



Geotechnical Engineering Report

**GUC 115 KV Phase 1 & Phase II Transmission Lines
Greenville, Pitt County, North Carolina**

December 17, 2021

Terracon Project No. 72215031

Prepared for:

Stanley Consultants Inc
Centennial, CO

Prepared by:

Terracon Consultants, Inc.
Winterville, NC



December 17, 2021



Stanley Consultants Inc
8000 S Chester St Ste 500
Centennial, CO 80112

Attn: Jason Varone Civil/Structural
P: (303) 925-8349
E: VaroneJason@stanleygroup.com

Re: Geotechnical Engineering Report
GUC 115 KV Phase 1 & Phase II Transmission Lines
Greenville, Pitt County, North Carolina
Terracon Project No. 72215031

Dear Mr. Varone:

We have completed the Geotechnical Engineering services for the above referenced project. This study was performed in general accordance with Terracon Proposal No. P72215031 dated July 20, 2021. This report presents the findings of the subsurface exploration and provides geotechnical recommendations concerning design and construction of foundations for the proposed project.

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

Sincerely,
Terracon Consultants, Inc.

Branson Rogers
Staff Professional
Geotechnical Services

Andrew J. Gliniak, PE
Geotechnical Project Engineer
Registered NC 042183

Andrew A. Nash, PE
Geotechnical Department Manager (Raleigh)

SME Review: André M. Gallet, PE / Vice President / Senior Principal

Terracon Consultants, Inc. 314 Beacon Drive Winterville, NC 28590
P (252) 353 1600 F (252) 353 0002 terracon.com Registered NC F-0869

Environmental



Facilities



Geotechnical



Materials

REPORT TOPICS

INTRODUCTION.....	1
SITE CONDITIONS.....	1
PROJECT DESCRIPTION.....	2
GEOTECHNICAL CHARACTERIZATION.....	3
GEOTECHNICAL OVERVIEW	4
DRILLED PIER FOUNDATIONS	5
CORROSIVITY.....	7
GENERAL COMMENTS.....	8
FIGURES	10
ATTACHMENTS.....	11

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

ATTACHMENTS

EXPLORATION AND TESTING PROCEDURES
SITE LOCATION AND EXPLORATION PLANS
EXPLORATION RESULTS
DESIGN SOIL PARAMETERS FOR DRILLED PIERS
SUPPORTING INFORMATION

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

Geotechnical Engineering Report
GUC 115 KV Phase 1 & Phase II Transmission Lines
Sugg Parkway and Old Cree Road
Greenville, Pitt County, North Carolina
Terracon Project No. 72215031
December 17, 2021

INTRODUCTION

This report presents the results of our subsurface exploration and geotechnical engineering services performed for the proposed substation and poles to be located in Greenville, Pitt County, North Carolina. The purpose of these services is to provide information and geotechnical engineering recommendations relative to:

- Subsurface soil conditions
- Foundation design and construction
- Groundwater conditions

The geotechnical engineering Scope of Services for this project included the advancement of sixteen test borings to a depth of approximately 50 feet below existing site grades.

Maps showing the site and boring locations are shown in the **Site Location** and **Exploration Plan** sections, respectively. The results of the laboratory testing performed on soil samples obtained from the site during the field exploration are included on the boring logs and as separate graphs in the **Exploration Results** section.

SITE CONDITIONS

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

Item	Description
Parcel Information	<p>The project is located in Greenville, Pitt County, North Carolina. The project consists of two phases located as follows:</p> <ul style="list-style-type: none"> ■ Phase 1: Mount Pleasant Substation to the Indigreen Substation along Belvoir School Road, US-264, NC-11, NC-903, Whichard Road, Lewis Dudley Road, Old Creek Road, and Sugg Parkway. (7.2 miles) ■ Phase 2: G230 South POD to the Simpson Substation along LT Hardee Road, NC-33, Blackjack Simpson Road, Hudson’s Crossroads Road, and Mills Road. (7.6 miles) <p>See Site Location</p>

Geotechnical Engineering Report

GUC 115 KV Phase 1 & Phase II Transmission Lines ■ Greenville, Pitt County, North Carolina
December 17, 2021 ■ Terracon Project No. 72215031



Item	Description
Existing Improvements	Undeveloped at foundation locations.
Current Ground Cover	Grass, cultivated or thinly wooded.
Existing Topography	Relatively level
Geology	<p>The subject site is located in the Coastal Plain Physiographic Province. The Coastal Plain soils consist mainly of marine sediments that were deposited during successive periods of fluctuating sea level and moving shoreline. The soils include sands, silts, and clays with irregular deposits of shells, which are typical of those lain down in a shallow sloping sea bottom. Recent alluvial sands, silts, and clays are typically present near rivers and creeks.</p> <p>According to USGS Mineral Resources On-Line Spatial Data based on the 1998 digital equivalent of the 1985 Geologic Map of North Carolina updated in 1998, the site is mapped within the Yorktown Formation and Duplin Formation, Undivided (Tertiary)</p>

PROJECT DESCRIPTION

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

Item	Description
Information Provided	A Scope of services, route maps, and shared requested test locations from your email dated July 9, 2021
Project Description	<p>The purpose of the subsurface investigation is to provide geotechnical design parameters and data to Stanley Consultants (Engineer) for the 115kV Transmission Line Upgrades Project for Greenville Utilities Commission (Owner). The project will be split into two phases.</p> <p>The project consists of the installation of 115kV transmission lines with distribution under build, replacing the existing 12.47kV distribution lines. The new 115kV transmission lines will follow existing distribution routes between Mt. Pleasant sub and Sugg Sub for Phase 1 construction and between Simpson Sub and POD3 (G203 POD) Sub for Phase 2 construction.</p>
Proposed Structures	Foundations of vibratory driven piles and concrete drilled piers are anticipated.

Item	Description
<p>Maximum Loads (Provided in RFP)</p>	<p>Estimated transmission line structure loads (unfactored):</p> <ul style="list-style-type: none"> ■ Single circuit tangent steel structure, direct embedded; 13.0 kips vertical; 30.0 kips lateral; and 1600 ft-kips overturning moment. ■ Single circuit 44 degree running angle anchored to a drilled concrete pier; 20.0 kips vertical; 60.0 kips lateral; and 3000 ft-kips overturning moment. ■ Single circuit 90 degree dead-end anchored to a drilled concrete pier; 25.0 kips vertical; 150 kips laterally; and 9500 ft-kips overturning moment.
<p>Estimated Start of Construction</p>	<p>Late 2021</p>

GEOTECHNICAL CHARACTERIZATION

We have developed a general characterization of the subsurface conditions based upon our review of the subsurface exploration, laboratory data, geologic setting and our understanding of the project. This characterization, termed GeoModel, forms the basis of our geotechnical calculations and evaluation of site preparation and foundation options. Conditions encountered at each exploration point are indicated on the individual logs. The individual logs can be found in the **Exploration Results** section and the GeoModel can be found in the **Figures** section of this report.

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

Model Layer	Layer Name	General Description
01	Fill	Silty sand fill
02	Sand	Loose to medium dense sand
03	Clay	Soft to medium stiff clay
04	Very loose and soft soil	Very loose sand and very soft clay
05	Denser and stiffer soil	Dense to very dense sand and stiff to hard clay

The subsurface exploration encountered near surface fill consisting of silty sand between 3 to 5 feet below the ground surface at test locations SB-8A and SB-12A. The fill encountered appears to have been placed in a controlled manner (compacted), but we have no records of the fill placement.

Groundwater

Mud rotary drilling techniques were used to advance the borings which obscure the detection of water levels. Groundwater was measured at depths of 1 foot to 9 feet while drilling and after allowing the water levels to stabilize at least 24 hours. Groundwater while drilling was based on the moisture condition of the soil samples and observations during the exploration. Based on the moisture condition of the soil samples, cave in depths, and measurements, groundwater is anticipated at depths of 1 foot to 5 feet below the existing ground surface in all of the boring locations with the exception of SB-9. Groundwater in SB-9 is anticipated at a depth of 9 feet.

The groundwater level can change due to seasonal variations in the amount of rainfall, runoff and other factors not evident at the time the borings were performed. The possibility of groundwater level fluctuations should be considered when developing the design and construction plans for the project.

Seasonal High-Water Table

Soil samples were visually inspected using the Munsell Color System for determining color change indicative of SHWT. The seasonal high-water table is estimated at a depth of 3 feet to 5 feet at each of the boring locations. The SHWT is likely within the layer of fill or at the bottom of the surface fill encountered in Borings B-8A and B-12A to depths of 5 feet.

GEOTECHNICAL OVERVIEW

The borings encountered very loose to loose and very soft to medium stiff soil with underlying denser soil in some of the borings. Groundwater was encountered within 5 feet of the ground surface in all of the borings with the exception of SB-9 which was at approximately 9 feet. We understand drilled piers are the proposed foundations for the poles and driven piles are also being considered.

Other deep foundation alternative that could be considered are driven piles or ground anchors. If a different deep foundation system is selected other than drilled shafts, we can provide design parameters. A specialty ground anchors (driven tipping plates or helical piers) contractor will determine the actual final design capacities. .

Parameters for driven piles were not provided due to the risk of vibrations on existing utilities and adjacent structures. If driven piles are used vibrations should be accounted for by monitoring and pre-construction surveys as required.

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

DRILLED PIER FOUNDATIONS

Drilled Shaft Foundation Design

Shallow groundwater and sandy soils as encountered in the borings are conditions where caving of the sidewalls or “blow out” of the bottom can occur in the pier excavation. The “blow out” is caused by hydrostatic pressures causing water to flow upward into the excavation and lift soil from the bottom. Excavation for the piers utilizing slurry drilling techniques will reduce the potential blow out by counter-balancing the hydrostatic pressure. Typically, the wet method construction also requires incorporation of temporary or permanent surface casing to stabilize the top of the deep foundation excavation during construction. The temporary casing is removed after completion of concrete placement.

Drilled Shaft Axial Parameters

The axial soil design parameters are provided below in the table for the design of drilled shaft foundations. Design parameters for the skin and end bearing capacity of drilled piers are presented in **Design Soil Parameters for Drilled Piers section**. The values presented are factored side friction and end bearing. The provided skin friction values should be reduced by 2/3 for uplift loading. These values should be considered approximate. To avoid a reduction in uplift and lateral resistance caused by variable soil depths and quality, we recommend that a minimum pier length be stated on the design drawings.

The design should **consider reducing or neglecting the upper 3 feet of surficial material** to the potential effects of construction disturbance and creation of an annulus from lateral movements. If the design pier length exceeds 50 feet, Terracon should be contacted to provide additional comment with regard to end bearing support. It may be necessary to drill an additional soil test boring to confirm conditions at greater depths. It should be noted that subsurface conditions could vary if supports are moved from the location of our boring or if significant grade changes occur at the site.

MFAD Foundation Design

It is our understanding that the new transmission line structure will be supported on a deep foundation system, such as drilled shaft. We understand that the lateral load capacity for deep foundations (drilled shafts or direct embedment) will be analyzed using the MFAD program developed by the Electric Power Research Institute (EPRI) at each foundation location. The soil parameters used in the analyses include moist unit weight (γ_m), undrained shear strength (S_u), angle of internal friction (Φ), and the deformation modulus (E_p). It should be noted that the recommended soil strength parameters are not factored. Therefore, appropriate safety factors should be applied to the foundation design. Allowable soil/concrete bond strength for the shaft are zero. Additionally, lateral pile capacity analysis programs typically require input of moist unit weight above the groundwater table and submerged or effective unit weight below the groundwater table. Based on the data obtained in our exploration, and correlations provided in the MFAD 5.0 User

Guide, we recommend the lateral resistance of drilled piers presented in **Design Soil Parameters for Drilled Piers** section.

Drilled Shaft Construction Considerations

Based on subsurface conditions, a wet slurry displacement method is recommended for drilled shaft foundation construction. Drilled shafts and this construction method are typically used in the project area for support of similar structures subjected to high ground line moment and shear loads (traffic signal mast arms, high mast lighting, highway guide signs, etc.). Experienced drilled shaft contractors should be available in the area. The following recommendations are applicable for the wet method of drilled shaft construction.

- Temporary casing of the top portion of the shaft excavation is recommended to help maintain stability and reduce the potential for caving at the top of the excavation. Temporary casing will likely be permanent due to site conditions.
- A slurry displacement method drilled shaft is constructed by excavating with a drill rig equipped with appropriately sized tooling (earth augers, clean-out buckets, etc.) beneath drilling mud slurry which stabilizes the excavated shaft walls above the tooling while the shaft is being excavated.
- Typically, the slurry is introduced into the excavation at some depth above the groundwater level to help prevent caving of the sidewalls and maintain the integrity of the side friction resistance provided by the soil.
- When the design shaft depth is reached, fluid concrete is placed through a tremie pipe at the bottom of the excavation and the slurry is displaced out of the top of the shaft excavation as the shaft fills with concrete.
- The slurry level in the shaft excavation should be maintained at a minimum of 5 feet or one shaft diameter (whichever is greater) above the subsurface water level.
- Observation during drilled shaft excavation should include monitoring: plumbness; sufficient slurry head; the density, viscosity, pH and sand content of the drilling slurry; and any changes in the depth of the excavation between initial approval and prior to concreting. Recommend following local NCDOT slurry specifications.
- The specific gravity or relative density of the drilling mud slurry should be periodically monitored from the initial mixing to the completion of the excavation of each shaft. An increase in the specific gravity or density of the drilling slurry at the bottom of the shaft by as much as 10 percent could be indicative of soil particles settling out of the slurry onto the bottom of the excavation. Excessive accumulation of loose particles in the bottom of the shaft prior to concrete placement could result in a reduction of the factored bearing capacity

of the bottom of the drilled shaft or discontinuities in the shaft cross section if loose soil becomes suspended in the fluid concrete mass during concrete placement.

- The required fabricated reinforcing steel cage should be placed in the drilled shaft excavation after the shaft has reached the required depth and the drilling slurry has been cleaned/modified as necessary to meet specification requirements, and as close to the initiation of shaft concrete placement as feasible. The reinforcing cage should be designed to allow fluid concrete to flow freely between and around the individual bars. Minimum concrete cover should be 3 inches for drilled shafts with diameters up to 3 feet; 4 inches for diameters greater than 3 feet and less than 5 feet; and 6 inches for drilled shaft diameters of 5 feet or larger.
- Following approval of the shaft excavation depth and drilling slurry properties, the drilled shaft should be concreted as soon as practically possible using tremie methods. We recommend Type II Portland cement be used in the concrete mix. The concrete should have a 7- to 9-inch slump prior to discharge into the tremie. The bottom of the tremie pipe should be set at about one tremie pipe diameter above the bottom of the shaft excavation. A closure flap at the bottom of the tremie should be used, or a sliding plug introduced into the tremie before the fluid concrete, to reduce the potential for the concrete being contaminated by the slurry. The bottom of the tremie pipe must be completely embedded (typically at least 5 feet) in fluid concrete during placement, which should be a continuous operation.
- If temporary casings are used and the contractor is unable to remove the casing during pier construction the design engineer should be contacted. Any portion of temporary casing that cannot be removed may require additional drilled pier length to compensate for any loss of skin friction.

Due to the inherent variability in the subsurface materials, a representative of the Geotechnical Engineer should verify the design parameters are valid during drilled shaft and direct embedment construction. Some modification to the design values presented in this report could be required in the field.

CORROSIVITY

The table below lists the results of laboratory soluble sulfate, soluble chloride, electrical resistivity, and pH testing. The values may be used to estimate potential corrosive characteristics of the on-site soils with respect to contact with the various underground materials which will be used for project construction.

