring at 20 feet BGS. Borehole backfilled with soil cuttings. 20.0 | | | | | |

**Water Level Data**

| Date | Time | Elapsed Time (hr) | Depth in feet to: Bot. of Casing | Bottom of Hole | Water |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

**Sample Type**

| | |
|---|---|
| **O** | Open End Rod |
| **T** | Thin-Wall Tube |
| **U** | Undisturbed Sample |
| **SS** | Split Spoon Sample |
| **G** | Grab Sample |

**Notes:**
PP = Pocket Penetrometer
No groundwater encountered during subsurface investigation.

Boring No.: **B-33**

**Field Test Legend:**
Dilatancy: N - None S - Slow R - Rapid
Toughness: L - Low M - Medium H - High
Plasticity: NP - Non-Plastic L - Low M - Medium H - High
Dry Strength: N - None L - Low M - Medium H - High VH - Very High

NOTES: 1.) "ppd" denotes soil sample average diametral pocket penetrometer reading. 2.) "ppa" denotes soil sample average axial pocket penetrometer reading.
3.) Maximum Particle Size is determined by direct observation within limitations of sampler size. 4.) Soil identifications and field tests based on visual-manual methods per ASTM D2488.

MOTT MACDONALD

# SOIL BORING LOG

BORING NO.: **B-34**
Page **1** of **1**

| | | | |
|---|---|---|---|
| **Project:** | South Ripley Solar | **Project No.:** | 505100267-001 |
| **Location:** | South Ripley, NY | **Project Mgr:** | Eric Pauli |
| **Client:** | ConnectGen | **Field Eng. Staff:** | Diego Melgar |
| **Drilling Co.:** | Earth Dimensions, Inc. | **Date/Time Started:** | July 30, 2020 at 7:45 am |
| **Driller/Helper:** | Brian B. /Harold Kleever | **Date/Time Finished:** | July 30, 2020 at 8:45 am |

**Elevation:** Grade ft. **Vertical Datum:** | **Boring Location:** See Boring Location Plan | **Coord.:** **Lat:** 42.174669° **Long:** -79.695800° | **Horizontal Datum:** NAD 1983

| Item | Casing | Sampler | Core Barrel |
|---|---|---|---|
| Type | HSA | SS | - |
| Length | 5 ft | 2 ft | - |
| Inside Dia. (in.) | 4.25 | 1.375 | - |
| Hammer Wt. (lb.) | 140 | 140 | - |
| Hammer Fall (in.) | 30 | 30 | - |

**Rig Make & Model:** Diedrich D-50

| | | | |
|---|---|---|---|
| ☐ Truck | ☐ Tripod | ☐ Cat-Head | |
| ☐ ATV | ☐ Geoprobe | ☑ Winch | |
| ☑ Track | ☐ Air Track | ☐ Roller Bit | |
| ☐ Skid | ☐ _____ | ☑ Cutting Head | |

**Hammer Type**: ☐ Safety ☑ Doughnut ☐ Automatic ☐ _____

**Drilling Fluid**: ☐ Bentonite ☐ Polymer ☐ Water ☑ None

**Drill Rod Size:**

**Casing Advance**: Hollow Stem Auger

| Depth/ Elev. (ft) | Sample No. / Interval (ft) | Rec. (in) | Sample Blows per 6" | Stratum Graphic | USCS Group Symbol | Visual - Manual Identification & Description (Density/consistency, color, Group Name, constituents, particle size, structure, moisture, optional descriptions, geologic interpretation, Symbol) | Field Tests: Dilatancy | Toughness | Plasticity | Dry Strength | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | S-1 0.0'- 2.0' 0.3'-' | 7 | 1 7 11 10 | | ML | 0.3 Top 4" - TOPSOIL<br>Very stiff, dark brown SILT, some Clay, trace fine Sand, trace fine Gravel, moist (ML) | - N | - L | - L | - - | PP = 1.75 tsf |
| | S-2 2.0'- 4.0' | 24 | 6 5 6 7 | | CL | 2.0<br>Stiff, brown CLAY, some Silt, trace fine Sand, trace fine Gravel, moist (CL) | N | M | L | - | PP = 2.5 tsf |
| 5 | S-3 4.0'- 6.0' | 22 | 3 4 7 9 | | CL | Stiff, light brown CLAY, some Silt, little fine Sand, trace fine Gravel, moist (CL) | N | M | L | - | PP = 4.0 tsf |
| | S-4 6.0'- 8.0' | 24 | 8 12 12 7 | | ML | 6.0<br>Very stiff, light brown SILT, some Clay, little fine Sand, trace fine Gravel, dry (ML) | S | L | L | H | PP > 4.5 tsf |
| | S-5 8.0'- 10.0' | 24 | 9 16 26 27 | | ML | Hard, brown SILT, some Clay, little fine Sand, little fine Gravel, dry (ML) | N | L | L | H | PP = 4.25 tsf<br>Glacial till recovered at 8 feet BGS.<br>Red Sand observed at 8 feet BGS. |
| 10 | | | | | | | | | | | |
| | S-6 13.0'- 15.0' | 23 | 8 18 29 25 | | ML | Hard, gray SILT, some Clay, little fine Sand, little coarse to fine Gravel, dry (ML) | N | L | L | VH | PP > 4.5 tsf |
| 15 | | | | | | | | | | | |
| | S-7 18.0'- 18.8' | 8 | 36 50/3" | | ML | Hard, brown to gray SILT, some Clay, trace fine Sand, trace fine Gravel, dry (ML)<br>18.8<br>End of Boring at 18.8 feet BGS.<br>Borehole backfilled with soil cuttings. | N | L | L | H | PP = 2.25 tsf |

**Water Level Data**

| Date | Time | Elapsed Time (hr) | Depth in feet to: Bot. of Casing | Bottom of Hole | Water |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

**Sample Type**

- **O** Open End Rod
- **T** Thin-Wall Tube
- **U** Undisturbed Sample
- **SS** Split Spoon Sample
- **G** Grab Sample

**Notes:**
PP = Pocket Penetrometer

Boring No.: **B-34**

**Field Test Legend:**
Dilatancy: N - None S - Slow R - Rapid
Toughness: L - Low M - Medium H - High
Plasticity: NP - Non-Plastic L - Low M - Medium H - High
Dry Strength: N - None L - Low M - Medium H - High VH - Very High

NOTES: 1.) "ppd" denotes soil sample average diametral pocket penetrometer reading. 2.) "ppa" denotes soil sample average axial pocket penetrometer reading.
3.) Maximum Particle Size is determined by direct observation within limitations of sampler size. 4.) Soil identifications and field tests based on visual-manual methods per ASTM D2488.

MOTT MACDONALD

# SOIL BORING LOG

BORING NO.: **B-35**
Page **1** of **1**

| | | | |
|---|---|---|---|
| **Project:** | South Ripley Solar | **Project No.:** | 505100267-001 |
| **Location:** | South Ripley, NY | **Project Mgr:** | Eric Pauli |
| **Client:** | ConnectGen | **Field Eng. Staff:** | Diego Melgar |
| **Drilling Co.:** | Earth Dimensions, Inc. | **Date/Time Started:** | August 5, 2020 at 12:45 pm |
| **Driller/Helper:** | Brian B. /Harold Kleever | **Date/Time Finished:** | August 5, 2020 at 2:05 pm |

**Elevation:** Grade ft. **Vertical Datum:** | **Boring Location:** See Boring Location Plan | **Coord.:** **Lat:** 42.181265° **Long:** -79.682242° | **Horizontal Datum:** NAD 1983

| Item | Casing | Sampler | Core Barrel |
|---|---|---|---|
| Type | HSA | SS | - |
| Length | 5 ft | 2 ft | - |
| Inside Dia. (in.) | 4.25 | 1.375 | - |
| Hammer Wt. (lb.) | 140 | 140 | - |
| Hammer Fall (in.) | 30 | 30 | - |

**Rig Make & Model:** Diedrich D-50

☐ Truck ☐ Tripod ☐ Cat-Head
☐ ATV ☐ Geoprobe ☑ Winch
☑ Track ☐ Air Track ☐ Roller Bit
☐ Skid ☐ _____ ☑ Cutting Head

**Hammer Type:** ☐ Safety ☑ Doughnut ☐ Automatic ☐ _____

**Drilling Fluid:** ☐ Bentonite ☐ Polymer ☐ Water ☑ None

**Drill Rod Size:**

**Casing Advance:** Hollow Stem Auger

| Depth/ Elev. (ft) | Sample No. / Interval (ft) | Rec. (in) | Sample Blows per 6" | Stratum Graphic | USCS Group Symbol | Visual - Manual Identification & Description (Density/consistency, color, Group Name, constituents, particle size, structure, moisture, optional descriptions, geologic interpretation, Symbol) | Field Tests: Dilatancy | Toughness | Plasticity | Dry Strength | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | S-1 0.0'- 2.0' 0.5'-' | 18 | 2 2 5 8 | | | 0.5 Top 6" - TOPSOIL | - | - | - | - | |
| | | | | | CL | Medium stiff, light brown CLAY, some Silt, trace fine Sand, trace fine Gravel, dry (CL) | N | M | L | L | PP = 0.75 tsf |
| | S-2 2.0'- 4.0' | 21 | 8 6 6 7 | | CL | Stiff, grayish brown CLAY, some Silt, little coarse to fine Sand, trace fine Gravel, moist (CL) | N | M | L | - | PP = 2.5 tsf |
| | | | | | | 4.0 | | | | | |
| | S-3 4.0'- 6.0' | 19 | 3 6 8 10 | | ML | Stiff, brown SILT, some Clay, little fine Gravel, trace fine Sand, moist (ML) | N | L | L | - | PP = 3.0 tsf |
| 5 | | | | | | | | | | | |
| | S-4 6.0'- 8.0' | 21 | 6 11 35 38 | | ML | Hard, brown SILT, some Clay, little coarse to fine Sand, little coarse to fine Gravel, moist (ML) | N | L | L | - | PP = 2.0 tsf |
| | S-5 8.0'- 10.0' | 17 | 30 48 50/4" | | ML | Hard, brown SILT, some Clay, some coarse to fine Gravel, little fine Sand, dry (ML) | N | L | L | VH | PP = N/A |
| 10 | | | | | | | | | | | |
| | S-6 13.0'- 15.0' | 24 | 13 30 32 38 | | ML | Hard, gray SILT, some Clay, some coarse to fine Gravel, trace fine Sand, dry (ML) | N | L | L | VH | PP > 4.5 tsf |
| 15 | | | | | | | | | | | |
| | S-7 18.0'- 20.0' | 21 | 15 29 49 32 | | ML | Hard, gray SILT, some Clay, little fine Gravel, trace fine Sand, dry (ML) | N | L | L | L | PP = 2.0 tsf |
| | | | | | | End of Boring at 20 feet BGS. 20.0 Borehole backfilled with soil cuttings. | | | | | |

**Water Level Data**

| Date | Time | Elapsed Time (hr) | Depth in feet to: Bot. of Casing | Bottom of Hole | Water |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

**Sample Type**

**O** Open End Rod
**T** Thin-Wall Tube
**U** Undisturbed Sample
**SS** Split Spoon Sample
**G** Grab Sample

**Notes:**
PP = Pocket Penetrometer
No groundwater encountered during subsurface investigation.

Boring No.: **B-35**

**Field Test Legend:**
Dilatancy: N - None S - Slow R - Rapid
Toughness: L - Low M - Medium H - High
Plasticity: NP - Non-Plastic L - Low M - Medium H - High
Dry Strength: N - None L - Low M - Medium H - High VH - Very High

NOTES: 1.) "ppd" denotes soil sample average diametral pocket penetrometer reading. 2.) "ppa" denotes soil sample average axial pocket penetrometer reading.
3.) Maximum Particle Size is determined by direct observation within limitations of sampler size. 4.) Soil identifications and field tests based on visual-manual methods per ASTM D2488.

MOTT MACDONALD

# SOIL BORING LOG

BORING NO.: **B-36**
Page **1** of **1**

| | | | |
|---|---|---|---|
| **Project:** | South Ripley Solar | **Project No.:** | 505100267-001 |
| **Location:** | South Ripley, NY | **Project Mgr:** | Eric Pauli |
| **Client:** | ConnectGen | **Field Eng. Staff:** | Diego Melgar |
| **Drilling Co.:** | Earth Dimensions, Inc. | **Date/Time Started:** | August 5, 2020 at 10:30 am |
| **Driller/Helper:** | Brian B. /Harold Kleever | **Date/Time Finished:** | August 5, 2020 at 11:40 am |

**Elevation:** Grade ft. **Vertical Datum:** | **Boring Location:** See Boring Location Plan | **Coord.:** **Lat:** 42.177692° **Long:** -79.678467° | **Horizontal Datum:** NAD 1983

| Item | Casing | Sampler | Core Barrel |
|---|---|---|---|
| Type | HSA | SS | - |
| Length | 5 ft | 2 ft | - |
| Inside Dia. (in.) | 4.25 | 1.375 | - |
| Hammer Wt. (lb.) | 140 | 140 | - |
| Hammer Fall (in.) | 30 | 30 | - |

**Rig Make & Model:** Diedrich D-50

| | | | | |
|---|---|---|---|---|
| ☐ Truck | ☐ Tripod | ☐ Cat-Head | **Hammer Type** ☐ Safety | **Drilling Fluid** ☐ Bentonite |
| ☐ ATV | ☐ Geoprobe | ☑ Winch | ☑ Doughnut | ☐ Polymer |
| ☑ Track | ☐ Air Track | ☐ Roller Bit | ☐ Automatic | ☐ Water |
| ☐ Skid | ☐ _____ | ☑ Cutting Head | ☐ _____ | ☑ None |

**Drill Rod Size:** | **Casing Advance:** Hollow Stem Auger

| Depth/ Elev. (ft) | Sample No. / Interval (ft) | Rec. (in) | Sample Blows per 6" | Stratum Graphic | USCS Group Symbol | Visual - Manual Identification & Description (Density/consistency, color, Group Name, constituents, particle size, structure, moisture, optional descriptions, geologic interpretation, Symbol) | Field Tests: Dilatancy | Toughness | Plasticity | Dry Strength | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | S-1 0.0'- 2.0' 0.3'-' | 21 | 1 2 3 7 | | ML | 0.3 Top 4" - TOPSOIL<br>Medium stiff, light brown SILT, some Clay, little fine Sand, trace fine Gravel, moist (ML) | - S | - L | - L | - - | PP = 1.75 tsf |
| | S-2 2.0'- 4.0' | 24 | 7 6 10 14 | | ML | Very stiff, brown SILT, some Clay, trace fine Sand, trace fine Gravel, moist (ML) | S | L | L | - | PP = 2.25 tsf |
| 5 | S-3 4.0'- 6.0' | 16 | 5 5 6 7 | | CL | 4.0<br>Stiff, brown CLAY, some Silt, little fine Sand, trace fine Gravel, moist (CL) | N | M | L | - | PP = 1.5 tsf |
| | S-4 6.0'- 8.0' | 18 | 4 8 12 15 | | SM | 6.0<br>Medium dense, brown fine SAND, some Silt, little fine Gravel, little Clay, wet (SM) | R | L | NP | - | |
| 10 | S-5 8.0'- 10.0' | 21 | 12 23 27 28 | | ML | 8.0<br>Hard, brown SILT, some fine Sand, some Clay, little fine Gravel, moist (ML) | S | L | L | - | PP = 1.5 tsf |
| | S-6 13.0'- 15.0' | 17 | 9 18 47 43 | | ML | Hard, gray SILT, some Clay, some coarse to fine Gravel, little coarse to fine Sand, wet (ML) | N | L | L | - | PP = 3.75 tsf |
| 15 | | | | | | | | | | | |
| | S-7 18.0'- 20.0' | 10.5 | 7 21 20 26 | | ML | Hard, brownish gray SILT, some Clay, little fine Gravel, little fine Sand, wet (ML) | S | L | L | - | |
| | | | | | | End of Boring at 20 feet BGS.<br>20.0 Borehole backfilled with soil cuttings. | | | | | |

**Water Level Data**

| Date | Time | Elapsed Time (hr) | Depth in feet to: Bot. of Casing | Bottom of Hole | Water |
|---|---|---|---|---|---|
| 8/5/20 | 11:40 | - | | | 12 |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

**Sample Type**

- **O** Open End Rod
- **T** Thin-Wall Tube
- **U** Undisturbed Sample
- **SS** Split Spoon Sample
- **G** Grab Sample

**Notes:**
PP = Pocket Penetrometer
Groundwater encountered at 12 feet BGS.

Boring No.: **B-36**

**Field Test Legend:**
Dilatancy: N - None S - Slow R - Rapid
Toughness: L - Low M - Medium H - High
Plasticity: NP - Non-Plastic L - Low M - Medium H - High
Dry Strength: N - None L - Low M - Medium H - High VH - Very High

NOTES: 1.) "ppd" denotes soil sample average diametral pocket penetrometer reading. 2.) "ppa" denotes soil sample average axial pocket penetrometer reading.
3.) Maximum Particle Size is determined by direct observation within limitations of sampler size. 4.) Soil identifications and field tests based on visual-manual methods per ASTM D2488.

MOTT MACDONALD

# SOIL BORING LOG

BORING NO.: **B-37**
Page **1** of **1**

| | | | |
|---|---|---|---|
| **Project:** | South Ripley Solar | **Project No.:** | 505100267-001 |
| **Location:** | South Ripley, NY | **Project Mgr:** | Eric Pauli |
| **Client:** | ConnectGen | **Field Eng. Staff:** | Diego Melgar |
| **Drilling Co.:** | Earth Dimensions, Inc. | **Date/Time Started:** | July 30, 2020 at 11:55 am |
| **Driller/Helper:** | Brian B. /Harold Kleever | **Date/Time Finished:** | July 30, 2020 at 12:40 pm |

**Elevation:** Grade ft. **Vertical Datum:** | **Boring Location:** See Boring Location Plan | **Coord.:** **Lat:** 42.174003° **Long:** -79.681085° | **Horizontal Datum:** NAD 1983

| Item | Casing | Sampler | Core Barrel |
|---|---|---|---|
| Type | HSA | SS | - |
| Length | 5 ft | 2 ft | - |
| Inside Dia. (in.) | 4.25 | 1.375 | - |
| Hammer Wt. (lb.) | 140 | 140 | - |
| Hammer Fall (in.) | 30 | 30 | - |

**Rig Make & Model:** Diedrich D-50

| | | | |
|---|---|---|---|
| ☐ Truck | ☐ Tripod | ☐ Cat-Head | |
| ☐ ATV | ☐ Geoprobe | ☑ Winch | |
| ☑ Track | ☐ Air Track | ☐ Roller Bit | |
| ☐ Skid | ☐ _____ | ☑ Cutting Head | |

**Hammer Type**: ☐ Safety ☑ Doughnut ☐ Automatic ☐ _____

**Drilling Fluid**: ☐ Bentonite ☐ Polymer ☐ Water ☑ None

**Drill Rod Size:**

**Casing Advance**: Hollow Stem Auger

| Depth/ Elev. (ft) | Sample No. / Interval (ft) | Rec. (in) | Sample Blows per 6" | Stratum Graphic | USCS Group Symbol | Visual - Manual Identification & Description (Density/consistency, color, Group Name, constituents, particle size, structure, moisture, optional descriptions, geologic interpretation, Symbol) | Field Tests: Dilatancy | Toughness | Plasticity | Dry Strength | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | S-1 0.0'- 2.0' | 16 | 1<br>2<br>3<br>7 | | ML | Medium stiff, grayish brown SILT, some Clay, little fine Sand, trace fine Gravel, dry (ML) | S | L | L | L | PP = 3.0 tsf |
| | S-2 2.0'- 4.0' | 19 | 6<br>8<br>8<br>12 | | ML | Very stiff, brown SILT, some Clay, little fine Sand, trace fine Gravel, moist (ML) | N | L | L | - | PP = 1.5 tsf |
| 5 | S-3 4.0'- 6.0' | 17 | 3<br>4<br>4<br>2 | | ML | Stiff, brown SILT, some coarse to fine Sand, little fine Gravel, little Clay, wet (ML) | R | L | L | - | PP = 1.0 tsf |
| | S-4 6.0'- 8.0' | 7 | 3<br>1<br>2<br>7 | | SM | 6.0<br>Very loose, brown Silty coarse to fine SAND, little fine Gravel, little Clay, wet (SM) | R | L | NP | - | |
| 10 | S-5 8.0'- 10.0' | 15 | 3<br>6<br>11<br>11 | | ML | 8.0<br>Very stiff, brown SILT, some coarse to fine Sand, little coarse to fine Gravel, trace Clay, wet (ML) | S | L | L | - | PP = 1.75 tsf |
| 15 | S-6 13.0'- 15.0' | 2 | 50/4" | | ML | Hard, brown to gray SILT, some coarse to fine Sand, little coarse to fine Gravel, trace Clay, moist (ML) | N | L | L | L | Not enough sample recovered to perform Pocket Penetrometer field test.<br>Cobbles encountered fmr 13.5 to 15 feet BGS. |
| | S-7 18.0'- 20.0' | 24 | 16<br>32<br>40<br>40 | | ML | Hard, gray SILT, some coarse to fine Sand, little coarse to fine Gravel, little Clay, dry (ML) | N | L | L | L | PP = 1.25 tsf |
| | | | | | | End of Boring at 20 feet BGS.<br>20.0 Borehole backfilled with soil cuttings. | | | | | |

**Water Level Data**

| Date | Time | Elapsed Time (hr) | Depth in feet to: Bot. of Casing | Bottom of Hole | Water |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

**Sample Type**

- **O** Open End Rod
- **T** Thin-Wall Tube
- **U** Undisturbed Sample
- **SS** Split Spoon Sample
- **G** Grab Sample

**Notes:**

PP = Pocket Penetrometer
No groundwater encountered during subsurface investigation, but wet samples indicate its presence.

Boring No.: **B-37**

**Field Test Legend:**
Dilatancy: N - None S - Slow R - Rapid
Toughness: L - Low M - Medium H - High
Plasticity: NP - Non-Plastic L - Low M - Medium H - High
Dry Strength: N - None L - Low M - Medium H - High VH - Very High

NOTES: 1.) "ppd" denotes soil sample average diametral pocket penetrometer reading. 2.) "ppa" denotes soil sample average axial pocket penetrometer reading.
3.) Maximum Particle Size is determined by direct observation within limitations of sampler size. 4.) Soil identifications and field tests based on visual-manual methods per ASTM D2488.

MOTT MACDONALD

# SOIL BORING LOG

BORING NO.: **B-38**
Page **1** of **1**

| | | | |
|---|---|---|---|
| **Project:** | South Ripley Solar | **Project No.:** | 505100267-001 |
| **Location:** | South Ripley, NY | **Project Mgr:** | Eric Pauli |
| **Client:** | ConnectGen | **Field Eng. Staff:** | Diego Melgar |
| **Drilling Co.:** | Earth Dimensions, Inc. | **Date/Time Started:** | August 6, 2020 at 7:50 am |
| **Driller/Helper:** | Brian B. /Harold Kleever | **Date/Time Finished:** | August 6, 2020 at 9:15 am |

**Elevation:** Grade ft. **Vertical Datum:** | **Boring Location:** See Boring Location Plan | **Coord.:** **Lat:** 42.175467° **Long:** -79.674797° | **Horizontal Datum:** NAD 1983

| Item | Casing | Sampler | Core Barrel |
|---|---|---|---|
| Type | HSA | SS | - |
| Length | 5 ft | 2 ft | - |
| Inside Dia. (in.) | 4.25 | 1.375 | - |
| Hammer Wt. (lb.) | 140 | 140 | - |
| Hammer Fall (in.) | 30 | 30 | - |

**Rig Make & Model:** Diedrich D-50

| | | | |
|---|---|---|---|
| ☐ Truck | ☐ Tripod | ☐ Cat-Head | |
| ☐ ATV | ☐ Geoprobe | ☑ Winch | |
| ☑ Track | ☐ Air Track | ☐ Roller Bit | |
| ☐ Skid | ☐ _____ | ☑ Cutting Head | |

**Hammer Type**: ☐ Safety ☑ Doughnut ☐ Automatic ☐ _____

**Drilling Fluid**: ☐ Bentonite ☐ Polymer ☐ Water ☑ None

**Drill Rod Size:**

**Casing Advance**: Hollow Stem Auger

| Depth/ Elev. (ft) | Sample No. / Interval (ft) | Rec. (in) | Sample Blows per 6" | Stratum Graphic | USCS Group Symbol | Visual - Manual Identification & Description (Density/consistency, color, Group Name, constituents, particle size, structure, moisture, optional descriptions, geologic interpretation, Symbol) | Field Tests: Dilatancy | Toughness | Plasticity | Dry Strength | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | S-1 0.0'- 2.0' 0.5'-' | 15 | 1 3 4 4 | | | 0.5 Top 6" - TOPSOIL | - | - | - | - | |
| | | | | | ML | Medium stiff, light brown SILT, some Clay, trace fine Sand, trace fine Gravel, moist (ML) | N | L | L | - | PP = 1.0 tsf |
| | S-2 2.0'- 4.0' | 17 | 7 6 6 7 | | ML | Stiff, brown SILT, some Clay, little fine Sand, trace fine Gravel, moist (ML) | N | L | L | - | PP = 1.0 tsf |
| 5 | S-3 4.0'- 6.0' | 15 | 4 3 11 16 | | ML | Stiff, brown SILT, some Clay, some fine Sand, trace fine Gravel, moist (ML) | N | L | L | - | PP = 2.5 tsf |
| | S-4 6.0'- 8.0' | 24 | 13 23 28 33 | | ML | Hard, brown SILT, some Clay, some coarse to fine Sand, trace coarse to fine Gravel, moist (ML) | N | L | L | - | PP > 4.5 tsf |
| | S-5 8.0'- 10.0' | 22 | 3 26 25 20 | | ML | Hard, light brown SILT, some coarse to fine Sand, some Clay, trace fine Gravel, moist (ML) | N | L | L | - | PP = 1.75 tsf |
| 10 | | | | | | | | | | | |
| | S-6 13.0'- 15.0' | 24 | 21 28 34 50/5" | | ML | Hard, gray SILT, some Clay, little coarse to fine Sand, little fine Gravel, dry (ML) | N | L | L | VH | PP = 3.75 tsf |
| 15 | | | | | | | | | | | |
| | S-7 18.0'- 20.0' | 22 | 32 33 36 37 | | ML | Hard, gray SILT, some fine Sand, some Clay, little fine Gravel, dry (ML) | N | L | L | L | PP > 4.5 tsf |
| | | | | | | 20.0 End of Boring at 20 feet BGS. Borehole backfilled with soil cuttings. | | | | | |

**Water Level Data**

| Date | Time | Elapsed Time (hr) | Depth in feet to: Bot. of Casing | Bottom of Hole | Water |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

**Sample Type**

| | |
|---|---|
| **O** | Open End Rod |
| **T** | Thin-Wall Tube |
| **U** | Undisturbed Sample |
| **SS** | Split Spoon Sample |
| **G** | Grab Sample |

**Notes:**
PP = Pocket Penetrometer
No groundwater encountered during subsurface investigation.

Boring No.: **B-38**

**Field Test Legend:**
Dilatancy: N - None S - Slow R - Rapid
Toughness: L - Low M - Medium H - High
Plasticity: NP - Non-Plastic L - Low M - Medium H - High
Dry Strength: N - None L - Low M - Medium H - High VH - Very High

NOTES: 1.) "ppd" denotes soil sample average diametral pocket penetrometer reading. 2.) "ppa" denotes soil sample average axial pocket penetrometer reading.
3.) Maximum Particle Size is determined by direct observation within limitations of sampler size. 4.) Soil identifications and field tests based on visual-manual methods per ASTM D2488.

MOTT MACDONALD

# SOIL BORING LOG

BORING NO.: **B-39**
Page **1** of **1**

| | | | |
|---|---|---|---|
| **Project:** | South Ripley Solar | **Project No.:** | 505100267-001 |
| **Location:** | South Ripley, NY | **Project Mgr:** | Eric Pauli |
| **Client:** | ConnectGen | **Field Eng. Staff:** | Diego Melgar |
| **Drilling Co.:** | Earth Dimensions, Inc. | **Date/Time Started:** | July 30, 2020 at 3:00 pm |
| **Driller/Helper:** | Brian B. /Harold Kleever | **Date/Time Finished:** | July 30, 2020 at 3:55 pm |

**Elevation:** Grade ft. **Vertical Datum:** | **Boring Location:** See Boring Location Plan | **Coord.:** **Lat:** 42.180081° **Long:** -79.665621° | **Horizontal Datum:** NAD 1983

| Item | Casing | Sampler | Core Barrel |
|---|---|---|---|
| Type | HSA | SS | - |
| Length | 5 ft | 2 ft | - |
| Inside Dia. (in.) | 4.25 | 1.375 | - |
| Hammer Wt. (lb.) | 140 | 140 | - |
| Hammer Fall (in.) | 30 | 30 | - |

**Rig Make & Model:** Diedrich D-50

| | | | |
|---|---|---|---|
| ☐ Truck | ☐ Tripod | ☐ Cat-Head | |
| ☐ ATV | ☐ Geoprobe | ☑ Winch | |
| ☑ Track | ☐ Air Track | ☐ Roller Bit | |
| ☐ Skid | ☐ _____ | ☑ Cutting Head | |

**Hammer Type**: ☐ Safety ☑ Doughnut ☐ Automatic ☐ _____

**Drilling Fluid**: ☐ Bentonite ☐ Polymer ☐ Water ☑ None

**Drill Rod Size:** | **Casing Advance**: Hollow Stem Auger

| Depth/ Elev. (ft) | Sample No. / Interval (ft) | Rec. (in) | Sample Blows per 6" | Stratum Graphic | USCS Group Symbol | Visual - Manual Identification & Description (Density/consistency, color, Group Name, constituents, particle size, structure, moisture, optional descriptions, geologic interpretation, Symbol) | Field Tests: Dilatancy | Toughness | Plasticity | Dry Strength | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | S-1 0.0'- 2.0' 0.6'-' | 16 | 2 3 3 6 | | | Top 8" - TOPSOIL 0.6 | - | - | - | - | |
| | | | | | CL | Medium stiff, light to dark brown CLAY, some Silt, trace fine Sand, trace fine Gravel, moist (CL) | N | M | L | - | PP = 2.25 tsf |
| | S-2 2.0'- 4.0' | 22 | 2 3 2 5 | | CL | Medium stiff, light brown CLAY, some Silt, little coarse to fine Sand, trace fine Gravel, moist (CL) 4.0 | N | M | L | - | PP = 1.0 tsf |
| 5 | S-3 4.0'- 6.0' | 16 | 3 2 2 2 | | ML | Medium stiff, brown SILT, some coarse to fine Sand, trace fine Gravel, trace Clay, moist (ML) | S | L | L | - | PP = 1.75 tsf |
| | S-4 6.0'- 8.0' | 18 | 2 5 6 7 | | ML | Stiff, brown SILT, some Clay, trace fine Sand, trace fine Gravel, moist (ML) | S | L | L | - | PP = 2.0 tsf |
| | S-5 8.0'- 10.0' | 21 | 4 7 8 11 | | ML | Very stiff, brown SILT, some coarse to fine Sand, little Clay, trace fine Gravel, moist (ML) | S | L | L | - | PP = 3.5 tsf |
| 10 | | | | | | | | | | | |
| | S-6 13.0'- 15.0' | 14 | 13 41 50/4" | | ML | Hard, brown SILT, some coarse to fine Sand, little Clay, trace coarse to fine Gravel, wet (ML) | N | L | L | - | PP = 2.0 tsf |
| 15 | 14.5'-' | | | | | | - | - | - | - | Augered through cobbles from 14.5 to 15.5 feet BGS. |
| | S-7 18.0'- 20.0' | 18 | 14 26 44 49 | | ML | Hard, gray SILT, some coarse to fine Sand, little Clay, trace coarse to fine Gravel, dry (ML) | N | L | L | VH | PP = 2.25 tsf |
| | | | | | | End of Boring at 20 feet BGS. 20.0 Borehole backfilled with soil cuttings. | | | | | |

**Water Level Data**

| Date | Time | Elapsed Time (hr) | Depth in feet to: Bot. of Casing | Bottom of Hole | Water |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

**Sample Type**

| | |
|---|---|
| **O** | Open End Rod |
| **T** | Thin-Wall Tube |
| **U** | Undisturbed Sample |
| **SS** | Split Spoon Sample |
| **G** | Grab Sample |

**Notes:**
PP = Pocket Penetrometer
No groundwater encountered during subsurface investigation.

Boring No.: **B-39**

**Field Test Legend:**
Dilatancy: N - None S - Slow R - Rapid
Toughness: L - Low M - Medium H - High
Plasticity: NP - Non-Plastic L - Low M - Medium H - High
Dry Strength: N - None L - Low M - Medium H - High VH - Very High

NOTES: 1.) "ppd" denotes soil sample average diametral pocket penetrometer reading. 2.) "ppa" denotes soil sample average axial pocket penetrometer reading.
3.) Maximum Particle Size is determined by direct observation within limitations of sampler size. 4.) Soil identifications and field tests based on visual-manual methods per ASTM D2488.

MOTT MACDONALD

# SOIL BORING LOG

BORING NO.: **B-40**
Page **1** of **1**

| | | | |
|---|---|---|---|
| **Project:** | South Ripley Solar | **Project No.:** | 505100267-001 |
| **Location:** | South Ripley, NY | **Project Mgr:** | Eric Pauli |
| **Client:** | ConnectGen | **Field Eng. Staff:** | Diego Melgar |
| **Drilling Co.:** | Earth Dimensions, Inc. | **Date/Time Started:** | August 5, 2020 at 7:10 am |
| **Driller/Helper:** | Brian B. /Harold Kleever | **Date/Time Finished:** | August 5, 2020 at 8:10 am |

**Elevation:** Grade ft. **Vertical Datum:** | **Boring Location:** See Boring Location Plan | **Coord.:** **Lat:** 42.181103° **Long:** -79.659652° | **Horizontal Datum:** NAD 1983

| Item | Casing | Sampler | Core Barrel |
|---|---|---|---|
| Type | HSA | SS | - |
| Length | 5 ft | 2 ft | - |
| Inside Dia. (in.) | 4.25 | 1.375 | - |
| Hammer Wt. (lb.) | 140 | 140 | - |
| Hammer Fall (in.) | 30 | 30 | - |

**Rig Make & Model:** Diedrich D-50

| | | | |
|---|---|---|---|
| ☐ Truck | ☐ Tripod | ☐ Cat-Head | |
| ☐ ATV | ☐ Geoprobe | ☑ Winch | |
| ☑ Track | ☐ Air Track | ☐ Roller Bit | |
| ☐ Skid | ☐ _____ | ☑ Cutting Head | |

**Hammer Type**: ☐ Safety ☑ Doughnut ☐ Automatic ☐ _____

**Drilling Fluid**: ☐ Bentonite ☐ Polymer ☐ Water ☑ None

**Drill Rod Size:**

**Casing Advance**: Hollow Stem Auger

| Depth/ Elev. (ft) | Sample No. / Interval (ft) | Rec. (in) | Sample Blows per 6" | Stratum Graphic | USCS Group Symbol | Visual - Manual Identification & Description (Density/consistency, color, Group Name, constituents, particle size, structure, moisture, optional descriptions, geologic interpretation, Symbol) | Field Tests: Dilatancy | Toughness | Plasticity | Dry Strength | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | S-1 0.0'- 2.0' 0.5'-' | 21 | 1 3 7 7 | | | 0.5 Top 6" - TOPSOIL | - | - | - | - | |
| | | | | | ML | Medium stiff, grayish brown SILT, some Clay, trace fine Sand, trace fine Gravel, moist (ML) | N | L | L | - | PP = 2.0 tsf |
| | S-2 2.0'- 4.0' | 14 | 5 8 13 10 | | ML | Very stiff, brown SILT, some Clay, little fine Sand, trace fine Gravel, moist (ML) | N | L | L | - | PP = 2.0 tsf |
| | | | | | | 4.0 | | | | | |
| | S-3 4.0'- 6.0' | 17 | 2 3 4 4 | | CL | Medium stiff, brown Silty CLAY, some fine Sand, trace fine Gravel, moist (CL) | N | M | L | - | PP = 0.75 tsf |
| 5 | | | | | | | | | | | |
| | S-4 6.0'- 8.0' | 12 | 2 4 4 5 | | CL | Stiff, brown Silty CLAY, some fine Sand, trace fine Gravel, moist (CL) | N | M | L | - | PP = 0.75 tsf |
| | S-5 8.0'- 10.0' | 13 | 5 8 15 21 | | CL | Very stiff, brown Silty CLAY, some fine Sand, trace fine Gravel, moist (CL) | S | M | L | - | PP = 3.25 tsf |
| 10 ▽ | | | | | | | | | | | |
| | | | | | | 11.5 | | | | | |
| | S-6 13.0'- 15.0' | 17 | 25 44 50/5" | | ML | Hard, dark gray SILT, some Clay, some fine Gravel, trace fine Sand, dry (ML) | N | L | L | VH | PP = 2.75 tsf |
| 15 | | | | | | | | | | | |
| | S-7 18.0'- 20.0' | 18 | 34 32 36 32 | | ML | Hard, brownish gray SILT, some Clay, little fine Sand, little fine Gravel, wet (ML) | N | L | L | - | |
| | | | | | | End of Boring at 20 feet BGS. | | | | | |
| | | | | | | 20.0 Borehole backfilled with soil cuttings. | | | | | |

**Water Level Data**

| Date | Time | Elapsed Time (hr) | Depth in feet to: Bot. of Casing | Bottom of Hole | Water |
|---|---|---|---|---|---|
| 8/5/20 | 8:10 | - | | | 10 |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

**Sample Type**

| | |
|---|---|
| **O** | Open End Rod |
| **T** | Thin-Wall Tube |
| **U** | Undisturbed Sample |
| **SS** | Split Spoon Sample |
| **G** | Grab Sample |

**Notes:**
PP = Pocket Penetrometer
Groundwater encountered at 10 feet BGS.

Boring No.: **B-40**

**Field Test Legend:**
Dilatancy: N - None S - Slow R - Rapid
Toughness: L - Low M - Medium H - High
Plasticity: NP - Non-Plastic L - Low M - Medium H - High
Dry Strength: N - None L - Low M - Medium H - High VH - Very High

NOTES: 1.) "ppd" denotes soil sample average diametral pocket penetrometer reading. 2.) "ppa" denotes soil sample average axial pocket penetrometer reading.
3.) Maximum Particle Size is determined by direct observation within limitations of sampler size. 4.) Soil identifications and field tests based on visual-manual methods per ASTM D2488.

MOTT MACDONALD

# SOIL BORING LOG

BORING NO.: **B-41**
Page **1** of **1**

| | | | |
|---|---|---|---|
| **Project:** | South Ripley Solar | **Project No.:** | 505100267-001 |
| **Location:** | South Ripley, NY | **Project Mgr:** | Eric Pauli |
| **Client:** | ConnectGen | **Field Eng. Staff:** | Diego Melgar |
| **Drilling Co.:** | Earth Dimensions, Inc. | **Date/Time Started:** | July 30, 2020 at 1:40 pm |
| **Driller/Helper:** | Brian B. /Harold Kleever | **Date/Time Finished:** | July 30, 2020 at 2:35 pm |

**Elevation:** Grade ft. **Vertical Datum:** | **Boring Location:** See Boring Location Plan | **Coord.:** **Lat:** 42.183030° **Long:** -79.665242° | **Horizontal Datum:** NAD 1983

| Item | Casing | Sampler | Core Barrel |
|---|---|---|---|
| Type | HSA | SS | - |
| Length | 5 ft | 2 ft | - |
| Inside Dia. (in.) | 4.25 | 1.375 | - |
| Hammer Wt. (lb.) | 140 | 140 | - |
| Hammer Fall (in.) | 30 | 30 | - |

**Rig Make & Model:** Diedrich D-50

| | | | |
|---|---|---|---|
| ☐ Truck | ☐ Tripod | ☐ Cat-Head | ☐ Safety |
| ☐ ATV | ☐ Geoprobe | ☑ Winch | ☑ Doughnut |
| ☑ Track | ☐ Air Track | ☐ Roller Bit | ☐ Automatic |
| ☐ Skid | ☐ _____ | ☑ Cutting Head | ☐ _____ |

**Hammer Type** | **Drilling Fluid**: ☐ Bentonite ☐ Polymer ☐ Water ☑ None | **Drill Rod Size:** | **Casing Advance**: Hollow Stem Auger

| Depth/ Elev. (ft) | Sample No. / Interval (ft) | Rec. (in) | Sample Blows per 6" | Stratum Graphic | USCS Group Symbol | Visual - Manual Identification & Description (Density/consistency, color, Group Name, constituents, particle size, structure, moisture, optional descriptions, geologic interpretation, Symbol) | Field Tests: Dilatancy | Toughness | Plasticity | Dry Strength | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | S-1 0.0'- 2.0' 0.3'-' | 24 | 2 5 7 7 | | ML | 0.3 Top 4" - TOPSOIL<br>Stiff, brown SILT, some Clay, trace fine Sand, trace fine Gravel, dry (ML) | N | L | L | L | PP = 2.0 tsf |
| | S-2 2.0'- 4.0' | 24 | 4 7 7 8 | | CL | 2.0<br>Stiff, brown CLAY, some Silt, trace fine Sand, trace fine Gravel, dry (CL) | N | M | L | - | PP = 1.75 tsf |
| 5 | S-3 4.0'- 6.0' | 19 | 3 5 7 12 | | CL | Stiff, brown CLAY, some Silt, little fine Gravel, trace fine Sand, moist (CL) | N | M | L | - | PP = 3.5 tsf |
| | S-4 6.0'- 8.0' | 18 | 6 11 21 8 | | ML | 6.0<br>Hard, brown SILT, some Clay, some coarse to fine Sand, little fine Gravel, moist (ML) | S | L | L | - | PP = 2.25 tsf |
| 10 | S-5 8.0'- 10.0' | 20 | 10 21 27 30 | | ML | Hard, brown SILT, some Clay, some coarse to fine Sand, little coarse to fine Gravel, moist (ML) | S | L | L | - | PP = 4.0 tsf |
| | S-6 13.0'- 15.0' | 23 | 21 43 45 44 | | ML | Hard, gray SILT, some Clay, little coarse to fine Sand, little coarse to fine Gravel, dry (ML) | N | L | L | - | PP = 2.0 tsf |
| 15 | S-7 18.0'- 19.4' | 24 | 19 41 50/4" | | ML | Hard, gray SILT, some Clay, some coarse to fine Gravel, little fine Sand, dry (ML)<br>19.4 | N | L | L | L | PP = 1.25 tsf |
| | | | | | | End of Boring at 19.4 feet BGS.<br>Borehole backfilled with soil cuttings. | | | | | |

**Water Level Data**

| Date | Time | Elapsed Time (hr) | Depth in feet to: Bot. of Casing | Bottom of Hole | Water |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

**Sample Type**

| | |
|---|---|
| **O** | Open End Rod |
| **T** | Thin-Wall Tube |
| **U** | Undisturbed Sample |
| **SS** | Split Spoon Sample |
| **G** | Grab Sample |

**Notes:**
PP = Pocket Penetrometer
Groundwater encountered at 8 feet BGS.

Boring No.: **B-41**

**Field Test Legend:**
Dilatancy: N - None S - Slow R - Rapid
Toughness: L - Low M - Medium H - High
Plasticity: NP - Non-Plastic L - Low M - Medium H - High
Dry Strength: N - None L - Low M - Medium H - High VH - Very High

NOTES: 1.) "ppd" denotes soil sample average diametral pocket penetrometer reading. 2.) "ppa" denotes soil sample average axial pocket penetrometer reading.
3.) Maximum Particle Size is determined by direct observation within limitations of sampler size. 4.) Soil identifications and field tests based on visual-manual methods per ASTM D2488.

MOTT MACDONALD

# SOIL BORING LOG

BORING NO.: **B-42**
Page **1** of **1**

| | | | |
|---|---|---|---|
| **Project:** | South Ripley Solar | **Project No.:** | 505100267-001 |
| **Location:** | South Ripley, NY | **Project Mgr:** | Eric Pauli |
| **Client:** | ConnectGen | **Field Eng. Staff:** | Diego Melgar |
| **Drilling Co.:** | Earth Dimensions, Inc. | **Date/Time Started:** | August 7, 2020 at 7:45 am |
| **Driller/Helper:** | Brian B. /Harold Kleever | **Date/Time Finished:** | August 7, 2020 at 8:50 am |

**Elevation:** Grade ft. **Vertical Datum:** | **Boring Location:** See Boring Location Plan | **Coord.:** **Lat:** 42.185718° **Long:** -79.669588° | **Horizontal Datum:** NAD 1983

| Item | Casing | Sampler | Core Barrel |
|---|---|---|---|
| Type | HSA | SS | - |
| Length | 5 ft | 2 ft | - |
| Inside Dia. (in.) | 4.25 | 1.375 | - |
| Hammer Wt. (lb.) | 140 | 140 | - |
| Hammer Fall (in.) | 30 | 30 | - |

**Rig Make & Model:** Diedrich D-50

| | | | |
|---|---|---|---|
| ☐ Truck | ☐ Tripod | ☐ Cat-Head | |
| ☐ ATV | ☐ Geoprobe | ☑ Winch | |
| ☑ Track | ☐ Air Track | ☐ Roller Bit | |
| ☐ Skid | ☐ _____ | ☑ Cutting Head | |

**Hammer Type**: ☐ Safety ☑ Doughnut ☐ Automatic ☐ _____

**Drilling Fluid**: ☐ Bentonite ☐ Polymer ☐ Water ☑ None

**Drill Rod Size:**

**Casing Advance**: Hollow Stem Auger

| Depth/ Elev. (ft) | Sample No. / Interval (ft) | Rec. (in) | Sample Blows per 6" | Stratum Graphic | USCS Group Symbol | Visual - Manual Identification & Description (Density/consistency, color, Group Name, constituents, particle size, structure, moisture, optional descriptions, geologic interpretation, Symbol) | Field Tests: Dilatancy | Toughness | Plasticity | Dry Strength | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | S-1 0.0'- 2.0' 0.6'-' | 15 | 1 3 8 12 | | | Top 7" - TOPSOIL | - | - | - | - | |
| | | | | | | 0.6 | | | | | |
| | | | | | ML | Stiff, brownish gray SILT, some Clay, little fine Sand, little coarse to fine Gravel, trace Clay, moist (ML) | N | L | L | - | PP = 1.25 tsf |
| | S-2 2.0'- 4.0' | 13 | 8 9 12 12 | | ML | Very stiff, brown SILT, some coarse to fine Sand, little coarse to fine Gravel, dry (ML) | N | L | L | L | PP = 1.0 tsf<br>Black till recovered at 2 feet BGS. |
| | | | | | | 4.0 | | | | | |
| 5 | S-3 4.0'- 6.0' | 23 | 10 9 14 15 | | CL | Very stiff, brown CLAY, some Silt, little coarse to fine Gravel, trace fine Sand, dry (CL) | N | M | L | VH | PP = 4.0 tsf |
| | S-4 6.0'- 8.0' | 24 | 10 11 13 22 | | CL | Very stiff, brownish gray CLAY, some Silt, some coarse to fine Gravel, trace fine Sand, dry (CL) | N | M | L | VH | PP > 4.5 tsf |
| | S-5 8.0'- 10.0' | 22 | 9 15 16 16 | | CL | Hard, gray CLAY, some Silt, little coarse to fine Gravel, trace fine Sand, dry (CL) | N | H | L | VH | PP = 4.25 tsf |
| 10 | | | | | | | | | | | |
| | | | | | | 11.5 | | | | | |
| | S-6 13.0'- 15.0' | 24 | 13 28 23 40 | | ML | Hard, gray SILT, some coarse to fine Sand, some Clay, some coarse to fine Gravel, dry (ML) | S | H | L | M | PP = 2.25 tsf |
| 15 | | | | | | | | | | | |
| | S-7 18.0'- 20.0' | 18 | 19 17 22 50 | | ML | Hard, gray SILT, some coarse to fine Gravel, some Clay, trace fine Sand, moist (ML) | N | H | L | - | PP = 4.0 tsf<br>Foliated rock recovered at 18 feet BGS. |
| | | | | | | End of Boring at 20 feet BGS.<br>Borehole backfilled with soil cuttings. | | | | | |
| | | | | | | 20.0 | | | | | |

**Water Level Data**

| Date | Time | Elapsed Time (hr) | Depth in feet to: Bot. of Casing | Bottom of Hole | Water |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

**Sample Type**

- **O** Open End Rod
- **T** Thin-Wall Tube
- **U** Undisturbed Sample
- **SS** Split Spoon Sample
- **G** Grab Sample

**Notes:**

PP = Pocket Penetrometer
No groundwater encountered during subsurface investigation.

