



# GEOTECHNICAL BASELINE REPORT

SC 83 Bridge Replacement over Little Pee Dee River  
Marlboro County, South Carolina



## PREPARED FOR

SCDOT

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Columbia, South Carolina 29201



## PREPARED BY

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SCDOT Project ID: P042879

FME Project No.: G7100.010

April 8, 2025

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Mr. Trapp Harris, P.E.  
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Re: Geotechnical Baseline Report  
SC 83 Bridge Replacement over Little Pee Dee River  
Marlboro County, South Carolina  
SCDOT Project ID.: P042879  
FME Project No.: G7100.010

Mr. Harris:

Submitted herein is F&ME Consultants, Inc.'s (FME) Geotechnical Baseline Report for the SC 83 Bridge Replacement over the Little Pee Dee River. Included is a summary of the subsurface data, the subsurface findings, the soil laboratory test results, and our conceptual geotechnical assessment of the assumed bridge foundation systems and bridge/roadway embankments.

Please notify us if there are any questions or if we can be of further assistance.

Sincerely,

F&ME CONSULTANTS



John F. Hamilton, PE  
Geotechnical Design Manager

Attachments

JFH/rl:jfh



# TABLE OF CONTENTS

|   |           |
|---|-----------|
| <b>1. PROJECT DESCRIPTION .....</b>   | <b>1</b>  |
| <b>2. SUBSURFACE EXPLORATION .....</b>  | <b>1</b>  |
| 2.1. SOIL TEST BORINGS.....   | 1         |
| 2.2. ELECTRO-PIEZOCONE SOUNDING TESTS.....  | 2         |
| 2.3. MANUAL AUGER BORINGS .....   | 2         |
| 2.4. BULK SOIL SAMPLES.....   | 3         |
| 2.5. DOWNHOLE SHEAR WAVE VELOCITY TESTING .....                                   | 3         |
| 2.6. GROUNDWATER .....  | 3         |
| <b>3. LABORATORY TESTING.....</b>   | <b>4</b>  |
| <b>4. SUBSURFACE CONDITIONS .....</b>   | <b>5</b>  |
| 4.1. SITE GEOLOGY.....  | 5         |
| 4.2. SOIL STRATIGAPHY.....  | 6         |
| 4.3. GROUNDWATER .....  | 7         |
| <b>5. REGIONAL SEISMICITY.....</b>  | <b>7</b>  |
| 5.1. SUBSURFACE SHEAR WAVE VELOCITY.....  | 7         |
| 5.2. GEOTECHNICAL SEISMIC HAZARD POTENTIAL.....                                   | 8         |
| <b>6. CONCEPTUAL GEOTECHNICAL ASSESSMENT FOR BRIDGE &amp; ROADWAY DESIGN.....</b> | <b>9</b>  |
| 6.1. EMBANKMENTS .....  | 9         |
| 6.1.1. EMBANKMENT SUBGRADE PREPARATION.....                                       | 10        |
| 6.1.2. EMBANKMENT SETTLEMENT.....   | 10        |
| 6.1.2.1. STATIC SETTLEMENT .....  | 10        |
| 6.1.2.2. SEISMIC SETTLEMENT .....   | 10        |
| 6.1.3. EMBANKMENT SLOPE STABILITY .....   | 11        |
| 6.1.3.1. STATIC .....   | 11        |
| 6.1.3.2. SEISMIC .....  | 11        |
| 6.1.4. GROUND IMPROVEMENT .....   | 12        |
| 6.2. BRIDGE FOUNDATIONS.....  | 12        |
| 6.2.1. SUBSURFACE STEEL CORROSION & CONCRETE DETERIORATION.....                   | 12        |
| 6.2.2. DRIVEN PILE FOUNDATIONS.....   | 13        |
| 6.2.2.1. AXIAL RESISTANCE.....  | 13        |
| 6.2.2.2. LATERAL RESISTANCE .....   | 13        |
| 6.2.2.3. DRIVABILITY.....   | 14        |
| 6.2.3. DRILLED SHAFT FOUNDATIONS .....  | 14        |
| 6.2.3.1. AXIAL RESISTANCE.....  | 15        |
| 6.2.3.2. LATERAL RESISTANCE.....  | 15        |
| 6.2.3.3. CONSTRUCTABILITY.....  | 15        |
| <b>7. EXISTING PAVEMENT .....</b>   | <b>16</b> |
| <b>8. LIMITATIONS OF REPORT .....</b>   | <b>16</b> |

# APPENDIX

|           |                                   |
|-----------|-----------------------------------|
| Section 1 | Site Location Plan                |
| Section 2 | Boring Location Plan              |
| Section 3 | Subsurface Exploration Logs       |
| Section 4 | Downhole Geophysical Test Results |
| Section 5 | Laboratory Test Results           |
| Section 6 | On-Site Drill Rig Photos          |
| Section 7 | Pavement Core Photos              |
| Section 8 | SPT Hammer Calibration Report     |
| Section 9 | Geo-Scoping Form                  |



## 1. PROJECT DESCRIPTION

The project site is located along SC Highway 83, near the North Carolina border in Marlboro County, South Carolina. A site location plan is presented in the Appendix.

The project consists of demolishing the existing bridge and replacing it with a new bridge structure. The new bridge will be a multi-span structure. We assume that the proposed bridge substructure elements will consist of driven pile foundations at the end bents. At the interior bents and assuming a flat-slab superstructure, driven, pre-stressed concrete (PSC) pile foundations are considered appropriate. At the interior bents with a beam/girder superstructure, drilled shaft foundations are considered appropriate.

The geotechnical subsurface investigation was performed in general accordance with the 2022 SCDOT Geotechnical Design Manual (GDM). The field exploration methods and laboratory testing procedures were conducted in general accordance with the current American Association of State Highway and Transportation Officials (AASHTO), American Society of Testing and Materials (ASTM) Standards. The conceptual bridge foundation analyses and the development of conceptual design recommendations, provided herein, were performed in general accordance with the GDM and/or the AASHTO LRFD Bridge Design Specifications.

## 2. SUBSURFACE EXPLORATION

From February 25 through March 18, 2025, FME performed four (4) Soil Test Borings, six (6) Manual Auger Borings, one (1) Downhole Shear Wave Velocity Test (DHT), two (2) Electro-Piezocone Soundings, and two (2) bulk soil samples.

The recovered soils were visually classified in the field based upon the Unified Soil Classification System (USCS) in general accordance with ASTM D2488. Test locations and target exploration depths were provided by the SCDOT. A Boring Location Plan displaying the test locations performed during the subsurface exploration is provided in the Appendix.

### 2.1. SOIL TEST BORINGS

Soil Test Borings were performed utilizing a CME 550X ATV-mounted drill rig. The Soil Test Borings utilized rotary wash drilling techniques to maintain a stable borehole. In general, Standard Penetration Testing was conducted at standard testing intervals relative to the SCDOT GDM requirements. Soil boring B-3 was continuously sampled in the top fifty (50) feet using a two-foot split-spoon sampling device. The other soil borings were continuously sampled in the top ten (10) feet. Following the continuous sampling, SPT testing was performed on standard five (5) foot intervals thereafter until the target boring depth was achieved. SPT sampling was performed in general accordance with ASTM D1586 to determine the relative densities and consistencies of the subsurface soils and to collect subsurface soil samples. An automatic hammer with a calibrated Energy Transfer Ratio (ETR) was used to perform the SPTs. The measured ETR for the CME 550X was 82%. The SPT hammer calibration records are provided in the Appendix. The following table summarizes the performed soil borings.

**Table 1 – Field Exploration Summary Table – Soil Test Borings**

| Test ID      | Test Type | Soil Depth (ft) | Bridge/Air/<br>Water Gap (ft) | Total Boring<br>Depth (ft) | Latitude    | Longitude    | Elevation<br>(ft-MSL) |
|--------------|-----------|-----------------|-------------------------------|----------------------------|-------------|--------------|-----------------------|
| B-1          | STB       | 100.0           | 0.0                           | 100.0                      | 34.61081784 | -79.50139568 | 142.8                 |
| B-2          | STB       | 100.0           | 16.3                          | 116.3                      | 34.61095439 | -79.50115053 | 142.3                 |
| B-3          | STB       | 100.0           | 0.0                           | 100.0                      | 34.61146639 | -79.50024480 | 140.4                 |
| B-4/DHT      | STB/DHT   | 100.0           | 0.0                           | 100.0                      | 34.61123386 | -79.50064937 | 141.7                 |
| <b>Total</b> |           | <b>400.0</b>    | <b>16.3</b>                   | <b>416.3</b>               |             |              |                       |

## 2.2. ELECTRO-PIEZOCONE SOUNDING TESTS

Electro-Piezcone Sounding Tests (CPT) were advanced on site using the CME 550X drill rig. CPT tests were generally performed at 5-centimeter intervals. CPT-1 was performed near soil boring B-1, and CPT-2 was performed adjacent to soil boring B-3. The following table summarizes the performed CPTs.

**Table 2 – Field Exploration Summary Table – Electro Piezocone Soundings**

| Test ID      | Test Type | Test Depth (ft) | Latitude    | Longitude    | Elevation |
|--------------|-----------|-----------------|-------------|--------------|-----------|
| CPT-1        | CPT       | 51.7            | 34.61079498 | -79.50137862 | 142.6     |
| CPT-2        | CPT       | 22.0            | 34.61145840 | -79.50021440 | 140.6     |
| <b>Total</b> |           | <b>73.7</b>     |             |              |           |

## 2.3. MANUAL AUGER BORINGS

Six (6) locations were identified to collect pavement cores of the existing pavement structure and perform shallow soil borings at the pavement subgrade. Below each of the pavement core locations, FME performed Manual Auger Borings with Dynamic Cone Penetration (DCP) testing. DCP's were performed on one (1) foot testing interval depths. Following completion of the manual auger borings, the pavement cores were bagged and transported to FME's laboratory facility. These cores were measured and photographed to document thickness, distress and existing surface conditions. The photos of the pavement cores are provided in the Appendix. The following table summarizes the performed pavement coring and manual auger borings.

**Table 3 – 3 – Field Exploration Summary Table – Manual Auger Borings**

| Test ID      | Test Type | Test Depth (ft) | Latitude    | Longitude    | Elevation<br>(ft-MSL) |
|--------------|-----------|-----------------|-------------|--------------|-----------------------|
| P-1          | MAB       | 5.3             | 34.60968573 | -79.50343590 | 161.0                 |
| P-2          | MAB       | 5.3             | 34.61006583 | -79.50274430 | 153.3                 |
| P-3          | MAB       | 5.3             | 34.61044908 | -79.50205456 | 146.0                 |
| P-4          | MAB       | 5.3             | 34.61159915 | -79.49999666 | 140.4                 |
| P-5          | MAB       | 5.2             | 34.61197846 | -79.49930656 | 139.9                 |
| P-6          | MAB       | 5.3             | 34.61236357 | -79.49861834 | 139.0                 |
| <b>Total</b> |           | <b>31.7</b>     |             |              |                       |

## 2.4. BULK SOIL SAMPLES

Two (2) Bulk Soil Samples (designated as BS-1 and BS-2) were collected at the site. BS-1 was collected at the proposed beginning of bridge location, near soil boring B-1. Bulk Soil Sample BS-2 was collected adjacent to soil boring P-1. BS-1 was performed for the purpose of performing triaxial laboratory testing on re-molded samples compacted to 95% of the Standard Proctor testing. BS-2 was performed for the primary purpose of performing California Bearing Ratio testing. The following table summarizes the performed bulk soil sampling.

**Table 4 – Field Exploration Summary Table – Bulk Soil Samples**

| Test ID           | Test Type | Test Depth (ft) | Latitude         | Longitude        | Elevation (ft-MSL) |
|-------------------|-----------|-----------------|------------------|------------------|--------------------|
| BS-1              | BS/MAB    | 5.0             | 34.61082414      | -79.50141463     | 142.3              |
| BS-2 <sup>1</sup> | BS/MAB    | 5.0             | N/A <sup>1</sup> | N/A <sup>1</sup> | N/A <sup>1</sup>   |
| Total             |           | 10.0            |                  |                  |                    |

<sup>1</sup>Composite Bulk Soil Sample BS-2 was Created from Upper Five (5) feet of Auger Cuttings Collected within Manul Auger Borings P-1 through P-6.

## 2.5. DOWNHOLE SHEAR WAVE VELOCITY TESTING

Following completion of the SPT testing within soil boring B-4, the borehole was prepared for Downhole Shear Wave Velocity geophysical testing (DHT). The geophysical test data was collected by recording seismic shear-wave and compression wave velocities directly with a downhole geophone receiver. A 24-channel Geometrics Geode seismograph along with a three-component GeoStuff BHG-3 borehole geophone and control box were used to record seismic waves generated from a sixteen-pound sledgehammer horizontally striking an 8.5-foot-long shear beam with aluminum strike plates affixed to the ends. Measurements were taken starting at the bottom of the borehole (maximum of 95 feet for our testing due to downhole tool configuration) and the testing continued at 2.5-foot intervals as the geophone was raised to the ground surface. Each interval included two separate recordings from energy sources designed to enhance specific properties of the secondary wave: 1) positive shear (south end of beam hammer blow), and 2) negative shear (north end of beam hammer blow). Additionally, a third compression wave recording was collected for the compression (P or primary) wave. The results from the downhole shear wave velocity testing are provided in the Appendix.

## 2.6. GROUNDWATER

In each soil boring, groundwater depths were recorded at the time of boring (TOB) and/or twenty-four (24) hours following boring completion. The groundwater depth measurements are noted on the individual logs provided in the Appendix. The groundwater depths are discussed in further sections of this report.

### 3. LABORATORY TESTING

Following completion of the subsurface investigation, soil samples were selected by FME personnel for laboratory testing. The tests were conducted in an AASHTO certified laboratory in accordance with applicable ASTM/AASHTO standards.

The laboratory testing performed on the soil samples collected from the Soil Test Borings is summarized in the table below. The data sheets containing the results from this testing are provided in the Appendix.

**Laboratory Testing Summary Table – Soil Test Boring (Split-Spoon Samples)**

| Type of Test                        | Quantity | Procedure                          |
|-------------------------------------|----------|------------------------------------|
| Moisture Content                    | 16       | AASHTO T265 (ASTM D2216)           |
| Atterberg Limits                    | 14       | AASHTO T89/T90 (ASTM D4318)        |
| Grain-Size Distribution w/ Wash 200 | 13       | ASTM D6913/AASHTO T11 (ASTM D1140) |
| Hydrometer and Grain Size           | 3        | ASTM D7928/D6913                   |

The laboratory testing performed on the Bulk Soil Samples are summarized in the table below. The data sheets containing the results from this testing are provided in the Appendix.

**Laboratory Testing Summary Table – Bulk Soil Samples**

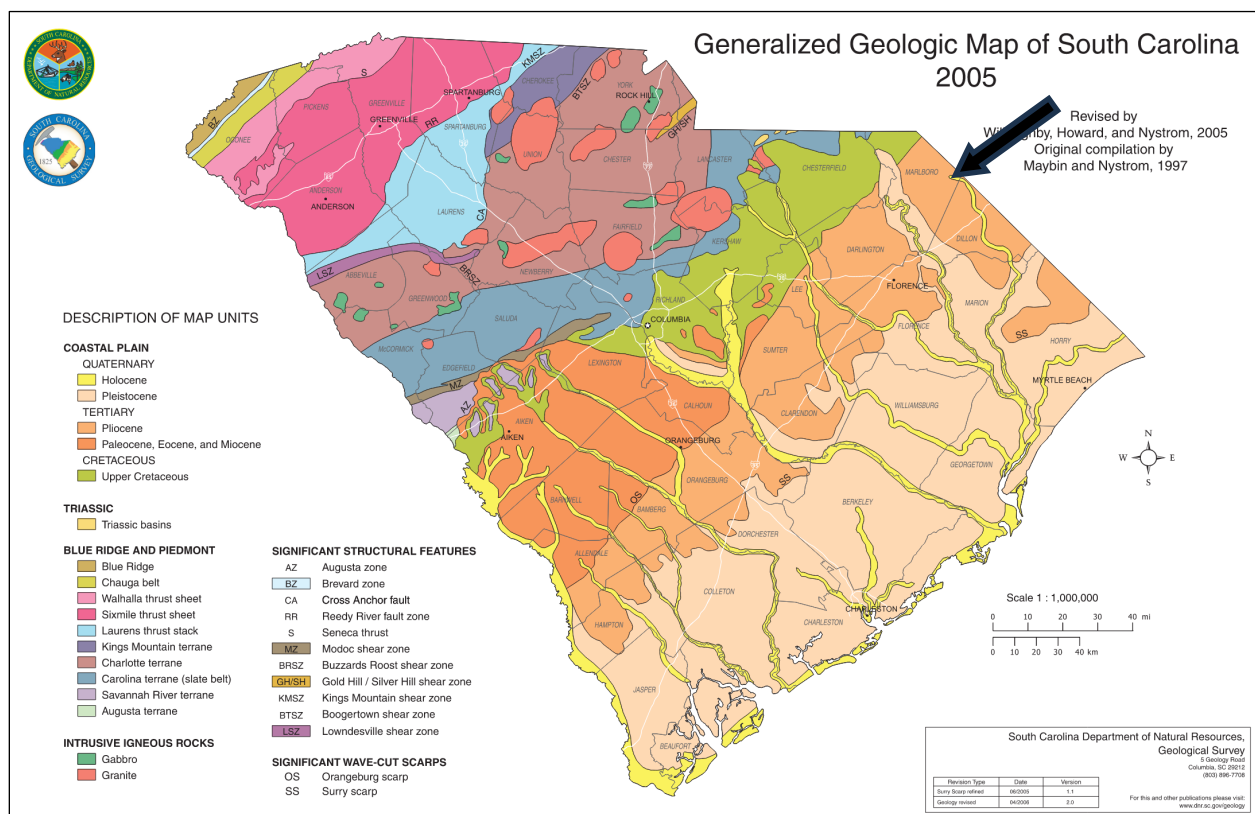
| Type of Test                        | Quantity | Procedure                          |
|-------------------------------------|----------|------------------------------------|
| Moisture Content                    | 2        | AASHTO T265 (ASTM D2216)           |
| Atterberg Limits                    | 2        | AASHTO T89/T90 (ASTM D4318)        |
| Grain-size Distribution w/ Wash 200 | 2        | ASTM D6913/AASHTO T11 (ASTM D1140) |
| Direct Shear                        | 1        | AASHTO T236 (ASTM D3080)           |
| California Bearing Ratio            | 1        | AASHTO T193 (ASTM D1883)           |
| pH                                  | 1        | AASHTO T289/ASTM G51               |
| Resistivity                         | 1        | AASHTO T288                        |
| Chloride Content                    | 1        | AASHTO T291                        |
| Sulfate                             | 1        | AASHTO T290 (ASTM C1580)           |

## 4. SUBSURFACE CONDITIONS

### 4.1. SITE GEOLOGY

The bridge site is located within the Middle Coastal Plain geologic unit of South Carolina. The Coastal Plain unit has a gently dipping topography towards the ocean and is comprised of several geologic formations, which represent sedimentary sequences believed to have been formed during periods of eustatic sea level rise/fall or tectonic uplift/subsidence over geologic time.

The following figure displays the location of the site relative to the Generalized Geologic Map of South Carolina. The available quadrangle maps developed by the South Carolina Geologic Survey near the project site were also used to delineate the various coastal plain geologic stratigraphy.



The following geologic strata were encountered in the subsurface investigation. The strata are presented in descending order relative to their age (youngest to oldest).

- Existing Embankment Fill
- Alluvium (Holocene)
- Duplin Formation (Pliocene)
- Middendorf Formation (Cretaceous)

Below the existing embankment fill, the Holocene-aged Alluvium represents the surficial soils of the naturally occurring flood-plain. The soil composition of the Alluvium is primarily sandy with some interbedded silts. Based on laboratory testing performed on limited samples from the subsurface investigation, the alluvial material is expected to be primarily non-plastic. The SPT blow counts in the Alluvium generally suggest very soft silts and very loose to medium dense sands.

Below the Alluvium, the Pliocene-aged Duplin Formation soils were encountered. From the available geologic mapping, the Duplin Formation at this bridge site is separated into an upper layer consisting of mainly Clay-Like soils and a lower layer consisting of mainly Sand-Like soils. The Clay-Like soil description follows the definition provided in the GDM. These soils may contain less than 50% fines content, but the Plasticity Indices are greater than 10, which gives the soil more of a clay-like behavior. The SPT blow counts in the Duplin Formation generally suggest stiff to hard silts/clays and medium dense to very dense sands.

Below the Duplin Formation, the Cretaceous aged Middendorf Formation soils were encountered. The upper contact of the Middendorf Formation is sometimes identified by a relatively thin, hard, calcified crust. This crust was observed within some borings performed at the site. At the other borings where this crust was not observed, we interpret that the crust was likely drilled through between the 5-ft SPT test depth intervals. Within the Middendorf Formation and below crust, the relative densities are comparable to that of the overlying Duplin Formation. At this site and to the depths explored, the Middendorf Formation is predominantly sandy. The SPT blow counts in the Middendorf Formation generally suggest medium dense to very dense sands.

## 4.2.SOIL STRATIGAPHY

The soil test borings indicate four (4) geologic strata at the site: Existing Embankment Fill, Alluvium, Duplin Formation, and Middendorf Formation. The following table summarizes the geologic stratigraphy.

**Soil Stratification Table**

| Geology                           | <sup>1</sup> Elevation of Top of Layer (ft-MSL) | USCS Soil Type              | SPT N-Values (bpf) | Average CPT Tip Resistance (tsf) |
|-----------------------------------|---|-----------------------------|--------------------|----------------------------------|
| Existing Fill                     | +142  | SM, SC-SM, SP-SM            | 2 to 24            | 76                               |
| Alluvium (Holocene)               | +129  | SP, SM, SC, SC-SM, ML       | 1 to 28            | 52                               |
| Duplin Formation (Pliocene)       | +109  | SP, SM, SC, SC-SM, ML, CL   | 10 to 68           | 98                               |
| Middendorf Formation (Cretaceous) | +69   | SP, SM, SP-SM, SP-SC, SC-SM | 14 to 100+         | N/A                              |

<sup>1</sup> Elevations are generalized from the totality of subsurface information collected



### 4.3. GROUNDWATER

In general, the encountered groundwater table generally matches the surface water elevation of the Little Pee Dee River at the time of our investigation. We anticipate the groundwater table will fluctuate with the stage elevation of the river. Groundwater table measurements were recorded immediately following completion of the borings/soundings and/or 24-hours following completion of the boring/sounding. The groundwater table depth was measured at approximately fourteen (14) feet below the existing roadway grade. This depth corresponds to a groundwater elevation of +127 ft-NAVD. During and following periods of rainfall, the groundwater table elevation may be encountered at higher elevations than shown on the boring logs.

We also note that artesian groundwater conditions can be encountered within certain zones of the Middendorf Formation. We did not observe an artesian condition within the field testing performed during our subsurface investigation, but that is not to say that artesian groundwater conditions may not be encountered at depths greater than we explored. If additional soil borings are to be collected, the Design Team should be aware of the potential for artesian groundwater conditions.

## 5. REGIONAL SEISMICITY

Most of the seismic research and discussion in the United States is confined to the western part of the country, but there are historical records that indicate major seismic events have occurred in the Central and Eastern United States (CEUS). In 1886, the largest historic seismic event in the southeastern United States occurred near Charleston, South Carolina. This event had an estimated moment magnitude ( $M_w$ ) of 7.3. This seismic event has dominated the development of the seismic accelerations used for design of structures in South Carolina. The following sections globally discuss the field investigation procedures used to aid in the development of the design seismic accelerations and the resulting estimated seismic hazard potential at the project site.

### 5.1. SUBSURFACE SHEAR WAVE VELOCITY

From the results of the downhole geophysical testing, FME developed subsurface shear wave velocity and compression wave velocity profiles for the site. SCDOT uses a proprietary software to generate project-specific Acceleration Design Response Spectra (ADRS). The software requires a shear wave velocity ( $V_s$ ) profile that extends to at least the Site Class B (Rock) and Site Class C (Very Dense Soil/Soft Rock) boundary. This contact is called the B-C boundary. The SCDOT defines the B-C Boundary as having consistent shear wave velocities above 2,500 ft/sec.

For the geophysical testing performed at this site, we interpret that the individual downhole geophysical test did not penetrate the B-C boundary. In order to complete the  $V_s$  Profile to the B-C Boundary, additional deep-hole geophysical data was used. From SCDOT's Deep Geophysical Testing Database, we selected the I-73 deep boring to complete the  $V_s$  Profile.

The constructed Vs Profile was submitted to SCDOT for generations of the project's ADRS curves. The following table summarizes the seismic design accelerations from the SCDOT generated ADRS curve.

| Acceleration Design Response Spectra |      |          |          |
|--------------------------------------|------|----------|----------|
| Design Event                         | PGA  | $S_{DS}$ | $S_{D1}$ |
| FEE                                  | 0.13 | 0.27     | 0.13     |
| SEE                                  | 0.26 | 0.58     | 0.39     |

The ADRS curves are provided with the Request for Proposals (RFP) on the SCDOT website.

## 5.2. GEOTECHNICAL SEISMIC HAZARD POTENTIAL

Geotechnical seismic hazards consist of a loss in a soil's shear strength through cyclic ground motions induced by earthquakes. The GDM classifies this phenomenon with the term soil Shear Strength Loss (SSL). Liquefaction is the traditional term used to describe SSL in sand-like soils. Cyclic-softening is the typical terminology for clay-like soils. Of the two phenomena, sand-like liquefaction is considered the most devastating seismically induced geotechnical hazard. We note that the GDM does not consider Sand-Like soils with a geologic age older than Pleistocene to be susceptible to SSL. Clay-Like soils are considered susceptible to SSL regardless of their age.

Liquefaction is the loss of a soil's shear strength due to a rapid increase in pore water pressure resulting from seismic shaking. The seismic shaking causes the soil particles to dilate within the soil matrix. The result is that the soil particles are suspended in the groundwater and the relative strength of the soil is greatly reduced. Soils most susceptible to liquefaction generally consist of saturated, loose sands.

Cyclic softening from seismic shaking occurs in clay-like soils. The softening effect occurs when seismic-induced shear stresses exceed the soil's cyclic shear resistance, which causes an accumulation of micro-deformations and, thus, strain softening. Soils most susceptible to strain softening generally consists of saturated, sensitive, moderate to high plasticity silts and clays.

Screening for potential SSL soils was performed based on the results from the soil borings, CPTs, and laboratory test results. The SSL screening process was performed in accordance with the GDM. Based on the SSL screening process, the Sand-Like SSL potential is erratic within the Alluvial soils. We do not expect to see SSL within the Clay-Like soils of the various geologic formations. The effects from the predicted sand-like SSL are globally discussed in the proceeding sections of this report.

## 6. CONCEPTUAL GEOTECHNICAL ASSESSMENT FOR BRIDGE & ROADWAY DESIGN

Based on our understanding of the project, the following elements were considered for the conceptual geotechnical design provided herein:

- Earthen bridge and roadway embankments
- Bridge foundations

A global discussion of the conceptual geotechnical design of the elements noted above is provided in the proceeding sections of this report. Other elements such as earth retaining structures, drainage structures (ie. pipe culverts greater than 48 inch diameter and box culverts), sound barrier walls, and miscellaneous structures are not expected to be included with this project and are not discussed in this report.

### 6.1. EMBANKMENTS

The GDM separates embankments into two (2) categories: bridge embankments and roadway embankments. The GDM defines the bridge embankments as *“The portion of the approach embankment that requires an Extreme Event limit state global stability check, unless indicated otherwise within the GDM. The longitudinal length of Bridge Embankment shall be based on the specified mitigation method (either geotechnical or structural) that is required to achieve satisfactory global stability for the Extreme Event limit state check.”* At a minimum, the bridge embankment consists of the front slope and extends to 3.25 times the height of the abutment, measured from the end of the approach slab (refer to Figure 2-1 & 2-2 of the GDM).

The GDM defines the roadway embankments as *“The portion of the embankment that extends beyond the bridge embankment and extends between the toes of the slopes on either side”*.

In general, the GDM requires a static and seismic evaluation of the bridge embankments. Only a static evaluation is required for the roadway embankments. As such, static and seismic settlement analyses and static and seismic slope stability analyses should be performed for the bridge embankments. Static settlement and static slope stability analyses should be performed for the roadway embankments. Each of these analyses is globally discussed in the following sections.

### **6.1.1. EMBANKMENT SUBGRADE PREPARATION**

For the proposed embankment widening and assuming standard 2H:1V side slopes, there is typically a portion of new fill that bears on the natural ground soils. At this site, the bearing material that will support this new fill footprint will consist of wet, low to moderate density, alluvial sands. We do not expect that this material would need to be mucked or undercut to meet the design requirements, but this material may need to be treated for embankment subgrade preparation in order to meet the SCDOT requirements for embankment fill placement. The Design Team should review the embankment subgrade soils relative to muck excavation, bridge lifts, and/or soil reinforcement and discuss these project risks with the Contractor.

### **6.1.2. EMBANKMENT SETTLEMENT**

Bridge and roadway embankment settlements are separated into two (2) categories: static settlement as a result of fill placement and seismic settlement as a result of redistribution effects following liquefaction of sand-like soils. Each of these conditions is globally discussed in the following sections.

#### **6.1.2.1. STATIC SETTLEMENT**

Based on the conceptual plans, the maximum fill height is on the order of four (4) feet relative to the roadway centerline. Larger fills are expected at the widened embankment side slope locations.

The proposed bridge and roadway embankment subgrade soils consist of a predominant loose to medium dense sand-like soils with some interbedded, relatively thin (< 5 feet) layers of soft, non-plastic silt. Fill placement at this site will result in deformation of these subgrade soils. We anticipate that the magnitudes of settlement would be minimal at this site, and the majority of the deformations would occur rapidly with new fill placement. Some limited consolidation settlements may occur, but these settlements are expected to complete during construction and without ground improvement.

We do not anticipate that in-situ ground improvement, such as wick drains, or soil surcharges would be required to expedite static settlements for this project.

#### **6.1.2.2. SEISMIC SETTLEMENT**

For the assumed SSL conditions, a subsequent deformation analysis was qualitatively performed to estimate the vertical settlement from the sand-like soil's redistribution effects. Seismic settlement is generally confined to only sand-like soils.

Based on the conceptual SSL screening, the seismic induced deformations are anticipated to meet the GDM performance limits and performance objectives without ground improvement. For an OC II structure, the GDM allows an unlimited amount of seismic settlement for the SEE event. The GDM does limit the seismic settlement for the FEE event. The seismic settlement for the FEE event should be checked for conformance with the GDM performance criteria. The seismic settlements will likely induce downdrag loadings on the foundations, which should be accounted for in the geotechnical design of the bridge foundations.

### **6.1.3. EMBANKMENT SLOPE STABILITY**

Static and seismic slope stability analyses should be performed on the bridge embankment side slopes and front slopes. Only static slope stability analyses are required for the roadway embankments. The GDM requires that Spencer's method of slope stability be used for determining stability. The conceptual static and seismic slope stability analyses are qualitatively discussed in the following sections.

#### **6.1.3.1. STATIC**

From reviewing the boring logs, we anticipate that the static slope stability analyses under non-scoured conditions will generate resistance factors that meet the GDM criteria without ground improvement. For the bridge embankment front slopes, the 100-yr and 500-yr scour profiles should also be included in the static slope stability analyses. Typically, soil reinforcement is required to generate the resistance needed to meet the GDM geotechnical resistance factor for the 100-year scour condition. The static slope stability analyses for the non-scoured and 100-year scour conditions are governed by the Strength Limit State, and the static slope stability analyses for the 500-year scour conditions are governed by the Extreme Event limit state.

#### **6.1.3.2. SEISMIC**

The GDM requires that pseudo-static, limit equilibrium slope stability analyses be performed at the bridge embankments. The inertial driving forces from the design seismic event in addition to the inclusion of the residual soil strength parameters shall be included in the seismic slope stability analyses. In accordance with the GDM, the seismic slope stability analyses should also include both circular and non-circular surfaces.

From the SSL screening process, SSL is predicted at the site within a portion of the Sand-Like alluvium. We would expect SSL would occur for both the FEE and SEE events, with the SEE event having more appreciable SSL layer thickness. The residual soil strength parameters determined from the SSL calculations should be applied in the seismic slope stability analyses. For the estimated SSL conditions, we would expect the slope stability resistance factors would be in excess of 1.00. For conditions where greater than 1.00 resistance factors are observed, a Newmark displacement analysis should be performed in accordance with the GDM. The calculated Newmark displacements should be included in the lateral bridge foundation analyses to determine compliance in accordance with the GDM Performance Objectives.

The GEOR and SEOR shall determine if geotechnical mitigation (ie. ground improvement) or structural mitigation is needed at the site. We note that the GDM performance objective for bridge embankments under the Extreme Event I limit state is that the bridge embankment does not adversely affect the bridge structure. As such, there are no performance limits provided, and the bridge embankments are allowed to move so long as the bridge design includes sufficient structural mitigation to resist the movements relative to the Performance Objectives of the bridge.

#### 6.1.4. GROUND IMPROVEMENT

Seismic induced SSL was identified at this site, and both geotechnical mitigation and structural mitigation appear feasible. Geotechnical mitigation may consist of in-situ ground improvements and/or embankment reinforcement. Structural mitigation may consist of larger bridge foundations.

## 6.2. BRIDGE FOUNDATIONS

Deep foundations are anticipated for support of the new bridge structure. We assume typical, steel HP pile foundations will be used at the end bents. At the interior bents, we expect driven pre-stressed concrete pile foundations will be used for the bents outside of the main river span and drilled shaft foundations will be used to span the main channel. The conceptual geotechnical assessment of these foundation elements is globally discussed in the following sections.

#### 6.2.1. SUBSURFACE STEEL CORROSION & CONCRETE DETERIORATION

In accordance with AASHTO LRFD Bridge Design Specifications, the following soil or site conditions are considered indicative of a potential for steel and/or concrete deterioration or corrosion.

- Resistivity less than 2,000 ohm-cm;
- pH less than 5.5;
- Chloride concentrations greater than 500 mg/kg;
- Sulfate concentrations greater than 1,000 mg/kg;

The results from the performed corrosion series laboratory testing are summarized in the following table.

**Corrosion Series Laboratory Test Result Summary**

| Test ID | Depth (ft) | Resistivity (ohm-cm) | pH  | Chloride (mg/kg) | Sulfate (mg/kg) |
|---------|------------|----------------------|-----|------------------|-----------------|
| BS-1    | 0-5        | 30,016               | 5.4 | 2.2              | 67.1            |

The corrosion series laboratory testing results are provided in the Appendix. Based on the lab test results, subsurface steel corrosion should be accounted for at this site based on the pH test result. Subsurface sulfate attack on concrete elements is not expected at the site. We note that additional corrosion series laboratory testing is recommended for the final bridge design.



## 6.2.2. DRIVEN PILE FOUNDATIONS

Driven piles are anticipated for support of the bridge end bents and some interior bents. Specific driven pile design issues are discussed in the following sections.

### 6.2.2.1. AXIAL RESISTANCE

For the end bent HP pile foundations, the Strength limit state axial loading conditions are expected to govern the geotechnical driven pile foundation design. The driven HP piles are expected to develop the required driving resistance through predominantly skin friction in the Coastal Plain soils below the alluvium. If a large pile hammer is needed to mobilize the required driving resistance, these hammers may more easily penetrate the cemented sands within the Middendorf Formation, and a lower resistance than predicted may be observed. To the extent possible, smaller pile driving equipment should be used. As is typical with driving piles in the Coastal Plain, the required driving resistance will likely not be observed during the initial pile driving. A prescribed wait period may be required for development of pile freeze following the initial pile driving.

For the interior bent PSC pile foundations, the Design-Team should carefully evaluate the subsurface soil conditions relative to a displacement pile type. At this site, the upper Duplin Formation soils contain an appreciable amount of fines content. When driving displacement pile in these types of soils, the pore pressures that are developed during pile driving become too high to allow for any measurable amount of pile advancement. In most cases, the pile driving operations would need to pause (sometimes for days) to allow for the porewater pressures to dissipate before re-striking and advancing the pile. Typically, only a couple of feet of pile advancement is observed during these re-strikes. This process is repeated until a sufficient amount of resistance and/or pile embedment is achieved.

To mitigate the risks associated with driving displacement piles in Coastal Plain soils with high fines contents, a composite PSC pile with a relatively short PSC length and a long HP pile extension can be used. For these types of composite piles, the Strength Limit State axial loading conditions typically govern the foundation design, with some minimum required PSC embedment in the bearing strata. At this site and considering the lengths of each type of pile, each pile would likely be installed in separate driving sequences for constructability purposes and to properly maintain pile plumbness.

### 6.2.2.2. LATERAL RESISTANCE

For the Strength limit state, we expect that the driven HP pile foundations and the composite PSC pile foundations can be installed with impact pile driving equipment to the minimum tip elevation required for lateral stability. We do not anticipate that pre-drilling operation will be required, unless the Structural design requires some appreciable amount of PSC embedment in the bearing stratum.

For the Extreme Event I limit state, the driven piles will also develop the required lateral stability in the Coastal Plain soils. In accordance with the GDM, the available bridge abutment backwall passive pressure is on the order of 1.0 ksf for a 5.5 foot high backwall and an assumed sandy, cohesionless backfill material. The remaining lateral resistance, following use of the bridge abutment backwall resistance, will have to be carried by the pile foundations. If the bridge design is such that the end bents are responsible for absorbing a significant amount of the lateral loads, then we anticipate that large piles and/or multiple rows of piles may be required. If the end bent piles are used for slope stabilizing purposes for the seismic event, then an additional lateral soil movement loading would be applied to the foundations which should be accounted for in the lateral design analyses. The procedure provided in Appendix K of the GDM should be used to evaluate the magnitude of the soil movement loading acting on the pile foundations.

### 6.2.2.3. DRIVABILITY

The driven piles will likely use a diesel impact pile hammer. We anticipate that both the end bent and interior bents piles will extend into the Middendorf Formation. Based on the anticipated pile lengths and the assumed construction logistics, we expect that the PSC piles may be driven in at least two (2) sequences to allow for connecting the HP section to the PSC section. For the assumed HP pile lengths, we anticipate small to medium sized pile hammers (40-80 k-ft) will be required to effectively mobilize the required driving resistance. For the assumed PSC pile lengths and considering the porewater pressures discussed previously, we anticipate larger pile hammers (80-120 k-ft) will be required to advance the pile and mobilize the required driving resistance.

Based on the soil conditions encountered, we anticipate that the required driving resistance will not be observed during the initial pile driving. The required driving resistance is typically observed following a wait time for pile freeze to develop.

In general, we do not anticipate any pile driving issues for successful installation of the driven piles. For a properly sized pile driving hammer, the pile driving compressive and tensile stresses are expected to conform to the SCDOT criteria.

### 6.2.3. DRILLED SHAFT FOUNDATIONS

Drilled shafts are anticipated for support of the bridge interior bents that span over the main river channel. We anticipate that drilled shaft sizes could range from 36 inch to 60 inch diameter shafts. Specific drilled shaft design issues are discussed in the following sections.

#### **6.2.3.1. AXIAL RESISTANCE**

The Strength limit state axial loading conditions are expected to govern the geotechnical drilled shaft design. We anticipate the drilled shafts will develop the required axial resistance through skin friction and tip resistance in the coastal plain soils. Permanent construction casing is required for the drilled shaft construction on SCDOT projects. We expect the construction casing would extend into the Duplin Formation. The wet method for drilled shaft construction should be utilized to maintain a stable excavation. A polymer slurry or a mineral slurry is recommended. Hard drilling in the Middendorf Formation is expected, and rock excavation equipment may be needed to penetrate the cemented layers.

#### **6.2.3.2. LATERAL RESISTANCE**

For the Strength limit state and Extreme Event I limit state, we expect the drilled shafts will develop the required lateral stability within the Coastal Plain soils. The point of lateral fixity is expected to be above the depth to develop the required axial resistance. The drilled shafts should be sized to accommodate the structural loads and to give the desired performance.

#### **6.2.3.3. CONSTRUCTABILITY**

Due to the presence of hard, calcified layers of soils within the Middendorf Formation, drilled shaft construction equipment, not necessarily common to the Coastal Plain region, may be required in order to excavate to the estimated drilled shaft tip elevation. At a minimum, rock augers should be considered in the drilled shaft construction logistics.

For drilled shafts in the Coastal Plain region, the design typically consists of a combination of side resistance and tip resistance. The calculated side resistance will likely be fully mobilized over the estimated displacements. Care should be taken to not overload the tip of the drilled shafts such that an unrealistic amount of tip resistance is assumed and cannot be fully mobilized for the estimate displacement. A careful balance of side resistance, tip resistance, and the strain compatibility between the two resistances should be implemented. In addition, the Contractor should use best practices to effectively clean the bottom of the excavation and maintain the cleanliness of slough debris prior to and during concreting the drilled shaft.

## 7. EXISTING PAVEMENT

In addition to the soil borings performed for the bridge design, six (6) shallow manual auger borings were also performed at the site. At each MAB location, asphalt cores of the existing pavement were collected. The core thicknesses generally range from three (3) inches to eleven (11) inches.

From the soil test borings and subsequent CBR testing, we note that the quality of the subgrade material below the existing paved shoulders is considered good relative to secondary roadway pavements. The following table summarizes the conditions at the existing paved roadway shoulders.

**Existing Pavement Data**

| Boring ID | Pavement Thickness (in) | CBR @ 95% Compaction |
|-----------|-------------------------|----------------------|
| B-1       | 11.0                    | N/A                  |
| B-3       | 7.0                     | N/A                  |
| B-4       | 9.5                     | N/A                  |
| P-1       | 3.0                     | 15.9                 |
| P-2       | 3.5                     | N/A                  |
| P-3       | 3.5                     | N/A                  |
| P-4       | 3.0                     | N/A                  |
| P-5       | 2.0                     | N/A                  |
| P-6       | 3.0                     | N/A                  |

## 8. LIMITATIONS OF REPORT

This report has been prepared in accordance with generally accepted geotechnical engineering practice for specific application to the referenced bridge project. The conclusions and recommendations contained herein are based upon the provided test borings and test result data, contained within, and applicable standards in this geographic area at the time this report was prepared. No other warranty, expressed or implied, is made.