Corrosivity Test Results Summary									
Boring	Sample Depth (feet)	Soil Description (composite samples)	pH	Water Soluble Sulfate (SO ₄), (mg/kg)	Sulfides, (mg/kg)	Chlorides, (mg/kg)	RedOx, (mV)	Total Salts (mg/kg)	Electrical Resistivity (Ω-cm)
SB-1	1-10	SC, CL, CH	4.3	31	0	19	+507	349	4,956
SB-3	13.5-20	CH	4	946	0	14	+532	2,260	733
SB-5	23.5-45	SM	5.9	1,850	0	19	+355	3,815	568
SB-7	3.5-10	SP	6.4	6	0	7	+367	173	9,293
SB-8	13.5-25	SM, SP	6.3	3	0	8	+366	137	13,423
SB-11	23.5-30	CL	3.6	682	0	18	+577	2,190	847
SB-13	3.5-7.5	SC	4.2	29	0	14	+535	291	5,472
SB-15	13.5-25	CL, CH	3.7	2,356	0	23	+539	6,915	516
SB-16	13.5-25	SM	4.5	17	0	14	+512	150	9,912

Results of soluble sulfate testing indicate samples of the on-site soils tested possess negligible sulfate concentrations when classified in accordance with Table 4.2.1 of the ACI Design Manual. Concrete should be designed in accordance with the provisions of the ACI Design Manual, Section 318, Chapter 4. However, the data evaluation should be made by a qualified corrosion professional.

GENERAL COMMENTS

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

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

Geotechnical Engineering Report

GUC 115 KV Phase 1 & Phase II Transmission Lines ■ Greenville, Pitt County, North C
December 17, 2021 ■ Terracon Project No. 72215031



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

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

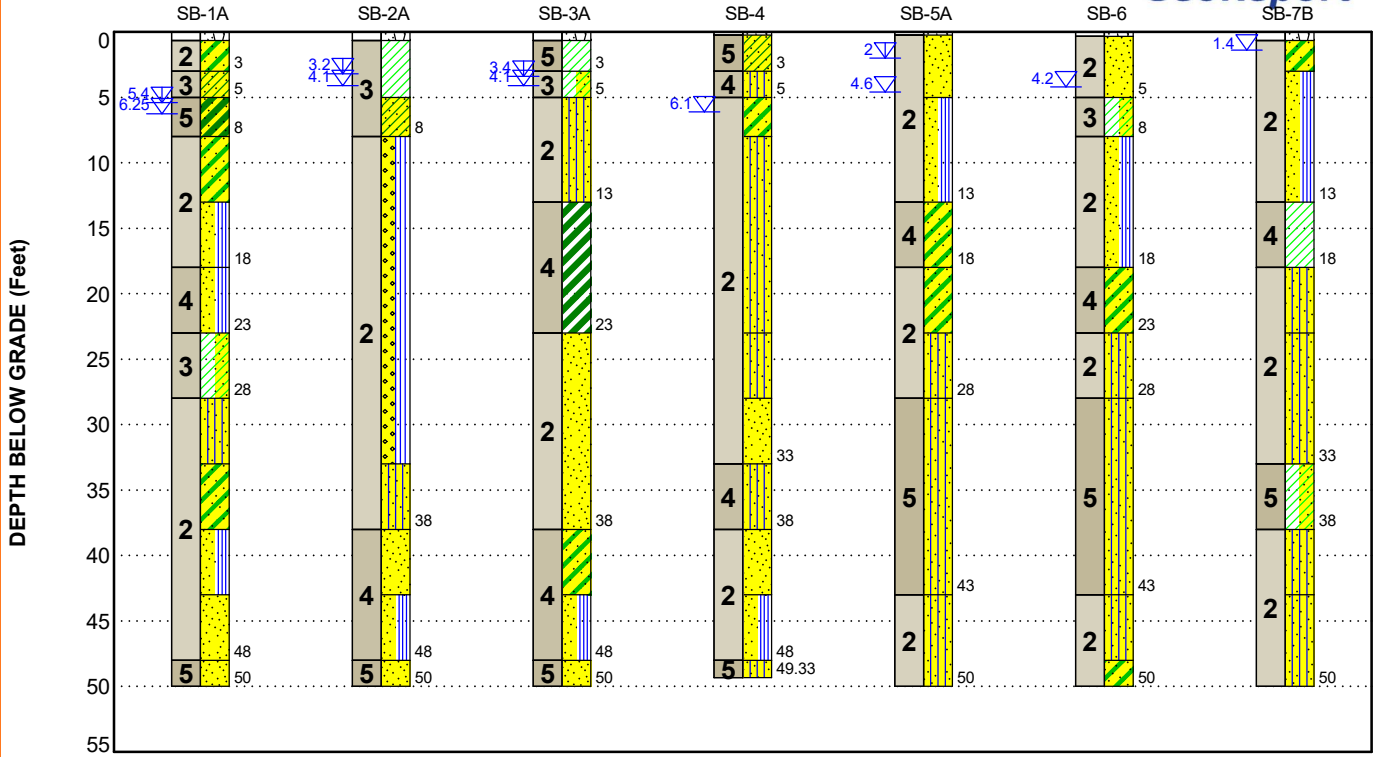
FIGURES

Contents:

GeoModel (2 pages)

GEOMODEL

GUC 115 KV Phase I and Phase II Transmission Line Upgrades ■ Greenville, NC
Terracon Project No. 72215031



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

Model Layer	Layer Name	General Description
1	Fill	Silty sand fill
2	Sand	Loose to medium dense sand
3	Clay	Soft to medium stiff clay
4	Very loose and very soft soil	Very loose sand and very soft clay
5	Denser and stiffer soil	Dense to very dense sand and stiff to hard clay

LEGEND

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

- First Water Observation
- Second Water Observation

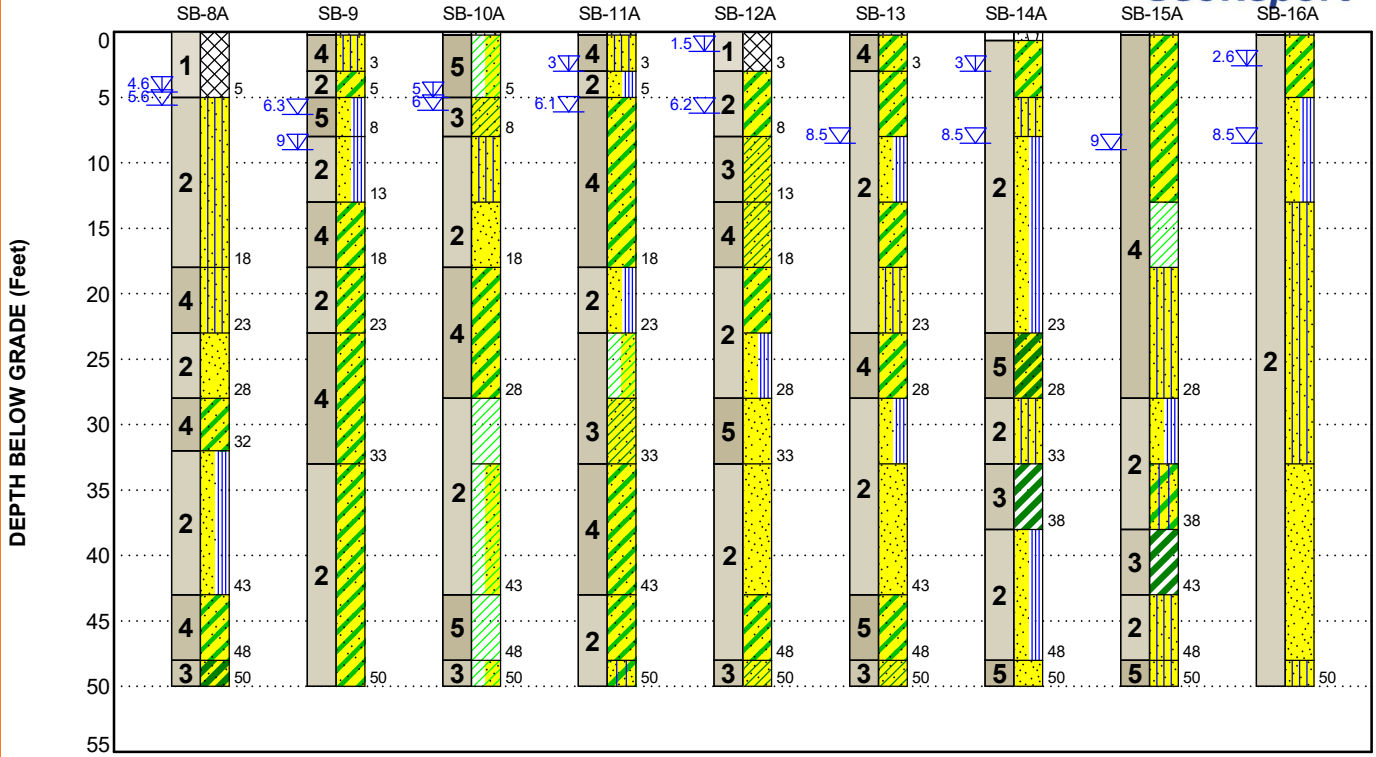
Groundwater levels are temporal. The levels shown are representative of the date and time of our exploration. Significant changes are possible over time. Water levels shown are as measured during and/or after drilling. In some cases, boring advancement methods mask the presence/absence of groundwater.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

NOTES:

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

GEOMODEL

GUC 115 KV Phase I and Phase II Transmission Line Upgrades ■ Greenville, NC
Terracon Project No. 72215031



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

Model Layer	Layer Name	General Description
1	Fill	Silty sand fill
2	Sand	Loose to medium dense sand
3	Clay	Soft to medium stiff clay
4	Very loose and very soft soil	Very loose sand and very soft clay
5	Denser and stiffer soil	Dense to very dense sand and stiff to hard clay

LEGEND

- Fill
- Clayey Sand
- Topsoil
- Lean Clay
- Silty Sand
- Poorly-graded Sand with Silt
- Lean Clay with Sand
- Silty Clayey Sand
- Poorly-graded Sand
- Sandy Fat Clay
- Sandy Lean Clay
- Fat Clay

- First Water Observation
- Second Water Observation

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

NOTES:

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

ATTACHMENTS

EXPLORATION AND TESTING PROCEDURES

Field Exploration

Phase 1

Number of Borings	Boring Depth (feet)	Location
Seven	50 or refusal	Requested boring locations

Phase 2

Number of Borings	Boring Depth (feet)	Location
Nine	50 or refusal	Requested boring locations

Boring Layout and Elevations: Boring locations were marked in the field by the client. The location of the borings should be considered accurate only to the degree implied by the means and methods used to define it.

Subsurface Exploration Procedures: We advanced the borings with a track-mounted rotary drill rig using hollow stem auger and mud rotary drilling techniques. Four samples were obtained in the upper 10 feet of each boring and at intervals of 5 feet thereafter. In the split-barrel sampling procedure, a standard 2-inch outer diameter split-barrel sampling spoon was driven into the ground by a 140-pound automatic hammer falling a distance of 30 inches. The number of blows required to advance the sampling spoon the last 12 inches of a normal 18-inch penetration is recorded as the Standard Penetration Test (SPT) resistance value. The SPT resistance values, also referred to as N-values, are indicated on the boring logs at the test depths. We observed and recorded groundwater levels during drilling and sampling. For safety purposes, all borings were backfilled with soil cuttings after their completion.

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

Laboratory Testing

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

- ASTM D2216 Standard Test Method of Determination of Water Content of Soil and Rock by Mass
- ASTM D2487 Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System)
- ASTM D2488 Standard Practice of Description and Identification of Soils (Visual Manual Method)
- ASTM D422 Standard Test Method for Particle Size Analysis of Soils
- ASTM D1140 Standard Test Methods for Determining the Amount of Material Finer than No. 200 Sieve in Soils by Washing
- ASTM D4318 Standard Test Method for Liquid Limit, Plastic Limit and Plasticity Index of Soils

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

SITE LOCATION AND EXPLORATION PLANS

Contents:

Exploration Plans (two pages)

Note: All attachments are one page unless noted above.

EXPLORATION PLAN

GUC 115 KV Phase I and Phase II Transmission Line Upgrades ■ Greenville, NC
December 17, 2021 ■ Terracon Project No. 72215031

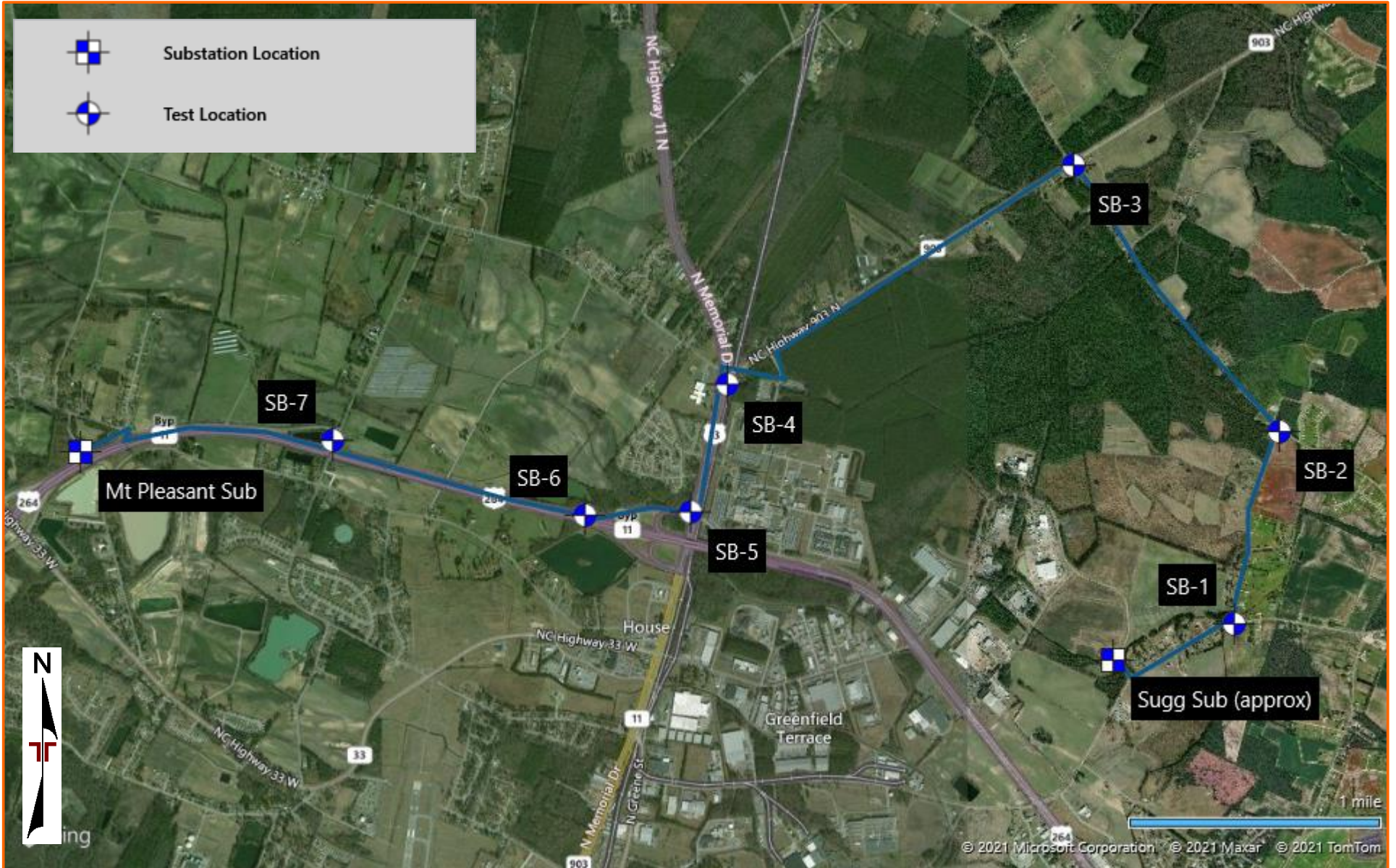


DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

AERIAL PHOTOGRAPHY PROVIDED BY MICROSOFT BING MAPS

EXPLORATION PLAN

GUC 115 KV Phase I and Phase II Transmission Line Upgrades ■ Greenville, NC
December 17, 2021 ■ Terracon Project No. 72215031