Boring No.: **B-42**

**Field Test Legend:**
Dilatancy: N - None S - Slow R - Rapid
Toughness: L - Low M - Medium H - High
Plasticity: NP - Non-Plastic L - Low M - Medium H - High
Dry Strength: N - None L - Low M - Medium H - High VH - Very High

NOTES: 1.) "ppd" denotes soil sample average diametral pocket penetrometer reading. 2.) "ppa" denotes soil sample average axial pocket penetrometer reading.
3.) Maximum Particle Size is determined by direct observation within limitations of sampler size. 4.) Soil identifications and field tests based on visual-manual methods per ASTM D2488.

MOTT MACDONALD

# SOIL BORING LOG

BORING NO.: **B-43**
Page **1** of **1**

| | | | |
|---|---|---|---|
| **Project:** | South Ripley Solar | **Project No.:** | 505100267-001 |
| **Location:** | South Ripley, NY | **Project Mgr:** | Eric Pauli |
| **Client:** | ConnectGen | **Field Eng. Staff:** | Diego Melgar |
| **Drilling Co.:** | Earth Dimensions, Inc. | **Date/Time Started:** | August 7, 2020 at 9:30 am |
| **Driller/Helper:** | Brian B. /Harold Kleever | **Date/Time Finished:** | August 7, 2020 at 10:45 am |

**Elevation:** Grade ft. **Vertical Datum:** | **Boring Location:** See Boring Location Plan | **Coord.:** **Lat:** 42.190171° **Long:** -79.666428° | **Horizontal Datum:** NAD 1983

| Item | Casing | Sampler | Core Barrel |
|---|---|---|---|
| Type | HSA | SS | - |
| Length | 5 ft | 2 ft | - |
| Inside Dia. (in.) | 4.25 | 1.375 | - |
| Hammer Wt. (lb.) | 140 | 140 | - |
| Hammer Fall (in.) | 30 | 30 | - |

**Rig Make & Model:** Diedrich D-50

| | | | |
|---|---|---|---|
| ☐ Truck | ☐ Tripod | ☐ Cat-Head | |
| ☐ ATV | ☐ Geoprobe | ☑ Winch | |
| ☑ Track | ☐ Air Track | ☐ Roller Bit | |
| ☐ Skid | ☐ _____ | ☑ Cutting Head | |

**Hammer Type**: ☐ Safety ☑ Doughnut ☐ Automatic ☐ _____

**Drilling Fluid**: ☐ Bentonite ☐ Polymer ☐ Water ☑ None

**Drill Rod Size:**

**Casing Advance**: Hollow Stem Auger

| Depth/ Elev. (ft) | Sample No. / Interval (ft) | Rec. (in) | Sample Blows per 6" | Stratum Graphic | USCS Group Symbol | Visual - Manual Identification & Description (Density/consistency, color, Group Name, constituents, particle size, structure, moisture, optional descriptions, geologic interpretation, Symbol) | Field Tests: Dilatancy | Toughness | Plasticity | Dry Strength | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | S-1 0.0'- 2.0' 0.5'-' | 19 | 1 2 5 8 | | ML | 0.5 Top 6" - TOPSOIL<br>Medium stiff, brown SILT, some Clay, little fine Sand, trace fine Gravel, moist (ML) | N | L | L | - | PP = 3.0 tsf |
| | S-2 2.0'- 4.0' | 18 | 8 6 5 8 | | ML | Stiff, grayish brown SILT, some Clay, little fine Sand, trace fine Gravel, dry (ML) | N | L | L | M | PP = 2.0 tsf |
| 5 | S-3 4.0'- 6.0' | 20 | 6 9 12 11 | | SM | 4.0<br>Medium dense, brown fine SAND, some Silt, little fine Gravel, trace fine Gravel, wet (SM)<br>6.0 | R | L | NP | - | |
| | S-4 6.0'- 8.0' | 21 | 8 13 16 15 | | ML | Very stiff, brown SILT, some Clay, some fine Sand, little coarse to fine Gravel, moist (ML) | S | L | L | - | PP = 1.5 tsf |
| 10 | S-5 8.0'- 10.0' | 24 | 9 11 17 29 | | ML | Very stiff, brown SILT, some Clay, little fine Sand, little fine Gravel, dry (ML) | N | L | L | VH | PP > 4.5 tsf |
| | S-6 13.0'- 15.0' | 24 | 17 23 23 22 | | ML | Hard, gray SILT, some Clay, little coarse to fine Gravel, trace fine Sand, dry (ML) | S | L | L | VH | PP > 4.5 tsf |
| 15 | S-7 18.0'- 20.0' | 16 | 17 49 50/5" | | ML | Hard, gray SILT, some fine Sand, some Clay, little fine Gravel, dry (ML) | S | L | L | L | PP = 3.5 tsf |
| | | | | | | 20.0 End of Boring at 20 feet BGS.<br>Borehole backfilled with soil cuttings. | | | | | |

**Water Level Data**

| Date | Time | Elapsed Time (hr) | Depth in feet to: Bot. of Casing | Bottom of Hole | Water |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

**Sample Type**

- **O** Open End Rod
- **T** Thin-Wall Tube
- **U** Undisturbed Sample
- **SS** Split Spoon Sample
- **G** Grab Sample

**Notes:**

PP = Pocket Penetrometer
No groundwater encountered during subsurface investigation.

Boring No.: **B-43**

**Field Test Legend:**
Dilatancy: N - None S - Slow R - Rapid
Toughness: L - Low M - Medium H - High
Plasticity: NP - Non-Plastic L - Low M - Medium H - High
Dry Strength: N - None L - Low M - Medium H - High VH - Very High

NOTES: 1.) "ppd" denotes soil sample average diametral pocket penetrometer reading. 2.) "ppa" denotes soil sample average axial pocket penetrometer reading.
3.) Maximum Particle Size is determined by direct observation within limitations of sampler size. 4.) Soil identifications and field tests based on visual-manual methods per ASTM D2488.

MOTT MACDONALD

# SOIL BORING LOG

BORING NO.: **B-44**
Page **1** of **1**

| | | | |
|---|---|---|---|
| **Project:** | South Ripley Solar | **Project No.:** | 505100267-001 |
| **Location:** | South Ripley, NY | **Project Mgr:** | Eric Pauli |
| **Client:** | ConnectGen | **Field Eng. Staff:** | Diego Melgar |
| **Drilling Co.:** | Earth Dimensions, Inc. | **Date/Time Started:** | August 5, 2020 at 8:50 am |
| **Driller/Helper:** | Brian B. /Harold Kleever | **Date/Time Finished:** | August 5, 2020 at 9:50 am |

**Elevation:** Grade ft. **Vertical Datum:** | **Boring Location:** See Boring Location Plan | **Coord.:** **Lat:** 42.195544° **Long:** -79.662147° | **Horizontal Datum:** NAD 1983

| Item | Casing | Sampler | Core Barrel |
|---|---|---|---|
| Type | HSA | SS | - |
| Length | 5 ft | 2 ft | - |
| Inside Dia. (in.) | 4.25 | 1.375 | - |
| Hammer Wt. (lb.) | 140 | 140 | - |
| Hammer Fall (in.) | 30 | 30 | - |

**Rig Make & Model:** Diedrich D-50

| | | | |
|---|---|---|---|
| ☐ Truck | ☐ Tripod | ☐ Cat-Head | ☐ Safety |
| ☐ ATV | ☐ Geoprobe | ☑ Winch | ☑ Doughnut |
| ☑ Track | ☐ Air Track | ☐ Roller Bit | ☐ Automatic |
| ☐ Skid | ☐ _____ | ☑ Cutting Head | ☐ _____ |

**Hammer Type**

**Drilling Fluid**: ☐ Bentonite ☐ Polymer ☐ Water ☑ None

**Drill Rod Size:**

**Casing Advance**: Hollow Stem Auger

| Depth/ Elev. (ft) | Sample No. / Interval (ft) | Rec. (in) | Sample Blows per 6" | Stratum Graphic | USCS Group Symbol | Visual - Manual Identification & Description (Density/consistency, color, Group Name, constituents, particle size, structure, moisture, optional descriptions, geologic interpretation, Symbol) | Field Tests: Dilatancy | Toughness | Plasticity | Dry Strength | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | S-1 0.0'- 2.0' 0.5'-' | 17 | 1 1 8 10 | | | 0.5 Top 6" - TOPSOIL | - | - | - | - | |
| | | | | | CL | Stiff, grayish brown CLAY, some Silt, trace fine Sand, trace fine Gravel, dry (CL) | N | L | L | - | PP = 3.0 tsf |
| | S-2 2.0'- 4.0' | 19 | 3 7 7 9 | | CL | Stiff, brown Silty CLAY, some coarse to fine Sand, trace fine Gravel, wet (CL) | N | L | L | - | PP = 1.75 tsf |
| 5 | S-3 4.0'- 6.0' | 18 | 6 10 8 8 | | CL | Very stiff, brown Silty CLAY, some coarse to fine Sand, trace fine Gravel, wet (CL) | S | L | L | - | PP = 0.75 tsf |
| | S-4 6.0'- 8.0' | 19 | 4 6 9 14 | | CL | Very stiff, brown Silty CLAY, some coarse to fine Sand, trace fine Gravel, wet (CL) | N | L | L | - | PP = 2.5 tsf |
| | S-5 8.0'- 10.0' | 24 | 10 33 42 31 | | CL | Hard, grayish brown CLAY, some Silt, trace fine Sand, trace fine Gravel, dry (CL) | N | L | L | VH | PP = 4.5 tsf |
| 10 | | | | | | 11.5 | | | | | |
| | S-6 13.0'- 15.0' | 10 | 20 50/4" | | SM | Very dense, gray coarse to fine SAND, some Silt, trace fine Gravel, moist (SM) | R | - | NP | - | |
| 15 | | | | | | | | | | | |
| | S-7 18.0'- 18.9' | 7 | 15 50/5" | | SM | Very dense, gray fine SAND, some Silt, little fine Gravel, dry (SM) | R | - | NP | - | |
| | | | | | | 18.9 End of Boring at 18.9 feet BGS. Borehole backfilled with soil cuttings. | | | | | |

**Water Level Data**

| Date | Time | Elapsed Time (hr) | Depth in feet to: Bot. of Casing | Bottom of Hole | Water |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

**Sample Type**

- **O** Open End Rod
- **T** Thin-Wall Tube
- **U** Undisturbed Sample
- **SS** Split Spoon Sample
- **G** Grab Sample

**Notes:**

PP = Pocket Penetrometer
No groundwater encountered during subsurface investigation.

Boring No.: **B-44**

**Field Test Legend:**
Dilatancy: N - None S - Slow R - Rapid
Toughness: L - Low M - Medium H - High
Plasticity: NP - Non-Plastic L - Low M - Medium H - High
Dry Strength: N - None L - Low M - Medium H - High VH - Very High

NOTES: 1.) "ppd" denotes soil sample average diametral pocket penetrometer reading. 2.) "ppa" denotes soil sample average axial pocket penetrometer reading.
3.) Maximum Particle Size is determined by direct observation within limitations of sampler size. 4.) Soil identifications and field tests based on visual-manual methods per ASTM D2488.

MOTT MACDONALD

# SOIL BORING LOG

BORING NO.: **B-45**
Page **1** of **1**

| | | | |
|---|---|---|---|
| **Project:** | South Ripley Solar | **Project No.:** | 505100267-001 |
| **Location:** | South Ripley, NY | **Project Mgr:** | Eric Pauli |
| **Client:** | ConnectGen | **Field Eng. Staff:** | Diego Melgar |
| **Drilling Co.:** | Earth Dimensions, Inc. | **Date/Time Started:** | August 5, 2020 at 10:35 am |
| **Driller/Helper:** | Brian B. /Harold Kleever | **Date/Time Finished:** | August 5, 2020 at 11:25 am |

**Elevation:** Grade ft. **Vertical Datum:** | **Boring Location:** See Boring Location Plan | **Coord.:** **Lat:** 42.195679° **Long:** -79.654647° | **Horizontal Datum:** NAD 1983

| Item | Casing | Sampler | Core Barrel |
|---|---|---|---|
| Type | HSA | SS | - |
| Length | 5 ft | 2 ft | - |
| Inside Dia. (in.) | 4.25 | 1.375 | - |
| Hammer Wt. (lb.) | 140 | 140 | - |
| Hammer Fall (in.) | 30 | 30 | - |

**Rig Make & Model:** Diedrich D-50

| | | | |
|---|---|---|---|
| ☐ Truck | ☐ Tripod | ☐ Cat-Head | |
| ☐ ATV | ☐ Geoprobe | ☑ Winch | |
| ☑ Track | ☐ Air Track | ☐ Roller Bit | |
| ☐ Skid | ☐ _____ | ☑ Cutting Head | |

**Hammer Type**: ☐ Safety ☑ Doughnut ☐ Automatic ☐ _____

**Drilling Fluid**: ☐ Bentonite ☐ Polymer ☐ Water ☑ None

**Drill Rod Size:**

**Casing Advance**: Hollow Stem Auger

| Depth/ Elev. (ft) | Sample No. / Interval (ft) | Rec. (in) | Sample Blows per 6" | Stratum Graphic | USCS Group Symbol | Visual - Manual Identification & Description (Density/consistency, color, Group Name, constituents, particle size, structure, moisture, optional descriptions, geologic interpretation, Symbol) | Field Tests: Dilatancy | Toughness | Plasticity | Dry Strength | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | S-1 0.0'- 2.0' 0.3'-' | 11 | 1 1 6 8 | | CL | 0.3 Top 4" - TOPSOIL<br>Medium stiff, dark brown CLAY, some Silt, trace fine Sand, moist (CL) | N | M | L | - | PP = 0.25 tsf |
| | S-2 2.0'- 4.0' | 15 | 4 4 3 3 | | ML | 2.0<br>Medium stiff, reddish brown SILT, some fine Sand, little fine Gravel, little Clay, moist (ML) | N | L | L | - | PP = 1.75 tsf |
| 5 | S-3 4.0'- 6.0' | 14 | 2 2 1 2 | | CL | 4.0<br>Soft, brown CLAY, some coarse to fine Sand, little Silt, trace fine Gravel, wet (CL) | N | M | L | - | PP = 0.75 tsf |
| | S-4 6.0'- 8.0' | 15 | 2 3 5 6 | | CL | Stiff, brown CLAY, some coarse to fine Sand, little Silt, trace fine Gravel, moist (CL) | R | M | L | - | PP = 2.75 tsf<br>Red sand recovered at 6 feet BGS. |
| | S-5 8.0'- 10.0' | 16 | 2 3 26 15 | | CL | Very stiff, brown CLAY, some Silt, little fine Gravel, little fine Sand, moist (CL) | N | M | L | - | PP = 1.75 tsf |
| 10 | | | | | | 11.5 | | | | | |
| | S-6 13.0'- 15.0' | 24 | 22 35 46 50/5" | | ML | Hard, gray SILT, some fine Sand, little coarse to fine Gravel, trace Clay, moist (ML) | N | L | L | - | PP = 1.75 tsf |
| 15 | | | | | | | | | | | |
| | S-7 18.0'- 18.7' | 21 | 25 50/3" | | ML | Hard, brownish gray SILT, some fine Sand, little Clay, little fine Gravel, wet (ML)<br>18.7 End of Boring at 18.7 feet BGS.<br>Borehole backfilled with soil cuttings. | N | L | L | - | PP = 1.50 tsf |

**Water Level Data**

| Date | Time | Elapsed Time (hr) | Depth in feet to: Bot. of Casing | Bottom of Hole | Water |
|---|---|---|---|---|---|
| 8/5/20 | 11:25 | - | | | 12 |

**Sample Type**

- **O** Open End Rod
- **T** Thin-Wall Tube
- **U** Undisturbed Sample
- **SS** Split Spoon Sample
- **G** Grab Sample

**Notes:**
PP = Pocket Penetrometer
Groundwater encountered at 12 feet BGS.

Boring No.: **B-45**

**Field Test Legend:**
Dilatancy: N - None S - Slow R - Rapid
Toughness: L - Low M - Medium H - High
Plasticity: NP - Non-Plastic L - Low M - Medium H - High
Dry Strength: N - None L - Low M - Medium H - High VH - Very High

NOTES: 1.) "ppd" denotes soil sample average diametral pocket penetrometer reading. 2.) "ppa" denotes soil sample average axial pocket penetrometer reading.
3.) Maximum Particle Size is determined by direct observation within limitations of sampler size. 4.) Soil identifications and field tests based on visual-manual methods per ASTM D2488.

MOTT MACDONALD

# SOIL BORING LOG

BORING NO.: **B-46**
Page **1** of **1**

| | | | |
|---|---|---|---|
| **Project:** | South Ripley Solar | **Project No.:** | 505100267-001 |
| **Location:** | South Ripley, NY | **Project Mgr:** | Eric Pauli |
| **Client:** | ConnectGen | **Field Eng. Staff:** | Diego Melgar |
| **Drilling Co.:** | Earth Dimensions, Inc. | **Date/Time Started:** | August 5, 2020 at 1:00 pm |
| **Driller/Helper:** | Brian B. /Harold Kleever | **Date/Time Finished:** | August 5, 2020 at 2:10 pm |

**Elevation:** Grade ft. **Vertical Datum:** | **Boring Location:** See Boring Location Plan | **Coord.:** **Lat:** 42.195825° **Long:** -79.650305° | **Horizontal Datum:** NAD 1983

| Item | Casing | Sampler | Core Barrel |
|---|---|---|---|
| Type | HSA | SS | - |
| Length | 5 ft | 2 ft | - |
| Inside Dia. (in.) | 4.25 | 1.375 | - |
| Hammer Wt. (lb.) | 140 | 140 | - |
| Hammer Fall (in.) | 30 | 30 | - |

**Rig Make & Model:** Diedrich D-50

| | | | |
|---|---|---|---|
| ☐ Truck | ☐ Tripod | ☐ Cat-Head | |
| ☐ ATV | ☐ Geoprobe | ☑ Winch | |
| ☑ Track | ☐ Air Track | ☐ Roller Bit | |
| ☐ Skid | ☐ _____ | ☑ Cutting Head | |

**Hammer Type**: ☐ Safety ☑ Doughnut ☐ Automatic ☐ _____

**Drilling Fluid**: ☐ Bentonite ☐ Polymer ☐ Water ☑ None

**Drill Rod Size:**

**Casing Advance**: Hollow Stem Auger

| Depth/ Elev. (ft) | Sample No. / Interval (ft) | Rec. (in) | Sample Blows per 6" | Stratum Graphic | USCS Group Symbol | Visual - Manual Identification & Description (Density/consistency, color, Group Name, constituents, particle size, structure, moisture, optional descriptions, geologic interpretation, Symbol) | Field Tests: Dilatancy | Toughness | Plasticity | Dry Strength | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | S-1 0.0'- 2.0' 0.3'-' | 21 | 2 2 5 6 | | ML | 0.3 Top 4" - TOPSOIL<br>Medium stiff, grayish brown SILT, some Clay, little fine Sand, trace fine Gravel, moist (ML) | - N | - L | - L | - - | PP = 1.25 tsf |
| | S-2 2.0'- 4.0' | 18 | 7 7 5 9 | | CL | 2.0<br>Stiff, dark brown CLAY, little Silt, little fine Gravel, trace fine Sand, dry (CL) | N | M | L | H | PP > 4.5 tsf |
| 5 | S-3 4.0'- 6.0' | 22 | 5 8 9 13 | | CL | Very stiff, light brown CLAY, some Silt, little fine Sand, trace fine Gravel, dry (CL) | N | M | L | H | PP > 4.5 tsf |
| | S-4 6.0'- 8.0' | 24 | 9 16 26 36 | | ML | 6.0<br>Hard, brown SILT, some Clay, some fine Gravel, little fine Sand, dry (ML) | N | L | L | H | PP > 4.5 tsf |
| 10 | S-5 8.0'- 10.0' | 24 | 9 16 21 28 | | CL | 8.0<br>Hard, gray CLAY, some Silt, trace fine Gravel, dry (CL) | N | M | L | VH | PP > 4.5 tsf |
| | | | | | | 11.5 | | | | | |
| | S-6 13.0'- 15.0' | 24 | 10 27 35 36 | | ML | Hard, gray SILT, some Clay, little fine Gravel, little fine Sand, dry (ML) | S | L | L | L | PP = 4.5 tsf |
| 15 | | | | | | | | | | | |
| | S-7 18.0'- 20.0' | 24 | 22 39 38 37 | | ML | Hard, light gray SILT, some Clay, some coarse to fine Gravel, trace fine Sand, dry (ML) | S | L | L | L | PP = 4.0 tsf |
| | | | | | | End of Boring at 20 feet BGS.<br>20.0 Borehole backfilled with soil cuttings. | | | | | |

**Water Level Data**

| Date | Time | Elapsed Time (hr) | Depth in feet to: Bot. of Casing | Bottom of Hole | Water |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

**Sample Type**

- **O** Open End Rod
- **T** Thin-Wall Tube
- **U** Undisturbed Sample
- **SS** Split Spoon Sample
- **G** Grab Sample

**Notes:**
PP = Pocket Penetrometer
No groundwater encountered during subsurface investigation.

Boring No.: **B-46**

**Field Test Legend:**
Dilatancy: N - None S - Slow R - Rapid
Toughness: L - Low M - Medium H - High
Plasticity: NP - Non-Plastic L - Low M - Medium H - High
Dry Strength: N - None L - Low M - Medium H - High VH - Very High

NOTES: 1.) "ppd" denotes soil sample average diametral pocket penetrometer reading. 2.) "ppa" denotes soil sample average axial pocket penetrometer reading.
3.) Maximum Particle Size is determined by direct observation within limitations of sampler size. 4.) Soil identifications and field tests based on visual-manual methods per ASTM D2488.

MOTT MACDONALD

# SOIL BORING LOG

BORING NO.: **B-47**
Page **1** of **1**

| | | | |
|---|---|---|---|
| **Project:** | South Ripley Solar | **Project No.:** | 505100267-001 |
| **Location:** | South Ripley, NY | **Project Mgr:** | Eric Pauli |
| **Client:** | ConnectGen | **Field Eng. Staff:** | Diego Melgar |
| **Drilling Co.:** | Earth Dimensions, Inc. | **Date/Time Started:** | August 5, 2020 at 2:30 pm |
| **Driller/Helper:** | Brian B. /Harold Kleever | **Date/Time Finished:** | August 5, 2020 at 3:40 pm |

**Elevation:** Grade ft. **Vertical Datum:**

**Boring Location:** See Boring Location Plan

**Coord.:** **Lat:** 42.199420° **Long:** -79.655358°

**Horizontal Datum:** NAD 1983

| Item | Casing | Sampler | Core Barrel |
|---|---|---|---|
| Type | HSA | SS | - |
| Length | 5 ft | 2 ft | - |
| Inside Dia. (in.) | 4.25 | 1.375 | - |
| Hammer Wt. (lb.) | 140 | 140 | - |
| Hammer Fall (in.) | 30 | 30 | - |

**Rig Make & Model:** Diedrich D-50

| | | | |
|---|---|---|---|
| ☐ Truck | ☐ Tripod | ☐ Cat-Head | |
| ☐ ATV | ☐ Geoprobe | ☑ Winch | |
| ☑ Track | ☐ Air Track | ☐ Roller Bit | |
| ☐ Skid | ☐ _____ | ☑ Cutting Head | |

**Hammer Type**

| |
|---|
| ☐ Safety |
| ☑ Doughnut |
| ☐ Automatic |
| ☐ _____ |

**Drilling Fluid**

| |
|---|
| ☐ Bentonite |
| ☐ Polymer |
| ☐ Water |
| ☑ None |

**Drill Rod Size:**

**Casing Advance**

Hollow Stem Auger

| Depth/ Elev. (ft) | Sample No. / Interval (ft) | Rec. (in) | Sample Blows per 6" | Stratum Graphic | USCS Group Symbol | Visual - Manual Identification & Description (Density/consistency, color, Group Name, constituents, particle size, structure, moisture, optional descriptions, geologic interpretation, Symbol) | Field Tests: Dilatancy | Toughness | Plasticity | Dry Strength | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | S-1 0.0'- 2.0' 0.5'-' | 17 | 1 3 5 7 | | | 0.5 Top 6" - TOPSOIL | - | - | - | - | |
| | | | | | CL | Stiff, grayish brown CLAY, some Silt, little fine Sand, trace fine Gravel, moist (CL) | N | L | L | - | PP = 3.5 tsf |
| | S-2 2.0'- 4.0' | 24 | 5 8 10 9 | | CL | Very stiff, brown Silty CLAY, some fine Sand, trace fine Gravel, moist (CL) | N | L | L | - | PP = 2.75 tsf |
| | S-3 4.0'- 6.0' | 12 | 4 5 4 4 | | CL | Very stiff, brown Silty CLAY, some fine Sand, trace fine Gravel, moist (CL) | N | L | H | - | PP = 0.25 tsf |
| 5 | | | | | | 6.0 | | | | | |
| | S-4 6.0'- 8.0' | 12 | 3 5 4 5 | | ML | Stiff, brown SILT, some coarse to fine Sand, little fine Gravel, trace Clay, wet (ML) | S | L | L | - | PP = 1.25 tsf |
| | S-5 8.0'- 10.0' | 17 | 6 10 14 13 | | ML | Very stiff, brown SILT, some coarse to fine Sand, little coarse to fine Gravel, trace Clay, moist (ML) | S | L | L | - | PP = 1.25 tsf |
| 10 | | | | | | 11.5 | | | | | |
| ▽ | | | | | | | | | | | |
| | S-6 13.0'- 15.0' | 2 | 50/5" | | GM | Very dense, gray coarse to fine GRAVEL, some Silt, little Clay, little fine Sand, wet (GM) | N | - | NP | - | |
| 15 | | | | | | 16.5 | | | | | |
| | S-7 18.0'- 19.3' | 13 | 34 37 50/4" | | ML | Hard, gray SILT, some coarse to fine Sand, little fine Gravel, little Clay, wet (ML) | N | L | L | - | PP = 1.0 tsf |
| | | | | | | 19.3 End of Boring at 19.3 feet BGS. Borehole backfilled with soil cuttings. | | | | | |

**Water Level Data**

| Date | Time | Elapsed Time (hr) | Depth in feet to: Bot. of Casing | Bottom of Hole | Water |
|---|---|---|---|---|---|
| 8/5/20 | 15:40 | - | | | 11.5 |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

**Sample Type**

- **O** Open End Rod
- **T** Thin-Wall Tube
- **U** Undisturbed Sample
- **SS** Split Spoon Sample
- **G** Grab Sample

**Notes:**

PP = Pocket Penetrometer
Groundwater encountered at 11.5 feet BGS.

Boring No.: **B-47**

**Field Test Legend:**
Dilatancy: N - None S - Slow R - Rapid
Toughness: L - Low M - Medium H - High
Plasticity: NP - Non-Plastic L - Low M - Medium H - High
Dry Strength: N - None L - Low M - Medium H - High VH - Very High

NOTES: 1.) "ppd" denotes soil sample average diametral pocket penetrometer reading. 2.) "ppa" denotes soil sample average axial pocket penetrometer reading.
3.) Maximum Particle Size is determined by direct observation within limitations of sampler size. 4.) Soil identifications and field tests based on visual-manual methods per ASTM D2488.

MOTT MACDONALD

# SOIL BORING LOG

BORING NO.: **B-SS-1**
Page **1** of **1**

| | | | |
|---|---|---|---|
| **Project:** | South Ripley Solar | **Project No.:** | 505100267-001 |
| **Location:** | South Ripley, NY | **Project Mgr:** | Eric Pauli |
| **Client:** | ConnectGen | **Field Eng. Staff:** | Diego Melgar |
| **Drilling Co.:** | Earth Dimensions, Inc. | **Date/Time Started:** | July 20, 2020 at 1:20 pm |
| **Driller/Helper:** | Brian B. /Harold Kleever | **Date/Time Finished:** | July 20, 2020 at 2:15 pm |

**Elevation:** Grade ft. **Vertical Datum:**

**Boring Location:** See Boring Location Plan

**Coord.:** **Lat:** 42.198501° **Long:** -79.760142°

**Horizontal Datum:** NAD 1983

| Item | Casing | Sampler | Core Barrel |
|---|---|---|---|
| Type | HSA | SS | - |
| Length | 5 ft | 2 ft | - |
| Inside Dia. (in.) | 4.25 | 1.375 | - |
| Hammer Wt. (lb.) | 140 | 140 | - |
| Hammer Fall (in.) | 30 | 30 | - |

**Rig Make & Model:** Diedrich D-50

☐ Truck ☐ Tripod ☐ Cat-Head
☐ ATV ☐ Geoprobe ☑ Winch
☑ Track ☐ Air Track ☐ Roller Bit
☐ Skid ☐ _____ ☑ Cutting Head

**Hammer Type**
☐ Safety
☑ Doughnut
☐ Automatic
☐ _____

**Drilling Fluid**
☐ Bentonite
☐ Polymer
☐ Water
☑ None

**Drill Rod Size:**

**Casing Advance**
Hollow Stem Auger

| Depth/ Elev. (ft) | Sample No. / Interval (ft) | Rec. (in) | Sample Blows per 6" | Stratum Graphic | USCS Group Symbol | Visual - Manual Identification & Description (Density/consistency, color, Group Name, constituents, particle size, structure, moisture, optional descriptions, geologic interpretation, Symbol) | Field Tests: Dilatancy | Toughness | Plasticity | Dry Strength | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | S-1<br>0.0'- 2.0'<br>0.6'-' | 19 | 1<br>2<br>2<br>9 | | | Top 7" - TOPSOIL<br>0.6 | - | - | - | - | |
| | | | | | CL | Soft, dark brown to brown CLAY, little Silt, little coarse to fine Sand, moist (CL) | - | M | L | L | PP = 0.5 tsf<br>TV = 1.0 tsf |
| | S-2<br>2.0'- 4.0' | 21 | 4<br>9<br>5<br>7 | | CL | Very stiff, light brown CLAY, some coarse to fine Sand, little Silt, trace fine Gravel, moist (CL) | - | M | L | L | PP = 2.25 tsf<br>TV = 1.25 tsf |
| 5 | S-3<br>4.0'- 6.0' | 23 | 3<br>3<br>3<br>4 | | CL | Medium stiff, brown CLAY, some coarse to fine Sand, little Silt, trace fine Gravel, moist (CL) | - | M | L | - | PP = 1.5 tsf<br>TV = 1.0 tsf |
| | S-4<br>6.0'- 8.0' | 22 | 5<br>6<br>8<br>10 | | CL | Stiff, light brown CLAY, some coarse to fine Sand, trace Silt, trace fine Gravel, moist (CL) | - | H | L | - | PP = 4.5 tsf<br>TV = 1.25 tsf |
| | S-5<br>8.0'- 10.0' | 24 | 9<br>9<br>10<br>13 | | CL | Very stiff, brown CLAY, some coarse to fine Sand, some Silt, trace fine Gravel, moist (CL) | - | L | L | - | PP = 3.5 tsf<br>TV = 2.0 tsf |
| 10 | | | | | | | | | | | |
| | S-6<br>13.0'- 15.0' | 22 | 14<br>30<br>42<br>47 | | CL | Hard, light gray CLAY, some coarse to fine Gravel, some coarse to fine Sand, dry (CL) | - | H | L | VH | PP = 4.5 tsf<br>TV = 3.5 tsf |
| 15 | | | | | | | | | | | |
| | | | | | | 16.5 | | | | | |
| | S-7<br>18.0'- 20.0' | 13 | 10<br>23<br>26<br>22 | | GC | Hard, dark gray GRAVEL, some Clay, some coarse to fine Sand, some Silt, dry (GC) | - | - | - | - | Quartz fragment observed from 18 to 20 feet BGS. |
| | | | | | | End of Boring at 20 feet BGS.<br>20.0 Borehole backfilled with soil cuttings. | | | | | |

**Water Level Data**

| Date | Time | Elapsed Time (hr) | Depth in feet to: Bot. of Casing | Bottom of Hole | Water |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

**Sample Type**

**O** Open End Rod
**T** Thin-Wall Tube
**U** Undisturbed Sample
**SS** Split Spoon Sample
**G** Grab Sample

**Notes:**

PP = Pocket Penetrometer
No groundwater encountered during subsurface investigation.

Boring No.: **B-SS-1**

**Field Test Legend:**
Dilatancy: N - None S - Slow R - Rapid
Toughness: L - Low M - Medium H - High
Plasticity: NP - Non-Plastic L - Low M - Medium H - High
Dry Strength: N - None L - Low M - Medium H - High VH - Very High

NOTES: 1.) "ppd" denotes soil sample average diametral pocket penetrometer reading. 2.) "ppa" denotes soil sample average axial pocket penetrometer reading.
3.) Maximum Particle Size is determined by direct observation within limitations of sampler size. 4.) Soil identifications and field tests based on visual-manual methods per ASTM D2488.

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# SOIL BORING LOG

BORING NO.: **B-SS-2**
Page **1** of **1**

| | | | |
|---|---|---|---|
| **Project:** | South Ripley Solar | **Project No.:** | 505100267-001 |
| **Location:** | South Ripley, NY | **Project Mgr:** | Eric Pauli |
| **Client:** | ConnectGen | **Field Eng. Staff:** | Diego Melgar |
| **Drilling Co.:** | Earth Dimensions, Inc. | **Date/Time Started:** | July 20, 2020 at 11:30 am |
| **Driller/Helper:** | Brian B. /Harold Kleever | **Date/Time Finished:** | July 20, 2020 at 1:00 pm |

**Elevation:** Grade ft. **Vertical Datum:**

**Boring Location:** See Boring Location Plan

**Coord.:** **Lat:** 42.197701° **Long:** -79.759675°

**Horizontal Datum:** NAD 1983

| Item | Casing | Sampler | Core Barrel |
|---|---|---|---|
| Type | HSA | SS | - |
| Length | 5 ft | 2 ft | - |
| Inside Dia. (in.) | 4.25 | 1.375 | - |
| Hammer Wt. (lb.) | 140 | 140 | - |
| Hammer Fall (in.) | 30 | 30 | - |

**Rig Make & Model:** Diedrich D-50

☐ Truck ☐ Tripod ☐ Cat-Head
☐ ATV ☐ Geoprobe ☑ Winch
☑ Track ☐ Air Track ☐ Roller Bit
☐ Skid ☐ _____ ☑ Cutting Head

**Hammer Type**
☐ Safety
☑ Doughnut
☐ Automatic
☐ _____

**Drilling Fluid**
☐ Bentonite
☐ Polymer
☐ Water
☑ None

**Drill Rod Size:**

**Casing Advance**
Hollow Stem Auger

| Depth/ Elev. (ft) | Sample No. / Interval (ft) | Rec. (in) | Sample Blows per 6" | Stratum Graphic | USCS Group Symbol | Visual - Manual Identification & Description (Density/consistency, color, Group Name, constituents, particle size, structure, moisture, optional descriptions, geologic interpretation, Symbol) | Field Tests: Dilatancy | Toughness | Plasticity | Dry Strength | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | S-1 0.0'- 2.0' 0.3'-' | 16 | 2 2 4 5 | | CL | 0.3 Top 4" - TOPSOIL<br>Stiff, grayish CLAY, some coarse to fine Sand, trace Silt, moist (CL) | - N | - M | - L | - L | PP = 2.25 tsf<br>TV = N/A |
| | S-2 2.0'- 4.0' | 24 | 5 6 7 7 | | CL | Stiff, light brown CALY, some coarse to fine Sand, little fine Gravel, moist (CL) | N | M | L | L | PP = 3.5 tsf<br>TV = 2.0 tsf |
| 5 | S-3 4.0'- 6.0' | 17 | 3 2 5 6 | | CL | Medium stiff, light brown CLAY, some fine Sand, little fine Gravel, trace Silt, moist (CL) | N | M | L | L | PP = 2.5 tsf<br>TV = 2.0 tsf |
| | S-4 6.0'- 8.0' | 24 | 6 13 19 16 | | CL | Hard, grayish brown CLAY, some Silt, little coarse to fine Sand, little fine Gravel, moist (CL) | N | M | L | H | PP = 3.0 tsf<br>TV = 1.5 tsf |
| | S-5 8.0'- 10.0' | 22 | 9 12 17 20 | | CL | Very stiff, dark brown CLAY, some coarse to fine Sand, some fine Gravel, trace Silt, moist (CL) | N | M | L | - | PP = 2.5 tsf<br>TV = 2.75 tsf<br>Pocket of wet Sand recovered at 8 feet BGS. |
| 10 | | | | | | | | | | | |
| | S-6 13.0'- 15.0' | 24 | 17 15 18 22 | | CL | Hard, light gray CLAY, some fine Gravel, little coarse to fine Sand, trace Silt, dry (CL) | S | M | L | H | PP = 4.0 tsf<br>TV = 1.25 tsf<br>Weathered bedrock fragments recovered at 13 feet BGS. |
| 15 | | | | | | | | | | | |
| | S-7 18.0'- 20.0' | 22 | 14 20 19 20 | | CL | Hard, brownish gray CLAY, some Silt, little fine Gravel, little coarse to fine Sand, dry (CL) | N | M | L | VH | PP > 4.5 tsf<br>TV = 1.25 tsf |
| | | | | | | 20.0 End of Boring at 20 feet BGS.<br>Borehole backfilled with soil cuttings. | | | | | |

**Water Level Data**

| Date | Time | Elapsed Time (hr) | Depth in feet to: Bot. of Casing | Bottom of Hole | Water |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

**Sample Type**

**O** Open End Rod
**T** Thin-Wall Tube
**U** Undisturbed Sample
**SS** Split Spoon Sample
**G** Grab Sample

**Notes:**

PP = Pocket Penetrometer
TV = Torvane
No groundwater encountered during subsurface investigation.

Boring No.: **B-SS-2**

**Field Test Legend:**
Dilatancy: N - None S - Slow R - Rapid
Toughness: L - Low M - Medium H - High
Plasticity: NP - Non-Plastic L - Low M - Medium H - High
Dry Strength: N - None L - Low M - Medium H - High VH - Very High

NOTES: 1.) "ppd" denotes soil sample average diametral pocket penetrometer reading. 2.) "ppa" denotes soil sample average axial pocket penetrometer reading.
3.) Maximum Particle Size is determined by direct observation within limitations of sampler size. 4.) Soil identifications and field tests based on visual-manual methods per ASTM D2488.

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# SOIL BORING LOG

BORING NO.: **B-SS-3**
Page **1** of **1**

| | | | |
|---|---|---|---|
| **Project:** | South Ripley Solar | **Project No.:** | 505100267-001 |
| **Location:** | South Ripley, NY | **Project Mgr:** | Eric Pauli |
| **Client:** | ConnectGen | **Field Eng. Staff:** | Diego Melgar |
| **Drilling Co.:** | Earth Dimensions, Inc. | **Date/Time Started:** | July 20, 2020 at 10:00 am |
| **Driller/Helper:** | Brian B. /Harold Kleever | **Date/Time Finished:** | July 20, 2020 at 11:01 am |

**Elevation:** Grade ft. **Vertical Datum:**

**Boring Location:** See Boring Location Plan

**Coord.:** **Lat:** 42.197438° **Long:** -79.758142°

**Horizontal Datum:** NAD 1983

| Item | Casing | Sampler | Core Barrel |
|---|---|---|---|
| Type | HSA | SS | - |
| Length | 5 ft | 2 ft | - |
| Inside Dia. (in.) | 4.25 | 1.375 | - |
| Hammer Wt. (lb.) | 140 | 140 | - |
| Hammer Fall (in.) | 30 | 30 | - |

**Rig Make & Model:** Diedrich D-50

☐ Truck ☐ Tripod ☐ Cat-Head
☐ ATV ☐ Geoprobe ☑ Winch
☑ Track ☐ Air Track ☐ Roller Bit
☐ Skid ☐ _____ ☑ Cutting Head

**Hammer Type**
☐ Safety
☑ Doughnut
☐ Automatic
☐ _____

**Drilling Fluid**
☐ Bentonite
☐ Polymer
☐ Water
☑ None

**Drill Rod Size:**

**Casing Advance**
Hollow Stem Auger

| Depth/ Elev. (ft) | Sample No. / Interval (ft) | Rec. (in) | Sample Blows per 6" | Stratum Graphic | USCS Group Symbol | Visual - Manual Identification & Description (Density/consistency, color, Group Name, constituents, particle size, structure, moisture, optional descriptions, geologic interpretation, Symbol) | Field Tests: Dilatancy | Toughness | Plasticity | Dry Strength | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | S-1 0.0'- 2.0' 0.3'-' | 18 | 3 4 6 7 | | CL | 0.3 Top 4" - TOPSOIL<br>Stiff, light brown grayish CLAY, trace Silt, trace fine Gravel, dry (CL) | - - | - L | - NP | - L | PP = 2.0 tsf<br>TV = 0.75 tsf |
| | S-2 2.0'- 4.0' | 19 | 6 14 9 11 | | CL | Very stiff, grayish light brown CLAY, trace fine Gravel, dry (CL) | - | M | L | L | PP = 3.75 tsf<br>TV = 2.5 tsf |
| 5 | S-3 4.0'- 6.0' | 21 | 4 4 9 11 | | CL | Stiff, brown CLAY, trace fine Gravel, trace Silt, moist (CL) | - | M | L | L | PP = 4.0 tsf<br>TV = 2.0 tsf |
| | S-4 6.0'- 8.0' | 21 | 5 17 11 16 | | CL | Very stiff, dark brown CLAY, trace fine Gravel, trace Silt, moist (CL) | S | M | L | - | PP = 4.5 tsf<br>TV = 2.5 tsf |
| 10 | S-5 8.0'- 10.0' | 19 | 10 12 14 18 | | CL | Very stiff, brown to light gray, CLAY, some coarse to fine Sand, trace fine Gravel, trace Silt, moist (CL) | N | M | L | - | PP = 3.0 tsf<br>TV = 2.5 tsf<br>Wet Sand pocket recovered at 8 feet BGS. |
| 15 | S-6 13.0'- 15.0' | 24 | 17 25 27 50 | | CL | Hard, brown to light gray CLAY, some fine Gravel, little coarse to fine Sand, trace Silt, dry (CL) | N | H | L | - | PP = 3.0 tsf<br>TV = N/A<br>Weathered Gravel encountered 15 feet BGS. |
| ▽ | S-7 18.0'- 18.4' | 4 | 50/4" | | CL | 18.4 Hard, brown CLAY, some coarse to fine Gravel, little Silt, moist (CL)<br>Split spoon refusal at 18.4 feet BGS.<br>End of Boring at 18.4 feet BGS.<br>Borehole backfilled with soil cuttings. | - | H | L | - | |

**Water Level Data**

| Date | Time | Elapsed Time (hr) | Depth in feet to: Bot. of Casing | Bottom of Hole | Water |
|---|---|---|---|---|---|
| 7/20/20 | 11:00 | 0:00 | | 18.4 | 17 |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

**Sample Type**

**O** Open End Rod
**T** Thin-Wall Tube
**U** Undisturbed Sample
**SS** Split Spoon Sample
**G** Grab Sample

**Notes:**

PP = Pocket Penetrometer
TV = Torvane

Boring No.: **B-SS-3**

**Field Test Legend:**
Dilatancy: N - None S - Slow R - Rapid
Toughness: L - Low M - Medium H - High
Plasticity: NP - Non-Plastic L - Low M - Medium H - High
Dry Strength: N - None L - Low M - Medium H - High VH - Very High

NOTES: 1.) "ppd" denotes soil sample average diametral pocket penetrometer reading. 2.) "ppa" denotes soil sample average axial pocket penetrometer reading.
3.) Maximum Particle Size is determined by direct observation within limitations of sampler size. 4.) Soil identifications and field tests based on visual-manual methods per ASTM D2488.