# SC 83 over Little Pee Dee River

## Geotechnical Baseline Report

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### APPENDIX

|            |  |
|------------|--|
| SECTION 1  | SITE LOCATION PLAN                         |
| SECTION 2  | BORING LOCATION PLAN                       |
| SECTION 3  | SUBSURFACE EXPLORATION LOGS                |
| SECTION 3A | SOIL TEST BORING (STB) LOGS                |
| SECTION 3B | MANUAL AUGER BORING (MAB) LOGS             |
| SECTION 3C | BULK SOIL SAMPLE (BS) LOGS                 |
| SECTION 3D | ELECTRO-PIEZOCONE SOUNDING (CPT) LOGS      |
| SECTION 4  | DOWNHOLE SHEAR WAVE VELOCITY TESTING (DHT) |
| SECTION 5  | LABORATORY TEST RESULTS                    |
| SECTION 5A | SPLIT-SPOON SAMPLES (SS)                   |
| SECTION 5B | BULK SOIL SAMPLES (BS)                     |
| SECTION 5C | CORROSION SERIES TESTING                   |
| SECTION 6  | ON-SITE DRILL RIG PHOTOS                   |
| SECTION 7  | PAVEMENT CORE PHOTOS                       |
| SECTION 8  | SPT HAMMER CALIBRATION                     |
| SECTION 9  | GEOSCOPING FORM                            |

# SC 83 over Little Pee Dee River

## Geotechnical Baseline Report

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# APPENDIX

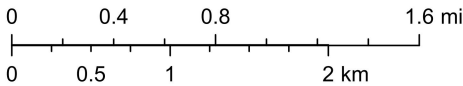
## SECTION 1

## SITE LOCATION PLAN





1:58,000



F&ME CONSULTANTS, INC.  
COLUMBIA, SC

| 4     |     |              |                         |
|-------|-----|--------------|-------------------------|
| 3     |     |              |                         |
| 2     |     |              |                         |
| 1     |     |              |                         |
| REV.  | BY  | DATE         | DESCRIPTION OF REVISION |
| TOPO. |     | DATE         |                         |
| DWG.  | CTC | DATE 2.28.25 | GROUP -- --             |
| R/W   |     | DATE         |                         |

SC 83 OVER LITTLE PEEDEE RIVER  
MARLBORO COUNTY, SOUTH CAROLINA

SITE LOCATION PLAN

SCDOT PROJECT ID: P042879

FME JOB NO. G7100.010 TASK 00001

SCALE: AS NOTED

FIGURE 1

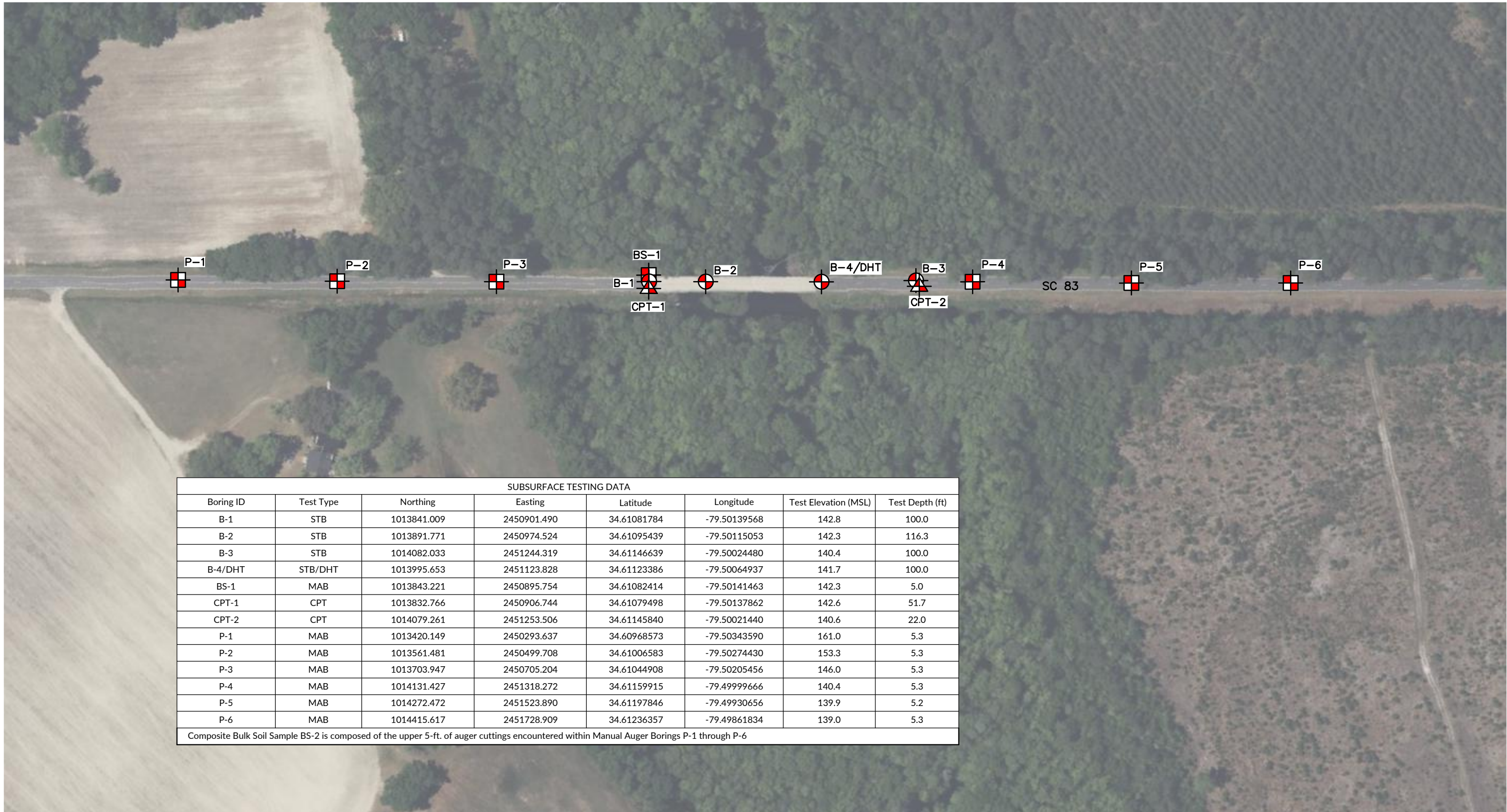
# **SC 83 over Little Pee Dee River**

## **Geotechnical Baseline Report**

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# **APPENDIX**

## **SECTION 2      BORING LOCATION PLAN**



| SUBSURFACE TESTING DATA  |           |             |             |             |              |                      |                 |
|--|-----------|-------------|-------------|-------------|--------------|----------------------|-----------------|
| Boring ID  | Test Type | Northing    | Easting     | Latitude    | Longitude    | Test Elevation (MSL) | Test Depth (ft) |
| B-1  | STB       | 1013841.009 | 2450901.490 | 34.61081784 | -79.50139568 | 142.8                | 100.0           |
| B-2  | STB       | 1013891.771 | 2450974.524 | 34.61095439 | -79.50115053 | 142.3                | 116.3           |
| B-3  | STB       | 1014082.033 | 2451244.319 | 34.61146639 | -79.50024480 | 140.4                | 100.0           |
| B-4/DHT  | STB/DHT   | 1013995.653 | 2451123.828 | 34.61123386 | -79.50064937 | 141.7                | 100.0           |
| BS-1   | MAB       | 1013843.221 | 2450895.754 | 34.61082414 | -79.50141463 | 142.3                | 5.0             |
| CPT-1  | CPT       | 1013832.766 | 2450906.744 | 34.61079498 | -79.50137862 | 142.6                | 51.7            |
| CPT-2  | CPT       | 1014079.261 | 2451253.506 | 34.61145840 | -79.50021440 | 140.6                | 22.0            |
| P-1  | MAB       | 1013420.149 | 2450293.637 | 34.60968573 | -79.50343590 | 161.0                | 5.3             |
| P-2  | MAB       | 1013561.481 | 2450499.708 | 34.61006583 | -79.50274430 | 153.3                | 5.3             |
| P-3  | MAB       | 1013703.947 | 2450705.204 | 34.61044908 | -79.50205456 | 146.0                | 5.3             |
| P-4  | MAB       | 1014131.427 | 2451318.272 | 34.61159915 | -79.49999666 | 140.4                | 5.3             |
| P-5  | MAB       | 1014272.472 | 2451523.890 | 34.61197846 | -79.49930656 | 139.9                | 5.2             |
| P-6  | MAB       | 1014415.617 | 2451728.909 | 34.61236357 | -79.49861834 | 139.0                | 5.3             |
| Composite Bulk Soil Sample BS-2 is composed of the upper 5-ft. of auger cuttings encountered within Manual Auger Borings P-1 through P-6 |           |             |             |             |              |                      |                 |



LEGEND:

SOIL TEST BORING LOCATION

MANUAL AUGER BORING TEST LOCATION

CONE PENETRATION TEST LOCATION

|       |     |              |                         |
|-------|-----|--------------|-------------------------|
| 4     |     |              |                         |
| 3     |     |              |                         |
| 2     |     |              |                         |
| 1     |     |              |                         |
| REV.  | BY  | DATE         | DESCRIPTION OF REVISION |
| TOPO. |     | DATE         |                         |
| DWG.  | CTC | DATE 3.31.25 | GROUP -                 |
| R/W   |     | DATE         |                         |

F&ME CONSULTANTS, INC.  
COLUMBIA, SC

SC 83 OVER LITTLE PEEDEE RIVER  
MARLBORO COUNTY, SOUTH CAROLINA

BORING LOCATION PLAN

|                           |                                  |
|---------------------------|----------------------------------|
| SCDOT PROJECT ID: P042879 | FME JOB NO. G7100.010 TASK 00001 |
| SCALE: 1" = 150'          | FIGURE 2                         |



# **SC 83 over Little Pee Dee River**

## **Geotechnical Baseline Report**

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# **APPENDIX**

## **SECTION 3      SUBSURFACE EXPLORATION LOGS**

## Boring Log Descriptors

### Correlation of Penetration Resistance with Relative Density and Consistency

| Coarse Grained Soils (Sand/Gravel) |                  | Fine Grained Soils (Silt/Clay) |             |
|------------------------------------|------------------|--------------------------------|-------------|
| SPT Blow Count                     | Relative Density | SPT Blow Count                 | Consistency |
| ≤4                                 | Very Loose       | ≤2                             | Very Soft   |
| 5 – 10                             | Loose            | 3 – 4                          | Soft        |
| 11 – 30                            | Medium Dense     | 5 – 8                          | Firm        |
| 31 – 50                            | Dense            | 9 – 15                         | Stiff       |
| ≥51                                | Very Dense       | 16 – 30                        | Very Stiff  |
|                                    |                  | ≥31                            | Hard        |

### Particle Size Identification

| Gravel | Sieve Size       |
|--------|------------------|
| Fine   | #4 to 3/4-in.    |
| Coarse | 3/4-in. to 3-in. |

| Sand   | Sieve Size  |
|--------|-------------|
| Fine   | #200 to #40 |
| Medium | #40 to #10  |
| Coarse | #10 to #4   |

| Clay/Silt     | Sieve Size |
|---------------|------------|
| Fines Content | <#200      |

| SYMBOL | INT CODE* | TYPICAL DESCRIPTION    |
|--------|-----------|------------------------|
|        | SCCT      | CONCRETE               |
|        | SCAT      | ASPHALT                |
|        | SCTS      | TOPSOIL/PEAT           |
|        | SCSAND    | SAND                   |
|        | SCSTSAND  | SILTY SAND/SANDY SILT  |
|        | SCCLSAND  | CLAYEY SAND/SANDY CLAY |
|        | SCCLAY    | CLAY                   |
|        | SCSILT    | SILT                   |
|        | SCSTCLAY  | SILTY CLAY/CLAYEY SILT |
|        | SCSAP     | SAPROLITE              |
|        | SCLS      | LIMESTONE              |
|        | SCBR      | GRANITE (BEDROCK)      |
|        | SCMARL    | MARL                   |

### SOIL CLASSIFICATION CHART

| MAJOR DIVISIONS      |                           |   | SYMBOLS |        | TYPICAL DESCRIPTIONS   |
|----------------------|---------------------------|---|---------|--------|--|
|                      |                           |   | GRAPH   | LETTER |  |
| COARSE GRAINED SOILS | GRAVEL AND GRAVELLY SOILS | CLEAN GRAVELS<br><br>(LITTLE OR NO FINES)               |         | GW     | WELL-GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES  |
|                      |                           |   |         | GP     | POORLY-GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES  |
|                      |                           | GRAVELS WITH FINES<br><br>(APPRECIABLE AMOUNT OF FINES) |         | GM     | SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURES   |
|                      | SAND AND SANDY SOILS      | CLEAN SANDS<br><br>(LITTLE OR NO FINES)                 |         | SW     | WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES  |
|                      |                           |   |         | SP     | POORLY-GRADED SANDS, GRAVELLY SAND, LITTLE OR NO FINES   |
|                      |                           | SANDS WITH FINES<br><br>(APPRECIABLE AMOUNT OF FINES)   |         | SM     | SILTY SANDS, SAND-SILT MIXTURES  |
| FINE GRAINED SOILS   | SILTS AND CLAYS           | LIQUID LIMIT LESS THAN 50                               |         | ML     | INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY |
|                      |                           |   |         | CL     | INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS                  |
|                      |                           |   |         | OL     | ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY  |
|                      | SILTS AND CLAYS           | LIQUID LIMIT GREATER THAN 50                            |         | MH     | INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS  |
|                      |                           |   |         | CH     | INORGANIC CLAYS OF HIGH PLASTICITY   |
|                      |                           |   |         | OH     | ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS  |
| HIGHLY ORGANIC SOILS |                           |   |         | PT     | PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS  |

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS



# **SC 83 over Little Pee Dee River**

## **Geotechnical Baseline Report**

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# **APPENDIX**

## **SECTION 3      SUBSURFACE EXPLORATION LOGS**

### **SECTION 3A      SOIL TEST BORING (STB) LOGS**



# SCDOT Soil Test Log

|                                 |                                 |                              |             |                        |              |
|---------------------------------|---------------------------------|------------------------------|-------------|------------------------|--------------|
| <b>Project ID:</b>              | P042879                         | <b>County:</b>               | Marlboro    | <b>Boring No.:</b>     | B-1          |
| <b>Site Description:</b>        | SC 83 over Little Pee Dee River |                              |             | <b>Route:</b>          | SC 83        |
| <b>Eng./Geo.:</b>               | B. Vogel                        | <b>Boring Location:</b>      | 102+59      | <b>Offset:</b>         | 5.2-L        |
| <b>Elev.:</b>                   | 142.8 ft                        | <b>Latitude:</b>             | 34.61081784 | <b>Longitude:</b>      | -79.50139568 |
| <b>Total Depth:</b>             | 100 ft                          | <b>Soil Depth:</b>           | 100 ft      | <b>Core Depth:</b>     | N/A ft       |
| <b>Bore Hole Diameter (in):</b> | 3.0                             | <b>Sampler Configuration</b> |             | <b>Liner Required:</b> | Y (N)        |
| <b>Drill Machine:</b>           | CME 550X                        | <b>Drill Method:</b>         | RW          | <b>Hammer Type:</b>    | Automatic    |
| <b>Core Size:</b>               | N/A                             | <b>Driller:</b>              | J. Phillips | <b>Energy Ratio:</b>   | 82.0%        |
|                                 |                                 |                              |             | <b>Groundwater:</b>    | TOB 15 ft    |
|                                 |                                 |                              |             | <b>24HR</b>            | 24 ft        |

| Elevation (ft) | Depth (ft) | MATERIAL DESCRIPTION   | Graphic Log | Sample Depth (ft) | Sample No./Type | 1st 6" | 2nd 6" | 3rd 6" | 4th 6" | N Value | <div> <div>● SPT N VALUE ●</div> <div> <div>PL X</div> <div>MC ○</div> <div>LL X</div> </div> <div>▲ FINES CONTENT (%)</div> </div> |
|----------------|------------|--|-------------|-------------------|-----------------|--------|--------|--------|--------|---------|---|
|                | 0.0        | ASPHALT ROADWAY (SC 83) (11.0-in.)   |             |                   |                 |        |        |        |        |         |   |
|                | 0.9        | EXISTING FILL  |             | 0.9               |                 |        |        |        |        |         |   |
|                | 2.0        | Medium Dense, Moist, Very Pale Brown/White, Non-Plastic to Low Plasticity, Silty Fine to Medium SAND (SM/A-2-4), 10YR7/3 & 10YR8/1                       |             | 2.0               | SS-1            | 6      | 11     | 8      |        | 17      |   |
|                | 4.0        | Loose, Moist, White/Light Yellowish Brown, Low Plasticity, Silty Clayey Fine to Coarse SAND (SC-SM/A-2-4) with Trace Gravel, 10YR8/1 & 10YR6/4           |             | 4.0               | SS-2            | 4      | 4      | 5      | 5      | 9       |   |
| 137.8          | 6.0        | Loose, Moist, Brownish Yellow/Light Yellowish Brown, Non-Plastic, Silty Fine to Medium SAND (SM/A-2-4), 10YR6/6 & 10YR4/1                                |             | 6.0               | SS-3            | 3      | 3      | 3      | 3      | 6       |   |
|                | 8.0        | LL=NP, PL=NP, PI=NP, NMC=10.3%, %200=19.1  |             | 8.0               | SS-4            | 2      | 3      | 4      | 4      | 7       |   |
| 132.8          |            | Loose, Moist, Light Yellowish Brown/Reddish Yellow, Low Plasticity, Silty Clayey Fine to Coarse SAND (SC-SM/A-2-4) with Trace Gravel, 10YR6/4 & 7.5YR6/6 |             |                   | SS-5            | 3      | 5      | 4      | 4      | 9       |   |
|                | 13.5       | Loose, Moist, White/Reddish Yellow, Non-Plastic to Low Plasticity, Silty Fine to Coarse SAND (SM/A-2-4) with Trace Gravel, 10YR8/1 & 7.5YR6/6            |             | 13.5              |                 |        |        |        |        |         |   |
| 127.8          |            | ALLUVIUM (HOLOCENE)  |             |                   | SS-6            | 3      | 4      | 2      |        | 6       |   |
|                | 18.5       | Loose, Moist, Light Brown/Reddish Yellow, Low Plasticity, Silty Clayey Fine to Coarse SAND (SC-SM/A-1-b) with Trace Gravel, 7.5YR6/4 & 5YR6/6            |             | 18.5              |                 |        |        |        |        |         |   |
|                |            | LL=18, PL=14, PI=4, NMC=16.5%, %200=15.7   |             |                   |                 |        |        |        |        |         |   |
| 122.8          |            | Very Soft, Moist to Wet, Very Dark Gray, Non-Plastic, Sandy SILT (ML/A-4) with Few Gravel & Some Organics, 5YR3/1  |             |                   | SS-7            | 1/12"  | 1      |        |        | 2       |   |
|                |            | LL=NP, PL=NP, PI=NP, NMC=252.9%, %200=52.6   |             |                   |                 |        |        |        |        |         |   |
|                | 23.5       | Medium Dense, Moist, Light Yellowish Brown, Non-Plastic, Fine to Coarse Poorly Graded SAND (SP/A-3), 2.5Y6/3   |             | 23.5              | SS-8            | 7      | 9      | 10     |        | 19      |   |
| 117.8          |            |  |             |                   |                 |        |        |        |        |         |   |

## LEGEND

| SAMPLER TYPE |                      | DRILLING METHOD |                            |
|--------------|----------------------|-----------------|----------------------------|
| SS           | - Split Spoon        | HSA             | - Hollow Stem Auger        |
| UD           | - Undisturbed Sample | CFA             | - Continuous Flight Augers |
| AWG          | - Rock Core, 1-1/8"  | DC              | - Driving Casing           |
| NQ           | - Rock Core, 1-7/8"  | RW              | - Rotary Wash              |
| CU           | - Cuttings           | RC              | - Rock Core                |
| CT           | - Continuous Tube    |                 |                            |

Continued Next Page

# SCDOT Soil Test Log

|                              |  |                                 |  |                         |  |                           |  |
|------------------------------|--|---------------------------------|--|-------------------------|--|---------------------------|--|
| Project ID: P042879          |  |                                 |  | County: Marlboro        |  | Boring No.: B-1           |  |
| Site Description:            |  | SC 83 over Little Pee Dee River |  |                         |  | Route: SC 83              |  |
| Eng./Geo.: B. Vogel          |  | Boring Location: 102+59         |  | Offset: 5.2-L           |  | Alignment: Existing       |  |
| Elev.: 142.8 ft              |  | Latitude: 34.61081784           |  | Longitude: -79.50139568 |  | Date Started: 3/10/2025   |  |
| Total Depth: 100 ft          |  | Soil Depth: 100 ft              |  | Core Depth: N/A ft      |  | Date Completed: 3/11/2025 |  |
| Bore Hole Diameter (in): 3.0 |  | Sampler Configuration           |  | Liner Required: Y (N)   |  | Liner Used: Y (N)         |  |
| Drill Machine: CME 550X      |  | Drill Method: RW                |  | Hammer Type: Automatic  |  | Energy Ratio: 82.0%       |  |
| Core Size: N/A               |  | Driller: J. Phillips            |  | Groundwater: TOB 15 ft  |  | 24HR 24 ft                |  |

| Elevation (ft) | Depth (ft) | MATERIAL DESCRIPTION  | Graphic Log | Sample Depth (ft) | Sample No./Type | 1st 6" | 2nd 6" | 3rd 6" | 4th 6" | N Value | <div> ● SPT N VALUE ●<br/> PL X MC O LL X<br/> ▲ FINES CONTENT (%) </div> |
|----------------|------------|---|-------------|-------------------|-----------------|--------|--------|--------|--------|---------|---|
| 112.8          | 28.5       | @SS-9: Very Loose, No Recovery  |             | 28.5              | SS-9            | 1      | 1      | 2      |        | 3       | ●   |
| 107.8          | 33.5       | <b>DUPLIN FORMATION (PLIOCENE)</b><br>Medium Dense, Moist, Gray, Low Plasticity, Silty Clayey Fine to Coarse SAND (SC-SM/A-2-4), 5/N  |             | 33.5              | SS-10           | 6      | 9      | 9      |        | 18      | ●   |
| 102.8          | 38.5       | Medium Dense, Moist, Light Gray, Non-Plastic to Low Plasticity, Silty Fine to Medium SAND (SM/A-2-4), 7/N   |             | 38.5              | SS-11           | 6      | 6      | 10     |        | 16      | ●   |
| 97.8           | 43.5       | Medium Dense, Moist, Gray, Medium Plasticity, Clayey Fine to Medium SAND (SC/A-2-6), Micaceous, 5Y5/1 & 5/N<br><br>@SS-12: Light Gray, 7/N<br>LL=31, PL=16, PI=15, NMC=16.9%, %200=31.5 |             | 43.5              | SS-12           | 8      | 7      | 11     |        | 18      | ●   |
| 92.8           | 48.5       | Medium Dense, Moist, Light Gray, Non-Plastic to Low Plasticity, Silty Fine to Medium SAND (SM/A-2-4), 7/N   |             | 48.5              | SS-13           | 6      | 6      | 11     |        | 17      | ●   |
|                |            | Very Stiff, Moist, Dark Gray, Low Plasticity to   |             |                   |                 |        |        |        |        |         |   |

## LEGEND

Continued Next Page

| SAMPLER TYPE            |                        | DRILLING METHOD                |                  |
|-------------------------|------------------------|--------------------------------|------------------|
| SS - Split Spoon        | NQ - Rock Core, 1-7/8" | HSA - Hollow Stem Auger        | RW - Rotary Wash |
| UD - Undisturbed Sample | CU - Cuttings          | CFA - Continuous Flight Augers | RC - Rock Core   |
| AWG - Rock Core, 1-1/8" | CT - Continuous Tube   | DC - Driving Casing            |                  |

# SCDOT Soil Test Log

|                              |  |                                 |  |                         |  |                           |  |
|------------------------------|--|---------------------------------|--|-------------------------|--|---------------------------|--|
| Project ID: P042879          |  |                                 |  | County: Marlboro        |  | Boring No.: B-1           |  |
| Site Description:            |  | SC 83 over Little Pee Dee River |  |                         |  | Route: SC 83              |  |
| Eng./Geo.: B. Vogel          |  | Boring Location: 102+59         |  | Offset: 5.2-L           |  | Alignment: Existing       |  |
| Elev.: 142.8 ft              |  | Latitude: 34.61081784           |  | Longitude: -79.50139568 |  | Date Started: 3/10/2025   |  |
| Total Depth: 100 ft          |  | Soil Depth: 100 ft              |  | Core Depth: N/A ft      |  | Date Completed: 3/11/2025 |  |
| Bore Hole Diameter (in): 3.0 |  | Sampler Configuration           |  | Liner Required: Y (N)   |  | Liner Used: Y (N)         |  |
| Drill Machine: CME 550X      |  | Drill Method: RW                |  | Hammer Type: Automatic  |  | Energy Ratio: 82.0%       |  |
| Core Size: N/A               |  | Driller: J. Phillips            |  | Groundwater: TOB 15 ft  |  | 24HR 24 ft                |  |

| Elevation<br>(ft) | Depth<br>(ft) | MATERIAL DESCRIPTION  | Graphic<br>Log | Sample<br>Depth<br>(ft) | Sample<br>No./Type | SPT N VALUE |        |        |        | N Value | PL MC LL            |    |    |    |    |    |    |    |    |    |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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|                   |               |   |                |                         |                    | 1st 6"      | 2nd 6" | 3rd 6" | 4th 6" |         | ▲ FINES CONTENT (%) |    |    |    |    |    |    |    |    |    |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               |   |                |                         |                    |             |        |        |        |         | 0                   | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Medium Plasticity, Sandy Lean <u>CLAY</u> ( <u>CL/A-6</u> ) with Trace Organics, Micaceous, 5Y4/1 |                |                         |                    |             |        |        |        |         |                     |    |    |    |    |    |    |    |    |    |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

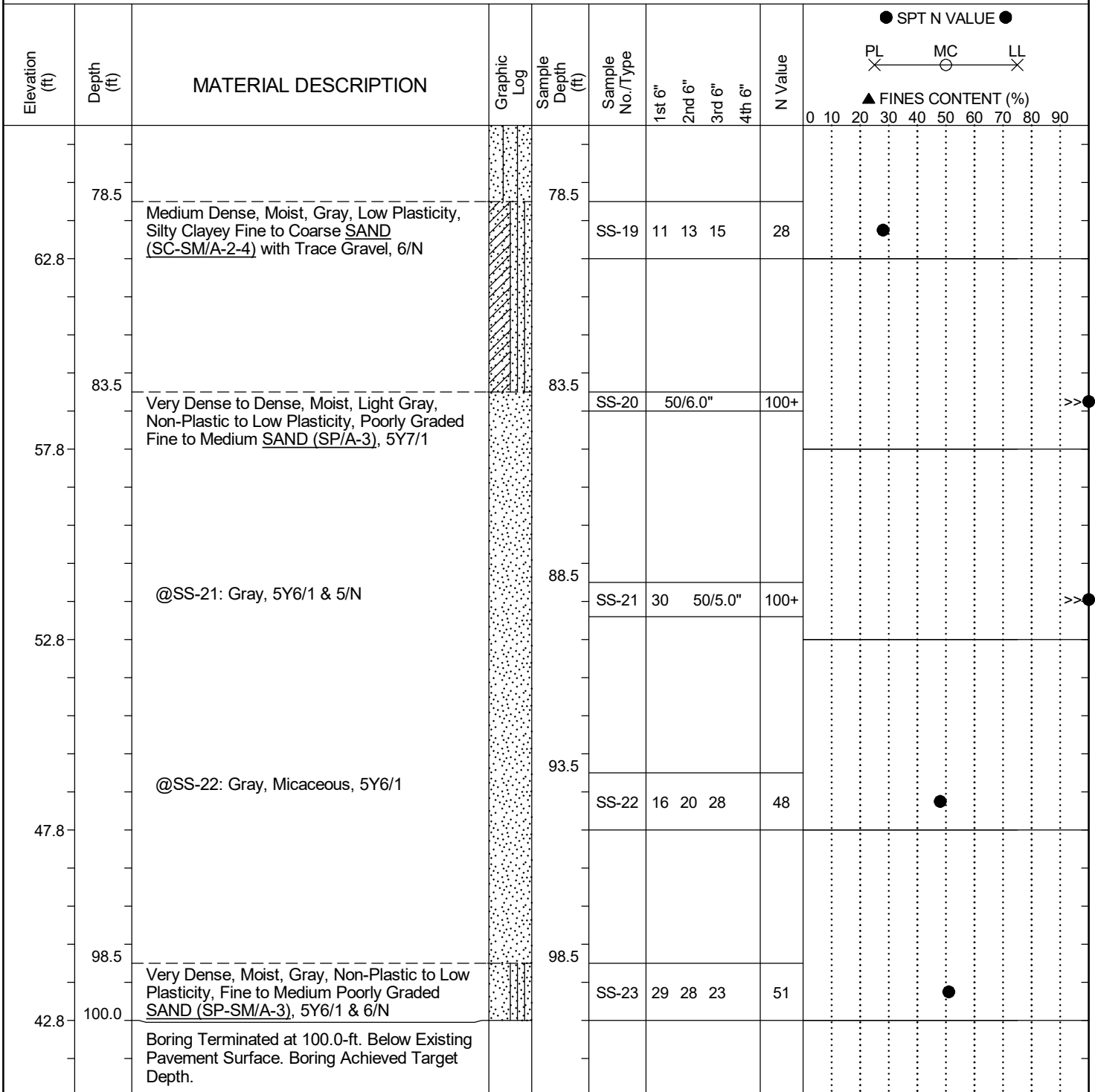
## LEGEND

Continued Next Page

| SAMPLER TYPE            |                        | DRILLING METHOD                |                  |
|-------------------------|------------------------|--------------------------------|------------------|
| SS - Split Spoon        | NQ - Rock Core, 1-7/8" | HSA - Hollow Stem Auger        | RW - Rotary Wash |
| UD - Undisturbed Sample | CU - Cuttings          | CFA - Continuous Flight Augers | RC - Rock Core   |
| AWG - Rock Core, 1-1/8" | CT - Continuous Tube   | DC - Driving Casing            |                  |

# SCDOT Soil Test Log

|                                 |                                 |                              |             |                     |              |
|---------------------------------|---------------------------------|------------------------------|-------------|---------------------|--------------|
| <b>Project ID:</b>              | P042879                         | <b>County:</b>               | Marlboro    | <b>Boring No.:</b>  | B-1          |
| <b>Site Description:</b>        | SC 83 over Little Pee Dee River |                              |             | <b>Route:</b>       | SC 83        |
| <b>Eng./Geo.:</b>               | B. Vogel                        | <b>Boring Location:</b>      | 102+59      | <b>Offset:</b>      | 5.2-L        |
| <b>Elev.:</b>                   | 142.8 ft                        | <b>Latitude:</b>             | 34.61081784 | <b>Longitude:</b>   | -79.50139568 |
| <b>Date Started:</b>            | 3/10/2025                       |                              |             |                     |              |
| <b>Total Depth:</b>             | 100 ft                          | <b>Soil Depth:</b>           | 100 ft      | <b>Core Depth:</b>  | N/A ft       |
| <b>Date Completed:</b>          | 3/11/2025                       |                              |             |                     |              |
| <b>Bore Hole Diameter (in):</b> | 3.0                             | <b>Sampler Configuration</b> |             |                     |              |
| <b>Liner Required:</b>          | Y                               | <b>Liner Used:</b>           | Y           |                     |              |
| <b>Drill Machine:</b>           | CME 550X                        | <b>Drill Method:</b>         | RW          | <b>Hammer Type:</b> | Automatic    |
| <b>Energy Ratio:</b>            | 82.0%                           |                              |             |                     |              |
| <b>Core Size:</b>               | N/A                             | <b>Driller:</b>              | J. Phillips | <b>Groundwater:</b> | TOB 15 ft    |
| <b>24HR</b>                     | 24 ft                           |                              |             |                     |              |

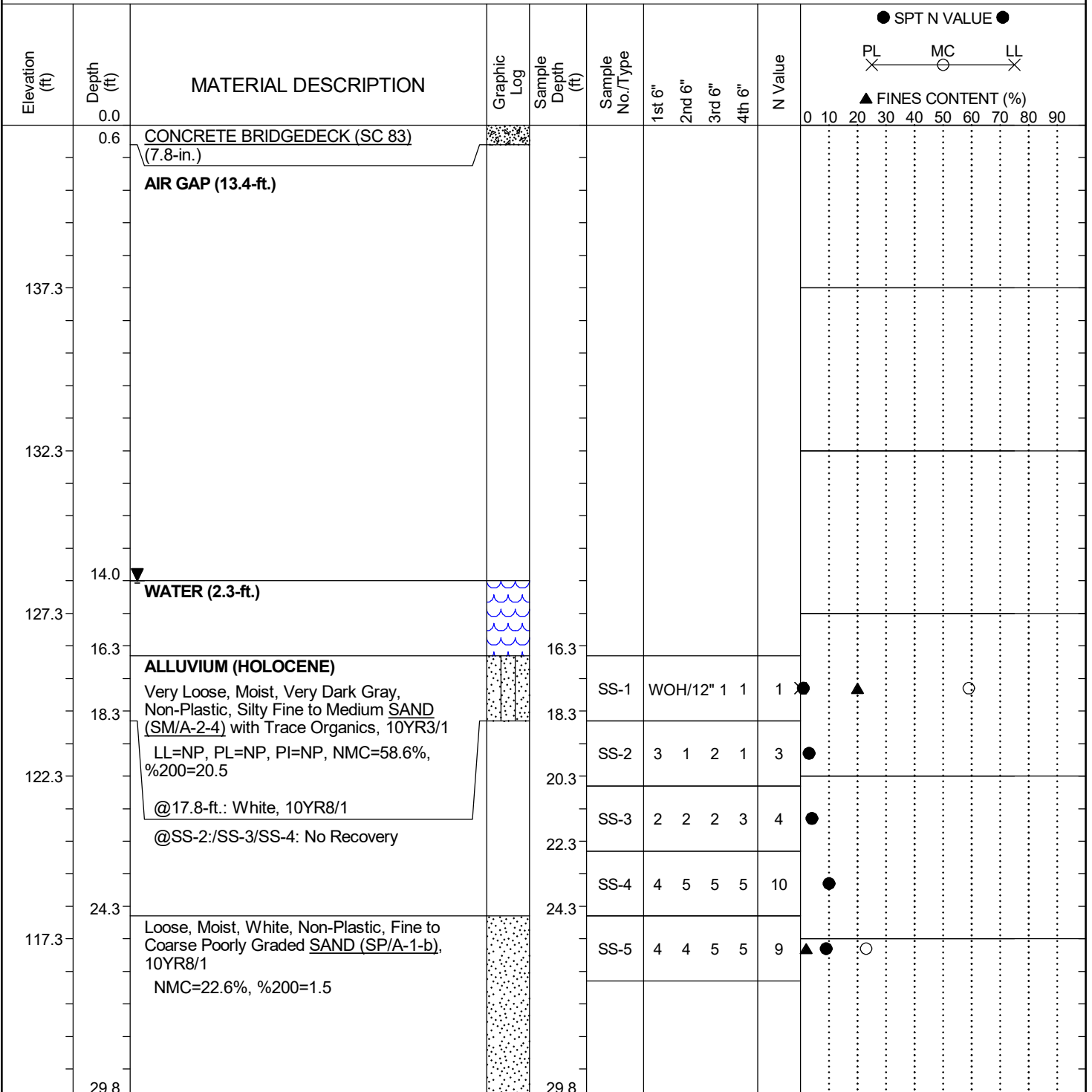


## LEGEND

| SAMPLER TYPE            |                        | DRILLING METHOD                |                  |
|-------------------------|------------------------|--------------------------------|------------------|
| SS - Split Spoon        | NQ - Rock Core, 1-7/8" | HSA - Hollow Stem Auger        | RW - Rotary Wash |
| UD - Undisturbed Sample | CU - Cuttings          | CFA - Continuous Flight Augers | RC - Rock Core   |
| AWG - Rock Core, 1-1/8" | CT - Continuous Tube   | DC - Driving Casing            |                  |

# SCDOT Soil Test Log

|                          |  |                                 |     |                  |                       |             |          |                 |             |              |       |                 |  |           |       |  |
|--------------------------|--|---------------------------------|-----|------------------|-----------------------|-------------|----------|-----------------|-------------|--------------|-------|-----------------|--|-----------|-------|--|
| Project ID:              |  | P042879                         |     |                  | County:               |             | Marlboro |                 | Boring No.: |              | B-2   |                 |  |           |       |  |
| Site Description:        |  | SC 83 over Little Pee Dee River |     |                  |                       |             |          |                 | Route:      |              | SC 83 |                 |  |           |       |  |
| Eng./Geo.:               |  | B. Vogel                        |     | Boring Location: |                       | 103+48      |          | Offset:         |             | 5.2-L        |       | Alignment:      |  | Existing  |       |  |
| Elev.:                   |  | 142.3 ft                        |     | Latitude:        |                       | 34.61095439 |          | Longitude:      |             | -79.50115053 |       | Date Started:   |  | 3/13/2025 |       |  |
| Total Depth:             |  | 116.3 ft                        |     | Soil Depth:      |                       | 100 ft      |          | Core Depth:     |             | N/A ft       |       | Date Completed: |  | 3/14/2025 |       |  |
| Bore Hole Diameter (in): |  |                                 | 3.0 |                  | Sampler Configuration |             |          | Liner Required: |             | Y (N)        |       | Liner Used:     |  |           | Y (N) |  |
| Drill Machine:           |  | CME 550X                        |     | Drill Method:    |                       | RW          |          | Hammer Type:    |             | Automatic    |       | Energy Ratio:   |  | 82.0%     |       |  |
| Core Size:               |  | N/A                             |     | Driller:         |                       | J. Phillips |          | Groundwater:    |             | TOB 14 ft    |       | 24HR            |  | 14 ft     |       |  |



## LEGEND

Continued Next Page

| SAMPLER TYPE            |                        | DRILLING METHOD                |                  |
|-------------------------|------------------------|--------------------------------|------------------|
| SS - Split Spoon        | NQ - Rock Core, 1-7/8" | HSA - Hollow Stem Auger        | RW - Rotary Wash |
| UD - Undisturbed Sample | CU - Cuttings          | CFA - Continuous Flight Augers | RC - Rock Core   |
| AWG - Rock Core, 1-1/8" | CT - Continuous Tube   | DC - Driving Casing            |                  |

# SCDOT Soil Test Log

|                              |                       |                                 |                        |                       |                     |                     |  |
|------------------------------|-----------------------|---------------------------------|------------------------|-----------------------|---------------------|---------------------|--|
| Project ID: P042879          |                       |                                 |                        | County: Marlboro      |                     | Boring No.: B-2     |  |
| Site Description:            |                       | SC 83 over Little Pee Dee River |                        |                       |                     | Route: SC 83        |  |
| Eng./Geo.: B. Vogel          |                       | Boring Location: 103+48         |                        | Offset: 5.2-L         |                     | Alignment: Existing |  |
| Elev.: 142.3 ft              | Latitude: 34.61095439 | Longitude: -79.50115053         |                        | Date Started:         |                     | 3/13/2025           |  |
| Total Depth: 116.3 ft        | Soil Depth: 100 ft    | Core Depth: N/A ft              |                        | Date Completed:       |                     | 3/14/2025           |  |
| Bore Hole Diameter (in): 3.0 |                       | Sampler Configuration           |                        | Liner Required: Y (N) |                     | Liner Used: Y (N)   |  |
| Drill Machine: CME 550X      | Drill Method: RW      |                                 | Hammer Type: Automatic |                       | Energy Ratio: 82.0% |                     |  |
| Core Size: N/A               | Driller: J. Phillips  |                                 | Groundwater: TOB 14 ft |                       | 24HR: 14 ft         |                     |  |

| Elevation (ft) | Depth (ft) | MATERIAL DESCRIPTION  | Graphic Log | Sample Depth (ft) | Sample No./Type | 1st 6" | 2nd 6" | 3rd 6" | 4th 6" | N Value | <div> <div>● SPT N VALUE ●</div> <div> <div>PL X</div> <div>MC ○</div> <div>LL X</div> </div> <div>▲ FINES CONTENT (%)</div> <div>0 10 20 30 40 50 60 70 80 90</div> </div> |
|----------------|------------|---|-------------|-------------------|-----------------|--------|--------|--------|--------|---------|---|
| 112.3          | 33.0       | Very Loose, Moist, Light Gray, High Plasticity, Clayey Fine to Medium SAND (SC/A-2-6), Micaceous, 7/N<br>@SS-6: LL=35, PL=13, PI=22, NMC=17.8%, %200=25.4   |             |                   | SS-6            | 3      | 1      | 1      |        | 2       | ● X ○ ▲ X   |
| 107.3          | 34.8       | <b>DUPLIN FORMATION (PLIOCENE)</b><br>Moist, Light Gray, Medium Plasticity, Clayey Fine to Medium SAND (SC/A-2-6), Micaceous, 7/N<br>@SS-7: Medium Dense, Light Bluish Gray, with Trace Gravel, 10B7/1<br>LL=33, PL=15, PI=18, NMC=19.2%, %200=26.0 |             |                   | SS-7            | 7      | 7      | 10     |        | 17      | X ● ▲ X   |
| 102.3          | 39.8       | Medium Dense, Moist, Light Gray, Non-Plastic to Low Plasticity, Silty Fine to Coarse SAND (SM/A-2-4) with Trace Gravel, 7/N   |             |                   | SS-8            | 5      | 9      | 11     |        | 20      | ●   |
| 97.3           | 44.8       | Stiff to Very Stiff, Moist, Gray, Medium Plasticity to High Plasticity, Sandy Lean CLAY (CL/A-6), Micaceous, 5Y5/1<br>@SS-9: Gray, with Trace Gravel, 10YR5/1   |             |                   | SS-9            | 4      | 7      | 7      |        | 14      | ●   |
| 92.3           | 49.8       | Hard, Moist, Gray/Light Olive Brown, Medium Plasticity to High Plasticity, Lean CLAY (CL/A-6), Micaceous, 5/N & 2.5Y5/4   |             |                   | SS-10           | 9      | 18     | 50     |        | 68      | ●   |
| 87.3           | 54.8       | Very Stiff, Moist, Light Gray, Medium Plasticity to High Plasticity, Sandy Lean CLAY (CL/A-6), Micaceous, 7/N   |             |                   | SS-11           | 6      | 9      | 10     |        | 19      | ●   |

## LEGEND

| SAMPLER TYPE            |                        | DRILLING METHOD                |                  |
|-------------------------|------------------------|--------------------------------|------------------|
| SS - Split Spoon        | NQ - Rock Core, 1-7/8" | HSA - Hollow Stem Auger        | RW - Rotary Wash |
| UD - Undisturbed Sample | CU - Cuttings          | CFA - Continuous Flight Augers | RC - Rock Core   |
| AWG - Rock Core, 1-1/8" | CT - Continuous Tube   | DC - Driving Casing            |                  |

Continued Next Page

# SCDOT Soil Test Log

|                              |  |                                 |  |                         |  |                           |  |
|------------------------------|--|---------------------------------|--|-------------------------|--|---------------------------|--|
| Project ID: P042879          |  |                                 |  | County: Marlboro        |  | Boring No.: B-2           |  |
| Site Description:            |  | SC 83 over Little Pee Dee River |  |                         |  | Route: SC 83              |  |
| Eng./Geo.: B. Vogel          |  | Boring Location: 103+48         |  | Offset: 5.2-L           |  | Alignment: Existing       |  |
| Elev.: 142.3 ft              |  | Latitude: 34.61095439           |  | Longitude: -79.50115053 |  | Date Started: 3/13/2025   |  |
| Total Depth: 116.3 ft        |  | Soil Depth: 100 ft              |  | Core Depth: N/A ft      |  | Date Completed: 3/14/2025 |  |
| Bore Hole Diameter (in): 3.0 |  | Sampler Configuration           |  | Liner Required: Y (N)   |  | Liner Used: Y (N)         |  |
| Drill Machine: CME 550X      |  | Drill Method: RW                |  | Hammer Type: Automatic  |  | Energy Ratio: 82.0%       |  |
| Core Size: N/A               |  | Driller: J. Phillips            |  | Groundwater: TOB 14 ft  |  | 24HR 14 ft                |  |

| Elevation (ft) | Depth (ft) | MATERIAL DESCRIPTION  | Graphic Log | Sample Depth (ft) | Sample No./Type | 1st 6"  | 2nd 6" | 3rd 6"  | 4th 6" | N Value | <div> ● SPT N VALUE ● </div> <div> PL X MC O LL X </div> <div> ▲ FINES CONTENT (%) </div> |
|----------------|------------|---|-------------|-------------------|-----------------|---------|--------|---------|--------|---------|---|
| 82.3           | 59.8       | Dense, Moist, Light Gray, Non-Plastic to Low Plasticity, Silty Fine to Medium SAND (SM/A-2-4), 7/N                                |             | 59.8              | SS-12           | 11      | 16     | 17      |        | 33      |   |
| 64.3           | 64.3       | Dense to Very Dense, Moist, White, Non-Plastic to Low Plasticity, Fine to Medium Poorly Graded SAND (SP/A-3), 8.5/N               |             | 64.8              | SS-13           | 13      | 18     | 17      |        | 35      |   |
| 72.3           | 72.3       | @SS-14: Light Gray, 7/N   |             | 69.8              | SS-14           | 26      | 28     | 23      |        | 51      |   |
| 74.8           | 74.8       | MIDDENDORF FORMATION (CRETACEOUS)<br>Very Dense, Moist, Gray, Low Plasticity, Silty Clayey Fine to Medium SAND (SC-SM/A-2-4), 6/N |             | 74.8              | SS-15           | 11      | 45     | 50/4.0" |        | 95      |   |
| 62.3           | 79.8       | Very Dense, Moist, Light Gray, Non-Plastic, Fine to Medium Poorly Graded SAND (SP/A-3), 7/N                                       |             | 79.8              | SS-16           | 36      | 40     | 40      |        | 80      |   |
| 57.3           | 84.8       | @SS-17: No Recovery   |             | 84.8              | SS-17           | 50/5.0" |        |         |        | 100+    |   |

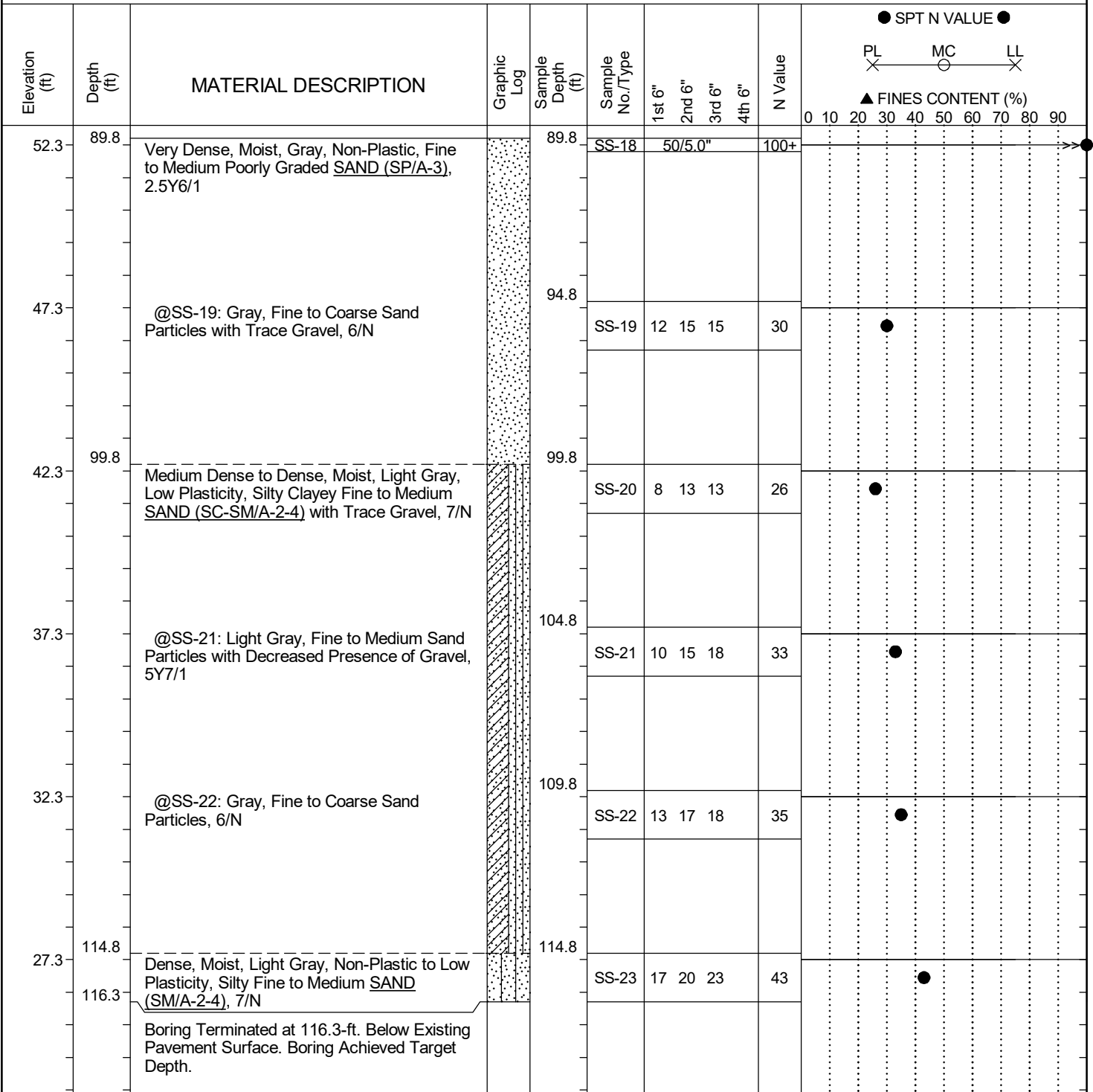
## LEGEND

Continued Next Page

| SAMPLER TYPE            |                        | DRILLING METHOD                |                  |
|-------------------------|------------------------|--------------------------------|------------------|
| SS - Split Spoon        | NQ - Rock Core, 1-7/8" | HSA - Hollow Stem Auger        | RW - Rotary Wash |
| UD - Undisturbed Sample | CU - Cuttings          | CFA - Continuous Flight Augers | RC - Rock Core   |
| AWG - Rock Core, 1-1/8" | CT - Continuous Tube   | DC - Driving Casing            |                  |

# SCDOT Soil Test Log

|                          |  |                                 |     |                  |                       |             |          |                 |             |              |       |                 |  |           |       |  |
|--------------------------|--|---------------------------------|-----|------------------|-----------------------|-------------|----------|-----------------|-------------|--------------|-------|-----------------|--|-----------|-------|--|
| Project ID:              |  | P042879                         |     |                  | County:               |             | Marlboro |                 | Boring No.: |              | B-2   |                 |  |           |       |  |
| Site Description:        |  | SC 83 over Little Pee Dee River |     |                  |                       |             |          |                 | Route:      |              | SC 83 |                 |  |           |       |  |
| Eng./Geo.:               |  | B. Vogel                        |     | Boring Location: |                       | 103+48      |          | Offset:         |             | 5.2-L        |       | Alignment:      |  | Existing  |       |  |
| Elev.:                   |  | 142.3 ft                        |     | Latitude:        |                       | 34.61095439 |          | Longitude:      |             | -79.50115053 |       | Date Started:   |  | 3/13/2025 |       |  |
| Total Depth:             |  | 116.3 ft                        |     | Soil Depth:      |                       | 100 ft      |          | Core Depth:     |             | N/A ft       |       | Date Completed: |  | 3/14/2025 |       |  |
| Bore Hole Diameter (in): |  |                                 | 3.0 |                  | Sampler Configuration |             |          | Liner Required: |             | Y (N)        |       | Liner Used:     |  |           | Y (N) |  |
| Drill Machine:           |  | CME 550X                        |     | Drill Method:    |                       | RW          |          | Hammer Type:    |             | Automatic    |       | Energy Ratio:   |  | 82.0%     |       |  |
| Core Size:               |  | N/A                             |     | Driller:         |                       | J. Phillips |          | Groundwater:    |             | TOB 14 ft    |       | 24HR            |  | 14 ft     |       |  |



## LEGEND

| SAMPLER TYPE            |                        |                                | DRILLING METHOD  |  |
|-------------------------|------------------------|--------------------------------|------------------|--|
| SS - Split Spoon        | NQ - Rock Core, 1-7/8" | HSA - Hollow Stem Auger        | RW - Rotary Wash |  |
| UD - Undisturbed Sample | CU - Cuttings          | CFA - Continuous Flight Augers | RC - Rock Core   |  |
| AWG - Rock Core, 1-1/8" | CT - Continuous Tube   | DC - Driving Casing            |                  |  |