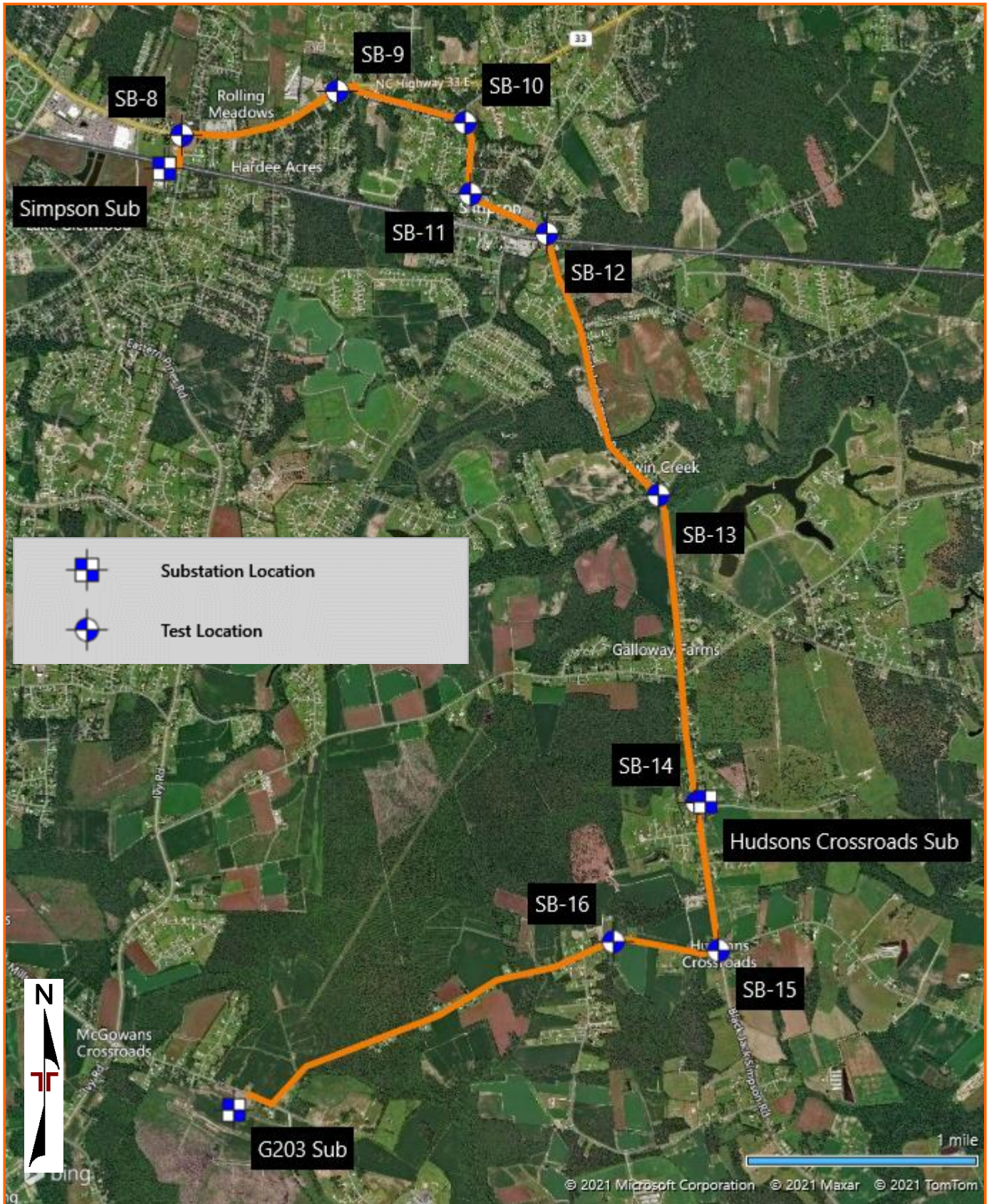


DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

AERIAL PHOTOGRAPHY PROVIDED BY MICROSOFT BING MAPS

EXPLORATION RESULTS

Contents:

Boring Logs (SB-1 through SB-16)

Grain Size Distribution (five pages)

Atterberg Limits

Chemical Laboratory Test Report (two pages)

Note: All attachments are one page unless noted above.

BORING LOG NO. SB-1A

PROJECT: GUC 115 KV Phase I and Phase II
Transmission Line Upgrades

CLIENT: Stanley Consultants Inc
Centennial, CO

SITE: NC-33, Blackjack Simpson Road, and Hudsons Crossroads Road
Greenville, NC

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL_ 72215031 GUC 115 KV PHASE GPJ TERRACON_DATATEMPLATE.GDT 11/17/21

MODEL LAYER	GRAPHIC LOG	LOCATION See Exploration Plan Latitude: 35.6544° Longitude: -77.3248°	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)	ATTERBERG LIMITS		PERCENT FINES
								LL-PL-PI		
		DEPTH								
		0.7 TOPSOIL , 8 inches								
2		3.0 CLAYEY SAND (SC) , light/dark gray, loose				2-2-2 N=4	19.3			
3		5.0 SANDY LEAN CLAY (CL) , light brown with orange, medium stiff				2-3-4 N=7	24.7			
5		8.0 SANDY FAT CLAY (CH) , light brown, stiff				3-5-6 N=11	24.3	52-15-37	69	
		13.0 CLAYEY SAND (SC) , light brown, loose				3-3-4 N=7	22.7			
2		18.0 POORLY GRADED SAND WITH SILT (SP-SM) , dark gray, medium dense				8-12-14 N=26	19.0			
4		23.0 POORLY GRADED SAND WITH SILT (SP-SM) , dark gray, very loose				1-2-1 N=3	19.1			
3		28.0 LEAN CLAY WITH SAND (CL) , dark gray, medium stiff				3-3-3 N=6	34.4			
		33.0 SILTY SAND (SM) , with shells, dark gray, loose				5-3-5 N=8	22.5			
		38.0 CLAYEY SAND (SC) , dark gray, medium dense				3-4-6 N=10				
2		43.0 POORLY GRADED SAND WITH SILT (SP-SM) , dark gray, medium dense				10-3-7 N=10	23.4			
		48.0 POORLY GRADED SAND (SP) , dark gray with green tint, medium dense				10-7-6 N=13				
5		50.0 POORLY GRADED SAND (SP) , dark gray with green tint, very dense				14-37-33 N=70	20.1			
Boring Terminated at 50 Feet										

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

Hammer Type: Automatic
Seasonal High Water Table in the upper 3 feet

Advancement Method:
Mud rotary

Abandonment Method:
Boring backfilled with soil cuttings upon completion.

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

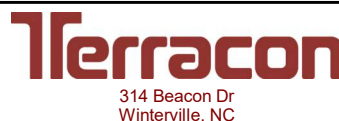
See [Supporting Information](#) for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

At completion of drilling
 on 8/24/2021

Cave in



Boring Started: 08-20-2021

Boring Completed: 08-20-2021

Drill Rig: D-50 track

Driller: JRT

Project No.: 72215031

BORING LOG NO. SB-2A

PROJECT: GUC 115 KV Phase I and Phase II
Transmission Line Upgrades

CLIENT: Stanley Consultants Inc
Centennial, CO

SITE: NC-33, Blackjack Simpson Road, and Hudsons Crossroads Road
Greenville, NC

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL_ 72215031.GUC 115 KV PHASE .GPJ TERRACON_DATATEMPLATE.GDT 11/17/21

MODEL LAYER	GRAPHIC LOG	LOCATION See Exploration Plan Latitude: 35.6655° Longitude: -77.3216°	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)	ATTERBERG LIMITS		PERCENT FINES
								LL-PL-PI		
		DEPTH								
		0.7 TOPSOIL , 8 inches								
3		LEAN CLAY (CL) , trace sand, brown with orange, medium stiff		▽		2-2-3 N=5				
		5.0 SANDY LEAN CLAY (CL) , light brown with orange, medium stiff	5			3-3-4 N=7				
		8.0 WELL GRADED SAND WITH SILT (SW-SM) , light brown to brown, loose to medium dense	10			1-3-3 N=6				
			15			6-9-10 N=19				
			20			5-7-6 N=13				
2			25			2-3-3 N=6	18.3	NP	8	
			30			3-6-8 N=14				
		33.0 SILTY SAND (SM) , dark gray, medium dense	35			3-7-10 N=17				
			40			3-6-8 N=14	25.3	22-19-3	21	
		38.0 POORLY GRADED SAND (SP) , dark gray, very loose	45			1-1-1 N=2				
4		43.0 POORLY GRADED SAND WITH SILT (SP-SM) , trace gravel, gray/black, very loose	50			2-1-2 N=3				
			48.0 POORLY GRADED SAND (SP) , gray, dense			7-13-20 N=33				
5		50.0 Boring Terminated at 50 Feet								

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

Hammer Type: Automatic
Seasonal High Water Table in the upper 3 feet

Advancement Method:
Mud rotary

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

Notes:

Abandonment Method:
Boring backfilled with soil cuttings upon completion.

See [Supporting Information](#) for explanation of symbols and abbreviations.

WATER LEVEL OBSERVATIONS

▽ At completion of drilling
▽ on 8/24/2021

☒ Cave in



Boring Started: 08-20-2020

Boring Completed: 08-20-2020

Drill Rig: D-50 track

Driller: JRT

Project No.: 72215031

BORING LOG NO. SB-3A

**PROJECT: GUC 115 KV Phase I and Phase II
Transmission Line Upgrades**

**CLIENT: Stanley Consultants Inc
Centennial, CO**

**SITE: NC-33, Blackjack Simpson Road, and Hudsons Crossroads Road
Greenville, NC**

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL_ 72215031.GUC 115 KV PHASE .GPJ TERRACON_DATATEMPLATE.GDT 11/17/21

MODEL LAYER	GRAPHIC LOG	LOCATION See Exploration Plan Latitude: 35.6808° Longitude: -77.3361°	DEPTH	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)	ATTERBERG LIMITS		PERCENT FINES
									LL-PL-PI		
			0.7								
5		TOPSOIL , 8 inches	3.0				3-5-5 N=10				
3		LEAN CLAY (CL) , trace sand, dark brown, stiff	5.0				3-4-4 N=8				
		LEAN CLAY WITH SAND (CL) , gray and brown, medium stiff to stiff					3-6-7 N=13				
		SILTY SAND (SM) , with clayey sand lense, light brown, medium dense					3-4-7 N=11				
2			13.0				2-1-1 N=2				
		FAT CLAY (CH) , dark gray, soft to very soft					WOH				
4			23.0				4-7-10 N=17				
		POORLY GRADED SAND (SP) , brown to gray, medium dense					4-5-7 N=12				
2			38.0				5-7-7 N=14				
		CLAYEY SAND (SC) , dark gray, very loose					1-2-1 N=3				
4			43.0				1-1-2 N=3				
		POORLY GRADED SAND WITH SILT (SP-SM) , trace gravel, dark gray, very loose					13-15-17 N=32				
5			48.0								
		POORLY GRADED SAND (SP) , trace gravel, dark gray, dense	50.0								
Boring Terminated at 50 Feet											

Stratification lines are approximate. In-situ, the transition may be gradual.
WOH = Weight of Hammer

Hammer Type: Automatic
Seasonal High Water Table in the upper 3 feet

Advancement Method:
Mud rotary

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

Notes:

Abandonment Method:
Boring backfilled with soil cuttings upon completion.

See [Supporting Information](#) for explanation of symbols and abbreviations.

WATER LEVEL OBSERVATIONS	
	While drilling
	on 8/24/2021
	Cave in

314 Beacon Dr
Winterville, NC

Boring Started: 08-20-2021	Boring Completed: 08-20-2021
Drill Rig: D-50 track	Driller: JRT
Project No.: 72215031	

BORING LOG NO. SB-4

PROJECT: GUC 115 KV Phase I and Phase II
Transmission Line Upgrades

CLIENT: Stanley Consultants Inc
Centennial, CO

SITE: NC-33, Blackjack Simpson Road, and Hudsons Crossroads Road
Greenville, NC

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL_72215031.GUC 115 KV PHASE .GPJ TERRACON_DATATEMPLATE.GDT 11/17/21

MODEL LAYER	GRAPHIC LOG	LOCATION See Exploration Plan Latitude: 35.6683° Longitude: -77.3607°	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)	ATTERBERG LIMITS		PERCENT FINES
								LL-PL-PI		
		DEPTH								
5		0.3' TOPSOIL , 3 inches								
		3.0' SANDY LEAN CLAY (CL) , light brown and orange, stiff				3-5-6 N=11	20.7			
4		5.0' SILTY SAND (SM) , brown and orange, very loose				1-2-1 N=3	18.0			
		8.0' CLAYEY SAND (SC) , light brown with orange, loose		▽		2-3-3 N=6	25.4			
		SILTY SAND (SM) , light brown to orangish brown, loose to medium dense				3-1-4 N=5	26.4	NP	40	
2		23.0' SILTY SAND (SM) , light brown, loose				2-5-7 N=12	25.6			
		28.0' POORLY GRADED SAND (SP) , light brown, medium dense				5-4-7 N=11	26.1			
		33.0' SILTY SAND (SM) , dark gray with orange/red, very loose				3-4-3 N=7	26.9	NP	29	
4		38.0' POORLY GRADED SAND (SP) , dark gray, loose				3-5-7 N=12	25.8			
		43.0' POORLY GRADED SAND WITH SILT (SP-SM) , trace shell and gravel, dark gray, medium dense				1-1-1 N=2				
2		48.0' POORLY GRADED SAND WITH SILT (SP-SM) , trace shell and gravel, dark gray, medium dense				3-5-1 N=6	23.1			
5		49.3' SILTY SAND (SM) , micaceous, dark gray and black, very dense				7-10-12 N=22				
		Boring Terminated at 49.3 Feet				17-50/4"	30.0			

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

Hammer Type: Automatic
Seasonal High Water Table in the upper 3 feet

Advancement Method:
Mud rotary

Abandonment Method:
Boring backfilled with soil cuttings upon completion.

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

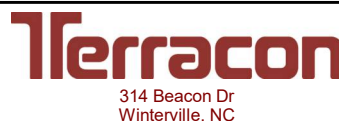
See [Supporting Information](#) for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

▽ *At completion of drilling*

☒ *Cave in*



Boring Started: 08-20-2021

Boring Completed: 08-20-2021

Drill Rig: D-50 track

Driller: JRT

Project No.: 72215031

BORING LOG NO. SB-5A

PROJECT: GUC 115 KV Phase I and Phase II
Transmission Line Upgrades

CLIENT: Stanley Consultants Inc
Centennial, CO

SITE: NC-33, Blackjack Simpson Road, and Hudsons Crossroads Road
Greenville, NC

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL_ 72215031.GUC 115 KV PHASE .GPJ TERRACON_DATATEMPLATE.GDT 11/17/21

MODEL LAYER	GRAPHIC LOG	LOCATION See Exploration Plan Latitude: 35.6610° Longitude: -77.3633°	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)	ATTERBERG LIMITS		PERCENT FINES
								LL-PL-PI		
		DEPTH								
		0.3' TOPSOIL , 3 inches		▽	X	4-5-3 N=8				
		POORLY GRADED SAND (SP) , trace organics, brown with orange, loose to medium dense		▽	X	2-7-11 N=18				
2		5.0' POORLY GRADED SAND WITH SILT (SP-SM) , light brown, medium dense			X	4-5-6 N=11				
		13.0'			X	3-3-8 N=11				
4		CLAYEY SAND (SC) , trace sand, dark gray, very loose			X	1-1-1 N=2	38.6	37-15-22	44	
		18.0'			X	1-1-3 N=4				
2		CLAYEY SAND (SC) , with shells, dark gray, loose			X	5-6-10 N=16				
		23.0'			X	17-43-50/4"				
		SILTY SAND (SM) , dark gray, medium dense			X	50/3"				
		28.0'			X	11-25-50/4"				
		SILTY SAND (SM) , trace mica, lean clay lense, dark gray, very dense			X	2-5-4 N=9				
		43.0'			X	2-5-8 N=13				
		SILTY SAND (SM) , with lean clay lense, dark gray, loose to medium dense			X					
		50.0'			X					
		Boring Terminated at 50 Feet								

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

Hammer Type: Automatic
Seasonal High Water Table in the upper 3 feet

Advancement Method:
Mud rotary

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

Notes:

Abandonment Method:
Boring backfilled with soil cuttings upon completion.

See [Supporting Information](#) for explanation of symbols and abbreviations.