# D. Electrical Resistivity Testing

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# Soil Resistivity Results

| | | | | |
|---|---|---|---|---|
| Project Name: | ConnectGen South Ripley Solar | Date: | | July 20 - Aug. 11, 2020 |
| Project Number: | 505100267-001 | Weather: | | Sunny |
| Project Location: | South Ripley, NY | Temperature: | | 69-85 F |
| Equipment: | AGI MiniSting | | | |
| Test Method: | Wenner 4 Electrode Array | | | |

| Array | | Data | Array spacing (ft) | | | | |
|---|---|---|---|---|---|---|---|
| | | | 2.00 | 5.00 | 10.00 | 20.00 | 50.00 |
| ERT-SS-1 | N-S | Measured Resistance (Ω) | 167.70 | 23.51 | 6.33 | 1.67 | 0.77 |
| | | Apparent Resistivity (Ω-m) | 642.21 | 225.06 | 121.28 | 84.55 | 74.16 |
| | E-W | Measured Resistance (Ω) | 281.00 | 27.92 | 6.15 | 1.79 | 0.88 |
| | | Apparent Resistivity (Ω-m) | 1075.64 | 267.25 | 117.71 | 85.68 | 84.06 |
| ERT-01 | N-S | Measured Resistance (Ω) | 110.60 | 17.90 | 14.83 | 1.68 | 0.83 |
| | | Apparent Resistivity (Ω-m) | 423.67 | 171.42 | 283.92 | 80.28 | 79.52 |
| | E-W | Measured Resistance (Ω) | 110.40 | 19.48 | 5.67 | 1.73 | 0.86 |
| | | Apparent Resistivity (Ω-m) | 422.76 | 186.54 | 108.48 | 82.60 | 82.02 |
| ERT-02 | N-S | Measured Resistance (Ω) | 19.08 | 11.17 | 4.66 | 2.48 | 1.32 |
| | | Apparent Resistivity (Ω-m) | 73.09 | 106.92 | 89.21 | 118.93 | 126.34 |
| | E-W | Measured Resistance (Ω) | 19.72 | 11.56 | 5.02 | 2.37 | 1.26 |
| | | Apparent Resistivity (Ω-m) | 75.53 | 110.61 | 96.10 | 113.20 | 120.73 |
| ERT-03 | N-S | Measured Resistance (Ω) | 50.72 | 7.16 | 3.69 | 1.59 | 0.80 |
| | | Apparent Resistivity (Ω-m) | 194.25 | 68.52 | 70.71 | 76.23 | 76.84 |
| | E-W | Measured Resistance (Ω) | 23.63 | 7.87 | 3.72 | 1.60 | 0.82 |
| | | Apparent Resistivity (Ω-m) | 90.40 | 75.32 | 71.23 | 76.81 | 78.03 |
| | | **Site Average (Ω)** | **97.86** | **15.82** | **6.26** | **1.86** | **0.94** |
| | | **Site Average (Ω-m)** | **374.69** | **151.46** | **119.83** | **89.79** | **90.21** |

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# Soil Resistivity Results

| | | | | |
|---|---|---|---|---|
| Project Name: | ConnectGen South Ripley Solar | Date: | | July 20 - Aug. 11, 2020 |
| Project Number: | 505100267-001 | Weather: | | Sunny |
| Project Location: | South Ripley, NY | Temperature: | | 69-85 F |
| Equipment: | AGI Ministing | | | |
| Test Method: | Wenner 4 Electrode Array | | | |

| Array | | Data | Array spacing (ft) | | | | |
|---|---|---|---|---|---|---|---|
| | | | 2.00 | 5.00 | 10.00 | 20.00 | 50.00 |
| ERT-04 | N-S | Measured Resistance (Ω) | 107.80 | 30.93 | 5.32 | 1.96 | 0.88 |
| | | Apparent Resistivity (Ω-m) | 412.70 | 296.14 | 101.96 | 93.39 | 84.61 |
| | E-W | Measured Resistance (Ω) | 148.60 | 15.98 | 4.68 | 1.78 | 0.90 |
| | | Apparent Resistivity (Ω-m) | 569.67 | 153.01 | 89.55 | 85.01 | 86.29 |
| ERT-05 | N-S | Measured Resistance (Ω) | 30.66 | 9.99 | 3.66 | 1.86 | 1.00 |
| | | Apparent Resistivity (Ω-m) | 117.44 | 95.62 | 70.04 | 88.82 | 95.46 |
| | E-W | Measured Resistance (Ω) | 29.60 | 8.27 | 4.03 | 1.46 | 0.96 |
| | | Apparent Resistivity (Ω-m) | 113.36 | 79.22 | 77.18 | 69.74 | 92.17 |
| ERT-06 | N-S | Measured Resistance (Ω) | 43.75 | 10.03 | 4.30 | 1.92 | 1.05 |
| | | Apparent Resistivity (Ω-m) | 167.61 | 96.04 | 82.33 | 91.68 | 100.31 |
| | E-W | Measured Resistance (Ω) | 44.57 | 8.35 | 4.30 | 1.97 | 1.02 |
| | | Apparent Resistivity (Ω-m) | 170.72 | 79.92 | 82.30 | 94.09 | 97.66 |
| ERT-07 | N-S | Measured Resistance (Ω) | 42.58 | 4.25 | 1.96 | 1.02 | 0.72 |
| | | Apparent Resistivity (Ω-m) | 163.04 | 40.66 | 37.43 | 48.95 | 68.49 |
| | E-W | Measured Resistance (Ω) | 25.64 | 4.28 | 2.06 | 1.15 | 0.77 |
| | | Apparent Resistivity (Ω-m) | 98.18 | 41.00 | 39.44 | 55.17 | 74.04 |
| | | **Site Average (Ω)** | **59.15** | **11.51** | **3.79** | **1.64** | **0.91** |
| | | **Site Average (Ω-m)** | **226.59** | **110.20** | **72.53** | **78.36** | **87.38** |

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# Soil Resistivity Results

| | | | | |
|---|---|---|---|---|
| Project Name: | ConnectGen South Ripley Solar | Date: | | July 20 - Aug. 11, 2020 |
| Project Number: | 505100267-001 | Weather: | | Sunny |
| Project Location: | South Ripley, NY | Temperature: | | 69-85 F |
| Equipment: | AGI Ministing | | | |
| Test Method: | Wenner 4 Electrode Array | | | |

| Array | | Data | Array spacing (ft) | | | | |
|---|---|---|---|---|---|---|---|
| | | | 2.00 | 5.00 | 10.00 | 20.00 | 50.00 |
| ERT-08 | N-S | Measured Resistance (Ω) | 108.60 | 13.01 | 4.88 | 2.09 | 1.07 |
| | | Apparent Resistivity (Ω-m) | 416.05 | 124.60 | 93.45 | 100.04 | 102.14 |
| | E-W | Measured Resistance (Ω) | 110.40 | 20.78 | 5.37 | 2.13 | 1.04 |
| | | Apparent Resistivity (Ω-m) | 423.06 | 198.97 | 102.57 | 102.17 | 99.24 |
| ERT-09 | N-S | Measured Resistance (Ω) | 214.00 | 55.34 | 10.03 | 3.69 | 2.06 |
| | | Apparent Resistivity (Ω-m) | 819.30 | 530.05 | 192.08 | 176.72 | 196.26 |
| | E-W | Measured Resistance (Ω) | 217.70 | 51.53 | 10.81 | 3.64 | 1.89 |
| | | Apparent Resistivity (Ω-m) | 833.63 | 493.17 | 207.08 | 173.64 | 175.14 |
| ERT-10 | N-S | Measured Resistance (Ω) | 121.00 | 49.40 | 20.79 | 7.93 | 2.15 |
| | | Apparent Resistivity (Ω-m) | 463.30 | 473.05 | 398.07 | 379.78 | 205.68 |
| | E-W | Measured Resistance (Ω) | 111.00 | 43.97 | 21.94 | 6.30 | 2.29 |
| | | Apparent Resistivity (Ω-m) | 425.20 | 420.93 | 420.01 | 301.81 | 219.09 |
| ERT-11 | N-S | Measured Resistance (Ω) | 32.68 | 10.80 | 4.91 | 2.06 | 1.11 |
| | | Apparent Resistivity (Ω-m) | 125.18 | 103.36 | 93.91 | 1013.19 | 105.98 |
| | E-W | Measured Resistance (Ω) | 30.15 | 9.02 | 4.96 | 2.12 | 1.03 |
| | | Apparent Resistivity (Ω-m) | 115.43 | 86.32 | 94.98 | 101.35 | 98.69 |
| | | **Site Average (Ω)** | **118.19** | **31.73** | **10.46** | **3.75** | **1.58** |
| | | **Site Average (Ω-m)** | **452.64** | **303.81** | **200.27** | **293.59** | **150.28** |

MOTT MACDONALD

# Soil Resistivity Results

| | | | | |
|---|---|---|---|---|
| Project Name: | ConnectGen South Ripley Solar | Date: | | July 20 - Aug. 11, 2020 |
| Project Number: | 505100267-001 | Weather: | | Sunny |
| Project Location: | South Ripley, NY | Temperature: | | 69-85 F |
| Equipment: | AGI Ministing | | | |
| Test Method: | Wenner 4 Electrode Array | | | |

| Array | | Data | Array spacing (ft) | | | | |
|---|---|---|---|---|---|---|---|
| | | | 2.00 | 5.00 | 10.00 | 20.00 | 50.00 |
| ERT-12 | N-S | Measured Resistance (Ω) | 410.30 | 136.20 | 54.11 | 13.84 | 2.45 |
| | | Apparent Resistivity (Ω-m) | 1571.55 | 1303.93 | 1036.32 | 662.94 | 235.00 |
| | E-W | Measured Resistance (Ω) | 346.50 | 181.10 | 49.48 | 13.09 | 2.50 |
| | | Apparent Resistivity (Ω-m) | 1327.10 | 1732.79 | 947.01 | 626.67 | 239.51 |
| ERT-13 | N-S | Measured Resistance (Ω) | 220.40 | 38.23 | 11.06 | 3.43 | 1.54 |
| | | Apparent Resistivity (Ω-m) | 843.99 | 366.06 | 211.74 | 164.13 | 147.13 |
| | E-W | Measured Resistance (Ω) | 209.10 | 50.93 | 9.91 | 4.33 | 1.69 |
| | | Apparent Resistivity (Ω-m) | 800.40 | 487.38 | 189.74 | 207.48 | 161.54 |
| ERT-14 | N-S | Measured Resistance (Ω) | 92.26 | 15.36 | 4.44 | 1.73 | 1.01 |
| | | Apparent Resistivity (Ω-m) | 353.26 | 147.07 | 85.10 | 82.84 | 96.59 |
| | E-W | Measured Resistance (Ω) | 95.51 | 21.91 | 5.62 | 1.82 | 0.96 |
| | | Apparent Resistivity (Ω-m) | 365.76 | 209.82 | 107.59 | 87.02 | 91.47 |
| ERT-15 | N-S | Measured Resistance (Ω) | 32.50 | 11.42 | 5.71 | 2.19 | 0.99 |
| | | Apparent Resistivity (Ω-m) | 124.48 | 109.36 | 109.27 | 104.64 | 94.61 |
| | E-W | Measured Resistance (Ω) | 25.64 | 12.44 | 4.90 | 2.70 | 1.02 |
| | | Apparent Resistivity (Ω-m) | 124.48 | 109.36 | 93.88 | 129.11 | 97.35 |
| | | **Site Average (Ω)** | **179.03** | **58.45** | **18.15** | **5.39** | **1.52** |
| | | **Site Average (Ω-m)** | **688.88** | **558.22** | **347.58** | **258.10** | **145.40** |

MOTT MACDONALD

# Soil Resistivity Results

| | | | | |
|---|---|---|---|---|
| Project Name: | ConnectGen South Ripley Solar | Date: | | July 20 - Aug. 11, 2020 |
| Project Number: | 505100267-001 | Weather: | | Sunny |
| Project Location: | South Ripley, NY | Temperature: | | 69-85 F |
| Equipment: | AGI Ministing | | | |
| Test Method: | Wenner 4 Electrode Array | | | |

| Array | | Data | Array spacing (ft) | | | | |
|---|---|---|---|---|---|---|---|
| | | | 2.00 | 5.00 | 10.00 | 20.00 | 50.00 |
| ERT-16 | N-S | Measured Resistance (Ω) | 46.61 | 13.75 | 6.24 | 2.36 | 1.18 |
| | | Apparent Resistivity (Ω-m) | 178.46 | 131.67 | 119.39 | 112.96 | 112.93 |
| | E-W | Measured Resistance (Ω) | 45.53 | 15.52 | 6.27 | 2.52 | 1.24 |
| | | Apparent Resistivity (Ω-m) | 174.32 | 148.59 | 120.03 | 120.82 | 118.93 |
| ERT-17 | N-S | Measured Resistance (Ω) | 34.88 | 12.28 | 6.18 | 3.40 | 1.23 |
| | | Apparent Resistivity (Ω-m) | 133.59 | 117.50 | 118.26 | 162.58 | 117.90 |
| | E-W | Measured Resistance (Ω) | 36.26 | 14.13 | 6.08 | 2.61 | 1.18 |
| | | Apparent Resistivity (Ω-m) | 138.81 | 135.27 | 116.40 | 125.09 | 112.53 |
| ERT-18 | N-S | Measured Resistance (Ω) | 25.43 | 12.45 | 6.33 | 2.15 | 1.06 |
| | | Apparent Resistivity (Ω-m) | 97.41 | 119.18 | 121.13 | 103.08 | 101.38 |
| | E-W | Measured Resistance (Ω) | 25.51 | 15.51 | 6.43 | 2.21 | 1.07 |
| | | Apparent Resistivity (Ω-m) | 97.66 | 148.53 | 123.08 | 105.92 | 102.05 |
| ERT-19 | N-S | Measured Resistance (Ω) | 46.77 | 11.53 | 3.86 | 1.69 | 0.96 |
| | | Apparent Resistivity (Ω-m) | 179.10 | 110.40 | 73.97 | 80.77 | 91.68 |
| | E-W | Measured Resistance (Ω) | 33.24 | 9.55 | 3.56 | 1.83 | 0.91 |
| | | Apparent Resistivity (Ω-m) | 127.31 | 91.47 | 68.15 | 87.66 | 87.20 |
| | | **Site Average (Ω)** | **36.78** | **13.09** | **5.62** | **2.35** | **1.10** |
| | | **Site Average (Ω-m)** | **140.83** | **125.33** | **107.55** | **112.36** | **105.58** |

MOTT MACDONALD

# Soil Resistivity Results

| | | | | |
|---|---|---|---|---|
| Project Name: | ConnectGen South Ripley Solar | Date: | | July 20 - Aug. 11, 2020 |
| Project Number: | 505100267-001 | Weather: | | Sunny |
| Project Location: | South Ripley, NY | Temperature: | | 69-85 F |
| Equipment: | AGI Ministing | | | |
| Test Method: | Wenner 4 Electrode Array | | | |

| Array | | Data | Array spacing (ft) | | | | |
|---|---|---|---|---|---|---|---|
| | | | 2.00 | 5.00 | 10.00 | 20.00 | 50.00 |
| ERT-20 | N-S | Measured Resistance (Ω) | 171.20 | 16.46 | 3.40 | 1.66 | 0.92 |
| | | Apparent Resistivity (Ω-m) | 2151.00 | 516.90 | 213.40 | 260.30 | 288.50 |
| | E-W | Measured Resistance (Ω) | 141.80 | 13.75 | 3.47 | 1.53 | 1.07 |
| | | Apparent Resistivity (Ω-m) | 1781.00 | 431.80 | 218.10 | 240.80 | 336.80 |
| | | **Site Average (Ω)** | **156.50** | **15.11** | **3.43** | **1.60** | **1.00** |
| | | **Site Average (Ω-m)** | **1966.00** | **474.35** | **215.75** | **250.55** | **312.65** |

# E. Laboratory Testing Results

**CONSULTANTS, INC.**
4405 South Clinton Avenue
South Plainfield, NJ 07080

**Tel: (800) 545-ATUL**
**(908) 754-8383**
**Fax: (908) 754-8633**

NJ EDA Approved Testing Laboratory • MBE/DBE Certified • NJ DEP Certified
www.ANSConsultants.net



August 31, 2020

Mott MacDonald
111 Wood Avenue South
Iselin, NJ 08830-4112

Attn.: Mr. Eric Paul
Project Engineer-Geotechnical

Re: **Subsurface Soil Investigation & Report- Lab. Test Results**
Connect Gen South Ripley, NY
Your Project # 505100267-001

Dear Mr. Paul,

Attached, please find three (3) sets of laboratory test reports.

- Appendix – A – 2 Sieve Analysis Reports
- Appendix – B – 22 Atterberg Reports

- Appendix – E – 32 Corrosion Analysis

Should you have any questions or require additional information, please contact the undersigned at (908) 754-8383.

Sincerely,
ANS CONSULTANTS, INC.


Atul N. Shah, PE, F. ASCE
President
NY PE license # 066546
ANS/ajs

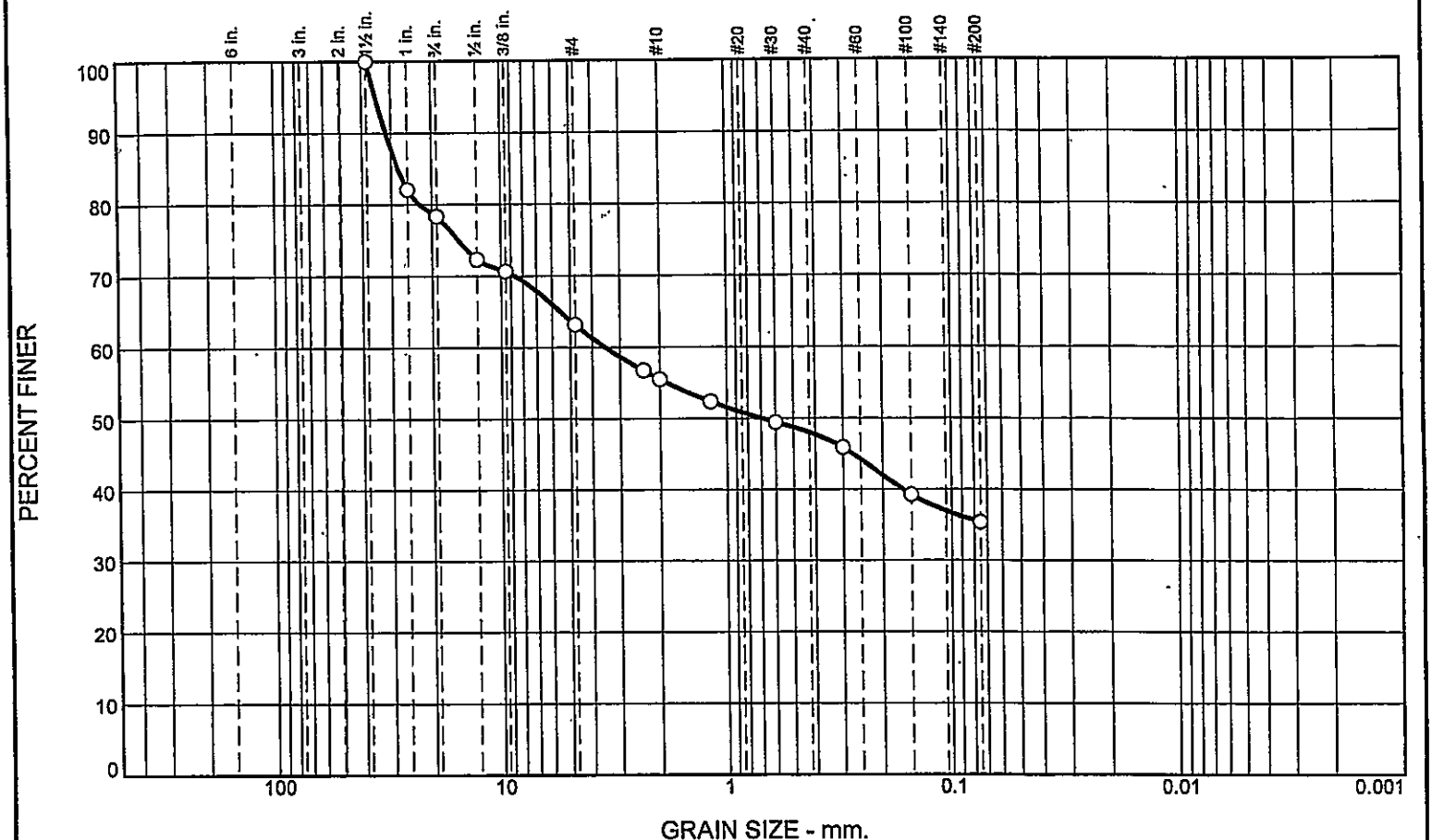
Phone: 973-379-8602
Email: eric.pauli@mottmac.com

Phone: 973-912-7517
Cell: 201-401-0301
Email: Vatsal.Shah@mottmac.com

File: ans.ajs.08312020.0521. Mott MacDonald

# Appendix-A

# Particle Size Distribution Report As per ASTM D-422




| % +3" | % Gravel | | % Sand | | | % Fines | |
|---|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | Silt | Clay |
| 0.0 | 21.6 | 15.2 | 7.7 | 7.5 | 12.6 | 35.4 | |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 1.5 | 100.0 | | |
| 1 | 82.1 | | |
| 3/4 | 78.4 | | |
| 1/2 | 72.3 | | |
| 3/8 | 70.6 | | |
| #4 | 63.2 | | |
| #8 | 56.8 | | |
| #10 | 55.5 | | |
| #16 | 52.4 | | |
| #30 | 49.4 | | |
| #50 | 45.9 | | |
| #100 | 39.3 | | |
| #200 | 35.4 | | |

* (no specification provided)

**Material Description**

Brown in color. silty gravel with sand

**Atterberg Limits**

PL= NP LL= NV PI= NP

**Coefficients**

$D_{90}$= 31.4205 $D_{85}$= 27.9276 $D_{60}$= 3.4905
$D_{50}$= 0.6902 $D_{30}$= $D_{15}$=
$D_{10}$= $C_u$= $C_c$=

**Classification**

USCS= GM AASHTO= A-2-4(0)

**Remarks**

Sample was dropped off by client 08/12/20 and tested on 08/19/20. In-Situ %MC=11.0
F.M.=3.44

**Location:** B-27, S-5, 8'-10'
**Sample Number:** S-1 **Depth:** 8'-10' **Date:** 08/20/2020

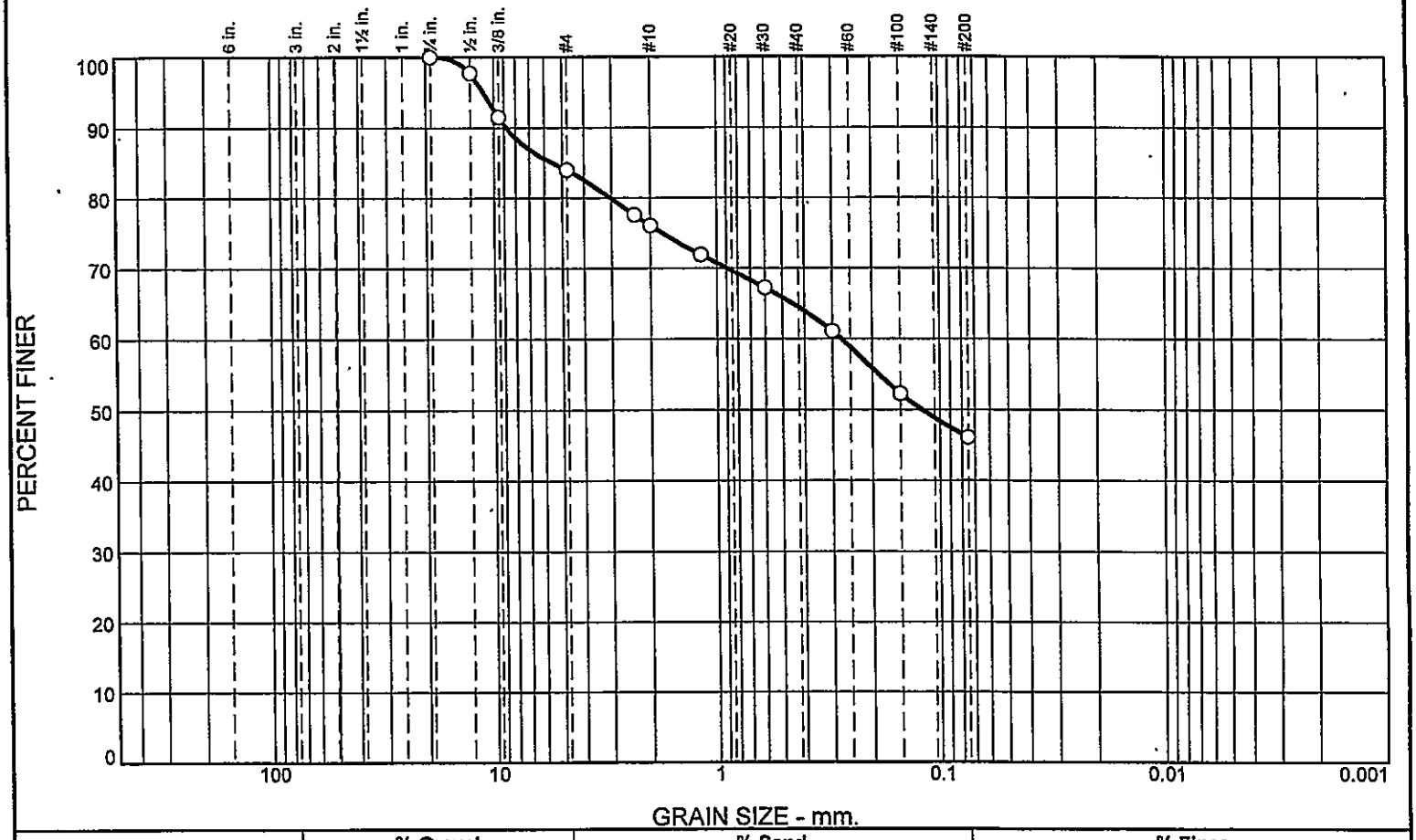
**ANS CONSULTANTS, INC.**

**South Plainfield, New Jersey**

**Client:** Mott MacDonald
**Project:** Connect Gen South Ripley, South Ripley, NY

**Project No:** APX-2492 **Figure** 1 F 1

# Particle Size Distribution Report As per ASTM D-422




| % +3" | % Gravel | | % Sand | | | % Fines | |
|---|---|---|---|---|---|---|---|
| | Coarse | Fine | Coarse | Medium | Fine | Silt | Clay |
| 0.0 | 0.0 | 16.0 | 7.9 | 11.5 | 18.5 | 46.1 | |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 3/4 | 100.0 | | |
| 1/2 | 97.7 | | |
| 3/8 | 91.5 | | |
| #4 | 84.0 | | |
| #8 | 77.6 | | |
| #10 | 76.1 | | |
| #16 | 71.9 | | |
| #30 | 67.3 | | |
| #50 | 61.1 | | |
| #100 | 52.3 | | |
| #200 | 46.1 | | |

* (no specification provided)

**Material Description**

Brown in color. silty sand with gravel

**Atterberg Limits**

PL= NP LL= NV PI= NP

**Coefficients**

$D_{90}$= 8.8000 $D_{85}$= 5.4994 $D_{60}$= 0.2745
$D_{50}$= 0.1204 $D_{30}$= $D_{15}$=
$D_{10}$= $C_u$= $C_c$=

**Classification**

USCS= SM AASHTO= A-4(0)

**Remarks**

Sample was dropped off by client on 08/12/20 and tested on 08/19/20. In-Situ %MC=13.8
F.M.=1.94

**Location:** B-37, S-4, 6'-8'
**Sample Number:** S-2 **Depth:** 6'-8' **Date:** 08/20/2020

**ANS CONSULTANTS, INC.**

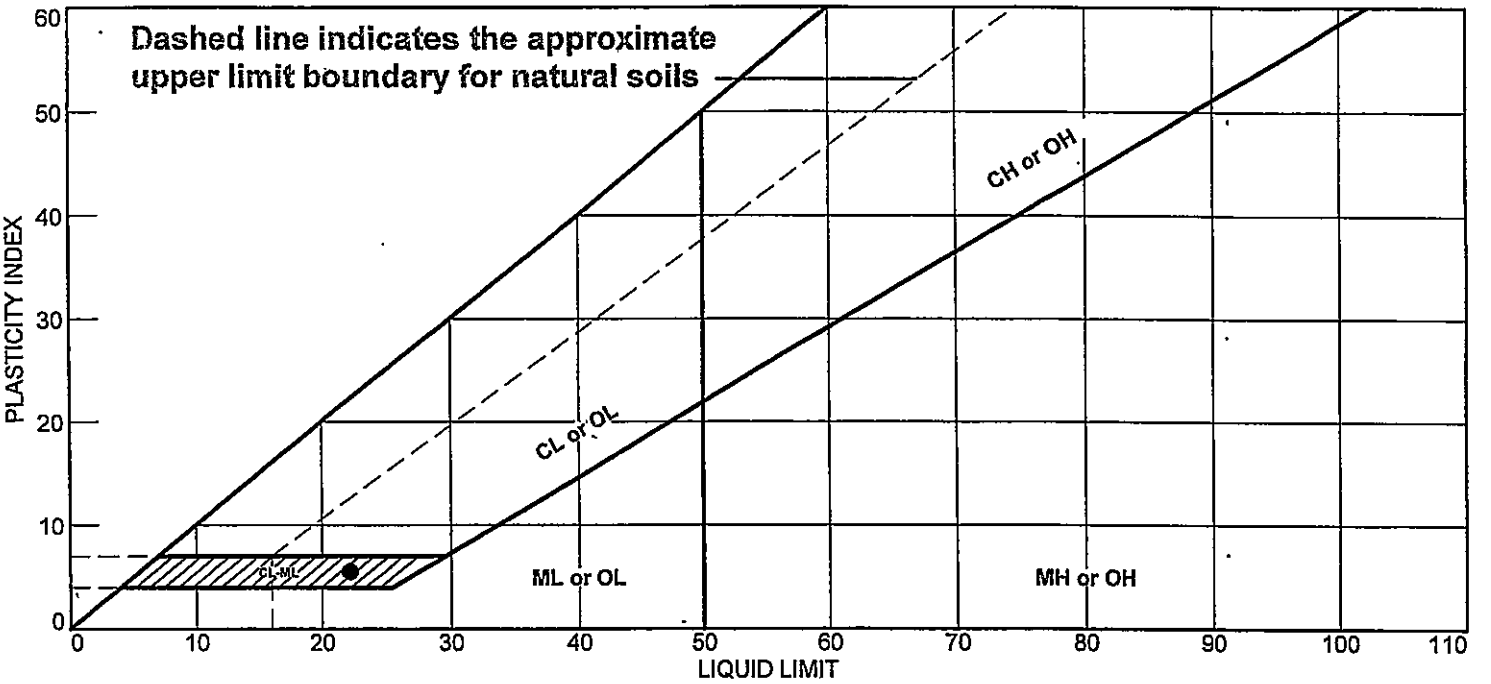
**South Plainfield, New Jersey**

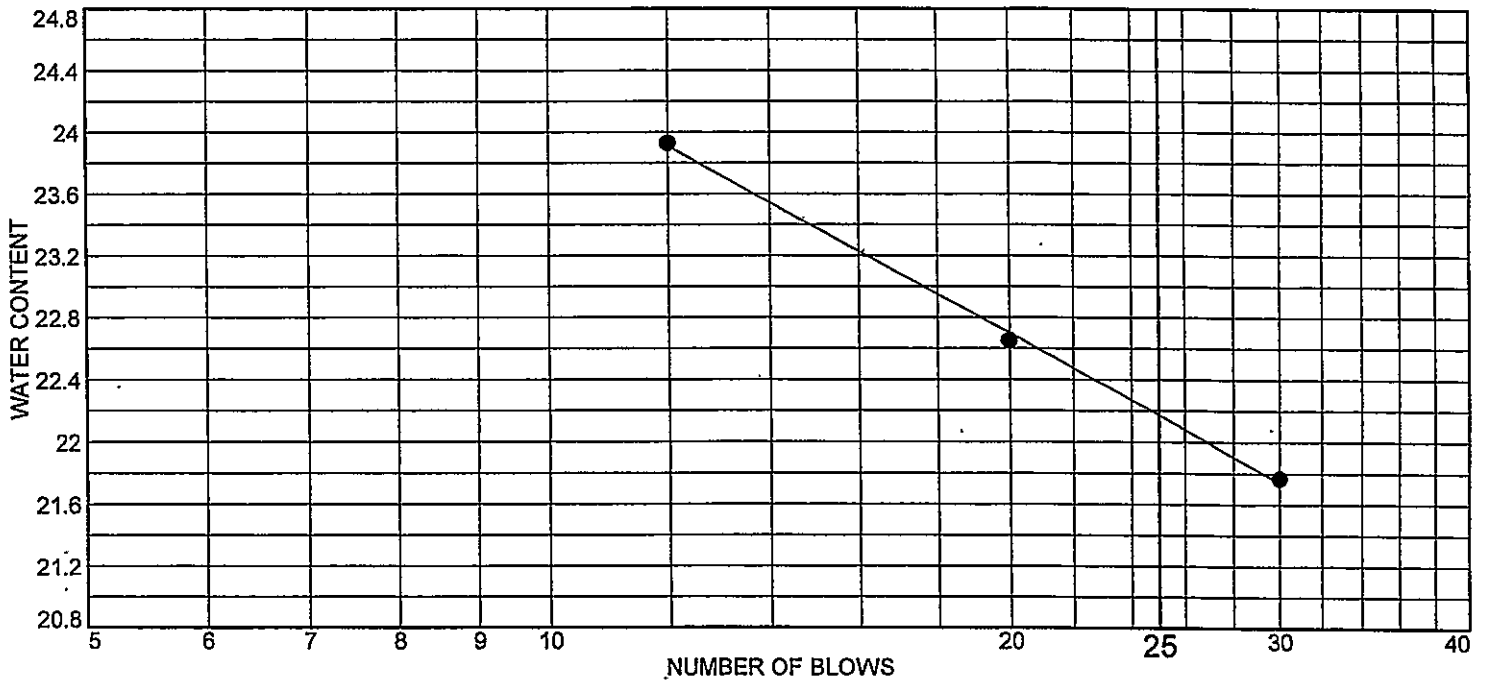
**Client:** Mott MacDonald
**Project:** Connect Gen South Ripley, South Ripley, NY

**Project No:** APX-2492 **Figure** 2 F 1

# Appendix-B

# LIQUID AND PLASTIC LIMITS TEST REPORT




| | MATERIAL DESCRIPTION | LL | PL | PI | %<#40 | %<#200 | USCS |
|---|---|---|---|---|---|---|---|
| ● | | 22.2 | 16.7 | 5.5 | | | |

**Project No.** APX-2492 **Client:** Mott MacDonald

**Project:** Connect Gen South Ripley, South Ripley, NY

**Location:** B-SS-1, S2, 2'-4'
**Sample Number:** S-3 **Depth:** 2'-4'

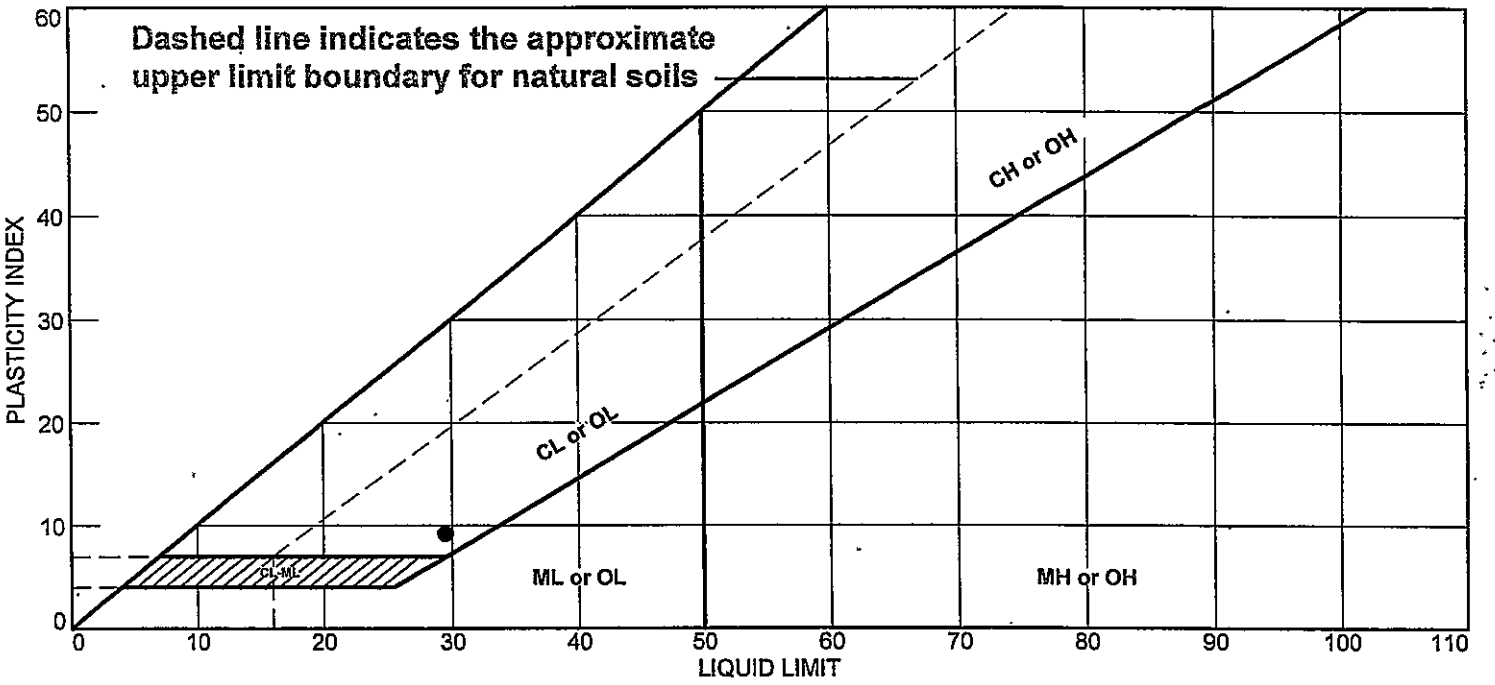
**ANS CONSULTANTS, INC.**

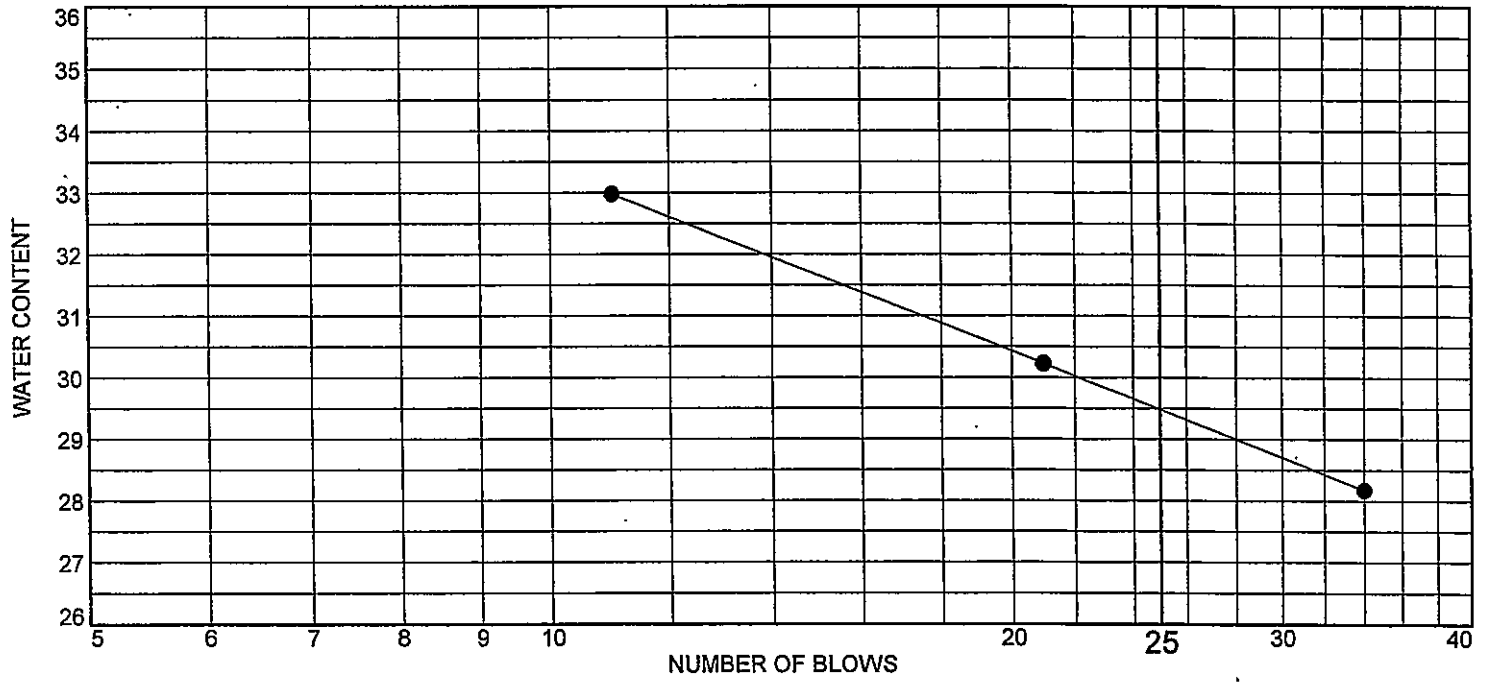
**South Plainfield, New Jersey**

**Remarks:**
● moiture content 17.2%

**Figure 3 F 3**

# LIQUID AND PLASTIC LIMITS TEST REPORT




| | MATERIAL DESCRIPTION | LL | PL | PI | %<#40 | %<#200 | USCS |
|---|---|---|---|---|---|---|---|
| ● | | 29.5 | 20.3 | 9.2 | | | |

**Project No.** APX-2492 **Client:** Mott MacDonald

**Project:** Connect Gen South Ripley, South Ripley, NY

**Location:** B-SS-3, S3, 4'-6'
**Sample Number:** S-4 **Depth:** 4'-6'

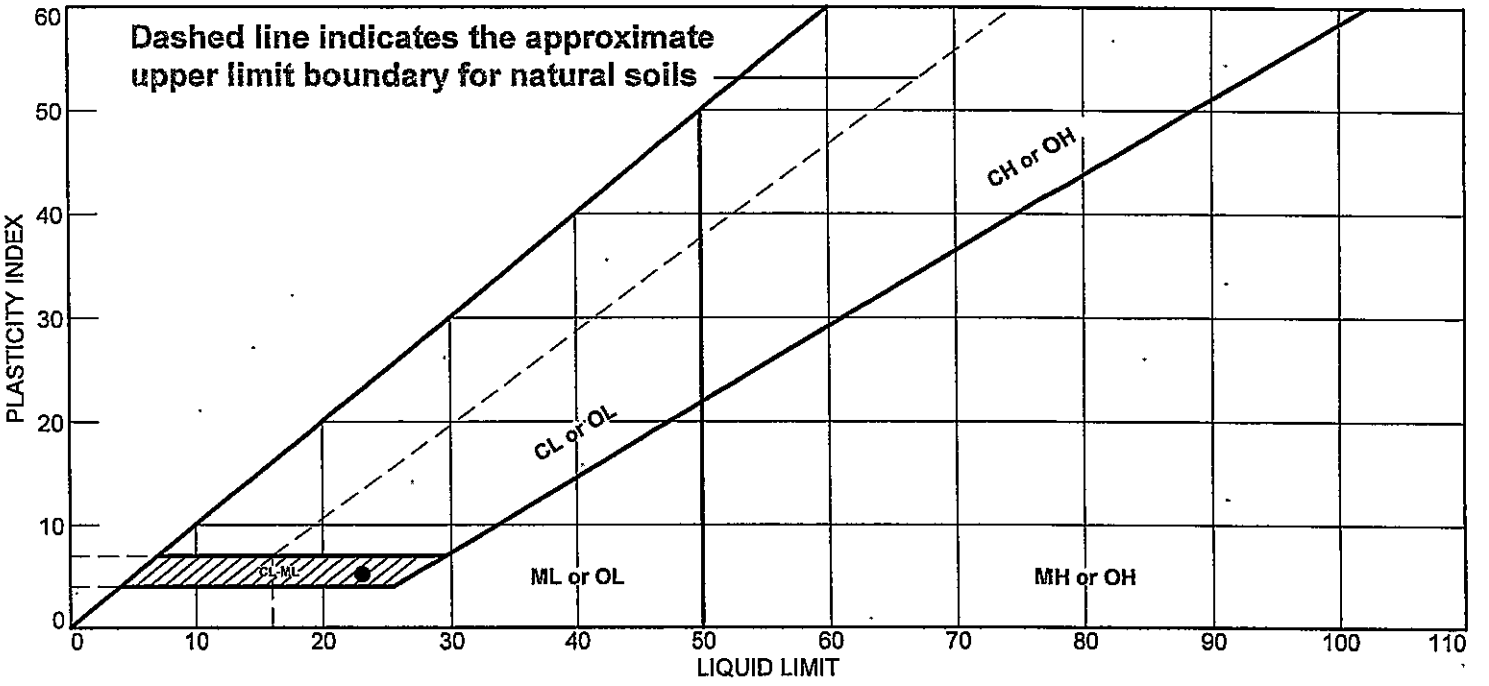
**ANS CONSULTANTS, INC.**

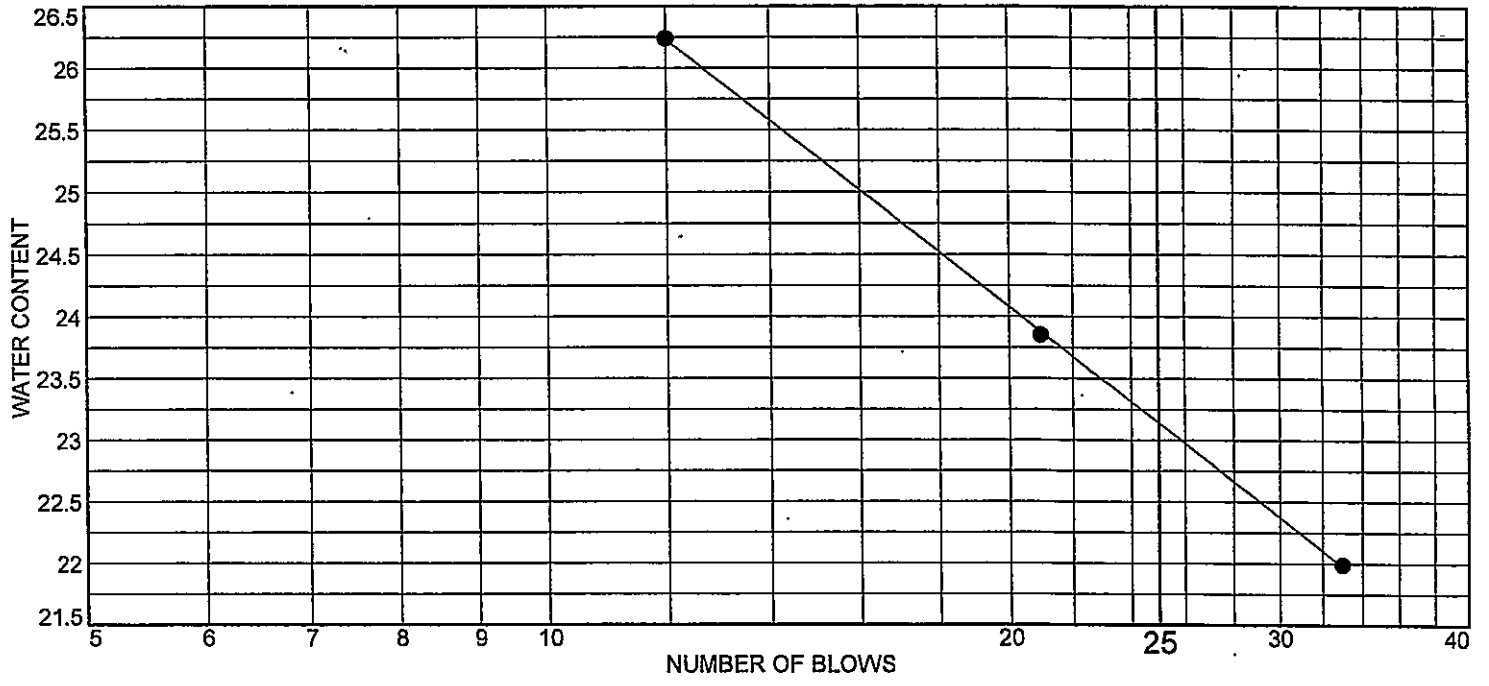
**South Plainfield, New Jersey**

**Remarks:**
● Moisture content 13.3%

**Figure 4 F 3**

# LIQUID AND PLASTIC LIMITS TEST REPORT




| | MATERIAL DESCRIPTION | LL | PL | PI | %<#40 | %<#200 | USCS |
|---|---|---|---|---|---|---|---|
| ● | | 23.1 | 17.9 | 5.2 | | | |

**Project No.** APX-2492 **Client:** Mott MacDonald

**Project:** Connect Gen South Ripley, South Ripley, NY

**Location:** B-1, S4, 6'-8'
**Sample Number:** S-5 **Depth:** 6'-8'

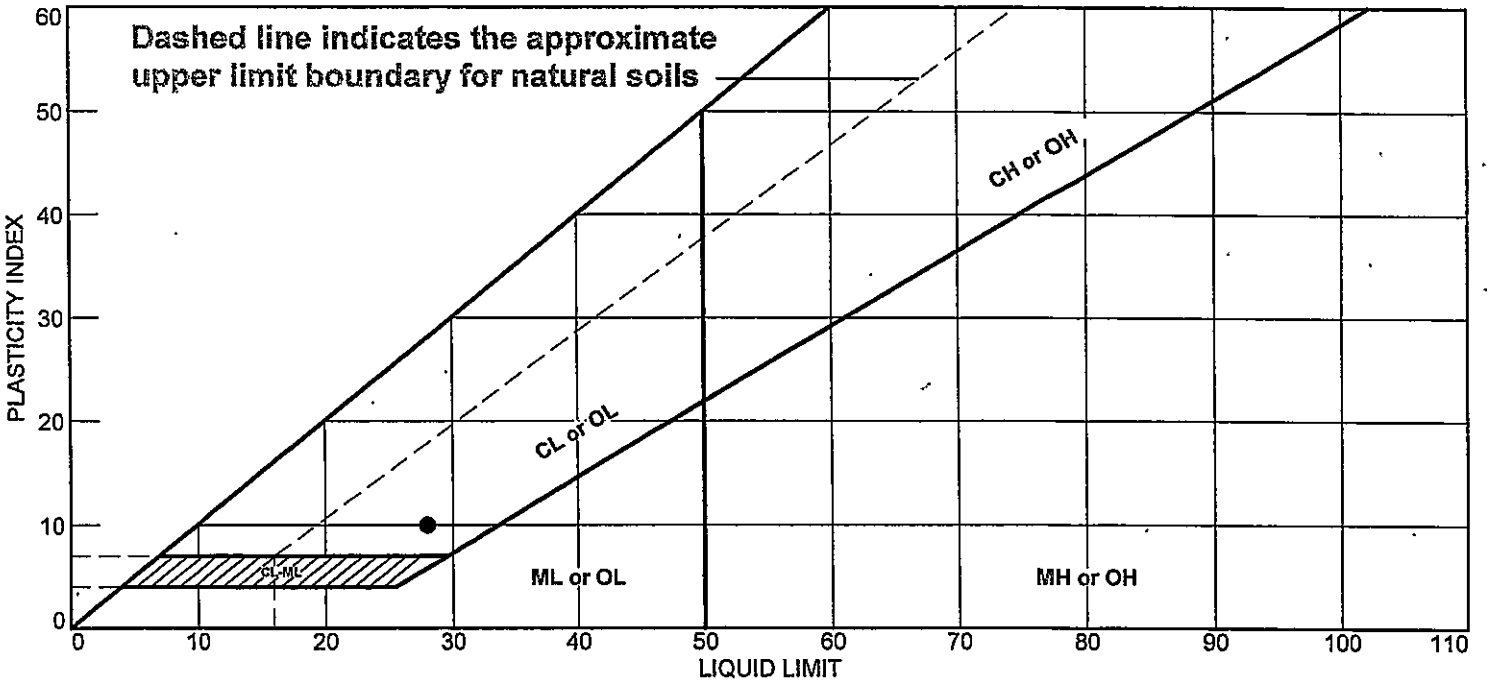
**ANS CONSULTANTS, INC.**

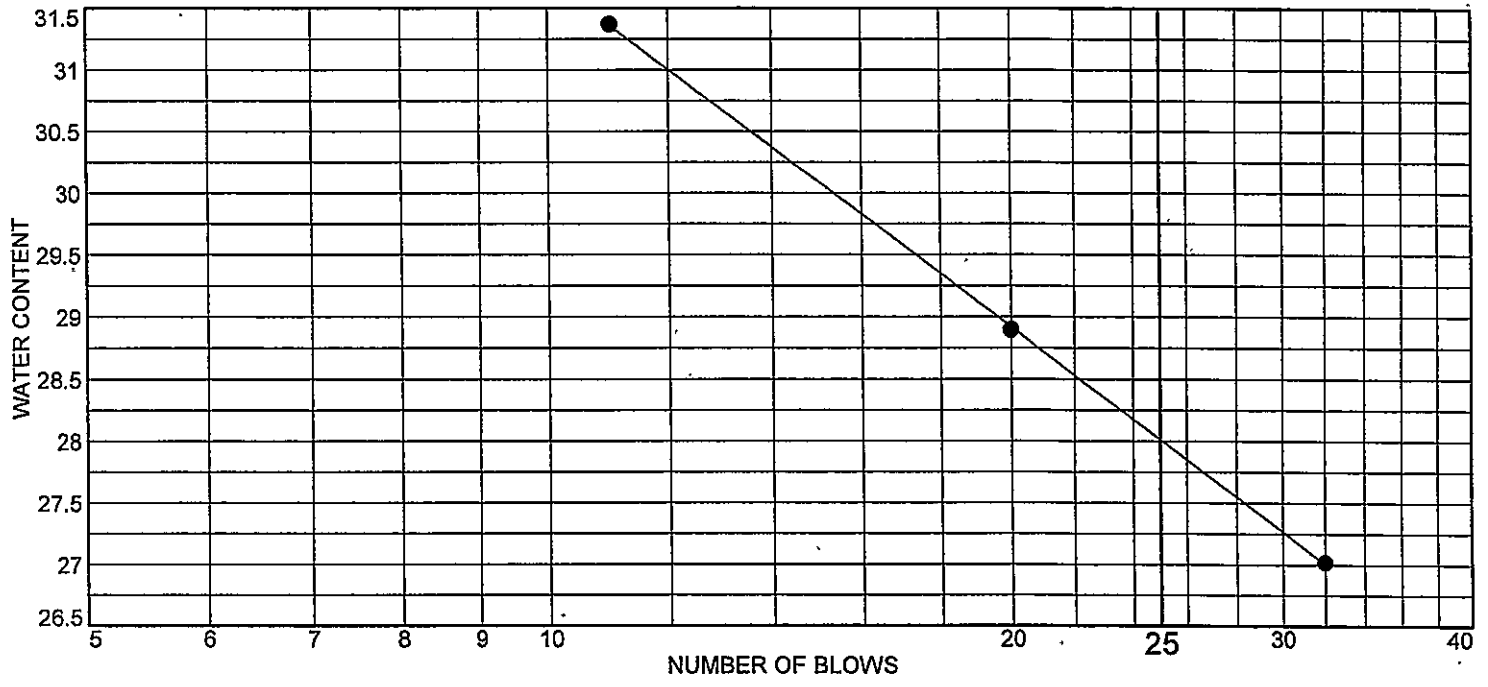
**South Plainfield, New Jersey**

**Remarks:**
● Moisture content 12.2%

**Figure 5 F 3**

# LIQUID AND PLASTIC LIMITS TEST REPORT




| | MATERIAL DESCRIPTION | LL | PL | PI | %<#40 | %<#200 | USCS |
|---|---|---|---|---|---|---|---|
| ● | | 28.0 | 18.0 | 10.0 | | | |