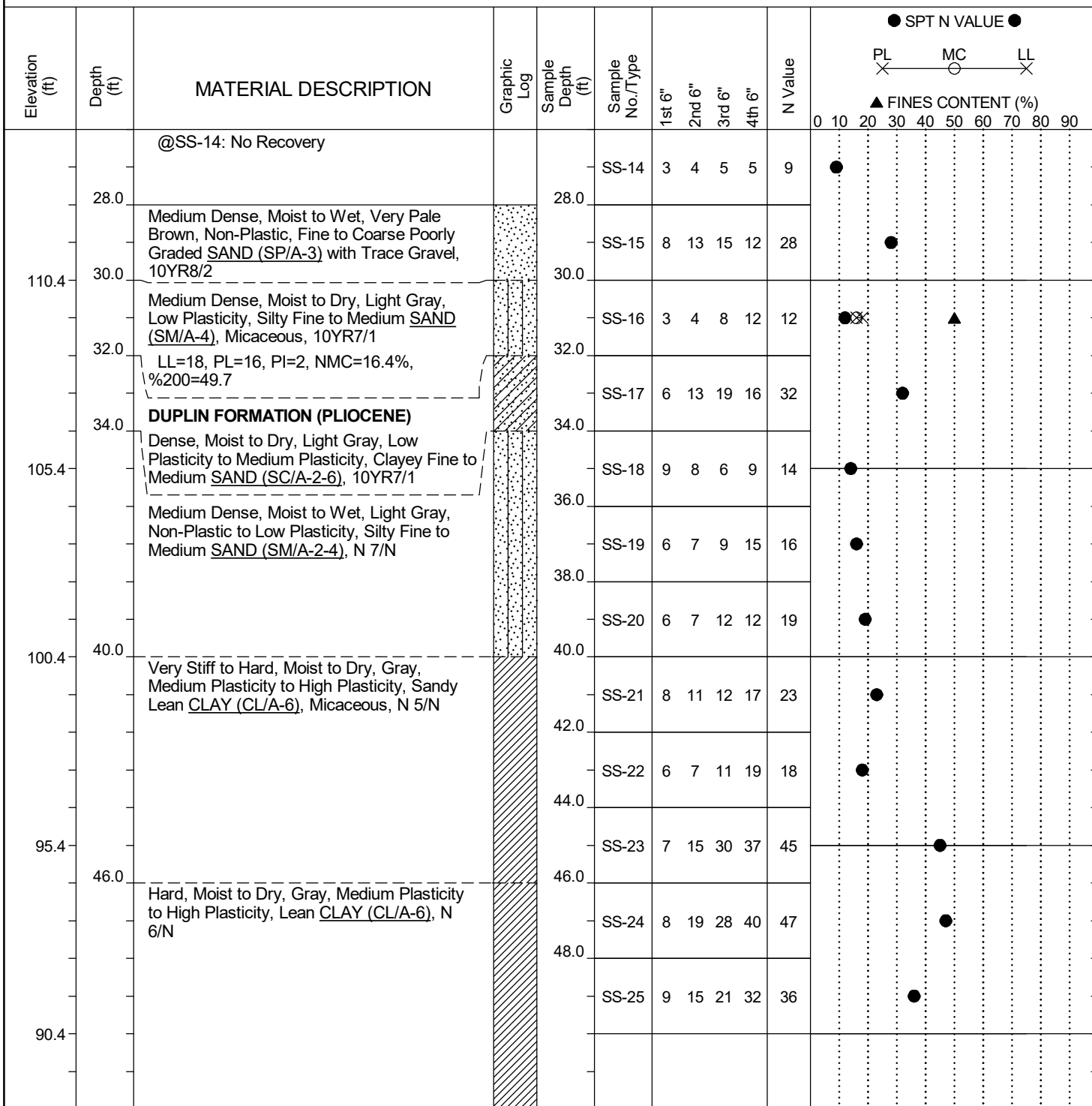


| Elevation (ft) | Depth (ft) | MATERIAL DESCRIPTION  | Graphic Log | Sample Depth (ft) | Sample No./Type | 1st 6" | 2nd 6" | 3rd 6" | 4th 6" | N Value | <div> <div>● SPT N VALUE ●</div> <div> <div>PL ×</div> <div>MC ○</div> <div>LL ×</div> </div> <div>▲ FINES CONTENT (%)</div> </div> |
|----------------|------------|---|-------------|-------------------|-----------------|--------|--------|--------|--------|---------|---|
|                | 0.0        |   |             |                   |                 |        |        |        |        |         | 0 10 20 30 40 50 60 70 80 90  |
|                | 0.6        | ASPHALT ROADWAY (SC 83) (7.0-in.)   |             | 0.6               |                 |        |        |        |        |         |   |
|                | 2.0        | <b>EXISTING FILL</b><br>Medium Dense, Moist to Wet, Strong Brown, Non-Plastic, Fine to Coarse Poorly Graded <u>SAND (SP-SM/A-3)</u> with Silt, 7.5YR5/8 |             | 2.0               | SS-1            | 4      | 6      | 10     | 13     | 16      |   |
|                |            | Medium Dense, Moist to Wet, Yellowish Brown, Low Plasticity, Silty Fine to Coarse <u>SAND (SM/A-2-4)</u> , 10YR5/6                                      |             | 4.0               | SS-2            | 4      | 12     | 11     | 11     | 23      |   |
| 135.4          |            | @SS-3: Moist to Dry, Grayish Brown, 10YR5/2   |             | 6.0               | SS-3            | 13     | 12     | 10     | 11     | 22      |   |
|                |            | @SS-4: Light Yellowish Brown, 10YR6/4<br>LL=17, PL=14, PI=3, NMC=9.5%, %200=20.3  |             | 8.0               | SS-4            | 9      | 10     | 10     | 9      | 20      |   |
|                |            | @SS-5: Brown, 10YR5/3   |             |                   | SS-5            | 9      | 11     | 13     | 12     | 24      |   |
| 130.4          |            | @SS-6: Very Pale Brown, 10YR8/2   |             | 10.0              |                 |        |        |        |        |         |   |
|                |            |   |             | 12.0              | SS-6            | 8      | 11     | 10     | 14     | 21      |   |
|                |            | @12.8-ft.: Dark Gray, 10YR4/1   |             | 14.0              | SS-7            | 6      | 6      | 7      | 10     | 13      |   |
|                | 14.0       | <b>ALLUVIUM (HOLOCENE)</b>  |             | 14.0              |                 |        |        |        |        |         |   |
| 125.4          |            | Medium Dense to Loose, Moist to Wet, Very Pale Brown, Non-Plastic, Medium to Coarse Poorly Graded <u>SAND (SP/A-1-b)</u> with Trace Organics, 10YR8/2   |             | 16.0              | SS-8            | 4      | 6      | 7      | 7      | 13      |   |
|                |            | @SS-9: Fine to Coarse Sand Particles<br>LL=NP, PL=NP, PI=NP, NMC=22.3%, %200=0.8  |             | 18.0              | SS-9            | 2      | 3      | 5      | 4      | 8       |   |
|                | 18.0       | Loose to Very Loose, Moist to Wet, Brown, Non-Plastic, Silty Fine <u>SAND (SM/A-2-4)</u> with Trace Organics, 10YR4/3                                   |             | 20.0              | SS-10           | 2      | 2      | 3      | 5      | 5       |   |
| 120.4          |            | @SS-11: Fine to Medium Sand Particles, 10YR4/2<br>LL=NP, PL=NP, PI=NP, NMC=33.0%, %200=24.4   |             | 22.0              | SS-11           | 2      | 1      | 1      | 2      | 2       |   |
|                |            | @SS-12: Medium Dense, Brown/White, Fine to Coarse Sand Particles, 10YR4/3 & 10YR8/1   |             | 24.0              | SS-12           | 6      | 7      | 10     | 11     | 17      |   |
| 115.4          |            | @SS-13: with Decreased Presence of Organics   |             | 26.0              | SS-13           | 3      | 5      | 7      | 7      | 12      |   |
|                | 26.0       |   |             | 26.0              |                 |        |        |        |        |         |   |

Continued Next Page

| SAMPLER TYPE            |                        | DRILLING METHOD                |                  |
|-------------------------|------------------------|--------------------------------|------------------|
| SS - Split Spoon        | NQ - Rock Core, 1-7/8" | HSA - Hollow Stem Auger        | RW - Rotary Wash |
| UD - Undisturbed Sample | CU - Cuttings          | CFA - Continuous Flight Augers | RC - Rock Core   |
| AWG - Rock Core, 1-1/8" | CT - Continuous Tube   | DC - Driving Casing            |                  |

|                                     |  |                                 |  |                                       |  |                                   |  |
|-------------------------------------|--|---------------------------------|--|---------------------------------------|--|-----------------------------------|--|
| <b>Project ID:</b> P042879          |  |                                 |  | <b>County:</b> Marlboro               |  | <b>Boring No.:</b> B-3            |  |
| <b>Site Description:</b>            |  | SC 83 over Little Pee Dee River |  |                                       |  | <b>Route:</b> SC 83               |  |
| <b>Eng./Geo.:</b> B. Carter         |  | <b>Boring Location:</b> 106+78  |  | <b>Offset:</b> 7.4-L                  |  | <b>Alignment:</b> Existing        |  |
| <b>Elev.:</b> 140.4 ft              |  | <b>Latitude:</b> 34.61146639    |  | <b>Longitude:</b> -79.5002448         |  | <b>Date Started:</b> 3/17/2025    |  |
| <b>Total Depth:</b> 100 ft          |  | <b>Soil Depth:</b> 100 ft       |  | <b>Core Depth:</b> N/A ft             |  | <b>Date Completed:</b> 3/18/2025  |  |
| <b>Bore Hole Diameter (in):</b> 3.0 |  | <b>Sampler Configuration</b>    |  | <b>Liner Required:</b> Y <sup>Ⓝ</sup> |  | <b>Liner Used:</b> Y <sup>Ⓝ</sup> |  |
| <b>Drill Machine:</b> CME 550X      |  | <b>Drill Method:</b> RW         |  | <b>Hammer Type:</b> Automatic         |  | <b>Energy Ratio:</b> 82.0%        |  |
| <b>Core Size:</b> N/A               |  | <b>Driller:</b> J. Phillips     |  | <b>Groundwater:</b> TOB 12 ft         |  | <b>24HR</b> 19 ft                 |  |



## LEGEND

*Continued Next Page*

| SAMPLER TYPE            |                        | DRILLING METHOD                |                  |
|-------------------------|------------------------|--------------------------------|------------------|
| SS - Split Spoon        | NQ - Rock Core, 1-7/8" | HSA - Hollow Stem Auger        | RW - Rotary Wash |
| UD - Undisturbed Sample | CU - Cuttings          | CFA - Continuous Flight Augers | RC - Rock Core   |
| AWG - Rock Core, 1-1/8" | CT - Continuous Tube   | DC - Driving Casing            |                  |

# SCDOT Soil Test Log

|                              |  |                                 |  |                        |  |                           |  |
|------------------------------|--|---------------------------------|--|------------------------|--|---------------------------|--|
| Project ID: P042879          |  |                                 |  | County: Marlboro       |  | Boring No.: B-3           |  |
| Site Description:            |  | SC 83 over Little Pee Dee River |  |                        |  | Route: SC 83              |  |
| Eng./Geo.: B. Carter         |  | Boring Location: 106+78         |  | Offset: 7.4-L          |  | Alignment: Existing       |  |
| Elev.: 140.4 ft              |  | Latitude: 34.61146639           |  | Longitude: -79.5002448 |  | Date Started: 3/17/2025   |  |
| Total Depth: 100 ft          |  | Soil Depth: 100 ft              |  | Core Depth: N/A ft     |  | Date Completed: 3/18/2025 |  |
| Bore Hole Diameter (in): 3.0 |  | Sampler Configuration           |  | Liner Required: Y (N)  |  | Liner Used: Y (N)         |  |
| Drill Machine: CME 550X      |  | Drill Method: RW                |  | Hammer Type: Automatic |  | Energy Ratio: 82.0%       |  |
| Core Size: N/A               |  | Driller: J. Phillips            |  | Groundwater: TOB 12 ft |  | 24HR 19 ft                |  |

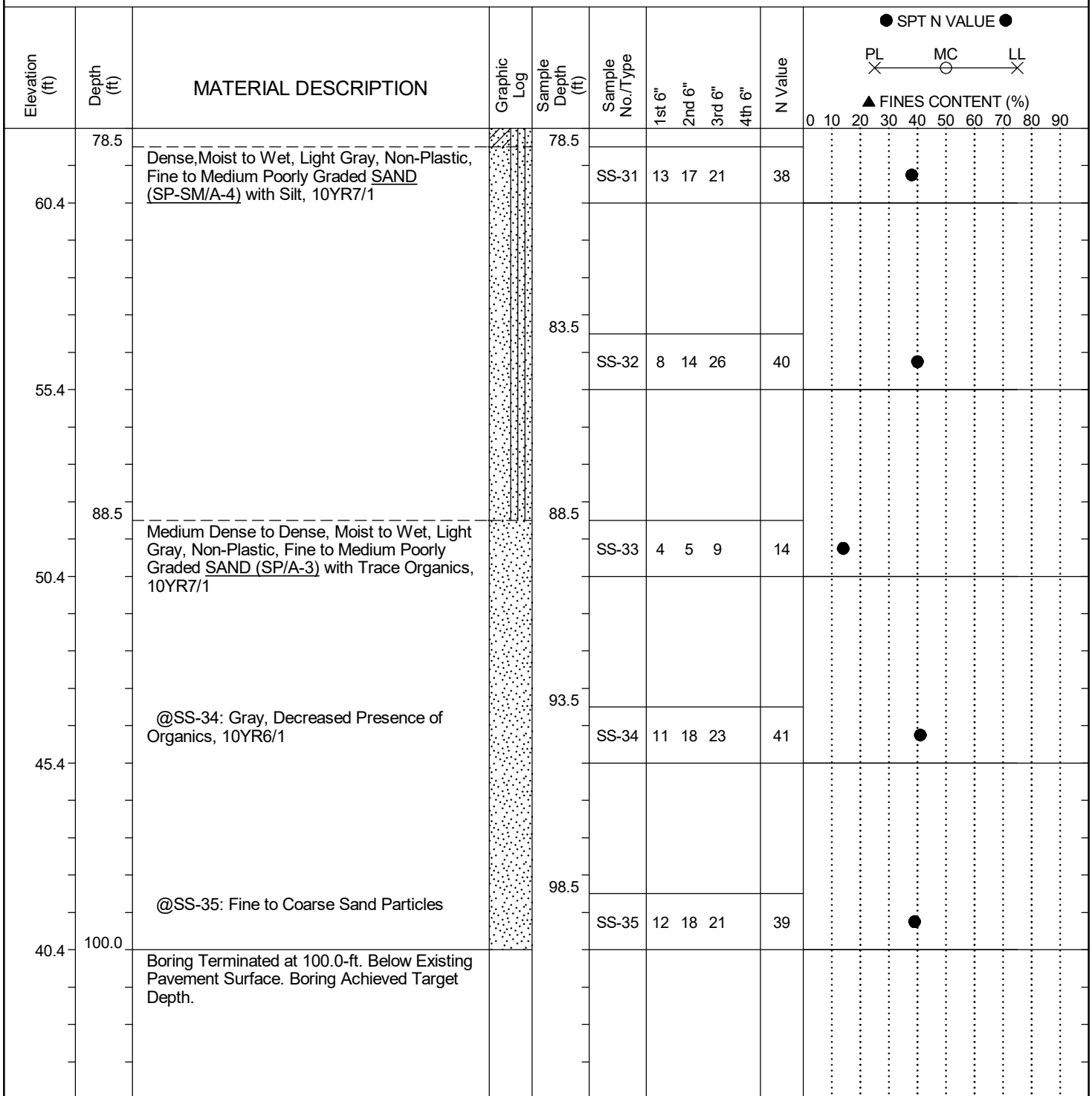
| Elevation (ft) | Depth (ft) | MATERIAL DESCRIPTION  | Graphic Log | Sample Depth (ft) | Sample No./Type | 1st 6" | 2nd 6" | 3rd 6" | 4th 6" | N Value | <div> <div>● SPT N VALUE ●</div> <div> <div>PL X</div> <div>MC ○</div> <div>LL X</div> </div> <div>▲ FINES CONTENT (%)</div> </div> |
|----------------|------------|---|-------------|-------------------|-----------------|--------|--------|--------|--------|---------|---|
| 53.5           | 85.4       | Hard, Dry, Light Gray, Non-Plastic to Low Plasticity, <u>SILT (ML/A-4)</u> , GLEY1 7/N  |             | 53.5              | SS-26           | 10     | 21     | 31     |        | 52      | ●   |
| 58.5           | 80.4       | Dense to Very Dense, Moist to Wet, Very Pale Brown, Non-Plastic, Fine to Medium Poorly Graded <u>SAND (SP/A-3)</u> , 10YR8/2                          |             | 58.5              | SS-27           | 13     | 21     | 27     |        | 48      | ●   |
| 63.5           | 75.4       | @SS-28: Light Gray, Fine Sand Particles, Micaceous, 10YR7/1   |             | 63.5              | SS-28           | 17     | 22     | 25     |        | 47      | ●   |
| 68.5           | 70.4       | @SS-29: Fine to Medium Sand Particles   |             | 68.5              | SS-29           | 15     | 23     | 31     |        | 54      | ●   |
| 73.5           | 65.4       | MIDDENDORF FORMATION (CRETACEOUS)<br>Dense, Moist to Wet, Light Gray, Low Plasticity, Silty Clayey Fine to Medium <u>SAND (SC-SM/A-2-4)</u> , 10YR7/1 |             | 73.5              | SS-30           | 17     | 15     | 23     |        | 38      | ●   |

## LEGEND

Continued Next Page

| SAMPLER TYPE            |                        | DRILLING METHOD                |                  |
|-------------------------|------------------------|--------------------------------|------------------|
| SS - Split Spoon        | NQ - Rock Core, 1-7/8" | HSA - Hollow Stem Auger        | RW - Rotary Wash |
| UD - Undisturbed Sample | CU - Cuttings          | CFA - Continuous Flight Augers | RC - Rock Core   |
| AWG - Rock Core, 1-1/8" | CT - Continuous Tube   | DC - Driving Casing            |                  |

|                                     |  |                                 |  |                                       |  |                                   |  |
|-------------------------------------|--|---------------------------------|--|---------------------------------------|--|-----------------------------------|--|
| <b>Project ID:</b> P042879          |  |                                 |  | <b>County:</b> Marlboro               |  | <b>Boring No.:</b> B-3            |  |
| <b>Site Description:</b>            |  | SC 83 over Little Pee Dee River |  |                                       |  | <b>Route:</b> SC 83               |  |
| <b>Eng./Geo.:</b> B. Carter         |  | <b>Boring Location:</b> 106+78  |  | <b>Offset:</b> 7.4-L                  |  | <b>Alignment:</b> Existing        |  |
| <b>Elev.:</b> 140.4 ft              |  | <b>Latitude:</b> 34.61146639    |  | <b>Longitude:</b> -79.5002448         |  | <b>Date Started:</b> 3/17/2025    |  |
| <b>Total Depth:</b> 100 ft          |  | <b>Soil Depth:</b> 100 ft       |  | <b>Core Depth:</b> N/A ft             |  | <b>Date Completed:</b> 3/18/2025  |  |
| <b>Bore Hole Diameter (in):</b> 3.0 |  | <b>Sampler Configuration</b>    |  | <b>Liner Required:</b> Y <sup>Ⓝ</sup> |  | <b>Liner Used:</b> Y <sup>Ⓝ</sup> |  |
| <b>Drill Machine:</b> CME 550X      |  | <b>Drill Method:</b> RW         |  | <b>Hammer Type:</b> Automatic         |  | <b>Energy Ratio:</b> 82.0%        |  |
| <b>Core Size:</b> N/A               |  | <b>Driller:</b> J. Phillips     |  | <b>Groundwater:</b> TOB 12 ft         |  | <b>24HR</b> 19 ft                 |  |



## LEGEND

| SAMPLER TYPE            |                        | DRILLING METHOD                |                  |
|-------------------------|------------------------|--------------------------------|------------------|
| SS - Split Spoon        | NQ - Rock Core, 1-7/8" | HSA - Hollow Stem Auger        | RW - Rotary Wash |
| UD - Undisturbed Sample | CU - Cuttings          | CFA - Continuous Flight Augers | RC - Rock Core   |
| AWG - Rock Core, 1-1/8" | CT - Continuous Tube   | DC - Driving Casing            |                  |

# SCDOT Soil Test Log

|                          |  |                                 |  |                  |  |                       |  |              |                 |              |       |                 |             |            |       |  |
|--------------------------|--|---------------------------------|--|------------------|--|-----------------------|--|--------------|-----------------|--------------|-------|-----------------|-------------|------------|-------|--|
| Project ID:              |  | P042879                         |  |                  |  | County:               |  | Marlboro     |                 | Boring No.:  |       | B-4/DH-1        |             |            |       |  |
| Site Description:        |  | SC 83 over Little Pee Dee River |  |                  |  |                       |  |              |                 | Route:       |       | SC 83           |             |            |       |  |
| Eng./Geo.:               |  | B. Vogel                        |  | Boring Location: |  | 105+30                |  | Offset:      |                 | 5.3-L        |       | Alignment:      |             | Existing   |       |  |
| Elev.:                   |  | 141.7 ft                        |  | Latitude:        |  | 34.61123386           |  | Longitude:   |                 | -79.50064937 |       | Date Started:   |             | 3/12/2025  |       |  |
| Total Depth:             |  | 100 ft                          |  | Soil Depth:      |  | 100 ft                |  | Core Depth:  |                 | N/A ft       |       | Date Completed: |             | 3/13/2025  |       |  |
| Bore Hole Diameter (in): |  |                                 |  | 3.0              |  | Sampler Configuration |  |              | Liner Required: |              | Y (N) |                 | Liner Used: |            | Y (N) |  |
| Drill Machine:           |  | CME 550X                        |  | Drill Method:    |  | RW                    |  | Hammer Type: |                 | Automatic    |       | Energy Ratio:   |             | 82.0%      |       |  |
| Core Size:               |  | N/A                             |  | Driller:         |  | J. Phillips           |  | Groundwater: |                 | TOB 17 ft    |       | 24HR            |             | Backfilled |       |  |

| Elevation (ft) | Depth (ft) | MATERIAL DESCRIPTION  | Graphic Log | Sample Depth (ft) | Sample No./Type | 1st 6" | 2nd 6" | 3rd 6" | 4th 6" | N Value | <div> <div>● SPT N VALUE ●</div> <div> <div>PL X</div> <div>MC ○</div> <div>LL X</div> </div> <div>▲ FINES CONTENT (%)</div> </div> |
|----------------|------------|---|-------------|-------------------|-----------------|--------|--------|--------|--------|---------|---|
|                | 0.0        | ASPHALT ROADWAY (SC 83) (9.5-in.)   |             |                   |                 |        |        |        |        |         | 0 10 20 30 40 50 60 70 80 90  |
|                | 0.8        | <b>EXISTING FILL</b>  |             | 0.8               |                 |        |        |        |        |         |   |
|                |            | Medium Dense, Moist, Grayish Brown, Brownish Yellow, Non-Plastic, Silty Fine to Medium SAND (SM/A-2-4), 10YR5/2 & 10YR6/1       |             | 2.0               | SS-1            | 10     | 12     |        |        |         |   |
|                |            | @SS-2: White/Reddish Yellow, 10YR8/1 & 7.5YR6/6   |             | 4.0               | SS-2            | 7      | 5      | 7      | 7      | 12      | ●   |
| 136.7          |            | @SS-3: Light Yellowish Brown/Yellowish Brown, 10YR6/4 & 10YR5/6   |             | 6.0               | SS-3            | 3      | 4      | 4      | 5      | 8       | ●   |
|                |            | @SS-4: Very Pale Brown/Reddish Yellow, 10YR7/3 & 7.5YR6/8   |             | 8.0               | SS-4            | 3      | 2      | 2      | 1      | 4       | ●   |
| 131.7          |            | @SS-5: Light Yellowish Brown/Dark Gray, 10YR6/4 & 10YR4/1   |             |                   | SS-5            | 1      | 1      | 1      | 2      | 2       | ● ▲   |
|                |            | LL=NP, PL=NP, PI=NP, NMC=14.2%, %200=12.8   |             |                   |                 |        |        |        |        |         |   |
|                | 13.5       | <b>ALLUVIUM (HOLOCENE)</b>  |             | 13.5              |                 |        |        |        |        |         |   |
| 126.7          |            | Loose, Moist, Light Olive Gray/Black, Non-Plastic, Silty Fine to Medium SAND (SM/A-2-4), with Trace Organics, 5Y6/2 & 2.5Y2.5/1 |             |                   | SS-6            | 3      | 5      | 2      |        | 7       | ●   |
|                |            | @SS-7: Light Brownish Gray/Grayish Brown, Fine Sand Particles (SM/A-4), Micaceous, 2.5Y6/2 & 2.5Y5/2                            |             | 18.5              | SS-7            | WOH    | 1      | 5      |        | 6       | ● ▲   |
| 121.7          |            | LL=NP, PL=NP, PI=NP, NMC=37.7%, %200=39.1   |             |                   |                 |        |        |        |        |         |   |
|                |            | @19.0-ft.: Dark Gray, 2.5Y4/1   |             |                   |                 |        |        |        |        |         |   |
| 23.5           |            | @SS-8: No Recovery  |             | 23.5              |                 |        |        |        |        |         |   |
| 116.7          |            |   |             |                   | SS-8            | 5      | 9      | 9      |        | 18      | ●   |
|                |            |   |             |                   |                 |        |        |        |        |         |   |
| 28.5           |            |   |             | 28.5              |                 |        |        |        |        |         |   |

## LEGEND

Continued Next Page

| SAMPLER TYPE            |                        | DRILLING METHOD                |                  |
|-------------------------|------------------------|--------------------------------|------------------|
| SS - Split Spoon        | NQ - Rock Core, 1-7/8" | HSA - Hollow Stem Auger        | RW - Rotary Wash |
| UD - Undisturbed Sample | CU - Cuttings          | CFA - Continuous Flight Augers | RC - Rock Core   |
| AWG - Rock Core, 1-1/8" | CT - Continuous Tube   | DC - Driving Casing            |                  |

# SCDOT Soil Test Log

|                              |  |                                 |  |                         |  |                           |  |
|------------------------------|--|---------------------------------|--|-------------------------|--|---------------------------|--|
| Project ID: P042879          |  |                                 |  | County: Marlboro        |  | Boring No.: B-4/DH-1      |  |
| Site Description:            |  | SC 83 over Little Pee Dee River |  |                         |  | Route: SC 83              |  |
| Eng./Geo.: B. Vogel          |  | Boring Location: 105+30         |  | Offset: 5.3-L           |  | Alignment: Existing       |  |
| Elev.: 141.7 ft              |  | Latitude: 34.61123386           |  | Longitude: -79.50064937 |  | Date Started: 3/12/2025   |  |
| Total Depth: 100 ft          |  | Soil Depth: 100 ft              |  | Core Depth: N/A ft      |  | Date Completed: 3/13/2025 |  |
| Bore Hole Diameter (in): 3.0 |  | Sampler Configuration           |  | Liner Required: Y (N)   |  | Liner Used: Y (N)         |  |
| Drill Machine: CME 550X      |  | Drill Method: RW                |  | Hammer Type: Automatic  |  | Energy Ratio: 82.0%       |  |
| Core Size: N/A               |  | Driller: J. Phillips            |  | Groundwater: TOB 17 ft  |  | 24HR Backfilled           |  |

| Elevation (ft) | Depth (ft) | MATERIAL DESCRIPTION  | Graphic Log | Sample Depth (ft) | Sample No./Type | 1st 6" | 2nd 6" | 3rd 6" | 4th 6" | N Value | <div> ● SPT N VALUE ●<br/> PL X MC O LL X<br/> ▲ FINES CONTENT (%)<br/> 0 10 20 30 40 50 60 70 80 90 </div> |
|----------------|------------|---|-------------|-------------------|-----------------|--------|--------|--------|--------|---------|---|
| 111.7          |            | Medium Dense, Moist, Grayish Brown, Non-Plastic, Fine to Coarse Well-Graded SAND (SW/A-1-b) with Few Gravel, 10YR5/2<br>NMC=14.7%, %200=3.7             |             |                   | SS-9            | 9      | 10     | 9      |        | 19      | ▲ ●   |
| 33.5           |            | <b>DUPLIN FORMATION (PLIOCENE)</b>  |             | 33.5              |                 |        |        |        |        |         |   |
| 106.7          |            | Hard, Moist, Gray, Medium Plasticity to High Plasticity, Sandy Lean CLAY (CL/A-6) with Trace Gravel, 6/N  |             |                   | SS-10           | 8      | 11     | 21     |        | 32      | ●   |
| 38.5           |            | Medium Dense, Moist, White, Low Plasticity, Fine to Coarse Poorly Graded SAND (SP-SC/A-2-4) with Clay, 8/N<br>LL=24, PL=14, PI=10, NMC=22.4%, %200=11.2 |             | 38.5              |                 |        |        |        |        |         |   |
| 101.7          |            |   |             |                   | SS-11           | 6      | 6      | 6      |        | 12      | ● X   |
| 43.5           |            | @SS-12: No Recovery   |             | 43.5              |                 |        |        |        |        |         |   |
| 96.7           |            |   |             |                   | SS-12           | 5      | 6      | 5      |        | 11      | ●   |
| 48.5           |            |   |             | 48.5              |                 |        |        |        |        |         |   |
| 91.7           |            | Hard to Very Stiff, Moist, Light Olive Brown/Gray, Medium Plasticity to High Plasticity, Lean CLAY (CL/A-6), Micaceous, Mottled, 2.5Y5/4 & 5/N          |             |                   | SS-13           | 11     | 16     | 21     |        | 37      | ●   |
| 53.5           |            | @SS-14: Gray/Light Olive Brown, 6/N & 2.5Y5/4   |             | 53.5              |                 |        |        |        |        |         |   |
| 86.7           |            |   |             |                   | SS-14           | 8      | 11     | 15     |        | 26      | ●   |

## LEGEND

Continued Next Page

| SAMPLER TYPE            |                        | DRILLING METHOD                |                  |
|-------------------------|------------------------|--------------------------------|------------------|
| SS - Split Spoon        | NQ - Rock Core, 1-7/8" | HSA - Hollow Stem Auger        | RW - Rotary Wash |
| UD - Undisturbed Sample | CU - Cuttings          | CFA - Continuous Flight Augers | RC - Rock Core   |
| AWG - Rock Core, 1-1/8" | CT - Continuous Tube   | DC - Driving Casing            |                  |

# SCDOT Soil Test Log

|                              |  |                                 |  |                         |  |                           |  |
|------------------------------|--|---------------------------------|--|-------------------------|--|---------------------------|--|
| Project ID: P042879          |  |                                 |  | County: Marlboro        |  | Boring No.: B-4/DH-1      |  |
| Site Description:            |  | SC 83 over Little Pee Dee River |  |                         |  | Route: SC 83              |  |
| Eng./Geo.: B. Vogel          |  | Boring Location: 105+30         |  | Offset: 5.3-L           |  | Alignment: Existing       |  |
| Elev.: 141.7 ft              |  | Latitude: 34.61123386           |  | Longitude: -79.50064937 |  | Date Started: 3/12/2025   |  |
| Total Depth: 100 ft          |  | Soil Depth: 100 ft              |  | Core Depth: N/A ft      |  | Date Completed: 3/13/2025 |  |
| Bore Hole Diameter (in): 3.0 |  | Sampler Configuration           |  | Liner Required: Y (N)   |  | Liner Used: Y (N)         |  |
| Drill Machine: CME 550X      |  | Drill Method: RW                |  | Hammer Type: Automatic  |  | Energy Ratio: 82.0%       |  |
| Core Size: N/A               |  | Driller: J. Phillips            |  | Groundwater: TOB 17 ft  |  | 24HR Backfilled           |  |

| Elevation (ft) | Depth (ft) | MATERIAL DESCRIPTION  | Graphic Log | Sample Depth (ft) | Sample No./Type | 1st 6" | 2nd 6" | 3rd 6"  | 4th 6" | N Value | <div> <div>● SPT N VALUE ●</div> <div> <div>PL X</div> <div>MC ○</div> <div>LL X</div> </div> <div>▲ FINES CONTENT (%)</div> </div> |
|----------------|------------|---|-------------|-------------------|-----------------|--------|--------|---------|--------|---------|---|
| 81.7           | 58.5       | Dense, Moist, White, Non-Plastic, Fine Poorly Graded <u>SAND (SP/A-3)</u> , 8/N   |             | 58.5              | SS-15           | 19     | 23     | 22      |        | 45      | ●   |
| 76.7           | 63.5       | Stiff, Moist, Gray, Medium Plasticity to High Plasticity, Lean <u>CLAY (CL/A-6)</u> with Trace Organics, Micaceous, 6/N   |             | 63.5              | SS-16           | 1      | 2      | 8       |        | 10      | ●   |
| 71.7           | 68.5       | Very Stiff, Moist, Light Gray, Medium Plasticity to High Plasticity, Sandy Lean <u>CLAY (CL/A-6)</u> with Trace Organics, Micaceous, 7/N  |             | 68.5              | SS-17           | 5      | 17     | 13      |        | 30      | ●   |
| 66.7           | 73.5       | <b>MIDDENDORF FORMATION (CRETACEOUS)</b>  |             | 73.5              | SS-18           | 7      | 33     | 50/4.0" |        | 83      | ●   |
| 78.5           | 78.5       | Very Dense, Moist, Gray/Dark Gray, Low Plasticity to Medium Plasticity, Fine to Medium Poorly Graded <u>SAND (SP-SC/A-2-4)</u> with Clay & Trace Organics, Micaceous, 5/N & 2.5Y4/1 |             | 78.5              | SS-19           | 11     | 9      | 10      |        | 19      | ●   |
| 61.7           | 83.5       | Medium Dense, Moist, Light Gray, Non-Plastic to Low Plasticity, Silty Fine <u>SAND (SM/A-2-4)</u> , Micaceous, 7/N  |             | 83.5              | SS-20           | 8      | 7      | 9       |        | 16      | ●   |

## LEGEND

Continued Next Page

| SAMPLER TYPE            |                        | DRILLING METHOD                |                  |
|-------------------------|------------------------|--------------------------------|------------------|
| SS - Split Spoon        | NQ - Rock Core, 1-7/8" | HSA - Hollow Stem Auger        | RW - Rotary Wash |
| UD - Undisturbed Sample | CU - Cuttings          | CFA - Continuous Flight Augers | RC - Rock Core   |
| AWG - Rock Core, 1-1/8" | CT - Continuous Tube   | DC - Driving Casing            |                  |

# SCDOT Soil Test Log

|                              |  |                                 |  |                         |  |                           |  |
|------------------------------|--|---------------------------------|--|-------------------------|--|---------------------------|--|
| Project ID: P042879          |  |                                 |  | County: Marlboro        |  | Boring No.: B-4/DH-1      |  |
| Site Description:            |  | SC 83 over Little Pee Dee River |  |                         |  | Route: SC 83              |  |
| Eng./Geo.: B. Vogel          |  | Boring Location: 105+30         |  | Offset: 5.3-L           |  | Alignment: Existing       |  |
| Elev.: 141.7 ft              |  | Latitude: 34.61123386           |  | Longitude: -79.50064937 |  | Date Started: 3/12/2025   |  |
| Total Depth: 100 ft          |  | Soil Depth: 100 ft              |  | Core Depth: N/A ft      |  | Date Completed: 3/13/2025 |  |
| Bore Hole Diameter (in): 3.0 |  | Sampler Configuration           |  | Liner Required: Y (N)   |  | Liner Used: Y (N)         |  |
| Drill Machine: CME 550X      |  | Drill Method: RW                |  | Hammer Type: Automatic  |  | Energy Ratio: 82.0%       |  |
| Core Size: N/A               |  | Driller: J. Phillips            |  | Groundwater: TOB 17 ft  |  | 24HR Backfilled           |  |

| Elevation (ft) | Depth (ft) | MATERIAL DESCRIPTION   | Graphic Log | Sample Depth (ft) | Sample No./Type | 1st 6" | 2nd 6" | 3rd 6" | 4th 6" | N Value | <div> <div>● SPT N VALUE ●</div> <div> <div>PL X</div> <div>MC ○</div> <div>LL X</div> </div> <div>▲ FINES CONTENT (%)</div> </div> |
|----------------|------------|--|-------------|-------------------|-----------------|--------|--------|--------|--------|---------|---|
| 88.5           |            |  |             | 88.5              |                 |        |        |        |        |         |   |
| 51.7           |            | Medium Dense, Moist, Light Gray, Non-Plastic, Fine Poorly Graded <u>SAND</u> (SP/A-3), Micaceous, 7/N                    |             |                   | SS-21           | 8      | 9      | 11     |        | 20      | ●   |
| 93.5           |            |  |             | 93.5              |                 |        |        |        |        |         |   |
| 46.7           |            | Dense to Very Dense, Moist, Light Gray, Fine to Medium Poorly Graded <u>SAND</u> (SP-SC/A-2-4) with Clay, Micaceous, 7/N |             |                   | SS-22           | 13     | 16     | 21     |        | 37      | ●   |
|                |            |  |             |                   |                 |        |        |        |        |         |   |
| 98.5           |            |  |             | 98.5              |                 |        |        |        |        |         |   |
| 41.7           | 100.0      | Boring Terminated at 100.0-ft. Below Existing Pavement Surface. Boring Achieved Target Depth.                            |             |                   | SS-23           | 13     | 24     | 32     |        | 56      | ●   |
|                |            |  |             |                   |                 |        |        |        |        |         |   |
| 36.7           |            |  |             |                   |                 |        |        |        |        |         |   |
|                |            |  |             |                   |                 |        |        |        |        |         |   |
| 31.7           |            |  |             |                   |                 |        |        |        |        |         |   |

## LEGEND

| SAMPLER TYPE            |                        | DRILLING METHOD                |                  |
|-------------------------|------------------------|--------------------------------|------------------|
| SS - Split Spoon        | NQ - Rock Core, 1-7/8" | HSA - Hollow Stem Auger        | RW - Rotary Wash |
| UD - Undisturbed Sample | CU - Cuttings          | CFA - Continuous Flight Augers | RC - Rock Core   |
| AWG - Rock Core, 1-1/8" | CT - Continuous Tube   | DC - Driving Casing            |                  |



# **SC 83 over Little Pee Dee River**

## **Geotechnical Baseline Report**

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# **APPENDIX**

## **SECTION 3      SUBSURFACE EXPLORATION LOGS**

### **SECTION 3B      MANUAL AUGER BORING (MAB) LOGS**

# SCDOT Soil Test Log

|                                 |                                 |                              |             |                        |             |
|---------------------------------|---------------------------------|------------------------------|-------------|------------------------|-------------|
| <b>Project ID:</b>              | P042879                         | <b>County:</b>               | Marlboro    | <b>Boring No.:</b>     | P-1         |
| <b>Site Description:</b>        | SC 83 over Little Pee Dee River |                              |             | <b>Route:</b>          | SC 83       |
| <b>Eng./Geo.:</b>               | T. Peterson                     | <b>Boring Location:</b>      | 95+20       | <b>Offset:</b>         | 6.6-L       |
| <b>Elev.:</b>                   | 161.0 ft                        | <b>Latitude:</b>             | 34.60968573 | <b>Longitude:</b>      | -79.5034359 |
| <b>Total Depth:</b>             | 5.3 ft                          | <b>Soil Depth:</b>           | 5.0 ft      | <b>Core Depth:</b>     | N/A ft      |
| <b>Bore Hole Diameter (in):</b> | 3.0                             | <b>Sampler Configuration</b> |             | <b>Liner Required:</b> | Y (N)       |
| <b>Drill Machine:</b>           | CME 550X                        | <b>Drill Method:</b>         | Hand Auger  | <b>Hammer Type:</b>    | Automatic   |
| <b>Core Size:</b>               | N/A                             | <b>Driller:</b>              | T. Peterson | <b>Groundwater:</b>    | TOB NE      |
|                                 |                                 |                              |             | <b>Energy Ratio:</b>   | N/A%        |
|                                 |                                 |                              |             | <b>24HR</b>            | Backfilled  |

| Elevation<br>(ft) | Depth<br>(ft) | MATERIAL DESCRIPTION              | Graphic<br>Log | Sample<br>Depth<br>(ft) | Sample<br>No./Type |        |        |        |        | N Value | ● SPT N VALUE ●<br>PL X — MC — LL X<br>▲ FINES CONTENT (%)<br>0 10 20 30 40 50 60 70 80 90 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |    |
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| 156.0             | 0.0           | ASPHALT ROADWAY (SC 83) (3.0-in.) |                |                         |                    |        |        |        |        |         |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | </ |

## LEGEND

| SAMPLER TYPE            |                        | DRILLING METHOD                |                  |
|-------------------------|------------------------|--------------------------------|------------------|
| SS - Split Spoon        | NQ - Rock Core, 1-7/8" | HSA - Hollow Stem Auger        | RW - Rotary Wash |
| UD - Undisturbed Sample | CU - Cuttings          | CFA - Continuous Flight Augers | RC - Rock Core   |
| AWG - Rock Core, 1-1/8" | CT - Continuous Tube   | DC - Driving Casing            |                  |

# SCDOT Soil Test Log

|                                 |                                 |                              |             |                        |             |
|---------------------------------|---------------------------------|------------------------------|-------------|------------------------|-------------|
| <b>Project ID:</b>              | P042879                         | <b>County:</b>               | Marlboro    | <b>Boring No.:</b>     | P-2         |
| <b>Site Description:</b>        | SC 83 over Little Pee Dee River |                              |             | <b>Route:</b>          | SC 83       |
| <b>Eng./Geo.:</b>               | T. Peterson                     | <b>Boring Location:</b>      | 97+70       | <b>Offset:</b>         | 5.0-L       |
| <b>Elev.:</b>                   | 153.3 ft                        | <b>Latitude:</b>             | 34.61006583 | <b>Longitude:</b>      | -79.5027443 |
| <b>Total Depth:</b>             | 5.3 ft                          | <b>Soil Depth:</b>           | 5.0 ft      | <b>Core Depth:</b>     | N/A ft      |
| <b>Bore Hole Diameter (in):</b> | 3.0                             | <b>Sampler Configuration</b> |             | <b>Liner Required:</b> | Y (N)       |
| <b>Drill Machine:</b>           | CME 550X                        | <b>Drill Method:</b>         | Hand Auger  | <b>Hammer Type:</b>    | Automatic   |
| <b>Core Size:</b>               | N/A                             | <b>Driller:</b>              | T. Peterson | <b>Groundwater:</b>    | TOB NE      |
|                                 |                                 |                              |             | <b>Energy Ratio:</b>   | N/A%        |
|                                 |                                 |                              |             | <b>24HR</b>            | Backfilled  |

| Elevation (ft) | Depth (ft) | MATERIAL DESCRIPTION   | Graphic Log | Sample Depth (ft) | Sample No./Type | 1st 6" | 2nd 6" | 3rd 6" | 4th 6" | N Value | <div> <div>● SPT N VALUE ●</div> <div> <div>PL X</div> <div>MC ○</div> <div>LL X</div> </div> <div>▲ FINES CONTENT (%)</div> </div> |
|----------------|------------|--|-------------|-------------------|-----------------|--------|--------|--------|--------|---------|---|
|                | 0.0        | ASPHALT ROADWAY (SC 83) (3.5-in.)  |             |                   |                 |        |        |        |        |         | 0 10 20 30 40 50 60 70 80 90  |
|                | 0.3        | EXISTING FILL  |             | 0.3               | DS-1            | 11     | 25+    |        |        | 13      |   |
|                |            | Medium Dense, Moist, Brown/Pale Brown, Non-Plastic, Fine to Medium Poorly Graded SAND (SP-SM/A-4) with Silt, 10YR5/3 & 10YR6/3 |             |                   |                 |        |        |        |        |         |   |
|                |            | @DS-2: Yellowish Brown, 10YR5/4  |             | 1.0               | DS-2            | 25+    |        |        |        | 13      |   |
|                | 2.0        | Stiff, Moist, Light Grayish Brown, Low Plasticity to Medium Plasticity, Sandy Lean CLAY (CL/A-6), 10YR6/2                      |             | 2.0               | DS-3            | 11     | 19     | 20     |        | 12      |   |
|                | 3.0        | Soft, Moist, Light Grayish Brown, Low Plasticity to Medium Plasticity, Lean CLAY (CL/A-6) with Sand, 10YR6/2                   |             | 3.0               | DS-4            | 2      | 4      | 5      |        | 4       |   |
|                |            | @DS-5: Stiff to Firm, Very Pale Brown, 10YR7/3   |             | 4.0               | DS-5            | 3      | 6      | 20     |        | 9       |   |
|                |            |  |             | 4.5               | DS-6            | 6      | 10     | 9      |        | 8       |   |
| 148.3          | 5.3        | Boring Terminated at 5.3-ft. Below Existing Roadway Surface. Boring Achieved Target Depth.                                     |             |                   |                 |        |        |        |        |         |   |

## LEGEND

| SAMPLER TYPE            |                        | DRILLING METHOD                |                  |
|-------------------------|------------------------|--------------------------------|------------------|
| SS - Split Spoon        | NQ - Rock Core, 1-7/8" | HSA - Hollow Stem Auger        | RW - Rotary Wash |
| UD - Undisturbed Sample | CU - Cuttings          | CFA - Continuous Flight Augers | RC - Rock Core   |
| AWG - Rock Core, 1-1/8" | CT - Continuous Tube   | DC - Driving Casing            |                  |

# SCDOT Soil Test Log

|                                 |                                 |                              |             |                        |              |
|---------------------------------|---------------------------------|------------------------------|-------------|------------------------|--------------|
| <b>Project ID:</b>              | P042879                         | <b>County:</b>               | Marlboro    | <b>Boring No.:</b>     | P-3          |
| <b>Site Description:</b>        | SC 83 over Little Pee Dee River |                              |             | <b>Route:</b>          | SC 83        |
| <b>Eng./Geo.:</b>               | T. Peterson                     | <b>Boring Location:</b>      | 100+20      | <b>Offset:</b>         | 4.7-L        |
| <b>Elev.:</b>                   | 146.0 ft                        | <b>Latitude:</b>             | 34.61044908 | <b>Longitude:</b>      | -79.50205456 |
| <b>Total Depth:</b>             | 5.3 ft                          | <b>Soil Depth:</b>           | 5.0 ft      | <b>Core Depth:</b>     | N/A ft       |
| <b>Bore Hole Diameter (in):</b> | 3.0                             | <b>Sampler Configuration</b> |             | <b>Liner Required:</b> | Y (N)        |
| <b>Drill Machine:</b>           | CME 550X                        | <b>Drill Method:</b>         | Hand Auger  | <b>Hammer Type:</b>    | Automatic    |
| <b>Core Size:</b>               | N/A                             | <b>Driller:</b>              | T. Peterson | <b>Groundwater:</b>    | TOB NE       |
|                                 |                                 |                              |             | <b>Energy Ratio:</b>   | N/A%         |
|                                 |                                 |                              |             | <b>24HR</b>            | Backfilled   |

| Elevation (ft) | Depth (ft) | MATERIAL DESCRIPTION   | Graphic Log | Sample Depth (ft) | Sample No./Type | 1st 6" | 2nd 6" | 3rd 6" | 4th 6" | N Value | <div> <div>● SPT N VALUE ●</div> <div> <div>PL X</div> <div>MC ○</div> <div>LL X</div> </div> <div>▲ FINES CONTENT (%)</div> </div> |
|----------------|------------|--|-------------|-------------------|-----------------|--------|--------|--------|--------|---------|---|
|                | 0.0        | ASPHALT ROADWAY (SC 83) (3.5-in.)  |             |                   |                 |        |        |        |        |         | 0 10 20 30 40 50 60 70 80 90  |
|                | 0.3        | EXISTING FILL  |             | 0.3               | DS-1            | 13     | 17     | 22     |        | 12      |   |
|                | 1.0        | Stiff, Moist, Yellowish Brown/Light Yellowish Brown, Non-Plastic to Low Plasticity, Sandy SILT (ML/A-4), 10YR5/6 & 10YR6/4                         |             | 1.0               | DS-2            | 25+    |        |        |        | 13      |   |
|                |            | Medium Dense to Loose, Moist, Light Gray, Low Plasticity to Medium Plasticity, Clayey Fine to Medium SAND (SC/A-2-6), 10YR7/2                      |             | 2.0               | DS-3            | 12     | 18     | 12     |        | 10      |   |
|                | 3.0        | Medium Dense, Moist, Yellowish Brown/Light Yellowish Brown, Non-Plastic to Low Plasticity, Silty Fine to Medium SAND (SM/A-2-4), 10YR6/4 & 10YR5/6 |             | 3.0               | DS-4            | 17     | 25+    |        |        | 13      |   |
|                |            |  |             | 4.0               | DS-5            | 21     | 25+    |        |        | 13      |   |
|                |            |  |             | 4.5               | DS-6            | 12     | 25+    |        |        | 13      |   |
| 141.0          | 5.3        | Boring Terminated at 5.3-ft. Below Existing Roadway Surface. Boring Achieved Target Depth.   |             |                   |                 |        |        |        |        |         |   |