WATER LEVEL OBSERVATIONS

▽ *At completion of drilling*
▽ *After 24 hours*

☒ *Cave in*



Boring Started: 08-23-2021

Boring Completed: 08-23-2021

Drill Rig: D-50 track

Driller: JRT

Project No.: 72215031

BORING LOG NO. SB-6

PROJECT: GUC 115 KV Phase I and Phase II
Transmission Line Upgrades

CLIENT: Stanley Consultants Inc
Centennial, CO

SITE: NC-33, Blackjack Simpson Road, and Hudsons Crossroads Road
Greenville, NC

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL_ 72215031 GUC 115 KV PHASE GPJ TERRACON_DATATEMPLATE.GDT 11/17/21

MODEL LAYER	GRAPHIC LOG	LOCATION See Exploration Plan Latitude: 35.6607° Longitude: -77.3708°	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)	ATTERBERG LIMITS		PERCENT FINES
								LL-PL-PI		
		DEPTH								
		0.3' TOPSOIL , 4 inches								
2		POORLY GRADED SAND (SP) , brown, loose to medium dense		▽		4-4-4 N=8				
		5.0'				2-4-6 N=10				
3		LEAN CLAY WITH SAND (CL) , brown, medium stiff				2-3-4 N=7				
		8.0'				2-3-7 N=10				
2		POORLY GRADED SAND WITH SILT (SP-SM) , brown to dark brown, medium dense				3-7-8 N=15				
		18.0'				1-1-1 N=2				
4		CLAYEY SAND (SC) , dark gray, very loose				2-9-11 N=20				
		23.0'				17-50				
2		SILTY SAND (SM) , dark gray, medium dense				50/3"				
		28.0'				50/4"				
5		SILTY SAND (SM) , micaceous, trace shell and gravel, dark gray, very dense				2-5-12 N=17				
		43.0'				2-5-11 N=16				
2		SILTY SAND (SM) , dark gray, medium dense								
		48.0'								
2		CLAYEY SAND (SC) , dark gray, medium dense								
		50.0'								
		Boring Terminated at 50 Feet								

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

Hammer Type: Automatic
Seasonal High Water Table in the upper 3 feet

Advancement Method:
Mud rotary

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

Abandonment Method:
Boring backfilled with soil cuttings upon completion.

See [Supporting Information](#) for explanation of symbols and abbreviations.

WATER LEVEL OBSERVATIONS

▽ *At completion of drilling*

☒ *Cave in*

Notes:



Boring Started: 08-24-2021	Boring Completed: 08-24-2021
Drill Rig: D-50 track	Driller: JRT
Project No.: 72215031	

BORING LOG NO. SB-7B

PROJECT: GUC 115 KV Phase I and Phase II
Transmission Line Upgrades

CLIENT: Stanley Consultants Inc
Centennial, CO

SITE: NC-33, Blackjack Simpson Road, and Hudsons Crossroads Road
Greenville, NC

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL. 72215031.GUC 115 KV PHASE .GPJ TERRACON_DATATEMPLATE.GDT 11/17/21

MODEL LAYER	GRAPHIC LOG	LOCATION See Exploration Plan Latitude: 35.6649° Longitude: -77.3880°	DEPTH	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)	ATTERBERG LIMITS		PERCENT FINES
									LL-PL-PI		
			0.7	0.7	▽						
			3.0	3.0			2-2-2 N=4	17.0			
2			13.0	5			2-5-8 N=13	19.2			
			18.0	10			1-4-6 N=10	21.0			
4			23.0	15			3-3-4 N=7	14.8			
			33.0	20			WOH	42.9			
2			38.0	25			4-5-3 N=8	25.2			
			43.0	30			2-3-5 N=8	40.2	37-27-10	44	
5			50.0	35			3-4-4 N=8	35.2			
				40			17-12-19 N=31				
2				45			1-4-4 N=8	38.6			
				50			11-12-15 N=27				
				50			2-5-6 N=11	37.7			
Boring Terminated at 50 Feet											

Stratification lines are approximate. In-situ, the transition may be gradual.
WOH = Weight of Hammer

Hammer Type: Automatic
Seasonal High Water Table in the upper 3 feet

Advancement Method:
Mud rotary

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

Notes:

Abandonment Method:
Boring backfilled with soil cuttings upon completion.

See [Supporting Information](#) for explanation of symbols and abbreviations.

WATER LEVEL OBSERVATIONS
▽ At completion of drilling

314 Beacon Dr
Winterville, NC

Boring Started: 08-24-2021	Boring Completed: 08-24-2021
Drill Rig: D-50 track	Driller: JRT
Project No.: 72215031	

Cave in

BORING LOG NO. SB-8A

PROJECT: GUC 115 KV Phase I and Phase II
Transmission Line Upgrades

CLIENT: Stanley Consultants Inc
Centennial, CO

SITE: NC-33, Blackjack Simpson Road, and Hudsons Crossroads Road
Greenville, NC

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL. 72215031.GUC 115 KV PHASE .GPJ TERRACON_DATATEMPLATE.GDT 11/17/21

MODEL LAYER	GRAPHIC LOG	LOCATION See Exploration Plan Latitude: 35.5805° Longitude: -77.3011°	DEPTH	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)	ATTERBERG LIMITS		PERCENT FINES
									LL-PL-PI		
1		FILL - POORLY GRADED SAND WITH SILT , trace gravel, brownish gray	5.0	5	▽		2-2-3 N=5				
2		SILTY SAND (SM) , brown to brownish gray, loose	18.0	5	▽		2-3-2 N=5				
			23.0	10	▽		1-2-2 N=4				
4		SILTY SAND (SM) , brown to brownish gray, very loose	23.0	15	▽		1-0-7 N=7				
2		POORLY GRADED SAND (SP) , brown/orange to gray, medium dense	28.0	20	▽		1-3-3 N=6				
4		CLAYEY SAND (SC) , dark gray, very loose	32.0	25	▽		0-0-2 N=2				
2		POORLY GRADED SAND WITH SILT (SP-SM) , dark gray, medium dense	43.0	30	▽		2-3-8 N=11				
4		CLAYEY SAND (SC) , dark gray, very loose	48.0	35	▽		WOH				
3		SANDY FAT CLAY (CH) , dark gray, soft	50.0	40	▽		4-5-5 N=10				
		Boring Terminated at 50 Feet		45	▽		4-5-8 N=13				
				50	▽		1-1-1 N=2				
							1-1-1 N=2				

Stratification lines are approximate. In-situ, the transition may be gradual.
WOH = Weight of Hammer

Hammer Type: Automatic
Seasonal High Water Table in the upper 5 feet

Advancement Method:
Mud rotary

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

Notes:

Abandonment Method:
Boring backfilled with soil cuttings upon completion.

See [Supporting Information](#) for explanation of symbols and abbreviations.

WATER LEVEL OBSERVATIONS

▽ At completion of drilling
▽ After 24 hours

☒ Cave in



Boring Started: 08-16-2021

Boring Completed: 08-16-2021

Drill Rig: D-50 track

Driller: JRT

Project No.: 72215031

BORING LOG NO. SB-9

**PROJECT: GUC 115 KV Phase I and Phase II
Transmission Line Upgrades**

**CLIENT: Stanley Consultants Inc
Centennial, CO**

**SITE: NC-33, Blackjack Simpson Road, and Hudsons Crossroads Road
Greenville, NC**

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL_ 72215031 GUC 115 KV PHASE GPJ TERRACON_DATATEMPLATE.GDT 11/17/21

MODEL LAYER	GRAPHIC LOG	LOCATION See Exploration Plan Latitude: 35.5834° Longitude: -77.2895°	DEPTH	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)	ATTERBERG LIMITS		PERCENT FINES
									LL-PL-PI		
			0.3								
4		TOPSOIL , 3 inches	0.3 - 3.0				WOH				
2		SILTY SAND (SM) , trace organics, brown, very loose	3.0 - 5.0				4-6-9 N=15				
2		CLAYEY SAND (SC) , brown, medium dense	5.0 - 8.0				13-19-21 N=40				
5		POORLY GRADED SAND WITH SILT (SP-SM) , brown to brown with orange, dense	8.0 - 13.0		▽		2-8-9 N=17				
2		POORLY GRADED SAND WITH SILT (SP-SM) , brown to brown with orange, medium dense	13.0 - 15.0		▽						
4		CLAYEY SAND (SC) , brown with orange, very loose	15.0 - 18.0		▽		1-1-1 N=2	42.7	33-15-18	42	
2		CLAYEY SAND (SC) , brown with orange, loose	18.0 - 23.0		▽		1-2-2 N=4				
4		CLAYEY SAND (SC) , brown with orange to dark gray, very loose	23.0 - 33.0		▽		1-1-2 N=3	37.2	32-15-17	34	
2		CLAYEY SAND (SC) , trace shell, gray to dark gray, loose	33.0 - 50.0		▽		1-1-2 N=3				
2		CLAYEY SAND (SC) , trace shell, gray to dark gray, loose	33.0 - 40.0		▽		1-2-3 N=5				
2		CLAYEY SAND (SC) , trace shell, gray to dark gray, loose	40.0 - 45.0		▽		2-3-4 N=7				
2		CLAYEY SAND (SC) , trace shell, gray to dark gray, loose	45.0 - 50.0		▽		2-2-4 N=6				
		Boring Terminated at 50 Feet	50.0		▽		1-2-3 N=5				

Stratification lines are approximate. In-situ, the transition may be gradual.
WOH= Weight of Hammer

Hammer Type: Automatic
Seasonal High Water Table in the upper 5 feet

Advancement Method:
Mud rotary

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

Notes:

Abandonment Method:
Boring backfilled with soil cuttings upon completion.

See [Supporting Information](#) for explanation of symbols and abbreviations.

WATER LEVEL OBSERVATIONS	
▽	<i>At completion of drilling</i>
▽	<i>After 24 hours</i>
☒	<i>Cave in</i>

314 Beacon Dr
Winterville, NC

Boring Started: 08-17-2021	Boring Completed: 08-17-2021
Drill Rig: D-50 track	Driller: JRT
Project No.: 72215031	

BORING LOG NO. SB-10A

PROJECT: GUC 115 KV Phase I and Phase II
Transmission Line Upgrades

CLIENT: Stanley Consultants Inc
Centennial, CO

SITE: NC-33, Blackjack Simpson Road, and Hudsons Crossroads Road
Greenville, NC

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL_ 72215031.GUC 115 KV PHASE .GPJ TERRACON_DATATEMPLATE.GDT 11/17/21

MODEL LAYER	GRAPHIC LOG	LOCATION See Exploration Plan Latitude: 35.5819° Longitude: -77.2807°	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)	ATTERBERG LIMITS	
								LL-PL-PI	PERCENT FINES
		DEPTH							
5		0.3' TOPSOIL , 3 inches				2-3-6 N=9	23.4		
		LEAN CLAY WITH SAND (CL) , brown, orange, red, stiff							
		5.0'				4-5-5 N=10	29.2		
3		SANDY LEAN CLAY (CL) , brown with orange/red, soft				1-2-2 N=4	35.6	41-18-23	65
		8.0'				6-7-8 N=15	33.6		
		SILTY SAND (SM) , clayey sand lenses, brownish orange, medium dense							
		13.0'				5-11-12 N=23	22.5		
2		POORLY GRADED SAND (SP) , brown, medium dense							
		18.0'				0-0-2 N=2	46.6		
4		CLAYEY SAND (SC) , brown and gray, very loose				WOH	39.2		
		28.0'				2-2-3 N=5	34.4		
		LEAN CLAY (CL) , trace sand, dark gray, medium stiff							
		33.0'				1-3-4 N=7			
2		LEAN CLAY WITH SAND (CL) , dark gray, medium stiff							
		43.0'				3-3-4 N=7	41.2		
		LEAN CLAY (CL) , trace sand, dark gray, stiff							
		48.0'				5-4-6 N=10			
5		LEAN CLAY WITH SAND (CL) , dark gray, medium stiff to stiff							
		50.0'				NR	38.8		
		Boring Terminated at 50 Feet							

Stratification lines are approximate. In-situ, the transition may be gradual.
WOH = Weight of Hammer, NR= Not Recorded, sample was similar in blow counts

Hammer Type: Automatic
Seasonal High Water Table in the upper 3 feet

Advancement Method:
Mud rotary

See [Exploration and Testing Procedures](#) for a description of field and laboratory procedures used and additional data (if any).

Notes:

Abandonment Method:
Boring backfilled with soil cuttings upon completion.

See [Supporting Information](#) for explanation of symbols and abbreviations.

WATER LEVEL OBSERVATIONS

▽	<i>At completion of drilling</i>
▽	<i>After 24 hours</i>
☒	<i>Cave in</i>

314 Beacon Dr
Winterville, NC

Boring Started: 08-18-2021	Boring Completed: 08-18-2021
Drill Rig: D-50 track	Driller: JRT
Project No.: 72215031	

BORING LOG NO. SB-11A

PROJECT: GUC 115 KV Phase I and Phase II
Transmission Line Upgrades

CLIENT: Stanley Consultants Inc
Centennial, CO

SITE: NC-33, Blackjack Simpson Road, and Hudsons Crossroads Road
Greenville, NC

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL_ 72215031 GUC 115 KV PHASE GPJ TERRACON_DATATEMPLATE.GDT 11/17/21

MODEL LAYER	GRAPHIC LOG	LOCATION See Exploration Plan Latitude: 35.5769° Longitude: -77.2788°	DEPTH	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)	ATTERBERG LIMITS		PERCENT FINES
									LL-PL-PI		
			0.3								
4		TOPSOIL , 3 inches	3.0		▽		2-1-2 N=3				
2		POORLY GRADED SAND WITH SILT (SP-SM) , brown, loose	5.0		▽		4-3-3 N=6				
4		CLAYEY SAND (SC) , gray to dark gray, very loose	18.0				WOH				
2		POORLY GRADED SAND WITH SILT (SP-SM) , dark gray, medium dense	23.0				10-13-11 N=24				
3		LEAN CLAY WITH SAND (CL) , dark gray, soft	28.0				1-1-1 N=2				
3		SANDY LEAN CLAY (CL) , dark gray, soft	33.0				1-1-1 N=2				
4		CLAYEY SAND (SC) , dark gray, very loose	43.0				1-1-1 N=2				
2		CLAYEY SAND (SC) , dark gray, loose	48.0				1-1-1 N=2				
2		SILTY CLAYEY SAND (SC-SM) , dark gray, loose	50.0				1-1-3 N=4				
Boring Terminated at 50 Feet											

Stratification lines are approximate. In-situ, the transition may be gradual.
WOH = Weight of Hammer

Hammer Type: Automatic
Seasonal High Water Table in the upper 3 feet

Advancement Method:
Mud rotary

Abandonment Method:
Boring backfilled with soil cuttings upon completion.

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

See [Supporting Information](#) for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS	
▽	At completion of drilling
▽	After 24 hours
☒	Cave in, Initial cave in at 48.6

314 Beacon Dr
Winterville, NC

Boring Started: 08-17-2021	Boring Completed: 08-17-2021
Drill Rig: D-50 track	Driller: JRT
Project No.: 72215031	

BORING LOG NO. SB-12A

PROJECT: GUC 115 KV Phase I and Phase II
Transmission Line Upgrades

CLIENT: Stanley Consultants Inc
Centennial, CO

SITE: NC-33, Blackjack Simpson Road, and Hudsons Crossroads Road
Greenville, NC

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL_ 72215031 GUC 115 KV PHASE .GPJ TERRACON_DATATEMPLATE.GDT 11/17/21

MODEL LAYER	GRAPHIC LOG	LOCATION See Exploration Plan Latitude: 35.5748° Longitude: -77.2737°	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)	ATTERBERG LIMITS		PERCENT FINES
								LL-PL-PI		
1		FILL - CLAYEY SAND , brown and dark brown	3.0	▽	X	2-1-3 N=4				
2		CLAYEY SAND (SC) , brown with orange, loose to medium dense	8.0	▽	X	4-4-5 N=9				
3		SANDY LEAN CLAY (CL) , light brown, medium stiff	13.0		X	2-4-6 N=10				
4		SANDY LEAN CLAY (CL) , brown, very soft	18.0		X	2-3-2 N=5				
4		SANDY LEAN CLAY (CL) , brown, very soft	18.0		X	WOH				
4		CLAYEY SAND (SC) , dark gray, medium dense	23.0		X	2-11-9 N=20				
2		POORLY GRADED SAND WITH SILT (SP-SM) , brown, medium dense	28.0		X	8-8-9 N=17				
5		POORLY GRADED SAND (SP) , black and orange, dense	33.0		X	8-12-19 N=31				
2		POORLY GRADED SAND (SP) , black and orange, medium dense	43.0		X	6-10-10 N=20				
2		CLAYEY SAND (SC) , dark gray and orangish red, loose	48.0		X	6-12-13 N=25				
3		SANDY LEAN CLAY (CL) , dark gray, medium stiff	50.0		X	4-4-4 N=8				
		Boring Terminated at 50 Feet			X	1-2-3 N=5				

Stratification lines are approximate. In-situ, the transition may be gradual.
WOH = Weight of Hammer

Hammer Type: Automatic
Seasonal High Water Table in the upper 5 feet

Advancement Method:
Mud rotary

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

Notes:

Abandonment Method:
Boring backfilled with soil cuttings upon completion.