**Project No.** APX-2492 **Client:** Mott MacDonald

**Project:** Connect Gen South Ripley, South Ripley, NY

**Location:** B-3, S3, 4'-6'
**Sample Number:** S-6 **Depth:** 4'-6'

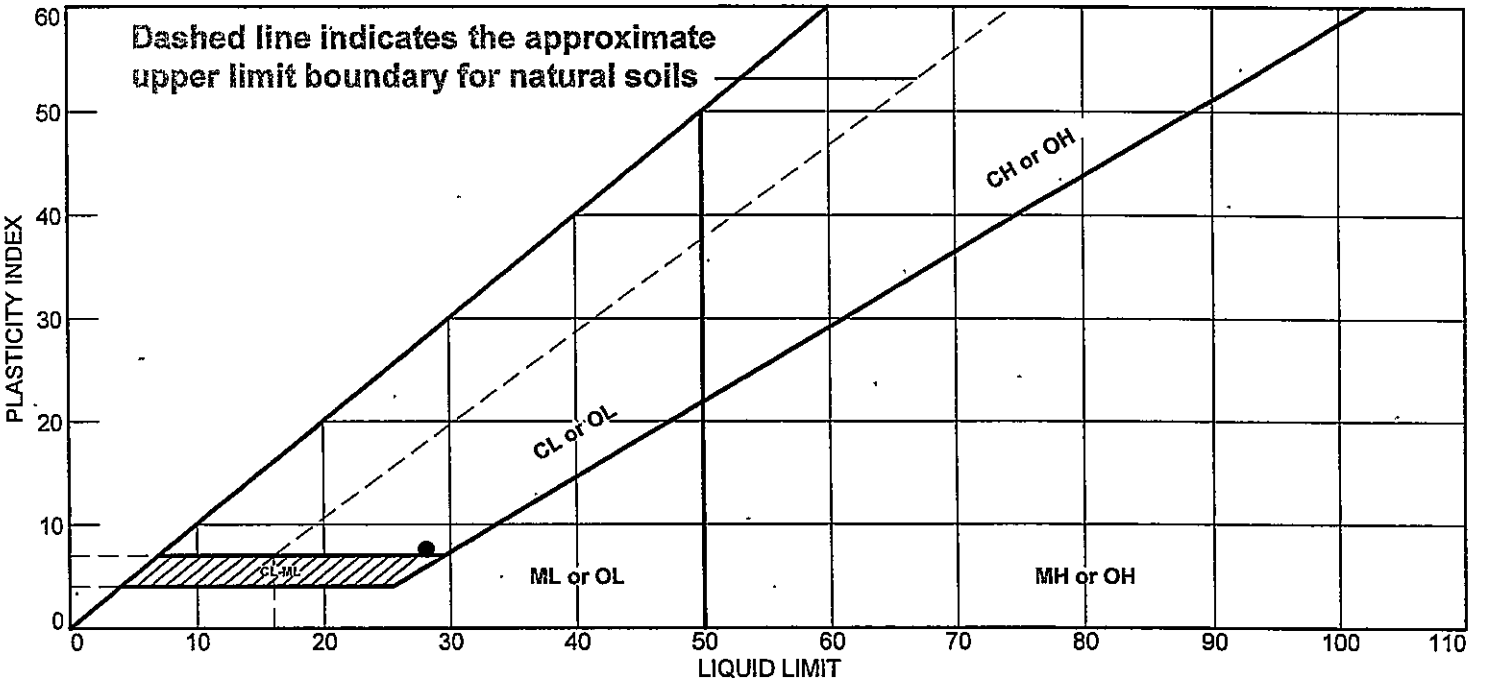
**ANS CONSULTANTS, INC.**

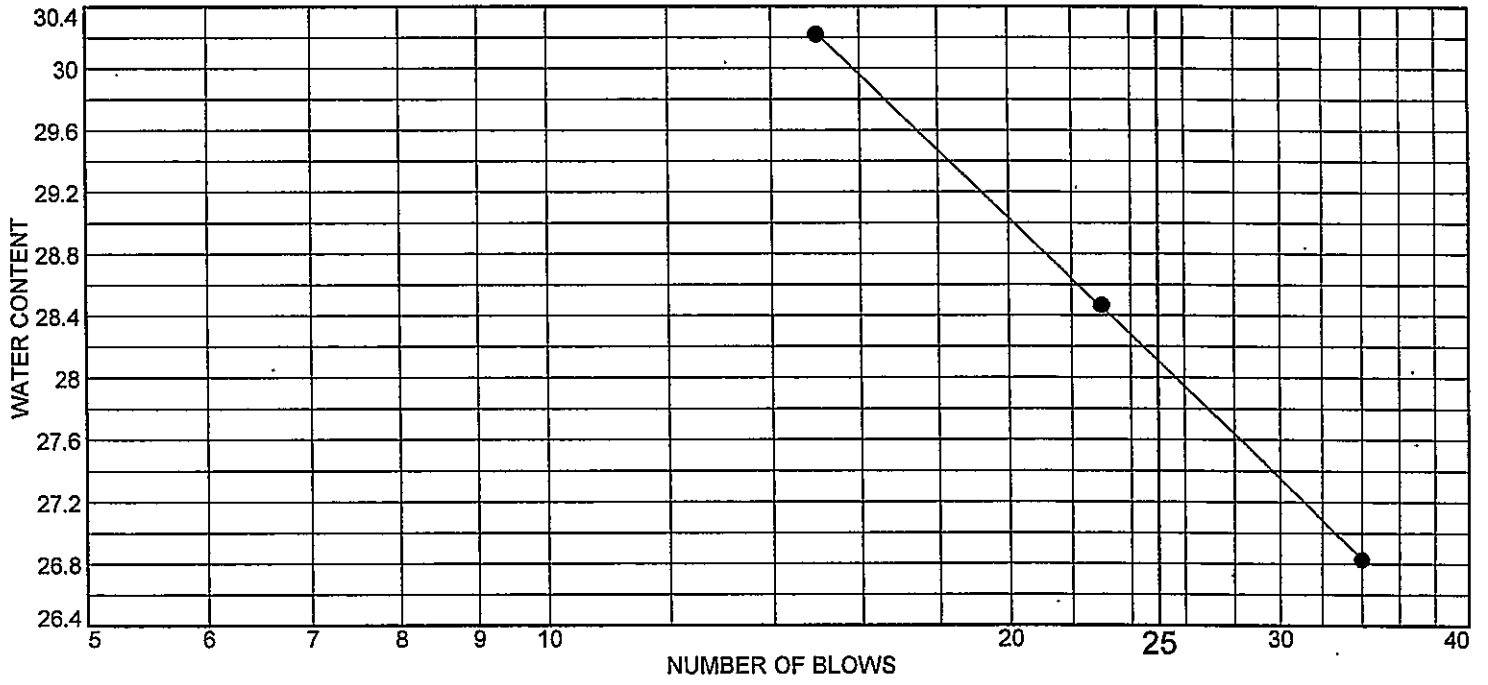
**South Plainfield, New Jersey**

**Remarks:**
● Moistur content 11.4%

**Figure 6 F 3**

# LIQUID AND PLASTIC LIMITS TEST REPORT




| | MATERIAL DESCRIPTION | LL | PL | PI | %<#40 | %<#200 | USCS |
|---|---|---|---|---|---|---|---|
| ● | | 28.1 | 20.5 | 7.6 | | | |

**Project No.** APX-2492 **Client:** Mott MacDonald

**Project:** Connect Gen South Ripley, South Ripley, NY

**Location:** B-4, S2, 2'-4'
**Sample Number:** S-7 **Depth:** 2'-4'

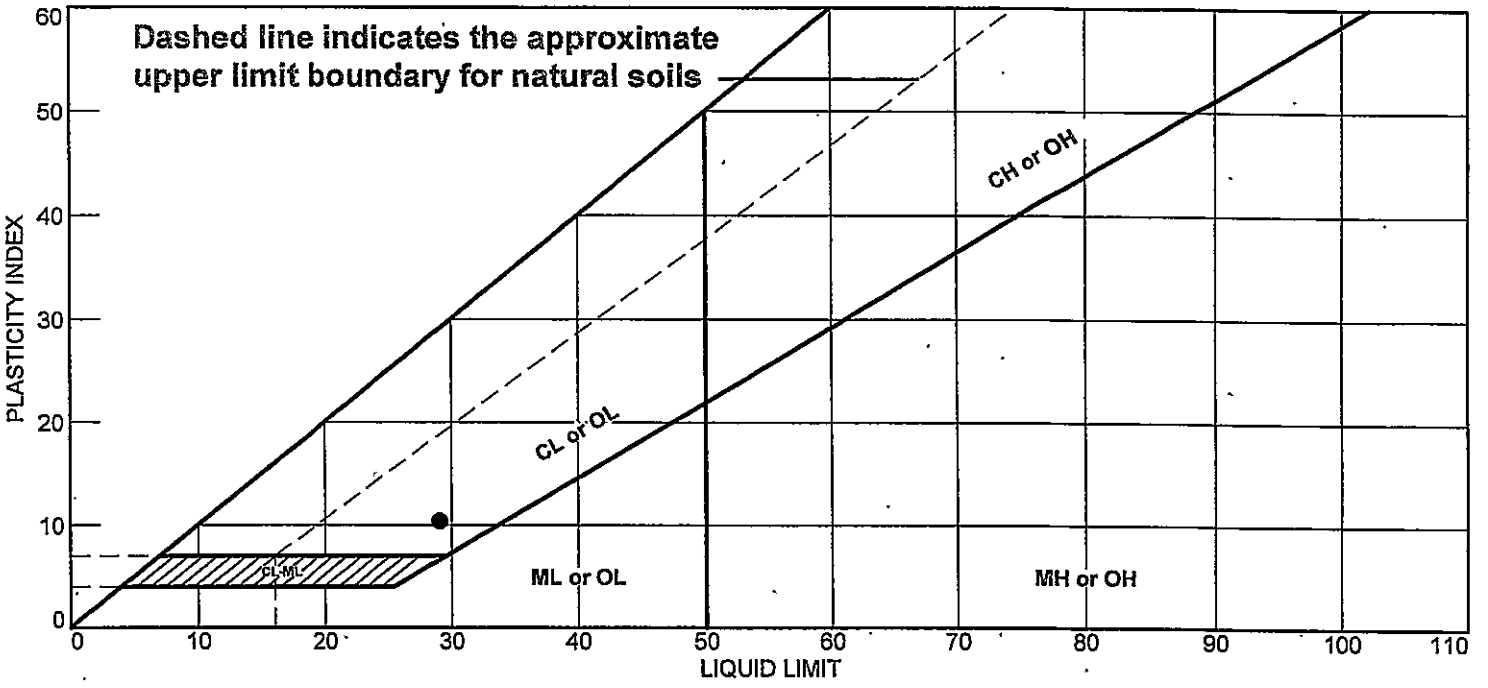
**ANS CONSULTANTS, INC.**

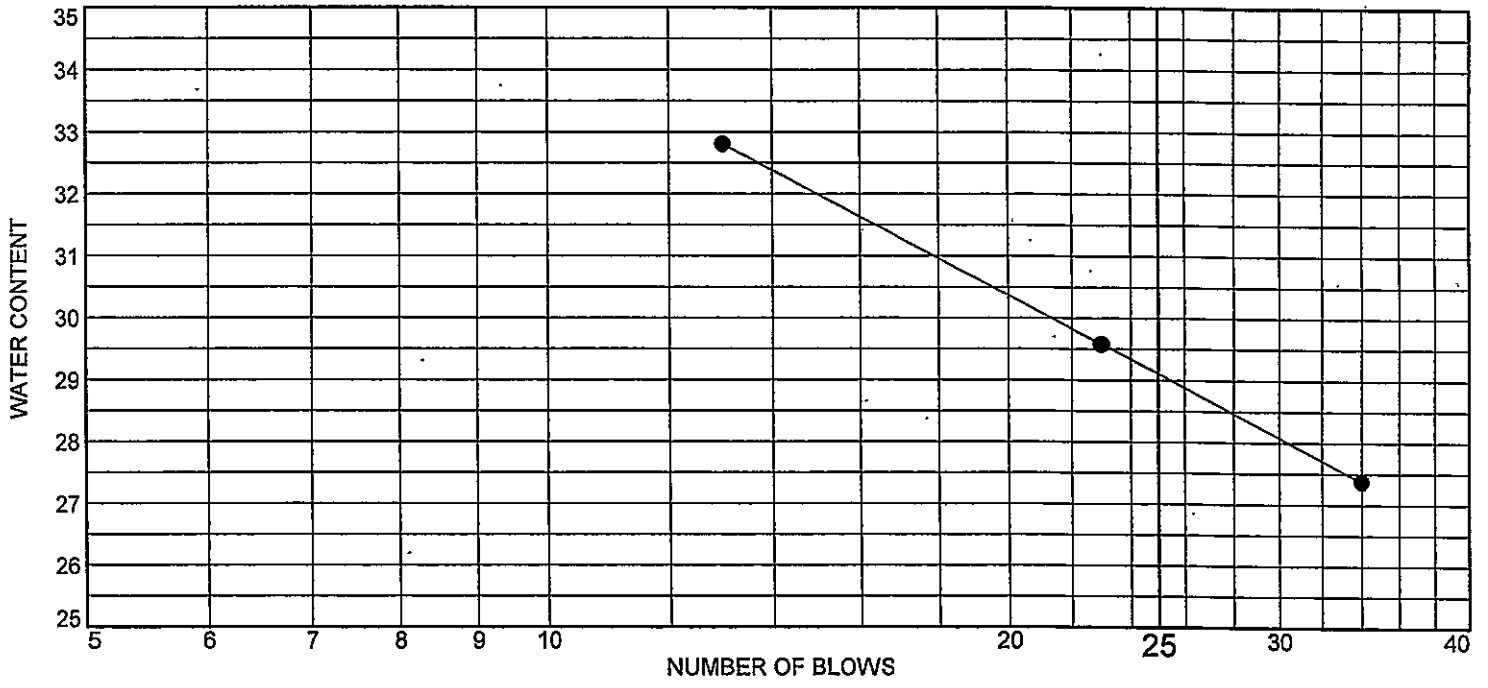
**South Plainfield, New Jersey**

**Remarks:**
● Moisture content 13.%

**Figure 7 F 3**

# LIQUID AND PLASTIC LIMITS TEST REPORT




| | MATERIAL DESCRIPTION | LL | PL | PI | %<#40 | %<#200 | USCS |
|---|---|---|---|---|---|---|---|
| ● | | 29.1 | 18.7 | 10.4 | | | |

**Project No.** APX-2492 **Client:** Mott MacDonald

**Project:** Connect Gen South Ripley, South Ripley, NY

**Location:** B-7, S3, 4'-6'
**Sample Number:** S-8 **Depth:** 4'-6'

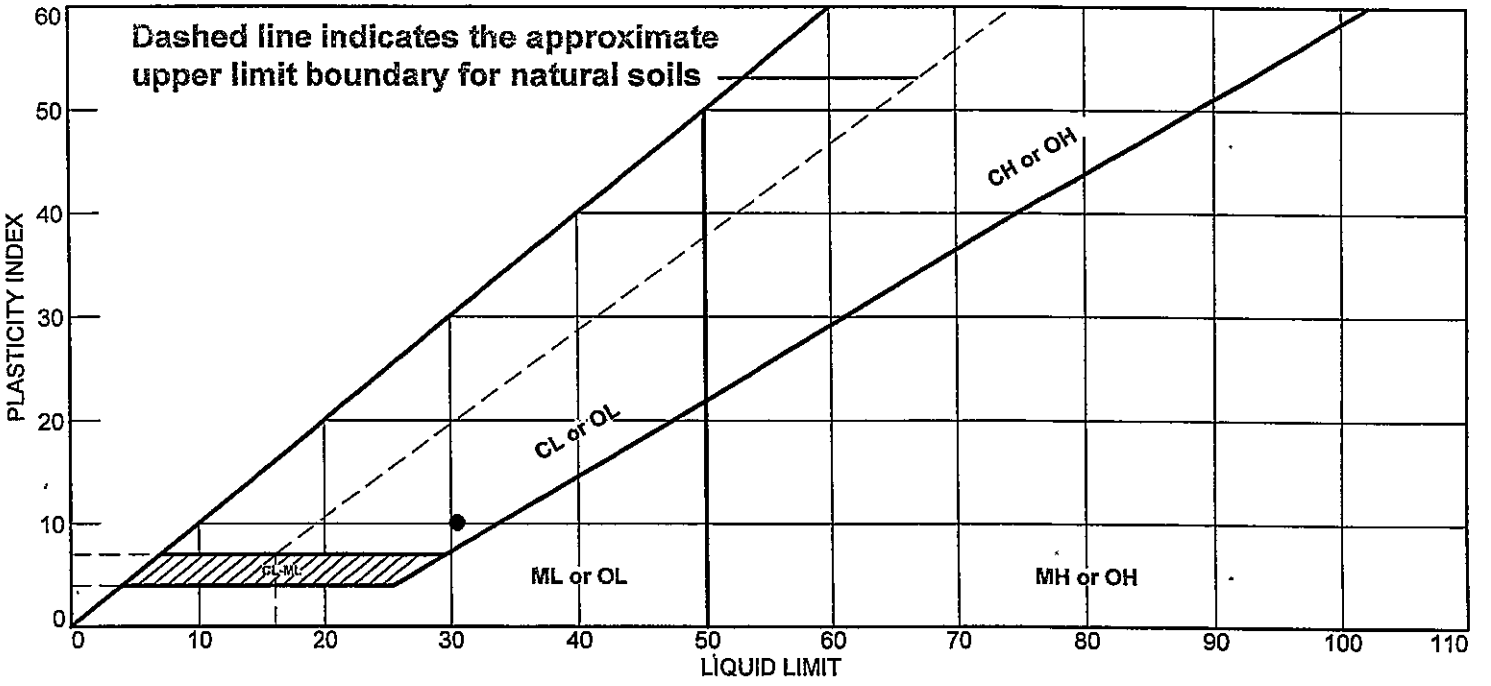
**ANS CONSULTANTS, INC.**

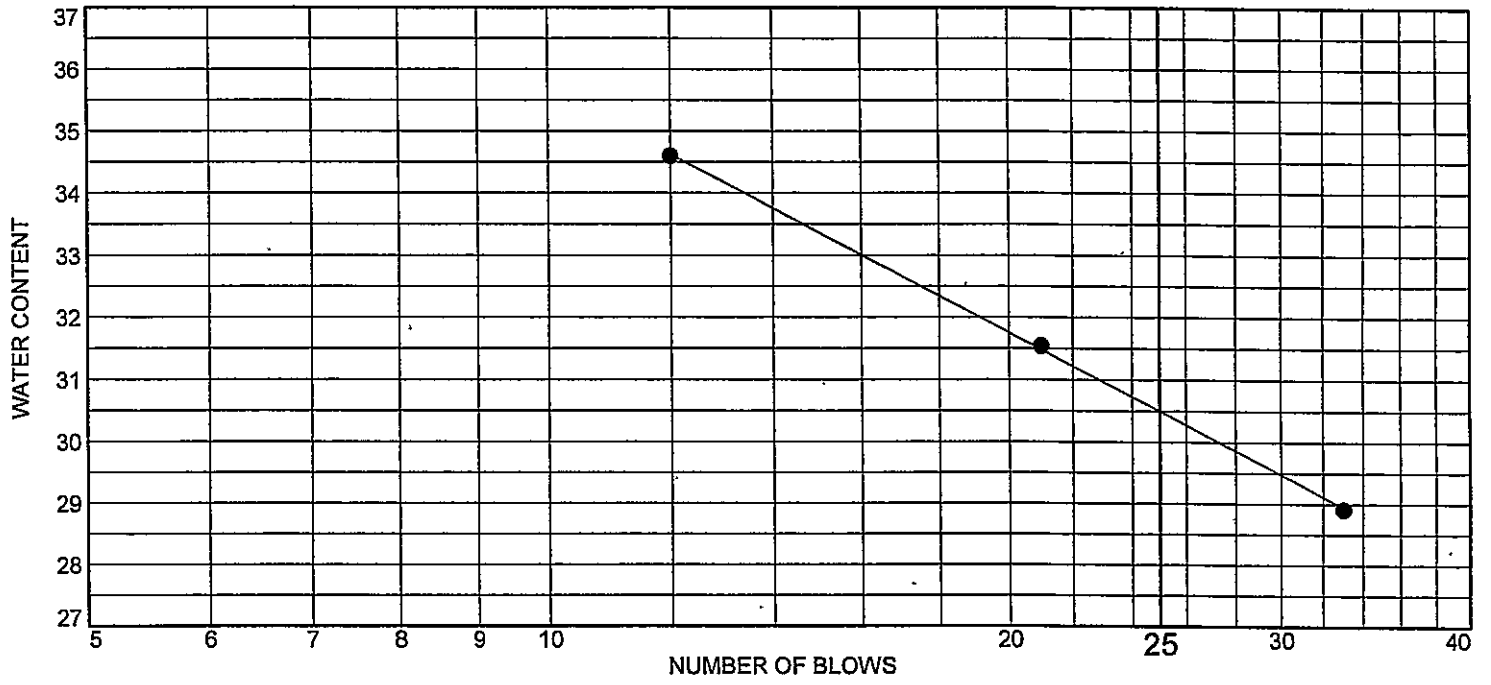
**South Plainfield, New Jersey**

**Remarks:**
● Moisture content 11.3%

**Figure 8 F 3**

# LIQUID AND PLASTIC LIMITS TEST REPORT




| | MATERIAL DESCRIPTION | LL | PL | PI | %<#40 | %<#200 | USCS |
|---|---|---|---|---|---|---|---|
| ● | | 30.5 | 20.4 | 10.1 | | | |

**Project No.** APX-2492 **Client:** Mott MacDonald

**Project:** Connect Gen South Ripley, South Ripley, NY

**Location:** B-8, S4, 6'-8'
**Sample Number:** S-9 **Depth:** 6'-8'

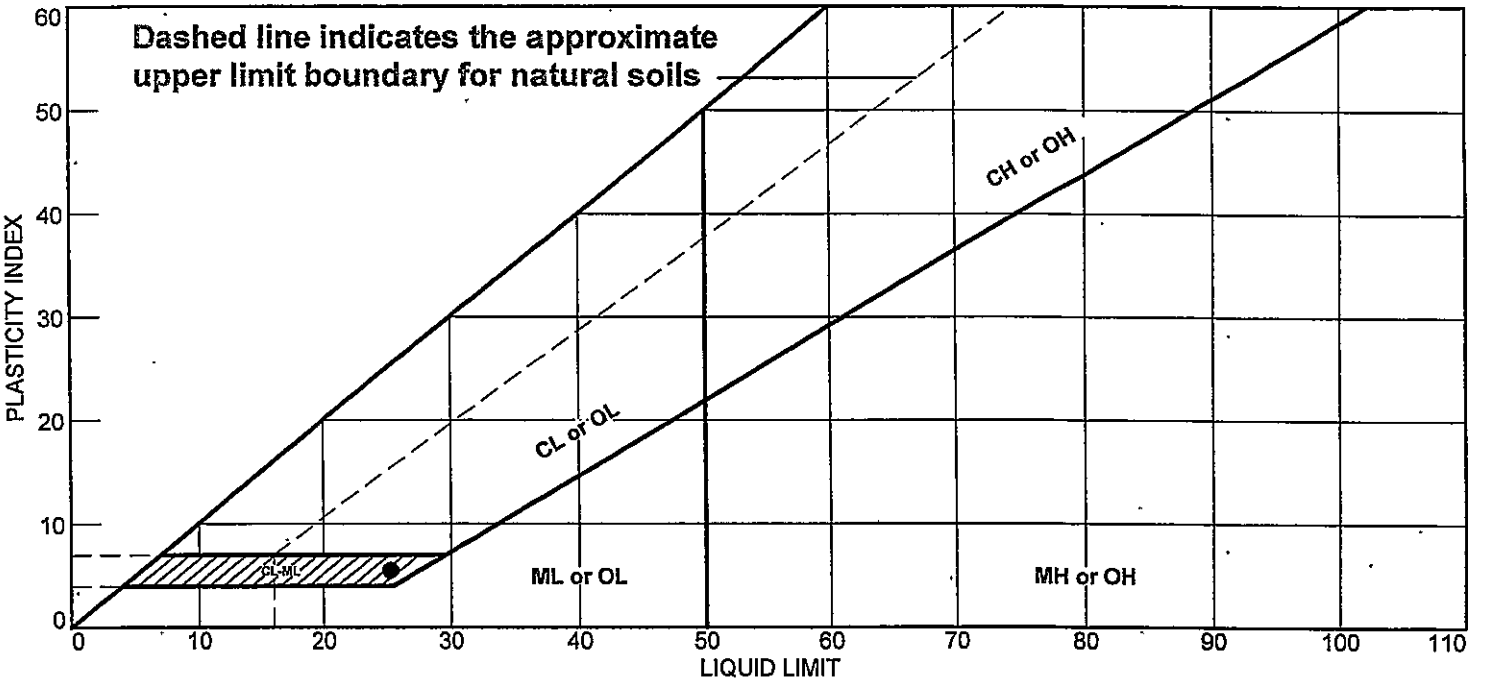
**ANS CONSULTANTS, INC.**

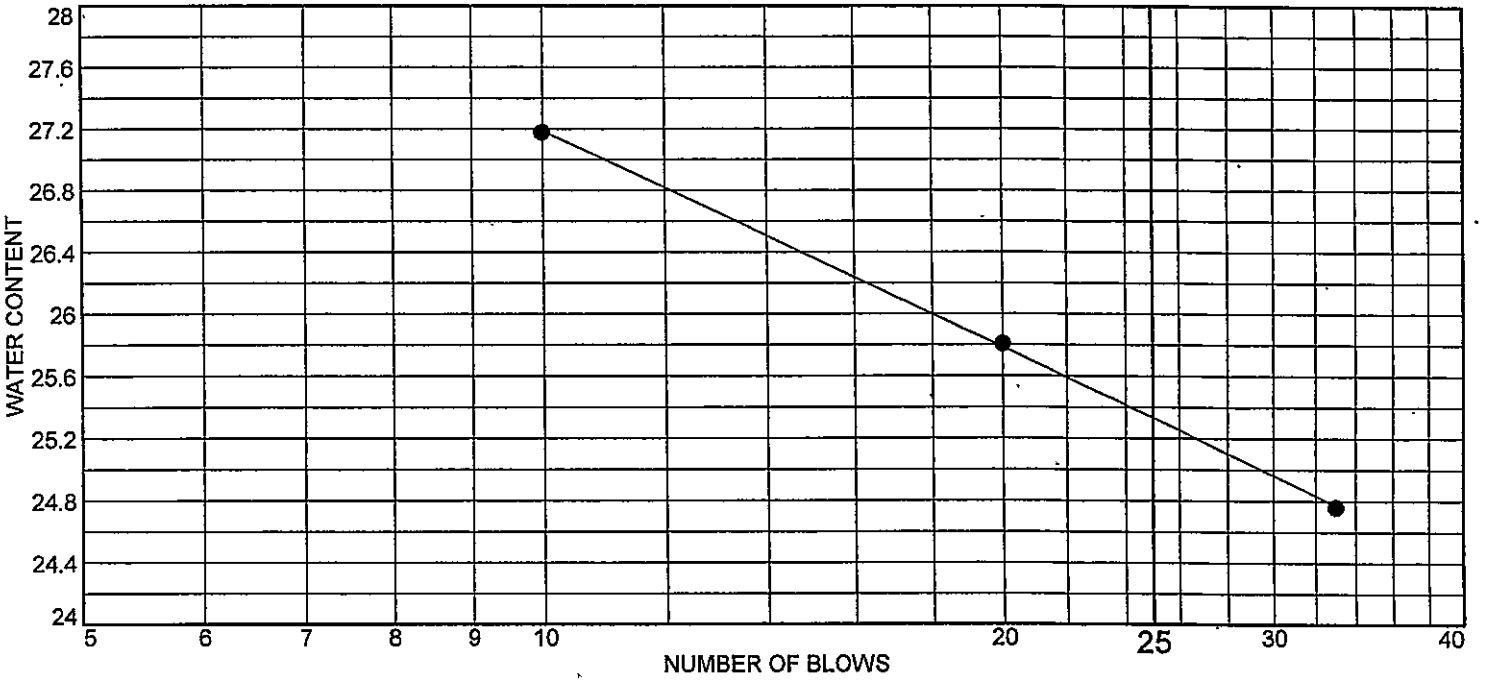
**South Plainfield, New Jersey**

**Remarks:**
● Moisture content 18.8%

**Figure 9 F 3**

# LIQUID AND PLASTIC LIMITS TEST REPORT




| | MATERIAL DESCRIPTION | LL | PL | PI | %<#40 | %<#200 | USCS |
|---|---|---|---|---|---|---|---|
| ● | | 25.3 | 19.8 | 5.5 | | | |

**Project No.** APX-2492 **Client:** Mott MacDonald

**Project:** Connect Gen South Ripley, South Ripley, NY

**Location:** B-10, S5, 8'-10'
**Sample Number:** S-10 **Depth:** 8'-10'

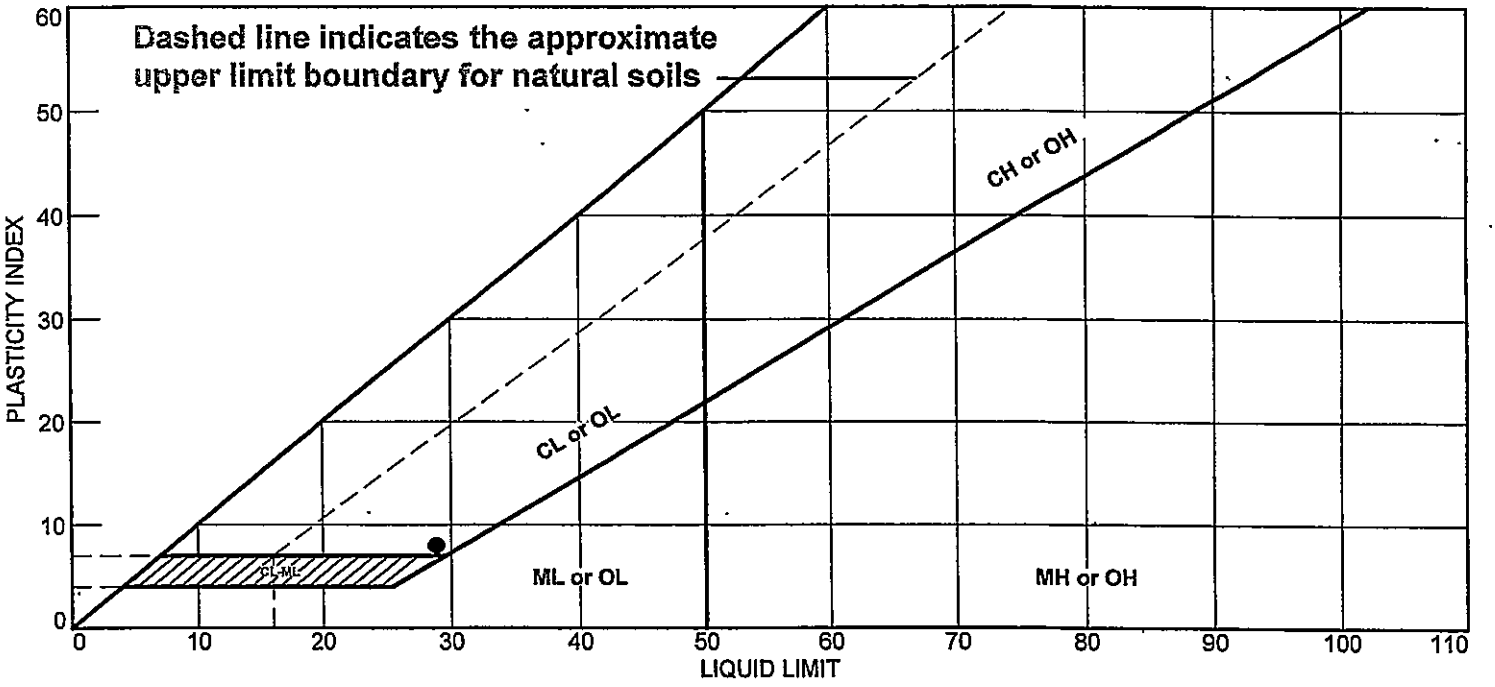
**ANS CONSULTANTS, INC.**

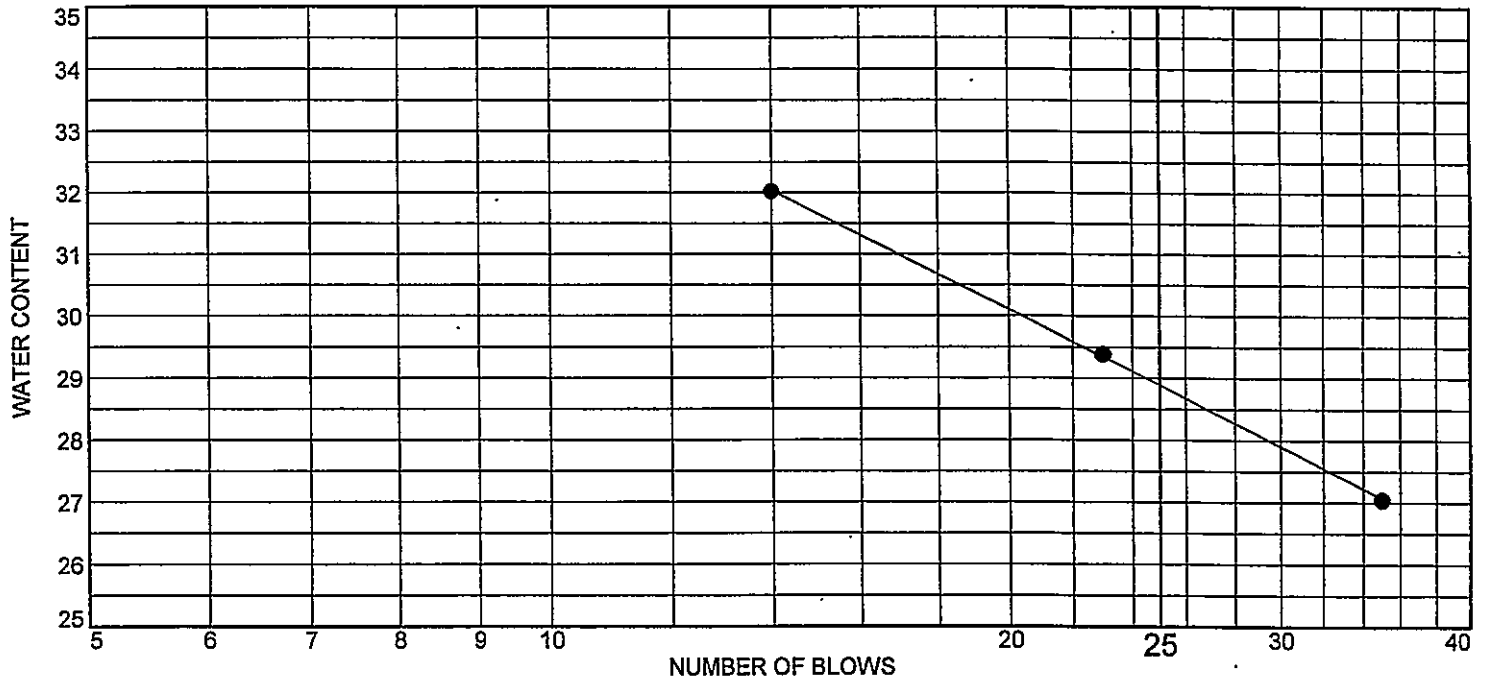
**South Plainfield, New Jersey**

**Remarks:**
● Moisture content 16.5%

**Figure 10 F 3**

# LIQUID AND PLASTIC LIMITS TEST REPORT




| | MATERIAL DESCRIPTION | LL | PL | PI | %<#40 | %<#200 | USCS |
|---|---|---|---|---|---|---|---|
| ● | | 28.9 | 20.9 | 8.0 | | | |

**Project No.** APX-2492 **Client:** Mott MacDonald

**Project:** Connect Gen South Ripley, South Ripley, NY

**Location:** B-14, S3, 4'-6'
**Sample Number:** S-11 **Depth:** 4'-6'

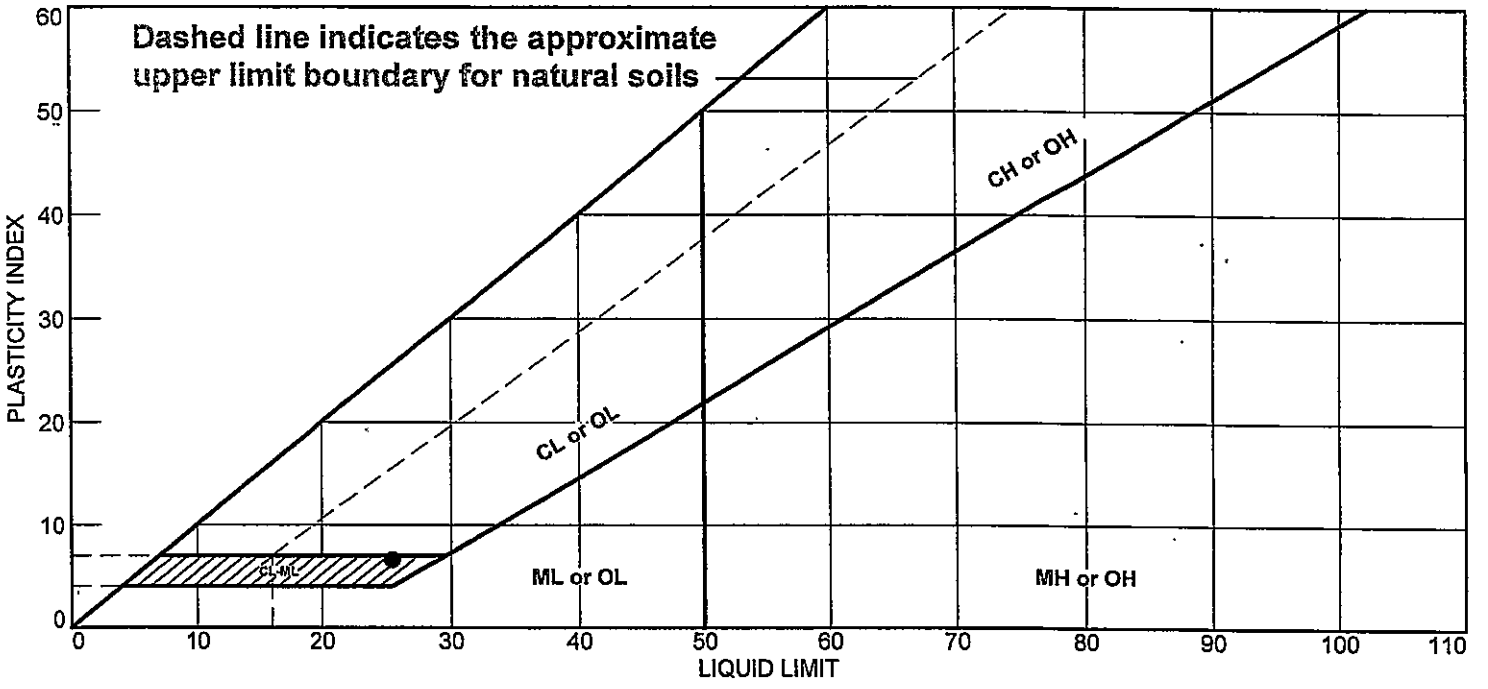
**ANS CONSULTANTS, INC.**

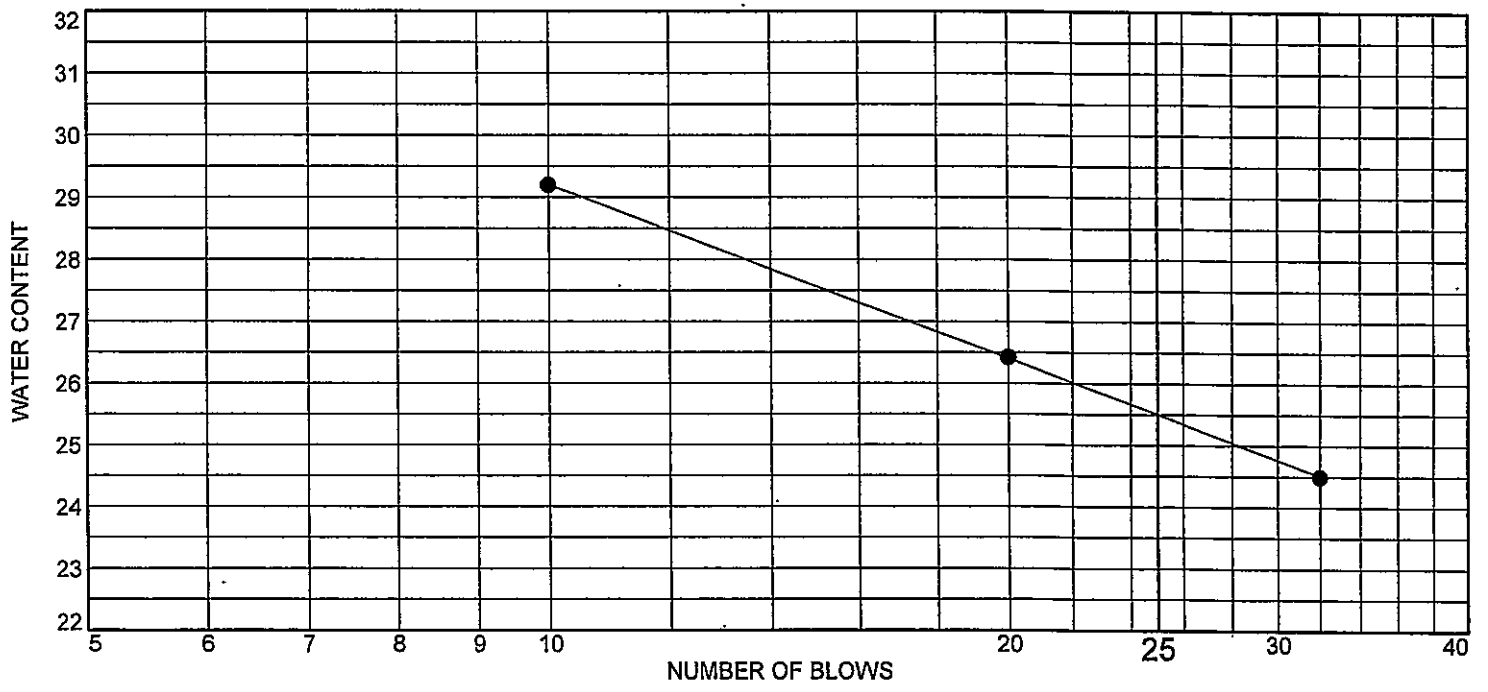
**South Plainfield, New Jersey**

**Remarks:**
● Moisture content 11.5%

**Figure 11 F 3**

# LIQUID AND PLASTIC LIMITS TEST REPORT




| | MATERIAL DESCRIPTION | LL | PL | PI | %<#40 | %<#200 | USCS |
|---|---|---|---|---|---|---|---|
| ● | | 25.5 | 18.9 | 6.6 | | | |

**Project No.** APX-2492 **Client:** Mott MacDonald

**Project:** Connect Gen South Ripley, South Ripley, NY

**Location:** B-16, S2, 2'-4'
**Sample Number:** S-12 **Depth:** 2'-4'

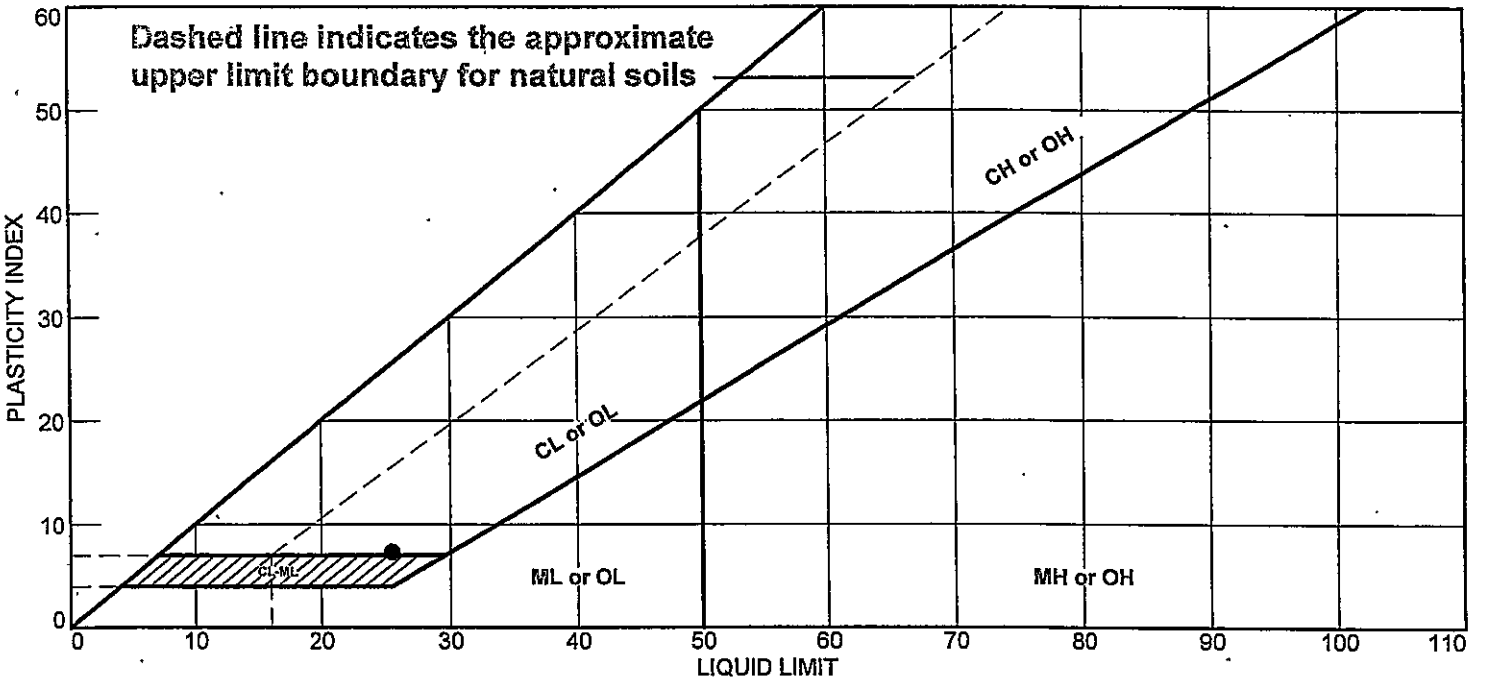
**ANS CONSULTANTS, INC.**

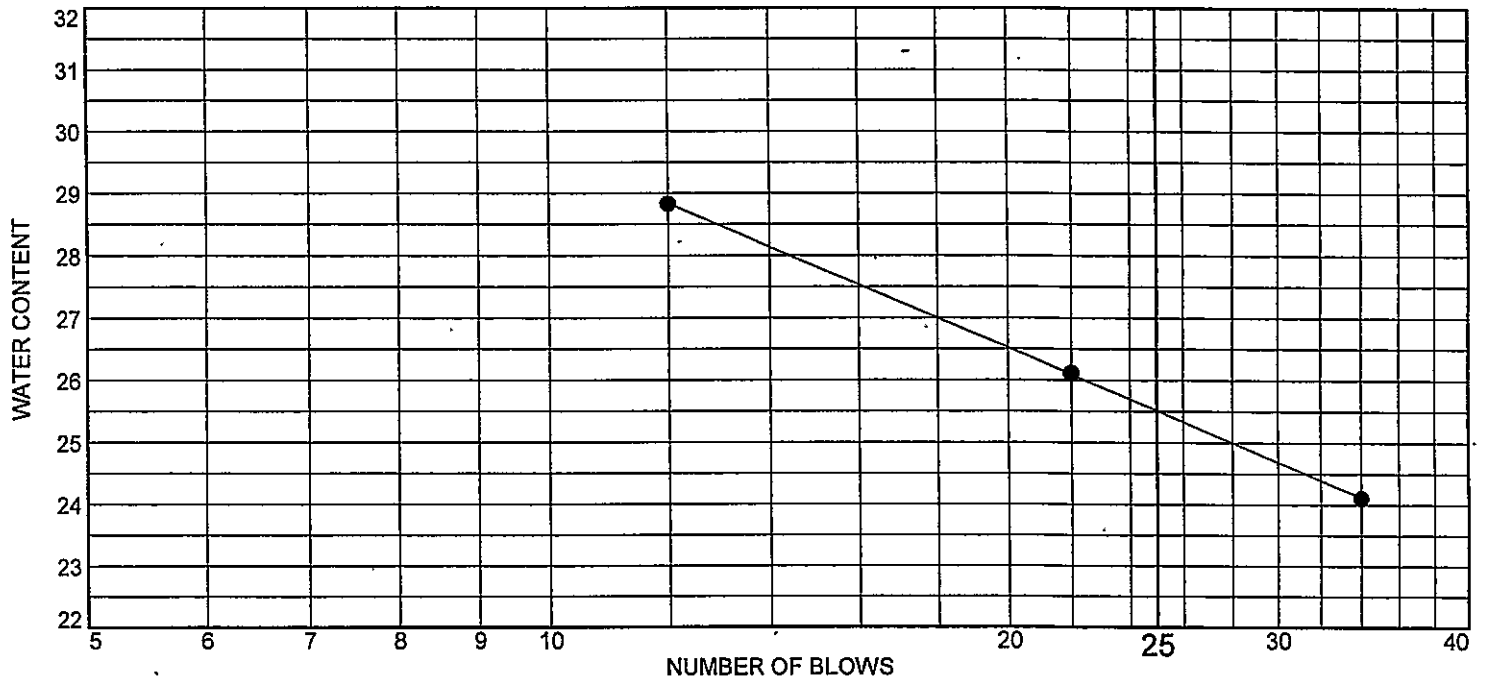
**South Plainfield, New Jersey**

**Remarks:**
● Moisture content 13.4%

**Figure 12 F 3**

# LIQUID AND PLASTIC LIMITS TEST REPORT




| | MATERIAL DESCRIPTION | LL | PL | PI | %<#40 | %<#200 | USCS |
|---|---|---|---|---|---|---|---|
| ● | | 25.5 | 18.2 | 7.3 | | | |