## LEGEND

| SAMPLER TYPE            |                        | DRILLING METHOD                |                  |
|-------------------------|------------------------|--------------------------------|------------------|
| SS - Split Spoon        | NQ - Rock Core, 1-7/8" | HSA - Hollow Stem Auger        | RW - Rotary Wash |
| UD - Undisturbed Sample | CU - Cuttings          | CFA - Continuous Flight Augers | RC - Rock Core   |
| AWG - Rock Core, 1-1/8" | CT - Continuous Tube   | DC - Driving Casing            |                  |

# SCDOT Soil Test Log

|                                 |                                 |                              |             |                        |              |
|---------------------------------|---------------------------------|------------------------------|-------------|------------------------|--------------|
| <b>Project ID:</b>              | P042879                         | <b>County:</b>               | Marlboro    | <b>Boring No.:</b>     | P-4          |
| <b>Site Description:</b>        | SC 83 over Little Pee Dee River |                              |             | <b>Route:</b>          | SC 83        |
| <b>Eng./Geo.:</b>               | T. Peterson                     | <b>Boring Location:</b>      | 107+67      | <b>Offset:</b>         | 5.8-L        |
| <b>Elev.:</b>                   | 140.4 ft                        | <b>Latitude:</b>             | 34.61159915 | <b>Longitude:</b>      | -79.49999666 |
| <b>Total Depth:</b>             | 5.3 ft                          | <b>Soil Depth:</b>           | 5.0 ft      | <b>Core Depth:</b>     | N/A ft       |
| <b>Bore Hole Diameter (in):</b> | 3.0                             | <b>Sampler Configuration</b> |             | <b>Liner Required:</b> | Y (N)        |
| <b>Drill Machine:</b>           | CME 550X                        | <b>Drill Method:</b>         | Hand Auger  | <b>Hammer Type:</b>    | Automatic    |
| <b>Core Size:</b>               | N/A                             | <b>Driller:</b>              | T. Peterson | <b>Groundwater:</b>    | TOB NE       |
|                                 |                                 |                              |             | <b>Energy Ratio:</b>   | N/A%         |
|                                 |                                 |                              |             | <b>24HR</b>            | Backfilled   |

| Elevation (ft) | Depth (ft) | MATERIAL DESCRIPTION   | Graphic Log | Sample Depth (ft) | Sample No./Type | 1st 6" | 2nd 6" | 3rd 6" | 4th 6" | N Value | <div> <div>● SPT N VALUE ●</div> <div> <div>PL X</div> <div>MC ○</div> <div>LL X</div> </div> <div>▲ FINES CONTENT (%)</div> </div> |
|----------------|------------|--|-------------|-------------------|-----------------|--------|--------|--------|--------|---------|---|
|                | 0.0        | ASPHALT ROADWAY (SC 83) (3.0-in.)  |             |                   |                 |        |        |        |        |         | 0 10 20 30 40 50 60 70 80 90  |
|                | 0.3        | EXISTING FILL  |             | 0.3               | DS-1            | 11     | 25+    |        |        | 13      | ●   |
|                | 1.0        | Medium Dense, Moist, Brownish Yellow/Light Gray, Non-Plastic to Low Plasticity, Silty Fine to Medium SAND (SM/A-2-4), 10YR6/6 & 10YR7/2  |             | 1.0               | DS-2            | 25+    |        |        |        | 13      | ●   |
|                | 2.0        | Medium Dense, Moist, Light Gray, Low Plasticity to Medium Plasticity, Fine to Medium Poorly Graded SAND (SP-SC/A-2-4) with Clay, 10YR7/2 |             | 2.0               | DS-3            | 17     | 25+    |        |        | 13      | ●   |
|                | 3.0        | Medium Dense, Moist, Dark Gray, Non-Plastic to Low Plasticity, Fine to Medium Poorly Graded SAND (SP-SM/A-2-4) with Silt, 10YR4/1        |             | 3.0               | DS-4            | 16     | 25+    |        |        | 13      | ●   |
|                | 4.0        | Medium Dense, Moist, Dark Gray/Light Gray, Non-Plastic to Low Plasticity, Silty fine to Medium SAND (SM/A-2-4), 10YR4/1 & 10YR7/2        |             | 4.0               | DS-5            | 25+    |        |        |        | 13      | ●   |
|                | 4.5        | @DS-6: Light Brownish Gray, 10YR6/2  |             | 4.5               | DS-6            | 22     | 25+    |        |        | 13      | ●   |
| 135.4          | 5.3        | Boring Terminated at 5.3-ft. Below Existing Roadway Surface. Boring Achieved Target Depth.   |             |                   |                 |        |        |        |        |         |   |

## LEGEND

| SAMPLER TYPE            |                        | DRILLING METHOD                |                  |
|-------------------------|------------------------|--------------------------------|------------------|
| SS - Split Spoon        | NQ - Rock Core, 1-7/8" | HSA - Hollow Stem Auger        | RW - Rotary Wash |
| UD - Undisturbed Sample | CU - Cuttings          | CFA - Continuous Flight Augers | RC - Rock Core   |
| AWG - Rock Core, 1-1/8" | CT - Continuous Tube   | DC - Driving Casing            |                  |

# SCDOT Soil Test Log

|                                 |                                 |                              |             |                        |              |
|---------------------------------|---------------------------------|------------------------------|-------------|------------------------|--------------|
| <b>Project ID:</b>              | P042879                         | <b>County:</b>               | Marlboro    | <b>Boring No.:</b>     | P-5          |
| <b>Site Description:</b>        | SC 83 over Little Pee Dee River |                              |             | <b>Route:</b>          | SC 83        |
| <b>Eng./Geo.:</b>               | T. Peterson                     | <b>Boring Location:</b>      | 110+16      | <b>Offset:</b>         | 4.2-L        |
| <b>Elev.:</b>                   | 139.9 ft                        | <b>Latitude:</b>             | 34.61197846 | <b>Longitude:</b>      | -79.49930656 |
| <b>Total Depth:</b>             | 5.2 ft                          | <b>Soil Depth:</b>           | 5.0 ft      | <b>Date Started:</b>   | 2/25/2025    |
| <b>Core Depth:</b>              | N/A ft                          | <b>Date Completed:</b>       | 2/25/2025   |                        |              |
| <b>Bore Hole Diameter (in):</b> | 3.0                             | <b>Sampler Configuration</b> |             | <b>Liner Required:</b> | Y (N)        |
| <b>Drill Machine:</b>           | CME 550X                        | <b>Drill Method:</b>         | Hand Auger  | <b>Energy Ratio:</b>   | N/A%         |
| <b>Core Size:</b>               | N/A                             | <b>Driller:</b>              | T. Peterson | <b>Groundwater:</b>    | TOB NE       |
|                                 |                                 |                              |             | <b>24HR</b>            | Backfilled   |

| Elevation (ft) | Depth (ft) | MATERIAL DESCRIPTION  | Graphic Log | Sample Depth (ft) | Sample No./Type | 1st 6" | 2nd 6" | 3rd 6" | 4th 6" | N Value | <div> <div>● SPT N VALUE ●</div> <div> <div>PL X</div> <div>MC ○</div> <div>LL X</div> </div> <div>▲ FINES CONTENT (%)</div> </div> |
|----------------|------------|---|-------------|-------------------|-----------------|--------|--------|--------|--------|---------|---|
|                | 0.0        | ASPHALT ROADWAY (SC 83) (2.0-in.)   |             |                   |                 |        |        |        |        |         | 0 10 20 30 40 50 60 70 80 90  |
|                | 0.2        | <b>EXISTING FILL</b><br>Medium Dense, Moist, Yellowish Brown, Low Plasticity to Medium Plasticity, Clayey Fine to Medium SAND (SC/A-2-6), 10YR6/6 |             | 0.2               | DS-1            | 13     | 21     | 25+    |        | 13      | ●   |
|                | 1.0        | Stiff, Moist, Yellowish Brown/Light Gray, Low Plasticity to Medium Plasticity, Sandy Lean CLAY (CL/A-6), 10YR6/6 & 10YR7/1                        |             | 1.0               | DS-2            | 25+    |        |        |        | 13      | ●   |
|                | 2.0        | Medium Dense, Moist, Yellowish Brown/Yellowish Red, Low Plasticity to Medium Plasticity, Clayey Fine to Medium SAND (SC/A-2-6), 10YR6/6 & 5YR5/8  |             | 2.0               | DS-3            | 14     | 25+    |        |        | 13      | ●   |
|                |            |   |             | 3.0               | DS-4            | 8      | 21     | 25+    |        | 13      | ●   |
|                |            |   |             | 4.0               | DS-5            | 16     | 18     | 25+    |        | 12      | ●   |
|                |            |   |             | 5.0               | DS-6            | 16     | 20     | 25+    |        | 13      | ●   |
| 134.9          | 5.2        | Boring Terminated at 5.2-ft. Below Existing Roadway Surface. Boring Achieved Target Depth.  |             |                   |                 |        |        |        |        |         |   |

## LEGEND

| SAMPLER TYPE            |                        | DRILLING METHOD                |                  |
|-------------------------|------------------------|--------------------------------|------------------|
| SS - Split Spoon        | NQ - Rock Core, 1-7/8" | HSA - Hollow Stem Auger        | RW - Rotary Wash |
| UD - Undisturbed Sample | CU - Cuttings          | CFA - Continuous Flight Augers | RC - Rock Core   |
| AWG - Rock Core, 1-1/8" | CT - Continuous Tube   | DC - Driving Casing            |                  |

# SCDOT Soil Test Log

|                                 |                                 |                              |             |                        |              |
|---------------------------------|---------------------------------|------------------------------|-------------|------------------------|--------------|
| <b>Project ID:</b>              | P042879                         | <b>County:</b>               | Marlboro    | <b>Boring No.:</b>     | P-6          |
| <b>Site Description:</b>        | SC 83 over Little Pee Dee River |                              |             | <b>Route:</b>          | SC 83        |
| <b>Eng./Geo.:</b>               | T. Peterson                     | <b>Boring Location:</b>      | 112+67      | <b>Offset:</b>         | 4.8-L        |
| <b>Elev.:</b>                   | 139.0 ft                        | <b>Latitude:</b>             | 34.61236357 | <b>Longitude:</b>      | -79.49861834 |
| <b>Total Depth:</b>             | 5.3 ft                          | <b>Soil Depth:</b>           | 5.0 ft      | <b>Core Depth:</b>     | N/A ft       |
| <b>Bore Hole Diameter (in):</b> | 3.0                             | <b>Sampler Configuration</b> |             | <b>Liner Required:</b> | Y (N)        |
| <b>Drill Machine:</b>           | CME 550X                        | <b>Drill Method:</b>         | Hand Auger  | <b>Hammer Type:</b>    | Automatic    |
| <b>Core Size:</b>               | N/A                             | <b>Driller:</b>              | T. Peterson | <b>Groundwater:</b>    | TOB NE       |
|                                 |                                 |                              |             | <b>Energy Ratio:</b>   | N/A%         |
|                                 |                                 |                              |             | <b>24HR</b>            | Backfilled   |

| Elevation (ft) | Depth (ft) | MATERIAL DESCRIPTION   | Graphic Log | Sample Depth (ft) | Sample No./Type | 1st 6" | 2nd 6" | 3rd 6" | 4th 6" | N Value | <div> <div>● SPT N VALUE ●</div> <div> <div>PL X</div> <div>MC ○</div> <div>LL X</div> </div> <div>▲ FINES CONTENT (%)</div> </div> |
|----------------|------------|--|-------------|-------------------|-----------------|--------|--------|--------|--------|---------|---|
|                | 0.0        | ASPHALT ROADWAY (SC 83) (3.0-in.)  |             |                   |                 |        |        |        |        |         | 0 10 20 30 40 50 60 70 80 90  |
|                | 0.3        | EXISTING FILL<br>Medium Dense, Moist, Reddish Yellow, Non-Plastic, Fine to Medium Poorly Graded SAND (SP-SM/A-2-4) with Silt, 7.5YR6/6         |             | 0.3               | DS-1            | 25+    |        |        |        | 13      | ●   |
|                |            | @DS-2: Yellowish Brown, 10YR6/6  |             | 1.0               | DS-2            | 25+    |        |        |        | 13      | ●   |
|                | 2.0        | Medium Dense, Moist, Yellowish Brown/Light Gray, Low Plasticity to Medium Plasticity, Clayey Fine to Medium SAND (SC/A-2-6), 10YR6/6 & 10YR7/1 |             | 2.0               | DS-3            | 21 25+ |        |        |        | 13      | ●   |
|                | 3.0        | Medium Dense, Moist, Light Gray, Non-Plastic to Low Plasticity, Silty Fine to Medium SAND (SM/A-2-4), 10YR7/1                                  |             | 3.0               | DS-4            | 17 25+ |        |        |        | 13      | ●   |
|                |            |  |             | 4.0               | DS-5            | 25+    |        |        |        | 13      | ●   |
|                |            |  |             | 4.5               | DS-6            | 9 25+  |        |        |        | 13      | ●   |
| 134.0          | 5.3        | Boring Terminated at 5.3-ft. Below Existing Roadway Surface. Boring Achieved Target Depth.   |             |                   |                 |        |        |        |        |         |   |

## LEGEND

| SAMPLER TYPE            |                        | DRILLING METHOD                |                  |
|-------------------------|------------------------|--------------------------------|------------------|
| SS - Split Spoon        | NQ - Rock Core, 1-7/8" | HSA - Hollow Stem Auger        | RW - Rotary Wash |
| UD - Undisturbed Sample | CU - Cuttings          | CFA - Continuous Flight Augers | RC - Rock Core   |
| AWG - Rock Core, 1-1/8" | CT - Continuous Tube   | DC - Driving Casing            |                  |

# **SC 83 over Little Pee Dee River**

## **Geotechnical Baseline Report**

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# **APPENDIX**

## **SECTION 3      SUBSURFACE EXPLORATION LOGS**

### **SECTION 3C      BULK SOIL SAMPLE (BS) LOGS**



# SCDOT Soil Test Log

|  |                                 |                                |  |                                  |  |                            |  |
|--|---------------------------------|--------------------------------|--|----------------------------------|--|----------------------------|--|
| <b>Project ID:</b> P042879                               |                                 |                                |  | <b>County:</b> Marlboro          |  | <b>Boring No.:</b> BS-1    |  |
| <b>Site Description:</b> SC 83 over Little Pee Dee River |                                 |                                |  | <b>Route:</b> SC 83              |  |                            |  |
| <b>Eng./Geo.:</b> T. Peterson                            |                                 | <b>Boring Location:</b> N/A    |  | <b>Offset:</b> N/A               |  | <b>Alignment:</b> Existing |  |
| <b>Elev.:</b> 142.3 ft                                   | <b>Latitude:</b> 34.61082414    | <b>Longitude:</b> -79.50141463 |  | <b>Date Started:</b> 2/25/2025   |  |                            |  |
| <b>Total Depth:</b> 5 ft                                 | <b>Soil Depth:</b> 5.0 ft       | <b>Core Depth:</b> N/A ft      |  | <b>Date Completed:</b> 2/25/2025 |  |                            |  |
| <b>Bore Hole Diameter (in):</b> 3.0                      |                                 | <b>Sampler Configuration</b>   |  | <b>Liner Required:</b> Y (N)     |  | <b>Liner Used:</b> Y (N)   |  |
| <b>Drill Machine:</b> CME 550X                           | <b>Drill Method:</b> Hand Auger | <b>Hammer Type:</b> Automatic  |  | <b>Energy Ratio:</b> N/A%        |  |                            |  |
| <b>Core Size:</b> N/A                                    | <b>Driller:</b> T. Peterson     | <b>Groundwater:</b> TOB NE     |  | <b>24HR</b>                      |  | Backfilled                 |  |

| Elevation (ft) | Depth (ft) | MATERIAL DESCRIPTION  | Graphic Log | Sample Depth (ft) | Sample No./Type | 1st 6" | 2nd 6" | 3rd 6" | 4th 6" | N Value | ● SPT N VALUE ●<br>PL X      MC ○      LL X<br>▲ FINES CONTENT (%)<br>0 10 20 30 40 50 60 70 80 90 |
|----------------|------------|---|-------------|-------------------|-----------------|--------|--------|--------|--------|---------|--|
|                | 0.0        | Moist, Non-Plastic, Silty Fine to Medium SAND (SM/A-2-4)<br>@BS-1: LL=NP, PL=NP, PI=NP, NMC=10.5, %200=15.4 |             | 0.0               |                 |        |        |        |        |         |  |
|                |            |   |             |                   | BS-1            |        |        |        |        | X       | ○▲   |
| 137.3          | 5.0        | Boring Terminated at 5.0-ft. Below the Existing Ground Surface. Boring Achieved Target Depth.               |             |                   |                 |        |        |        |        |         |  |

## LEGEND

| SAMPLER TYPE            |                        | DRILLING METHOD                |                  |
|-------------------------|------------------------|--------------------------------|------------------|
| SS - Split Spoon        | NQ - Rock Core, 1-7/8" | HSA - Hollow Stem Auger        | RW - Rotary Wash |
| UD - Undisturbed Sample | CU - Cuttings          | CFA - Continuous Flight Augers | RC - Rock Core   |
| AWG - Rock Core, 1-1/8" | CT - Continuous Tube   | DC - Driving Casing            |                  |

# SCDOT Soil Test Log

|  |                           |                                 |                           |                               |                                  |                            |  |
|--|---------------------------|---------------------------------|---------------------------|-------------------------------|----------------------------------|----------------------------|--|
| <b>Project ID:</b> P042879                               |                           |                                 |                           | <b>County:</b> Marlboro       |                                  | <b>Boring No.:</b> BS-2    |  |
| <b>Site Description:</b> SC 83 over Little Pee Dee River |                           |                                 |                           | <b>Route:</b> SC 83           |                                  |                            |  |
| <b>Eng./Geo.:</b> T. Peterson                            |                           | <b>Boring Location:</b> N/A     |                           | <b>Offset:</b> N/A            |                                  | <b>Alignment:</b> Existing |  |
| <b>Elev.:</b> 140.6 ft                                   | <b>Latitude:</b>          |                                 | <b>Longitude:</b>         |                               | <b>Date Started:</b> 2/25/2025   |                            |  |
| <b>Total Depth:</b> 5 ft                                 | <b>Soil Depth:</b> 5.0 ft |                                 | <b>Core Depth:</b> N/A ft |                               | <b>Date Completed:</b> 2/25/2025 |                            |  |
| <b>Bore Hole Diameter (in):</b> 3.0                      |                           | <b>Sampler Configuration</b>    |                           | <b>Liner Required:</b> Y (N)  |                                  | <b>Liner Used:</b> Y (N)   |  |
| <b>Drill Machine:</b> CME 550X                           |                           | <b>Drill Method:</b> Hand Auger |                           | <b>Hammer Type:</b> Automatic |                                  | <b>Energy Ratio:</b> N/A%  |  |
| <b>Core Size:</b> N/A                                    |                           | <b>Driller:</b> T. Peterson     |                           | <b>Groundwater:</b> TOB NE    |                                  | <b>24HR</b> Backfilled     |  |

| Elevation (ft) | Depth (ft) | MATERIAL DESCRIPTION   | Graphic Log | Sample Depth (ft) | Sample No./Type | 1st 6" | 2nd 6" | 3rd 6" | 4th 6" | N Value | ● SPT N VALUE ●<br>PL X MC O LL X<br>▲ FINES CONTENT (%)<br>0 10 20 30 40 50 60 70 80 90 |
|----------------|------------|--|-------------|-------------------|-----------------|--------|--------|--------|--------|---------|--|
|                | 0.0        | Moist, Non-Plastic, Silty Fine to Medium SAND (SM/A-2-4)<br>@BS-1: LL=NP, PL=NP, PI=NP, NMC=11.1, %200=18.2<br><br><i>Composite Bulk Soil Sample BS-1 was Formed Using the Upper 5.0-ft. of Auger Cuttings Encountered within Soil Test Borings P-1 Through P-6.</i> |             | 0.0               |                 |        |        |        |        |         |  |
| 135.6          | 5.0        | Boring Terminated at 5.0-ft. Below the Existing Ground Surface. Boring Achieved Target Depth.  |             |                   | BS-2            |        |        |        |        | X       | O ▲  |

## LEGEND

| SAMPLER TYPE            |                        | DRILLING METHOD                |                  |
|-------------------------|------------------------|--------------------------------|------------------|
| SS - Split Spoon        | NQ - Rock Core, 1-7/8" | HSA - Hollow Stem Auger        | RW - Rotary Wash |
| UD - Undisturbed Sample | CU - Cuttings          | CFA - Continuous Flight Augers | RC - Rock Core   |
| AWG - Rock Core, 1-1/8" | CT - Continuous Tube   | DC - Driving Casing            |                  |

# **SC 83 over Little Pee Dee River**

## **Geotechnical Baseline Report**

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# **APPENDIX**

## **SECTION 3      SUBSURFACE EXPLORATION LOGS**

### **SECTION 3D      ELECTRO-PIEZOCONE SOUNDING (CPT) LOGS**

# Cone Penetration Test



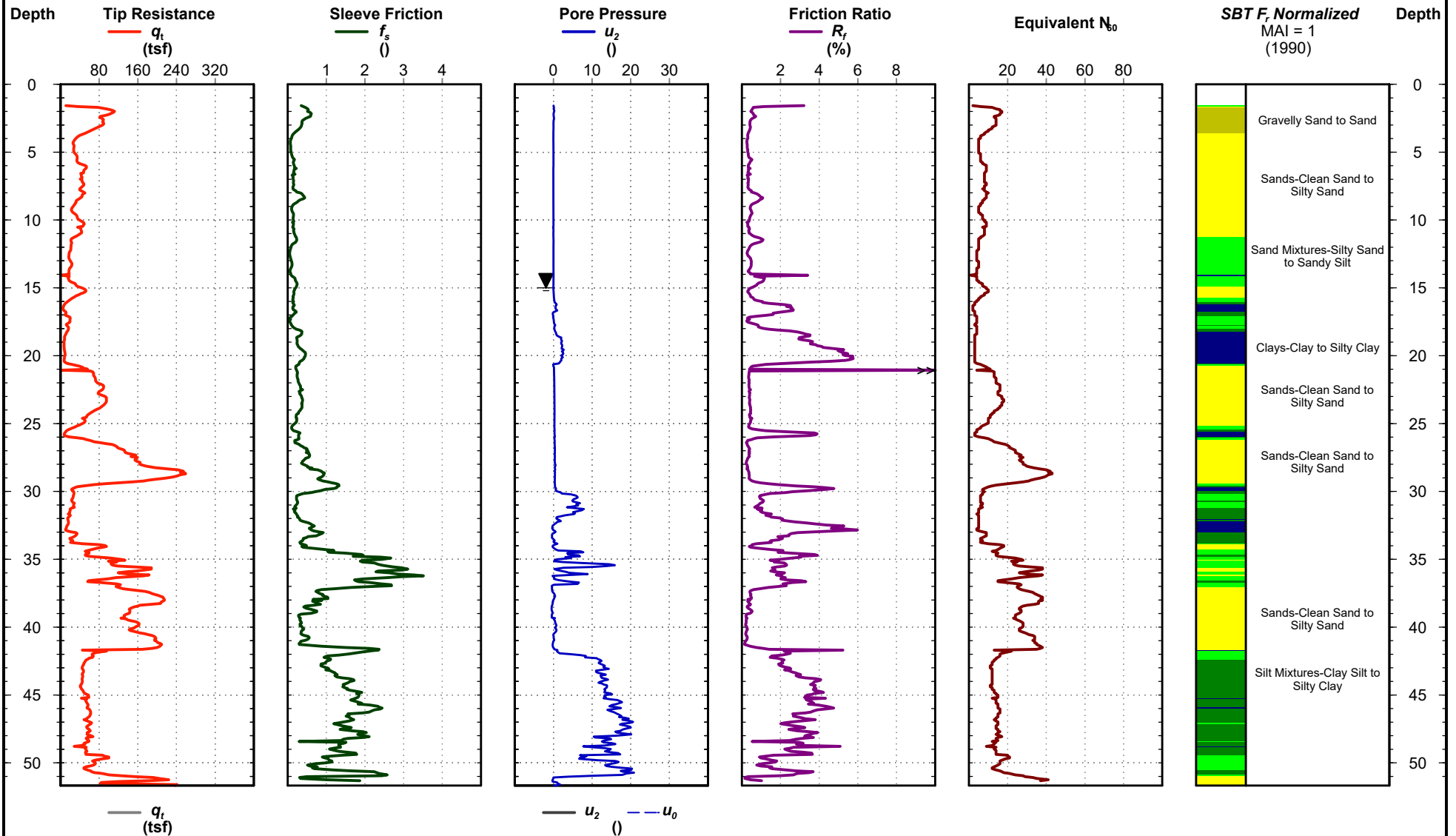
SC 83 over Little Pee Dee River  
Marlboro County (South Carolina)  
Project No. :P042879

**CPT-1**

Date: Mar. 14, 2025  
Estimated Water Depth: 15 ft  
Rig/Operator: G. Cantele

Station: 102+59  
Offset: 5.5-R  
Elevation: 142.6 ft-MSL

Total Depth: 51.7 ft  
Termination Criteria: Maximum Reaction Force  
CPT Probe ID: DDG1329



**CPT-1**

# Cone Penetration Test



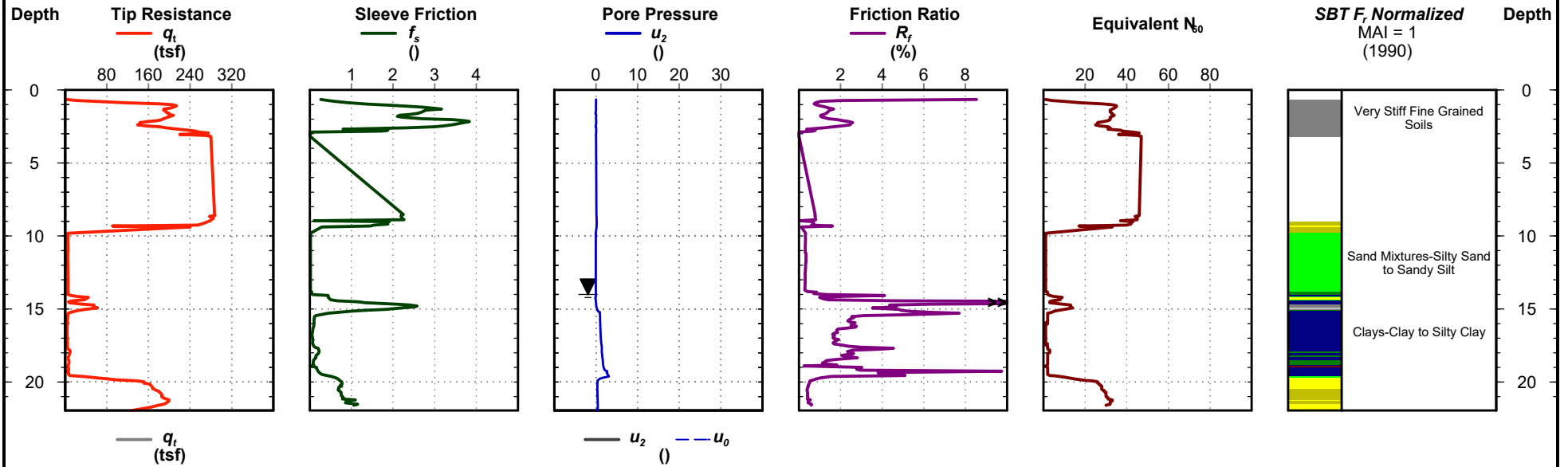
SC 83 over Little Pee Dee River  
Marlboro County (South Carolina)  
Project No. :P042879

**CPT-2**

Date: Mar. 14, 2025  
Estimated Water Depth: 14 ft  
Rig/Operator: G. Cantele

Station: 106+83  
Offset: 1.5-R  
Elevation: 141.7 ft-MSL

Total Depth: 22.0 ft  
Termination Criteria: Maximum Reaction Force  
CPT Probe ID: DDG1329



**CPT-2**

# **SC 83 over Little Pee Dee River**

## **Geotechnical Baseline Report**

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# **APPENDIX**

## **SECTION 4**

## **DOWNHOLE SHEAR WAVE VELOCITY TESTING**

Mr. Trapp Harris, P.E.  
South Carolina Department of Transportation  
955 Park Street  
Columbia, South Carolina 29201

Re: Geotechnical Subsurface Data Report  
SC 83 Bridge Replacement over Little Pee Dee River  
Marlboro County, South Carolina  
SCDOT Project ID.: P042879  
FME Project No.: G7100.010 - Task 00001

Mr. Harris:

A downhole seismic test, designated as Borehole B-4/DHT, was conducted at SC 83 Bridge Replacement over Little Pee Dee River on March 19, 2025, to determine shear-wave velocities at 2.5-foot intervals for the proposed bridge project. This report summarizes the downhole testing method and presents the shear-wave and compression-wave velocity results.

The boring was cased with a two-inch PVC pipe and grouted in the annulus between the casing and the borehole wall, the deepest depth reading for the downhole test was at 95.0 ft. The grout setup a minimum of 72 hours before testing. Water was pumped from the downhole pipe prior to testing.

Seismic data for the downhole testing was collected by recording seismic shear-waves and compression waves with a Geometrics ES-3000 seismograph paired with a GeoStuff triaxial BHG-3 geophone. Seismic waves were generated by using a sixteen-pound sledgehammer to horizontally strike both ends of a 7-foot-long wood beam with steel plates attached to the ends. Compression waves were generated by striking an aluminum plate on the ground surface with the sledgehammer. Seismic data was recorded starting at the bottom of the borehole and continued at 2.5-foot intervals.

Shear wave data was collected by striking the beam from opposite sides to produce reverse polarized waves when they are combined, these waves were used to identify shear wave arrivals. First arrivals were identified for the compression waves. The arrival times were used to calculate seismic shear wave and compression wave velocities for the interval depths. The seismic velocities for the intervals are visually presented on the attached graph and in table form for both seismic wave types. Geometrics software was used to process the seismic data.

The results from the downhole seismic test are a  $V_{s95.0}$  value of 747 ft/sec and a  $V_{p95.0}$  value of 2,919 ft/sec. This downhole seismic test was conducted at one location at the test site, the attached seismic velocity models may not be representative of subsurface conditions across the entire project area.

Regards,

A handwritten signature in blue ink, appearing to read 'Craig Piercy', is written over a light blue circular stamp.

Craig Piercy, P.G.  
Senior Geologist

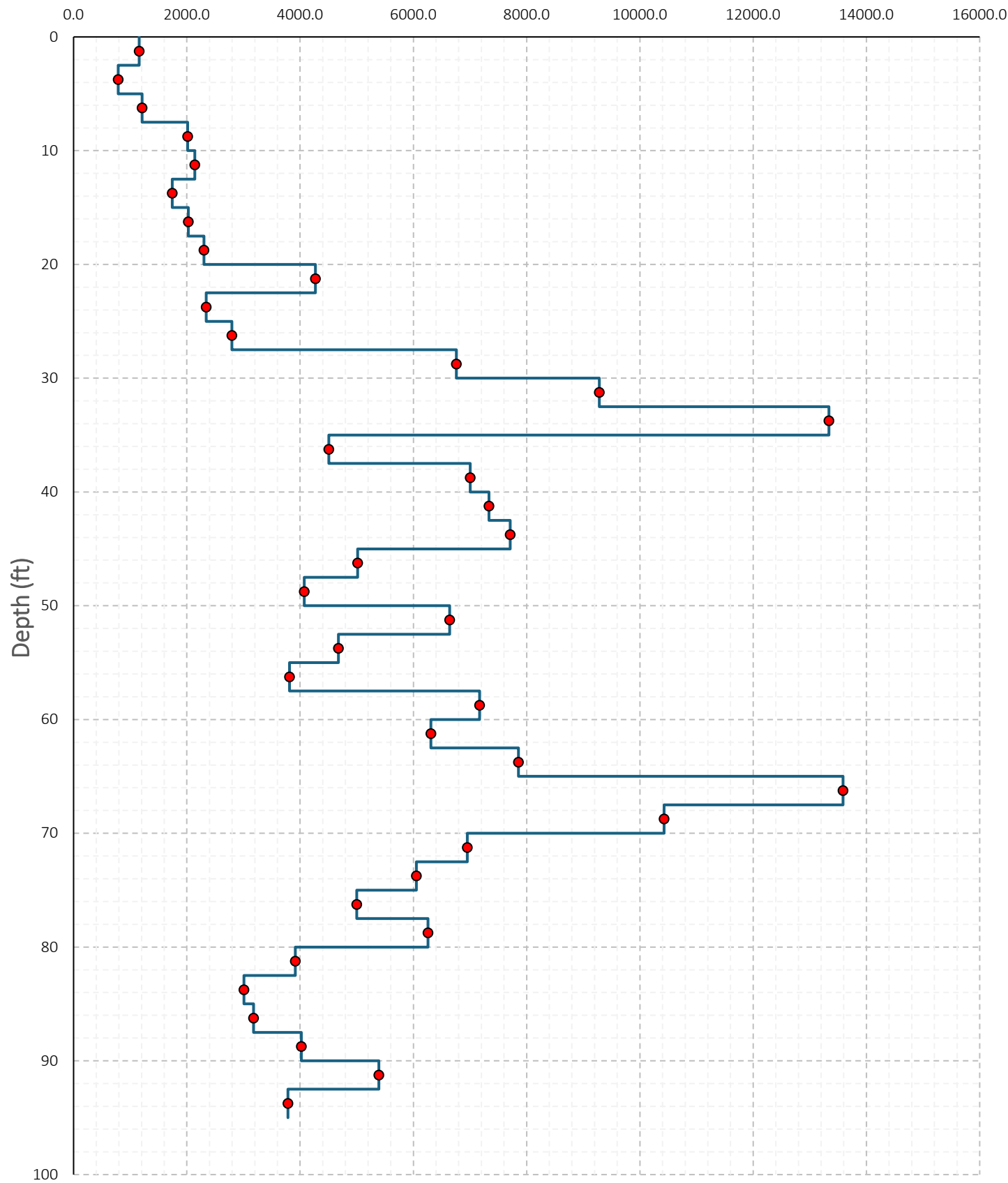


| SC 83 RBO Little Pee Dee River<br>B-4/DHT |                                  |                              |                                  |
|---|----------------------------------|------------------------------|----------------------------------|
| Compression (P) Wave Velocity             |                                  | Shear (S) Wave Velocity      |                                  |
| <u>Depth(ft)</u>                          | <u>Interval Velocity(ft/sec)</u> | <u>Depth(ft)</u>             | <u>Interval Velocity(ft/sec)</u> |
| 0   | --                               | 0                            | --                               |
| 2.5                                       | 1,160                            | 2.5                          | 559                              |
| 5   | 788                              | 5                            | 422                              |
| 7.5                                       | 1,208                            | 7.5                          | 514                              |
| 10  | 2,015                            | 10                           | 1,086                            |
| 12.5                                      | 2,140                            | 12.5                         | 591                              |
| 15  | 1,741                            | 15                           | 261                              |
| 17.5                                      | 2,025                            | 17.5                         | 214                              |
| 20  | 2,304                            | 20                           | 591                              |
| 22.5                                      | 4,272                            | 22.5                         | 468                              |
| 25  | 2,341                            | 25                           | 1,185                            |
| 27.5                                      | 2,794                            | 27.5                         | 697                              |
| 30  | 6,759                            | 30                           | 697                              |
| 32.5                                      | 9,283                            | 32.5                         | 967                              |
| 35  | 13,337                           | 35                           | 1,661                            |
| 37.5                                      | 4,509                            | 37.5                         | 1,334                            |
| 40  | 7,004                            | 40                           | 1,750                            |
| 42.5                                      | 7,335                            | 42.5                         | 1,101                            |
| 45  | 7,710                            | 45                           | 2,028                            |
| 47.5                                      | 5,016                            | 47.5                         | 1,271                            |
| 50  | 4,073                            | 50                           | 1,230                            |
| 52.5                                      | 6,642                            | 52.5                         | 2,447                            |
| 55  | 4,675                            | 55                           | 1,421                            |
| 57.5                                      | 3,811                            | 57.5                         | 1,120                            |
| 60  | 7,171                            | 60                           | 1,210                            |
| 62.5                                      | 6,309                            | 62.5                         | 1,225                            |
| 65  | 7,854                            | 65                           | 1,639                            |
| 67.5                                      | 13,587                           | 67.5                         | 1,447                            |
| 70  | 10,429                           | 70                           | 1,120                            |
| 72.5                                      | 6,952                            | 72.5                         | 1,029                            |
| 75  | 6,052                            | 75                           | 1,593                            |
| 77.5                                      | 4,999                            | 77.5                         | 2,280                            |
| 80  | 6,257                            | 80                           | 1,154                            |
| 82.5                                      | 3,916                            | 82.5                         | 1,474                            |
| 85  | 3,009                            | 85                           | 1,119                            |
| 87.5                                      | 3,177                            | 87.5                         | 1,309                            |
| 90  | 4,021                            | 90                           | 2,208                            |
| 92.5                                      | 5,391                            | 92.5                         | 1,980                            |
| 95  | 3,785                            | 95                           | 1,568                            |
| V <sub>p95</sub> =2,919 ft/sec            |                                  | V <sub>s95</sub> =747 ft/sec |                                  |



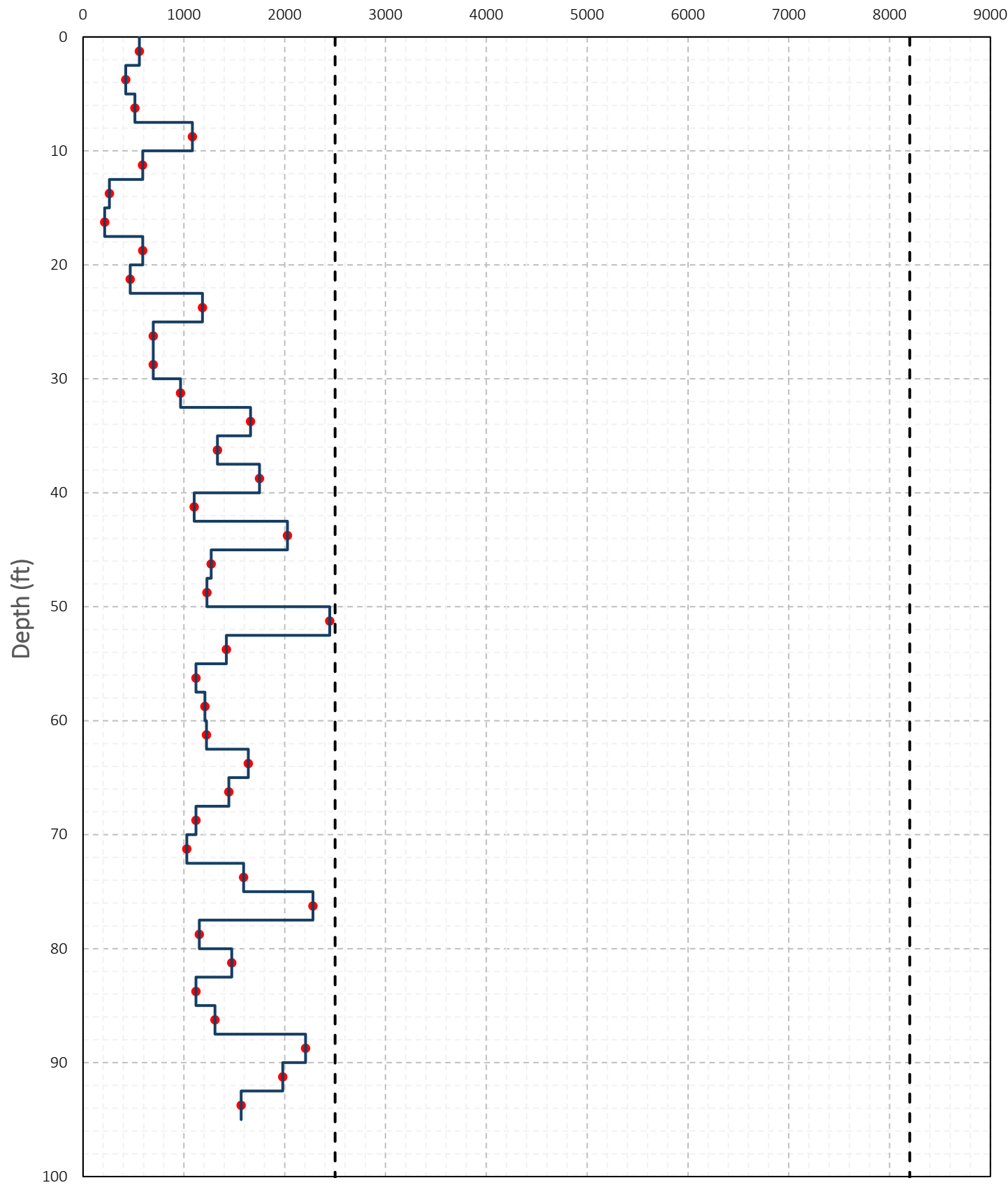


Compression Wave Velocity,  $V_p$  (ft/sec)





Shear Wave Velocity, Vs (ft/sec)



# **SC 83 over Little Pee Dee River**

## **Geotechnical Baseline Report**

---

# **APPENDIX**

## **SECTION 5**

## **LABORATORY TEST RESULTS**

# **SC 83 over Little Pee Dee River**

## **Geotechnical Baseline Report**

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# **APPENDIX**

## **SECTION 5      LABORATORY TEST RESULTS**

### **SECTION 5A      SPLIT-SPOON SAMPLES**



# SUMMARY OF LABORATORY RESULTS

PAGE 1 OF 1

PROJECT ID P042879

PROJECT NAME SC 83 over Little Pee Dee River

PROJECT COUNTY Marlboro

| Borehole | Depth | Liquid Limit | Plastic Limit | Plasticity Index | Maximum Size (mm) | %<#200 Sieve | Classification | Water Content (%) | Dry Density (pcf) | Saturation (%) | Void Ratio |
|----------|-------|--------------|---------------|------------------|-------------------|--------------|----------------|-------------------|-------------------|----------------|------------|
| B-1      | 6.0   | NP           | NP            | NP               | 9.51              | 19           | SM             | 10.3              |                   |                |            |
| B-1      | 15.0  | 18           | 14            | 4                | 19                | 16           | SC-SM          | 16.5              |                   |                |            |
| B-1      | 20.0  | NP           | NP            | NP               | 19                | 53           | ML             | 252.9             |                   |                |            |
| B-1      | 45.0  | 31           | 16            | 15               | 9.51              | 32           | SC             | 16.9              |                   |                |            |
| B-2      | 18.3  | NP           | NP            | NP               | 4.76              | 20           | SM             | 58.6              |                   |                |            |
| B-2      | 26.3  |              |               |                  | 9.51              | 2            | SP             | 22.6              |                   |                |            |
| B-2      | 31.3  | 35           | 13            | 22               | 9.51              | 25           | SC             | 17.8              |                   |                |            |
| B-2      | 36.3  | 33           | 15            | 18               | 9.51              | 26           | SC             | 19.2              |                   |                |            |
| B-3      | 8.0   | 17           | 14            | 3                | 9.51              | 20           | SM             | 9.5               |                   |                |            |
| B-3      | 18.0  | NP           | NP            | NP               | 4.76              | 1            | SP             | 22.3              |                   |                |            |
| B-3      | 22.0  | NP           | NP            | NP               | 9.51              | 24           | SM             | 33.0              |                   |                |            |
| B-3      | 32.0  | 18           | 16            | 2                | 9.51              | 50           | SM             | 16.4              |                   |                |            |
| B-4/DHT  | 10.0  | NP           | NP            | NP               | 4.76              | 13           | SM             | 14.2              |                   |                |            |
| B-4/DHT  | 20.0  | NP           | NP            | NP               | 4.76              | 39           | SM             | 37.7              |                   |                |            |
| B-4/DHT  | 30.0  |              |               |                  | 9.51              | 4            | SW             | 14.7              |                   |                |            |
| B-4/DHT  | 40.0  | 24           | 14            | 10               | 9.51              | 11           | SP-SC          | 22.4              |                   |                |            |