See [Supporting Information](#) for explanation of symbols and abbreviations.

WATER LEVEL OBSERVATIONS

▽	<i>At completion of drilling</i>
▽	<i>After 24 hours</i>
☒	<i>Cave in</i>

314 Beacon Dr
Winterville, NC

Boring Started: 08-17-2021	Boring Completed: 08-17-2021
Drill Rig: D-50 track	Driller: JRT
Project No.: 72215031	

BORING LOG NO. SB-13

PROJECT: GUC 115 KV Phase I and Phase II
Transmission Line Upgrades

CLIENT: Stanley Consultants Inc
Centennial, CO

SITE: NC-33, Blackjack Simpson Road, and Hudsons Crossroads Road
Greenville, NC

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL_ 72215031 GUC 115 KV PHASE .GPJ TERRACON_DATATEMPLATE.GDT 11/17/21

MODEL LAYER	GRAPHIC LOG	LOCATION See Exploration Plan Latitude: 35.5580° Longitude: -77.2647°	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)	ATTERBERG LIMITS		PERCENT FINES
								LL-PL-PI		
		DEPTH								
4		0.3 / TOPSOIL , 3 inches								
		3.0 CLAYEY SAND (SC) , brown with orange, very loose				1-1-2 N=3	17.1			
		CLAYEY SAND (SC) , brown with orange, loose	5			2-3-4 N=7	18.2			
						2-3-3 N=6	15.7			
		8.0 POORLY GRADED SAND WITH SILT (SP-SM) , brown with orange, medium dense	10	▽		5-7-8 N=15	23.1			
		CLAYEY SAND (SC) , dark gray, loose	15			1-3-4 N=7	32.4			
2		18.0 SILTY SAND (SM) , with shells, dark gray, loose	20			4-3-3 N=6	27.6	NP	15	
		23.0 CLAYEY SAND (SC) , dark gray, very loose	25			0-0-2 N=2	29.9			
4		28.0 POORLY GRADED SAND WITH SILT (SP-SM) , with shells, light gray, medium dense	30			6-9-10 N=19	24.6			
		33.0 POORLY GRADED SAND (SP) , with shells, dark gray, medium dense	35			11-12-12 N=24				
2		- No recovery from 38.5 foot sample	40			6-10-12 N=22				
		43.0 CLAYEY SAND (SC) , trace shells, dark gray, dense	45			2-2-30 N=32	28.3			
5		48.0 SANDY LEAN CLAY (CL) , dark gray, medium stiff to stiff	50			2-4-4 N=8	28.2			
		Boring Terminated at 50 Feet								

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

Hammer Type: Automatic
Seasonal High Water Table in the upper 5 feet

Advancement Method:
Mud rotary

Abandonment Method:
Boring backfilled with soil cuttings upon completion.

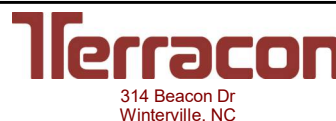
See [Exploration and Testing Procedures](#) for a description of field and laboratory procedures used and additional data (If any).

See [Supporting Information](#) for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

▽ While drilling



Boring Started: 08-18-2021	Boring Completed: 08-18-2021
Drill Rig: D-50 track	Driller: JRT
Project No.: 72215031	

BORING LOG NO. SB-14A

PROJECT: GUC 115 KV Phase I and Phase II
Transmission Line Upgrades

CLIENT: Stanley Consultants Inc
Centennial, CO

SITE: NC-33, Blackjack Simpson Road, and Hudsons Crossroads Road
Greenville, NC

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL_ 72215031 GUC 115 KV PHASE GPJ TERRACON_DATATEMPLATE.GDT 11/17/21

MODEL LAYER	GRAPHIC LOG	LOCATION See Exploration Plan Latitude: 35.5388° Longitude: -77.2619°	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)	ATTERBERG LIMITS		PERCENT FINES
								LL-PL-PI		
		DEPTH								
		0.7' TOPSOIL , 8 inches		▽	X	1-1-4 N=5				
		CLAYEY SAND (SC) , brown with orange, loose to medium dense			X	4-4-6 N=10				
		5.0' SILTY SAND (SM) , clayey sand lense, brown with orange, loose			X	3-5-4 N=9				
		8.0' POORLY GRADED SAND WITH SILT (SP-SM) , brown with orange, loose to medium dense		▽	X	6-6-9 N=15				
2					X	3-5-13 N=18				
		23.0' SANDY FAT CLAY (CH) , dark gray, very stiff			X	4-3-4 N=7				
5					X	5-8-10 N=18				
		28.0' SILTY SAND (SM) , dark gray, loose			X	2-1-4 N=5	26.5	NP	16	
2					X	2-3-3 N=6				
		33.0' FAT CLAY (CH) , dark gray, medium stiff			X	9-6-9 N=15				
3					X	3-9-18 N=27				
		38.0' POORLY GRADED SAND WITH SILT (SP-SM) , shell fragments, light gray, medium dense			X	12-14-17 N=31				
2					X					
		48.0' POORLY GRADED SAND (SP) , with shells, gray, dense			X					
5					X					
		50.0' Boring Terminated at 50 Feet								

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

Hammer Type: Automatic
Seasonal High Water Table in the upper 3 feet

Advancement Method:
Mud rotary

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

Notes:

Abandonment Method:
Boring backfilled with soil cuttings upon completion.

See [Supporting Information](#) for explanation of symbols and abbreviations.

WATER LEVEL OBSERVATIONS

▽ While drilling
▽ After 24 hours

☒ Cave in



Boring Started: 08-18-2021

Boring Completed: 08-18-2021

Drill Rig: D-50 track

Driller: JRT

Project No.: 72215031

BORING LOG NO. SB-15A

PROJECT: GUC 115 KV Phase I and Phase II
Transmission Line Upgrades

CLIENT: Stanley Consultants Inc
Centennial, CO

SITE: NC-33, Blackjack Simpson Road, and Hudsons Crossroads Road
Greenville, NC

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL_ 72215031 GUC 115 KV PHASE .GPJ TERRACON_DATATEMPLATE.GDT 11/17/21

MODEL LAYER	GRAPHIC LOG	LOCATION See Exploration Plan Latitude: 35.5294° Longitude: -77.2602°	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)	ATTERBERG LIMITS		PERCENT FINES
								LL-PL-PI		
		DEPTH								
		0.3 / TOPSOIL , 3 inches				0-0-3 N=3				
		CLAYEY SAND (SC) , clay lense, orange/red with gray, very loose to loose	5			4-3-4 N=7				
						2-3-6 N=9				
			10	▽		3-2-3 N=5				
		13.0 LEAN CLAY (CL) , dark gray, very soft	15			WOH				
4		18.0 SILTY SAND (SM) , dark gray, very loose	20			0-0-3 N=3	75.5	32-29-3	40	
			25			2-1-2 N=3				
		28.0 POORLY GRADED SAND WITH SILT (SP-SM) , trace gravel, dark gray, medium dense	30			3-6-12 N=18				
2		33.0 SILTY CLAYEY SAND (SM) , shell fragments, dark gray, medium dense	35			13-12-6 N=18				
		38.0 FAT CLAY (CH) , trace shells, dark gray, medium stiff	40			2-2-4 N=6				
3		43.0 SILTY SAND (SM) , trace shells, dark gray, medium dense	45			4-5-7 N=12				
2		48.0 SILTY SAND (SM) , with shells and trace limestone, dark gray, dense	50			3-18-15 N=33				
5		Boring Terminated at 50 Feet								

Stratification lines are approximate. In-situ, the transition may be gradual.
WOH = Weight of Hammer

Hammer Type: Automatic
Seasonal High Water Table in the upper 5 feet

Advancement Method:
Mud rotary

Abandonment Method:
Boring backfilled with soil cuttings upon completion.

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

See [Supporting Information](#) for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS
▽ While drilling

314 Beacon Dr
Winterville, NC

Boring Started: 08-19-2021	Boring Completed: 08-19-2021
Drill Rig: D-50 track	Driller: JRT
Project No.: 72215031	

BORING LOG NO. SB-16A

PROJECT: GUC 115 KV Phase I and Phase II
Transmission Line Upgrades

CLIENT: Stanley Consultants Inc
Centennial, CO

SITE: NC-33, Blackjack Simpson Road, and Hudsons Crossroads Road
Greenville, NC

MODEL LAYER	GRAPHIC LOG	LOCATION See Exploration Plan Latitude: 35.5299° Longitude: -77.2682°	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)	ATTERBERG LIMITS	
								LL-PL-PI	PERCENT FINES
DEPTH									
		TOPSOIL , 3 inches	0.3	▽	X	1-3-3 N=6	20.1		
		CLAYEY SAND (SC) , light brown to dark brown, loose	5.0		X	3-4-3 N=7	24.3		
		POORLY GRADED SAND WITH SILT (SP-SM) , light brown to orangish brown, medium dense	13.0	▽	X	3-9-9 N=18	25.8		
		SILTY SAND (SM) , clayey sand lense, orangish brown, medium dense	15.0		X	7-7-6 N=13	22.9	NP	8
			20.0		X	3-5-10 N=15	30.9		
			25.0		X	6-10-9 N=19	20.4		
			30.0		X	4-7-9 N=16	22.5		
			35.0		X	2-6-7 N=13	42.3		
		POORLY GRADED SAND (SP) , orangish brown to dark gray, medium dense	40.0		X	5-7-10 N=17			
			45.0		X	5-6-10 N=16	24.4		
			50.0		X	4-5-7 N=12			
		SILTY SAND (SM) , dark gray, loose	48.0		X	2-2-5 N=7	29.3		
		Boring Terminated at 50 Feet	50.0						

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

Hammer Type: Automatic
Seasonal High Water Table in the upper 3 feet

Advancement Method:
Mud rotary

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

Notes:

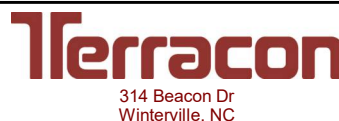
Abandonment Method:
Boring backfilled with soil cuttings upon completion.

See [Supporting Information](#) for explanation of symbols and abbreviations.

WATER LEVEL OBSERVATIONS

▽ While drilling
▽ After 24 hours

☒ Cave in



Boring Started: 08-19-2021

Boring Completed: 08-19-2021

Drill Rig: D-50 track

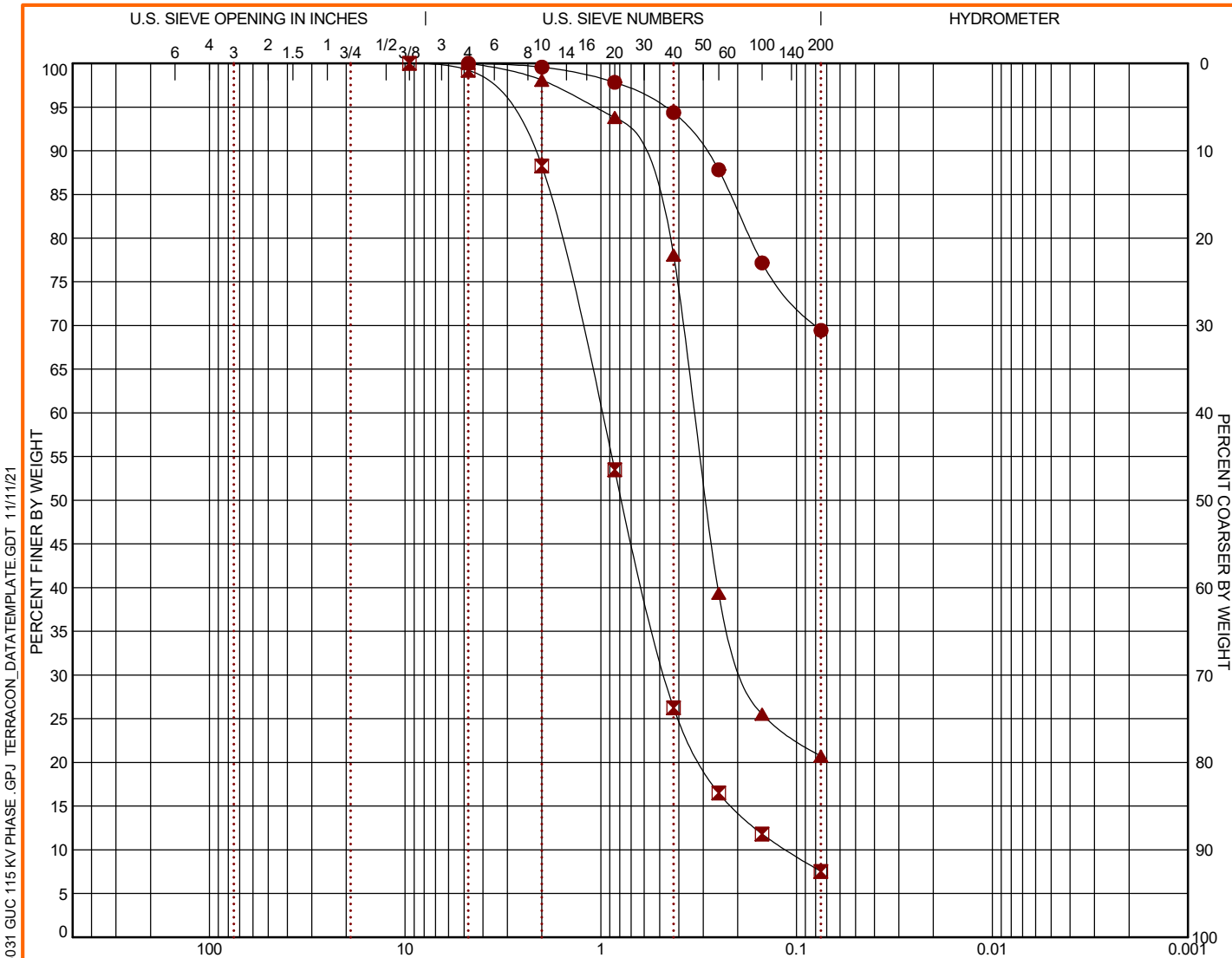
Driller: JRT

Project No.: 72215031

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL_72215031.GUC 115 KV PHASE .GPJ TERRACON_DATATEMPLATE.GDT 11/17/21

GRAIN SIZE DISTRIBUTION

ASTM D422 / ASTM C136



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

BORING ID	DEPTH	% COBBLES	% GRAVEL	% SAND	% SILT	% FINES	% CLAY	USCS
● SB-1A	6 - 7.5	0.0	0.0	30.6		69.4		CH
☒ SB-2A	18.5 - 20	0.0	0.8	91.7		7.5		SW-SM
▲ SB-2A	33.5 - 35	0.0	0.0	79.3		20.7		SM

GRAIN SIZE			
	●	☒	▲
D ₆₀	0.998	0.332	
D ₃₀	0.467	0.177	
D ₁₀	0.112		

COEFFICIENTS			
	●	☒	▲
C _c	1.96		
C _u	8.92		

●		☒		▲	
Sieve	% Finer	Sieve	% Finer	Sieve	% Finer
#4	100.0	3/8"	100.0	#4	100.0
#10	99.57	#4	99.21	#10	98.07
#20	97.83	#20	88.24	#20	93.82
#40	94.36	#20	53.49	#40	78.06
#60	87.82	#40	26.26	#60	39.35
#100	77.17	#60	16.52	#100	25.52
#200	69.44	#100	11.82	#200	20.72
		#200	7.53		