**Project No.** APX-2492 **Client:** Mott MacDonald

**Project:** Connect Gen South Ripley, South Ripley, NY

**Location:** B-17, S4, 6'-8'
**Sample Number:** S-13 **Depth:** 6'-8'

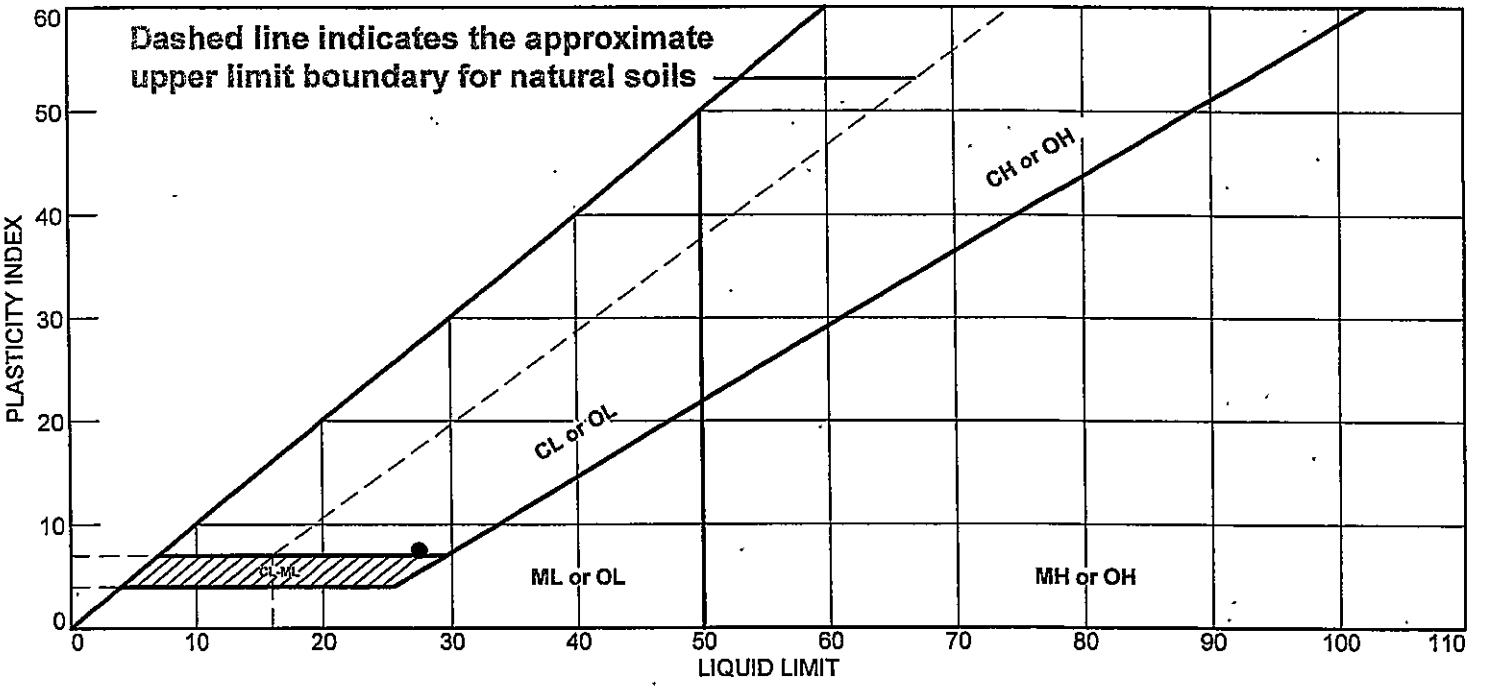
**ANS CONSULTANTS, INC.**

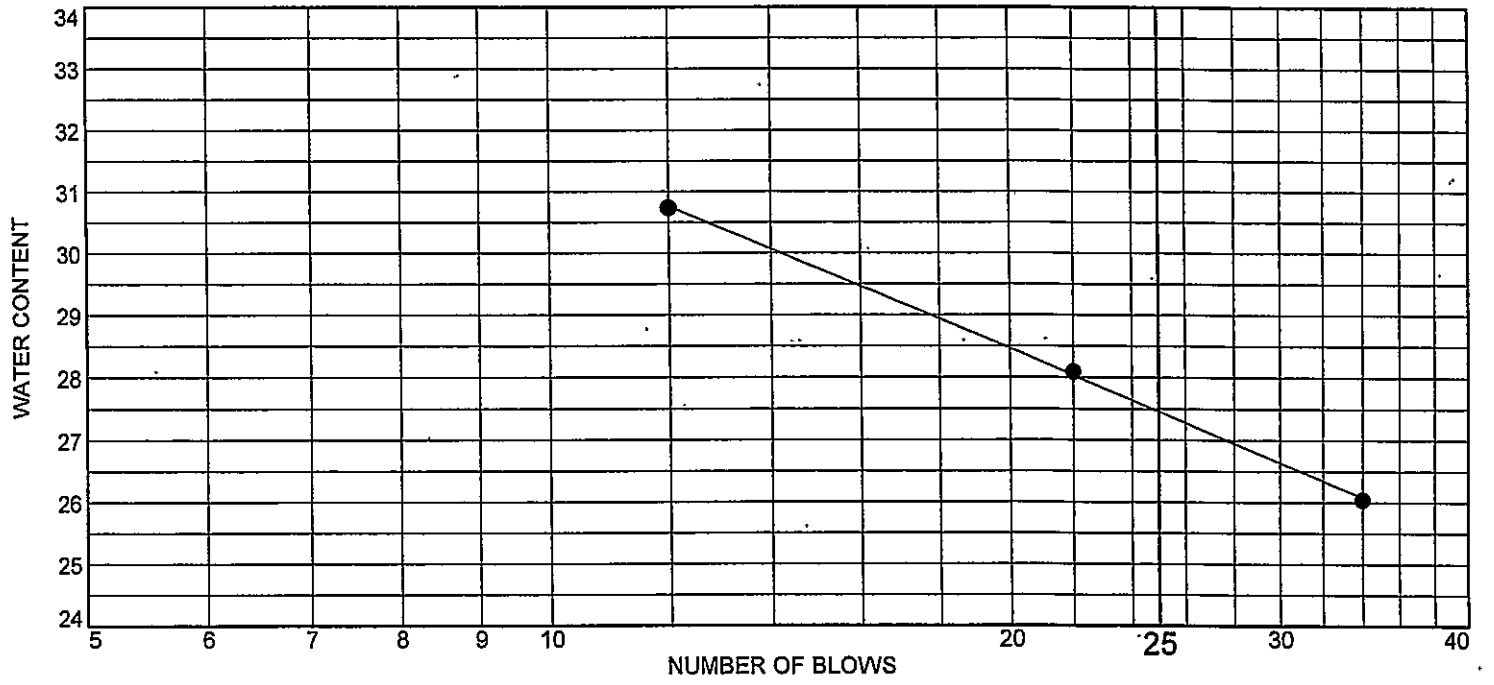
**South Plainfield, New Jersey**

**Remarks:**
● Moistur content 12.5%

**Figure 13 F 3**

# LIQUID AND PLASTIC LIMITS TEST REPORT




| | MATERIAL DESCRIPTION | LL | PL | PI | %<#40 | %<#200 | USCS |
|---|---|---|---|---|---|---|---|
| ● | | 27.5 | 20.0 | 7.5 | | | |

**Project No.** APX-2492 **Client:** Mott MacDonald

**Project:** Connect Gen South Ripley, South Ripley, NY

**Location:** B-21, S5, 8'-10'
**Sample Number:** S-14 **Depth:** 8'-10'

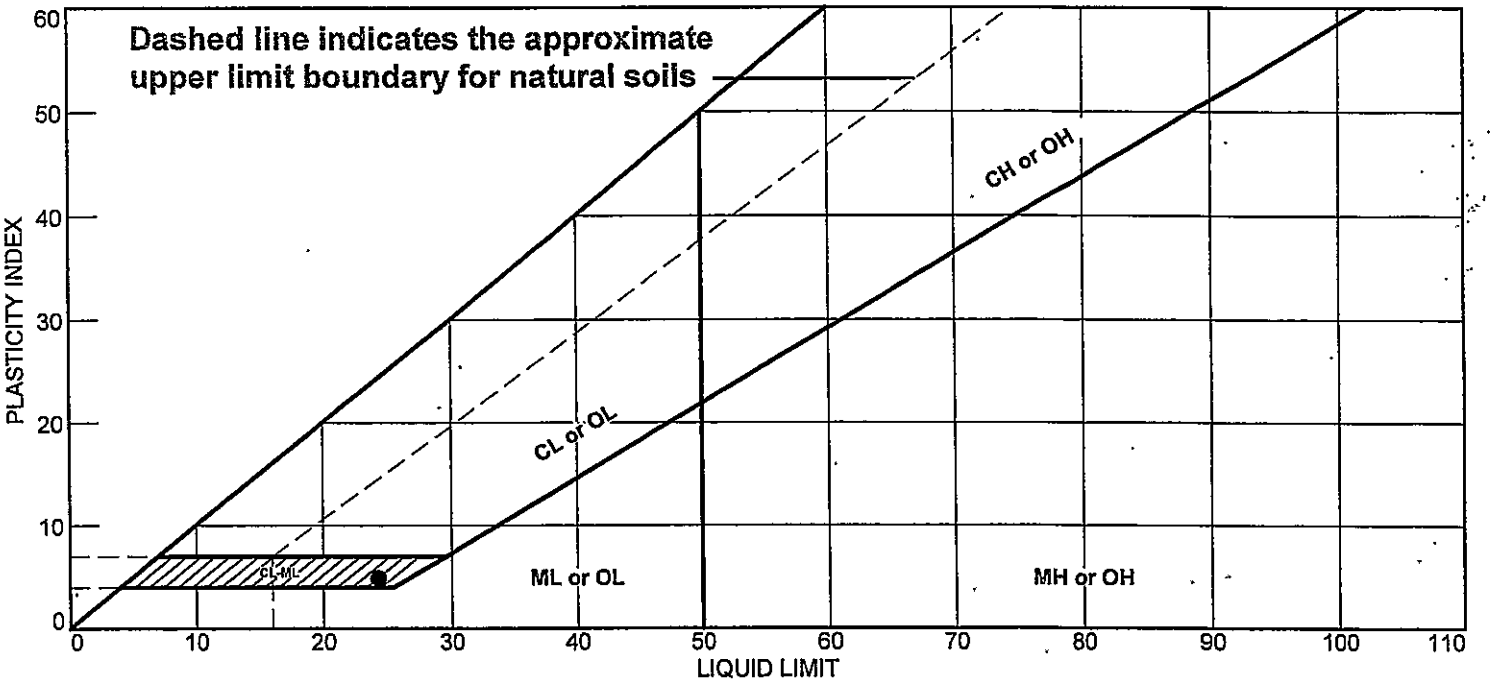
**ANS CONSULTANTS, INC.**

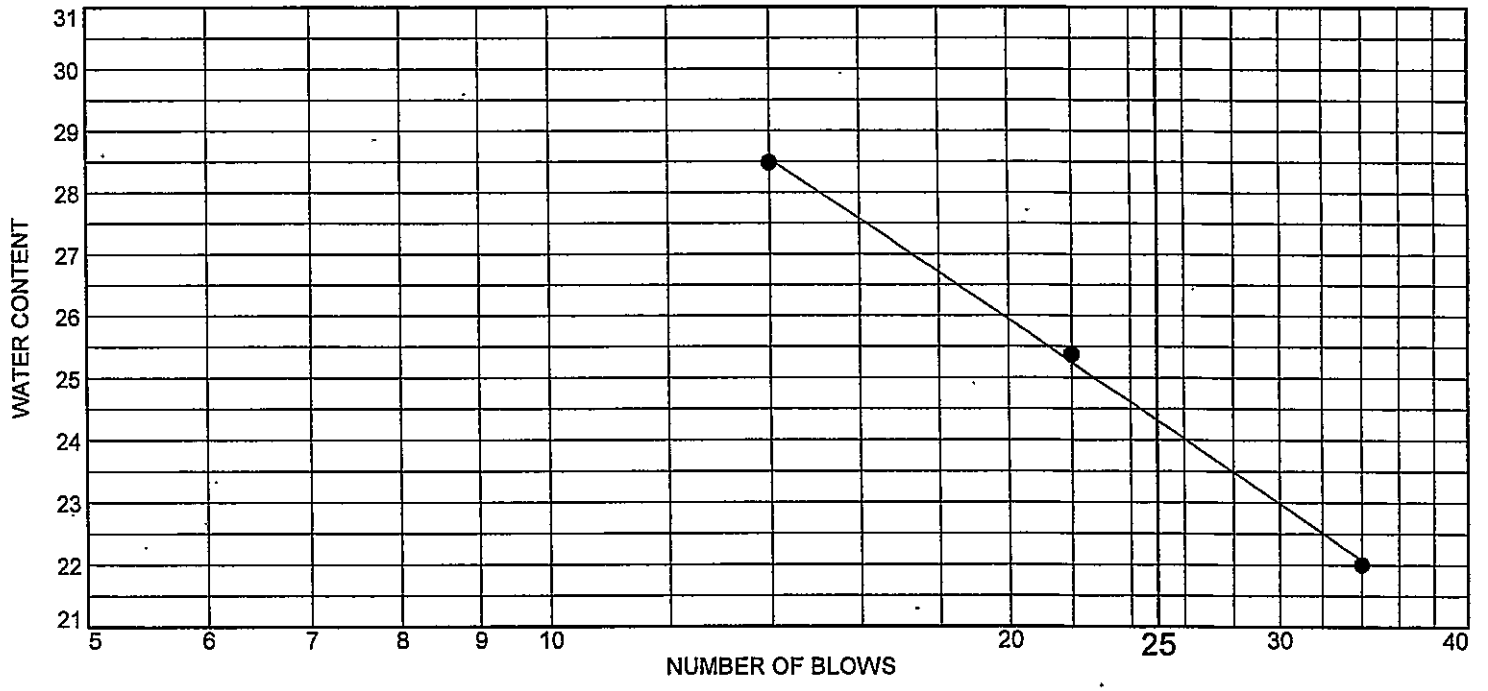
**South Plainfield, New Jersey**

**Remarks:**
● Moisture content 11.5%

**Figure 14 F 3**

# LIQUID AND PLASTIC LIMITS TEST REPORT




| | MATERIAL DESCRIPTION | LL | PL | PI | %<#40 | %<#200 | USCS |
|---|---|---|---|---|---|---|---|
| ● | | 24.3 | 19.4 | 4.9 | | | |

**Project No.** APX-2492 **Client:** Mott MacDonald

**Project:** Connect Gen South Ripley, South Ripley, NY

**Location:** B-24, S-5, 8'-10'
**Sample Number:** S-15 **Depth:** 8'-10'

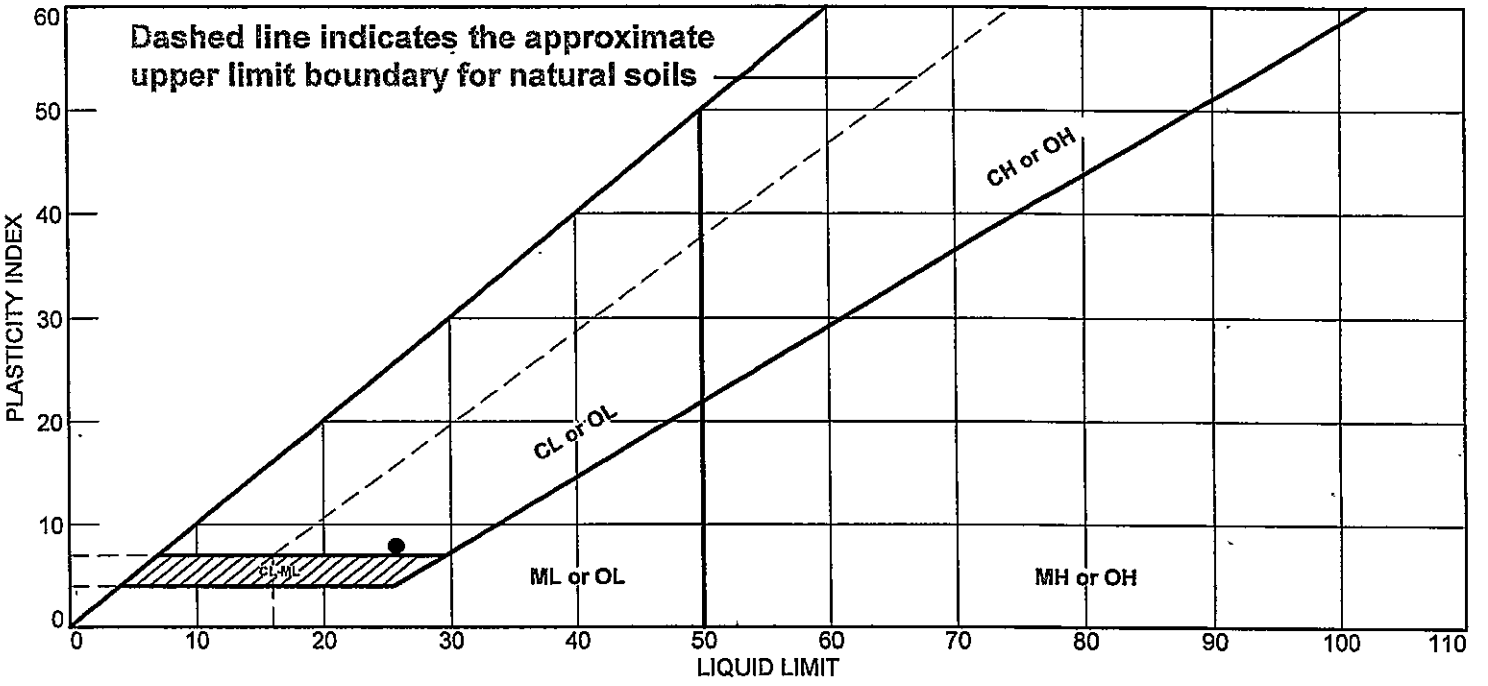
**ANS CONSULTANTS, INC.**

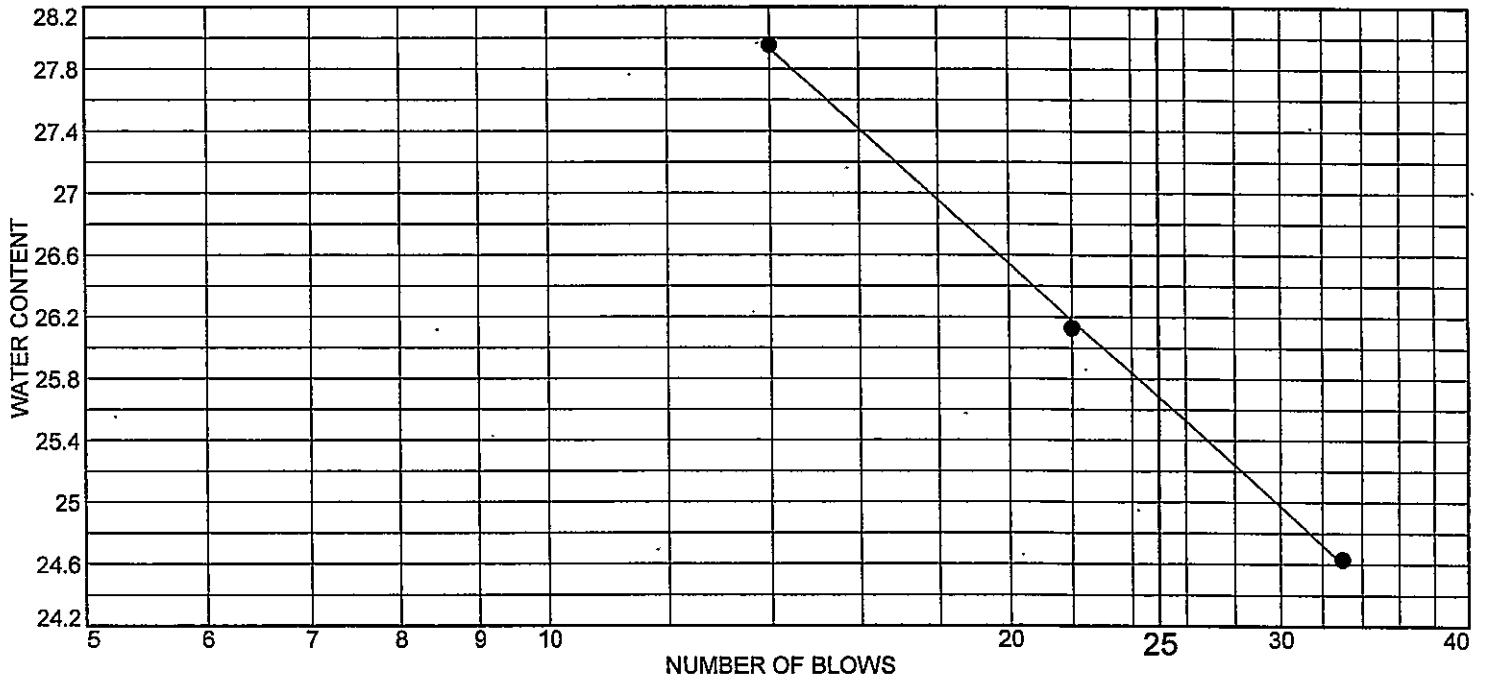
**South Plainfield, New Jersey**

**Remarks:**
● Moisture conten 8.7%

**Figure 15 F 3**

# LIQUID AND PLASTIC LIMITS TEST REPORT




| | MATERIAL DESCRIPTION | LL | PL | PI | %<#40 | %<#200 | USCS |
|---|---|---|---|---|---|---|---|
| ● | | 25.7 | 17.8 | 7.9 | | | |

**Project No.** APX-2492 **Client:** Mott MacDonald

**Project:** Connect Gen South Ripley, South Ripley, NY

**Location:** B-25, S3, 4'-6'
**Sample Number:** S-16 **Depth:** 4'-6'

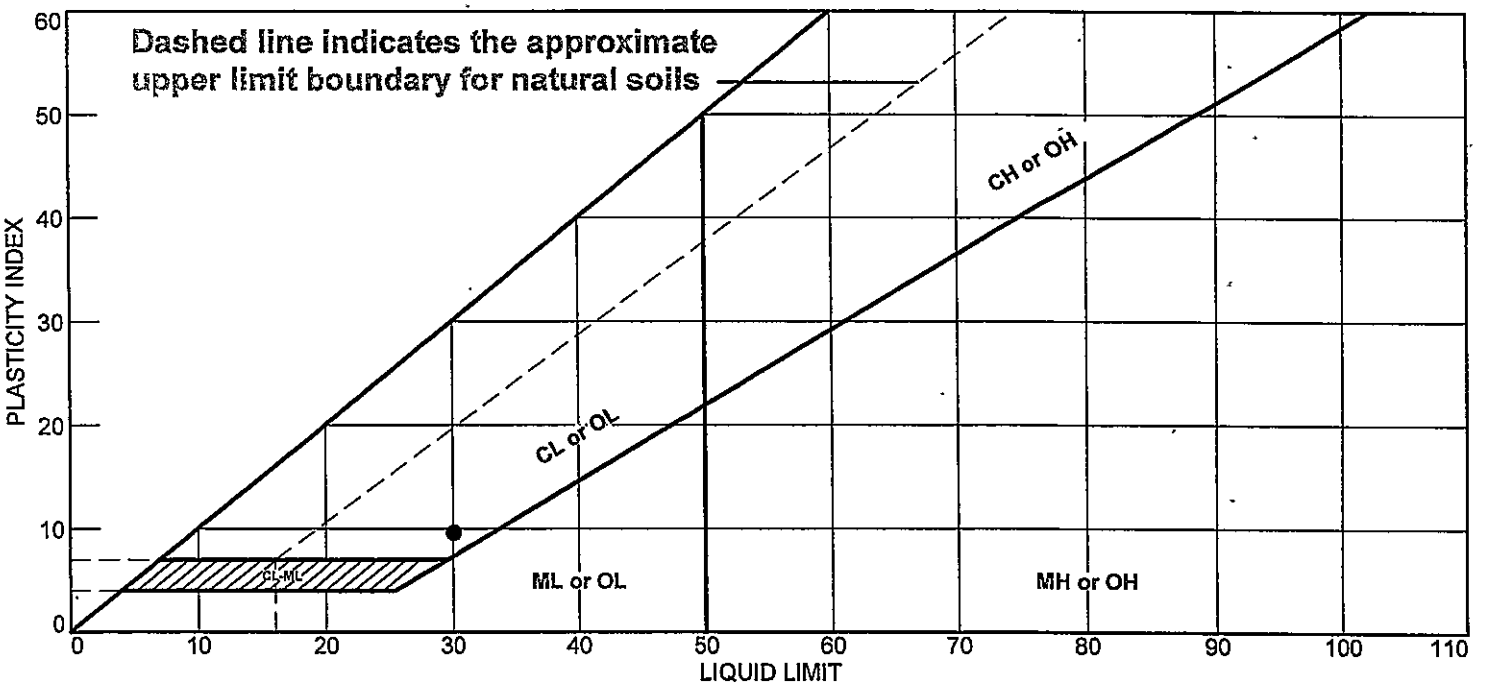
**ANS CONSULTANTS, INC.**

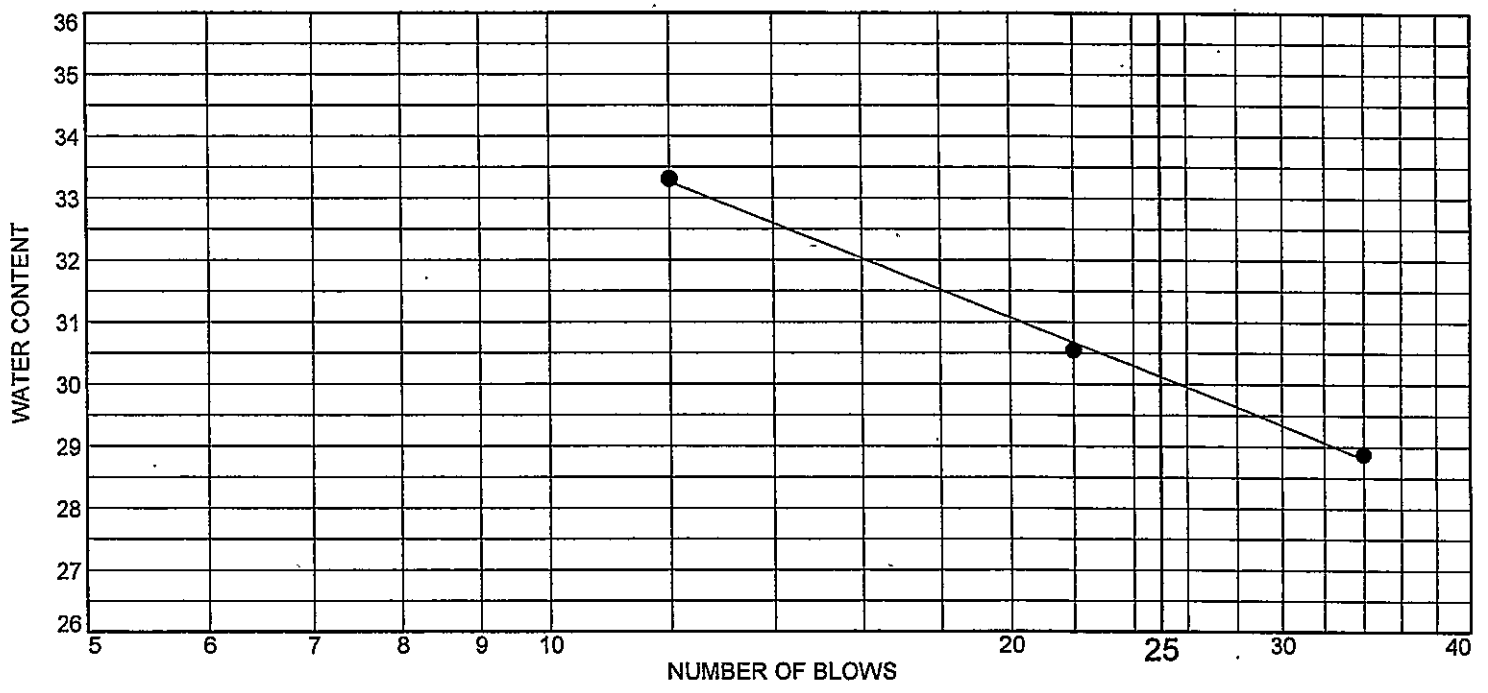
**South Plainfield, New Jersey**

**Remarks:**
● Moisture content 16.9%

**Figure 16 F 3**

# LIQUID AND PLASTIC LIMITS TEST REPORT




| | MATERIAL DESCRIPTION | LL | PL | PI | %<#40 | %<#200 | USCS |
|---|---|---|---|---|---|---|---|
| ● | | 30.1 | 20.5 | 9.6 | | | |

**Project No.** APX-2492 **Client:** Mott MacDonald

**Project:** Connect Gen South Ripley, South Ripley, NY

**Location:** B-30, S-3, 4'-6'
**Sample Number:** S-17 **Depth:** 4'-6'

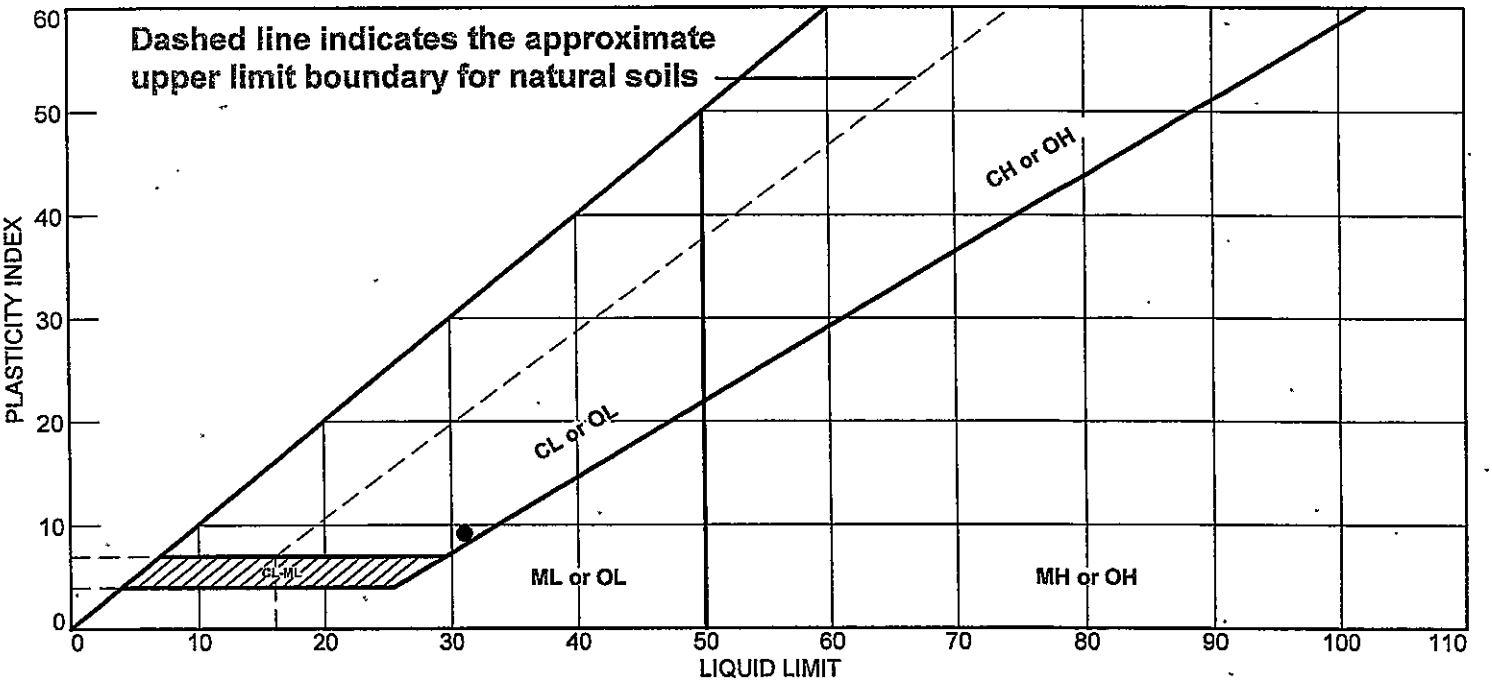
**ANS CONSULTANTS, INC.**

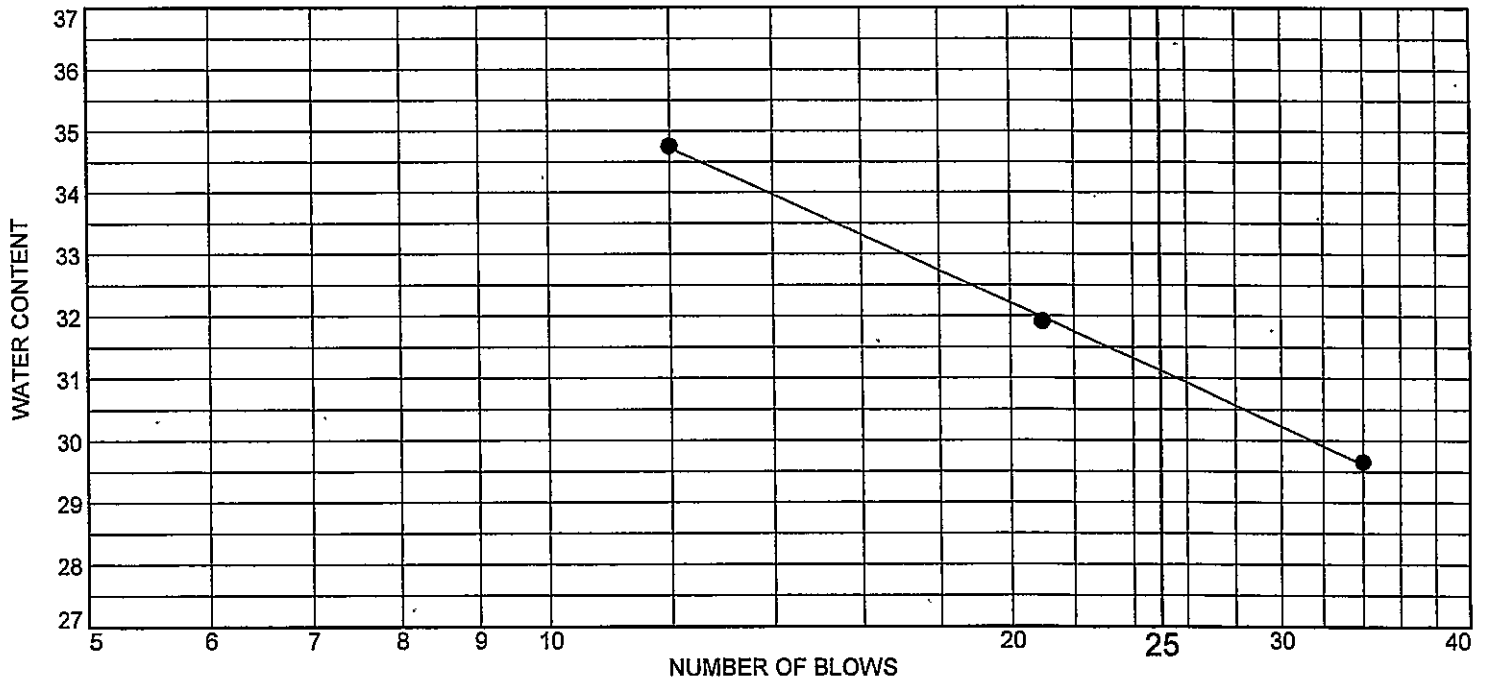
**South Plainfield, New Jersey**

**Remarks:**
● Moisture content 19.8%

**Figure 17 F 3**

# LIQUID AND PLASTIC LIMITS TEST REPORT




| | MATERIAL DESCRIPTION | LL | PL | PI | %<#40 | %<#200 | USCS |
|---|---|---|---|---|---|---|---|
| ● | | 31.1 | 21.9 | 9.2 | | | |

**Project No.** APX-2492 **Client:** Mott MacDonald

**Project:** Connect Gen South Ripley, South Ripley, NY

**Location:** B-31, S2, 2'-4'
**Sample Number:** S-1.8 **Depth:** 2'-4'

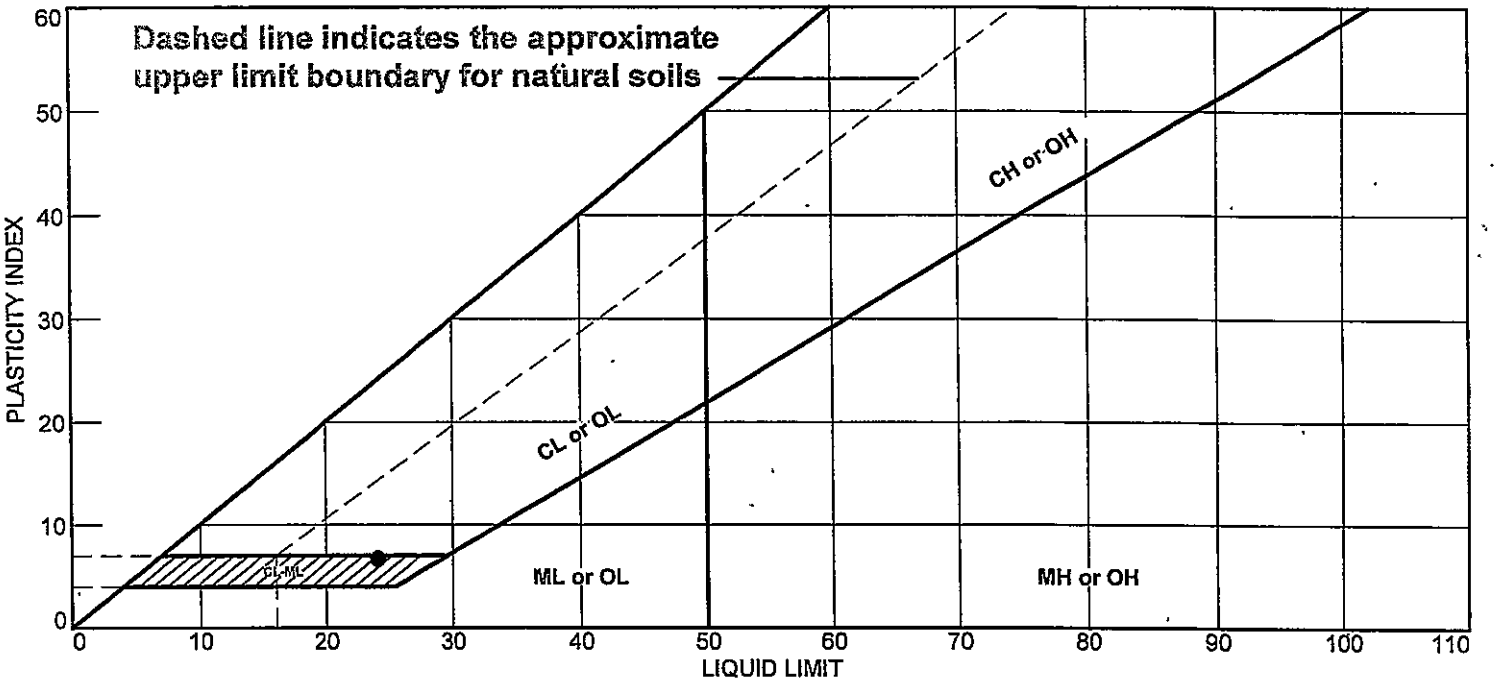
**ANS CONSULTANTS, INC.**

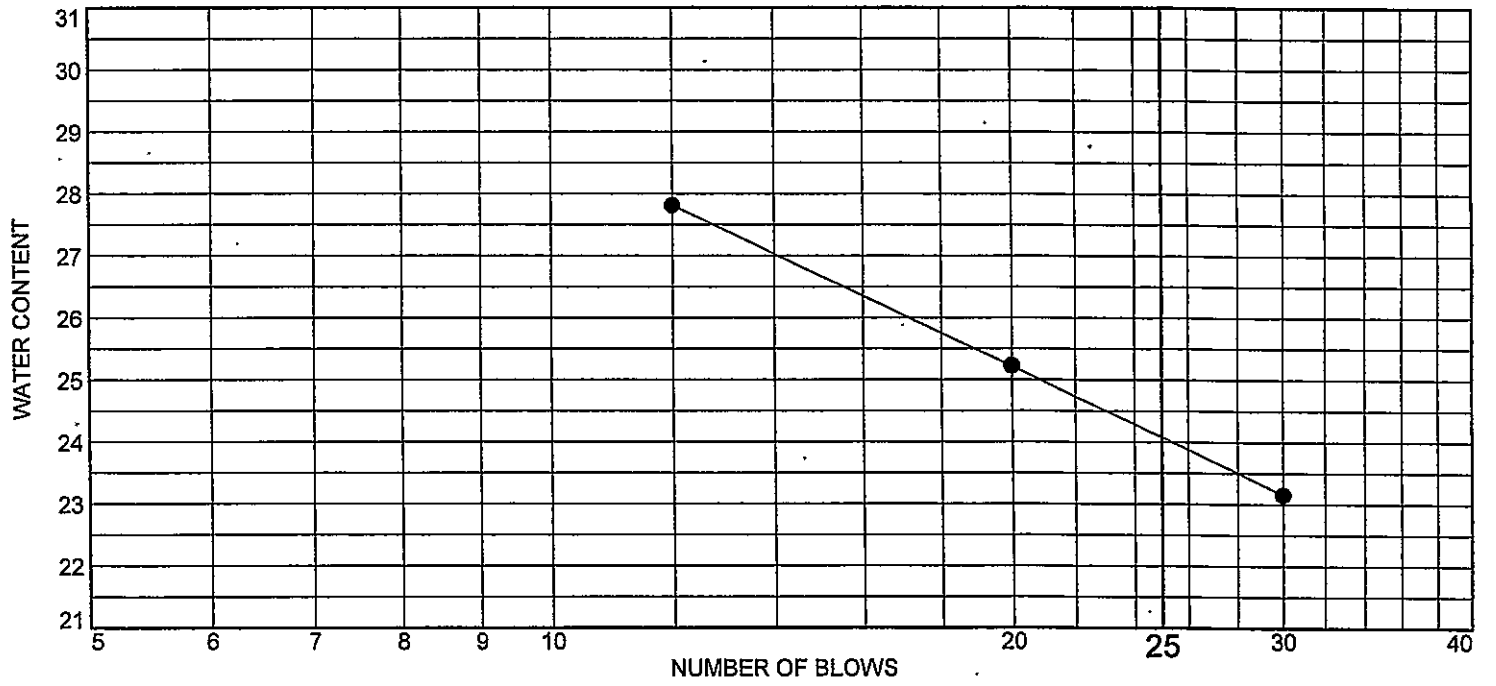
**South Plainfield, New Jersey**

**Remarks:**
● Moisture content 15.7%

**Figure 18 F 3**

# LIQUID AND PLASTIC LIMITS TEST REPORT




| | MATERIAL DESCRIPTION | LL | PL | PI | %<#40 | %<#200 | USCS |
|---|---|---|---|---|---|---|---|
| ● | | 24.1 | 17.4 | 6.7 | | | |