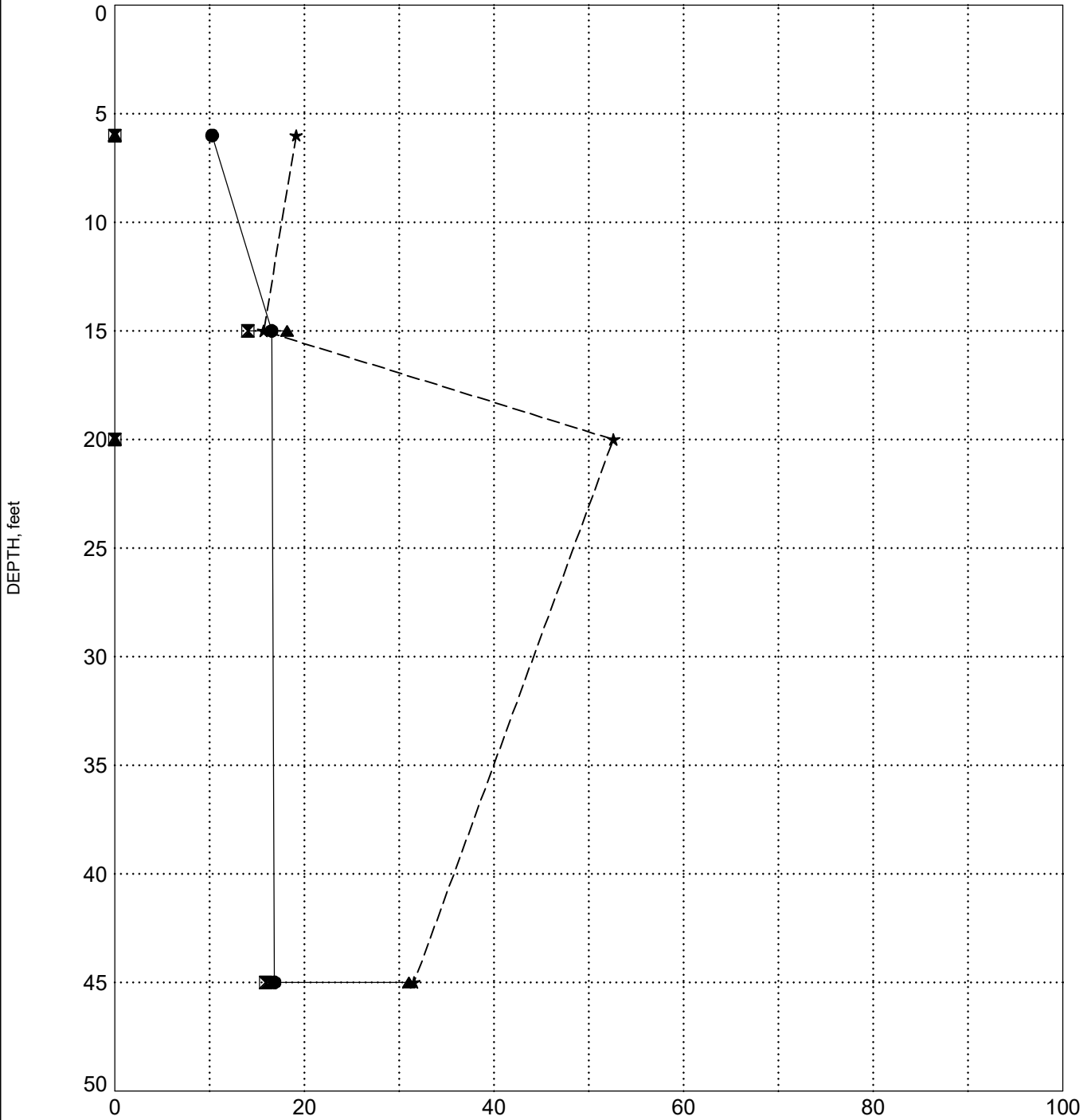
# INDEX PROPERTIES VERSUS DEPTH

PROJECT ID P042879

PROJECT NAME SC 83 over Little Pee Dee River

PROJECT COUNTY Marlboro

## BORING B-1



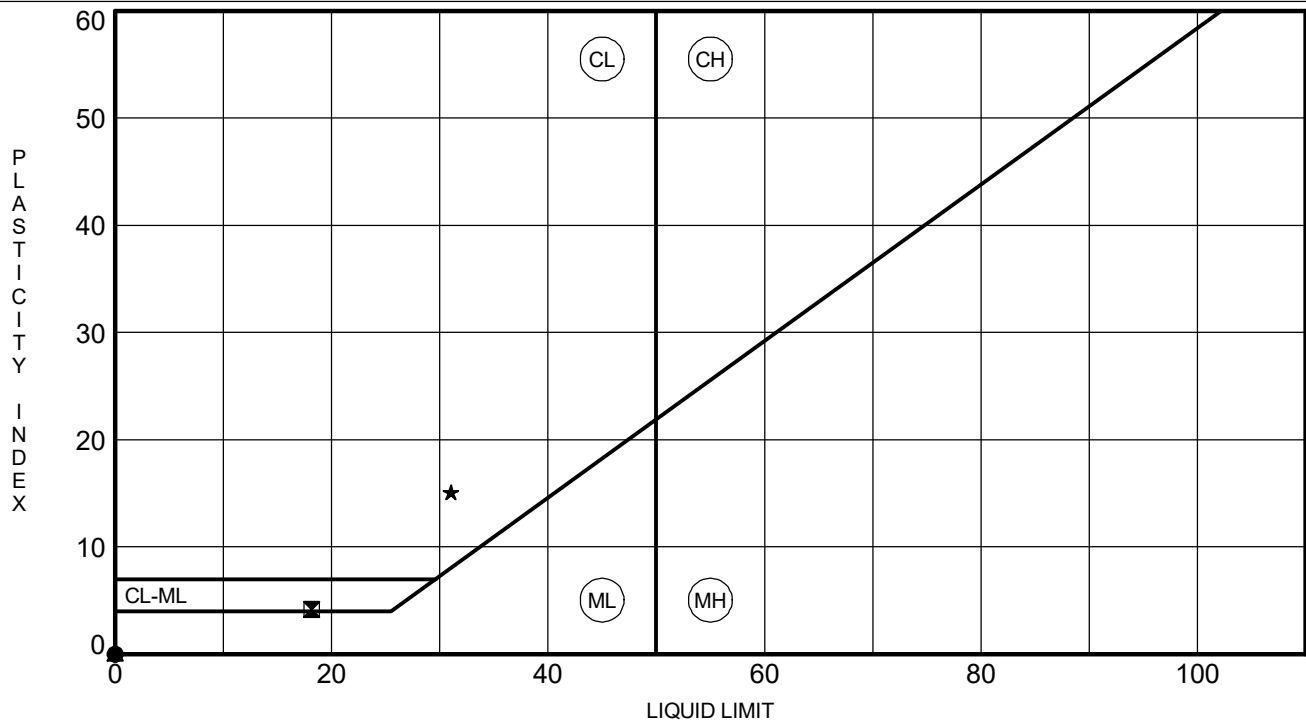
| LEGEND |               |
|--------|---------------|
| ●      | Water Content |
| ⊠      | Plastic Limit |
| ▲      | Liquid Limit  |
| ★      | Fines         |

## ATTERBERG LIMITS' RESULTS

**PROJECT ID** P042879

**PROJECT NAME** SC 83 over Little Pee Dee River

**PROJECT COUNTY** Marlboro

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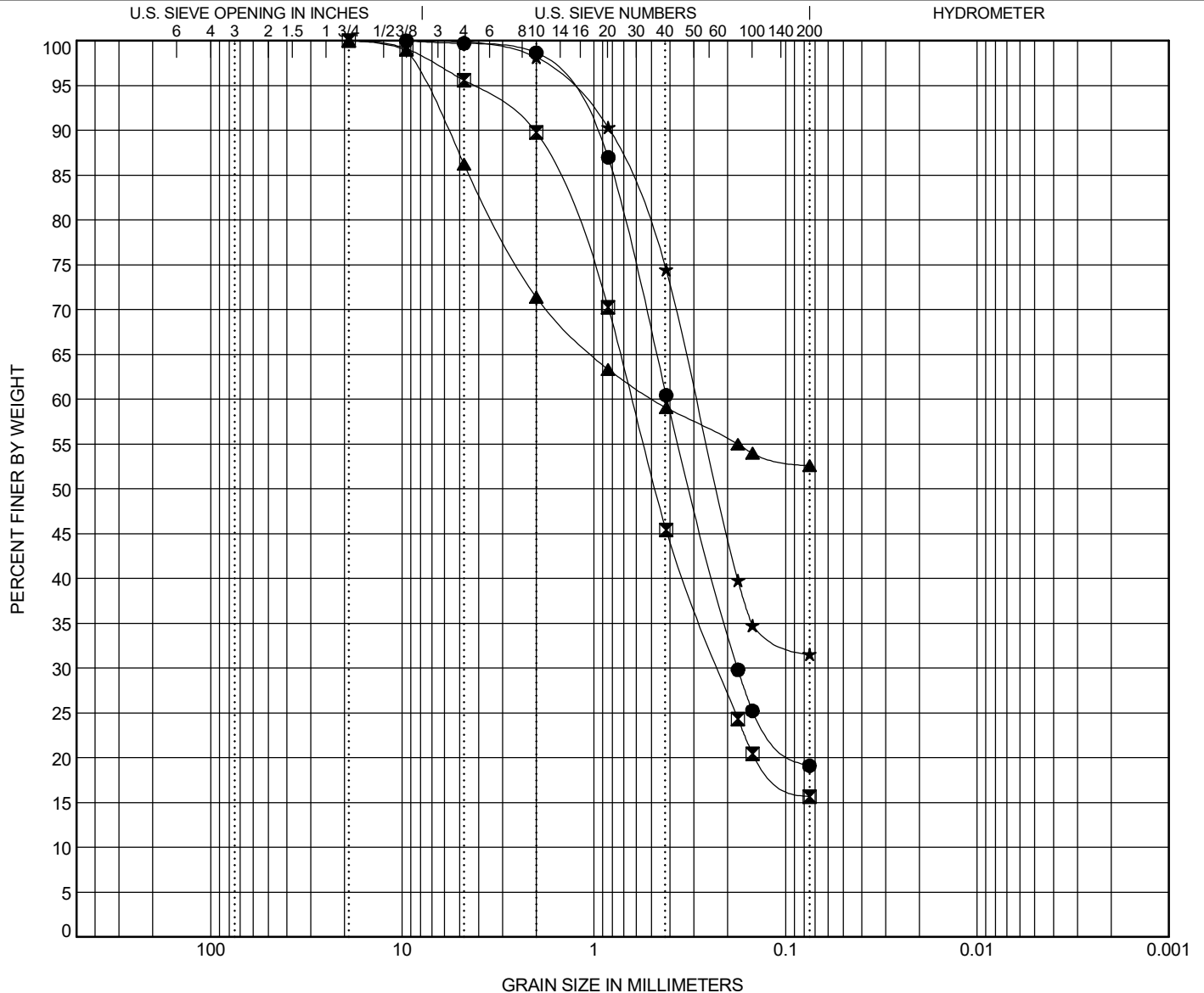


# GRAIN SIZE DISTRIBUTION

PROJECT ID P042879

PROJECT NAME SC 83 over Little Pee Dee River

PROJECT COUNTY Marlboro



| COBBLES | GRAVEL |      | SAND   |        |      | SILT OR CLAY |
|---------|--------|------|--------|--------|------|--------------|
|         | coarse | fine | coarse | medium | fine |              |

| BOREHOLE |     | DEPTH | Classification                   |       |       |     |         | LL    | PL    | PI | Cc    | Cu |
|----------|-----|-------|----------------------------------|-------|-------|-----|---------|-------|-------|----|-------|----|
| ●        | B-1 | 6.0   | SILTY SAND (SM/A-2-4)            |       |       |     |         | NP    | NP    | NP |       |    |
| ▣        | B-1 | 15.0  | SILTY, CLAYEY SAND (SC-SM/A-1-b) |       |       |     |         | 18    | 14    | 4  |       |    |
| ▲        | B-1 | 20.0  | SANDY SILT (ML/A-4)              |       |       |     |         | NP    | NP    | NP |       |    |
| ★        | B-1 | 45.0  | CLAYEY SAND (SC/A-2-6)           |       |       |     |         | 31    | 16    | 15 |       |    |
|          |     |       |                                  |       |       |     |         |       |       |    |       |    |
| BOREHOLE |     | DEPTH | D90                              | D60   | D30   | D10 | %Gravel | %Sand | %Silt |    | %Clay |    |
| ●        | B-1 | 6.0   | 1.051                            | 0.415 | 0.178 |     | 0.3     | 80.6  | 19.1  |    |       |    |
| ▣        | B-1 | 15.0  | 2.062                            | 0.631 | 0.223 |     | 4.4     | 79.9  | 15.7  |    |       |    |
| ▲        | B-1 | 20.0  | 5.84                             | 0.489 |       |     | 13.8    | 33.6  | 52.6  |    |       |    |
| ★        | B-1 | 45.0  | 0.828                            | 0.293 |       |     | 0.1     | 68.3  | 31.5  |    |       |    |
|          |     |       |                                  |       |       |     |         |       |       |    |       |    |



**F&ME CONSULTANTS, INC**  
**211 Business Park Blvd.**  
**Columbia, SC 29203**

**MOISTURE CONTENT DETERMINATION**  
**(AASHTO T265)**

|                             |                                 |                          |           |
|-----------------------------|---------------------------------|--------------------------|-----------|
| <b>PROJECT:</b>             | SC 83 over Little Pee Dee River | <b>SCDOT PROJECT ID:</b> | P042879   |
| <b>SAMPLE NUMBER:</b>       | 25-0823                         | <b>DATE REQUESTED:</b>   | 3/17/2025 |
| <b>DESCRIPTION OF SOIL:</b> | Various                         |                          |           |
| <b>TESTED BY:</b>           | AG & AB                         | <b>DATE OF TESTING:</b>  | 3/18/2025 |
| <b>WEIGHED BY:</b>          | TE                              | <b>DATE OF WEIGHING:</b> | 3/19/2025 |

|                   |           |             |             |             |  |
|-------------------|-----------|-------------|-------------|-------------|--|
| BORING NO.        | B-1       | B-1         | B-1         | B-1         |  |
| SAMPLE NO.        | SS-3      | SS-6        | SS-7        | SS-12       |  |
| SAMPLE DEPTH      | 4.0 - 6.0 | 13.5 - 15.0 | 18.5 - 20.0 | 43.5 - 45.0 |  |
| WATER CONTENT, W% | 10.3      | 16.5        | 252.9       | 16.9        |  |

|                   |  |  |  |  |  |
|-------------------|--|--|--|--|--|
| BORING NO.        |  |  |  |  |  |
| SAMPLE NO.        |  |  |  |  |  |
| SAMPLE DEPTH      |  |  |  |  |  |
| WATER CONTENT, W% |  |  |  |  |  |

|                   |  |  |  |  |  |
|-------------------|--|--|--|--|--|
| BORING NO.        |  |  |  |  |  |
| SAMPLE NO.        |  |  |  |  |  |
| SAMPLE DEPTH      |  |  |  |  |  |
| WATER CONTENT, W% |  |  |  |  |  |

|                   |  |  |  |  |  |
|-------------------|--|--|--|--|--|
| BORING NO.        |  |  |  |  |  |
| SAMPLE NO.        |  |  |  |  |  |
| SAMPLE DEPTH      |  |  |  |  |  |
| WATER CONTENT, W% |  |  |  |  |  |



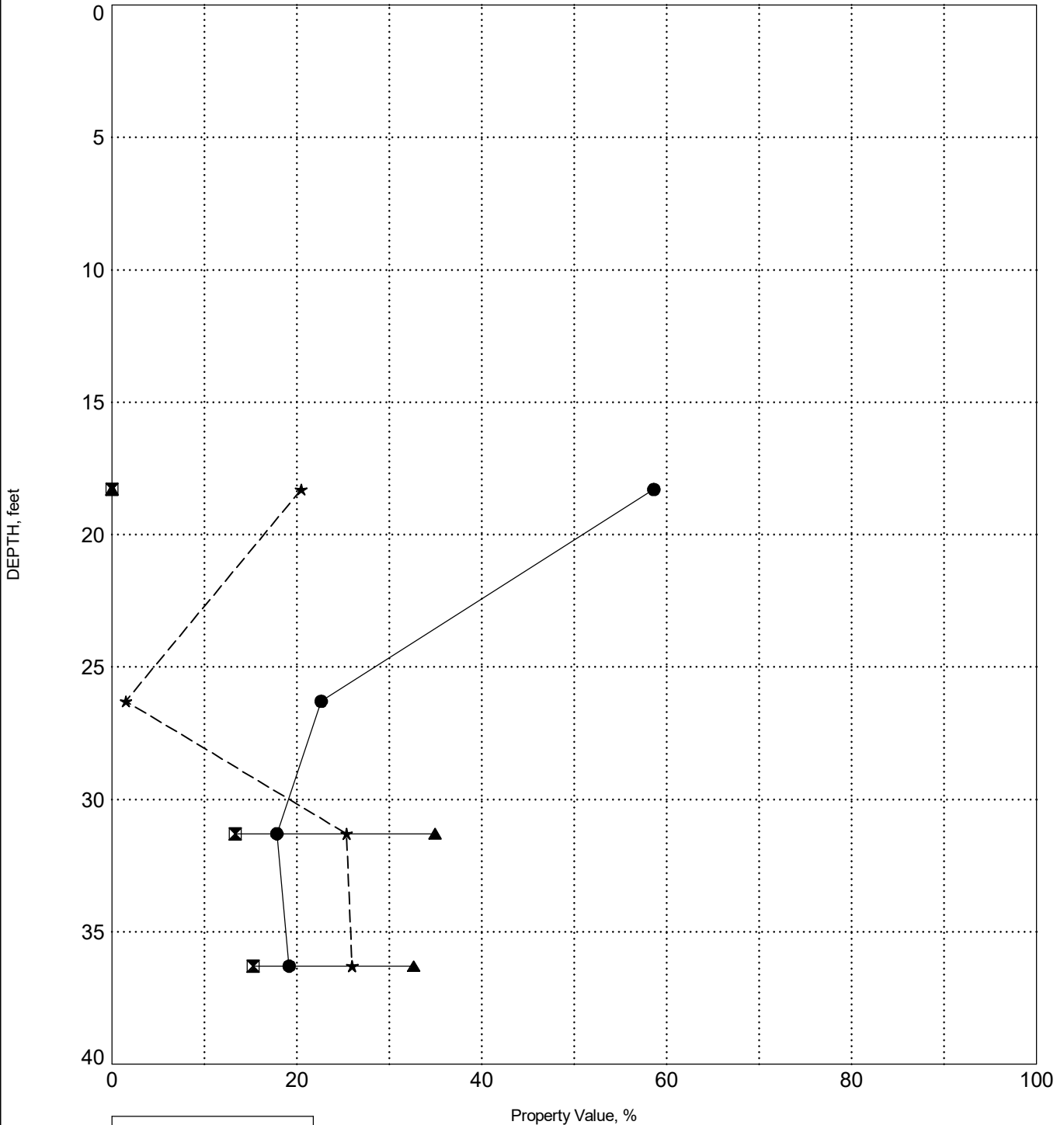
# INDEX PROPERTIES VERSUS DEPTH

PROJECT ID P042879

PROJECT NAME SC 83 over Little Pee Dee River

PROJECT COUNTY Marlboro

## BORING B-2



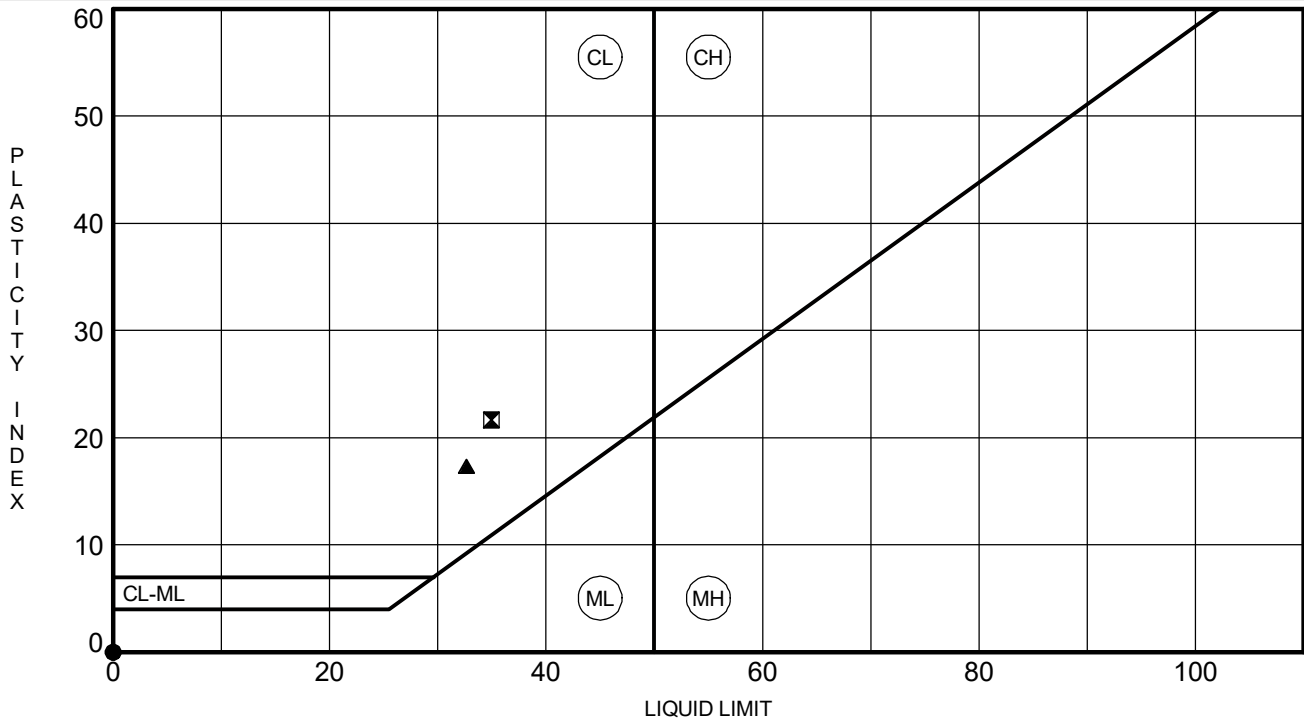
| LEGEND |               |
|--------|---------------|
| ●      | Water Content |
| ⊠      | Plastic Limit |
| ▲      | Liquid Limit  |
| ★      | Fines         |

## ATTERBERG LIMITS' RESULTS

**PROJECT ID** P042879

**PROJECT NAME** SC 83 over Little Pee Dee River

**PROJECT COUNTY** Marlboro

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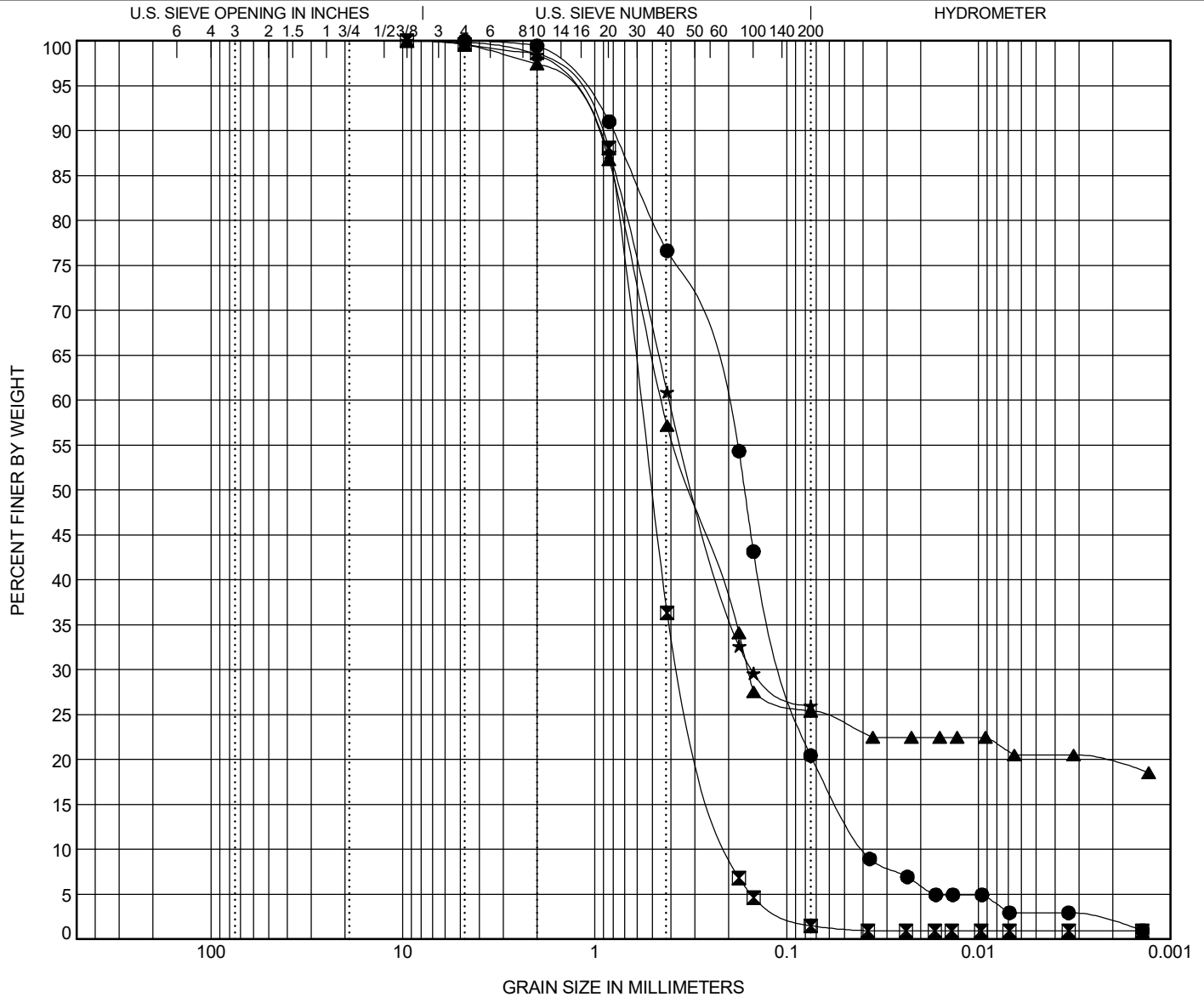


# GRAIN SIZE DISTRIBUTION

PROJECT ID P042879

PROJECT NAME SC 83 over Little Pee Dee River

PROJECT COUNTY Marlboro



| COBBLES | GRAVEL |      | SAND   |        |      | SILT OR CLAY |
|---------|--------|------|--------|--------|------|--------------|
|         | coarse | fine | coarse | medium | fine |              |

| BOREHOLE | DEPTH | Classification                |       |       |       |         |       | LL    | PL    | PI | Cc   | Cu   |
|----------|-------|-------------------------------|-------|-------|-------|---------|-------|-------|-------|----|------|------|
| ● B-2    | 18.3  | SILTY SAND (SM/A-2-4)         |       |       |       |         |       | NP    | NP    | NP | 1.15 | 5.60 |
| ☒ B-2    | 26.3  | POORLY GRADED SAND (SP/A-1-b) |       |       |       |         |       |       |       |    | 1.09 | 2.97 |
| ▲ B-2    | 31.3  | CLAYEY SAND (SC/A-2-6)        |       |       |       |         |       | 35    | 13    | 22 |      |      |
| ★ B-2    | 36.3  | CLAYEY SAND (SC/A-2-6)        |       |       |       |         |       | 33    | 15    | 18 |      |      |
|          |       |                               |       |       |       |         |       |       |       |    |      |      |
| BOREHOLE | DEPTH | D90                           | D60   | D30   | D10   | %Gravel | %Sand | %Silt | %Clay |    |      |      |
| ● B-2    | 18.3  | 0.801                         | 0.22  | 0.1   | 0.039 | 0.0     | 79.5  | 17.5  | 3.0   |    |      |      |
| ☒ B-2    | 26.3  | 0.982                         | 0.577 | 0.349 | 0.194 | 0.4     | 98.1  | 0.6   | 0.9   |    |      |      |
| ▲ B-2    | 31.3  | 1.093                         | 0.449 | 0.159 |       | 0.4     | 74.2  | 4.9   | 20.5  |    |      |      |
| ★ B-2    | 36.3  | 1.024                         | 0.408 | 0.152 |       | 0.2     | 73.9  | 26.0  |       |    |      |      |
|          |       |                               |       |       |       |         |       |       |       |    |      |      |

**F&ME CONSULTANTS, INC**  
**211 Business Park Blvd.**  
**Columbia, SC 29203**

**MOISTURE CONTENT DETERMINATION**  
**(AASHTO T265)**

|                             |                                 |                          |           |
|-----------------------------|---------------------------------|--------------------------|-----------|
| <b>PROJECT:</b>             | SC 83 over Little Pee Dee River | <b>SCDOT PROJECT ID:</b> | P042879   |
| <b>SAMPLE NUMBER:</b>       | 25-0825                         | <b>DATE REQUESTED:</b>   | 3/17/2025 |
| <b>DESCRIPTION OF SOIL:</b> | Various                         |                          |           |
| <b>TESTED BY:</b>           | JM & AB                         | <b>DATE OF TESTING:</b>  | 3/18/2025 |
| <b>WEIGHED BY:</b>          | AGB                             | <b>DATE OF WEIGHING:</b> | 3/19/2025 |

|                   |             |             |             |             |  |
|-------------------|-------------|-------------|-------------|-------------|--|
| BORING NO.        | B-2         | B-2         | B-2         | B-2         |  |
| SAMPLE NO.        | SS-1        | SS-5        | SS-7        | SS-8        |  |
| SAMPLE DEPTH      | 16.3 - 18.3 | 24.3 - 26.3 | 29.8 - 31.3 | 34.8 - 36.3 |  |
| WATER CONTENT, W% | 58.6        | 22.6        | 17.8        | 19.2        |  |

|                   |  |  |  |  |  |
|-------------------|--|--|--|--|--|
| BORING NO.        |  |  |  |  |  |
| SAMPLE NO.        |  |  |  |  |  |
| SAMPLE DEPTH      |  |  |  |  |  |
| WATER CONTENT, W% |  |  |  |  |  |

|                   |  |  |  |  |  |
|-------------------|--|--|--|--|--|
| BORING NO.        |  |  |  |  |  |
| SAMPLE NO.        |  |  |  |  |  |
| SAMPLE DEPTH      |  |  |  |  |  |
| WATER CONTENT, W% |  |  |  |  |  |

|                   |  |  |  |  |  |
|-------------------|--|--|--|--|--|
| BORING NO.        |  |  |  |  |  |
| SAMPLE NO.        |  |  |  |  |  |
| SAMPLE DEPTH      |  |  |  |  |  |
| WATER CONTENT, W% |  |  |  |  |  |



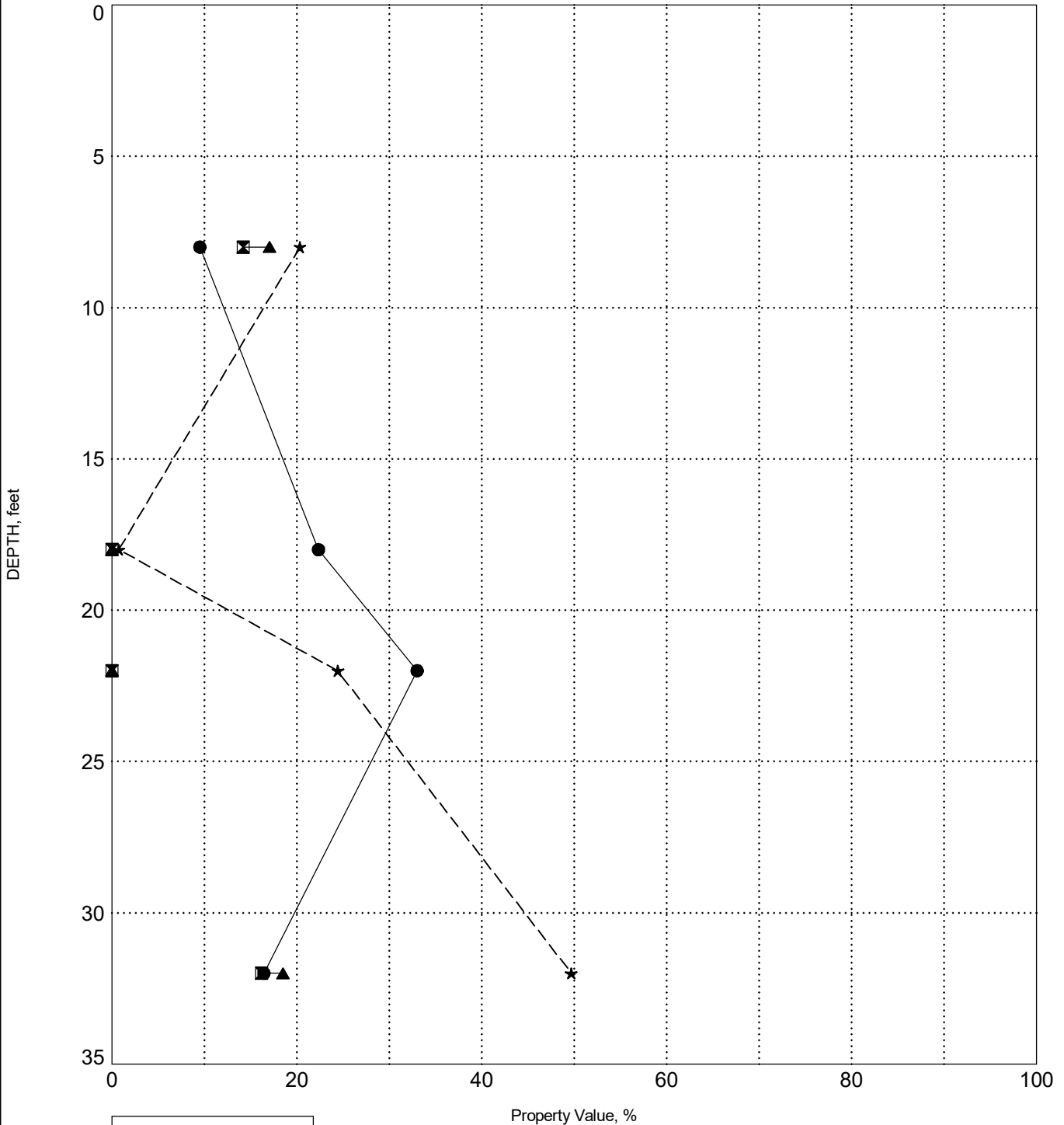
# INDEX PROPERTIES VERSUS DEPTH

PROJECT ID P042879

PROJECT NAME SC 83 over Little Pee Dee River

PROJECT COUNTY Marlboro

## BORING B-3



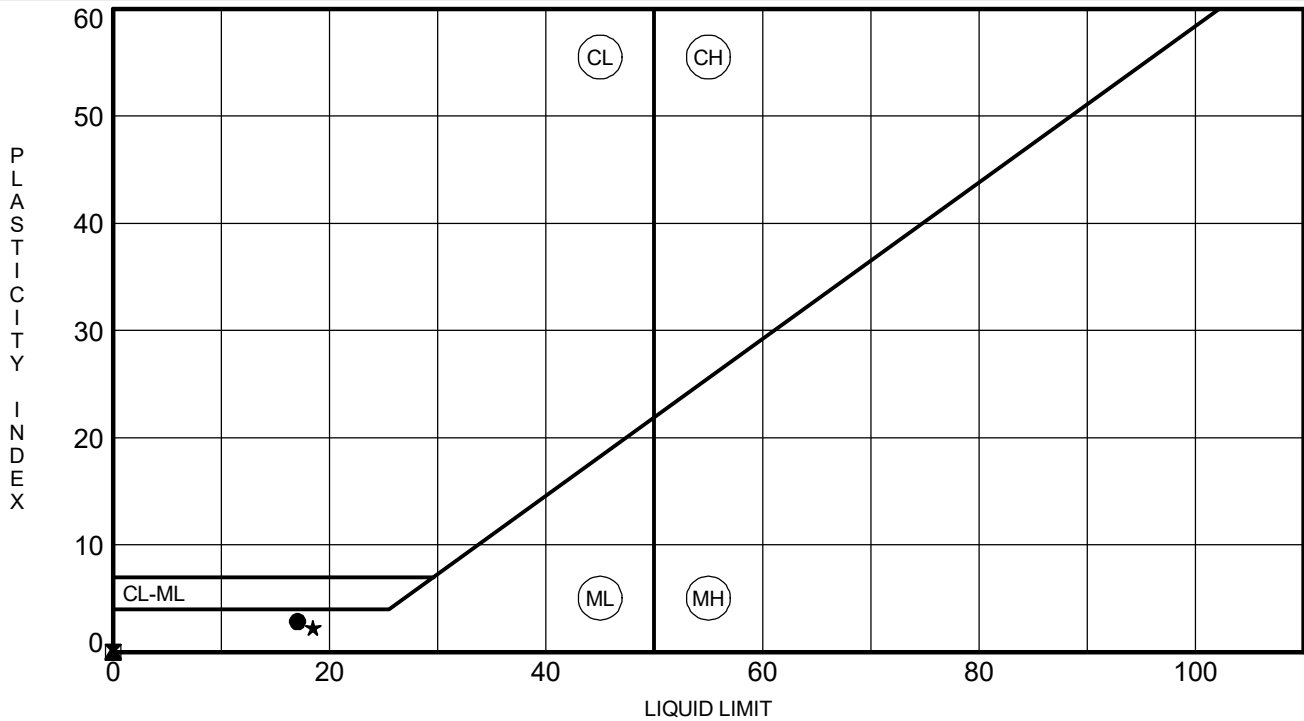
| LEGEND |               |
|--------|---------------|
| ●      | Water Content |
| ■      | Plastic Limit |
| ▲      | Liquid Limit  |
| ★      | Fines         |

## ATTERBERG LIMITS' RESULTS

**PROJECT ID** P042879

**PROJECT NAME** SC 83 over Little Pee Dee River

**PROJECT COUNTY** Marlboro

[illegible]

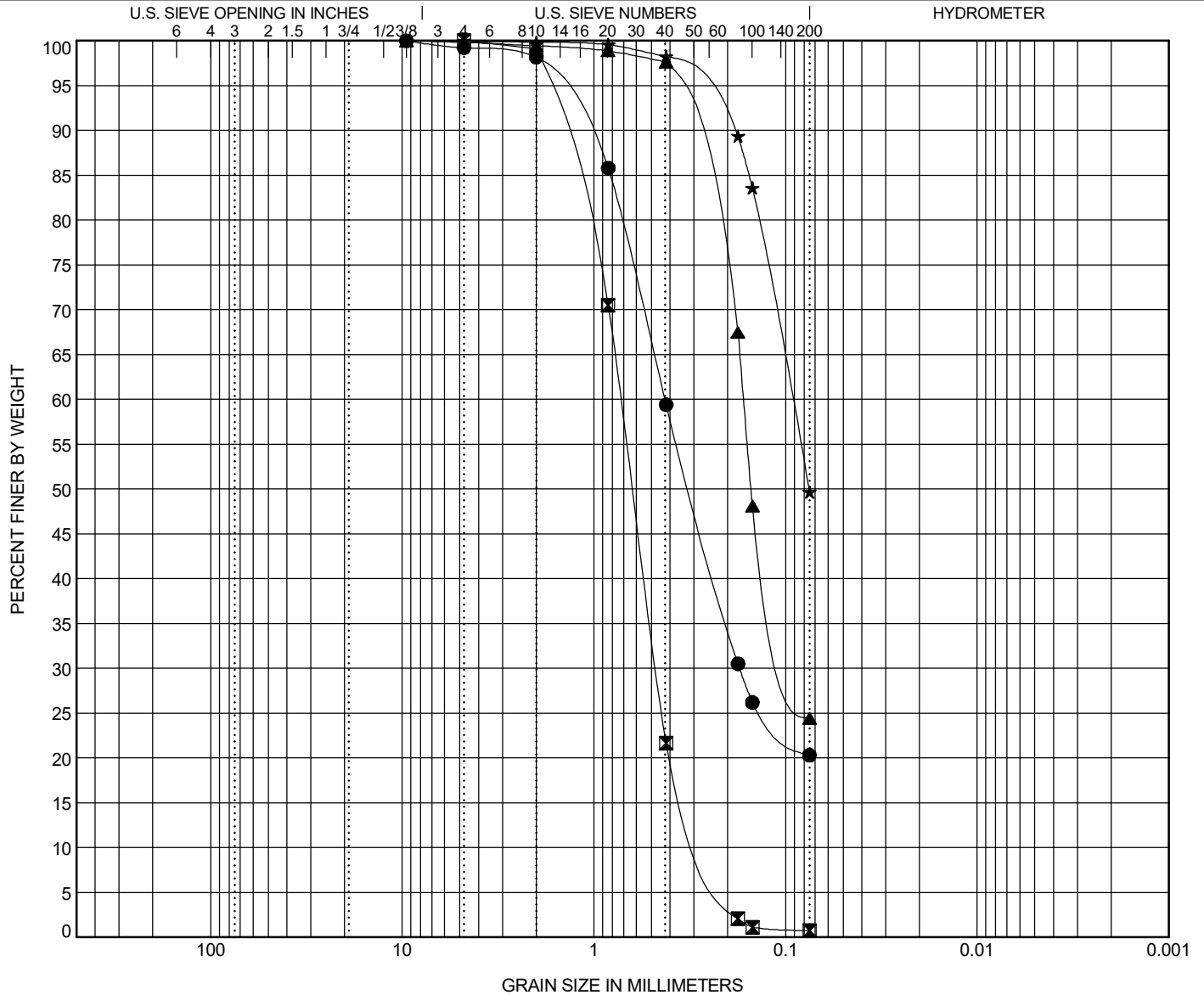


# GRAIN SIZE DISTRIBUTION

PROJECT ID P042879

PROJECT NAME SC 83 over Little Pee Dee River

PROJECT COUNTY Marlboro



| COBBLES | GRAVEL |      | SAND   |        |      | SILT OR CLAY |
|---------|--------|------|--------|--------|------|--------------|
|         | coarse | fine | coarse | medium | fine |              |

| BOREHOLE | DEPTH | Classification                |       |       |       |         |       | LL    | PL    | PI | Cc   | Cu   |
|----------|-------|-------------------------------|-------|-------|-------|---------|-------|-------|-------|----|------|------|
| ● B-3    | 8.0   | SILTY SAND (SM/A-2-4)         |       |       |       |         |       | 17    | 14    | 3  |      |      |
| ☒ B-3    | 18.0  | POORLY GRADED SAND (SP/A-1-b) |       |       |       |         |       | NP    | NP    | NP | 1.23 | 2.88 |
| ▲ B-3    | 22.0  | SILTY SAND (SM/A-2-4)         |       |       |       |         |       | NP    | NP    | NP |      |      |
| ★ B-3    | 32.0  | SILTY SAND (SM/A-4)           |       |       |       |         |       | 18    | 16    | 2  |      |      |
|          |       |                               |       |       |       |         |       |       |       |    |      |      |
| BOREHOLE | DEPTH | D90                           | D60   | D30   | D10   | %Gravel | %Sand | %Silt | %Clay |    |      |      |
| ● B-3    | 8.0   | 1.127                         | 0.427 | 0.173 |       | 0.8     | 78.9  | 20.3  |       |    |      |      |
| ☒ B-3    | 18.0  | 1.517                         | 0.724 | 0.473 | 0.251 | 0.0     | 99.2  | 0.8   |       |    |      |      |
| ▲ B-3    | 22.0  | 0.337                         | 0.166 | 0.088 |       | 0.2     | 75.4  | 24.4  |       |    |      |      |
| ★ B-3    | 32.0  | 0.188                         | 0.092 |       |       | 0.0     | 50.3  | 49.7  |       |    |      |      |
|          |       |                               |       |       |       |         |       |       |       |    |      |      |



**F&ME CONSULTANTS, INC**  
**211 Business Park Blvd.**  
**Columbia, SC 29203**

**MOISTURE CONTENT DETERMINATION**  
**(AASHTO T265)**

|                             |                                 |                          |           |
|-----------------------------|---------------------------------|--------------------------|-----------|
| <b>PROJECT:</b>             | SC 83 over Little Pee Dee River | <b>SCDOT PROJECT ID:</b> | P042879   |
| <b>SAMPLE NUMBER:</b>       | 25-0842                         | <b>DATE REQUESTED:</b>   | 3/17/2025 |
| <b>DESCRIPTION OF SOIL:</b> | Various                         |                          |           |
| <b>TESTED BY:</b>           | JM & AB                         | <b>DATE OF TESTING:</b>  | 3/19/2025 |
| <b>WEIGHED BY:</b>          | AGB                             | <b>DATE OF WEIGHING:</b> | 3/20/2025 |

|                   |           |             |             |             |  |
|-------------------|-----------|-------------|-------------|-------------|--|
| BORING NO.        | B-3       | B-3         | B-3         | B-3         |  |
| SAMPLE NO.        | SS-4      | SS-10       | SS-11       | SS-16       |  |
| SAMPLE DEPTH      | 6.0 - 8.0 | 18.0 - 20.0 | 20.0 - 22.0 | 30.0 - 32.0 |  |
| WATER CONTENT, W% | 9.5       | 22.3        | 33.0        | 16.4        |  |

|                   |  |  |  |  |  |
|-------------------|--|--|--|--|--|
| BORING NO.        |  |  |  |  |  |
| SAMPLE NO.        |  |  |  |  |  |
| SAMPLE DEPTH      |  |  |  |  |  |
| WATER CONTENT, W% |  |  |  |  |  |

|                   |  |  |  |  |  |
|-------------------|--|--|--|--|--|
| BORING NO.        |  |  |  |  |  |
| SAMPLE NO.        |  |  |  |  |  |
| SAMPLE DEPTH      |  |  |  |  |  |
| WATER CONTENT, W% |  |  |  |  |  |

|                   |  |  |  |  |  |
|-------------------|--|--|--|--|--|
| BORING NO.        |  |  |  |  |  |
| SAMPLE NO.        |  |  |  |  |  |
| SAMPLE DEPTH      |  |  |  |  |  |
| WATER CONTENT, W% |  |  |  |  |  |



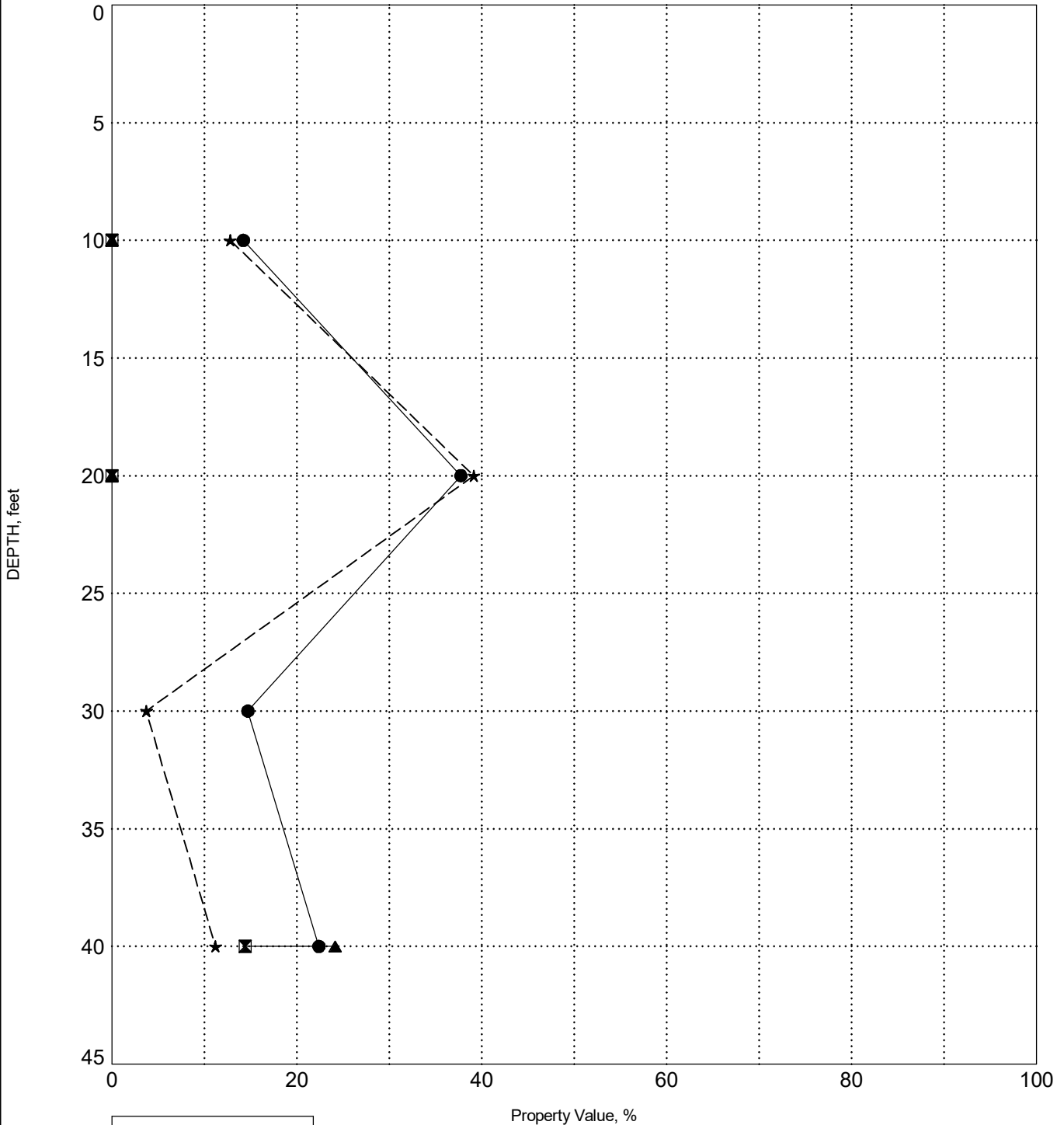
# INDEX PROPERTIES VERSUS DEPTH

PROJECT ID P042879

PROJECT NAME SC 83 over Little Pee Dee River

PROJECT COUNTY Marlboro

## BORING B-4/DHT



| LEGEND |               |
|--------|---------------|
| ●      | Water Content |
| ☒      | Plastic Limit |
| ▲      | Liquid Limit  |
| ★      | Fines         |



**PROJECT NAME** SC 83 over Little Pee Dee River

[illegible]