SOIL DESCRIPTION	
●	SANDY FAT CLAY (CH)
☒	WELL GRADED SAND with SILT (SW-SM)
▲	SILTY SAND (SM)

REMARKS	
●	
☒	
▲	

LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GRAIN SIZE: USCS 1 72215031 GUC 115 KV PHASE I.GPJ TERRACON_DATATEMPLATE.GDT 11/11/21

PROJECT: GUC 115 KV Phase I and Phase II Transmission Line Upgrades

SITE: NC-33, Blackjack Simpson Road, and Hudsons Crossroads Road Greenville, NC

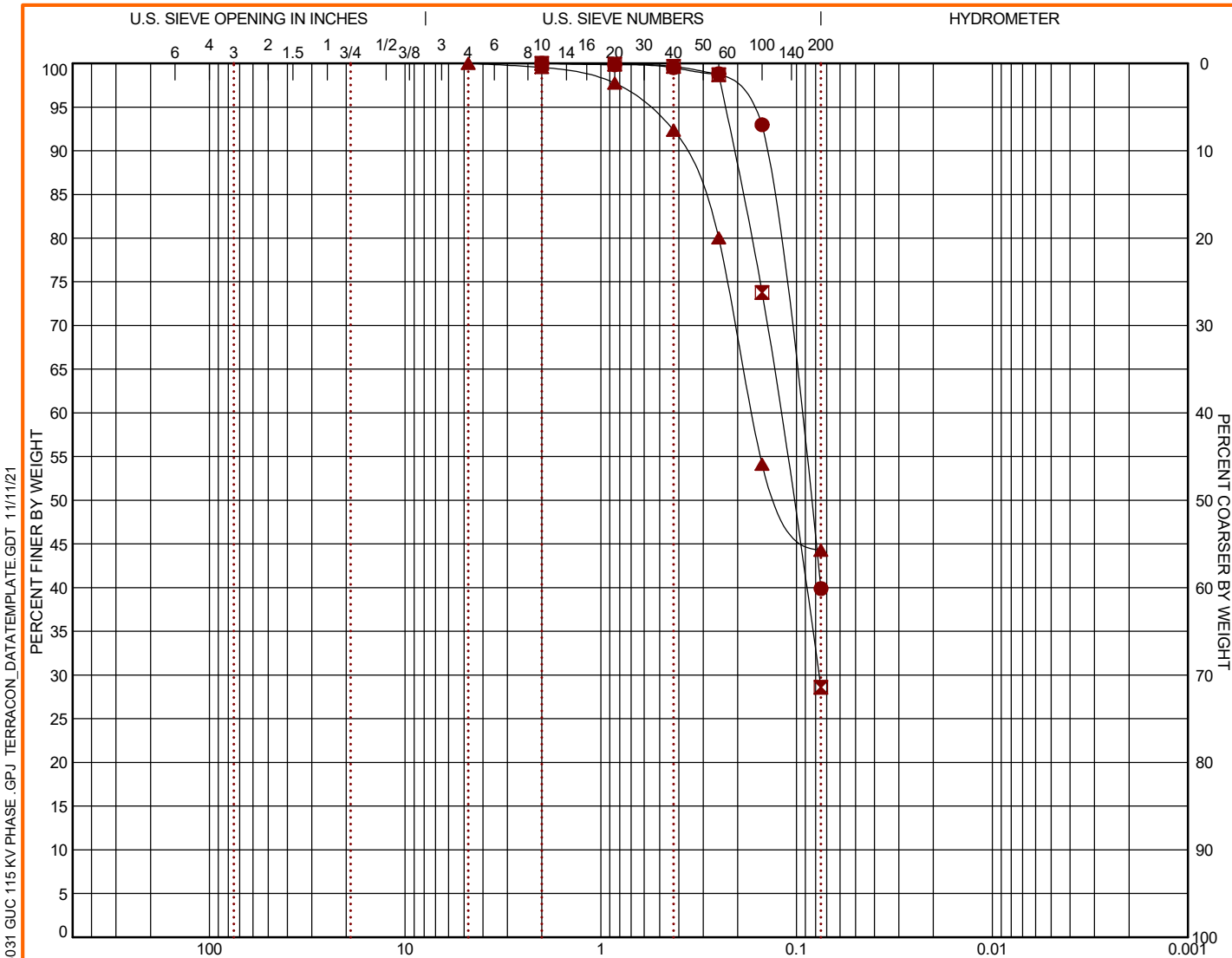


PROJECT NUMBER: 72215031

CLIENT: Stanley Consultants Inc Centennial, CO

GRAIN SIZE DISTRIBUTION

ASTM D422 / ASTM C136



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

BORING ID	DEPTH	% COBBLES	% GRAVEL	% SAND	% SILT	% FINES	% CLAY	USCS
● SB-4	8.5 - 10	0.0	0.0	60.1		39.9		SM
◻ SB-4	23.5 - 25	0.0	0.0	71.4		28.6		SM
▲ SB-5A	13.5 - 15	0.0	0.0	55.7		44.3		SC

GRAIN SIZE			
	●	◻	▲
D ₆₀	0.098	0.121	0.168
D ₃₀		0.077	
D ₁₀			

●		◻		▲	
Sieve	% Finer	Sieve	% Finer	Sieve	% Finer
#10	100.0	#10	100.0	#4	100.0
#20	99.85	#20	99.9	#10	99.53
#40	99.5	#40	99.65	#20	97.75
#60	98.8	#60	98.71	#40	92.35
#100	92.97	#100	73.78	#60	80.02
#200	39.9	#200	28.59	#100	54.12
				#200	44.28

SOIL DESCRIPTION	
●	SILTY SAND (SM)
◻	SILTY SAND (SM)
▲	CLAYEY SAND (SC)

COEFFICIENTS			
	●	◻	▲
C _c			
C _u			

REMARKS	
●	
◻	
▲	

LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GRAIN SIZE: USCS 1 72215031 GUC 115 KV PHASE .GPJ TERRACON_DATATEMPLATE.GDT 11/11/21

PROJECT: GUC 115 KV Phase I and Phase II Transmission Line Upgrades

SITE: NC-33, Blackjack Simpson Road, and Hudsons Crossroads Road Greenville, NC

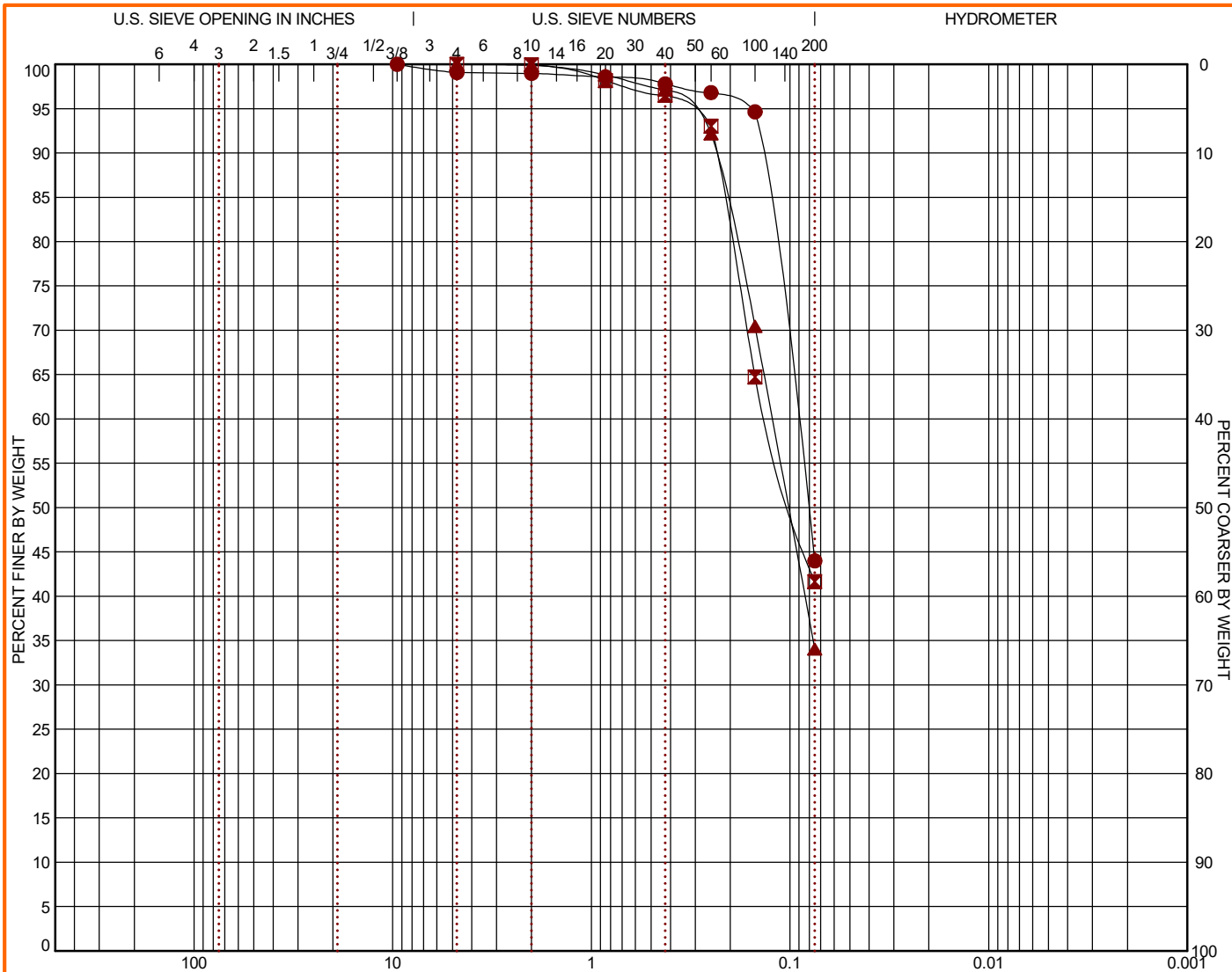


PROJECT NUMBER: 72215031

CLIENT: Stanley Consultants Inc Centennial, CO

GRAIN SIZE DISTRIBUTION

ASTM D422 / ASTM C136



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

BORING ID	DEPTH	% COBBLES	% GRAVEL	% SAND	% SILT	% FINES	% CLAY	USCS
● SB-7B	23.5 - 25	0.0	0.9	55.1		44.0		SM
☒ SB-9	13.5 - 15	0.0	0.0	58.4		41.6		SC
▲ SB-9	23.5 - 25	0.0	0.0	66.0		34.0		SC

GRAIN SIZE			
	●	☒	▲
D₆₀	0.093	0.13	0.123
D₃₀			
D₁₀			
COEFFICIENTS			
	●	☒	▲
C_c			
C_u			

●		☒		▲	
Sieve	% Finer	Sieve	% Finer	Sieve	% Finer
3/8"	100.0	#4	100.0	#4	100.0
#4	99.06	#10	99.94	#10	99.87
#10	98.97	#20	98.17	#20	98.8
#20	98.57	#40	96.52	#40	97.09
#40	97.79	#60	93.03	#60	92.17
#60	96.8	#100	64.74	#100	70.44
#100	94.64	#200	41.64	#200	34.05
#200	44.0				

SOIL DESCRIPTION	
●	SILTY SAND (SM)
☒	CLAYEY SAND (SC)
▲	CLAYEY SAND (SC)
REMARKS	
●	
☒	
▲	

LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GRAIN SIZE: USCS 1 72215031 GUC 115 KV PHASE .GPJ TERRACON_DATATEMPLATE.GDT 11/11/21

PROJECT: GUC 115 KV Phase I and Phase II
Transmission Line Upgrades

SITE: NC-33, Blackjack Simpson Road, and
Hudsons Crossroads Road
Greenville, NC

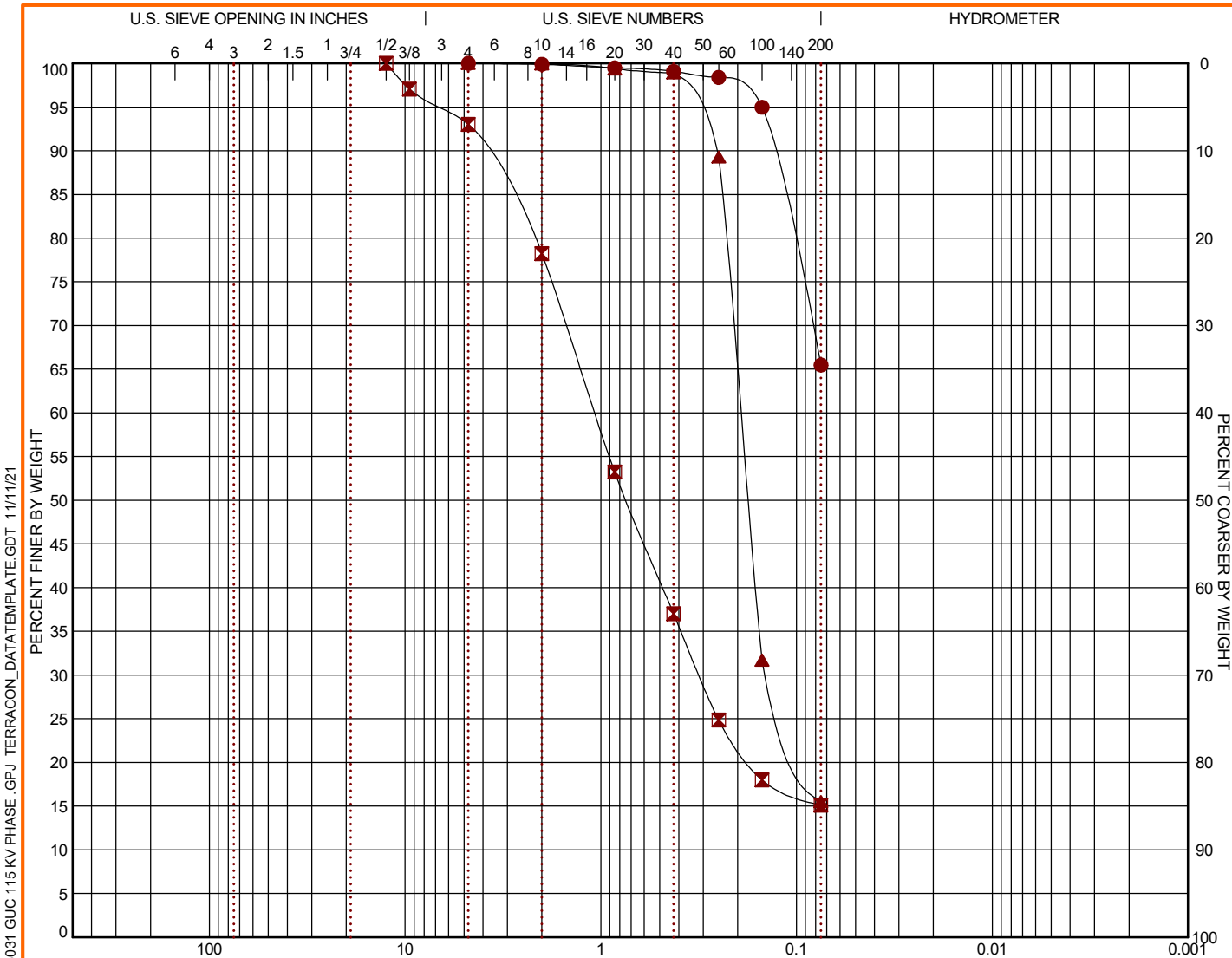


PROJECT NUMBER: 72215031

CLIENT: Stanley Consultants Inc
Centennial, CO

GRAIN SIZE DISTRIBUTION

ASTM D422 / ASTM C136



LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GRAIN SIZE: USCS 1 72215031 GUC 115 KV PHASE .GPJ TERRACON_DATATEMPLATE.GDT 11/11/21

COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

BORING ID	DEPTH	% COBBLES	% GRAVEL	% SAND	% SILT	% FINES	% CLAY	USCS
● SB-10A	6 - 7.5	0.0	0.0	34.5		65.5		CL
☒ SB-13	18.5 - 20	0.0	7.0	77.9		15.1		SM
▲ SB-14A	28.5 - 30	0.0	0.0	84.5		15.5		SM