**Project No.** APX-2492 **Client:** Mott MacDonald

**Project:** Connect Gen South Ripley, South Ripley, NY

**Location:** B-35, S3, 4'-6'
**Sample Number:** S-19 **Depth:** 4'-6'

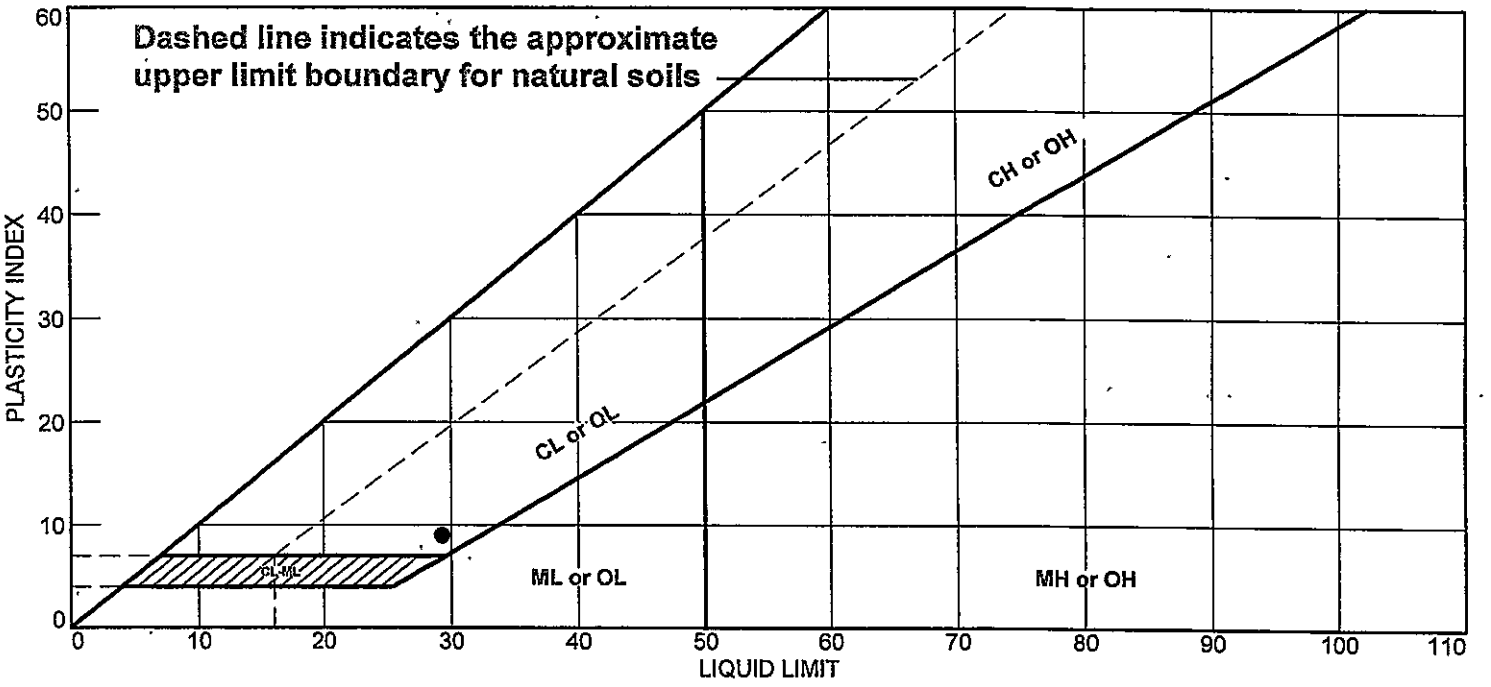
**ANS CONSULTANTS, INC.**

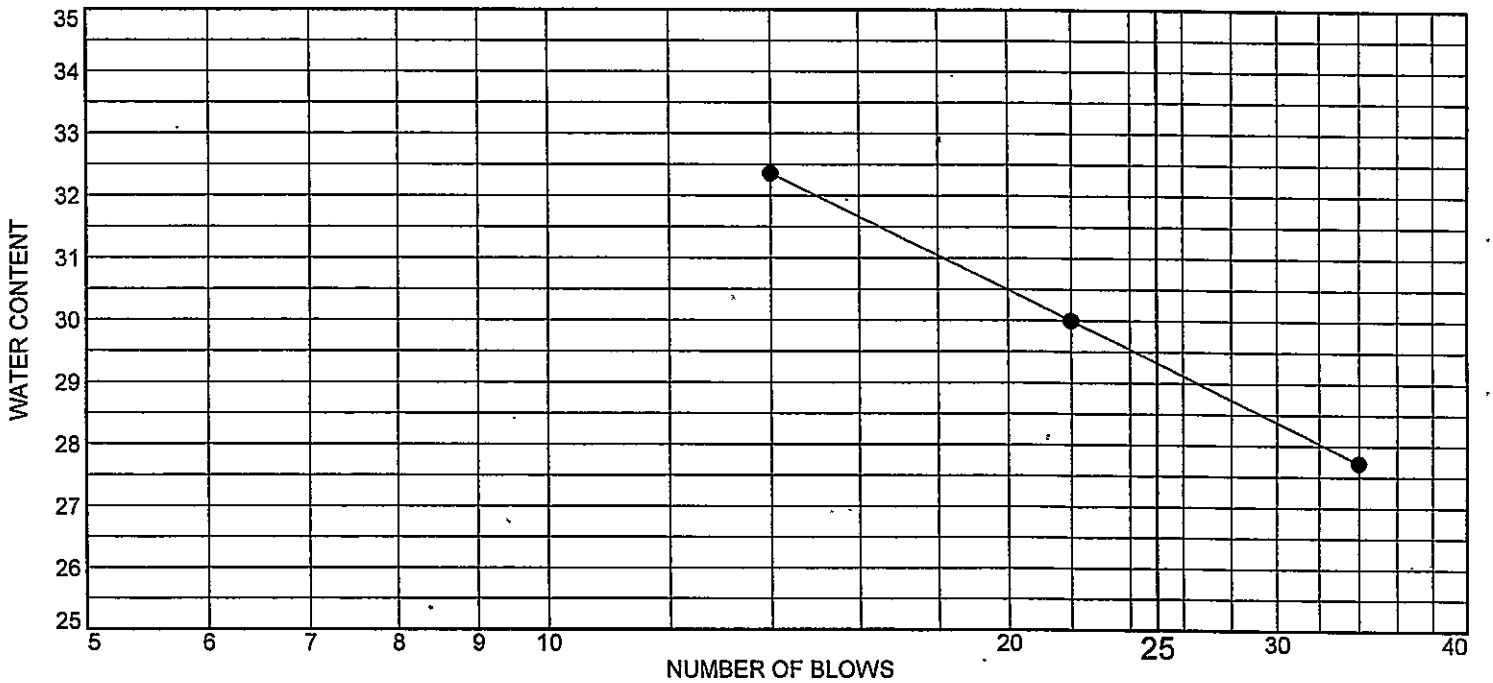
**South Plainfield, New Jersey**

**Remarks:**
● Moisture content 10.7%

**Figure 19 F 3**

# LIQUID AND PLASTIC LIMITS TEST REPORT




| | MATERIAL DESCRIPTION | LL | PL | PI | %<#40 | %<#200 | USCS |
|---|---|---|---|---|---|---|---|
| ● | | 29.3 | 20.3 | 9.0 | | | |

**Project No.** APX-2492 **Client:** Mott MacDonald

**Project:** Connect Gen South Ripley, South Ripley, NY

**Location:** B-40, S-5, 8'-10'
**Sample Number:** S-20 **Depth:** 8'-10'

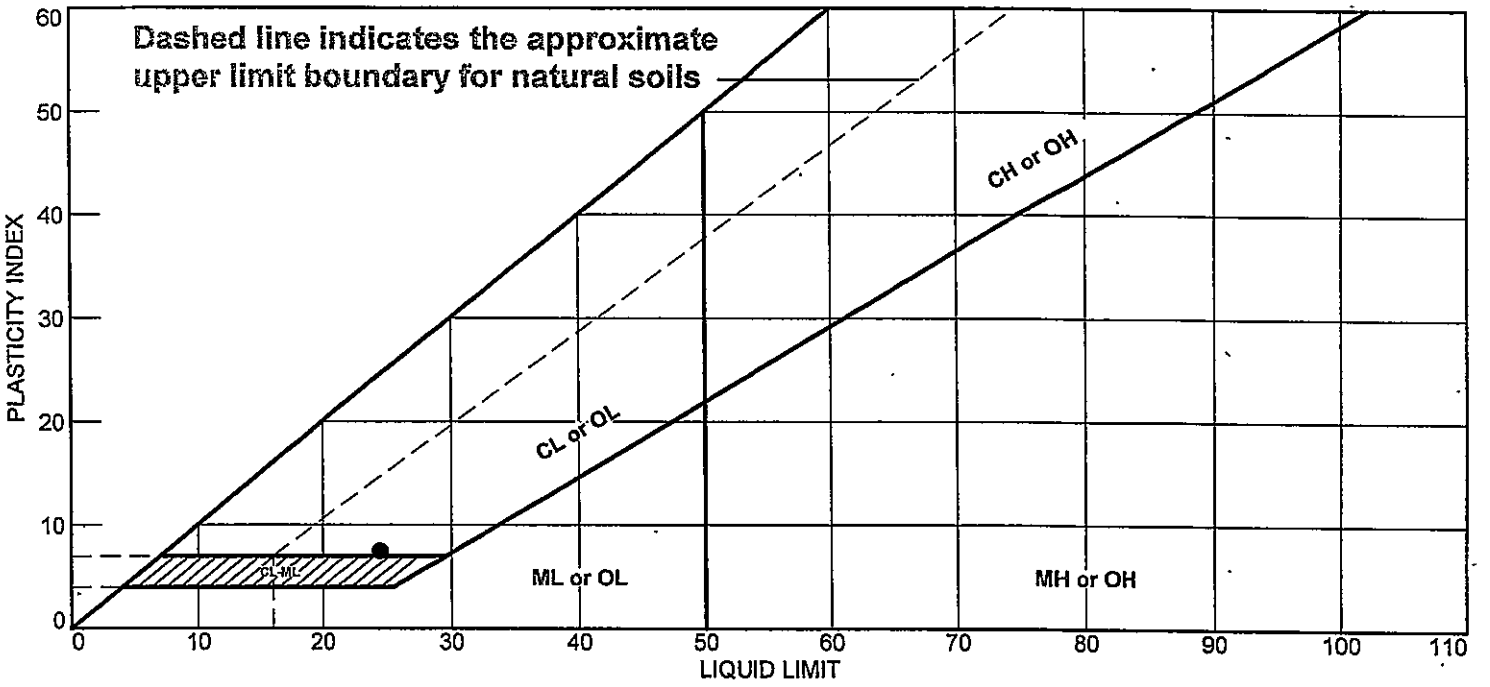
**ANS CONSULTANTS, INC.**

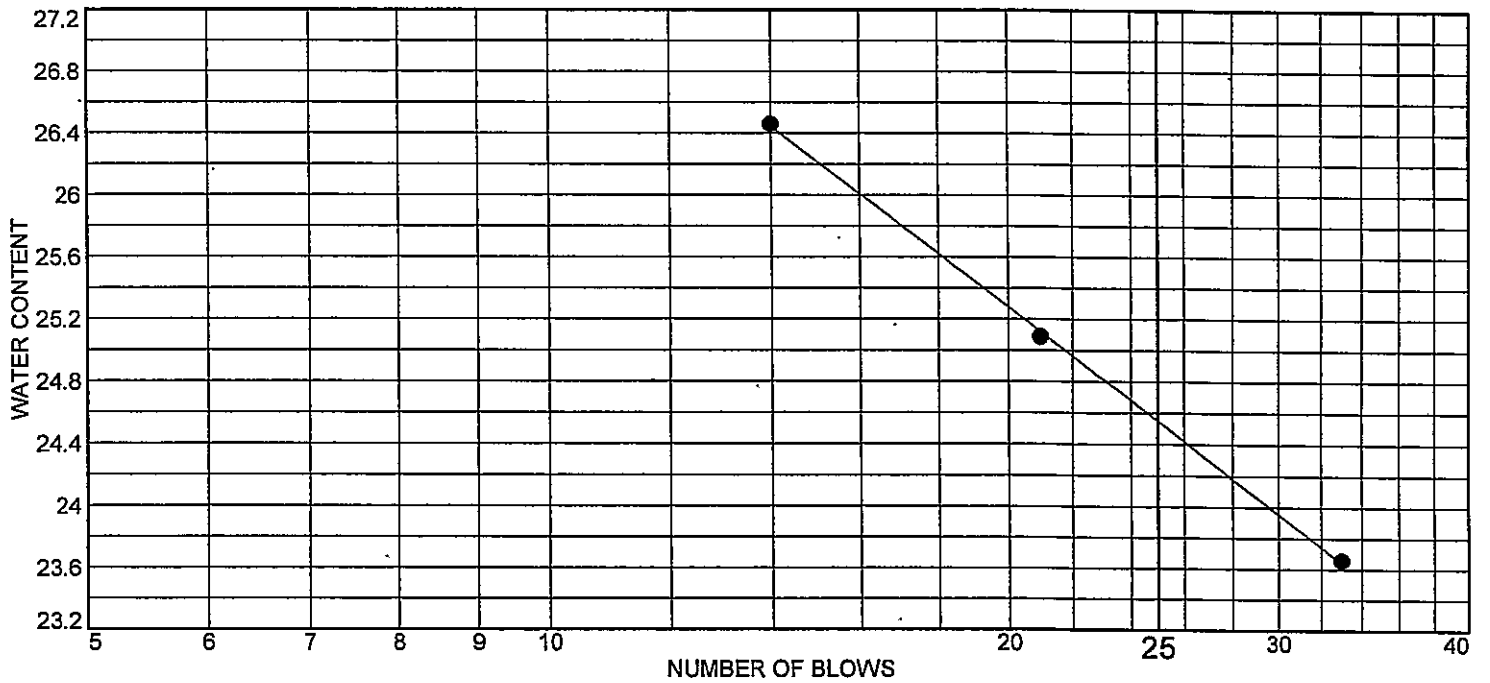
**South Plainfield, New Jersey**

**Remarks:**
● Moisture content 15.4%

**Figure 20 F 3**

# LIQUID AND PLASTIC LIMITS TEST REPORT




| | MATERIAL DESCRIPTION | LL | PL | PI | %<#40 | %<#200 | USCS |
|---|---|---|---|---|---|---|---|
| ● | | 24.5 | 17.0 | 7.5 | | | |

**Project No.** APX-2492 **Client:** Mott MacDonald

**Project:** Connect Gen South Ripley, South Ripley, NY

**Location:** B-42, S4, 6'-8'
**Sample Number:** S-21 **Depth:** 6'-8'

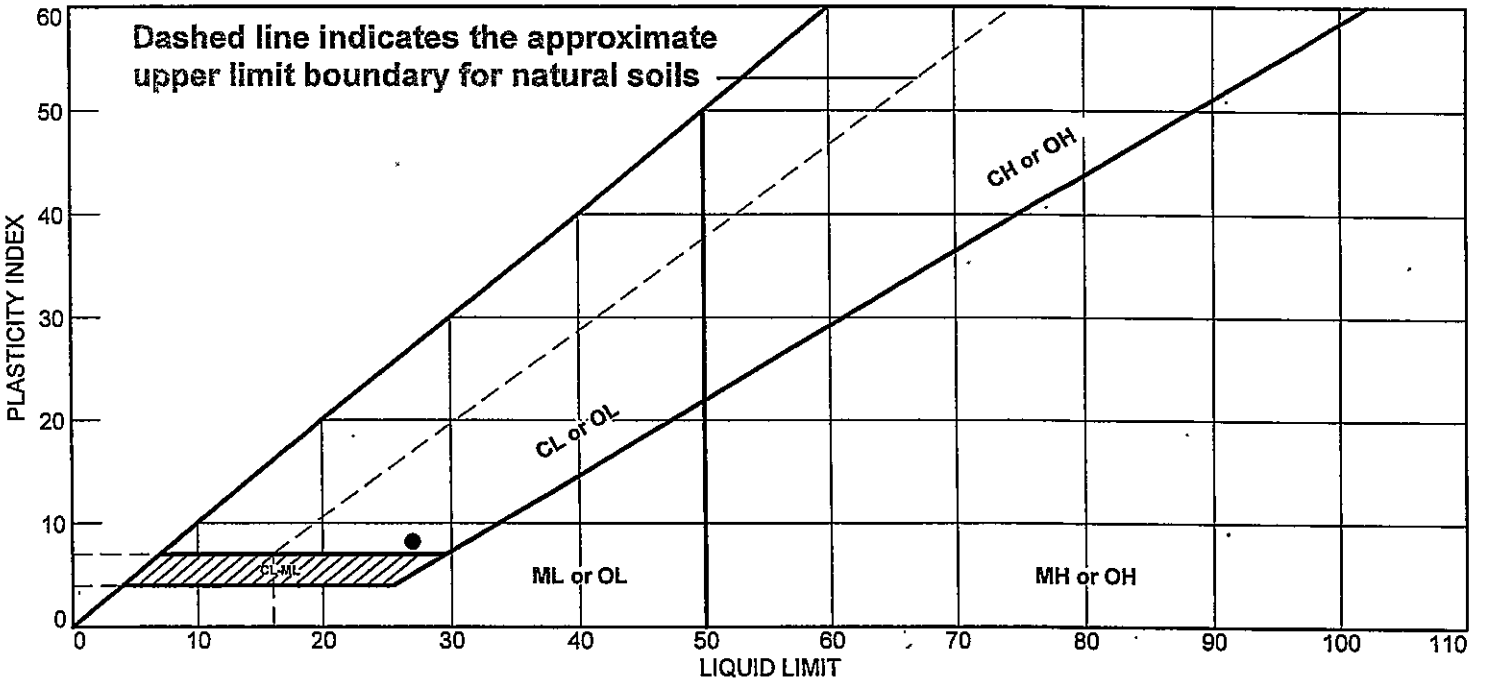
**ANS CONSULTANTS, INC.**

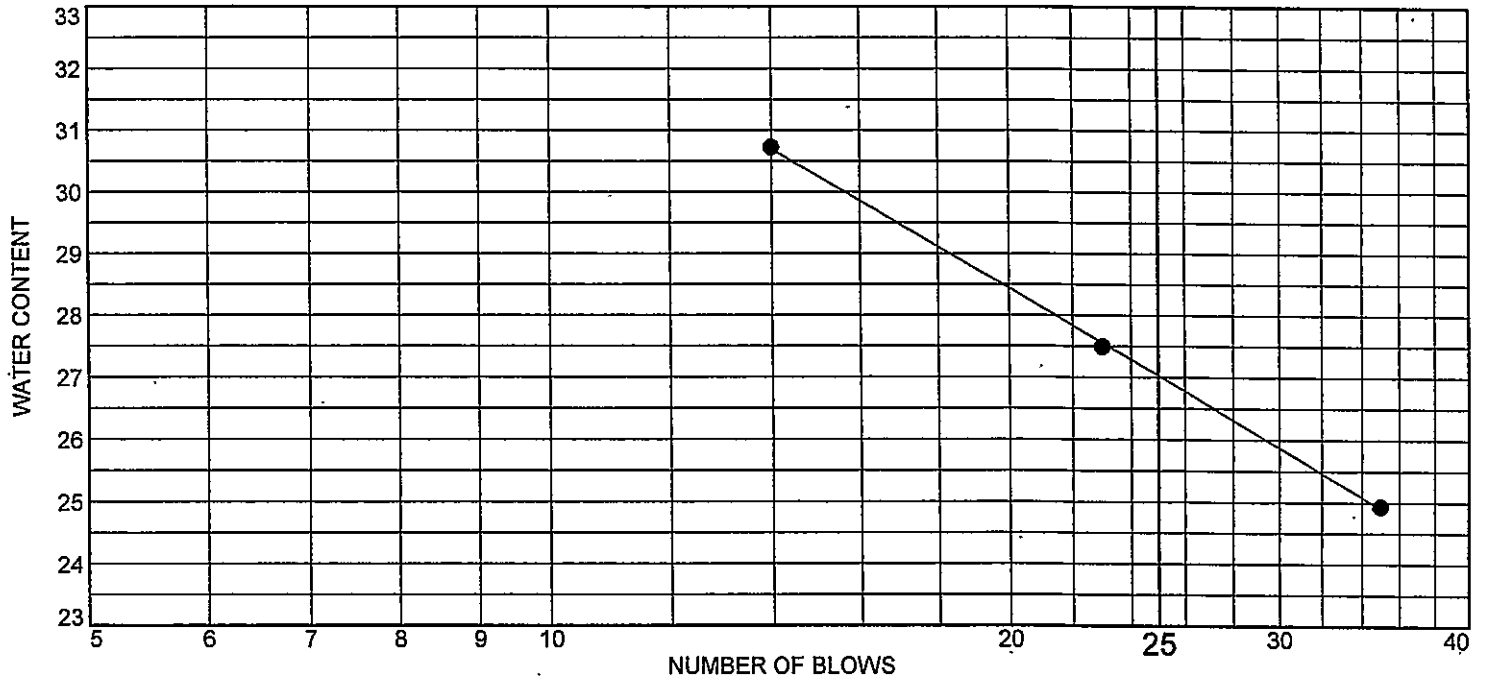
**South Plainfield, New Jersey**

**Remarks:**
● Moisture content 12.0%

**Figure 21 F 3**

# LIQUID AND PLASTIC LIMITS TEST REPORT




| | MATERIAL DESCRIPTION | LL | PL | PI | %<#40 | %<#200 | USCS |
|---|---|---|---|---|---|---|---|
| ● | | 27.0 | 18.8 | 8.2 | | | |

**Project No.** APX-2492 **Client:** Mott MacDonald

**Project:** Connect Gen South Ripley, South Ripley, NY

**Location:** B-44, S4, 6'-8'
**Sample Number:** S-22 **Depth:** 6'-8'

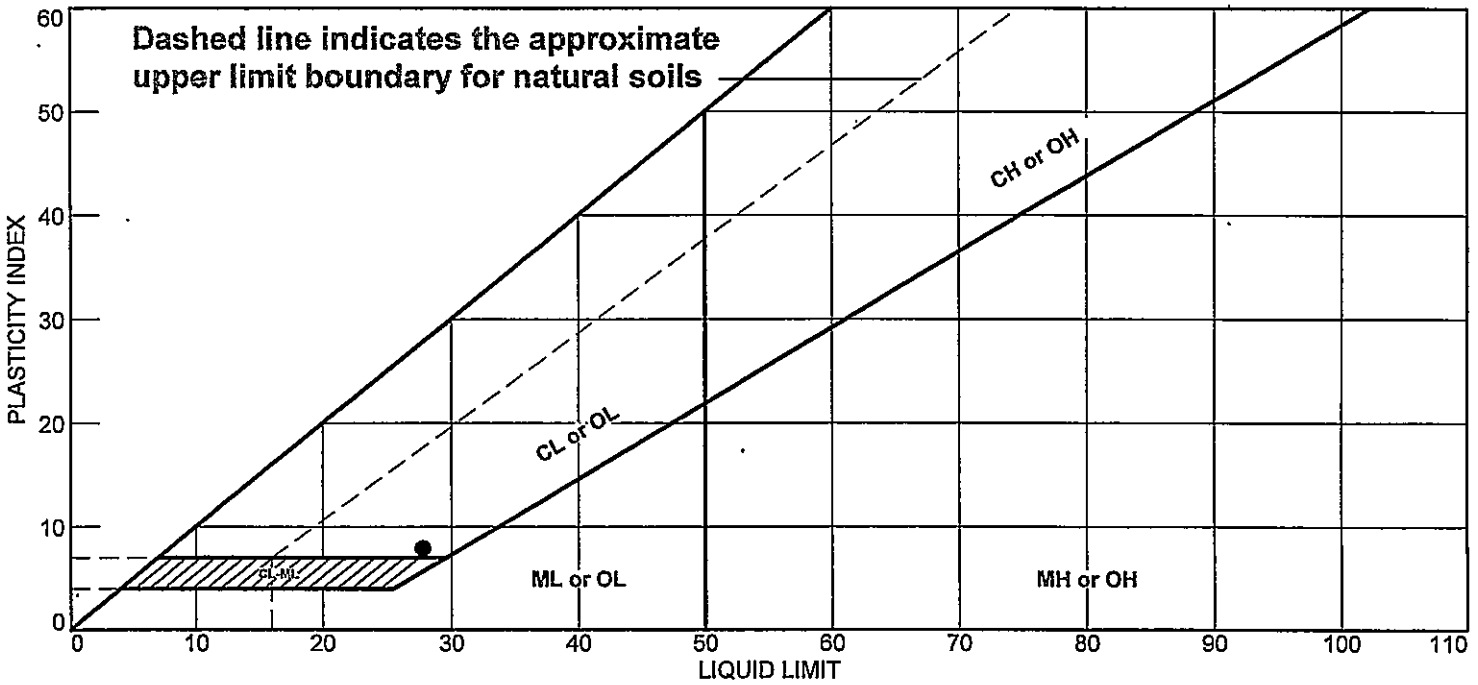
**ANS CONSULTANTS, INC.**

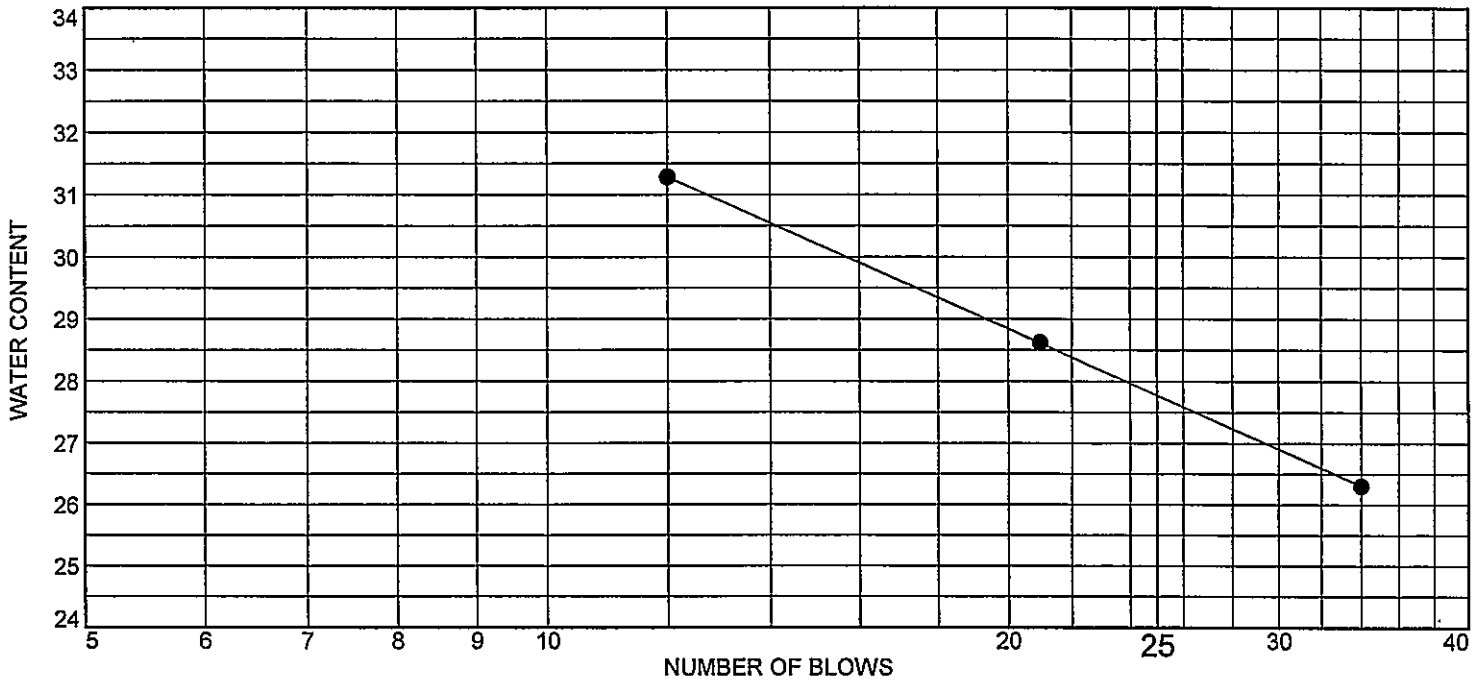
**South Plainfield, New Jersey**

**Remarks:**
● Moisture content 13.6%

**Figure 22 F 3**

# LIQUID AND PLASTIC LIMITS TEST REPORT




| | MATERIAL DESCRIPTION | LL | PL | PI | %<#40 | %<#200 | USCS |
|---|---|---|---|---|---|---|---|
| ● | | 27.8 | 19.9 | 7.9 | | | |

**Project No.** APX-2492 **Client:** Mott MacDonald

**Project:** Connect Gen South Ripley, South Ripley, NY

**Location:** B-46, S3, 4'-6'
**Sample Number:** S-23 **Depth:** 4'-6'

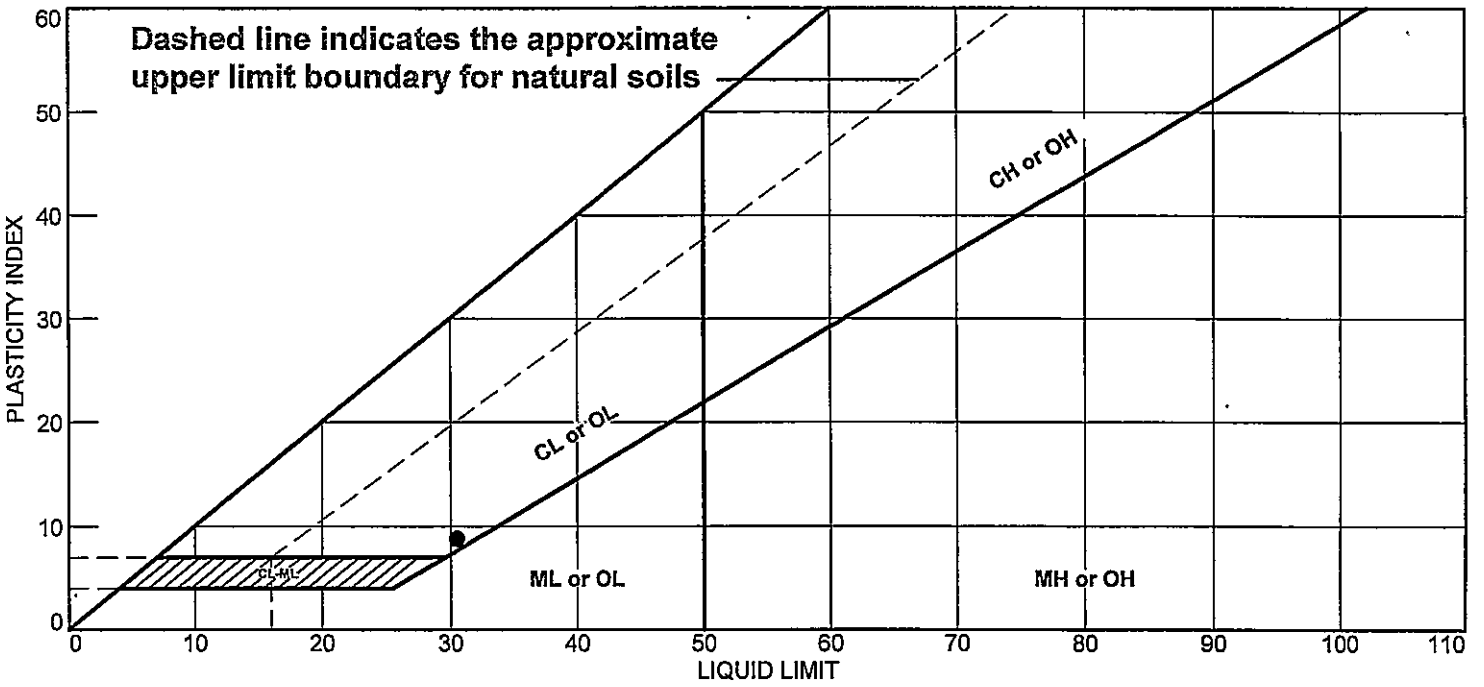
**ANS CONSULTANTS, INC.**

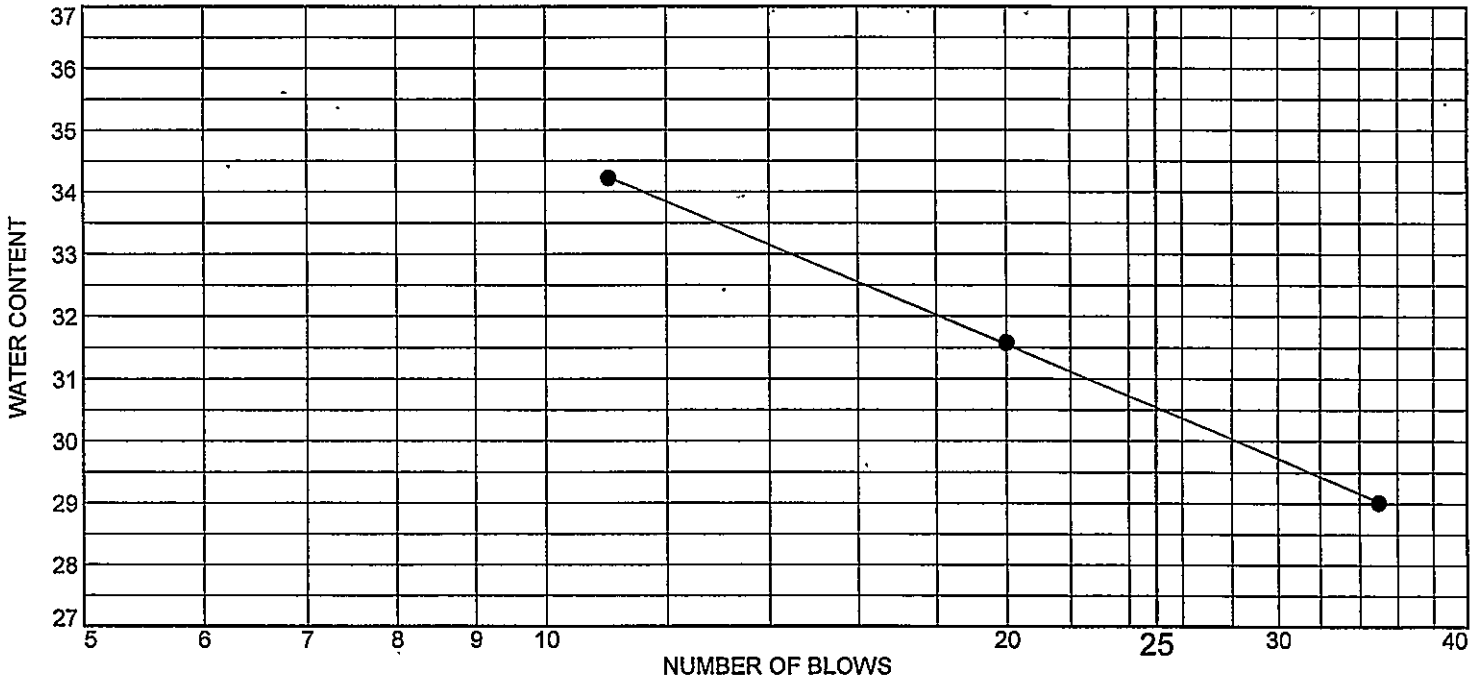
**South Plainfield, New Jersey**

**Remarks:**
● Moisture content 12.6%

**Figure 23 F 3**

# LIQUID AND PLASTIC LIMITS TEST REPORT




| | MATERIAL DESCRIPTION | LL | PL | PI | %<#40 | %<#200 | USCS |
|---|---|---|---|---|---|---|---|
| ● | | 30.5 | 21.7 | 8.8 | | | |

**Project No.** APX-2492 **Client:** Mott MacDonald

**Project:** Connect Gen South Ripley, South Ripley, NY

**Location:** B-47, S2, 2'-4'
**Sample Number:** S-24 **Depth:** 2'-4'

**ANS CONSULTANTS, INC.**

**South Plainfield, New Jersey**

**Remarks:**
● moisture content 18.1%

**Figure 24 F 3**

# Appendix-E

**CONSULTANTS, INC.**
4405 South Clinton Avenue
South Plainfield, NJ 07080

**Tel: (800) 545-ATUL**
**(908) 754-8383**
**Fax: (908) 754-8633**

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# CERTIFICATE OF TEST -CORROSION ANALYSIS

**CLIENT**: Mott MacDonald
111 Wood Avenue South
Iselin, NJ 08830-4112

**DATE:** 08-28-2020

**Kind Attn: Mr. Vatsal A.Shah. PE, Ph.D,D.GE**
Vice President/President Engineer

**FILE NO**: APX-2492

**PROJECT**: Connect Gen
South Ripley, NY

**REPORT NO:** S-25 to S-31

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

| Sample No. | Sample ID | Sulfate ( mg/Kg ) | pH | ORP ( mv ) | Chloride ( mg/Kg ) | Resistivity (Ohm-cm) |
|---|---|---|---|---|---|---|
| S-25 | B-01Bulk 01 2'-5' | 6 | 7.16 | +27 | 74 | 9,000 |
| S-26 | B-05Bulk 05 2'-5' | 15 | 6.16 | +52 | 30 | 14,000 |
| S-27 | B-08Bulk 08 2'-5' | 12 | 6.81 | + 47 | 32 | 14,500 |
| S-28 | B-09Bulk 09 2'-5' | 8 | 6.39 | +61 | 51 | 17,000 |
| S-29 | B-17Bulk 17 2'-5' | 5 | 7.94 | + 57 | 36 | 20,000 |
| S-30 | B-21Bulk 21 2'-5' | 15 | 6.37 | +35 | 31 | 19,000 |
| S-31 | B-35Bulk 35 2'-5' | 8 | 7.48 | + 17 | 53 | 17,000 |

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# CERTIFICATE OF TEST -CORROSION ANALYSIS

**CLIENT**: Mott MacDonald
111 Wood Avenue South
Iselin, NJ 08830-4112

**DATE:** 08-28-2020

**Kind Attn: Mr. Vatsal A.Shah. PE, Ph.D,D.GE**
Vice President/President Engineer

**FILE NO**: APX-2492

**PROJECT**: Connect Gen
South Ripley, NY

**REPORT NO:** S-32 to S-38

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

| Sample No. | Sample ID | Sulfate ( mg/Kg ) | pH | ORP ( mv ) | Chloride ( mg/Kg ) | Resistivity (Ohm-cm) |
|---|---|---|---|---|---|---|
| S-32 | B-38Bulk 38 2'-5' | 13 | 7.78 | +77 | 51 | 17,000 |
| S-33 | B-40Bulk 40 2'-5' | 15 | 7.39 | +93 | 42 | 9,000 |
| S-34 | B-42Bulk 42 2'-5' | 18 | 6.9 | + 32 | 45 | 23,000 |
| S-35 | B-43Bulk 43 2'-5' | 10 | 7.24 | +63 | 30 | 13,000 |
| S-36 | B-44Bulk 44 2'-5' | 12 | 7.0 | + 55 | 46 | 13,000 |
| S-37 | B-46Bulk 46 2'-5' | 13 | 7.39 | +15 | 68 | 11,000 |
| S-38 | B-47Bulk 47 2'-5' | 10 | 6.87 | + 47 | 55 | 28,000 |

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South Plainfield, NJ 07080

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# CERTIFICATE OF TEST -CORROSION ANALYSIS

**CLIENT**: Mott MacDonald
111 Wood Avenue South
Iselin, NJ 08830-4112

**DATE:** 08-28-2020

**Kind Attn: Mr. Vatsal A.Shah. PE, Ph.D,D.GE**
Vice President/President Engineer

**FILE NO**: APX-2492

**PROJECT**: Connect Gen
South Ripley, NY

**REPORT NO:** S-39 to S-44

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

| Sample No. | Sample ID | Sulfate ( mg/Kg ) | pH | ORP ( mv ) | Chloride ( mg/Kg ) | Resistivity (Ohm-cm) |
|---|---|---|---|---|---|---|
| S-39 | B-SS-2CRT-SS-2 2'-5' | 16 | 6.96 | -12 | 41 | TNP |
| S-40 | B-SS-3CRT-SS-3 2'-5' | 28 | 6.79 | -14 | 70 | TNP |
| S-41 | B-03 CRT03 2'-5' | 53 | 6.71 | + 41 | 40 | TNP |
| S-42 | B-04 CRT04 2'-5' | 14 | 4.54 | +75 | 38 | TNP |
| S-43 | B-06 CRT06 2'-5' | 20 | 6.68 | + 5 | 43 | TNP |
| S-44 | B-07 CRT07 2'-5' | 18 | 6.53 | +11 | 26 | TNP |

Note: TNP- Test not performed

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# CERTIFICATE OF TEST -CORROSION ANALYSIS

**CLIENT**: Mott MacDonald
111 Wood Avenue South
Iselin, NJ 08830-4112

**DATE:** 08-28-2020

**Kind Attn: Mr. Vatsal A.Shah. PE, Ph.D,D.GE**
Vice President/President Engineer

**FILE NO**: APX-2492

**PROJECT**: Connect Gen
South Ripley, NY

**REPORT NO:** S-45 to S-50

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

| Sample No. | Sample ID | Sulfate ( mg/Kg ) | pH | ORP ( mv ) | Chloride ( mg/Kg ) | Resistivity (Ohm-cm) |
|---|---|---|---|---|---|---|
| S-45 | B-08 CRT08 2'-5' | 10 | 7.21 | +19 | 56 | TNP |
| S-46 | B-10 CRT10 2'-5' | 21 | 6.81 | -24 | 41 | TNP |
| S-47 | B-11 CRT11 2'-5' | 23 | 7.21 | + 21 | 30 | TNP |
| S-48 | B-12 CRT12 2'-5' | 12 | 7.12 | -5 | 80 | TNP |
| S-49 | B-14 CRT14 2'-5' | 17 | 7.04 | + 15 | 52 | TNP |
| S-50 | B-15 CRT15 2'-5' | 12 | 7.09 | +18 | 43 | TNP |

Note: TNP- Test not performed

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# CERTIFICATE OF TEST -CORROSION ANALYSIS

**CLIENT**: Mott MacDonald
111 Wood Avenue South
Iselin, NJ 08830-4112

**DATE:** 08-28-2020

**Kind Attn: Mr. Vatsal A.Shah. PE, Ph.D,D.GE**
Vice President/President Engineer

**FILE NO**: APX-2492

**PROJECT**: Connect Gen
South Ripley, NY

**REPORT NO:** S-51 to S-56

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

| Sample No. | Sample ID | Sulfate ( mg/Kg ) | pH | ORP ( mv ) | Chloride ( mg/Kg ) | Resistivity (Ohm-cm) |
|---|---|---|---|---|---|---|
| S-51 | B-18 CRT18 2'-5' | 5 | 7.55 | +71 | 50 | TNP |
| S-52 | B-19 CRT19 2'-5' | 16 | 6.05 | -12 | 45 | TNP |
| S-53 | B-23 CRT23 2'-5' | 10 | 6.03 | + 25 | 47 | TNP |
| S-54 | B-25 CRT25 2'-5' | 19 | 7.02 | + 15 | 40 | TNP |
| S-55 | B-28 CRT28 2'-5' | 21 | 7.22 | + 10 | 38 | TNP |
| S-56 | B-39 CRT39 2'-5' | 5 | 6.84 | +40 | 31 | TNP |

Note: TNP- Test not performed

# F. Thermal Resistivity Results

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

**CLIENT**: Mott MacDonald
111 Wood Avenue South
Iselin, NJ 08830-4112

**DATE:** 08-27-2020

**Kind Attn: Mr. Vatsal A.Shah. PE, Ph.D,D.GE**
Vice President/President Engineer

**FILE NO**: APX-2492

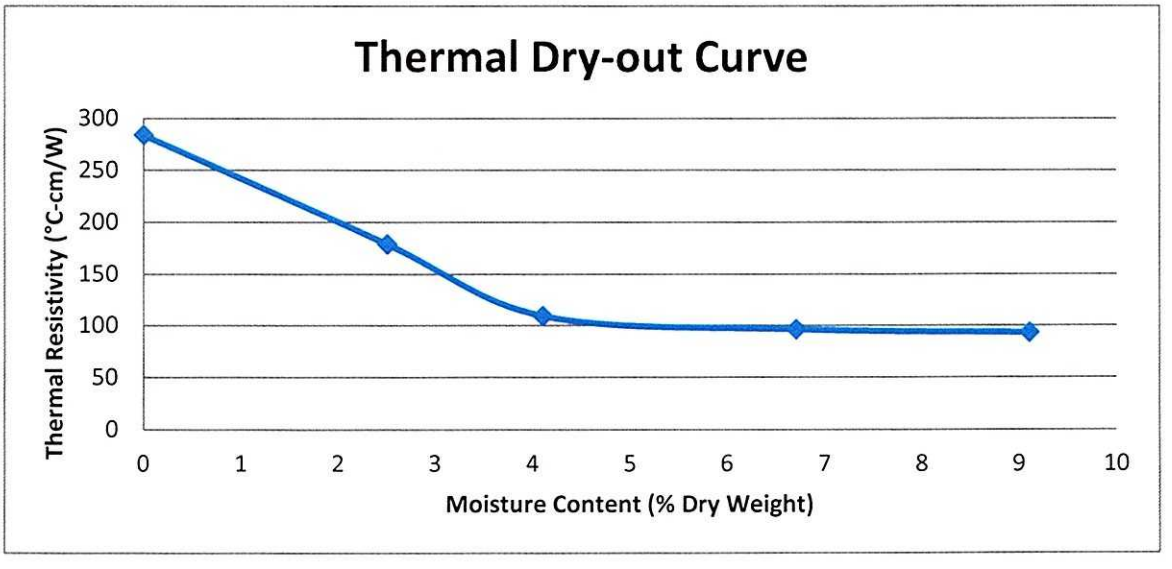
**PROJECT**: Connect Gen, South Ripley
South Ripley, NY

**REPORT NO:** 1

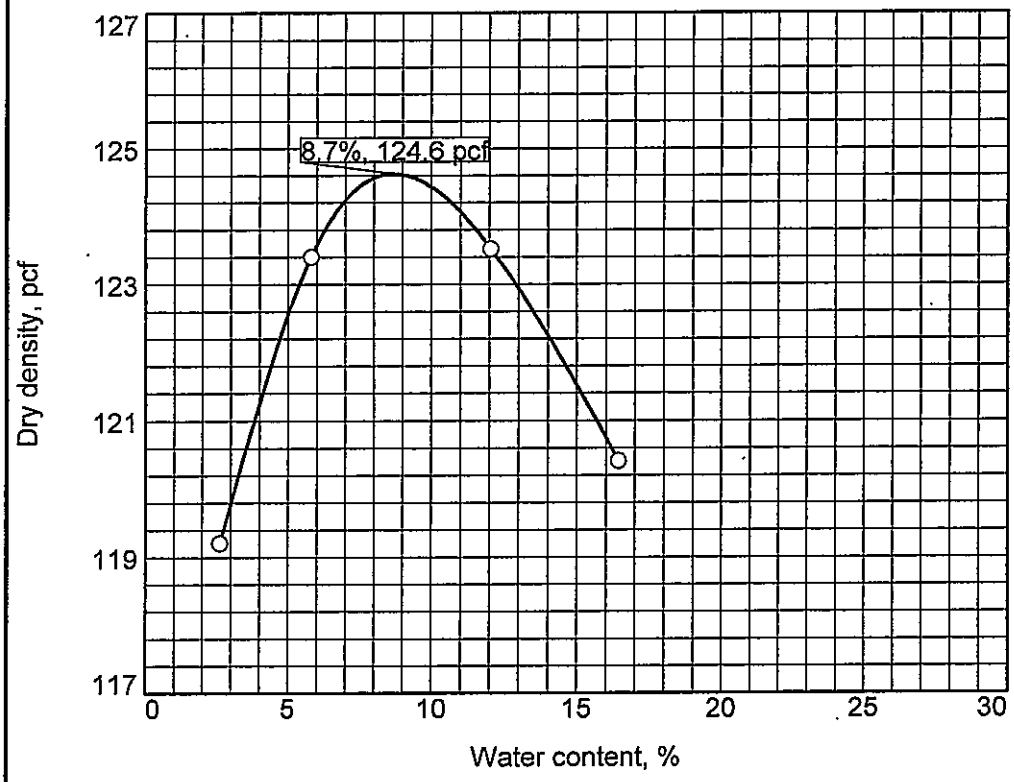
**Test Data- Sample No. S-25 ( B-01, Bulk-01, 2'-5' )**

Standard Proctor Value: 124.6 Optimum Moisture Content: 8.7%
Remolded Dry Density : 105.9 ( 85% ) Moisture Content as received: 13.6%

| Moisture Contents ( % ) | Initial Soil Temperature ( °C ) | Thermal Resistivity (°C-cm/W) |
|---|---|---|
| 0.0 | 25.6 | 284 |
| 2.5 | 25.4 | 179 |
| 4.1 | 25.3 | 109 |
| 6.7 | 25.3 | 96 |
| 9.1 | 25.3 | 93 |



# COMPACTION TEST REPORT




**Curve No.**
**S-25**

**Test Specification:**
ASTM D 698-91 Procedure B Standard

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

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

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

**TESTING DATA**

| | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| **WM + WS** | 13.50 | 13.78 | 14.04 | 14.10 | | |
| **WM** | 9.43 | 9.43 | 9.43 | 9.43 | | |
| **WW + T #1** | 606.6 | 871.4 | 854.6 | 868.5 | | |
| **WD + T #1** | 591.1 | 823.6 | 762.7 | 745.9 | | |
| **TARE #1** | 0.0 | 0.0 | 0.0 | 0.0 | | |
| **WW + T #2** | | | | | | |
| **WD + T #2** | | | | | | |
| **TARE #2** | | | | | | |
| **MOISTURE** | 2.6 | 5.8 | 12.0 | 16.4 | | |
| **DRY DENSITY** | 119.2 | 123.4 | 123.5 | 120.4 | | |