ATTERBERG LIMITS G7100.010 - TASK 00001 - SC 83 OVER LITTLE PEEDEE.GPJ SCDOT DATA TEMPLATE\_01 30\_2015.GDT 3/24/25

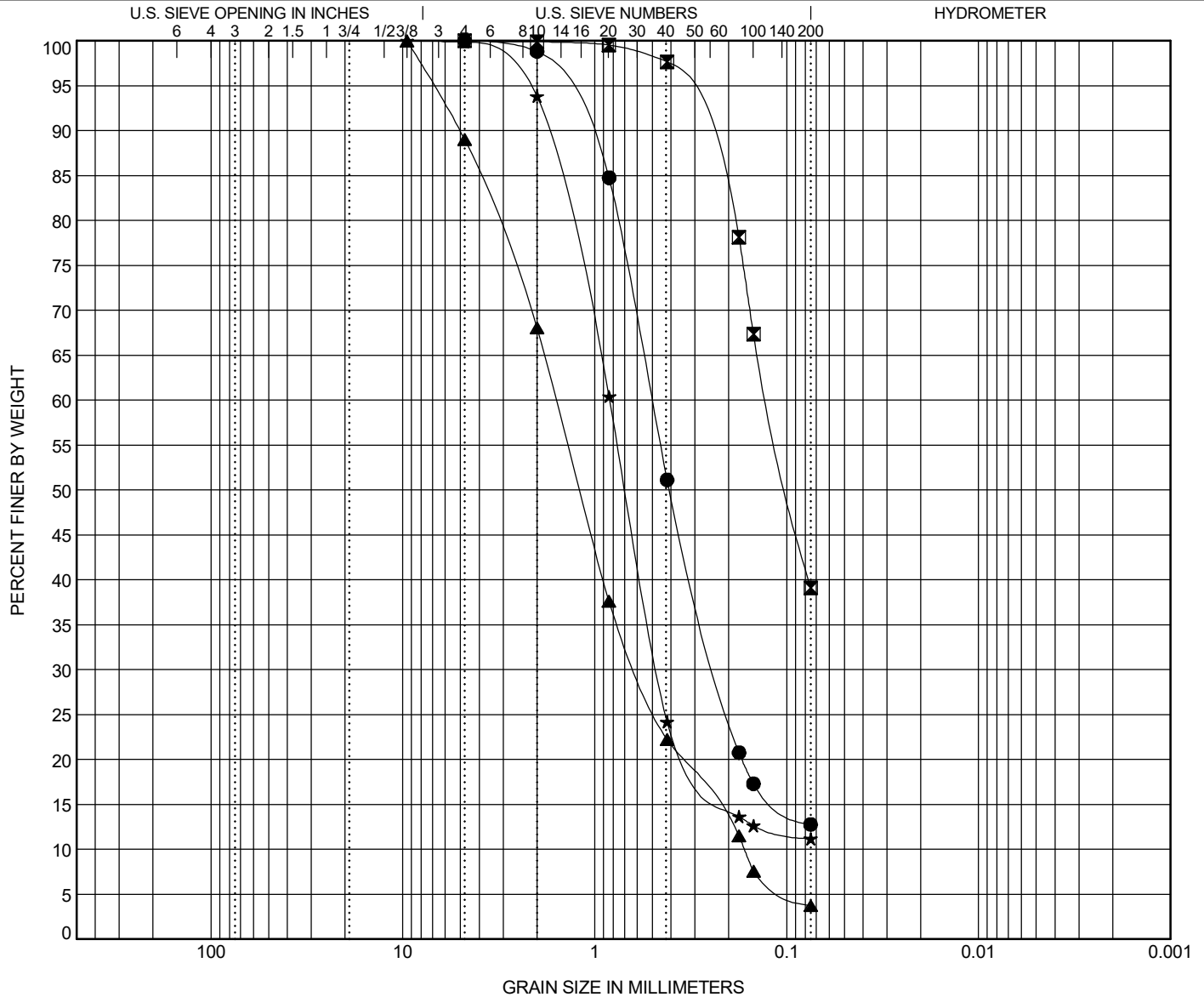


# GRAIN SIZE DISTRIBUTION

PROJECT ID P042879

PROJECT NAME SC 83 over Little Pee Dee River

PROJECT COUNTY Marlboro



| COBBLES | GRAVEL |      | SAND   |        |      | SILT OR CLAY |
|---------|--------|------|--------|--------|------|--------------|
|         | coarse | fine | coarse | medium | fine |              |

| BOREHOLE  | DEPTH | Classification                             | LL | PL | PI | Cc   | Cu    |
|-----------|-------|--|----|----|----|------|-------|
| ● B-4/DHT | 10.0  | SILTY SAND (SM/A-2-4)                      | NP | NP | NP |      |       |
| ☒ B-4/DHT | 20.0  | SILTY SAND (SM/A-4)                        | NP | NP | NP |      |       |
| ▲ B-4/DHT | 30.0  | WELL-GRADED SAND (SW/A-1-b)                |    |    |    | 1.35 | 9.59  |
| ★ B-4/DHT | 40.0  | POORLY GRADED SAND with CLAY (SP-SC/A-2-4) | 24 | 14 | 10 | 6.15 | 19.41 |

| BOREHOLE  | DEPTH | D90   | D60   | D30   | D10   | %Gravel | %Sand | %Silt | %Clay |
|-----------|-------|-------|-------|-------|-------|---------|-------|-------|-------|
| ● B-4/DHT | 10.0  | 1.161 | 0.504 | 0.23  |       | 0.0     | 87.2  | 12.8  |       |
| ☒ B-4/DHT | 20.0  | 0.299 | 0.125 |       |       | 0.0     | 60.9  | 39.1  |       |
| ▲ B-4/DHT | 30.0  | 5.057 | 1.591 | 0.596 | 0.166 | 11.0    | 85.3  | 3.7   |       |
| ★ B-4/DHT | 40.0  | 1.81  | 0.834 | 0.469 |       | 0.1     | 88.7  | 11.2  |       |

**F&ME CONSULTANTS, INC**  
**211 Business Park Blvd.**  
**Columbia, SC 29203**

**MOISTURE CONTENT DETERMINATION**  
**(AASHTO T265)**

|                             |                                 |                          |           |
|-----------------------------|---------------------------------|--------------------------|-----------|
| <b>PROJECT:</b>             | SC 83 over Little Pee Dee River | <b>SCDOT PROJECT ID:</b> | P042879   |
| <b>SAMPLE NUMBER:</b>       | 25-0824                         | <b>DATE REQUESTED:</b>   | 3/17/2025 |
| <b>DESCRIPTION OF SOIL:</b> | Various                         |                          |           |
| <b>TESTED BY:</b>           | JM & AB                         | <b>DATE OF TESTING:</b>  | 3/18/2025 |
| <b>WEIGHED BY:</b>          | AGB                             | <b>DATE OF WEIGHING:</b> | 3/19/2025 |

|                   |            |             |             |             |  |
|-------------------|------------|-------------|-------------|-------------|--|
| BORING NO.        | B-4/DHT    | B-4/DHT     | B-4/DHT     | B-4/DHT     |  |
| SAMPLE NO.        | SS-5       | SS-7        | SS-9        | SS-11       |  |
| SAMPLE DEPTH      | 8.0 - 10.0 | 18.5 - 20.0 | 28.5 - 30.0 | 38.5 - 40.0 |  |
| WATER CONTENT, W% | 14.2       | 37.7        | 14.7        | 22.4        |  |

|                   |  |  |  |  |  |
|-------------------|--|--|--|--|--|
| BORING NO.        |  |  |  |  |  |
| SAMPLE NO.        |  |  |  |  |  |
| SAMPLE DEPTH      |  |  |  |  |  |
| WATER CONTENT, W% |  |  |  |  |  |

|                   |  |  |  |  |  |
|-------------------|--|--|--|--|--|
| BORING NO.        |  |  |  |  |  |
| SAMPLE NO.        |  |  |  |  |  |
| SAMPLE DEPTH      |  |  |  |  |  |
| WATER CONTENT, W% |  |  |  |  |  |

|                   |  |  |  |  |  |
|-------------------|--|--|--|--|--|
| BORING NO.        |  |  |  |  |  |
| SAMPLE NO.        |  |  |  |  |  |
| SAMPLE DEPTH      |  |  |  |  |  |
| WATER CONTENT, W% |  |  |  |  |  |

# **SC 83 over Little Pee Dee River**

## **Geotechnical Baseline Report**

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# **APPENDIX**

## **SECTION 5      LABORATORY TEST RESULTS**

### **SECTION 5B      BULK SOIL SAMPLES**



## SUMMARY OF LABORATORY RESULTS

PROJECT ID P042879

PROJECT NAME SC 83 over Little Pee Dee River

PROJECT COUNTY Marlboro

| Boring No. | Sample Depth (ft.) | Liquid Limit | Plastic Limit | Plasticity Index | %<#200 Sieve | Soil Classification | Moisture Content (%) | Max Dry Density (PCF) | Optimum Moisture Content (%) | C (psi) | $\phi$ (Degrees) | C' (psi) | $\phi'$ (Degrees) |
|------------|--------------------|--------------|---------------|------------------|--------------|---------------------|----------------------|-----------------------|------------------------------|---------|------------------|----------|-------------------|
| BS-1       | 0.0 – 5.0          | NP           | NP            | NP               | 15.4         | SM                  | 10.5                 | 121.4                 | 10.4                         | --      | --               | 4.41     | 32.7              |
| BS-2       | 0.0 – 5.0          | NP           | NP            | NP               | 18.2         | SM                  | 11.1                 | 121.3                 | 11.1                         | --      | --               | --       | --                |



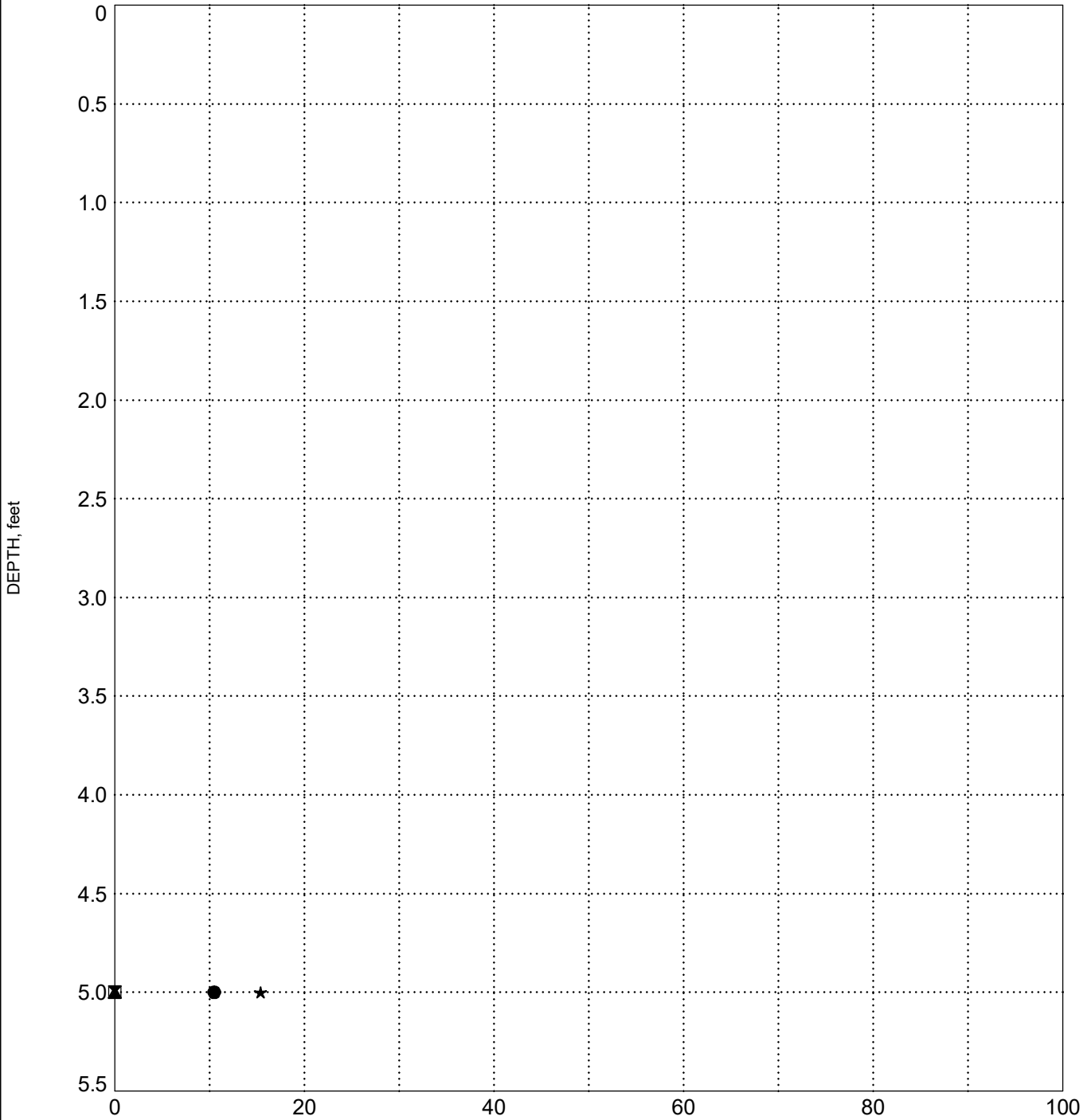
# INDEX PROPERTIES VERSUS DEPTH

PROJECT ID P042879

PROJECT NAME SC 83 over Little Pee Dee River

PROJECT COUNTY Marlboro

## BORING BS-1



| LEGEND |               |
|--------|---------------|
| ●      | Water Content |
| ☒      | Plastic Limit |
| ▲      | Liquid Limit  |
| ★      | Fines         |



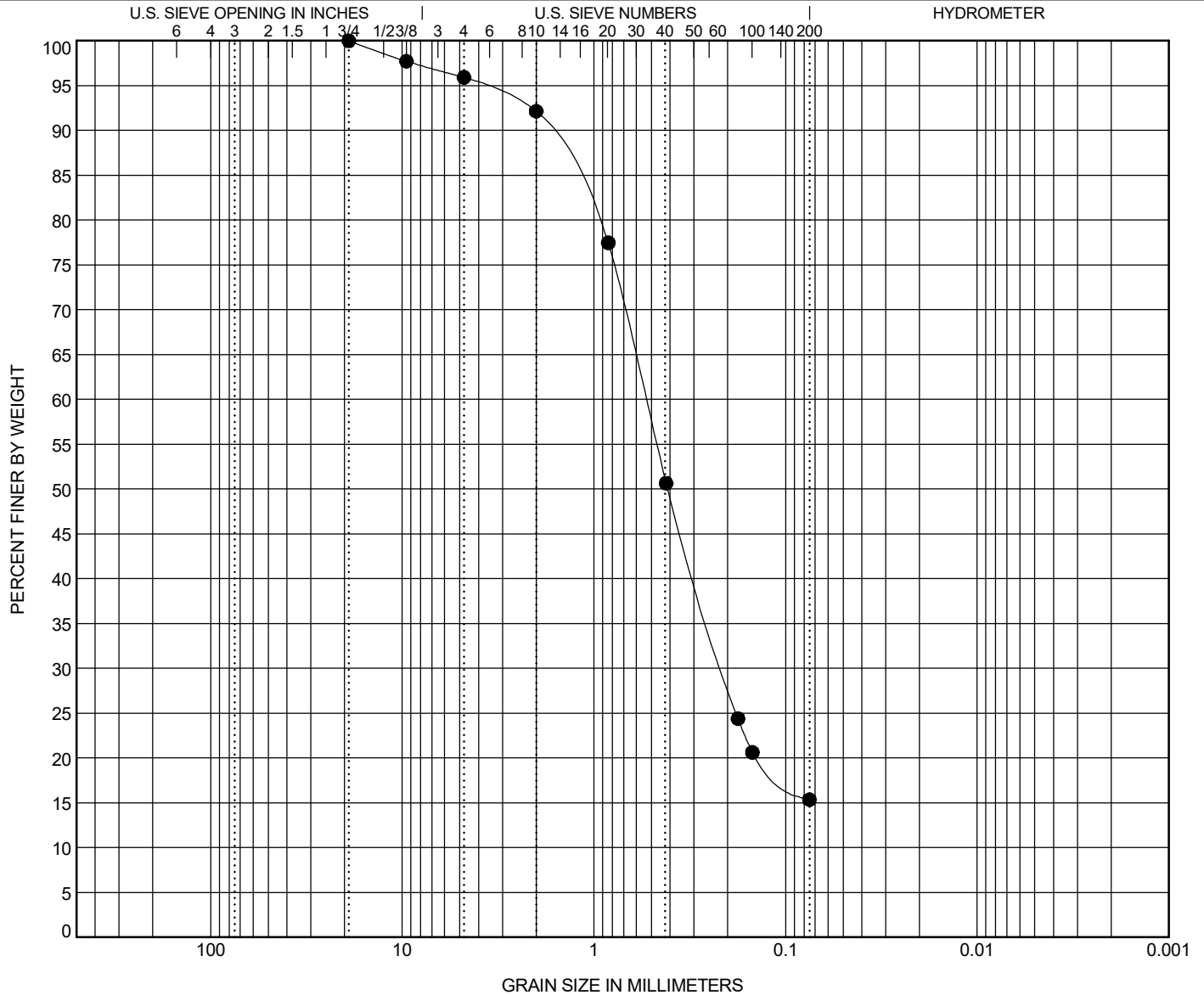


# GRAIN SIZE DISTRIBUTION

PROJECT ID P042879

PROJECT NAME SC 83 over Little Pee Dee River

PROJECT COUNTY Marlboro



**F&ME CONSULTANTS, INC**  
**211 Business Park Blvd.**  
**Columbia, SC 29203**

**MOISTURE CONTENT DETERMINATION**  
**(AASHTO T265)**

|                             |                                 |                          |           |
|-----------------------------|---------------------------------|--------------------------|-----------|
| <b>PROJECT:</b>             | SC 83 over Little Pee Dee River | <b>SCDOT PROJECT ID:</b> | P042879   |
| <b>SAMPLE NUMBER:</b>       | 25-0586                         | <b>DATE REQUESTED:</b>   | 2/26/2025 |
| <b>DESCRIPTION OF SOIL:</b> | Silty SAND (SM/A-2-4)           |                          |           |
| <b>TESTED BY:</b>           | AG & AB                         | <b>DATE OF TESTING:</b>  | 2/27/2025 |
| <b>WEIGHED BY:</b>          | TE                              | <b>DATE OF WEIGHING:</b> | 2/28/2025 |

|                   |           |  |  |  |  |
|-------------------|-----------|--|--|--|--|
| BORING NO.        | BS-1      |  |  |  |  |
| SAMPLE NO.        | --        |  |  |  |  |
| SAMPLE DEPTH      | 0.0 - 5.0 |  |  |  |  |
| WATER CONTENT, W% | 10.5      |  |  |  |  |

|                   |  |  |  |  |  |
|-------------------|--|--|--|--|--|
| BORING NO.        |  |  |  |  |  |
| SAMPLE NO.        |  |  |  |  |  |
| SAMPLE DEPTH      |  |  |  |  |  |
| WATER CONTENT, W% |  |  |  |  |  |

|                   |  |  |  |  |  |
|-------------------|--|--|--|--|--|
| BORING NO.        |  |  |  |  |  |
| SAMPLE NO.        |  |  |  |  |  |
| SAMPLE DEPTH      |  |  |  |  |  |
| WATER CONTENT, W% |  |  |  |  |  |

|                   |  |  |  |  |  |
|-------------------|--|--|--|--|--|
| BORING NO.        |  |  |  |  |  |
| SAMPLE NO.        |  |  |  |  |  |
| SAMPLE DEPTH      |  |  |  |  |  |
| WATER CONTENT, W% |  |  |  |  |  |

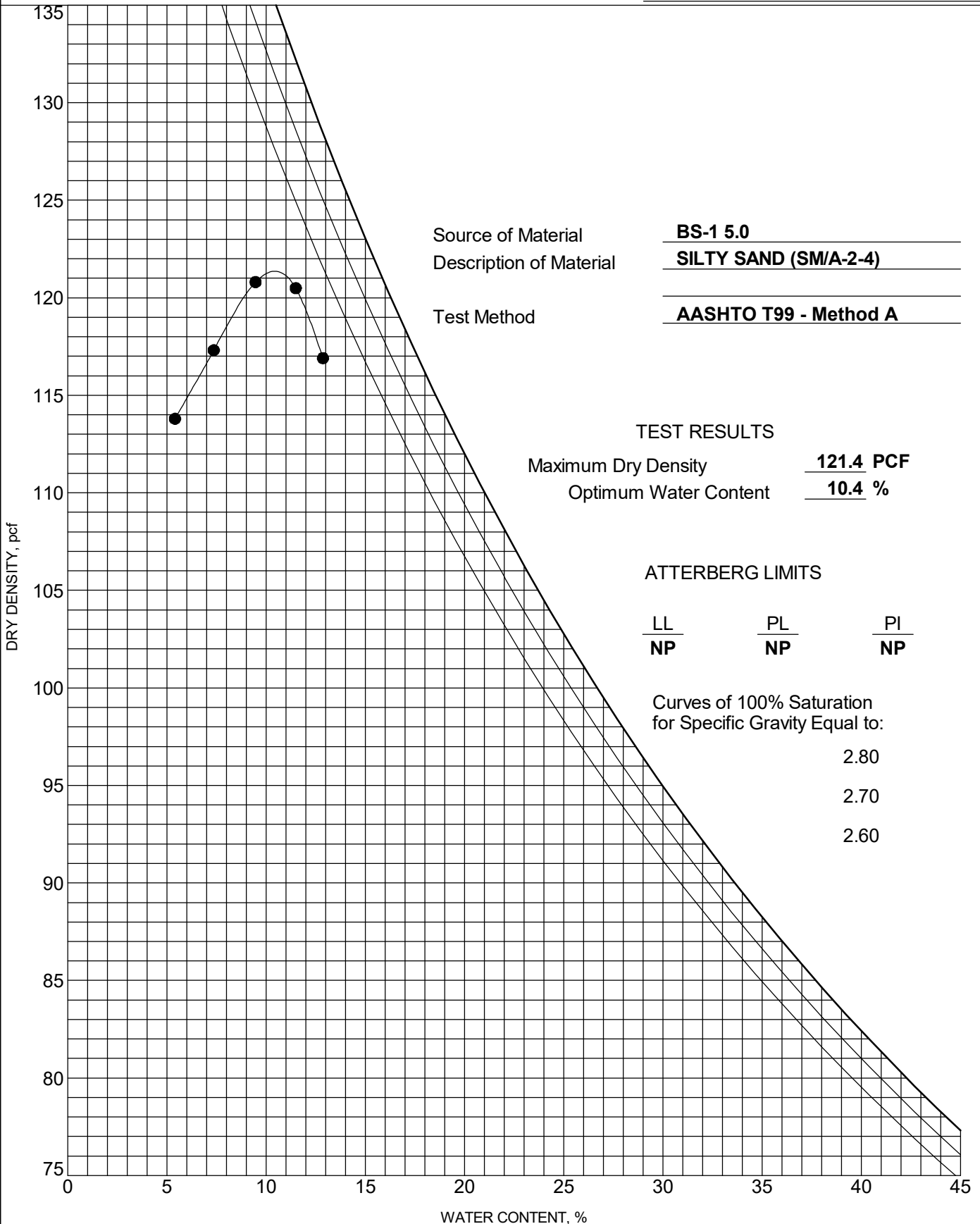


# MOISTURE-DENSITY RELATIONSHIP

PROJECT ID P042879

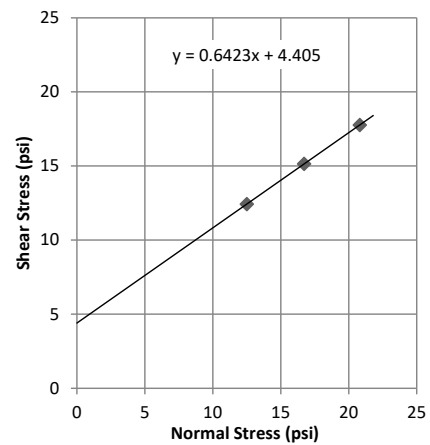
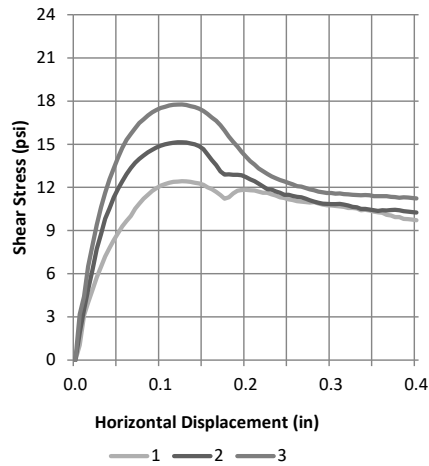
PROJECT NAME SC 83 over Little Pee Dee River

PROJECT COUNTY Marlboro



# DIRECT SHEAR TEST REPORT

## ASTM - D3080 / AASHTO T236



| Sample 1                      |                    |
|-------------------------------|--------------------|
| Normal Stress (psi)           | 12.5               |
| Speed (in./min.)              | 0.01               |
| Sample Width (in.)            | 4.00               |
| Percent Moisture              | 9.7%               |
| Wet Density (pcf)             | 130.0              |
| Dry Density (pcf)             | 118.4              |
| t50 (min.)                    | 0.2                |
| Saturation (%)                | 65.1%              |
| Horizontal Displacement (in.) | Shear Stress (psi) |
| 0.000                         | 0.00               |
| 0.005                         | 1.04               |
| 0.010                         | 3.11               |
| 0.015                         | 3.99               |
| 0.020                         | 4.87               |
| 0.030                         | 6.50               |
| 0.040                         | 7.79               |
| 0.050                         | 8.83               |
| 0.060                         | 9.66               |
| 0.070                         | 10.52              |
| 0.080                         | 11.21              |
| 0.090                         | 11.76              |
| 0.100                         | 12.12              |
| 0.125                         | 12.43              |
| 0.150                         | 12.18              |
| 0.175                         | 11.22              |
| 0.200                         | 11.84              |
| 0.225                         | 11.63              |
| 0.250                         | 11.17              |
| 0.300                         | 10.74              |
| 0.350                         | 10.31              |
| 0.400                         | 9.72               |
| Max Shear Stress              | <b>12.43</b>       |

| Sample 2                      |                    |
|-------------------------------|--------------------|
| Normal Stress (psi)           | 16.7               |
| Speed (in./min.)              | 0.01               |
| Sample Width (in.)            | 4.00               |
| Percent Moisture              | 9.8%               |
| Wet Density (pcf)             | 130.9              |
| Dry Density (pcf)             | 119.2              |
| t50 (min.)                    | 0.2                |
| Saturation (%)                | 67.4%              |
| Horizontal Displacement (in.) | Shear Stress (psi) |
| 0.000                         | 0.00               |
| 0.005                         | 1.91               |
| 0.010                         | 3.51               |
| 0.015                         | 4.89               |
| 0.020                         | 6.26               |
| 0.030                         | 8.76               |
| 0.040                         | 10.54              |
| 0.050                         | 11.91              |
| 0.060                         | 12.93              |
| 0.070                         | 13.71              |
| 0.080                         | 14.21              |
| 0.090                         | 14.61              |
| 0.100                         | 14.90              |
| 0.125                         | 15.13              |
| 0.150                         | 14.66              |
| 0.175                         | 12.89              |
| 0.200                         | 12.71              |
| 0.225                         | 11.89              |
| 0.250                         | 11.48              |
| 0.300                         | 10.84              |
| 0.350                         | 10.41              |
| 0.400                         | 10.26              |
| Max Shear Stress              | <b>15.14</b>       |

| Sample 3                      |                    |
|-------------------------------|--------------------|
| Normal Stress (psi)           | 20.8               |
| Speed (in./min.)              | 0.01               |
| Sample Width (in.)            | 4.00               |
| Percent Moisture              | 9.7%               |
| Wet Density (pcf)             | 130.6              |
| Dry Density (pcf)             | 119.0              |
| t50 (min.)                    | 0.2                |
| Saturation (%)                | 66.3%              |
| Horizontal Displacement (in.) | Shear Stress (psi) |
| 0.000                         | 0.00               |
| 0.005                         | 3.18               |
| 0.010                         | 4.41               |
| 0.015                         | 6.51               |
| 0.020                         | 7.96               |
| 0.030                         | 10.64              |
| 0.040                         | 12.56              |
| 0.050                         | 14.09              |
| 0.060                         | 15.31              |
| 0.070                         | 16.12              |
| 0.080                         | 16.73              |
| 0.090                         | 17.22              |
| 0.100                         | 17.52              |
| 0.125                         | 17.76              |
| 0.150                         | 17.31              |
| 0.175                         | 15.96              |
| 0.200                         | 14.14              |
| 0.225                         | 12.94              |
| 0.250                         | 12.31              |
| 0.300                         | 11.61              |
| 0.350                         | 11.39              |
| 0.400                         | 11.24              |
| Max Shear Stress              | <b>17.76</b>       |

Project Name SC 83 over Little Pee Dee River

F&ME Project No. G7100.010 Date 3/27/2025

SCDOT Project No. P042879

Location/Sample BS-1 / Sample No. 25-0586

Depth/Elevation 0' - 5'

Type of Test : Direct Shear - 4" by 4" Square Shear Box

Sample Type : Remolded 1" Thick, Non-Innundated

Description: Brown Silty Fine to Medium SAND (SM/A-2-4)

PI= NP % Fines= 15.4

SG= 2.65 Box Gap= 2.5 mm

$\phi$ = 32.7°  $C_{apparent}$ = 4.41 psi



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Geotechnical · Environmental · Materials



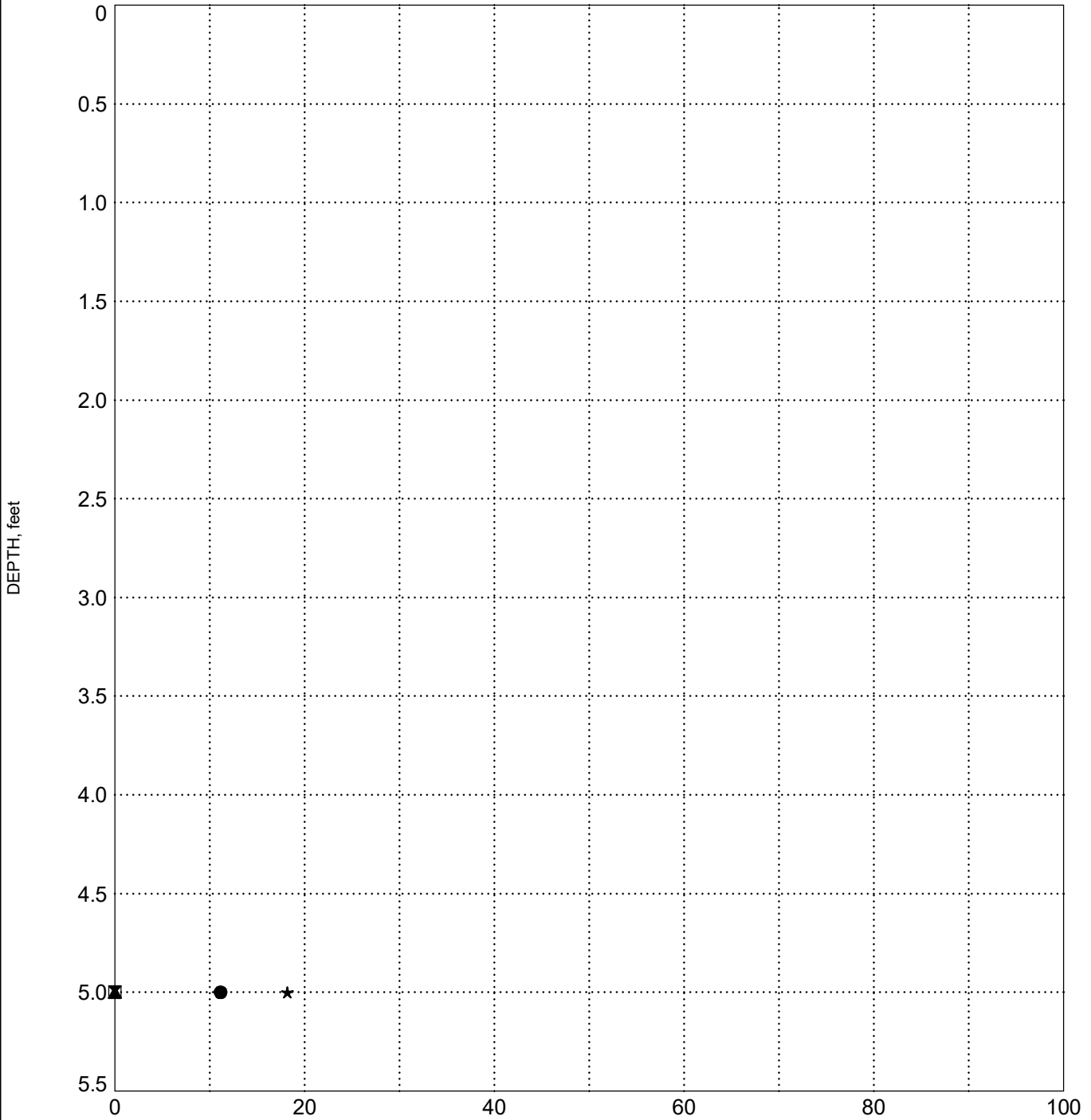
# INDEX PROPERTIES VERSUS DEPTH

PROJECT ID P042879

PROJECT NAME SC 83 over Little Pee Dee River

PROJECT COUNTY Marlboro

## BORING BS-2



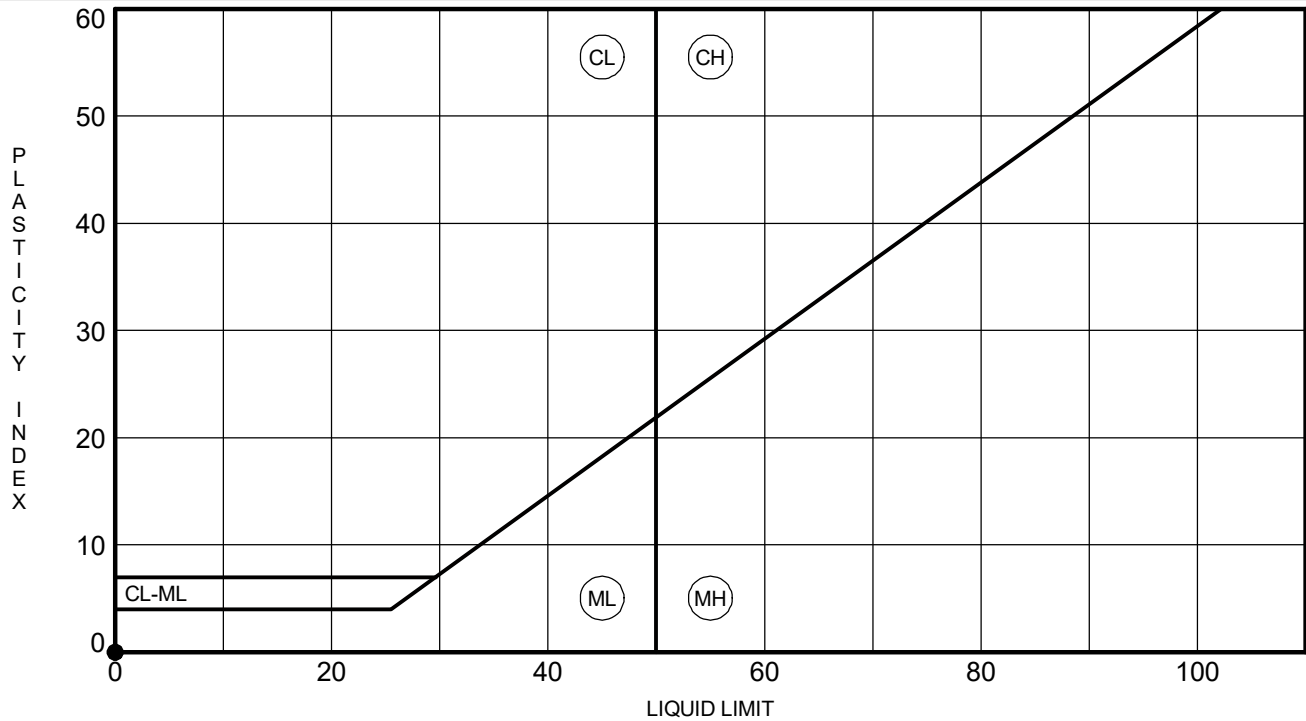
| LEGEND |               |
|--------|---------------|
| ●      | Water Content |
| ☒      | Plastic Limit |
| ▲      | Liquid Limit  |
| ★      | Fines         |

## ATTERBERG LIMITS' RESULTS

**PROJECT ID** P042879

**PROJECT NAME** SC 83 over Little Pee Dee River

**PROJECT COUNTY** Marlboro

[illegible]

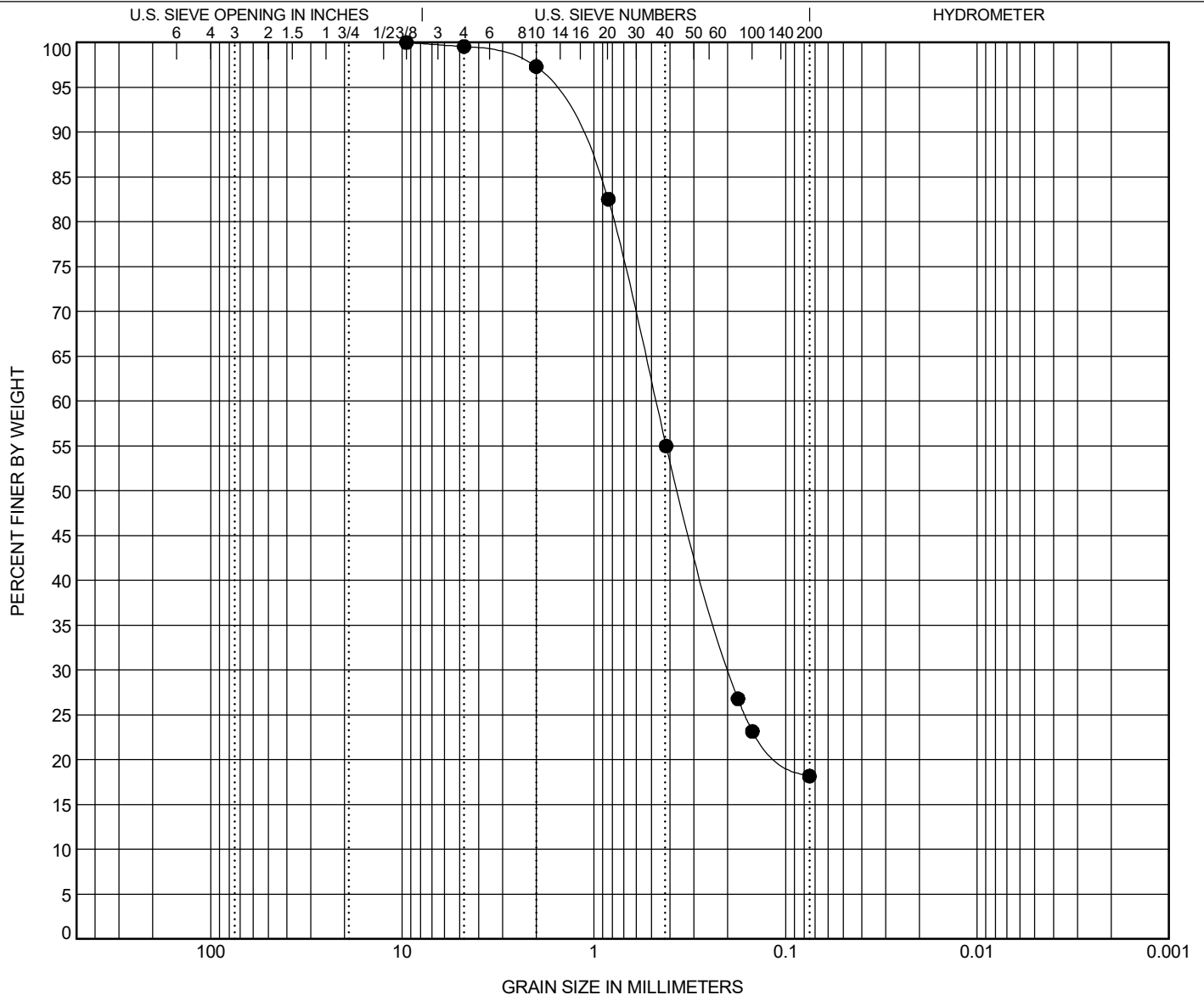


# GRAIN SIZE DISTRIBUTION

PROJECT ID P042879

PROJECT NAME SC 83 over Little Pee Dee River

PROJECT COUNTY Marlboro



**F&ME CONSULTANTS, INC**  
**211 Business Park Blvd.**  
**Columbia, SC 29203**

**MOISTURE CONTENT DETERMINATION**  
**(AASHTO T265)**

|                             |                                 |                          |           |
|-----------------------------|---------------------------------|--------------------------|-----------|
| <b>PROJECT:</b>             | SC 83 over Little Pee Dee River | <b>SCDOT PROJECT ID:</b> | P042879   |
| <b>SAMPLE NUMBER:</b>       | 25-0587                         | <b>DATE REQUESTED:</b>   | 2/26/2025 |
| <b>DESCRIPTION OF SOIL:</b> | Silty SAND (SM/A-2-4)           |                          |           |
| <b>TESTED BY:</b>           | AG & AB                         | <b>DATE OF TESTING:</b>  | 2/27/2025 |
| <b>WEIGHED BY:</b>          | TE                              | <b>DATE OF WEIGHING:</b> | 2/28/2025 |

|                   |           |  |  |  |  |
|-------------------|-----------|--|--|--|--|
| BORING NO.        | BS-2      |  |  |  |  |
| SAMPLE NO.        | --        |  |  |  |  |
| SAMPLE DEPTH      | 0.0 - 5.0 |  |  |  |  |
| WATER CONTENT, W% | 11.1      |  |  |  |  |

|                   |  |  |  |  |  |
|-------------------|--|--|--|--|--|
| BORING NO.        |  |  |  |  |  |
| SAMPLE NO.        |  |  |  |  |  |
| SAMPLE DEPTH      |  |  |  |  |  |
| WATER CONTENT, W% |  |  |  |  |  |

|                   |  |  |  |  |  |
|-------------------|--|--|--|--|--|
| BORING NO.        |  |  |  |  |  |
| SAMPLE NO.        |  |  |  |  |  |
| SAMPLE DEPTH      |  |  |  |  |  |
| WATER CONTENT, W% |  |  |  |  |  |

|                   |  |  |  |  |  |
|-------------------|--|--|--|--|--|
| BORING NO.        |  |  |  |  |  |
| SAMPLE NO.        |  |  |  |  |  |
| SAMPLE DEPTH      |  |  |  |  |  |
| WATER CONTENT, W% |  |  |  |  |  |



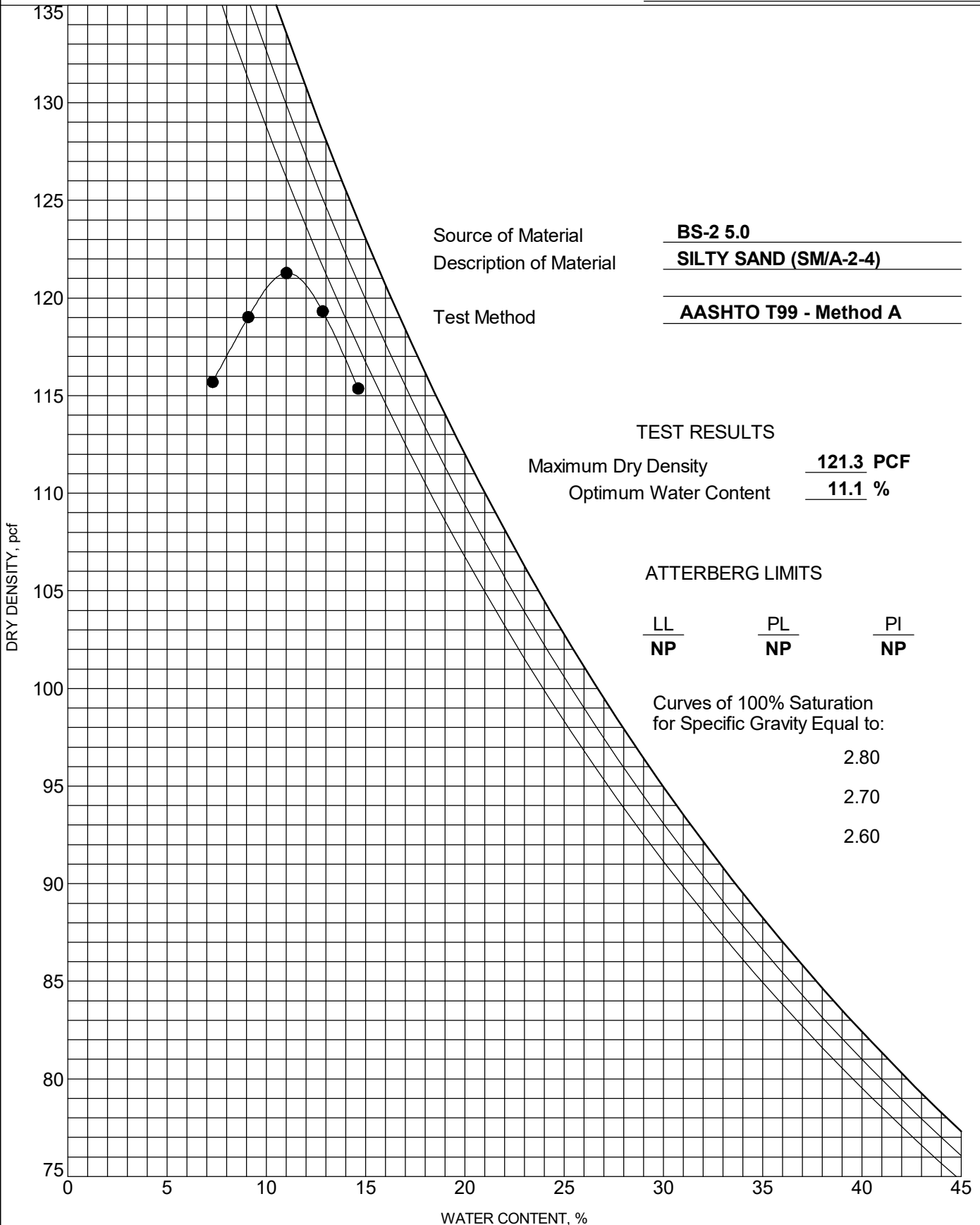


# MOISTURE-DENSITY RELATIONSHIP

PROJECT ID P042879

PROJECT NAME SC 83 over Little Pee Dee River

PROJECT COUNTY Marlboro



# CALIFORNIA BEARING RATIO (CBR) AASHTO T193

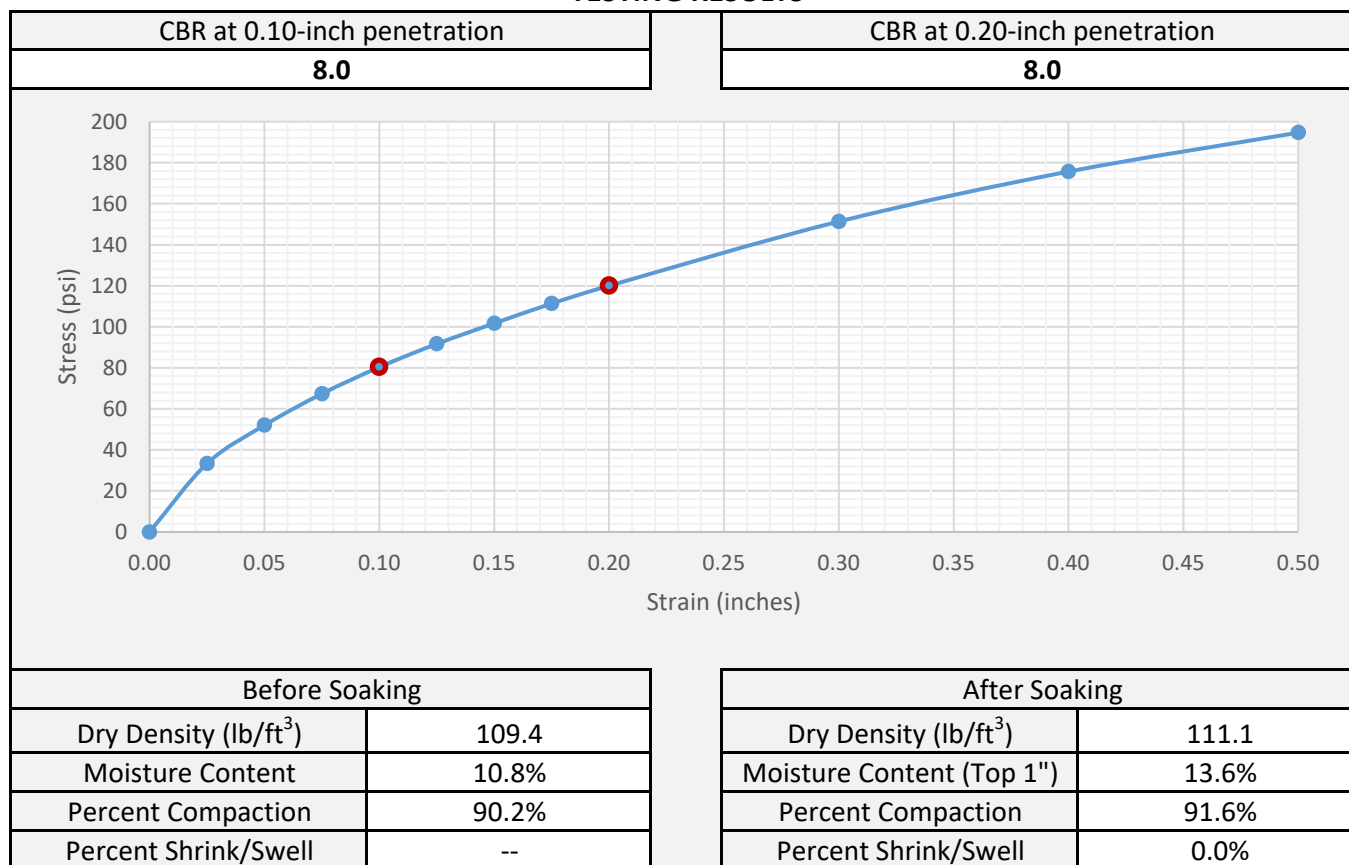
## SAMPLE INFORMATION

|                  |                                |                |         |               |                        |
|------------------|--------------------------------|----------------|---------|---------------|------------------------|
| Project Name     | SC 83 RBO Little Pee Dee River |                |         | Project No.   | G7100.010 - Task 00010 |
| Sample Location  | BS-2                           |                |         | FME Lab ID    | 25-0587                |
| Soil Description | Silty SAND (SM/A-2-4)          |                |         | Depth/Elev.   | 0.0 - 5.0              |
| Date Sampled     | --                             | Sampled By:    | JTP     | Date Received | 2/26/2025              |
| Date Test Began  | 3/6/2025                       | Date Completed | 3/10/25 | Tested By     | DH                     |