GRAIN SIZE			
	●	☒	▲
D ₆₀		1.071	0.193
D ₃₀		0.313	0.139
D ₁₀			

COEFFICIENTS			
	●	☒	▲
C _c			
C _u			

●		☒		▲	
Sieve	% Finer	Sieve	% Finer	Sieve	% Finer
#4	100.0	1/2"	100.0	#4	100.0
#10	99.88	3/8"	97.05	#10	99.93
#20	99.48	#4	93.01	#20	99.35
#40	99.08	#10	78.23	#40	98.91
#60	98.38	#20	53.25	#60	89.28
#100	94.98	#40	37.01	#100	31.72
#200	65.47	#60	24.86	#200	15.53
		#100	17.99		
		#200	15.12		

SOIL DESCRIPTION	
●	SANDY LEAN CLAY (CL)
☒	SILTY SAND with SHELLS (SM)
▲	SILTY SAND (SM)

REMARKS	
●	
☒	
▲	

PROJECT: GUC 115 KV Phase I and Phase II Transmission Line Upgrades

SITE: NC-33, Blackjack Simpson Road, and Hudsons Crossroads Road Greenville, NC

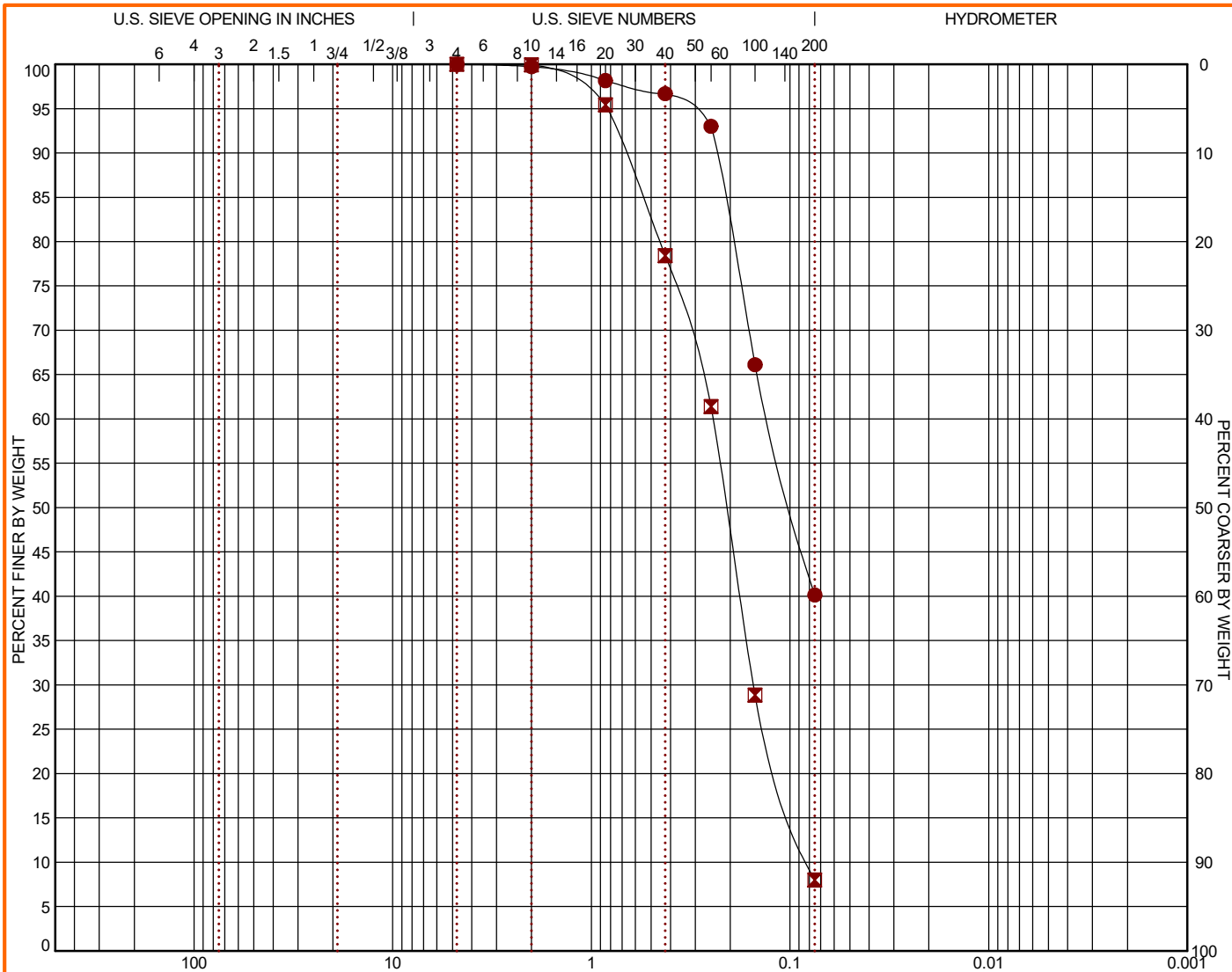


PROJECT NUMBER: 72215031

CLIENT: Stanley Consultants Inc Centennial, CO

GRAIN SIZE DISTRIBUTION

ASTM D422 / ASTM C136



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

BORING ID	DEPTH	% COBBLES	% GRAVEL	% SAND	% SILT	% FINES	% CLAY	USCS
● SB-15A	18.5 - 20	0.0	0.0	59.9		40.1		SM
☒ SB-16A	8.5 - 10	0.0	0.0	92.0		8.0		SP-SM

GRAIN SIZE		
	●	☒
D ₆₀	0.127	0.245
D ₃₀		0.153
D ₁₀		0.08

COEFFICIENTS		
	●	☒
C _c		1.19
C _u		3.05

●		☒			
Sieve	% Finer	Sieve	% Finer	Sieve	% Finer
#4	100.0	#4	100.0		
#10	99.72	#10	99.94		
#20	98.16	#20	95.43		
#40	96.69	#40	78.43		
#60	93.0	#60	61.39		
#100	66.11	#100	28.85		
#200	40.15	#200	8.0		

SOIL DESCRIPTION
● SILTY SAND (SM)
☒ POORLY GRADED SAND with SILT (SP-SM)

REMARKS
●
☒

LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GRAIN SIZE: USCS 1 72215031 GUC 115 KV PHASE .GPJ TERRACON_DATATEMPLATE.GDT 11/11/21

PROJECT: GUC 115 KV Phase I and Phase II Transmission Line Upgrades

SITE: NC-33, Blackjack Simpson Road, and Hudsons Crossroads Road Greenville, NC

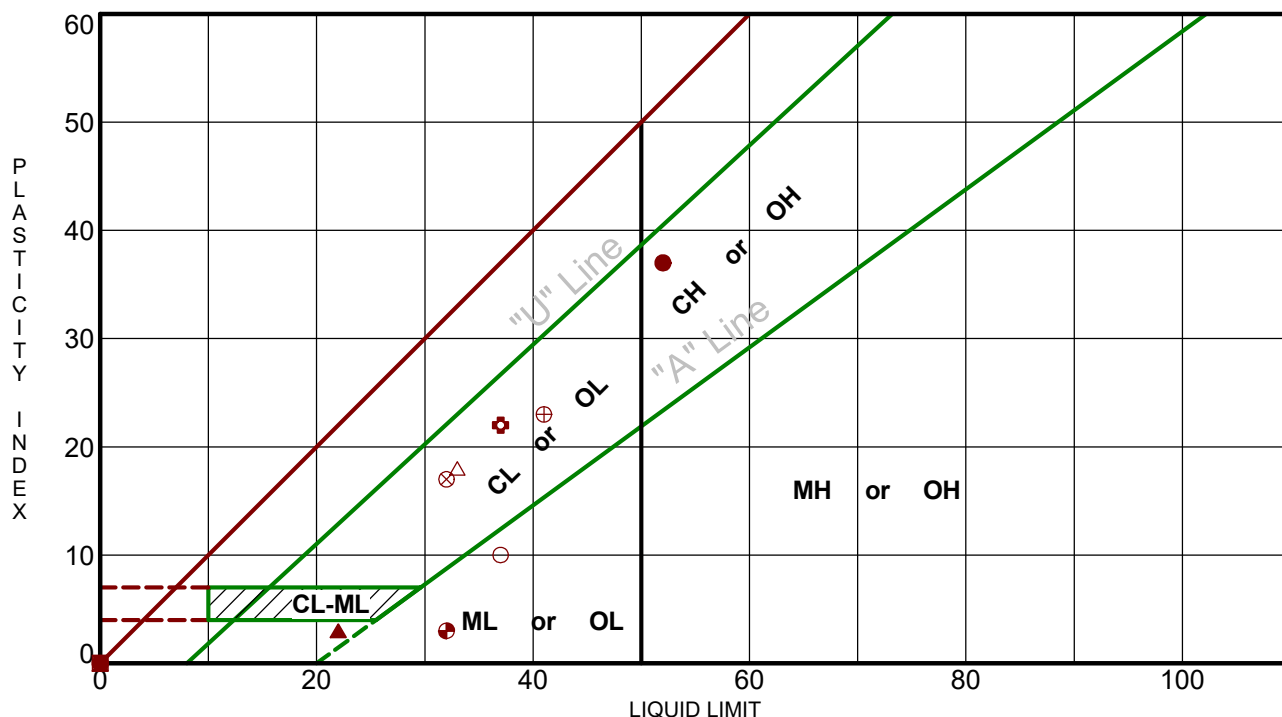


PROJECT NUMBER: 72215031

CLIENT: Stanley Consultants Inc Centennial, CO

ATTERBERG LIMITS RESULTS

ASTM D4318



LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. ATTERBERG LIMITS 72215031 GUC 115 KV PHASE.GPJ TERRACON_DATATEMPLATE.GDT 10/25/21

Boring ID	Depth	LL	PL	PI	Fines	USCS	Description
● SB-1A	6 - 7.5	52	15	37	69.4	CH	SANDY FAT CLAY
☒ SB-2A	18.5 - 20	NP	NP	NP	7.5	SW-SM	WELL GRADED SAND with SILT
▲ SB-2A	33.5 - 35	22	19	3	20.7	SM	SILTY SAND
★ SB-4	8.5 - 10	NP	NP	NP	39.9	SM	SILTY SAND
⊙ SB-4	23.5 - 25	NP	NP	NP	28.6	SM	SILTY SAND
⊕ SB-5A	13.5 - 15	37	15	22	44.3	SC	CLAYEY SAND
○ SB-7B	23.5 - 25	37	27	10	44.0	SM	SILTY SAND
△ SB-9	13.5 - 15	33	15	18	41.6	SC	CLAYEY SAND
⊗ SB-9	23.5 - 25	32	15	17	34.0	SC	CLAYEY SAND
⊕ SB-10A	6 - 7.5	41	18	23	65.5	CL	SANDY LEAN CLAY
☐ SB-13	18.5 - 20	NP	NP	NP	15.1	SM	SILTY SAND with SHELLS
⊕ SB-14A	28.5 - 30	NP	NP	NP	15.5	SM	SILTY SAND
⊕ SB-15A	18.5 - 20	32	29	3	40.1	SM	SILTY SAND
★ SB-16A	8.5 - 10	NP	NP	NP	8.0	SP-SM	POORLY GRADED SAND with SILT

PROJECT: GUC 115 KV Phase I and Phase II Transmission Line Upgrades
 SITE: NC-33, Blackjack Simpson Road, and Hudsons Crossroads Road Greenville, NC



PROJECT NUMBER: 72215031
 CLIENT: Stanley Consultants Inc Centennial, CO

CHEMICAL LABORATORY TEST REPORT

Project Number: 72215031

Service Date: 09/16/21

Report Date: 09/17/21

Terracon

10400 State Highway 191

Midland, Texas 79707

432-684-9600

Client

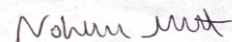
Stanley Consultants Inc
8000 S Chester St, Suite 500
Centennial, CO 80112-3516

Project

GUC 115 KV Phase I and Phase II Transmission Line Upgrades
NC-33, Blackjack Simpson Road, and Hudsons Crossroads Road
Greenville, NC

<i>Sample Location</i>	SB-1	SB-3	SB-5	SB-7	SB-8	SB-11	SB-13
<i>Sample Depth (ft.)</i>	1-10	13.5-20	23.5-45	3.5-10	13.5-25	23.5-30	3.5-7.5
pH Analysis, ASTM - G51-18	4.30	4.00	5.90	6.40	6.30	3.60	4.20
Water Soluble Sulfate (SO ₄), ASTM C 1580 (mg/kg)	31	946	1,850	6	3	682	29
Sulfides, ASTM - D4658-15, (mg/kg)	nil	nil	nil	nil	nil	nil	nil
Chlorides, ASTM D 512, (mg/kg)	19	14	19	7	8	18	14
RedOx, ASTM D-1498, (mV)	+507	+532	+355	+367	+366	+577	+535
Total Salts, ASTM D1125-14, (mg/kg)	349	2,260	3,815	173	137	2,190	291
Resistivity, ASTM G187, (ohm-cm)	4,956	733	568	9,293	13,423	847	5,472

Analyzed By:



Nohelia Monasterios
Staff Engineer

The tests were performed in general accordance with applicable ASTM, AASHTO, or DOT test methods. This report is exclusively for the use of the client indicated above and shall not be reproduced except in full without the written consent of our company. Test results transmitted herein are only applicable to the actual samples tested at the location(s) referenced and are not necessarily indicative of the properties of other apparently similar or identical materials.

CHEMICAL LABORATORY TEST REPORT

Project Number: 72215031

Service Date: 09/16/21

Report Date: 09/17/21

Terracon

10400 State Highway 191

Midland, Texas 79707

432-684-9600

Client

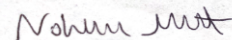
Stanley Consultants Inc
8000 S Chester St, Suite 500
Centennial, CO 80112-3516

Project

GUC 115 KV Phase I and Phase II Transmission Line Upgrades
NC-33, Blackjack Simpson Road, and Hudsons Crossroads Road
Greenville, NC

<i>Sample Location</i>	SB-15	SB-16
<i>Sample Depth (ft.)</i>	13.5-25	13.5-25
pH Analysis, ASTM - G51-18	3.70	4.50
Water Soluble Sulfate (SO ₄), ASTM C 1580 (mg/kg)	2,356	17
Sulfides, ASTM - D4658-15, (mg/kg)	nil	nil
Chlorides, ASTM D 512 , (mg/kg)	23	14
RedOx, ASTM D-1498, (mV)	+539	+512
Total Salts, ASTM D1125-14, (mg/kg)	6,915	150
Resistivity, ASTM G187, (ohm-cm)	516	9,912

Analyzed By:



Nohelia Monasterios
Staff Engineer

The tests were performed in general accordance with applicable ASTM, AASHTO, or DOT test methods. This report is exclusively for the use of the client indicated above and shall not be reproduced except in full without the written consent of our company. Test results transmitted herein are only applicable to the actual samples tested at the location(s) referenced and are not necessarily indicative of the properties of other apparently similar or identical materials.