**TEST RESULTS**

Maximum dry density = 124.6 pcf

Optimum moisture = 8.7 %

**Material Description**

**Remarks:**

**Project No.** APX-2492 **Client:** Mott MacDonald
**Project:**

○ **Location:** B-01, Bulk-01, 2'-5' **Depth:** 2'-4' **Sample Number:** S-25

**Checked by:**
**Title:**

**ANS CONSULTANTS, INC.**

**South Plainfield, New Jersey**

**Figure 25 F 2**

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

**CLIENT**: Mott MacDonald
111 Wood Avenue South
Iselin, NJ 08830-4112

**DATE:** 08-27-2020

**Kind Attn: Mr. Vatsal A.Shah. PE, Ph.D,D.GE**
Vice President/President Engineer

**FILE NO**: APX-2492

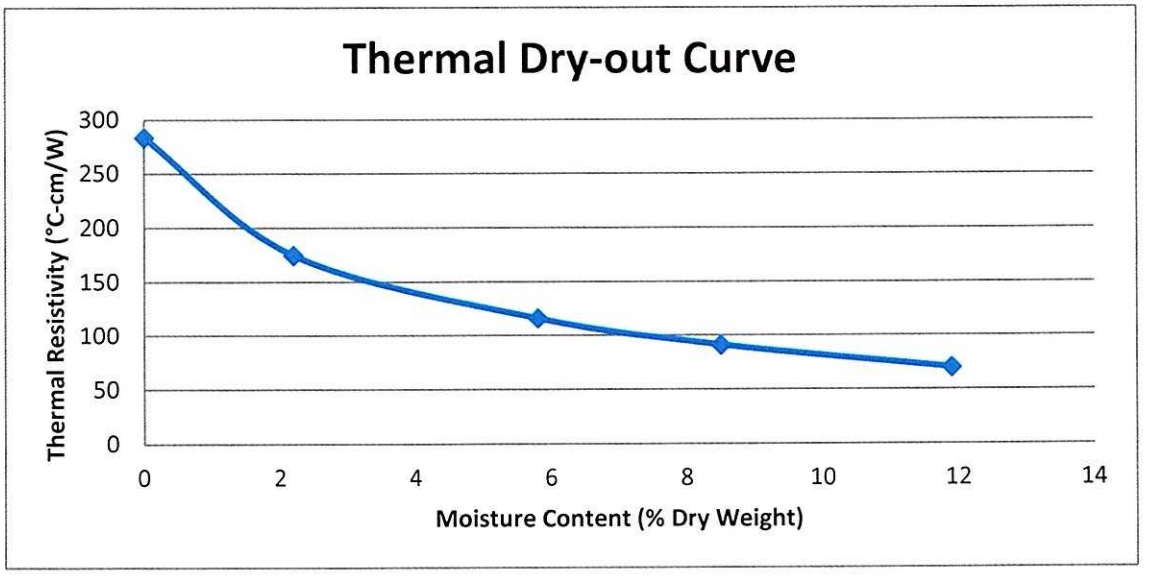
**PROJECT**: Connect Gen, South Ripley
South Ripley, NY

**REPORT NO:** 2

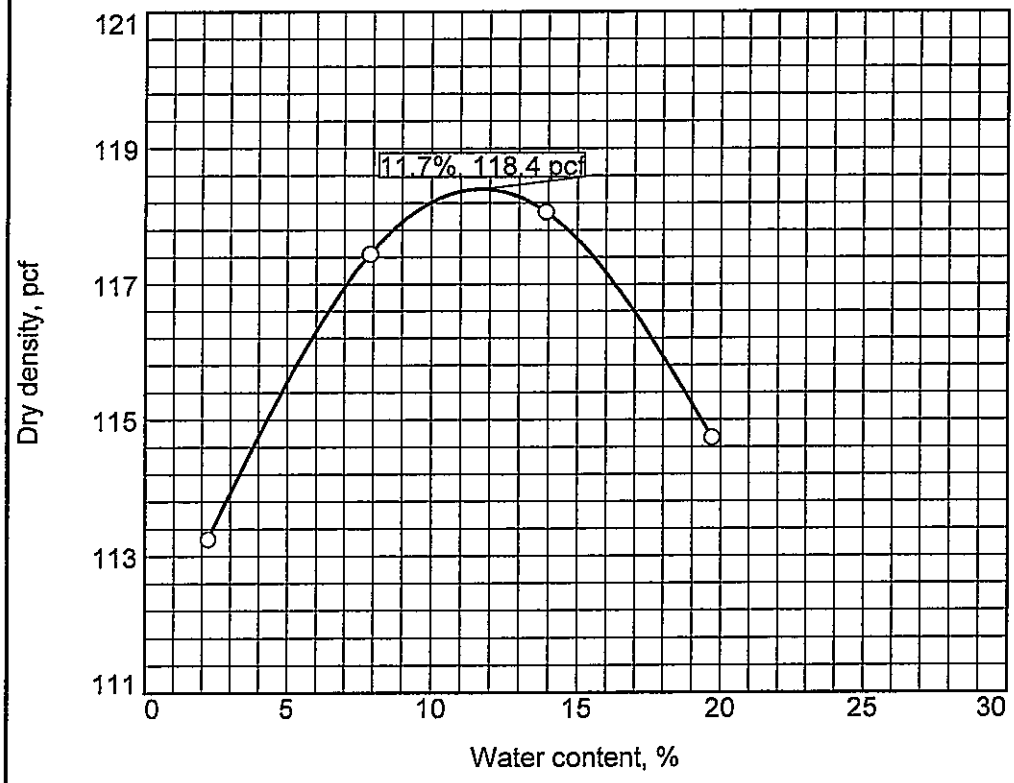
**Test Data- Sample No. S-26 ( B-05, Bulk-05, 2'-5' )**

Standard Proctor Value: 118.4
Optimum Moisture Content: 11.7%
Remolded Dry Density : 100.6 ( 85% )
Moisture Content as received: 13.2%

| Moisture Contents ( % ) | Initial Soil Temperature ( °C ) | Thermal Resistivity (°C-cm/W) |
|---|---|---|
| 0.0 | 24.4 | 284 |
| 2.2 | 24.1 | 175 |
| 5.8 | 24.0 | 116 |
| 8.5 | 23.9 | 91 |
| 11.9 | 23.8 | 70 |



# COMPACTION TEST REPORT




**Curve No.**
**S-26**

**Test Specification:**
ASTM D 698-91 Procedure B Standard

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

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

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

**TESTING DATA**

| | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| **WM + WS** | 13.28 | 13.65 | 13.91 | 14.00 | | |
| **WM** | 9.43 | 9.43 | 9.43 | 9.43 | | |
| **WW + T #1** | 683.2 | 606.2 | 712.5 | 930.7 | | |
| **WD + T #1** | 668.4 | 561.8 | 625.4 | 777.5 | | |
| **TARE #1** | 0.0 | 0.0 | 0.0 | 0.0 | | |
| **WW + T #2** | | | | | | |
| **WD + T #2** | | | | | | |
| **TARE #2** | | | | | | |
| **MOISTURE** | 2.2 | 7.9 | 13.9 | 19.7 | | |
| **DRY DENSITY** | 113.2 | 117.4 | 118.1 | 114.7 | | |

**TEST RESULTS**

Maximum dry density = 118.4 pcf

Optimum moisture = 11.7 %

**Material Description**

**Remarks:**

**Project No.** APX-2492 **Client:** Mott MacDonald
**Project:**

o **Location:** B-05, Bulk-05, 2-5 **Depth:** 2-5 **Sample Number:** S-26

**Checked by:**
**Title:**

**ANS CONSULTANTS, INC.**

**South Plainfield, New Jersey**

**Figure 26 F 2**

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

**CLIENT**: Mott MacDonald
111 Wood Avenue South
Iselin, NJ 08830-4112

**DATE:** 08-27-2020

**Kind Attn: Mr. Vatsal A.Shah. PE, Ph.D,D.GE**
Vice President/President Engineer

**FILE NO**: APX-2492

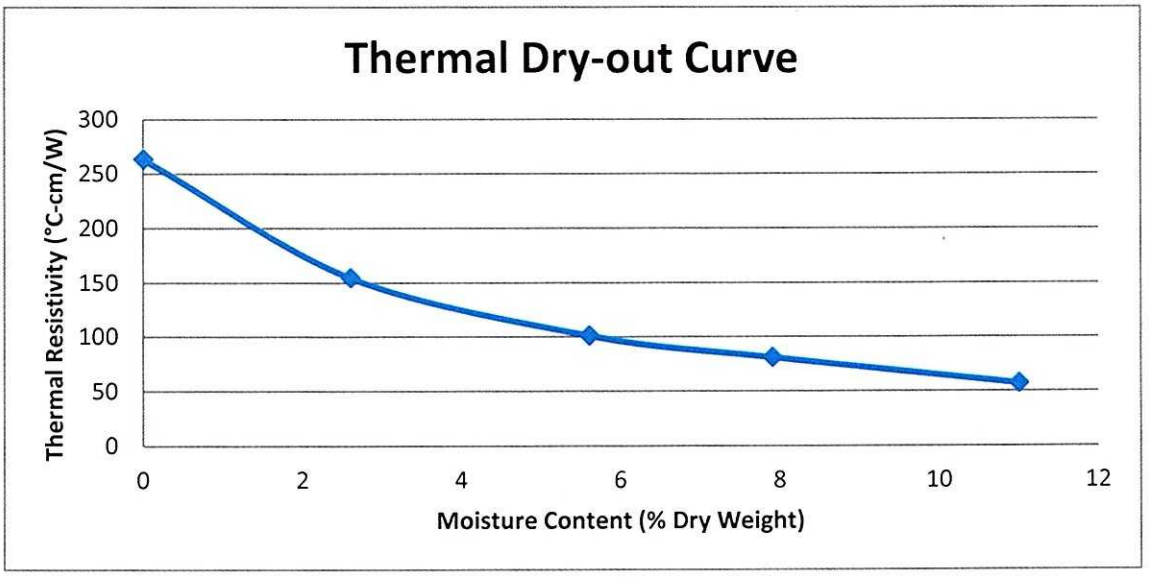
**PROJECT**: Connect Gen, South Ripley
South Ripley, NY

**REPORT NO:** 3

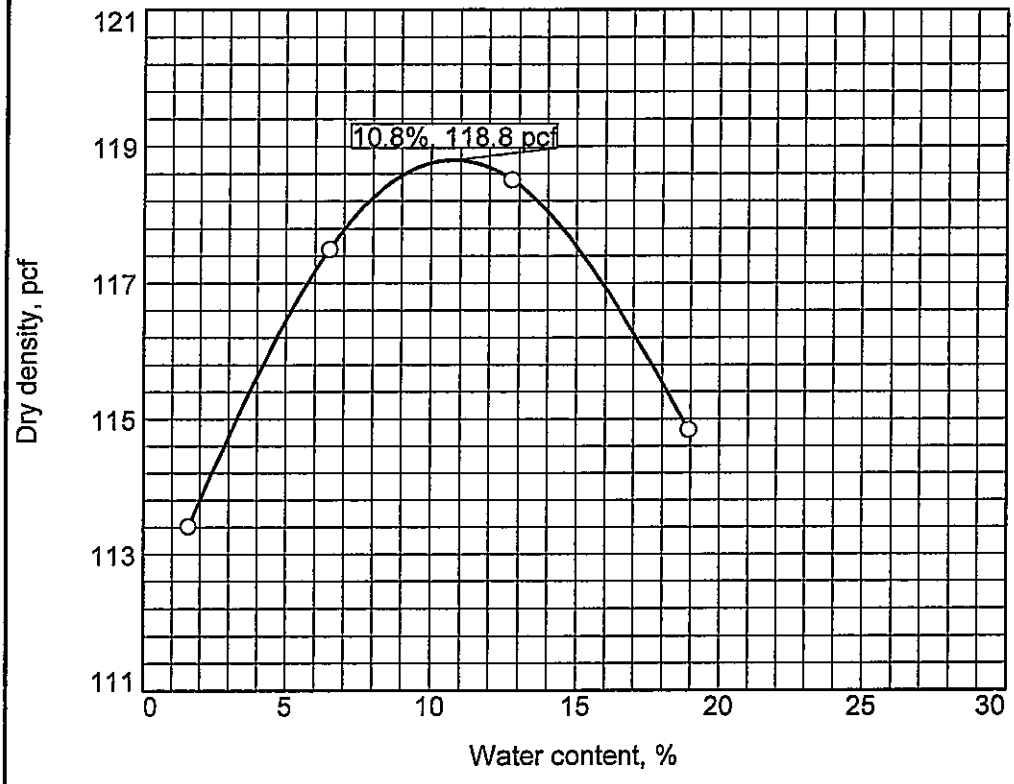
**Test Data- Sample No. S-27 ( B-08, Bulk-08, 2'-5' )**

Standard Proctor Value: 118.8 Optimum Moisture Content: 10.8%
Remolded Dry Density : 101.0 ( 85% ) Moisture Content as received: 15.6%

| Moisture Contents ( % ) | Initial Soil Temperature ( °C ) | Thermal Resistivity (°C-cm/W) |
|---|---|---|
| 0.0 | 24.3 | 264 |
| 2.6 | 24.2 | 155 |
| 5.6 | 24.1 | 101 |
| 7.9 | 24.1 | 81 |
| 11.0 | 24.1 | 57 |



# COMPACTION TEST REPORT




**Curve No.**
**S-27**

**Test Specification:**
ASTM D 698-91 Procedure B Standard

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

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

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

**TESTING DATA**

| | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| WM + WS | 13.27 | 13.60 | 13.88 | 13.98 | | |
| WM | 9.43 | 9.43 | 9.43 | 9.43 | | |
| WW + T #1 | 731.5 | 883.7 | 759.4 | 890.2 | | |
| WD + T #1 | 720.1 | 829.8 | 673.5 | 748.5 | | |
| TARE #1 | 0.0 | 0.0 | 0.0 | 0.0 | | |
| WW + T #2 | | | | | | |
| WD + T #2 | | | | | | |
| TARE #2 | | | | | | |
| MOISTURE | 1.6 | 6.5 | 12.8 | 18.9 | | |
| DRY DENSITY | 113.4 | 117.5 | 118.5 | 114.8 | | |

**TEST RESULTS**

Maximum dry density = 118.8 pcf

Optimum moisture = 10.8 %

**Material Description**

**Remarks:**

**Project No.** APX-2492 **Client:** Mott MacDonald
**Project:**

○ **Location:** B-08, Bulk-08, 2-5 **Depth:** 2-5 **Sample Number:** S-27

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**Checked by:**
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**Figure 27 F 2**

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

**CLIENT**: Mott MacDonald
111 Wood Avenue South
Iselin, NJ 08830-4112

**DATE:** 08-27-2020

**Kind Attn: Mr. Vatsal A.Shah. PE, Ph.D,D.GE**
Vice President/President Engineer

**FILE NO**: APX-2492

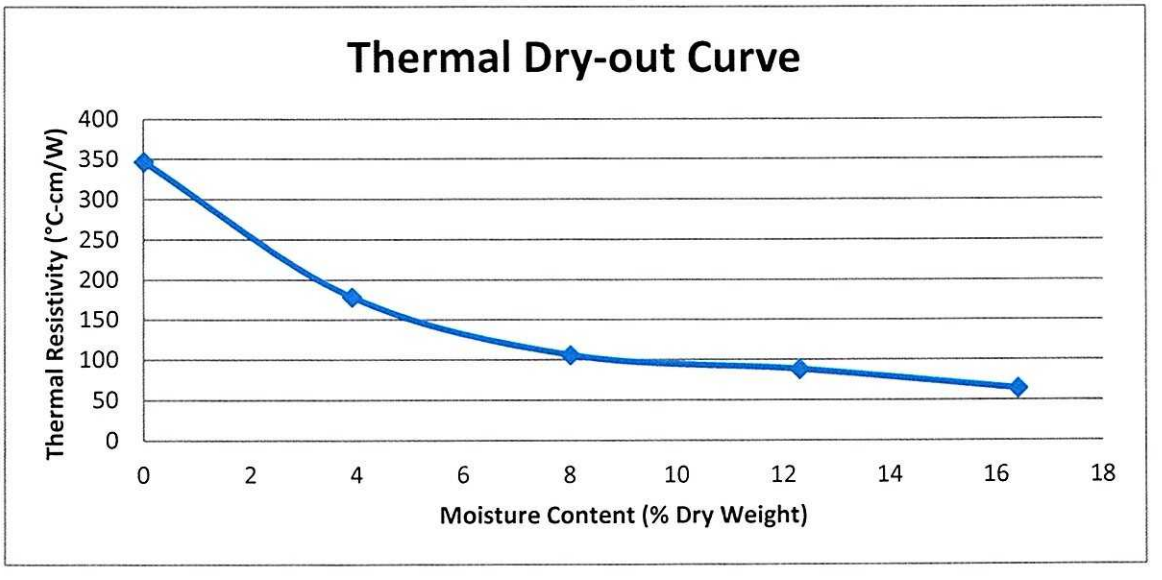
**PROJECT**: Connect Gen, South Ripley
South Ripley, NY

**REPORT NO:** 4

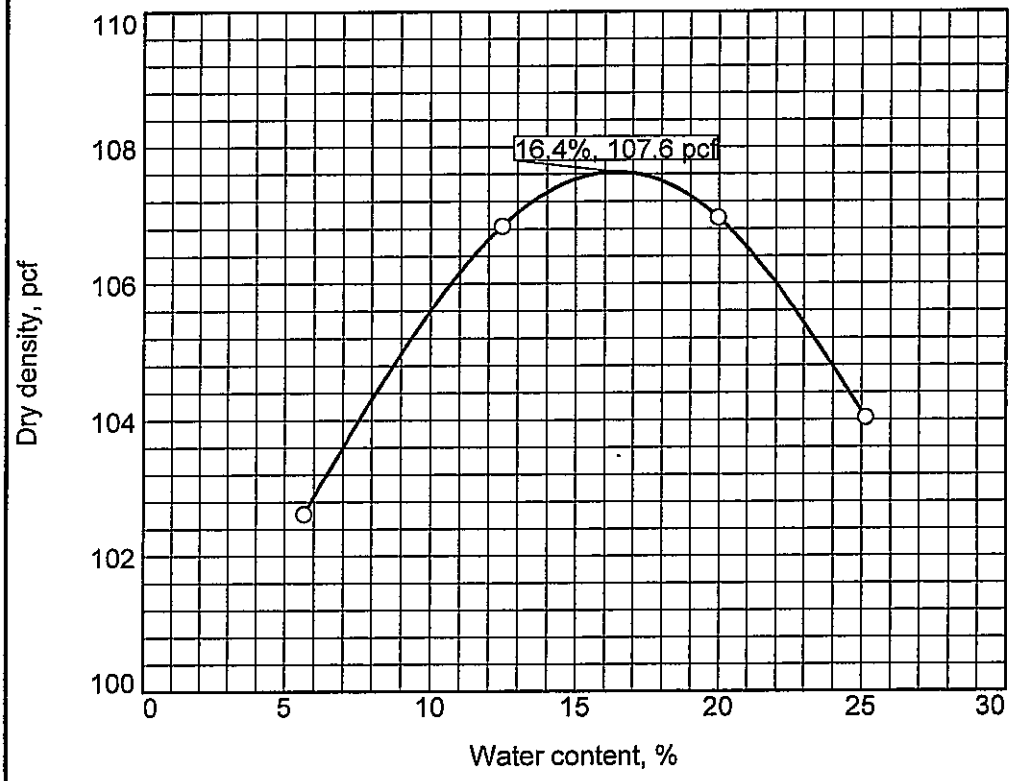
**Test Data- Sample No. S-28 ( B-09, Bulk-09, 2'-5' )**

Standard Proctor Value: 107.6 Optimum Moisture Content: 16.4%
Remolded Dry Density : 91.5 ( 85% ) Moisture Content as received: 17.6%

| Moisture Contents ( % ) | Initial Soil Temperature ( °C ) | Thermal Resistivity (°C-cm/W) |
|---|---|---|
| 0.0 | 25.3 | 347 |
| 3.9 | 25.0 | 179 |
| 8.0 | 24.9 | 106 |
| 12.3 | 24.8 | 88 |
| 16.4 | 24.8 | 64 |



# COMPACTION TEST REPORT




**Curve No.**
**S-28**

**Test Specification:**
ASTM D 698-91 Procedure B Standard

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

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

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

**TESTING DATA**

| | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| WM + WS | 13.04 | 13.43 | 13.70 | 13.76 | | |
| WM | 9.43 | 9.43 | 9.43 | 9.43 | | |
| WW + T #1 | 624.0 | 750.5 | 828.5 | 791.9 | | |
| WD + T #1 | 590.6 | 667.3 | 690.6 | 632.8 | | |
| TARE #1 | 0.0 | 0.0 | 0.0 | 0.0 | | |
| WW + T #2 | | | | | | |
| WD + T #2 | | | | | | |
| TARE #2 | | | | | | |
| MOISTURE | 5.7 | 12.5 | 20.0 | 25.1 | | |
| DRY DENSITY | 102.6 | 106.8 | 107.0 | 104.0 | | |

**TEST RESULTS**

Maximum dry density = 107.6 pcf

Optimum moisture = 16.4 %

**Material Description**

**Remarks:**

**Project No.** APX-2492 **Client:** Mott MacDonald
**Project:**

o **Location:** B-09, Bulk-09, 2-5 **Depth:** 2-5 **Sample Number:** S-28

**ANS CONSULTANTS, INC.**

**South Plainfield, New Jersey**

**Checked by:**
**Title:**

**Figure 28 F 2**

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

**CLIENT**: Mott MacDonald
111 Wood Avenue South
Iselin, NJ 08830-4112

**DATE:** 08-27-2020

**Kind Attn: Mr. Vatsal A.Shah. PE, Ph.D,D.GE**
Vice President/President Engineer

**FILE NO**: APX-2492

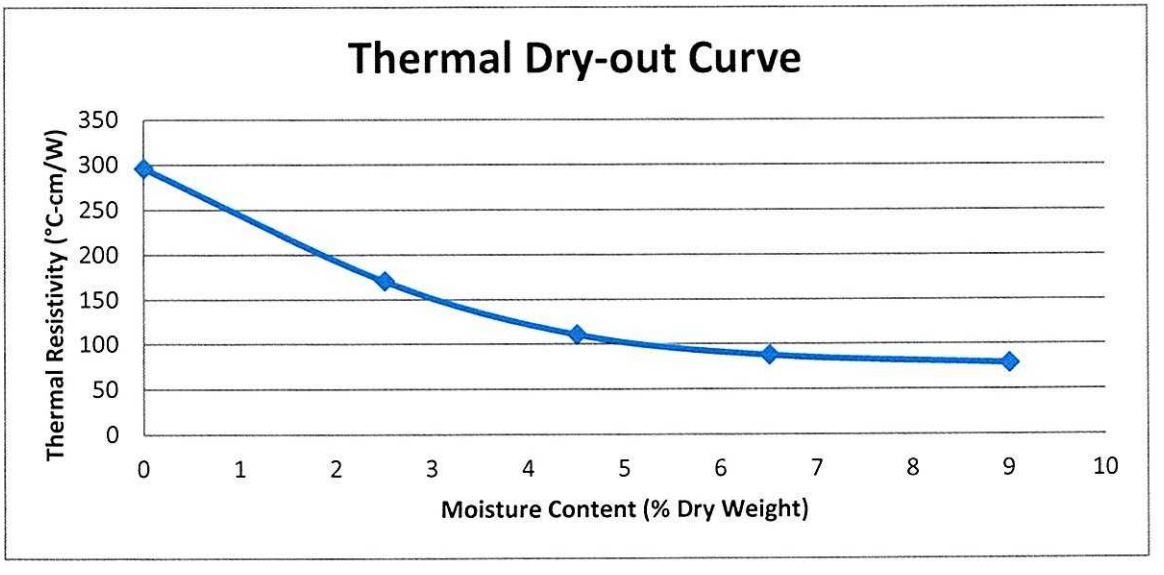
**PROJECT**: Connect Gen, South Ripley
South Ripley, NY

**REPORT NO:** 5

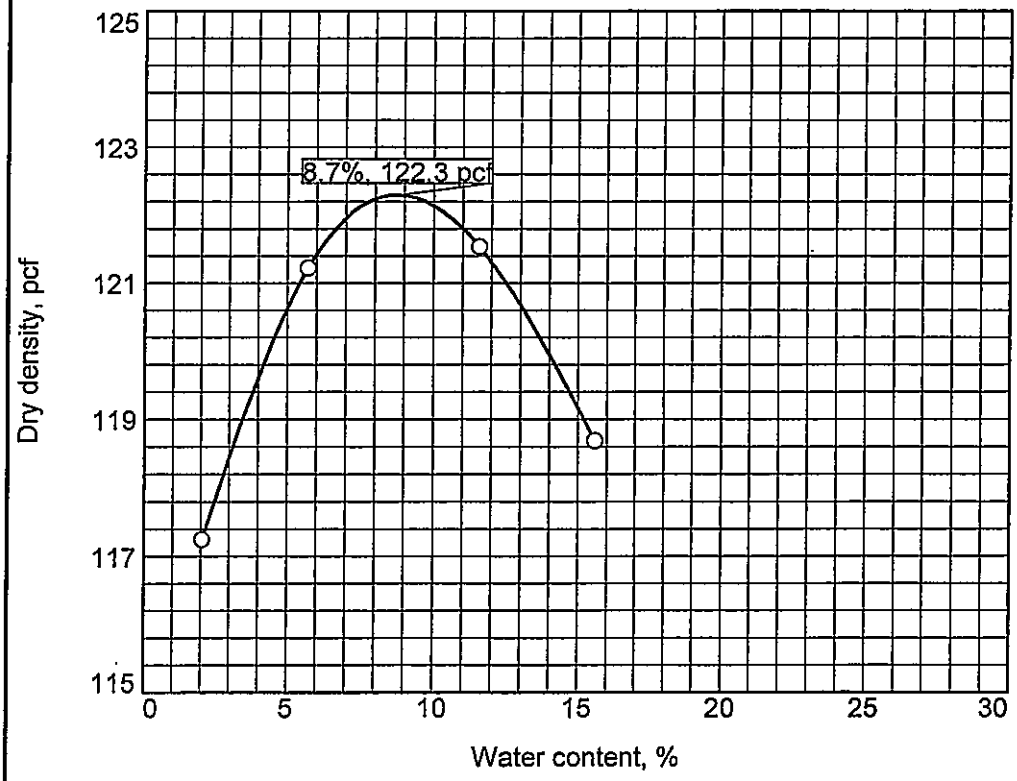
**Test Data- Sample No. S-29 ( B-17, Bulk-17, 2'-5' )**

Standard Proctor Value: 122.3 Optimum Moisture Content: 8.7%
Remolded Dry Density : 104.0 ( 85% ) Moisture Content as received: 17.%

| Moisture Contents ( % ) | Initial Soil Temperature ( °C ) | Thermal Resistivity (°C-cm/W) |
|---|---|---|
| 0.0 | 24.9 | 296 |
| 2.5 | 24.6 | 171 |
| 4.5 | 24.5 | 111 |
| 6.5 | 24.3 | 88 |
| 9.0 | 24.3 | 79 |



# COMPACTION TEST REPORT




**Curve No.**
**S-29**

**Test Specification:**
ASTM D 698-91 Procedure B Standard

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

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

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

**TESTING DATA**

| | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| WM + WS | 13.41 | 13.70 | 13.95 | 14.00 | | |
| WM | 9.43 | 9.43 | 9.43 | 9.43 | | |
| WW + T #1 | 639.7 | 785.5 | 947.1 | 759.3 | | |
| WD + T #1 | 626.9 | 743.0 | 848.9 | 656.9 | | |
| TARE #1 | 0.0 | 0.0 | 0.0 | 0.0 | | |
| WW + T #2 | | | | | | |
| WD + T #2 | | | | | | |
| TARE #2 | | | | | | |
| MOISTURE | 2.0 | 5.7 | 11.6 | 15.6 | | |
| DRY DENSITY | 117.2 | 121.2 | 121.5 | 118.7 | | |

**TEST RESULTS**

Maximum dry density = 122.3 pcf

Optimum moisture = 8.7 %

**Material Description**

**Remarks:**

**Project No.** APX-2492 **Client:** Mott MacDonald
**Project:**

o **Location:** B-17, Bulk-17, 2-5 **Depth:** 2-5 **Sample Number:** S-29

**ANS CONSULTANTS, INC.**

**South Plainfield, New Jersey**

**Checked by:**
**Title:**

**Figure 29 F 2**

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

**CLIENT**: Mott MacDonald
111 Wood Avenue South
Iselin, NJ 08830-4112

**DATE:** 08-27-2020

**Kind Attn: Mr. Vatsal A.Shah. PE, Ph.D,D.GE**
Vice President/President Engineer

**FILE NO**: APX-2492

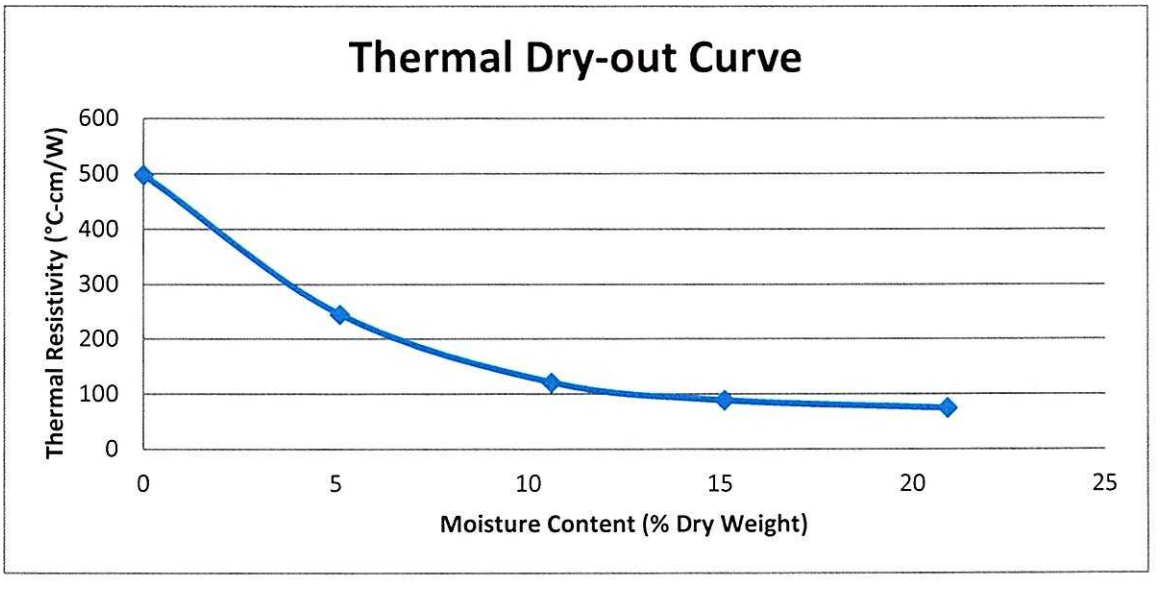
**PROJECT**: Connect Gen, South Ripley
South Ripley, NY

**REPORT NO:** 6

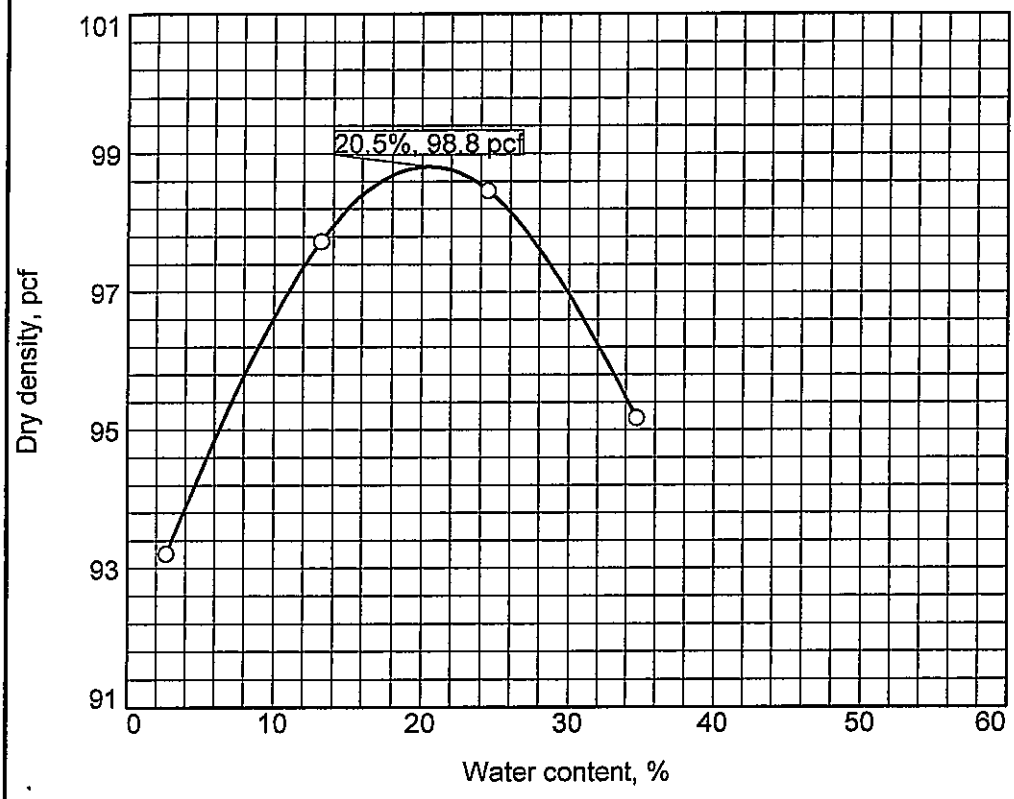
**Test Data- Sample No. S-30 ( B-21, Bulk-21, 2'-5' )**

Standard Proctor Value: 98.8 Optimum Moisture Content: 20.5%
Remolded Dry Density : 84.0 ( 85% ) Moisture Content as received: 21.2%

| Moisture Contents ( % ) | Initial Soil Temperature ( °C ) | Thermal Resistivity (°C-cm/W) |
|---|---|---|
| 0.0 | 24.3 | 498 |
| 5.1 | 24.3 | 245 |
| 10.6 | 24.1 | 121 |
| 15.1 | 24.2 | 89 |
| 20.9 | 24.1 | 75 |



# COMPACTION TEST REPORT




**Curve No.**
**S-30**

**Test Specification:**
ASTM D 698-91 Procedure B Standard

**Preparation Method** _____
**Hammer Wt.** 5.5 lb.
**Hammer Drop** 12 in.
**Number of Layers** three
**Blows per Layer** 25
**Mold Size** 0.03333 cu. ft.
**Test Performed on Material Passing** 3/8 in. **Sieve**

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

**TESTING DATA**

| | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| WM + WS | 12.62 | 13.11 | 13.51 | 13.70 | | |
| WM | 9.43 | 9.43 | 9.43 | 9.43 | | |
| WW + T #1 | 660.3 | 801.9 | 854.5 | 1010.8 | | |
| WD + T #1 | 643.1 | 708.5 | 686.4 | 750.2 | | |
| TARE #1 | 0.0 | 0.0 | 0.0 | 0.0 | | |
| WW + T #2 | | | | | | |
| WD + T #2 | | | | | | |
| TARE #2 | | | | | | |
| MOISTURE | 2.7 | 13.2 | 24.5 | 34.7 | | |
| DRY DENSITY | 93.2 | 97.7 | 98.5 | 95.2 | | |

**TEST RESULTS**

Maximum dry density = 98.8 pcf

Optimum moisture = 20.5 %

**Material Description**

**Remarks:**

**Project No.** APX-2492 **Client:** Mott MacDonald
**Project:**

○ **Location:** B-21, Bulk-21, 2-5 **Depth:** 2-5 **Sample Number:** S-30

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**Figure 30 F 2**

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

**CLIENT**: Mott MacDonald
111 Wood Avenue South
Iselin, NJ 08830-4112

**DATE:** 08-27-2020

**Kind Attn: Mr. Vatsal A.Shah. PE, Ph.D,D.GE**
Vice President/President Engineer

**FILE NO**: APX-2492

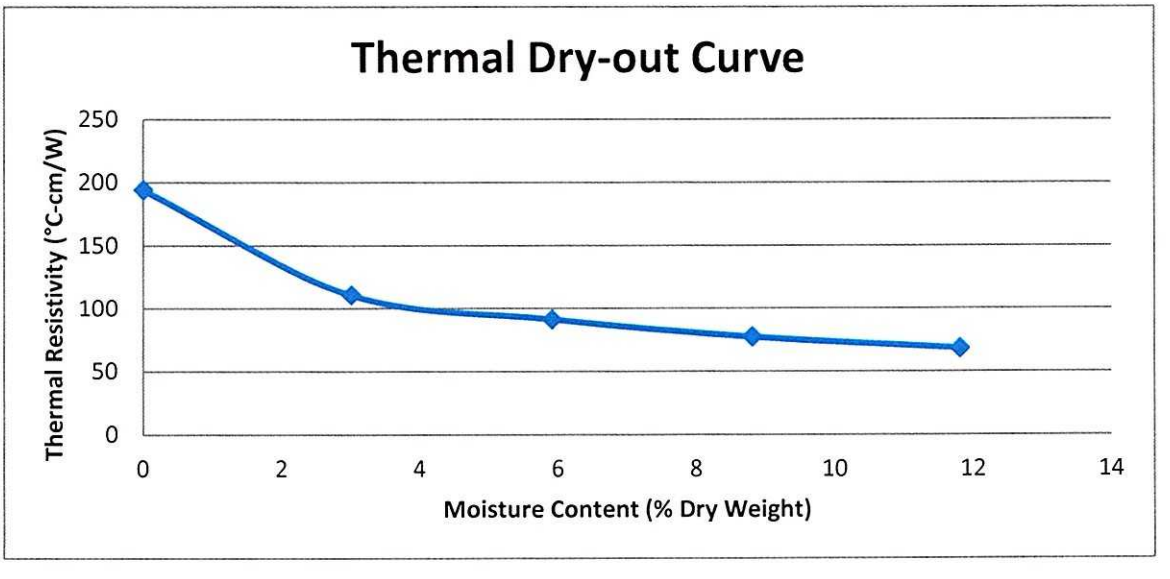
**PROJECT**: Connect Gen, South Ripley
South Ripley, NY

**REPORT NO:** 7

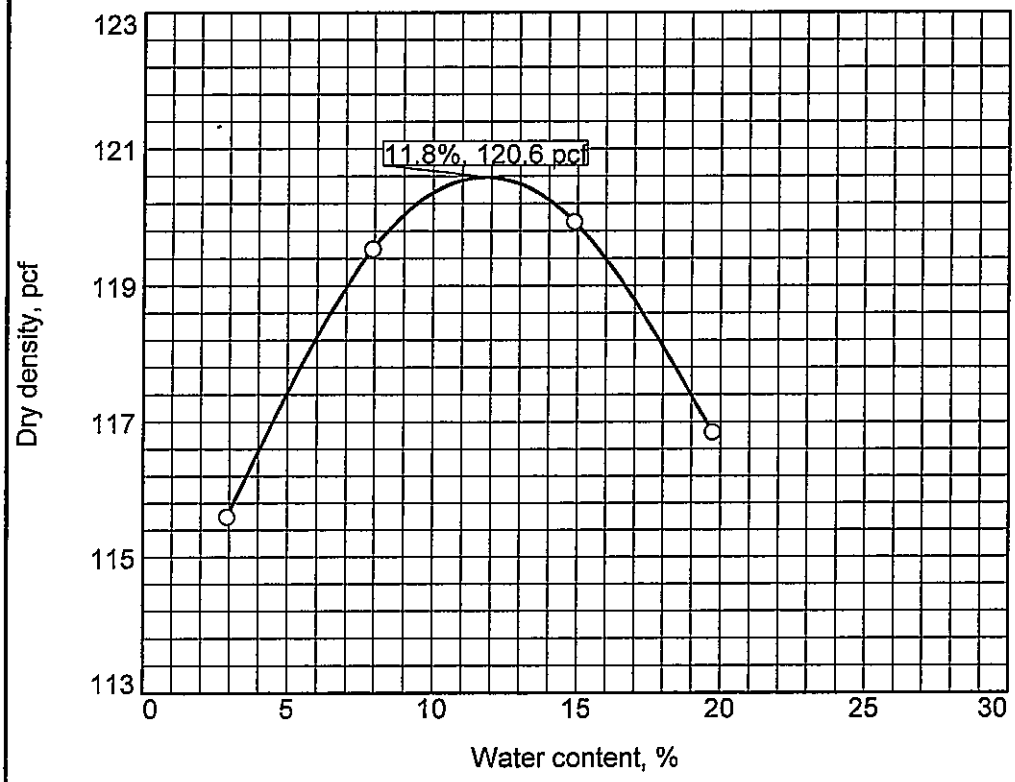
**Test Data- Sample No. S-31 ( B-35, Bulk-35, 2'-5' )**

Standard Proctor Value: 120.6 Optimum Moisture Content: 11.8%
Remolded Dry Density : 102.5 ( 85% ) Moisture Content as received: 15.2%

| Moisture Contents ( % ) | Initial Soil Temperature ( °C ) | Thermal Resistivity (°C-cm/W) |
|---|---|---|
| 0.0 | 24.3 | 194 |
| 3.0 | 24.1 | 111 |
| 5.9 | 24.0 | 91 |
| 8.8 | 23.9 | 77 |
| 11.8 | 23.9 | 68 |



# COMPACTION TEST REPORT




**Curve No.**
**S-31**

**Test Specification:**
ASTM D 698-91 Procedure B Standard

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

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

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

**TESTING DATA**

| | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| WM + WS | 13.39 | 13.73 | 14.02 | 14.09 | | |
| WM | 9.43 | 9.43 | 9.43 | 9.43 | | |
| WW + T #1 | 644.7 | 884.2 | 910.8 | 882.8 | | |
| WD + T #1 | 626.4 | 819.2 | 792.8 | 737.4 | | |
| TARE #1 | 0.0 | 0.0 | 0.0 | 0.0 | | |
| WW + T #2 | | | | | | |
| WD + T #2 | | | | | | |
| TARE #2 | | | | | | |
| MOISTURE | 2.9, | 7.9 | 14.9 | 19.7 | | |
| DRY DENSITY | 115.6 | 119.5 | 119.9 | 116.8 | | |

**TEST RESULTS**

Maximum dry density = 120.6 pcf

Optimum moisture = 11.8 %

**Material Description**

**Remarks:**

**Project No.** APX-2492 **Client:** Mott MacDonald
**Project:**

o **Location:** B-35, Bulk-35, 2-5 **Depth:** 2-5 **Sample Number:** S-31

**Checked by:**
**Title:**

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**Figure 31 F 2**

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

**CLIENT**: Mott MacDonald
111 Wood Avenue South
Iselin, NJ 08830-4112

**DATE:** 08-27-2020

**Kind Attn: Mr. Vatsal A.Shah. PE, Ph.D,D.GE**
Vice President/President Engineer

**FILE NO**: APX-2492

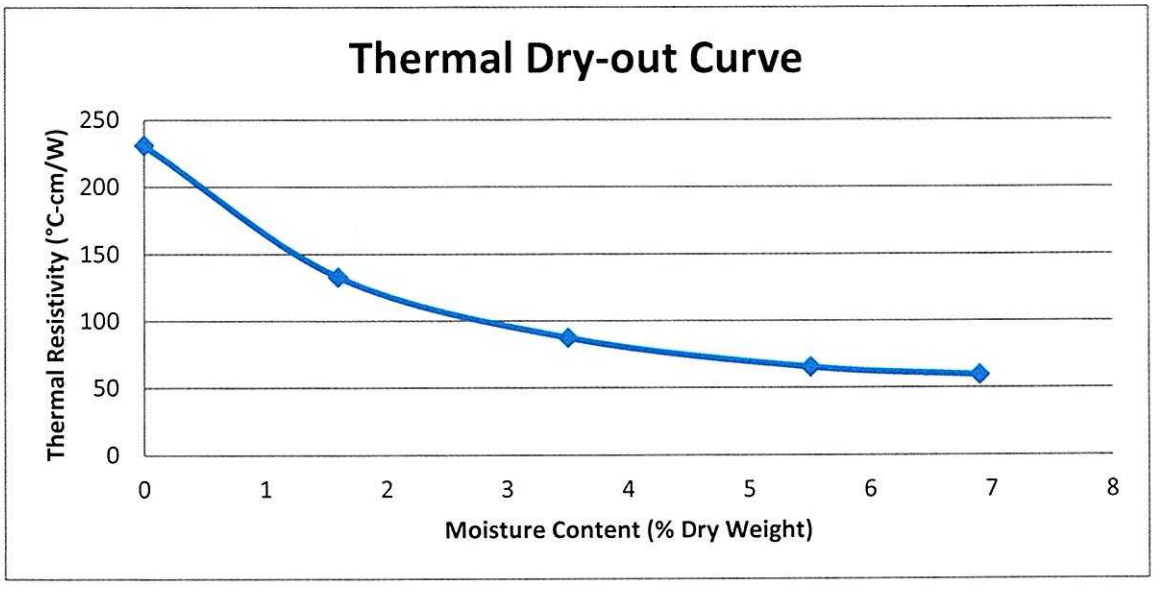
**PROJECT**: Connect Gen, South Ripley
South Ripley, NY

**REPORT NO:** 8

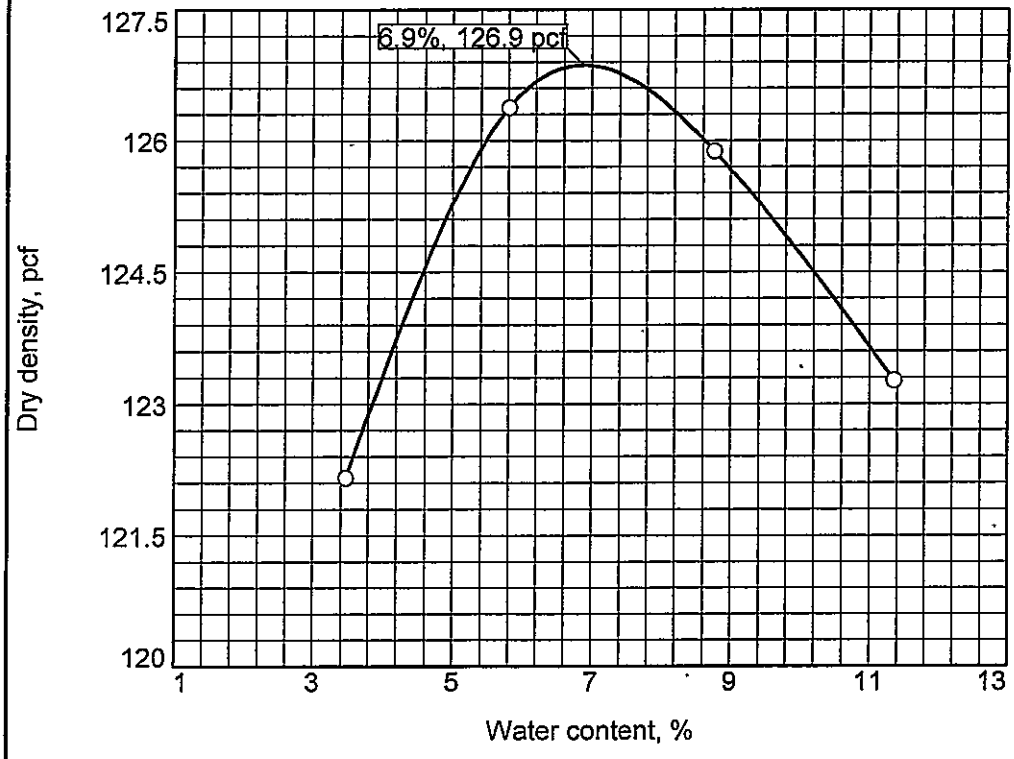
**Test Data- Sample No. S-32 ( B-38, Bulk-38, 2'-5' )**

Standard Proctor Value: 126.9 Optimum Moisture Content: 6.9%
Remolded Dry Density : 107.9 ( 85% ) Moisture Content as received: 11.4%

| Moisture Contents ( % ) | Initial Soil Temperature ( °C ) | Thermal Resistivity (°C-cm/W) |
|---|---|---|
| 0.0 | 24.4 | 231 |
| 1.6 | 24.4 | 133 |
| 3.5 | 24.4 | 87 |
| 5.5 | 24.4 | 65 |
| 6.9 | 24.3 | 59 |



# COMPACTION TEST REPORT




**Curve No.**
**S-32**

**Test Specification:**
ASTM D 698-91 Procedure B Standard

**Preparation Method** _____
**Hammer Wt.** 5.5 lb.
**Hammer Drop** 12 in.
**Number of Layers** three
**Blows per Layer** 25
**Mold Size** 0.03333 cu. ft.
**Test Performed on Material Passing** 3/8 in. **Sieve**

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

**TESTING DATA**

| | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| **WM + WS** | 13.64 | 13.88 | 13.99 | 14.00 | | |
| **WM** | 9.43 | 9.43 | 9.43 | 9.43 | | |
| **WW + T #1** | 652.2 | 781.4 | 743.3 | 799.2 | | |
| **WD + T #1** | 630.3 | 738.5 | 683.4 | 717.7 | | |
| **TARE #1** | 0.0 | 0.0 | 0.0 | 0.0 | | |
| **WW + T #2** | | | | | | |
| **WD + T #2** | | | | | | |
| **TARE #2** | | | | | | |
| **MOISTURE** | 3.5 | 5.8 | 8.8 | 11.4 | | |
| **DRY DENSITY** | 122.2 | 126.4 | 125.9 | 123.3 | | |