## MOLDING CHARACTERISTICS

|                                       |                       |                              |      |
|---------------------------------------|-----------------------|------------------------------|------|
| Method                                | AASHTO T99 - Method A | % Retained on 3/4" Sieve     | 0%   |
| Max Dry Density (lb/ft <sup>3</sup> ) | 121.3                 | Optimum Moisture Content (%) | 11.0 |
| Soak Time (hr)                        | 96                    | Surcharge Weight (lb)        | 10.0 |

## TESTING RESULTS



## ADDITIONAL COMMENTS

Target %Compaction = 90%

|   |   |   |                      |
|---|---|---|----------------------|
|  | <b>F&amp;ME Consultants, Inc.</b><br><small>211 Business Park Blvd., Columbia, South Carolina 29203</small> | <br><hr/> Reviewed By | <hr/> 4/3/25<br>Date |
|---|---|---|----------------------|

# CALIFORNIA BEARING RATIO (CBR) AASHTO T193

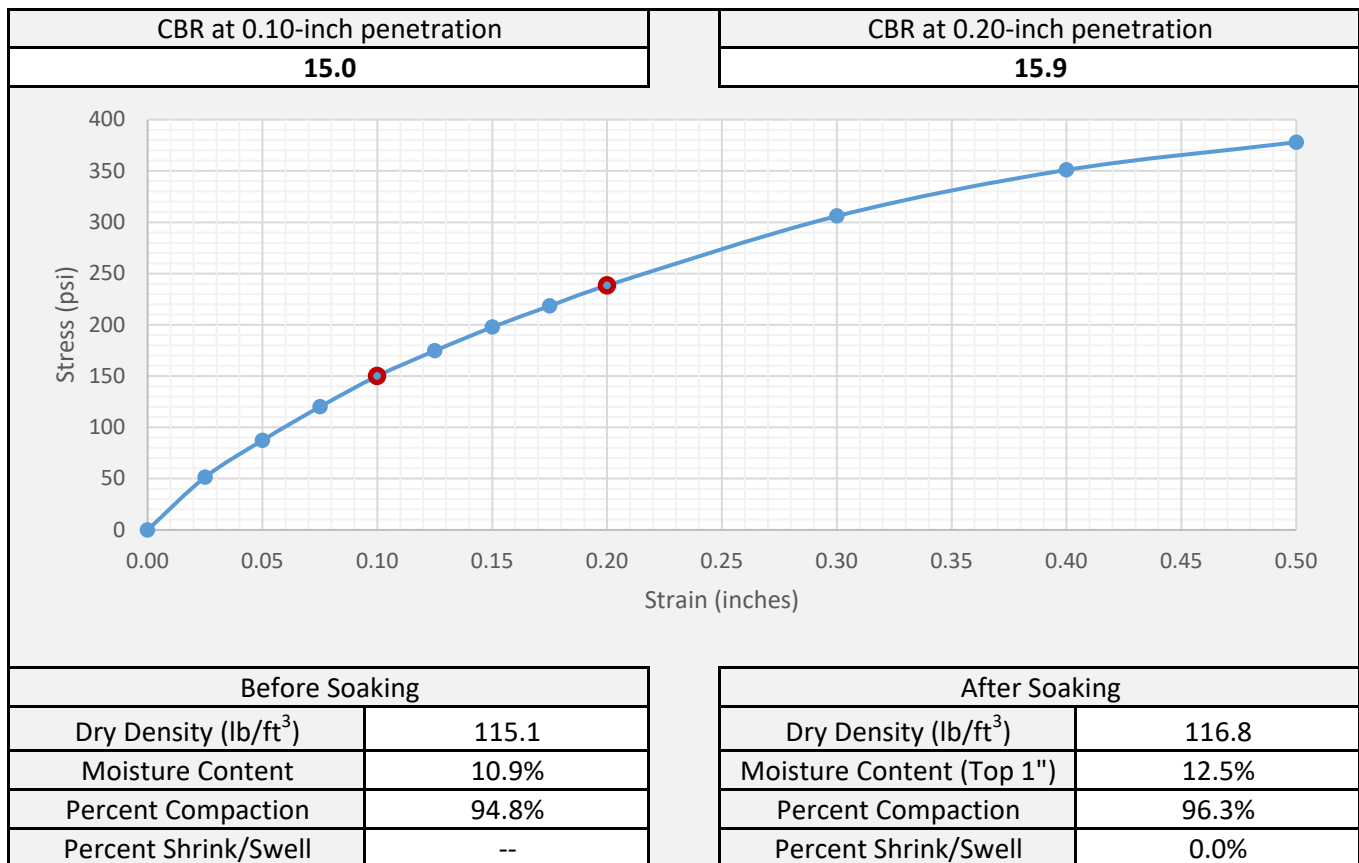
## SAMPLE INFORMATION

|                  |                                |                |         |               |                        |
|------------------|--------------------------------|----------------|---------|---------------|------------------------|
| Project Name     | SC 83 RBO Little Pee Dee River |                |         | Project No.   | G7100.010 - Task 00010 |
| Sample Location  | BS-2                           |                |         | FME Lab ID    | 25-0587                |
| Soil Description | Silty SAND (SM/A-2-4)          |                |         | Depth/Elev.   | 0.0 - 5.0              |
| Date Sampled     | --                             | Sampled By:    | JTP     | Date Received | 2/26/2025              |
| Date Test Began  | 3/6/2025                       | Date Completed | 3/10/25 | Tested By     | DH                     |

## MOLDING CHARACTERISTICS


|                                       |                       |                              |      |
|---------------------------------------|-----------------------|------------------------------|------|
| Method                                | AASHTO T99 - Method A | % Retained on 3/4" Sieve     | 0%   |
| Max Dry Density (lb/ft <sup>3</sup> ) | 121.3                 | Optimum Moisture Content (%) | 11.0 |
| Soak Time (hr)                        | 96                    | Surcharge Weight (lb)        | 10.0 |

## TESTING RESULTS



## ADDITIONAL COMMENTS

Target %Compaction = 95%

|   |   |   |                      |
|---|---|---|----------------------|
|  | <b>F&amp;ME Consultants, Inc.</b><br><small>211 Business Park Blvd., Columbia, South Carolina 29203</small> | <br><hr/> Reviewed By | <hr/> 4/3/25<br>Date |
|---|---|---|----------------------|

# CALIFORNIA BEARING RATIO (CBR) AASHTO T193

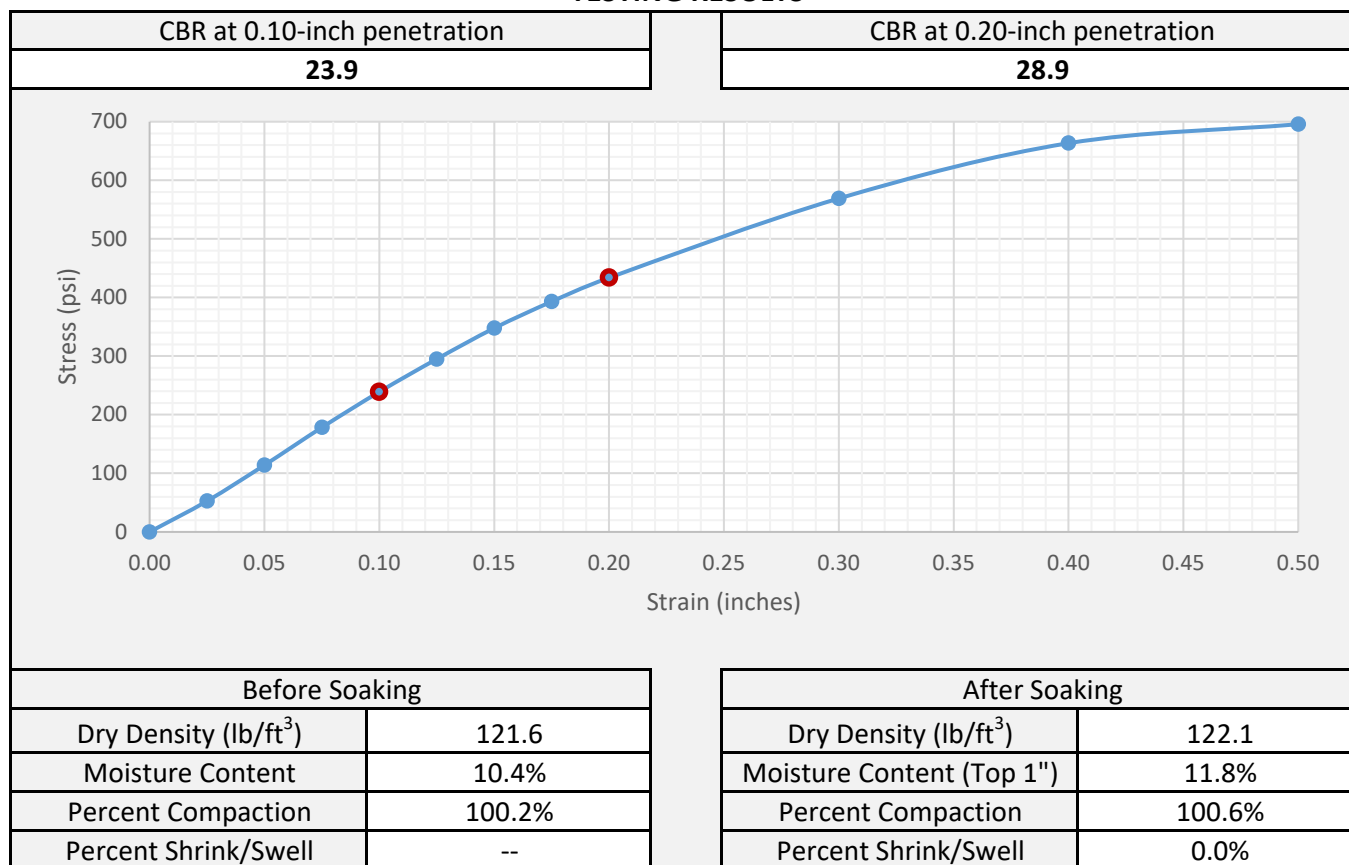
## SAMPLE INFORMATION

|                  |                                |                |         |               |                        |
|------------------|--------------------------------|----------------|---------|---------------|------------------------|
| Project Name     | SC 83 RBO Little Pee Dee River |                |         | Project No.   | G7100.010 - Task 00010 |
| Sample Location  | BS-2                           |                |         | FME Lab ID    | 25-0587                |
| Soil Description | Silty SAND (SM/A-2-4)          |                |         | Depth/Elev.   | 0.0 - 5.0              |
| Date Sampled     | --                             | Sampled By:    | JTP     | Date Received | 2/26/2025              |
| Date Test Began  | 3/6/2025                       | Date Completed | 3/10/25 | Tested By     | DH                     |

## MOLDING CHARACTERISTICS

|                                       |                       |                              |      |
|---------------------------------------|-----------------------|------------------------------|------|
| Method                                | AASHTO T99 - Method A | % Retained on 3/4" Sieve     | 0%   |
| Max Dry Density (lb/ft <sup>3</sup> ) | 121.3                 | Optimum Moisture Content (%) | 11.0 |
| Soak Time (hr)                        | 96                    | Surcharge Weight (lb)        | 10.0 |

## TESTING RESULTS



## ADDITIONAL COMMENTS

Target %Compaction = 100%

|   |   |   |                      |
|---|---|---|----------------------|
|  | <b>F&amp;ME Consultants, Inc.</b><br><small>211 Business Park Blvd., Columbia, South Carolina 29203</small> | <br><hr/> Reviewed By | <hr/> 4/3/25<br>Date |
|---|---|---|----------------------|

# **SC 83 over Little Pee Dee River**

## **Geotechnical Baseline Report**

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# **APPENDIX**

## **SECTION 5      LABORATORY TEST RESULTS**

### **SECTION 5C      CORROSION SERIES TESTING**

# CORROSION SERIES SUMMARY

PAGE 1 OF 1



PROJECT ID P042879

PROJECT NAME SC 83 over Little Pee Dee River

PROJECT COUNTY Marlboro

| Borehole | Sample No. | Sample Depth<br>(ft.) | pH of Soil in<br>Distilled Water | Electrical Resistivity<br>( $\Omega$ -cm) | Chloride Content<br>(mg/kg (ppm)) | Sulfate Content<br>(mg/kg (ppm)) |
|----------|------------|-----------------------|----------------------------------|---|-----------------------------------|----------------------------------|
| BS-1     | --         | 0.0 – 5.0             | 5.36                             | 30,016                                    | 2.16                              | 67.1                             |

**pH DETERMINATION  
(AASHTO T289)**

|                        |                                 |                         |           |
|------------------------|---------------------------------|-------------------------|-----------|
| Project Name:          | SC 83 over Little Pee Dee River | SCDOT Project Number:   | P042879   |
| FME Project No.:       | G7100.010 - Task 00001          | Sample Elevation/Depth: | BS-1      |
| Description of Sample: | Silty SAND (SM/A-2-4)           | Date Received           | 2/28/2025 |
| Tested By:             | JM                              | Date Tested:            | 3/7/2025  |

|                  |           |
|------------------|-----------|
| Boring ID        | BS-1      |
| Boring Depth     | 0.0 - 5.0 |
| FME Lab ID No.   | 25-0586   |
| pH Value         | 5.36      |
| Temperature (°C) | 20.4      |

Date Reviewed: 3/25/2025Reviewed By: A. Abernethy

**SOIL RESISTIVITY  
(AASHTO T288)**

|                   |                                |                 |           |
|-------------------|--------------------------------|-----------------|-----------|
| Project Name:     | SC 83 over Little PeeDee River | Project ID:     | P042879   |
| Location:         | BS-1                           | FME Lab ID No.: | 25-0586   |
| Sampled By:       | WAP                            | Date Sampled:   | 2/26/2025 |
| Soil Description: | Silty SAND (SM/A-2-4)          | Date Received:  | 2/26/2025 |
| Tested By:        | JM                             | Date Tested:    | 3/12/2025 |

| Boring No. | Sample Depth (ft.) | Minimum Soil Resistivity,<br>$\Omega$ -cm |
|------------|--------------------|---|
| BS-1       | 0.0 - 5.0          | 30,016                                    |

Date Reviewed: 3/12/2025 Reviewed By: A. Abernethy



## CHLORIDE ION CONTENT IN SOILS

AASHTO T 291 - 94 (2018) (Method B)

Client: F&ME Consultants, Inc.  
 Client Reference: Little Pee Dee River G7100.010  
 Project No.: 2025-161-001  
 Lab ID: 2025-161-001-001

Boring No.: BS-1  
 Depth (ft): 0.0-5.0'  
 Sample No.: BS-1  
 Description: Brown

( - # 10 Sieve material )

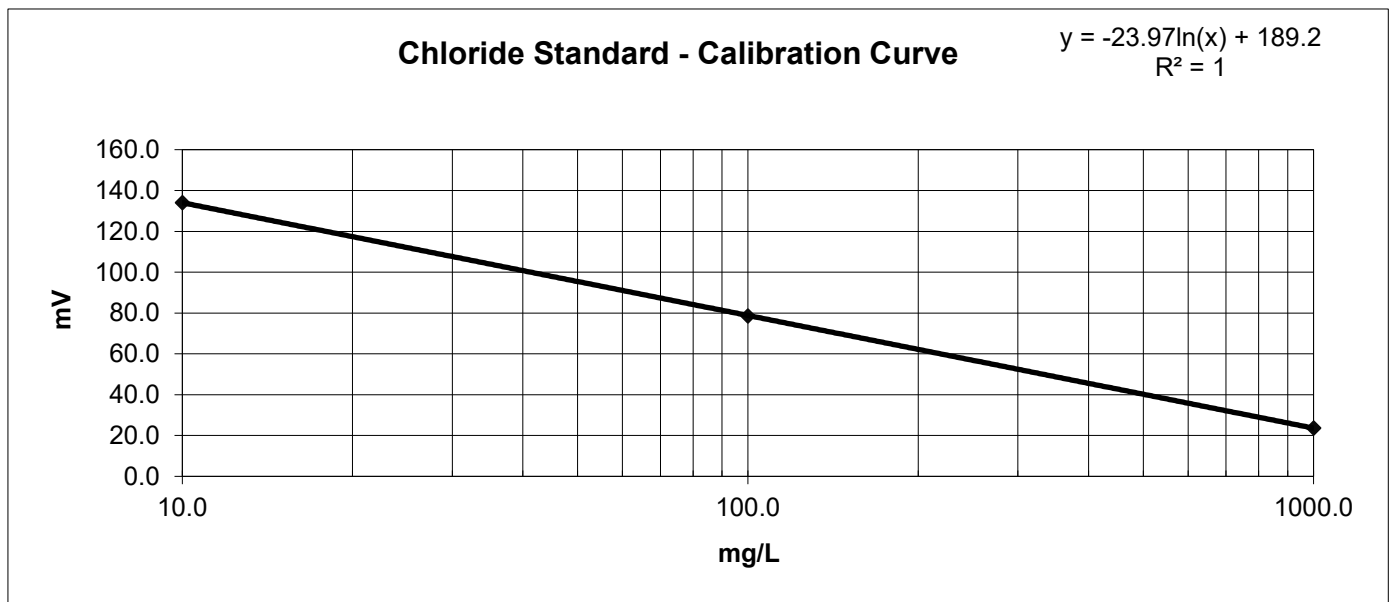
### CHLORIDE STANDARD: CALIBRATION CURVE

| STANDARD    | MILLIVOLTS<br>(mV) |
|-------------|--------------------|
| 10.0 mg/L   | 134.1              |
| 100.0 mg/L  | 78.6               |
| 1000.0 mg/L | 23.7               |

### MEASUREMENT OF CHLORIDES

|                              |       |               |               |
|------------------------------|-------|---------------|---------------|
| Sample Weight (g):           | 100.0 | CONCENTRATION | CONCENTRATION |
| Water added to Sample (ml):  | 100.0 | (mg/L)        | (mg/kg)       |
| Size of Sample Aliquot (ml): | 25.0  |               |               |
| Sample Reading (mV):         | 170.7 | 2.16          | 2.16          |

Notes: 1) Samples and standards were buffered by the addition of an equal volume of the 0.2 M KNO<sub>3</sub> solution (1:1 volume).  
 2) Samples were dried for a minimum of 12 hours at 110 °F. 5°C.



Notes:

Tested By JAM Date 3/26/25 Checked By EG Date 3/27/25

## Water-Soluble Sulfate Ion Content in Soil

### AASHTO T 290-95 (2020)

|                   |                                |                         |
|-------------------|--------------------------------|-------------------------|
| Client:           | F&ME Consultants, Inc.         | Boring No.: BS-1        |
| Client Reference: | Little Pee Dee River G7100.010 | Depth (ft): 0.0-5.0'    |
| Project No.:      | 2025-161-001                   | Sample No.: BS-1        |
| Lab ID:           | 2025-161-001-001               | Soil Description: Brown |

#### Sulfate Standard - Calibration Curve Spectrophotometer Readings

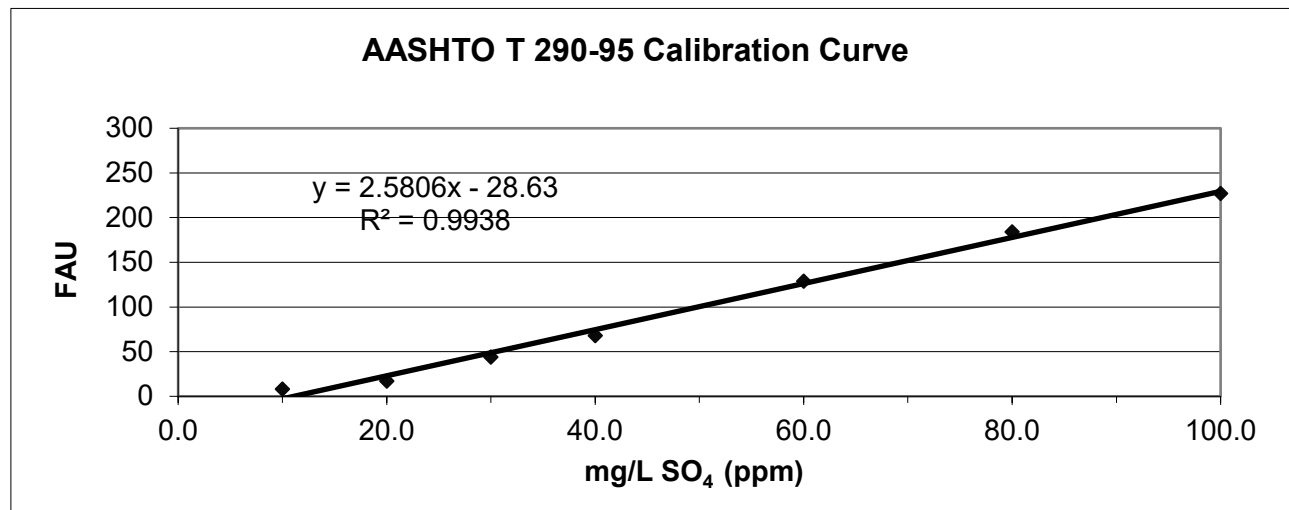
| <u>Sulfate Ion Concentrations (mg/L)</u> |            |      |      |      |      |      |      |       |
|--|------------|------|------|------|------|------|------|-------|
| 0.0                                      | 4.0        | 10.0 | 20.0 | 30.0 | 40.0 | 60.0 | 80.0 | 100.0 |
| <u>Spectrophotometer Readings (FAU)</u>  |            |      |      |      |      |      |      |       |
| Underrange                               | Underrange | 8    | 17   | 44   | 68   | 129  | 184  | 227   |

#### Measurement of Barium Chloride Turbidity

(Sample contains 5.0 mL NaCl solution and 0.3 g BaCl<sub>2</sub>·2H<sub>2</sub>O)

|   |  |
|---|--|
| <p><b>Sample Weight (g):</b> 100.0</p> <p><b>Water added to Sample (mL):</b> 300.0</p> <p><b>Size of Sample Aliquot (mL):</b> 50.0</p> <p><b>Sample Reading (FAU):</b> 29</p> <p><b>Sample Diluted:</b> No</p> <p><b>Sulfate Solution Added (ml):</b> 0</p> | <p><b><u>Sample Moisture Content</u></b></p> <p>Tare Number: 566</p> <p>Weight of Tare &amp; Wet Sample (g): 210.27</p> <p>Weight of Tare &amp; Dry Sample (g): 210.10</p> <p>Weight of Tare (g): 84.34</p> <p>Weight of Water (g): 0.17</p> <p>Weight of Dry Sample (g): 125.76</p> <p>Moisture Content (%): 0.14</p> |
|---|--|

|  |       |  |
|--|-------|--|
| <b>Sample Sulfate Ion Concentration:</b> | 22.33 | <b>mg/L SO<sub>4</sub> (ppm)</b>                         |
| <b>Sample Sulfate Ion Content:</b>       | 67.0  | <b>mg/Kg SO<sub>4</sub> (not corrected for moisture)</b> |
| <b>Sample Sulfate Ion Content:</b>       | 67.1  | <b>mg/Kg SO<sub>4</sub> (corrected for moisture)</b>     |



|                |               |                |                 |
|----------------|---------------|----------------|-----------------|
| Tested by: JAM | Date: 3/26/25 | Checked by: EG | Date: 3/27/2025 |
|----------------|---------------|----------------|-----------------|

page 1 of 1 DCN: CT-S87 DATE: 3/5/2020 REVISION: 1

# **SC 83 over Little Pee Dee River**

## **Geotechnical Baseline Report**

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# **APPENDIX**

## **SECTION 6**

## **ON-SITE DRILL RIG PHOTOS**



## On-Site Drill Rig Set Up Photographs



**B-1**



**B-2**



**B-3**



**B-4**





## On-Site Drill Rig Set Up Photographs



**CPT-1**



**CPT-2**





## On-Site Drill Rig Set Up Photographs



P-1



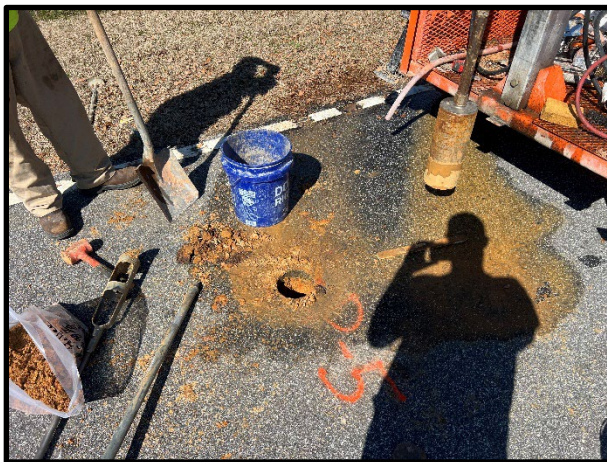
P-2



P-3



P-4



P-5



P-6





# **SC 83 over Little Pee Dee River**

## **Geotechnical Baseline Report**

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# **APPENDIX**

## **SECTION 7**

## **PAVEMENT CORE PHOTOS**

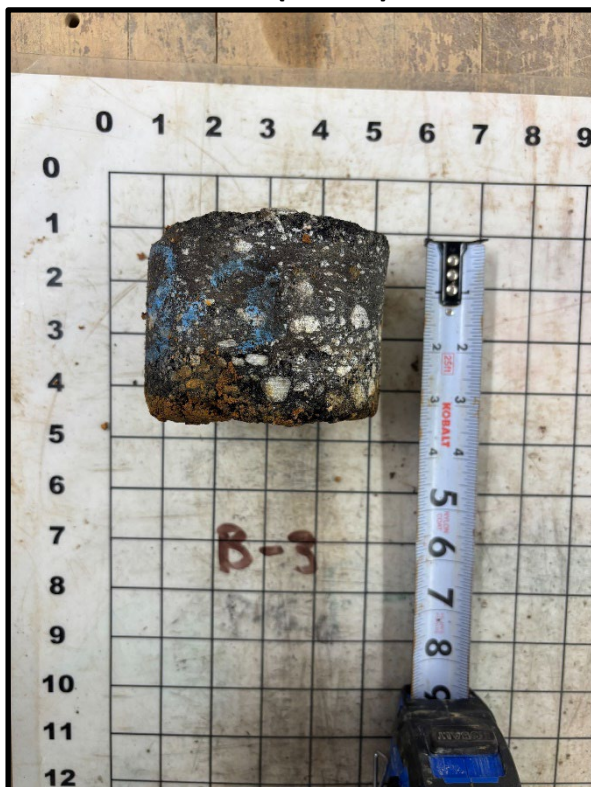
## Pavement Core Photographs



**B-1 (Side 1)**



**B-1 (Side 2)**



**B-3 (Side 1)**



**B-3 (Side 2)**





## Pavement Core Photographs



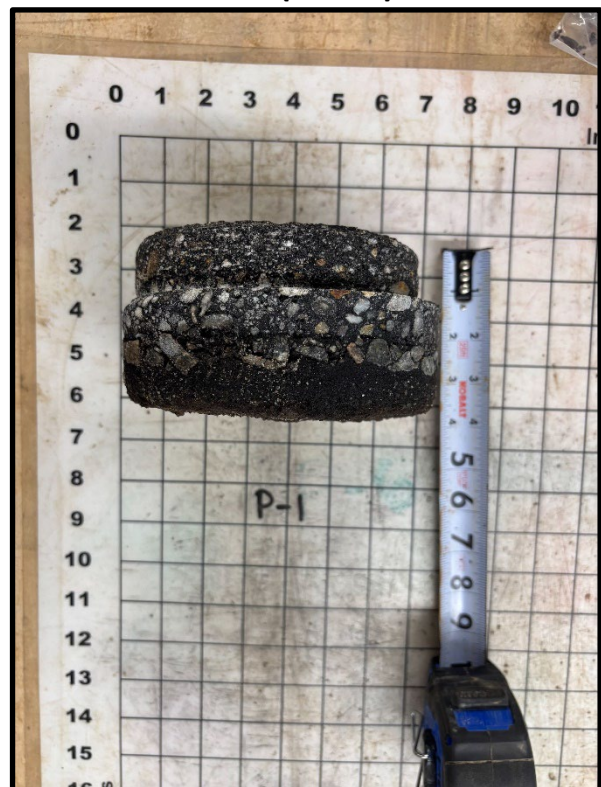
B-4 (Side 1)



B-4 (Side 2)



P-1 (Side 1)



P-1 (Side 2)





## Pavement Core Photographs



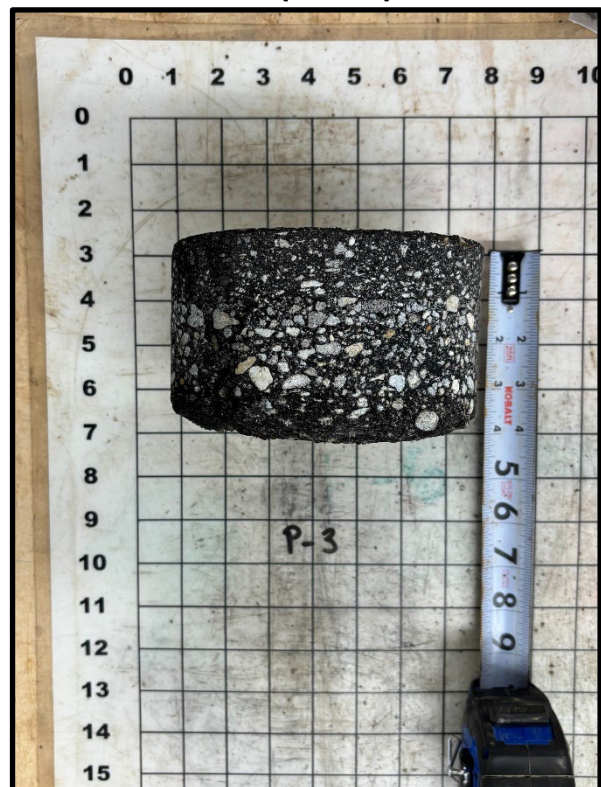
P-2 (Side 1)



P-2 (Side 2)



P-3 (Side 1)



P-3 (Side 2)





## Pavement Core Photographs



P-4 (Side 1)



P-4 (Side 2)



P-5 (Side 1)



P-5 (Side 2)





## Pavement Core Photographs



P-6 (Side 1)



P-6 (Side 2)



# SC 83 over Little Pee Dee River

## Geotechnical Baseline Report

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# APPENDIX

## SECTION 8

## SPT HAMMER CALIBRATION



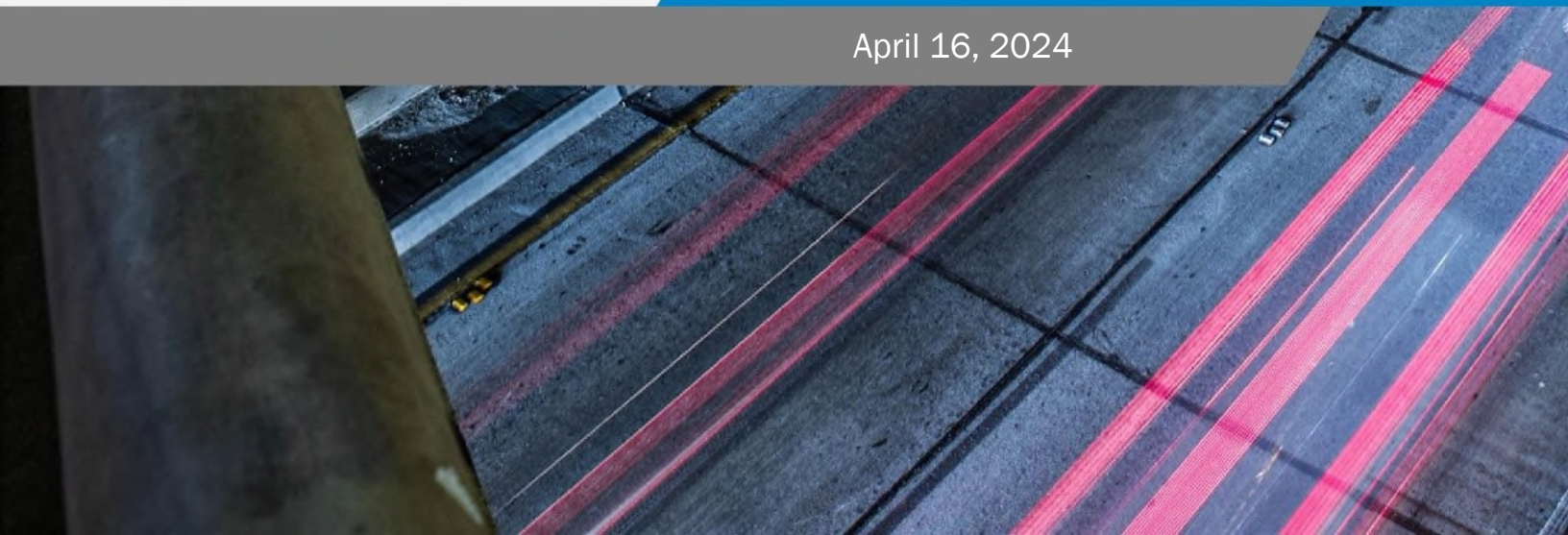


**CAROLINAS  
GEOTECHNICAL  
GROUP**

## **Report of SPT Hammer Energy**

Prepared for:  
Breccia Construction, LLC  
620-B Industrial Way  
Chester, South Carolina 29706

April 16, 2024





2400 Crownpoint Executive Drive  
Suite 800  
Charlotte, NC 28227



(980) 339-8684



contact@carolinasgeotech.com



www.carolinasgeotech.com

April 16, 2024

Mr. Adam J. Shannon  
Breccia Construction, LLC  
620-B Industrial Way  
Chester, South Carolina 29706

SUBJECT: **Report of SPT Hammer Energy**  
Breccia Construction, LLC CME 550X ATV Rig (SN 249533)  
Chester, South Carolina  
CG2 Project No.: 240021095

Dear Mr. Shannon:

Carolinas Geotechnical Group, PLLC (CG2) has completed the Standard Penetration Test (SPT) energy measurements on the automatic hammer mounted on a Breccia Construction, LLC (Breccia) CME 550X ATV-mounted drill rig with a serial number of 249533, see attached Drill Rig Photo Log. This service was performed by Mr. Robert E. Kral, PE on April 12, 2024. SPT energy testing was performed in general accordance with ASTM D4633 and the most recent revision of the North Carolina Department of Transportation (NCDOT), Geotechnical Engineering Unit's requirements. The testing procedures, equipment used during testing, and detailed results are presented in this report.

CG2 recommends Breccia submit this Report of SPT Hammer Energy to the NCDOT Geotechnical Engineering Unit at [SPT\\_Hammer\\_Energy\\_Submittal@ncdot.gov](mailto:SPT_Hammer_Energy_Submittal@ncdot.gov) for review and approval no later than May 10, 2024.

#### DYNAMIC TESTING METHODOLOGY

Testing was performed using a model SPT (Serial No. 4553 TB) Pile Driving Analyzer™ (PDA) manufactured by Pile Dynamics, Inc. The PDA was used to record and interpret data from two piezoresistive accelerometers (Serial Nos. K10959 and K10960) bolted to a 2-foot long AWJ drill rod (SN 728AWJ) internally instrumented with two strain transducers. The instrumented AWJ drill rod has a cross-sectional area of 1.13 square inches, an outside diameter of approximately 1.75 inches, and an inside diameter of 1.25 inches at the gauge location. The accelerometers and strain gauges, which are mounted on opposing axis near the middle of the instrumented rod, monitor acceleration and strain for each hammer blow. The analyzer converts the data to velocities and forces and computes the maximum transferred hammer energies with the "EFV" method described in ASTM D4633. Preliminary results are recorded and displayed in real-time for each blow. Calibration sheets for the PDA, accelerometers, and the instrumented rod are included in Appendix III.



## Report of SPT Hammer Energy

Chester, South Carolina

CG2 Project No.: 240021095

### TESTING AND OBSERVATIONS

CG2 personnel was on site April 12, 2024 to observe and perform high-strain dynamic testing during SPT sampling on the CME 550X ATV-mounted drill rig operated by J. Phillips of Breccia. The measurements were taken during drilling operations at 1817 Lowrys Highway in Chester, South Carolina (Chester County). The approximate coordinates (not professionally surveyed) for the test location are 34.7704051, -81.2454414. No Soil Test Boring Log was maintained. SPT energy measurements were recorded during three intervals at depths of approximately 28½, 33½, and 38½ feet below the existing ground surface. The information presented in the table below summarizes the equipment tested and tooling used during the SPT energy measurements.

**Table 1: SPT Field Data**

| Drill Rig Information                     |              |
|---|--------------|
| Manufacturer                              | CME          |
| Model                                     | 550X         |
| Serial Number                             | 249533       |
| Operator                                  | J. Phillips  |
| Carrier                                   | ATV          |
| Hammer Information                        |              |
| Model / Type                              | CME / Auto   |
| Serial Number                             | 249533       |
| Anvil Height (inches)                     | 11.5         |
| Anvil Diameter (inches)                   | 2.5          |
| Drop Height (inches)                      | 30           |
| Ram Weight (pounds)                       | 140          |
| Ram Serial Number                         | N/A          |
| Drilling and Instrumented Rod Information |              |
| Drill Rod Type                            | AWJ          |
| OD (inches)                               | 1.75         |
| ID (inches)                               | 1.25         |
| Cross-Sectional Area (in <sup>2</sup> )   | 1.13         |
| Typical Lengths (feet)                    | 5            |
| Instrumented Rod Type                     | AWJ (SN 728) |
| OD (inches)                               | 1.75         |
| ID (inches)                               | 1.25         |
| Cross-Sectional Area (in <sup>2</sup> )   | 1.13         |
| Total Instrumented Rod Length (feet)      | 2.00         |
| Length Below Gages (feet)                 | 0.70         |
| Split-Spoon Length (feet)                 | 2.85         |



## Report of SPT Hammer Energy

Chester, South Carolina

CG2 Project No.: 240021095

### DYNAMIC TESTING RESULTS

The total rod length from the instrumentation to the tip of the split-spoon sampler was determined by adding 3.6 feet to the required drill rod length at each sample depth. Based on the test data, the automatic hammer on the CME 550X ATV-mounted drill rig operated at a rate of about 51.4 to 53.9 blows per minute (BPM) during dynamic testing. The measured transferred hammer energy (EFV) ranged from 263.1 to 302.7 foot-pounds, which corresponds to Energy Transfer Ratio (ETR) values of 75.2 to 86.5%, respectively. These data ranges are based on the overall minimum and maximum values for the last 12 inches of each sample interval.

The SPT Energy Measurement Data Summary tables in Appendix I present the test data from every hammer blow at each sampling interval along with representative force and velocity traces for each test interval. The reported blow counts, obtained by the drill rig personnel, a summary of the test data, and average computed BPM, EFV, and ETR values are provided in Table 2. The BPM, EFV, and ETR values presented in Table 2 were computed by averaging data from the last 12 inches of each sample interval. Plots and tables of the following are also included in Appendix I and present the test data with depth for each test interval:

- Penetration vs. BLC
- Penetration vs. CSX
- Average ETR vs. Rod Length
- Penetration vs. FMX
- Penetration vs. VMX
- ETR vs. Rod Length
- Penetration vs. EFV
- Penetration vs. ETR

**Table 2: Summary of Dynamic Testing Results**

| Data Set ID     | Sample Depth (ft) | Drill Rod Length (ft) | Instrumentation to Sampler Tip Length (ft) | Blows per 6" Increment / N-value | Soil Sample Description (Piedmont Residual) | Avg. BPM | Avg. EFV (ft-lbs) | Avg. ETR (%) |
|-----------------|-------------------|-----------------------|--|----------------------------------|---|----------|-------------------|--------------|
| 1               | 28½ - 30          | 30                    | 33.6                                       | 4-6-10 / 16                      | SA SILT                                     | 52.7     | 276.3             | 79.0         |
| 2               | 33½ - 35          | 35                    | 38.6                                       | 5-6-9 / 15                       | SA SILT                                     | 53.6     | 288.5             | 82.4         |
| 3               | 38½ - 40          | 40                    | 43.6                                       | 6-9-13 / 22                      | SA SILT                                     | 51.7     | 293.4             | 83.8         |
| Overall Average |                   |                       |  |                                  |   | 52.5     | 286.9             | 82.0         |

The average hammer rate, transferred energy, and transfer ratio were calculated for each depth interval. Per ASTM D4633, only the blows from the final foot of each sample interval (i.e., the blows that determine the N-value) were included when computing the average values shown in Table 2. The overall average transferred hammer energy for the automatic hammer on the CME 550X ATV-mounted drill rig (for the depth intervals presented in Table 2) was 286.9 foot-pounds, with an average ETR of 82.0%.

**Report of SPT Hammer Energy**

Chester, South Carolina

CG2 Project No.: 240021095

**LIMITATIONS OF REPORT**

This report has been prepared in accordance with generally accepted geotechnical engineering practice for specific application to this project. The information contained in this report were based on the applicable standards of our profession in this geographic area at the time this report was prepared. No other warranty, express or implied, is made.

**CLOSING**

CG2 is pleased to have the opportunity to provide these services to you. If you have questions concerning the content of this report, or if CG2 can be of further service, please contact CG2 at (980) 339-8684.

Sincerely,  
**Carolinas Geotechnical Group, PLLC**

DocuSigned by:



F926DBFBAB0F4FE...  
Pressley M. Perry, EIT  
Staff Professional

DocuSigned by:



8AD703B2A8484F4...  
Robert E. Kral, PE  
Geotechnical Design Manager  
NC Registration No. 042642

**Appendices:**

- Appendix I - CME 550X ATV Rig (SN 249533) SPT Energy Measurements Summary Plots and Tables
- Appendix II - SPT Hammer Energy Field Form (Field Log) and Drill Rig Photo Log
- Appendix III - Instrumented Rod and Accelerometer Calibration Sheets
- Appendix IV - Certificate of Proficiency



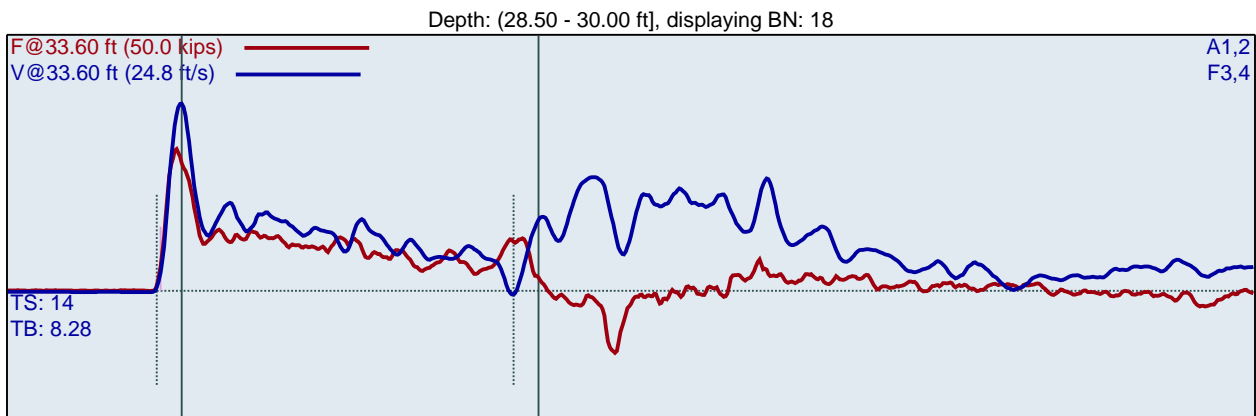
# APPENDIX I

CME 550X (SN 249533)  
REK  
B-3

B-3  
Interval start: 4/12/2024

AR: 1.13 in<sup>2</sup>  
LE: 33.60 ft  
WS: 16807.9 ft/s

SP: 0.492 k/ft<sup>3</sup>  
EM: 30000 ksi



F3 : [728AWJ1] 224.649 PDICAL (1) FF1  
F4 : [728AWJ2] 224.139 PDICAL (1) FF1

A1 (PR): [K10959] 413.827 mv/6.4v/5000g (1) VF1  
A2 (PR): [K10960] 419.894 mv/6.4v/5000g (1) VF1

BPM: Blows/Minute

FMX: Maximum Force

VMX: Maximum Velocity

DMX: Maximum Displacement

CSX: Compression Stress Maximum

DFN: Final Displacement

EFV: Maximum Energy

ETR: Energy Transfer Ratio - Rated

| LP      | BL# | BC  | BPM  | FMX  | VMX  | DMX | CSX  | DFN | EFV   | ETR  |
|---------|-----|-----|------|------|------|-----|------|-----|-------|------|
| ft      |     | /6" | bpm  | kips | ft/s | in  | ksi  | in  | ft-lb | %    |
| 28.63   | 1   | 4   | 1.9  | 25.8 | 18.3 | 2.1 | 22.8 | 1.5 | 277.5 | 79.3 |
| 28.75   | 2   | 4   | 51.7 | 27.0 | 19.5 | 1.7 | 23.9 | 1.5 | 287.4 | 82.1 |
| 28.88   | 3   | 4   | 51.4 | 24.3 | 17.0 | 1.7 | 21.5 | 1.5 | 270.1 | 77.2 |
| 29.00   | 4   | 4   | 52.1 | 26.1 | 17.8 | 1.5 | 23.1 | 1.5 | 281.0 | 80.3 |
| 29.08   | 5   | 6   | 52.6 | 26.8 | 17.9 | 1.2 | 23.7 | 1.0 | 275.7 | 78.8 |
| 29.17   | 6   | 6   | 52.7 | 24.7 | 16.5 | 1.2 | 21.8 | 1.0 | 275.1 | 78.6 |
| 29.25   | 7   | 6   | 52.7 | 27.2 | 18.6 | 1.3 | 24.1 | 1.0 | 282.6 | 80.7 |
| 29.33   | 8   | 6   | 52.8 | 24.7 | 16.6 | 1.1 | 21.9 | 1.0 | 263.1 | 75.2 |
| 29.42   | 9   | 6   | 52.9 | 24.5 | 16.5 | 1.0 | 21.7 | 1.0 | 265.7 | 75.9 |
| 29.50   | 10  | 6   | 52.7 | 26.7 | 17.9 | 1.1 | 23.7 | 1.0 | 273.0 | 78.0 |
| 29.55   | 11  | 10  | 52.9 | 26.9 | 18.0 | 1.0 | 23.8 | 0.6 | 272.8 | 77.9 |
| 29.60   | 12  | 10  | 52.6 | 26.5 | 17.5 | 0.9 | 23.5 | 0.6 | 266.8 | 76.2 |
| 29.65   | 13  | 10  | 52.7 | 27.7 | 18.3 | 1.0 | 24.6 | 0.6 | 278.7 | 79.6 |
| 29.70   | 14  | 10  | 52.9 | 27.2 | 18.1 | 0.9 | 24.1 | 0.6 | 278.1 | 79.5 |
| 29.75   | 15  | 10  | 52.4 | 27.2 | 18.5 | 1.0 | 24.1 | 0.6 | 280.5 | 80.2 |
| 29.80   | 16  | 10  | 52.7 | 27.6 | 18.4 | 1.0 | 24.5 | 0.6 | 284.1 | 81.2 |
| 29.85   | 17  | 10  | 52.9 | 27.3 | 18.1 | 0.8 | 24.2 | 0.6 | 273.4 | 78.1 |
| 29.90   | 18  | 10  | 52.7 | 27.7 | 18.1 | 0.9 | 24.5 | 0.6 | 280.7 | 80.2 |
| 29.95   | 19  | 10  | 52.7 | 27.8 | 18.6 | 0.9 | 24.6 | 0.6 | 287.9 | 82.3 |
| 30.00   | 20  | 10  | 52.8 | 27.6 | 18.6 | 0.9 | 24.4 | 0.6 | 283.1 | 80.9 |
| Average |     |     | 52.7 | 26.8 | 17.9 | 1.0 | 23.7 | 0.7 | 276.3 | 79.0 |
| Std Dev |     |     | 0.1  | 1.1  | 0.7  | 0.1 | 1.0  | 0.2 | 6.8   | 1.9  |
| Maximum |     |     | 52.9 | 27.8 | 18.6 | 1.3 | 24.6 | 1.0 | 287.9 | 82.3 |
| Minimum |     |     | 52.4 | 24.5 | 16.5 | 0.8 | 21.7 | 0.6 | 263.1 | 75.2 |

N-value: 16

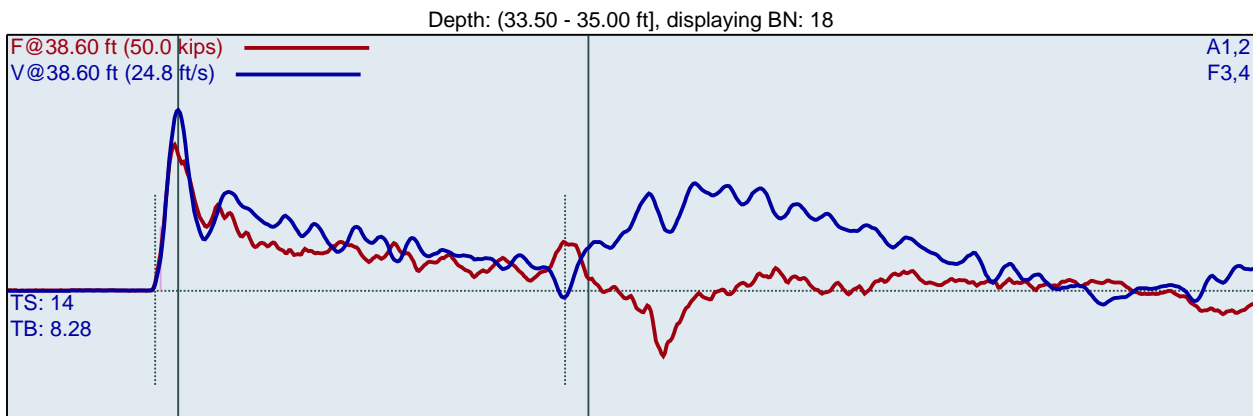
Sample Interval Time: 21.70 seconds.