DESIGN SOIL PARAMETERS FOR DRILLED PIERS

Applicable to the following tables:

- The thickness of the bottom layer is undetermined due to the boring termination depth.
- Soil classifications are based on visual examination of soil samples.
- Soil parameters are ultimate values, appropriate safety factors should be applied by the designer.
- We have considered groundwater at a depth of 0 feet.
- The upper 3 feet of soil profile should be ignored due to surface disturbance and frost action.
- Only LRFD design values with a resistance factor (factored loads) have been provided for use with the design. A factor of 0.55 was applied to sand and 0.45 was applied to clay. The factored loads provided are similar to allowable with a factor of safety (FS) of about 2.5 in compression for skin and a FS of 2.75 in base resistance. The FS for skin assumes permanent and live load components only, the remaining FSs took into account a reliability based analysis.
- The noted bearing pressure should be considered applicable to a depth 45 feet below the existing ground surface. this allows for 5 feet of data below the maximum tip depth of the shaft assuming shaft diameters of approximately 36 inches. Should it be necessary to extend the pile bottom below that depth or increase the diameter of the shaft at a depth of 50 feet, we recommend that a supplemental exploration be performed to collect deeper soil data.
- NR = Not Recommended

Boring SB-1

Layer (feet)		Soil Type (Clay/Sand)	Cohesion (psf)	Friction Angle (degrees)	Effective Unit Weight of Soil (pcf)	MFAD Deformation Modulus (ksi)	Factored Skin Friction (psf)	Factored End Bearing Capacity (psf)
Top	Bottom							
0	3	Sand	---	28	120 58	0.35	70	NR
3	8	Clay	1,000	---	125 63	0.6	245	NR
8	13	Sand	---	29	113 51	0.5	270	4,200
13	18	Sand	---	35	127 65	3.5	575	10,000
18	23	Sand	---	28	110 48	0.35	270	1,800
23	28	Clay	750	---	124 62	---	185	2,100
28	48	Sand	---	30	115 53	0.6	580	6,000

Geotechnical Engineering Report

GUC 115 KV Phase 1 & Phase II Transmission Lines ■ Greenville, Pitt County, North Carolina
 December 17, 2021 ■ Terracon Project No. 72215031



Layer (feet)		Soil Type (Clay/Sand)	Cohesion (psf)	Friction Angle (degrees)	Effective Unit Weight of Soil (pcf)	MFAD Deformation Modulus (ksi)	Factored Skin Friction (psf)	Factored End Bearing Capacity (psf)
Top	Bottom							
48	50	Sand	---	35	130 68	8	1,200	30,000

Boring SB-2

Layer (feet)		Soil Type (Clay/Sand)	Cohesion (psf)	Friction Angle (degrees)	Effective Unit Weight of Soil (pcf)	MFAD Deformation Modulus (ksi)	Factored Skin Friction (psf)	Factored End Bearing Capacity
Top	Bottom							
0	8	Clay	750	---	124 62	---	185	NR
8	18	Sand	---	32	120 58	0.9	400	9,600
18	23	Sand	---	29	113 51	0.5	355	3,600
23	38	Sand	---	32	120 58	0.9	600	9,000
38	48	Sand	---	27	110 48	0.2	420	1,800
48	50	Sand	---	35	132 70	8	1,030	19,800

Boring SB-3

Layer (feet)		Soil Type (Clay/Sand)	Cohesion (psf)	Friction Angle (degrees)	Effective Unit Weight of Soil (pcf)	MFAD Deformation Modulus (ksi)	Factored Skin Friction (psf)	Factored End Bearing Capacity (psf)
Top	Bottom							
0	5	Clay	1,000	---	125 63	0.6	250	NR
5	13	Sand	---	31	118 56	0.75	315	7,200
13	23	Clay	200	---	110 48	---	50	550
23	38	Sand	---	31	118 56	0.75	580	8,400
38	48	Sand	---	27	110 48	0.2	410	1,800
48	50	Sand	---	35	132 70	8	1,000	19,200

Geotechnical Engineering Report

GUC 115 KV Phase 1 & Phase II Transmission Lines ■ Greenville, Pitt County, North Carolina
December 17, 2021 ■ Terracon Project No. 72215031



Boring SB-4

Layer (feet)		Soil Type (Clay/Sand)	Cohesion (psf)	Friction Angle (degrees)	Effective Unit Weight of Soil (pcf)	MFAD Deformation Modulus (ksi)	Factored Skin Friction (psf)	Factored End Bearing Capacity (psf)
Top	Bottom							
0	3	Clay	1,500	---	126 64	1.0	370	NR
3	13	Sand	---	28	110 48	0.35	195	3,000
13	33	Sand	---	30	115 53	0.6	435	6,000
33	38	Sand	---	26	110 48	0.2	320	1,200
38	43	Sand	---	29	113 51	0.5	475	3,600
43	48	Sand	---	34	125 63	1.5	815	13,200
48	50	Sand	---	35	132 70	8	1,220	30,000

Boring SB-5

Layer (feet)		Soil Type (Clay/Sand)	Cohesion (psf)	Friction Angle (degrees)	Effective Unit Weight of Soil (pcf)	MFAD Deformation Modulus (ksi)	Factored Skin Friction (psf)	Factored End Bearing Capacity (psf)
Top	Bottom							
0	3	Sand	---	29	113 51	0.5	70	NR
3	13	Sand	---	31	118 56	0.75	295	7,800
13	23	Sand	---	27	110 48	0.2	250	1,800
23	28	Sand	---	32	120 58	0.9	550	9,600
28	43	Sand	---	35	132 70	8	1,090	15,000
43	50	Sand	---	30	115 53	0.6	680	6,600

Boring SB-6

Layer (feet)		Soil Type (Clay/Sand)	Cohesion (psf)	Friction Angle (degrees)	Effective Unit Weight of Soil (pcf)	MFAD Deformation Modulus (ksi)	Factored Skin Friction (psf)	Factored End Bearing Capacity (psf)
Top	Bottom							
0	5	Sand	---	30	115 53	0.6	125	NR

Geotechnical Engineering Report

GUC 115 KV Phase 1 & Phase II Transmission Lines ■ Greenville, Pitt County, North Carolina
December 17, 2021 ■ Terracon Project No. 72215031



Layer (feet)		Soil Type (Clay/Sand)	Cohesion (psf)	Friction Angle (degrees)	Effective Unit Weight of Soil (pcf)	MFAD Deformation Modulus (ksi)	Factored Skin Friction (psf)	Factored End Bearing Capacity (psf)
Top	Bottom							
5	8	Clay	750	---	124 62	---	185	NR
8	18	Sand	---	31	118 58	0.25	380	7,800
18	23	Sand	---	26	110 48	0.2	235	1,200
23	43	Sand	---	35	132 70	8	1,075	15,000
43	50	Sand	---	32	120 58	0.9	805	10,200

Boring SB-7

Layer (feet)		Soil Type (Clay/Sand)	Cohesion (psf)	Friction Angle (degrees)	Effective Unit Weight of Soil (pcf)	MFAD Deformation Modulus (ksi)	Factored Skin Friction (psf)	Factored End Bearing Capacity (psf)
Top	Bottom							
0	3	Sand	---	28	110 48	0.2	60	NR
3	13	Clay	---	30	115 53	0.6	255	6,000
13	18	Sand	200	---	120 58	---	50	560
18	33	Sand	---	29	113 51	0.5	425	4,800
33	38	Sand	4,000	---	131 69	2.5	990	11,200
38	43	Sand	---	29	113 51	0.5	545	4,800
43	50	Sand	---	33	123 61	1.1	795	11,400

Boring SB-8

Layer (feet)		Soil Type (Clay/Sand)	Cohesion (psf)	Friction Angle (degrees)	Effective Unit Weight of Soil (pcf)	MFAD Deformation Modulus (ksi)	Factored Skin Friction (psf)	Factored End Bearing Capacity (psf)
Top	Bottom							
0	18	Sand	---	28	110	0.35	195	3,000
18	23	Sand	---	26	110	0.2	225	1,200
23	28	Sand	---	30	115	0.6	460	6,600
28	33	Sand	---	26	110	0.5	0	0
33	43	Sand	---	31	118	0.75	580	7,200
43	48	Sand	---	26	110	0.2	360	1,200

Geotechnical Engineering Report

GUC 115 KV Phase 1 & Phase II Transmission Lines ■ Greenville, Pitt County, North Carolina
December 17, 2021 ■ Terracon Project No. 72215031



Layer (feet)		Soil Type (Clay/Sand)	Cohesion (psf)	Friction Angle (degrees)	Effective Unit Weight of Soil (pcf)	MFAD Deformation Modulus (ksi)	Factored Skin Friction (psf)	Factored End Bearing Capacity (psf)
Top	Bottom							
48	50	Clay	250	---	122	---	60	700

Boring SB-9

Layer (feet)		Soil Type (Clay/Sand)	Cohesion (psf)	Friction Angle (degrees)	Effective Unit Weight of Soil (pcf)	MFAD Deformation Modulus (ksi)	Factored Skin Friction (psf)	Factored End Bearing Capacity (psf)
Top	Bottom							
0	3	Sand	---	26	110	0.2	0	NR
3	5	Sand	---	32	120	0.9	200	NR
5	8	Sand	---	35	132	8	475	NR
8	13	Sand	---	32	120	0.9	390	10,200
13	33	Sand	---	27	110	0.2	290	1,800
33	50	Sand	---	28	110	0.35	455	3,000

Boring SB-10

Layer (feet)		Soil Type (Clay/Sand)	Cohesion (psf)	Friction Angle (degrees)	Effective Unit Weight of Soil (pcf)	MFAD Deformation Modulus (ksi)	Factored Skin Friction (psf)	Factored End Bearing Capacity (psf)
Top	Bottom							
0	5	Clay	1,500	---	126	1.0	370	NR
5	8	Clay	500	---	123	---	125	NR
8	18	Sand	---	33	123	1.1	470	11,400
18	28	Sand	---	26	110	0.2	200	600
28	43	Clay	750	---	124	---	185	2,100
43	50	Clay	1,500	---	126	1.0	370	4,200

Geotechnical Engineering ReportGUC 115 KV Phase 1 & Phase II Transmission Lines ■ Greenville, Pitt County, North Carolina
December 17, 2021 ■ Terracon Project No. 72215031**Boring SB-11**

Layer (feet)		Soil Type (Clay/Sand)	Cohesion (psf)	Friction Angle (degrees)	Effective Unit Weight of Soil (pcf)	MFAD Deformation Modulus (ksi)	Factored Skin Friction (psf)	Factored End Bearing Capacity (psf)
Top	Bottom							
0	5	Sand	---	28	110	0.35	95	3,000
5	18	Sand	---	26	110	0.2	125	600
18	23	Sand	---	34	125	1.5	580	14,400
23	33	Clay	250	---	122	---	60	700
33	50	Sand	---	27	110	0.2	395	1,800

Boring SB-12

Layer (feet)		Soil Type (Clay/Sand)	Cohesion (psf)	Friction Angle (degrees)	Effective Unit Weight of Soil (pcf)	MFAD Deformation Modulus (ksi)	Factored Skin Friction (psf)	Factored End Bearing Capacity (psf)
Top	Bottom							
0	3	Sand	---	27	110	0.2	50	NR
3	8	Sand	---	30	115	0.6	210	NR
8	13	Clay	500	---	123	---	125	1,400
13	18	Clay	200	---	120	---	50	550
18	43	Sand	---	34	125	1.5	730	13,800
43	48	Sand	---	29	113	0.5	610	4,800
48	50	Clay	500	---	123	---	125	1,400

Boring SB-13

Layer (feet)		Soil Type (Clay/Sand)	Cohesion (psf)	Friction Angle (degrees)	Effective Unit Weight of Soil (pcf)	MFAD Deformation Modulus (ksi)	Factored Skin Friction (psf)	Factored End Bearing Capacity (psf)
Top	Bottom							
0	3	Sand	---	27	110	0.2	50	NR
3	8	Sand	---	29	113	0.5	175	NR
8	13	Sand	---	32	120	0.9	350	9,000
13	23	Sand	---	29	113	0.5	335	4,200
23	28	Sand	---	26	110	0.2	265	1,200

Geotechnical Engineering Report

GUC 115 KV Phase 1 & Phase II Transmission Lines ■ Greenville, Pitt County, North Carolina
December 17, 2021 ■ Terracon Project No. 72215031



Layer (feet)		Soil Type (Clay/Sand)	Cohesion (psf)	Friction Angle (degrees)	Effective Unit Weight of Soil (pcf)	MFAD Deformation Modulus (ksi)	Factored Skin Friction (psf)	Factored End Bearing Capacity (psf)
Top	Bottom							
28	48	Sand	---	34	125	1.5	795	14,400
48	50	Clay	1,000	---	125	0.6	250	2,800

Boring SB-14

Layer (feet)		Soil Type (Clay/Sand)	Cohesion (psf)	Friction Angle (degrees)	Effective Unit Weight of Soil (pcf)	MFAD Deformation Modulus (ksi)	Factored Skin Friction (psf)	Factored End Bearing Capacity (psf)
Top	Bottom							
0	8	Sand	---	29	113	0.5	160	NR
8	18	Sand	---	32	120	0.9	405	9,600
18	23	Sand	---	29	113	0.5	365	4,200
23	28	Clay	1,750	---	127	1.1	435	4,900
28	33	Sand	---	28	110	0.35	405	3000
33	38	Clay	750	---	124	---	185	2,100
38	50	Sand	---	35	132	8.0	860	14,400

Boring SB-15

Layer (feet)		Soil Type (Clay/Sand)	Cohesion (psf)	Friction Angle (degrees)	Effective Unit Weight of Soil (pcf)	MFAD Deformation Modulus (ksi)	Factored Skin Friction (psf)	Factored End Bearing Capacity (psf)
Top	Bottom							
0	3	Sand	---	29	113	0.5	65	NR
3	13	Clay	200	---	120	---	50	560
13	18	Sand	---	27	110	0.2	0	0
18	28	Sand	---	32	120	0.9	265	1,800
28	38	Sand	---	28	110	0.35	675	10,800
38	43	Clay	750	---	124	---	185	2,100
43	48	Sand	---	31	118	0.75	660	7,200

Geotechnical Engineering Report

GUC 115 KV Phase 1 & Phase II Transmission Lines ■ Greenville, Pitt County, North Carolina
 December 17, 2021 ■ Terracon Project No. 72215031



Layer (feet)		Soil Type (Clay/Sand)	Cohesion (psf)	Friction Angle (degrees)	Effective Unit Weight of Soil (pcf)	MFAD Deformation Modulus (ksi)	Factored Skin Friction (psf)	Factored End Bearing Capacity (psf)
Top	Bottom							
48	50	Sand	---	35	132	8.0	1020	19,800

Boring SB-16

Layer (feet)		Soil Type (Clay/Sand)	Cohesion (psf)	Friction Angle (degrees)	Effective Unit Weight of Soil (pcf)	MFAD Deformation Modulus (ksi)	Factored Skin Friction (psf)	Factored End Bearing Capacity (psf)
Top	Bottom							
0	5	Sand	---	29	113	0.5	110	3,600
5	48	Sand	---	32	120	0.9	565	9,000
48	50	Sand	---	29	113	0.5	590	4,200

SUPPORTING INFORMATION

Contents:

General Notes

Unified Soil Classification System






Note: All attachments are one page unless noted above.

GENERAL NOTES

DESCRIPTION OF SYMBOLS AND ABBREVIATIONS

East Carteret High School Additions ■ Beaufort, NC

Terracon Project No. 72215115

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

DESCRIPTIVE SOIL CLASSIFICATION

Soil classification as noted on the soil boring logs is based Unified Soil Classification System. Where sufficient laboratory data exist to classify the soils consistent with ASTM D2487 "Classification of Soils for Engineering Purposes" this procedure is used. ASTM D2488 "Description and Identification of Soils (Visual-Manual Procedure)" is also used to classify the soils, particularly where insufficient laboratory data exist to classify the soils in accordance with ASTM D2487. In addition to USCS classification, coarse grained soils are classified on the basis of their in-place relative density, and fine-grained soils are classified on the basis of their consistency. See "Strength Terms" table below for details. The ASTM standards noted above are for reference to methodology in general. In some cases, variations to methods are applied as a result of local practice or professional judgment.

LOCATION AND ELEVATION NOTES

Exploration point locations as shown on the Exploration Plan and as noted on the soil boring logs in the form of Latitude and Longitude are approximate. See [Exploration and Testing Procedures](#) in the report for the methods used to locate the exploration points for this project. Surface elevation data annotated with +/- indicates that no actual topographical survey was conducted to confirm the surface elevation. Instead, the surface elevation was approximately determined from topographic maps of the area.

STRENGTH TERMS

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

RELEVANCE OF SOIL BORING LOG

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

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

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

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

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

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

^E $Cu = D_{60}/D_{10}$ $Cc = \frac{(D_{30})^2}{D_{10} \times D_{60}}$

^F If soil contains $\geq 15\%$ sand, add "with sand" to group name.

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

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

^I If soil contains $\geq 15\%$ gravel, add "with gravel" to group name.

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

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

^L If soil contains $\geq 30\%$ plus No. 200 predominantly sand, add "sandy" to group name.

^M If soil contains $\geq 30\%$ plus No. 200, predominantly gravel, add "gravelly" to group name.

^N $PI \geq 4$ and plots on or above "A" line.

^O $PI < 4$ or plots below "A" line.

^P PI plots on or above "A" line.

^Q PI plots below "A" line.