**TEST RESULTS**

Maximum dry density = 126.9 pcf

Optimum moisture = 6.9 %

**Material Description**

**Remarks:**

**Project No.** APX-2492 **Client:** Mott MacDonald
**Project:**

○ **Location:** B-38, Bulk-38, 2-5 **Depth:** 2-5 **Sample Number:** S-32

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**Figure 32 F 2**

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

**CLIENT**: Mott MacDonald
111 Wood Avenue South
Iselin, NJ 08830-4112

**DATE:** 08-27-2020

**Kind Attn: Mr. Vatsal A.Shah. PE, Ph.D,D.GE**
Vice President/President Engineer

**FILE NO**: APX-2492

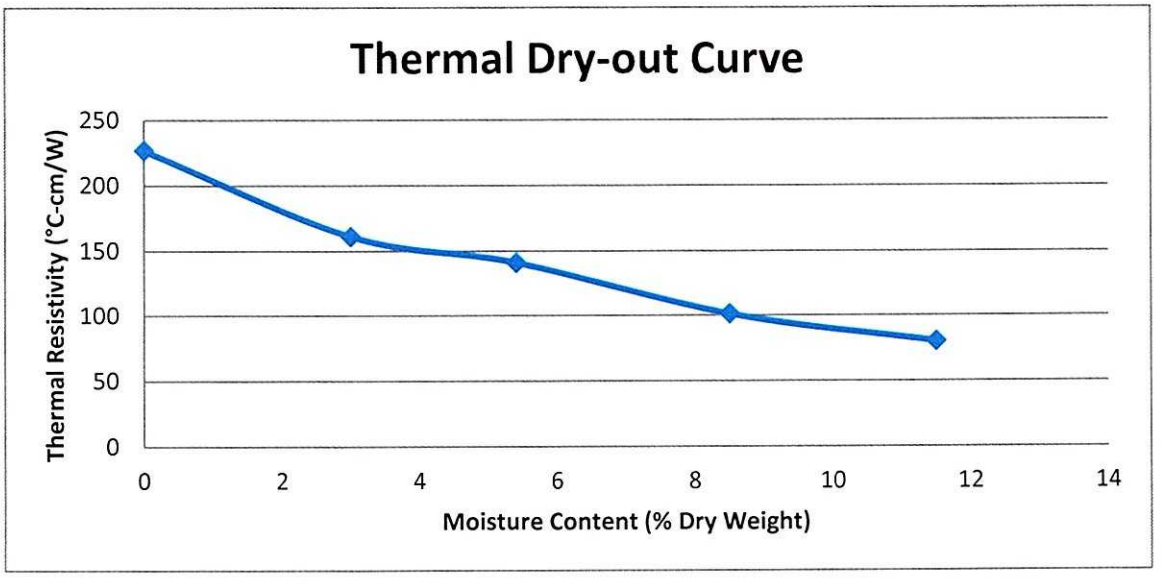
**PROJECT**: Connect Gen, South Ripley
South Ripley, NY

**REPORT NO:** 9

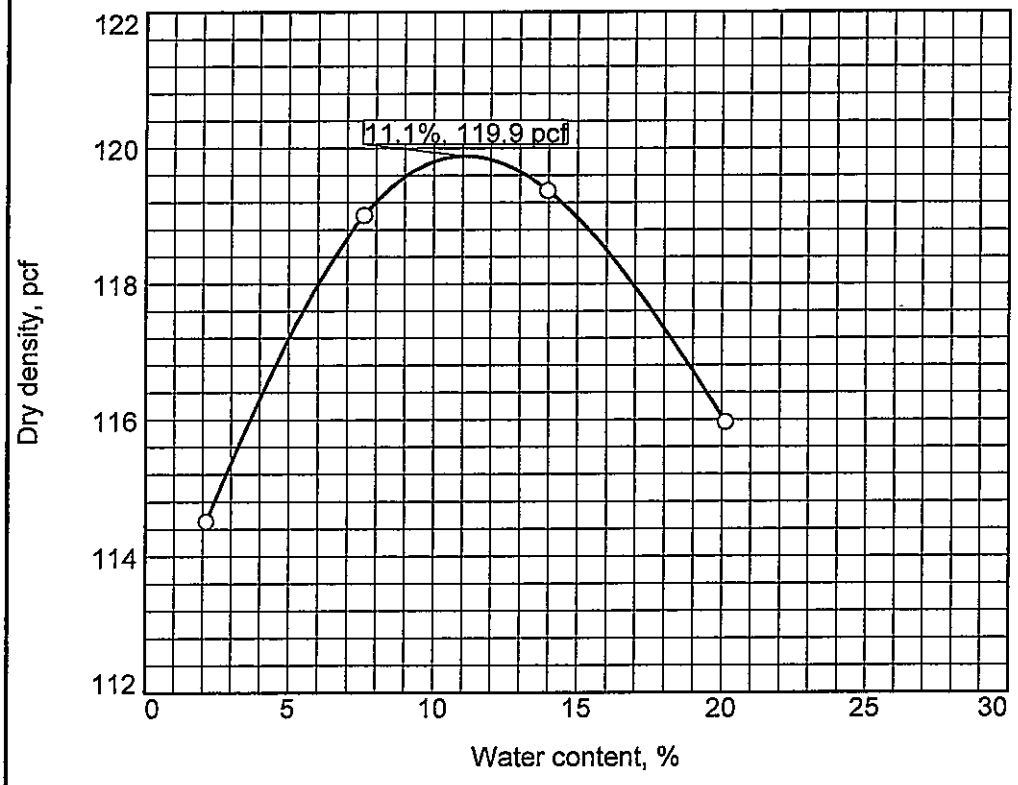
**Test Data- Sample No. S-33 ( B-40, Bulk-40, 2'-5' )**

Standard Proctor Value: 119.9 Optimum Moisture Content: 11.1%
Remolded Dry Density : 102.0 ( 85% ) Moisture Content as received: 15.1%

| Moisture Contents ( % ) | Initial Soil Temperature ( °C ) | Thermal Resistivity (°C-cm/W) |
|---|---|---|
| 0.0 | 24.4 | 227 |
| 3.0 | 24.1 | 161 |
| 5.4 | 24.0 | 141 |
| 8.5 | 23.9 | 101 |
| 11.5 | 23.7 | 80 |



# COMPACTION TEST REPORT




**Curve No.**
**S-33**

**Test Specification:**
ASTM D 698-91 Procedure B Standard

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

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

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

**TESTING DATA**

| | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| **WM + WS** | 13.32 | 13.69 | 13.96 | 14.07 | | |
| **WM** | 9.43 | 9.43 | 9.43 | 9.43 | | |
| **WW + T #1** | 649.4 | 557.6 | 925.8 | 894.7 | | |
| **WD + T #1** | 635.9 | 518.2 | 812.3 | 744.8 | | |
| **TARE #1** | 0.0 | 0.0 | 0.0 | 0.0 | | |
| **WW + T #2** | | | | | | |
| **WD + T #2** | | | | | | |
| **TARE #2** | | | | | | |
| **MOISTURE** | 2.1 | 7.6 | 14.0 | 20.1 | | |
| **DRY DENSITY** | 114.5 | 119.0 | 119.4 | 116.0 | | |

**TEST RESULTS**

Maximum dry density = 119.9 pcf

Optimum moisture = 11.1 %

**Material Description**

**Remarks:**

**Project No.** APX-2492 **Client:** Mott MacDonald
**Project:**

○ **Location:** B-40, Bulk-40, 2-5 **Depth:** 2-5 **Sample Number:** S-33

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**Figure 33 F 2**

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

**CLIENT**: Mott MacDonald
111 Wood Avenue South
Iselin, NJ 08830-4112

**DATE:** 08-27-2020

**Kind Attn: Mr. Vatsal A.Shah. PE, Ph.D,D.GE**
Vice President/President Engineer

**FILE NO**: APX-2492

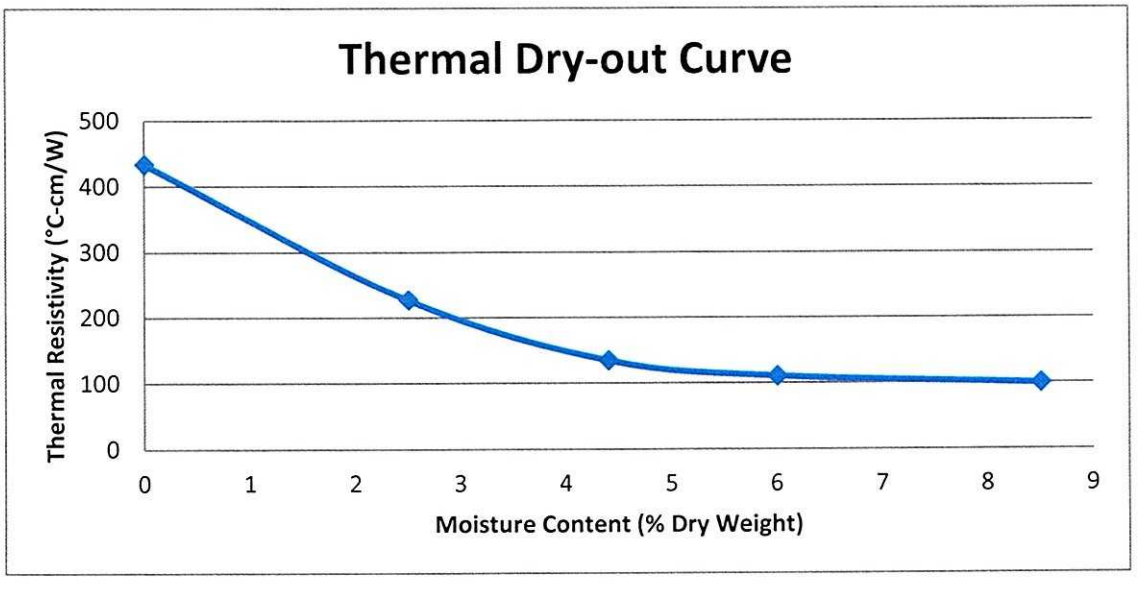
**PROJECT**: Connect Gen, South Ripley
South Ripley, NY

**REPORT NO:** 10

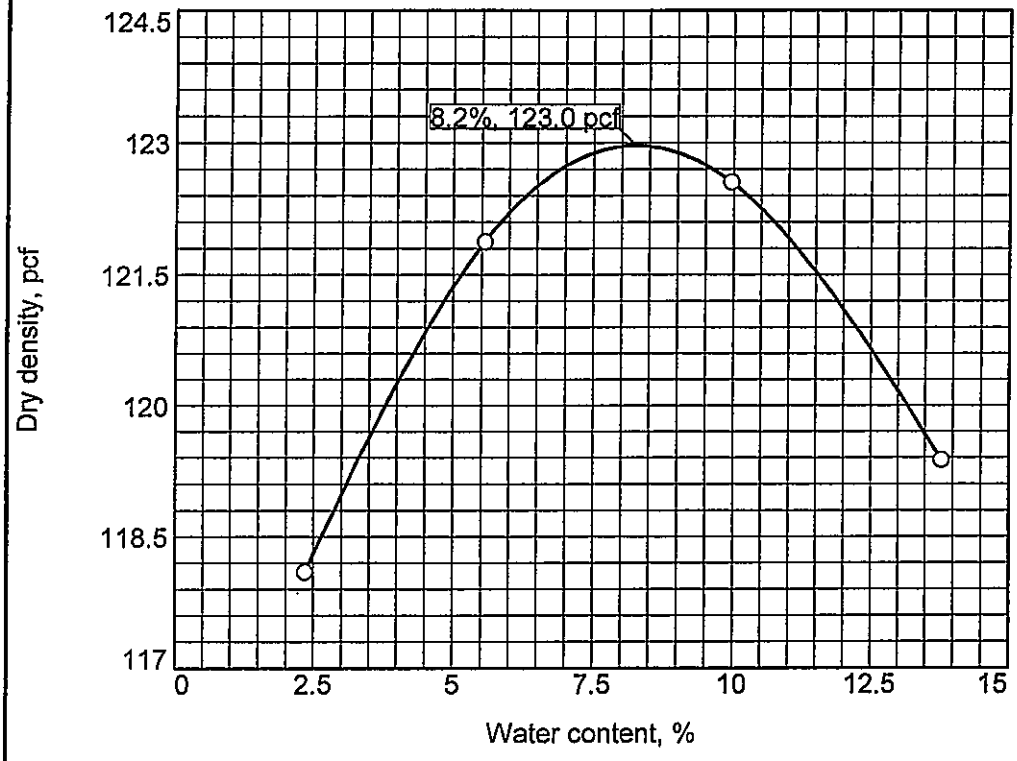
**Test Data- Sample No. S-34 ( B-42, Bulk-42, 2'-5' )**

Standard Proctor Value: 123.0 Optimum Moisture Content: 8.2%
Remolded Dry Density : 104.6 ( 85% ) Moisture Content as received: 12.1%

| Moisture Contents ( % ) | Initial Soil Temperature ( °C ) | Thermal Resistivity (°C-cm/W) |
|---|---|---|
| 0.0 | 27.1 | 434 |
| 2.5 | 26.8 | 227 |
| 4.4 | 26.8 | 134 |
| 6.0 | 26.5 | 110 |
| 8.5 | 26.1 | 99 |



# COMPACTION TEST REPORT




**Curve No.**
**S-34**

**Test Specification:**
ASTM D 698-91 Procedure B Standard

**Preparation Method** _____
**Hammer Wt.** 5.5 lb.
**Hammer Drop** 12 in.
**Number of Layers** three
**Blows per Layer** 25
**Mold Size** 0.03333 cu. ft.
**Test Performed on Material Passing** 3/8 in. **Sieve**

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

**TESTING DATA**

| | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| WM + WS | 13.45 | 13.71 | 13.92 | 13.95 | | |
| WM | 9.43 | 9.43 | 9.43 | 9.43 | | |
| WW + T #1 | 890.3 | 777.9 | 829.1 | 794.3 | | |
| WD + T #1 | 869.9 | 736.9 | 754.0 | 698.0 | | |
| TARE #1 | 0.0 | 0.0 | 0.0 | 0.0 | | |
| WW + T #2 | | | | | | |
| WD + T #2 | | | | | | |
| TARE #2 | | | | | | |
| MOISTURE | 2.3 | 5.6 | 10.0 | 13.8 | | |
| DRY DENSITY | 118.1 | 121.9 | 122.6 | 119.4 | | |

**TEST RESULTS**

Maximum dry density = 123.0 pcf

Optimum moisture = 8.2 %

**Material Description**

**Remarks:**

**Project No.** APX-2492 **Client:** Mott MacDonald
**Project:**

o **Location:** B-42, Bulk-42, 2-5 **Depth:** 2-5 **Sample Number:** S-34

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**Figure 34 F 2**

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

**CLIENT**: Mott MacDonald
111 Wood Avenue South
Iselin, NJ 08830-4112

**DATE:** 08-27-2020

**Kind Attn: Mr. Vatsal A.Shah. PE, Ph.D,D.GE**
Vice President/President Engineer

**FILE NO**: APX-2492

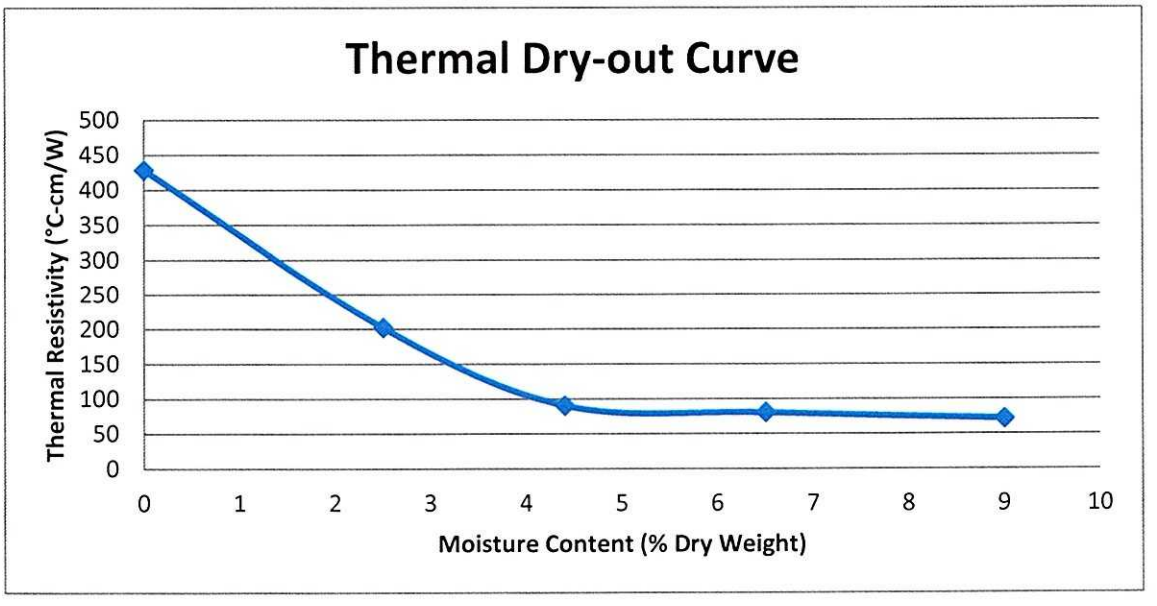
**PROJECT**: Connect Gen, South Ripley
South Ripley, NY

**REPORT NO:** 11

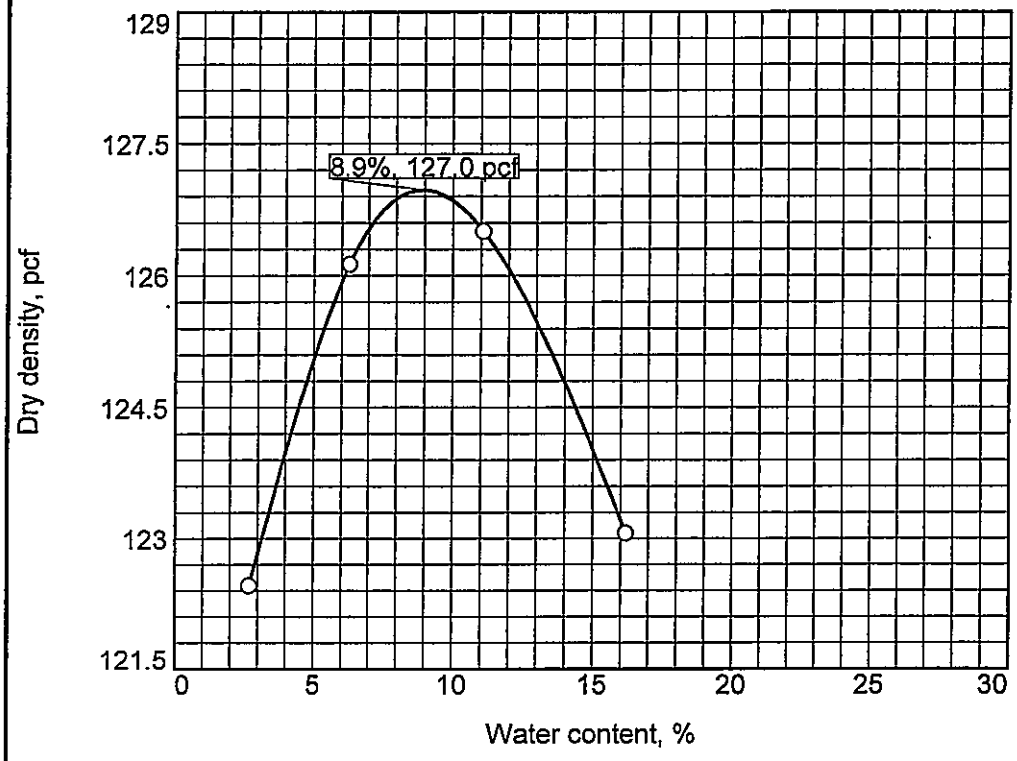
**Test Data- Sample No. S-35 ( B-43, Bulk-43, 2'-5' )**

Standard Proctor Value: 127.0 Optimum Moisture Content: 8.9%
Remolded Dry Density : 108.0 ( 85% ) Moisture Content as received: 11.7%

| Moisture Contents ( % ) | Initial Soil Temperature ( °C ) | Thermal Resistivity (°C-cm/W) |
|---|---|---|
| 0.0 | 24.7 | 429 |
| 2.5 | 24.6 | 202 |
| 4.4 | 24.5 | 90 |
| 6.5 | 24.2 | 80 |
| 9.0 | 23.9 | 71 |



# COMPACTION TEST REPORT




**Curve No.**
**S-35**

**Test Specification:**
ASTM D 698-91 Procedure C Standard

**Preparation Method** _____
**Hammer Wt.** 5.5 lb.
**Hammer Drop** 12 in.
**Number of Layers** three
**Blows per Layer** 56
**Mold Size** 0.075 cu. ft.

**Test Performed on Material**
**Passing** 3/4 in. **Sieve**

**NM** _____ **LL** _____ **PI** _____
**Sp.G. (ASTM D 854)** _____
**%>3/4 in.** _____ **%<No.200** _____
**USCS** _____ **AASHTO** _____
**Date Sampled** _____
**Date Tested** _____
**Tested By** _____

**TESTING DATA**

| | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| **WM + WS** | 23.18 | 23.80 | 24.29 | 24.47 | | |
| **WM** | 13.75 | 13.75 | 13.75 | 13.75 | | |
| **WW + T #1** | 833.5 | 807.0 | 818.5 | 979.4 | | |
| **WD + T #1** | 811.6 | 759.2 | 736.8 | 842.9 | | |
| **TARE #1** | 0.0 | 0.0 | 0.0 | 0.0 | | |
| **WW + T #2** | | | | | | |
| **WD + T #2** | | | | | | |
| **TARE #2** | | | | | | |
| **MOISTURE** | 2.7 | 6.3 | 11.1 | 16.2 | | |
| **DRY DENSITY** | 122.5 | 126.1 | 126.5 | 123.1 | | |

**TEST RESULTS**

Maximum dry density = 127.0 pcf

Optimum moisture = 8.9 %

**Material Description**

**Remarks:**

**Project No.** APX-2492 **Client:** Mott MacDonald
**Project:**

○ **Location:** B-43, Bulk-43, 2-5 **Depth:** 2-5 **Sample Number:** S-35

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**Figure 35 F 2**

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

**CLIENT**: Mott MacDonald
111 Wood Avenue South
Iselin, NJ 08830-4112

**DATE:** 08-27-2020

**Kind Attn: Mr. Vatsal A.Shah. PE, Ph.D,D.GE**
Vice President/President Engineer

**FILE NO**: APX-2492

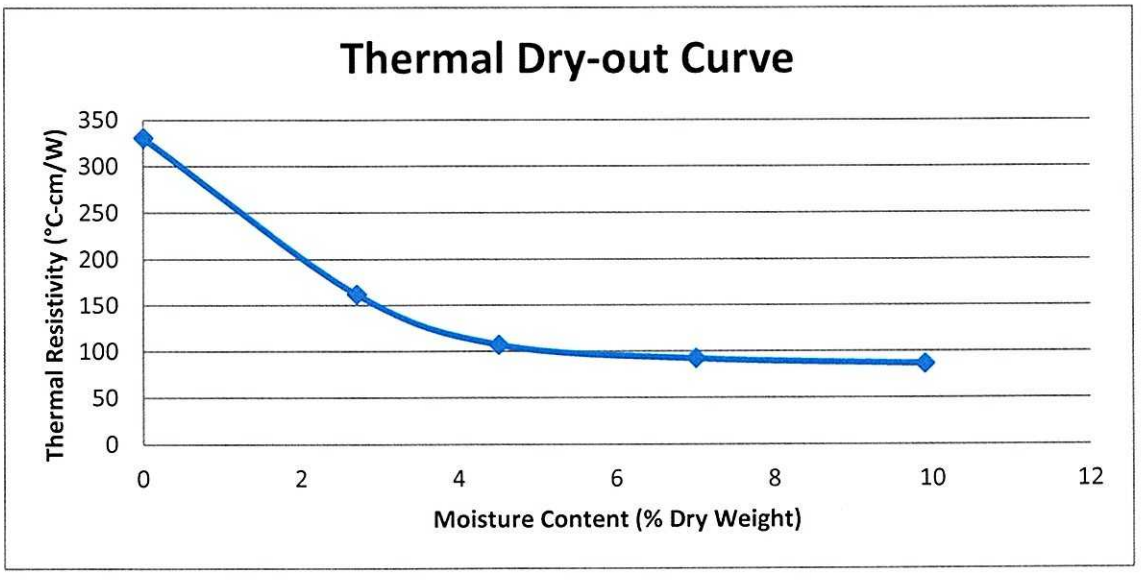
**PROJECT**: Connect Gen, South Ripley
South Ripley, NY

**REPORT NO:** 12

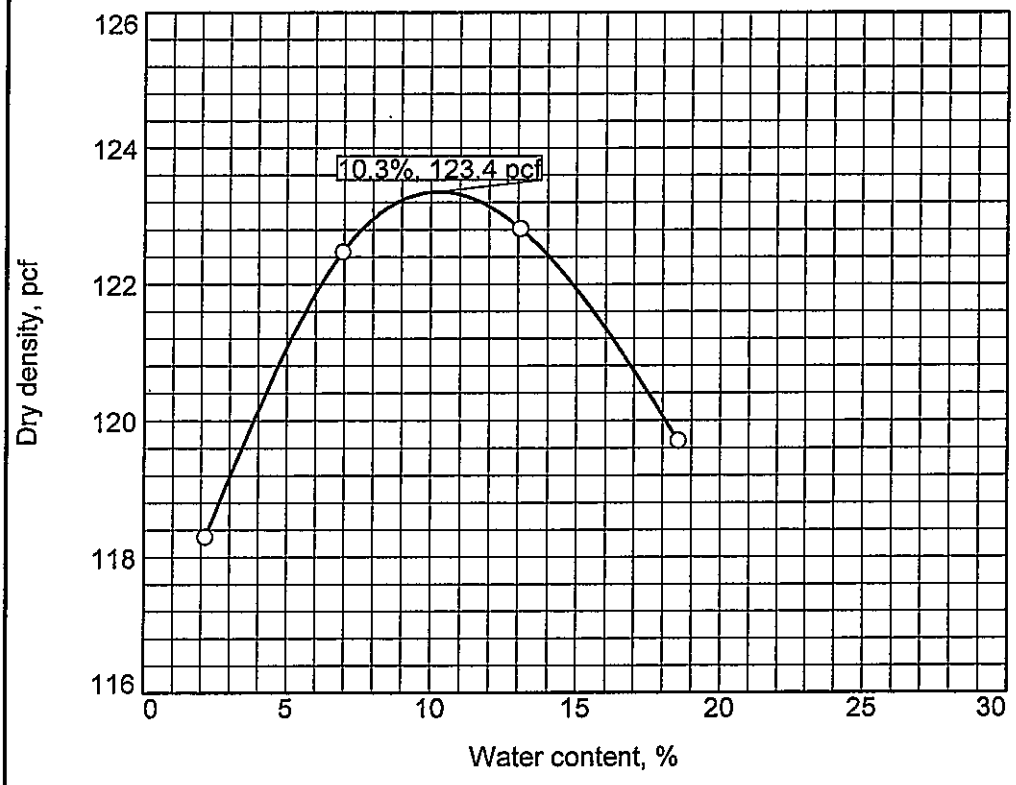
**Test Data- Sample No. S-36 ( B-44, Bulk-44, 2'-5' )**

Standard Proctor Value: 123.4 Optimum Moisture Content: 10.3%
Remolded Dry Density : 104.9 ( 85% ) Moisture Content as received: 14.3%

| Moisture Contents ( % ) | Initial Soil Temperature ( °C ) | Thermal Resistivity (°C-cm/W) |
|---|---|---|
| 0.0 | 26.2 | 331 |
| 2.7 | 26.0 | 162 |
| 4.5 | 25.9 | 107 |
| 7.0 | 25.6 | 92 |
| 9.9 | 25.4 | 86 |



# COMPACTION TEST REPORT




**Curve No.**
**S-36**

**Test Specification:**
ASTM D 698-91 Procedure B Standard

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

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

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

**TESTING DATA**

| | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| **WM + WS** | 13.45 | 13.79 | 14.05 | 14.15 | | |
| **WM** | 9.43 | 9.43 | 9.43 | 9.43 | | |
| **WW + T #1** | 800.8 | 716.2 | 832.9 | 824.3 | | |
| **WD + T #1** | 784.0 | 669.6 | 736.6 | 695.4 | | |
| **TARE #1** | 0.0 | 0.0 | 0.0 | 0.0 | | |
| **WW + T #2** | | | | | | |
| **WD + T #2** | | | | | | |
| **TARE #2** | | | | | | |
| **MOISTURE** | 2.1 | 7.0 | 13.1 | 18.5 | | |
| **DRY DENSITY** | 118.3 | 122.5 | 122.8 | 119.7 | | |

**TEST RESULTS**

Maximum dry density = 123.4 pcf

Optimum moisture = 10.3 %

**Material Description**

**Remarks:**

**Project No.** APX-2492 **Client:** Mott MacDonald
**Project:**

○ **Location:** B-44, Bulk-44, 2-5 **Depth:** 2-5 **Sample Number:** S-36

**Checked by:**
**Title:**

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**South Plainfield, New Jersey**

**Figure 36 F 2**

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

**CLIENT**: Mott MacDonald
111 Wood Avenue South
Iselin, NJ 08830-4112

**DATE:** 08-27-2020

**Kind Attn: Mr. Vatsal A.Shah. PE, Ph.D,D.GE**
Vice President/President Engineer

**FILE NO**: APX-2492

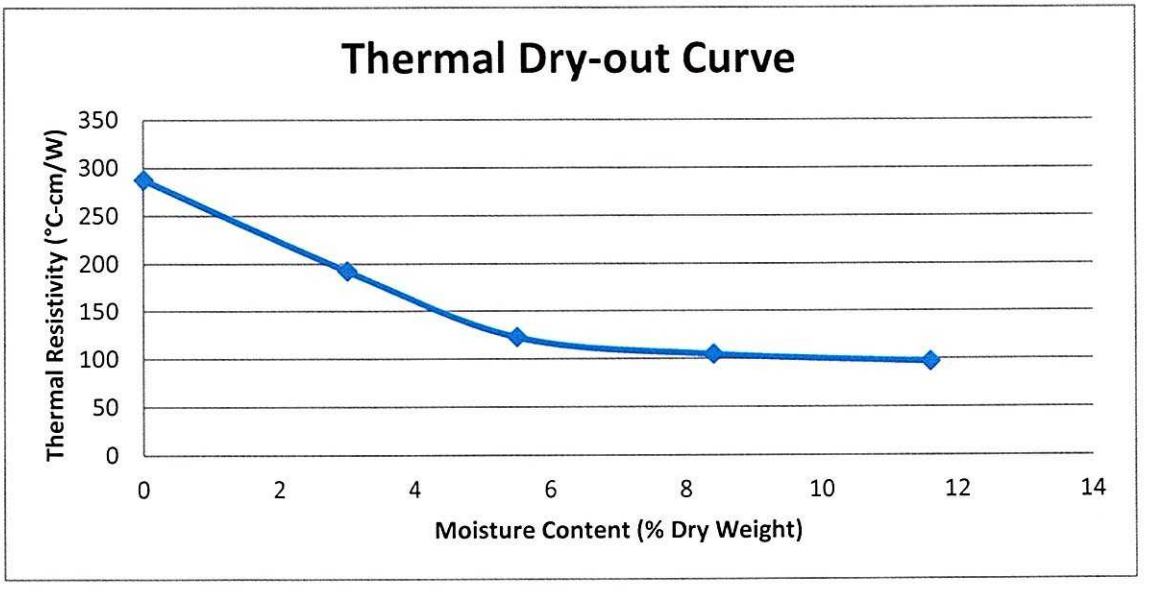
**PROJECT**: Connect Gen, South Ripley
South Ripley, NY

**REPORT NO:** 13

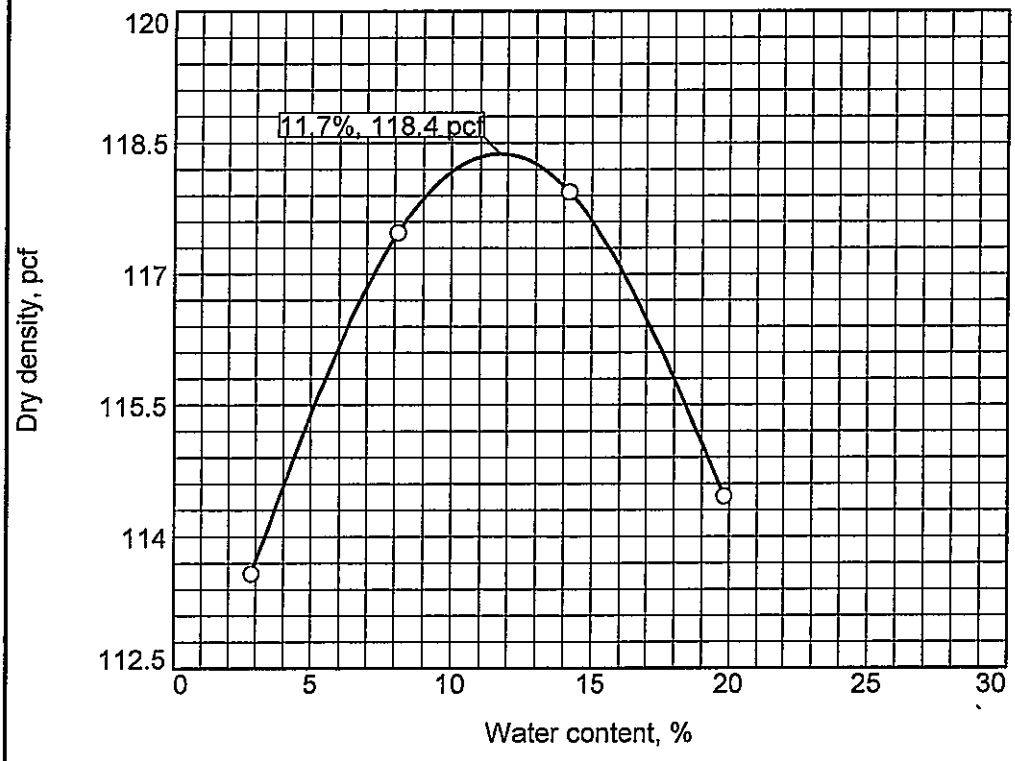
**Test Data- Sample No. S-37 ( B-46, Bulk-46, 2'-5' )**

Standard Proctor Value: 118.4 Optimum Moisture Content: 11.7%
Remolded Dry Density : 100.6 ( 85% ) Moisture Content as received: 15.1%

| Moisture Contents ( % ) | Initial Soil Temperature ( °C ) | Thermal Resistivity (°C-cm/W) |
|---|---|---|
| 0.0 | 26.5 | 228 |
| 3.0 | 26.5 | 193 |
| 5.5 | 26.3 | 123 |
| 8.4 | 25.9 | 105 |
| 11.6 | 25.8 | 97 |



# COMPACTION TEST REPORT




**Curve No.**
**S-37**

**Test Specification:**
ASTM D 698-91 Procedure B Standard

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

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

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

**TESTING DATA**

| | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| WM + WS | 13.32 | 13.66 | 13.91 | 14.00 | | |
| WM | 9.43 | 9.43 | 9.43 | 9.43 | | |
| WW + T #1 | 836.4 | 826.9 | 846.1 | 1026.8 | | |
| WD + T #1 | 813.3 | 764.9 | 741.0 | 857.0 | | |
| TARE #1 | 0.0 | 0.0 | 0.0 | 0.0 | | |
| WW + T #2 | | | | | | |
| WD + T #2 | | | | | | |
| TARE #2 | | | | | | |
| MOISTURE | 2.8 | 8.1 | 14.2 | 19.8 | | |
| DRY DENSITY | 113.6 | 117.5 | 117.9 | 114.5 | | |

**TEST RESULTS**

Maximum dry density = 118.4 pcf

Optimum moisture = 11.7 %

**Material Description**

**Remarks:**

**Project No.** APX-2492 **Client:** Mott MacDonald
**Project:**

○ **Location:** B-46, Bulk-46, 2-5 **Depth:** 2-5 **Sample Number:** S-37

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**Figure 37 F 2**

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

**CLIENT**: Mott MacDonald
111 Wood Avenue South
Iselin, NJ 08830-4112

**DATE:** 08-27-2020

**Kind Attn: Mr. Vatsal A.Shah. PE, Ph.D,D.GE**
Vice President/President Engineer

**FILE NO**: APX-2492

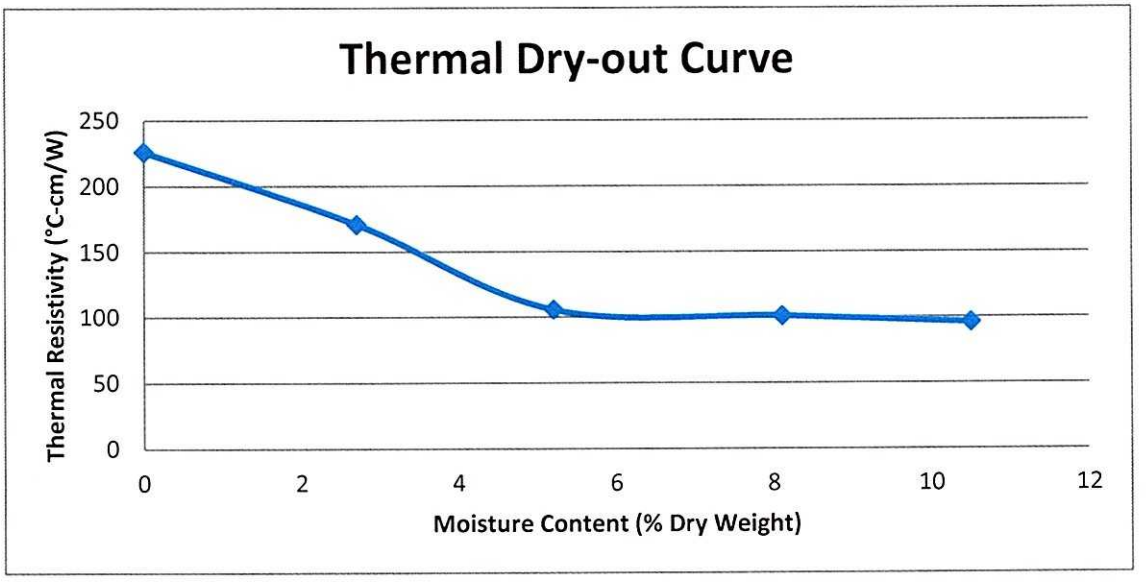
**PROJECT**: Connect Gen, South Ripley
South Ripley, NY

**REPORT NO:** 14

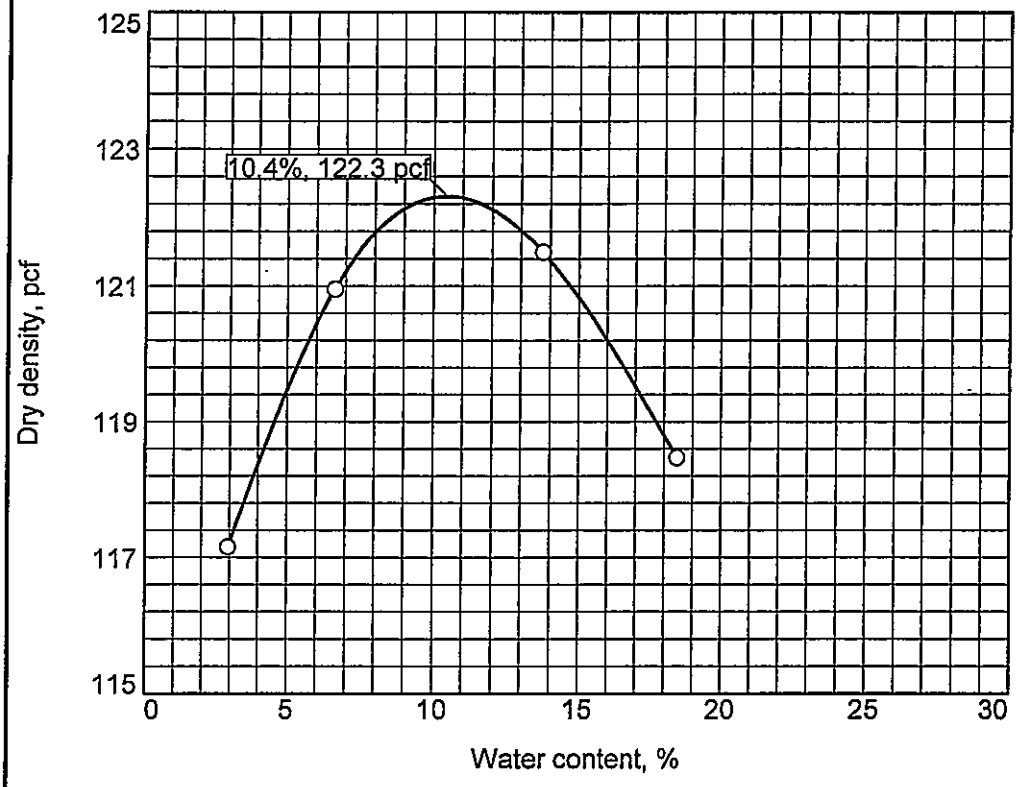
**Test Data- Sample No. S-38 ( B-47, Bulk-47, 2'-5' )**

Standard Proctor Value: 122.3 Optimum Moisture Content: 10.4%
Remolded Dry Density : 104.0 ( 85% ) Moisture Content as received: 13.9 %

| Moisture Contents ( % ) | Initial Soil Temperature ( °C ) | Thermal Resistivity (°C-cm/W) |
|---|---|---|
| 0.0 | 25.6 | 226 |
| 2.7 | 25.4 | 171 |
| 5.2 | 25.4 | 106 |
| 8.1 | 25.3 | 101 |
| 10.5 | 25.2 | 96 |



# COMPACTION TEST REPORT




**Curve No.**
**S-38**

**Test Specification:**
ASTM D 698-91 Procedure B Standard

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

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

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

**TESTING DATA**

| | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| WM + WS | 13.45 | 13.72 | 14.03 | 14.10 | | |
| WM | 9.43 | 9.43 | 9.43 | 9.43 | | |
| WW + T #1 | 639.9 | 564.7 | 835.1 | 793.0 | | |
| WD + T #1 | 621.6 | 529.6 | 734.2 | 669.5 | | |
| TARE #1 | 0.0 | 0.0 | 0.0 | 0.0 | | |
| WW + T #2 | | | | | | |
| WD + T #2 | | | | | | |
| TARE #2 | | | | | | |
| MOISTURE | 2.9 | 6.6 | 13.7 | 18.4 | | |
| DRY DENSITY | 117.2 | 121.0 | 121.5 | 118.5 | | |

**TEST RESULTS**

Maximum dry density = 122.3 pcf

Optimum moisture = 10.4 %

**Material Description**

**Remarks:**

**Project No.** APX-2492 **Client:** Mott MacDonald
**Project:**

○ **Location:** B-47, Bulk-47, 2-5 **Depth:** 2-5 **Sample Number:** S-38

**ANS CONSULTANTS, INC.**

**South Plainfield, New Jersey**

**Checked by:**
**Title:**

Figure 38 F 2

# G. Seismic Support Data

# Connect Gen- South Ripley

## South Ripley, NY 14775, USA

### Latitude, Longitude: 42.1950571, -79.72060259999999


| | |
|---|---|
| **Date** | 8/19/2020, 11:59:52 AM |
| **Design Code Reference Document** | ASCE7-16 |
| **Risk Category** | I |
| **Site Class** | D - Default (See Section 11.4.3) |

| Type | Value | Description |
|---|---|---|
| $S_S$ | 0.104 | $MCE_R$ ground motion. (for 0.2 second period) |
| $S_1$ | 0.039 | $MCE_R$ ground motion. (for 1.0s period) |
| $S_{MS}$ | 0.167 | Site-modified spectral acceleration value |
| $S_{M1}$ | 0.093 | Site-modified spectral acceleration value |
| $S_{DS}$ | 0.111 | Numeric seismic design value at 0.2 second SA |
| $S_{D1}$ | 0.062 | Numeric seismic design value at 1.0 second SA |

| Type | Value | Description |
|---|---|---|
| SDC | A | Seismic design category |
| $F_a$ | 1.6 | Site amplification factor at 0.2 second |
| $F_v$ | 2.4 | Site amplification factor at 1.0 second |
| PGA | 0.052 | $MCE_G$ peak ground acceleration |
| $F_{PGA}$ | 1.6 | Site amplification factor at PGA |
| $PGA_M$ | 0.084 | Site modified peak ground acceleration |
| $T_L$ | 12 | Long-period transition period in seconds |
| SsRT | 0.104 | Probabilistic risk-targeted ground motion. (0.2 second) |
| SsUH | 0.112 | Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration |
| SsD | 1.5 | Factored deterministic acceleration value. (0.2 second) |
| S1RT | 0.039 | Probabilistic risk-targeted ground motion. (1.0 second) |
| S1UH | 0.042 | Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration. |
| S1D | 0.6 | Factored deterministic acceleration value. (1.0 second) |
| PGAd | 0.5 | Factored deterministic acceleration value. (Peak Ground Acceleration) |
| $C_{RS}$ | 0.93 | Mapped value of the risk coefficient at short periods |

| Type | Value | Description |
| --- | --- | --- |
| $C_{R1}$ | 0.925 | Mapped value of the risk coefficient at a period of 1 s |

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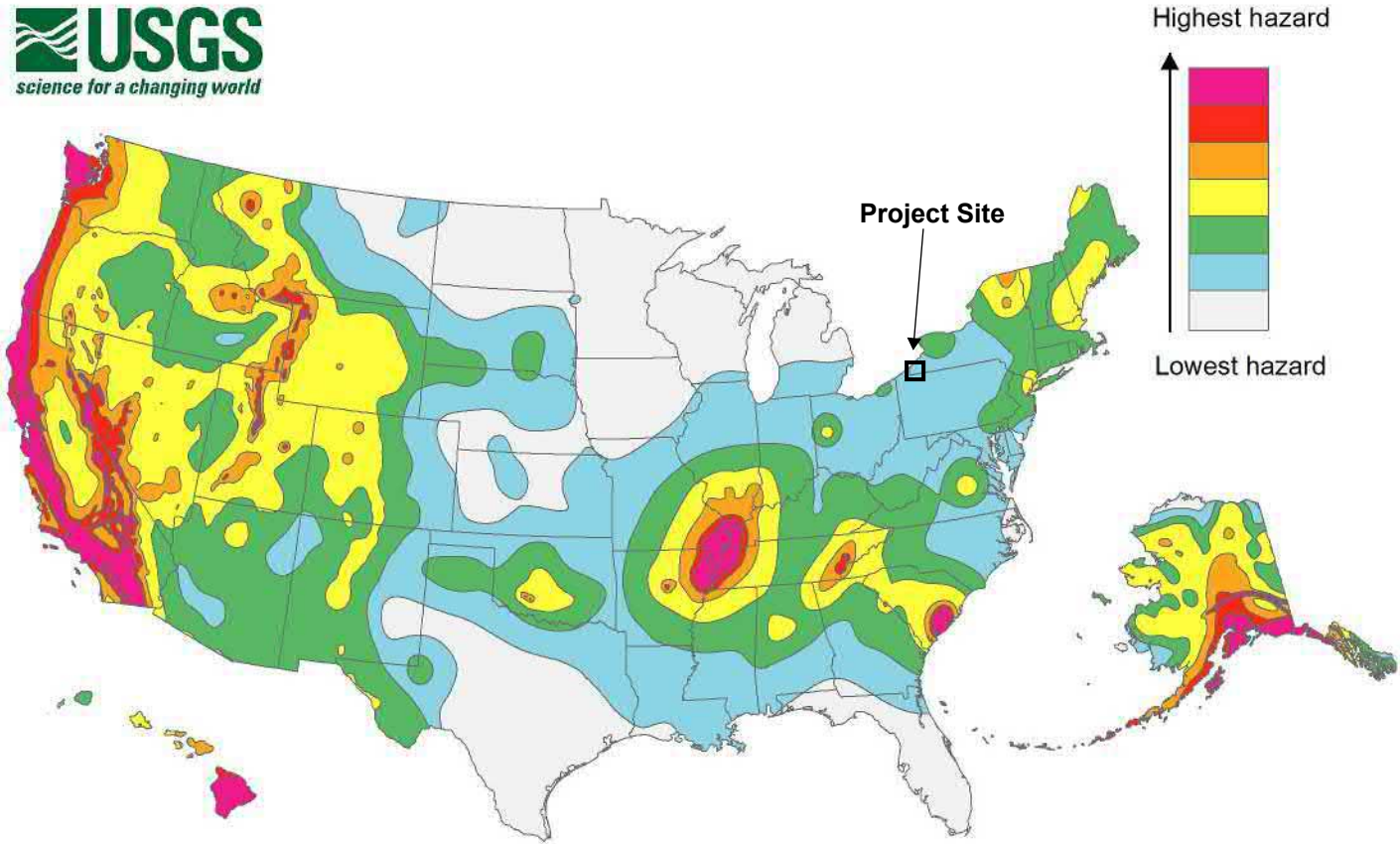
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science for a changing world
Highest hazard
Lowest hazard
Project Site