CME 550X (SN 249533)  
REK  
B-3

B-3  
Interval start: 4/12/2024

AR: 1.13 in<sup>2</sup>  
LE: 38.60 ft  
WS: 16807.9 ft/s

SP: 0.492 k/ft<sup>3</sup>  
EM: 30000 ksi



F3 : [728AWJ1] 224.649 PDICAL (1) FF1  
F4 : [728AWJ2] 224.139 PDICAL (1) FF1

A1 (PR): [K10959] 413.827 mv/6.4v/5000g (1) VF1  
A2 (PR): [K10960] 419.894 mv/6.4v/5000g (1) VF1

| LP<br>ft | BL# | BC<br>/6" | BPM<br>bpm | FMX<br>kips | VMX<br>ft/s | DMX<br>in | CSX<br>ksi | DFN<br>in | EFV<br>ft-lb | ETR<br>% |
|----------|-----|-----------|------------|-------------|-------------|-----------|------------|-----------|--------------|----------|
| 33.60    | 1   | 5         | 1.9        | 28.4        | 18.7        | 1.7       | 25.1       | 1.2       | 286.3        | 81.8     |
| 33.70    | 2   | 5         | 53.9       | 27.6        | 16.9        | 1.7       | 24.4       | 1.2       | 281.4        | 80.4     |
| 33.80    | 3   | 5         | 53.6       | 26.2        | 15.6        | 1.5       | 23.2       | 1.2       | 275.6        | 78.8     |
| 33.90    | 4   | 5         | 53.5       | 28.7        | 18.2        | 1.5       | 25.4       | 1.2       | 292.7        | 83.6     |
| 34.00    | 5   | 5         | 53.7       | 27.6        | 16.7        | 1.3       | 24.4       | 1.2       | 277.5        | 79.3     |
| 34.08    | 6   | 6         | 53.7       | 28.9        | 19.0        | 1.3       | 25.6       | 1.0       | 291.5        | 83.3     |
| 34.17    | 7   | 6         | 53.8       | 28.5        | 18.2        | 1.2       | 25.2       | 1.0       | 286.3        | 81.8     |
| 34.25    | 8   | 6         | 53.5       | 28.8        | 18.2        | 1.2       | 25.5       | 1.0       | 290.8        | 83.1     |
| 34.33    | 9   | 6         | 53.9       | 27.8        | 16.9        | 1.1       | 24.6       | 1.0       | 287.4        | 82.1     |
| 34.42    | 10  | 6         | 53.6       | 29.0        | 18.1        | 1.2       | 25.7       | 1.0       | 289.7        | 82.8     |
| 34.50    | 11  | 6         | 53.5       | 28.4        | 17.6        | 1.3       | 25.2       | 1.0       | 291.1        | 83.2     |
| 34.56    | 12  | 9         | 53.7       | 28.8        | 18.0        | 1.1       | 25.5       | 0.7       | 289.6        | 82.8     |
| 34.61    | 13  | 9         | 53.7       | 28.0        | 17.5        | 1.3       | 24.8       | 0.7       | 298.7        | 85.3     |
| 34.67    | 14  | 9         | 53.5       | 28.9        | 18.9        | 1.0       | 25.6       | 0.7       | 296.5        | 84.7     |
| 34.72    | 15  | 9         | 53.4       | 27.6        | 16.8        | 1.0       | 24.4       | 0.7       | 285.9        | 81.7     |
| 34.78    | 16  | 9         | 53.7       | 28.0        | 17.2        | 0.9       | 24.7       | 0.7       | 282.2        | 80.6     |
| 34.83    | 17  | 9         | 53.5       | 26.4        | 15.7        | 0.9       | 23.4       | 0.7       | 274.1        | 78.3     |
| 34.89    | 18  | 9         | 53.6       | 28.6        | 17.5        | 0.9       | 25.3       | 0.7       | 286.1        | 81.7     |
| 34.94    | 19  | 9         | 53.6       | 27.3        | 16.8        | 0.8       | 24.2       | 0.7       | 278.4        | 79.5     |
| 35.00    | 20  | 9         | 53.5       | 27.6        | 17.2        | 1.0       | 24.4       | 0.7       | 299.2        | 85.5     |
| Average  |     |           | 53.6       | 28.2        | 17.6        | 1.1       | 24.9       | 0.8       | 288.5        | 82.4     |
| Std Dev  |     |           | 0.1        | 0.7         | 0.8         | 0.2       | 0.6        | 0.2       | 6.7          | 1.9      |
| Maximum  |     |           | 53.9       | 29.0        | 19.0        | 1.3       | 25.7       | 1.0       | 299.2        | 85.5     |
| Minimum  |     |           | 53.4       | 26.4        | 15.7        | 0.8       | 23.4       | 0.7       | 274.1        | 78.3     |

N-value: 15

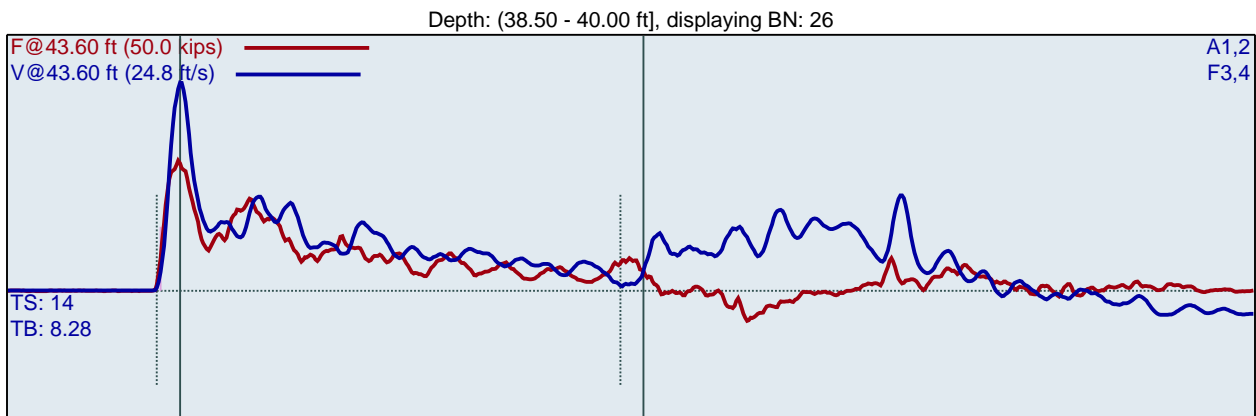
Sample Interval Time: 21.22 seconds.

CME 550X (SN 249533)  
REK  
B-3

B-3  
Interval start: 4/12/2024

AR: 1.13 in<sup>2</sup>  
LE: 43.60 ft  
WS: 16807.9 ft/s

SP: 0.492 k/ft<sup>3</sup>  
EM: 30000 ksi



F3 : [728AWJ1] 224.649 PDICAL (1) FF1  
F4 : [728AWJ2] 224.139 PDICAL (1) FF1

A1 (PR): [K10959] 413.827 mv/6.4v/5000g (1) VF1  
A2 (PR): [K10960] 419.894 mv/6.4v/5000g (1) VF1

| LP<br>ft | BL# | BC<br>/6" | BPM<br>bpm | FMX<br>kips | VMX<br>ft/s | DMX<br>in | CSX<br>ksi | DFN<br>in | EFV<br>ft-lb | ETR<br>% |
|----------|-----|-----------|------------|-------------|-------------|-----------|------------|-----------|--------------|----------|
| 38.58    | 1   | 6         | 17.9       | 26.9        | 19.0        | 1.2       | 23.8       | 1.0       | 286.5        | 81.9     |
| 38.67    | 2   | 6         | 51.8       | 25.5        | 17.6        | 1.3       | 22.6       | 1.0       | 281.5        | 80.4     |
| 38.75    | 3   | 6         | 51.8       | 26.4        | 19.5        | 1.3       | 23.4       | 1.0       | 289.3        | 82.7     |
| 38.83    | 4   | 6         | 51.7       | 26.7        | 19.0        | 1.2       | 23.6       | 1.0       | 286.0        | 81.7     |
| 38.92    | 5   | 6         | 51.7       | 26.9        | 19.6        | 1.2       | 23.8       | 1.0       | 284.1        | 81.2     |
| 39.00    | 6   | 6         | 51.7       | 26.4        | 20.3        | 1.3       | 23.4       | 1.0       | 296.2        | 84.6     |
| 39.06    | 7   | 9         | 51.7       | 26.7        | 20.5        | 1.0       | 23.6       | 0.7       | 294.0        | 84.0     |
| 39.11    | 8   | 9         | 51.7       | 26.1        | 19.9        | 1.1       | 23.1       | 0.7       | 293.4        | 83.8     |
| 39.17    | 9   | 9         | 51.7       | 26.7        | 20.4        | 1.0       | 23.6       | 0.7       | 302.7        | 86.5     |
| 39.22    | 10  | 9         | 51.6       | 25.9        | 20.3        | 0.9       | 23.0       | 0.7       | 293.9        | 84.0     |
| 39.28    | 11  | 9         | 51.6       | 26.3        | 19.9        | 0.9       | 23.3       | 0.7       | 295.9        | 84.5     |
| 39.33    | 12  | 9         | 51.9       | 25.7        | 19.3        | 0.9       | 22.7       | 0.7       | 289.0        | 82.6     |
| 39.39    | 13  | 9         | 51.8       | 26.6        | 20.9        | 0.8       | 23.6       | 0.7       | 298.6        | 85.3     |
| 39.44    | 14  | 9         | 51.4       | 25.6        | 19.9        | 0.8       | 22.7       | 0.7       | 289.0        | 82.6     |
| 39.50    | 15  | 9         | 51.8       | 25.9        | 20.5        | 0.9       | 22.9       | 0.7       | 292.5        | 83.6     |
| 39.54    | 16  | 13        | 51.8       | 25.6        | 20.1        | 0.8       | 22.6       | 0.5       | 292.2        | 83.5     |
| 39.58    | 17  | 13        | 51.6       | 25.6        | 19.8        | 0.8       | 22.6       | 0.5       | 286.1        | 81.7     |
| 39.62    | 18  | 13        | 51.5       | 26.1        | 20.0        | 0.8       | 23.1       | 0.5       | 291.6        | 83.3     |
| 39.65    | 19  | 13        | 51.7       | 25.7        | 20.3        | 0.7       | 22.8       | 0.5       | 294.7        | 84.2     |
| 39.69    | 20  | 13        | 51.6       | 25.7        | 19.9        | 0.7       | 22.7       | 0.5       | 295.2        | 84.3     |
| 39.73    | 21  | 13        | 51.8       | 26.0        | 20.2        | 0.7       | 23.0       | 0.5       | 294.7        | 84.2     |
| 39.77    | 22  | 13        | 51.7       | 25.5        | 20.1        | 0.7       | 22.6       | 0.5       | 289.0        | 82.6     |
| 39.81    | 23  | 13        | 51.6       | 25.4        | 20.6        | 0.6       | 22.5       | 0.5       | 293.6        | 83.9     |
| 39.85    | 24  | 13        | 51.8       | 25.3        | 20.0        | 0.6       | 22.4       | 0.5       | 290.5        | 83.0     |
| 39.88    | 25  | 13        | 51.8       | 25.5        | 19.8        | 0.7       | 22.6       | 0.5       | 294.1        | 84.0     |
| 39.92    | 26  | 13        | 51.6       | 25.5        | 20.2        | 0.6       | 22.5       | 0.5       | 293.9        | 84.0     |
| 39.96    | 27  | 13        | 51.7       | 25.1        | 20.5        | 0.6       | 22.2       | 0.5       | 293.5        | 83.9     |
| 40.00    | 28  | 13        | 51.6       | 25.3        | 20.5        | 0.7       | 22.4       | 0.5       | 297.1        | 84.9     |

|         |      |      |      |     |      |     |       |      |
|---------|------|------|------|-----|------|-----|-------|------|
| Average | 51.7 | 25.8 | 20.2 | 0.8 | 22.8 | 0.5 | 293.4 | 83.8 |
| Std Dev | 0.1  | 0.4  | 0.3  | 0.1 | 0.4  | 0.1 | 3.5   | 1.0  |
| Maximum | 51.9 | 26.7 | 20.9 | 1.1 | 23.6 | 0.7 | 302.7 | 86.5 |
| Minimum | 51.4 | 25.1 | 19.3 | 0.6 | 22.2 | 0.5 | 286.1 | 81.7 |

N-value: 22

Sample Interval Time: 31.39 seconds.



**Summary of SPT Test Results**

Project: CME 550X (SN 249533), Test Date: 4/12/2024

BPM: Blows/Minute

FMX: Maximum Force

VMX: Maximum Velocity

DMX: Maximum Displacement

CSX: Compression Stress Maximum

DFN: Final Displacement

EFV: Maximum Energy

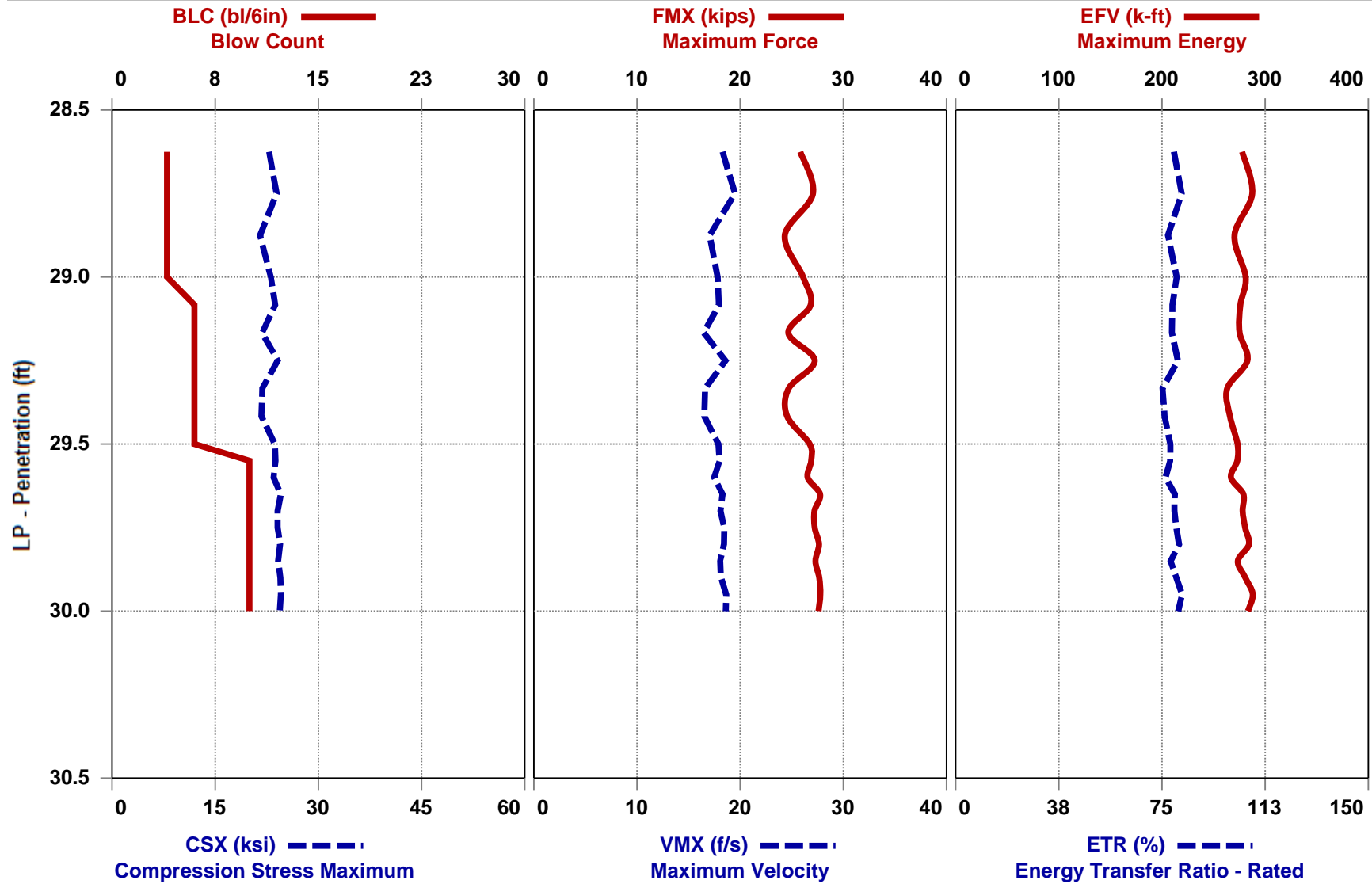
ETR: Energy Transfer Ratio - Rated

| Instr.<br>Length<br>ft         | Start<br>Depth<br>ft | Final<br>Depth<br>ft | Blows<br>Applied<br>/6" | N<br>Value | N60<br>Value | Average<br>BPM<br>bpm | Average<br>FMX<br>kips | Average<br>VMX<br>ft/s | Average<br>DMX<br>in | Average<br>CSX<br>ksi | Average<br>DFN<br>in | Average<br>EFV<br>ft-lb | Average<br>ETR<br>% |
|--------------------------------|----------------------|----------------------|-------------------------|------------|--------------|-----------------------|------------------------|------------------------|----------------------|-----------------------|----------------------|-------------------------|---------------------|
| 33.60                          | 28.50                | 30.00                | <b>4-6-10</b>           | <b>16</b>  | <b>21</b>    | 52.7                  | 26.8                   | 17.9                   | 1.0                  | 23.7                  | 0.7                  | 276.3                   | 79.0                |
| 38.60                          | 33.50                | 35.00                | <b>5-6-9</b>            | <b>15</b>  | <b>20</b>    | 53.6                  | 28.2                   | 17.6                   | 1.1                  | 24.9                  | 0.8                  | 288.5                   | 82.4                |
| 43.60                          | 38.50                | 40.00                | <b>6-9-13</b>           | <b>22</b>  | <b>30</b>    | 51.7                  | 25.8                   | 20.2                   | 0.8                  | 22.8                  | 0.5                  | 293.4                   | 83.8                |
| <b>Overall Average Values:</b> |                      |                      |                         |            |              | 52.5                  | 26.8                   | 18.7                   | 0.9                  | 23.7                  | 0.7                  | 286.9                   | 82.0                |
| <b>Standard Deviation:</b>     |                      |                      |                         |            |              | 0.8                   | 1.2                    | 1.4                    | 0.2                  | 1.1                   | 0.2                  | 9.2                     | 2.6                 |
| <b>Overall Maximum Value:</b>  |                      |                      |                         |            |              | 53.9                  | 29.0                   | 20.9                   | 1.3                  | 25.7                  | 1.0                  | 302.7                   | 86.5                |
| <b>Overall Minimum Value:</b>  |                      |                      |                         |            |              | 51.4                  | 24.5                   | 15.7                   | 0.6                  | 21.7                  | 0.5                  | 263.1                   | 75.2                |



CME 550X (SN 249533) - 28.5 TO 30.0

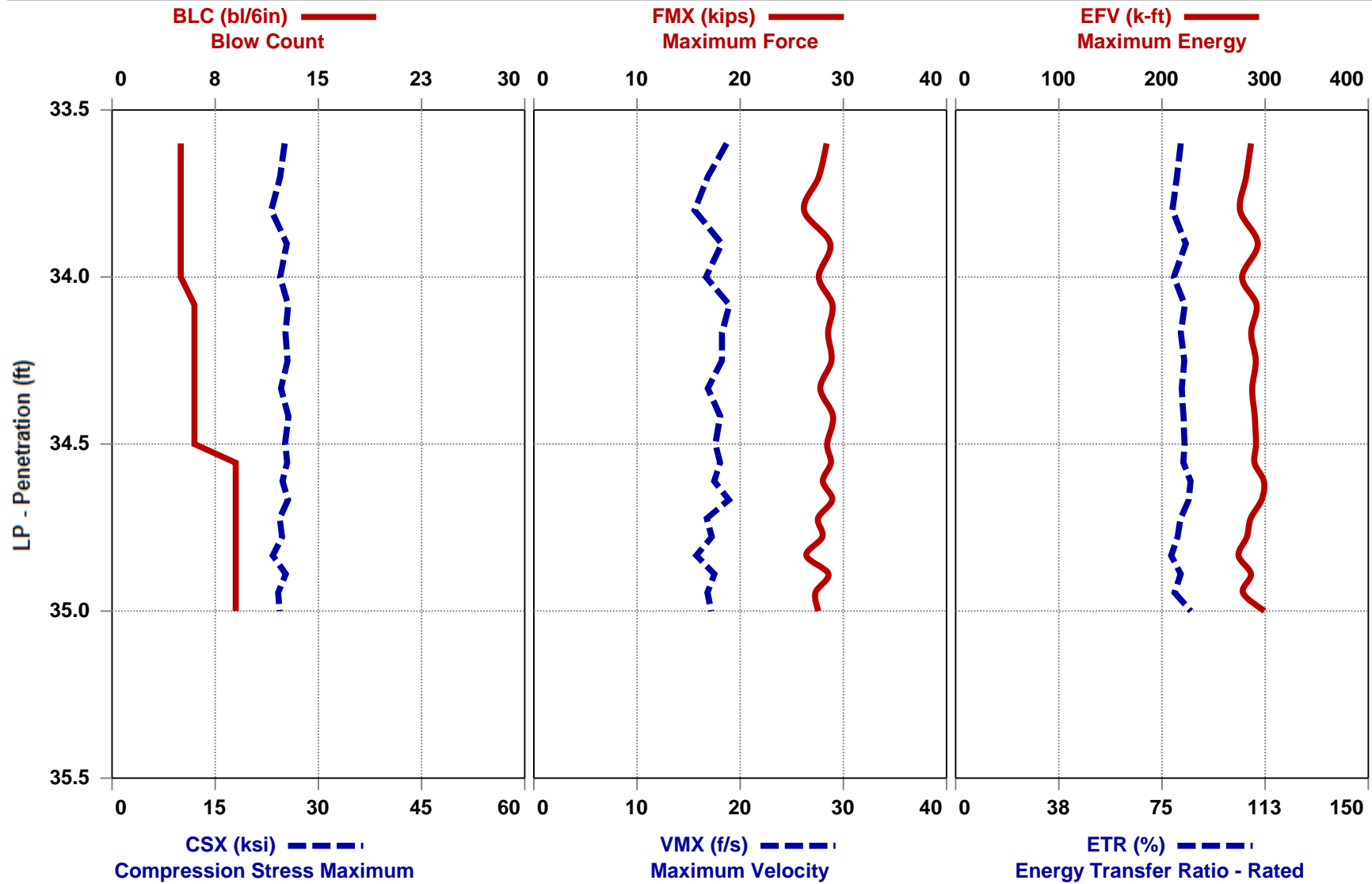
B-3





CME 550X (SN 249533) - 33.5 TO 35.0

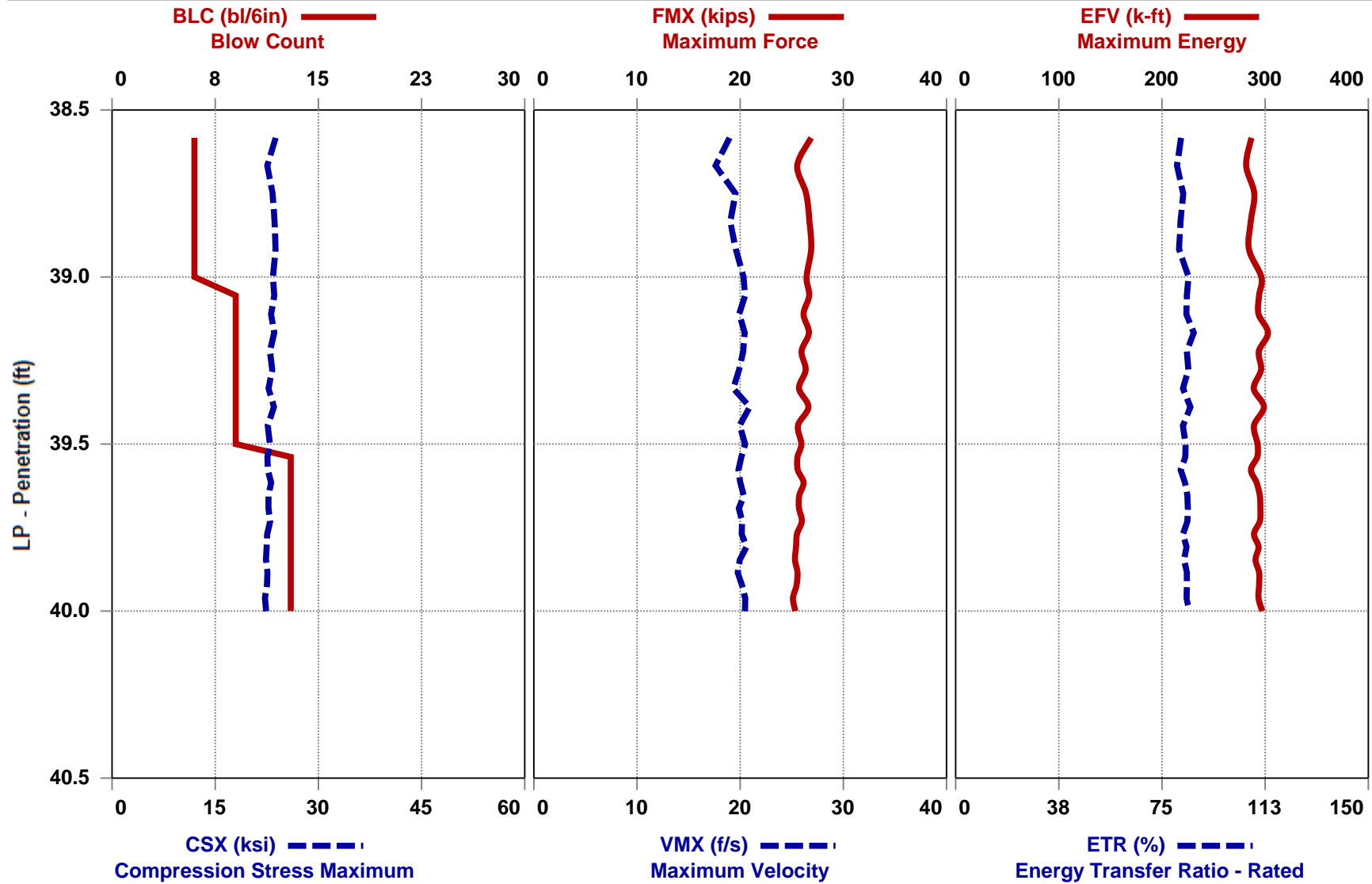
B-3

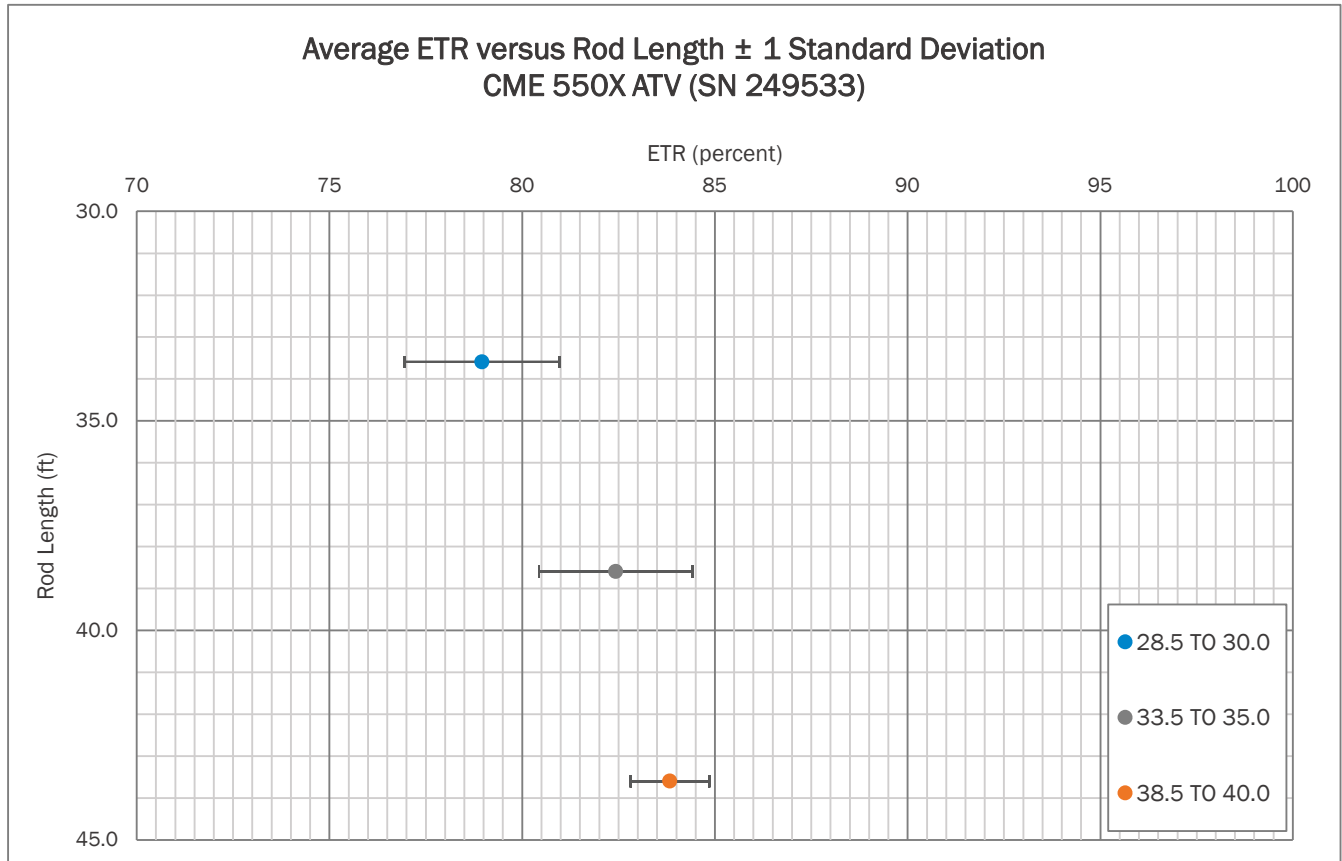
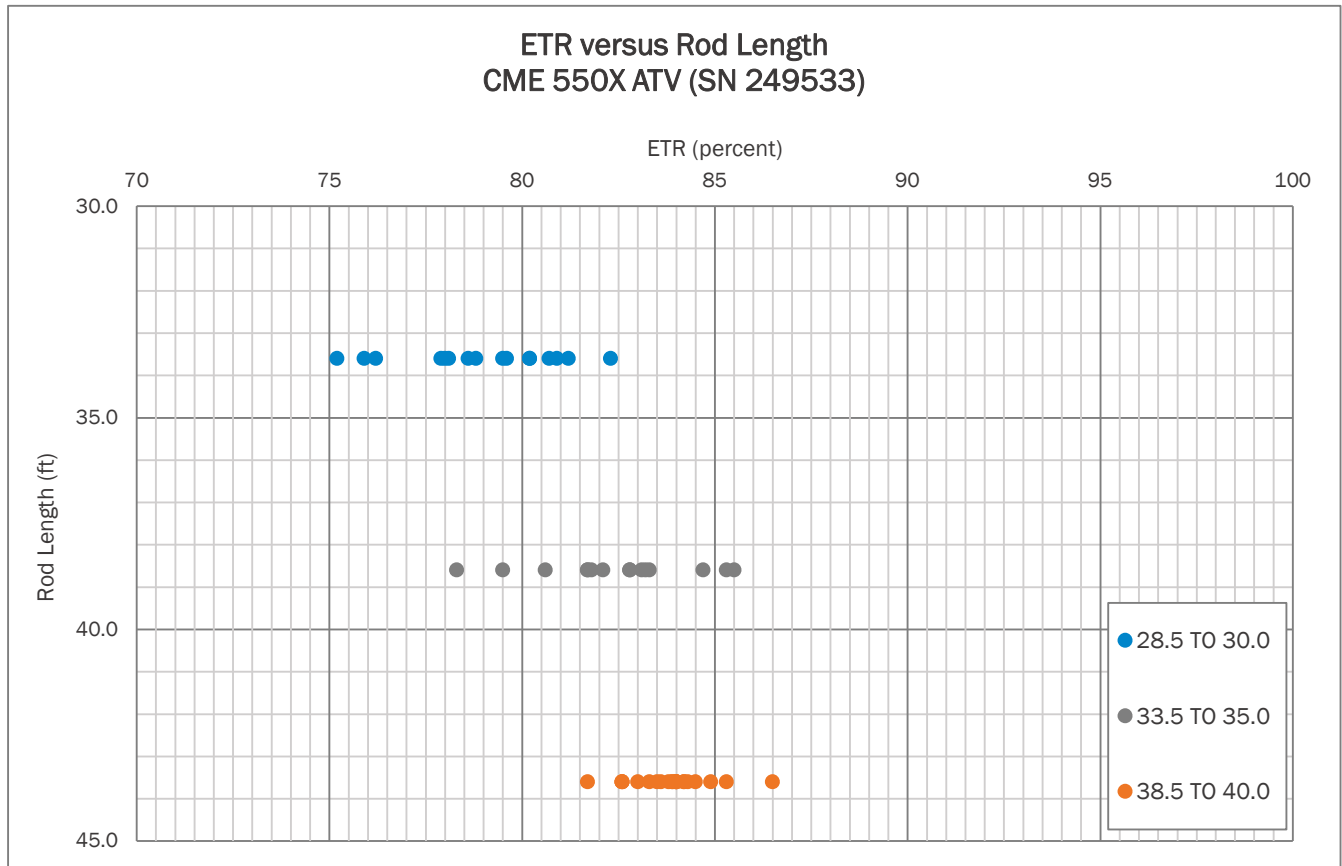




CME 550X (SN 249533) - 38.5 TO 40.0

B-3







## APPENDIX II

# SPT Hammer Energy Field Form

**Project:** SPT HAMMER ENERGY  
**Project No.:** 240021095  
**Boring No.:** B-3

**Date:** 4/12/2024  
**Weather:** 50's CLEAR  
**Drill Rod Type:** AWJ

## On-site Personnel

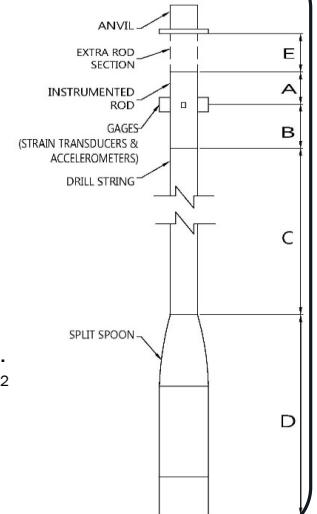
Drilling Company: BRECCIA CONSTRUCTION, LLC  
 Rig Operator: J. PHILLIPS  
 Engr/Geologist: N/A  
 Client Rep.: N/A  
 Analyzer Oper.: R. KRAL

## Rig/Hammer Info

Drill Rig Make/Model: CME 550X  
 Carrier Type: ATV  
 Rig Serial No.: 249533  
 Hammer Type/Model: CME  
 Hammer Serial No.: N/A  
 Hammer Drop System: AUTO  
 Lubrication Condition: PER MANUFACTURER  
 Manufacturer Recommended  
 Operation Rate (bpm): 55  
 Drop Height (in.): 30  
 Hammer Weight (lbs): 140  
 Anvil Dimension (in.): 11.5  
 Drilling Method: 2.25 HSA

## Rod Info

**(A + E)** Impact Surface to Gages Length: 1.36 ft  
**(B)** Instr. Rod Length below Gages: 0.70 ft  
**(A) + (B)** Instr. Rod Length: 2.00 ft  
**(D)** Spoon Length: 2.85 ft  
**(E)** Rod Length Above Instr. Rod (if applicable): 0.06 ft  
 Instr. Rod S/N: 728AWJ  
 Instr. Rod Outside Dia.: 1.75 in.  
 Instr. Rod Area: 1.13 in<sup>2</sup>  
 PDA Make/Model: SPT  
 PDA Serial No.: 4553 TB  
 Calib. Pulse Test (y/n): Y



## Gage Info

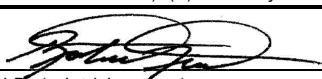
| Gage   |    | Serial No. | Calibration No. |
|--------|----|------------|-----------------|
| Accel. | A3 | K10959     | 413.83          |
|        | A4 | K10960     | 419.89          |
| Strain | F3 | 728AWJ-1   | 224.65          |
|        | F4 | 728AWJ-2   | 224.14          |

| Date of Test | Test Depth Increment<br>(ft to ft) | Test Time Start / Stop<br>(military) | Length of Drill String<br>(ft)<br>(C) | (LE) Length below Gages<br>(ft)<br>(B) + (C) + (D) | Avg. Meas. Hammer Rate<br>(BPM) | SPT Blow Counts |     |     |         | Drop Height in Tolerance<br>(y/n) | Soil Class. |
|--------------|------------------------------------|--------------------------------------|---------------------------------------|--|---------------------------------|-----------------|-----|-----|---------|-----------------------------------|-------------|
|              |                                    |                                      |                                       |  |                                 | 6"              | 12" | 18" | N-Value |                                   |             |
| 12-Apr       | 28.5 TO 30.0                       | 0842/0842                            | 30                                    | 33.6   | 52                              | 4               | 6   | 10  | 16      | Y                                 | SA SI       |
| 12-Apr       | 33.5 TO 35.0                       | 0849/0849                            | 35                                    | 38.6   | 53                              | 5               | 6   | 9   | 15      | Y                                 | SA SI       |
| 12-Apr       | 38.5 TO 40.0                       | 0859/0900                            | 40                                    | 43.6   | 51                              | 6               | 9   | 13  | 22      | Y                                 | SA SI       |
|              |                                    |                                      |                                       |  |                                 |                 |     |     |         |                                   |             |
|              |                                    |                                      |                                       |  |                                 |                 |     |     |         |                                   |             |
|              |                                    |                                      |                                       |  |                                 |                 |     |     |         |                                   |             |
|              |                                    |                                      |                                       |  |                                 |                 |     |     |         |                                   |             |
|              |                                    |                                      |                                       |  |                                 |                 |     |     |         |                                   |             |

## Notes:

TESTING PERFORMED AT 1817 LOWRYS HIGHWAY IN CHESTER, SOUTH CAROLINA (CHESTER COUNTY). THE APPROXIMATE COORDINATES ARE 34.7704051, -81.2454414.

NOTE: (1) Note any unusual hammer operating conditions that affect the hammer performance, or changes in operating conditions (e.g. verticality, weather, or lubrication between trials). (2) Note any changes in rod diameter along drill string and record locations of short rod sections.

  
 Prepared by (print/signature)

4/12/2024  
 Date





Figure No. 1: Rear View of Drill Rig



Figure No. 2: Side View of Drill Rig



Figure No. 3: Serial Number Plate



Figure No. 4: Automatic Hammer





## APPENDIX III



# *Certificate of Calibration*

Pile Dynamics, Inc. certifies that the

Pile Driving Analyzer®, Model SPT

Serial Number: 4553 TB

was calibrated on 18 December 2023  
using a PDA Calibration Box whose output was calibrated with test equipment  
traceable to NIST.

This certificate is valid for 2 years from above date.



Tested by [Signature]

Pile Dynamics, Inc.  
30725 Aurora Road  
Cleveland, Ohio 44139 USA





# *Certificate of Calibration*

**Pile Dynamics, Inc. certifies that the**

**Pile Driving Analyzer®, Model SPT**

**Serial Number: 4549 TB**

was calibrated on 14 July 2022

using a PDA Calibration Box whose output was calibrated with test equipment  
traceable to NIST.

This certificate is valid for 2 years from above date.



Tested by

*MCO*



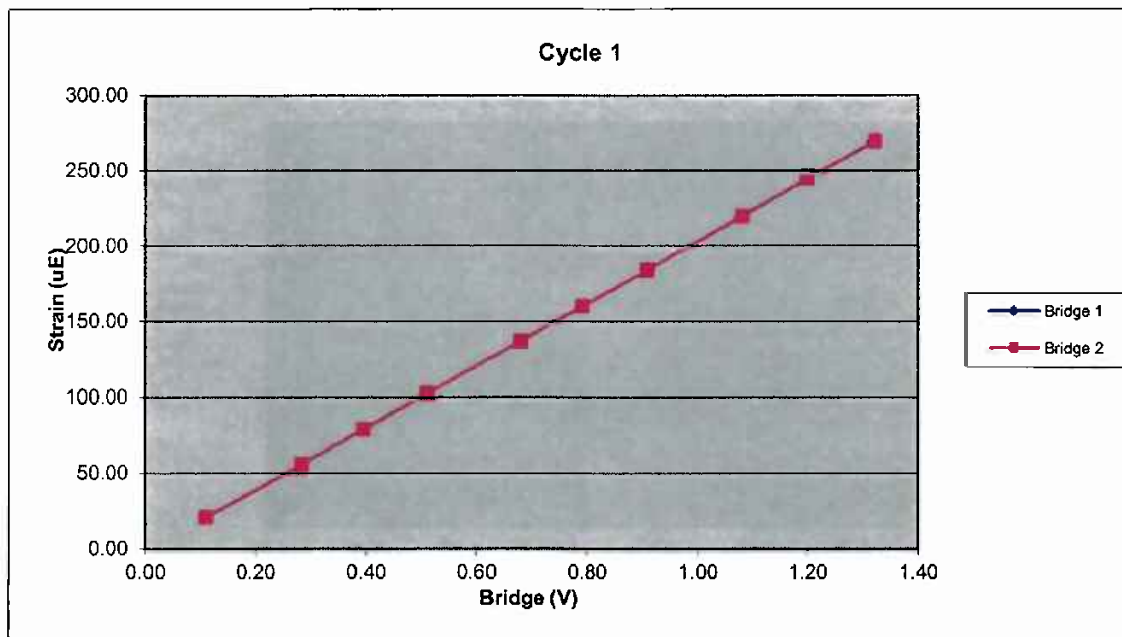
Pile Dynamics, Inc.  
30725 Aurora Road  
Cleveland, Ohio 44139 USA



| 528AWJ |            | Cycle 1                  |              |              |
|--------|------------|--------------------------|--------------|--------------|
| Sample | Force (lb) | Strain ( $\mu\text{E}$ ) | Bridge 1 (V) | Bridge 2 (V) |
| 1      | 0.00       | 0.00                     | 0.00         | 0.00         |
| 2      | 803.20     | 21.15                    | 0.11         | 0.11         |
| 3      | 2080.73    | 56.33                    | 0.28         | 0.28         |
| 4      | 2904.01    | 79.79                    | 0.39         | 0.39         |
| 5      | 3765.89    | 103.49                   | 0.51         | 0.51         |
| 6      | 5005.11    | 138.03                   | 0.68         | 0.68         |
| 7      | 5828.59    | 161.56                   | 0.79         | 0.79         |
| 8      | 6692.71    | 185.68                   | 0.91         | 0.91         |
| 9      | 7962.93    | 221.03                   | 1.08         | 1.08         |
| 10     | 8831.54    | 245.89                   | 1.20         | 1.20         |
| 11     | 9736.80    | 270.68                   | 1.32         | 1.32         |

| Bridge 1                               |          | Bridge 2                               |          |
|--|----------|--|----------|
| Force Calibration (lb/V)               | 7358.13  | Force Calibration (lb/V)               | 7351.82  |
| Offset                                 | 3.52     | Offset                                 | 6.26     |
| Correlation                            | 0.999999 | Correlation                            | 0.999999 |
| Strain Calibration ( $\mu\text{E/V}$ ) | 205.90   | Strain Calibration ( $\mu\text{E/V}$ ) | 205.73   |
| Offset                                 | -1.56    | Offset                                 | -1.48    |
| Correlation                            | 0.999995 | Correlation                            | 0.999996 |

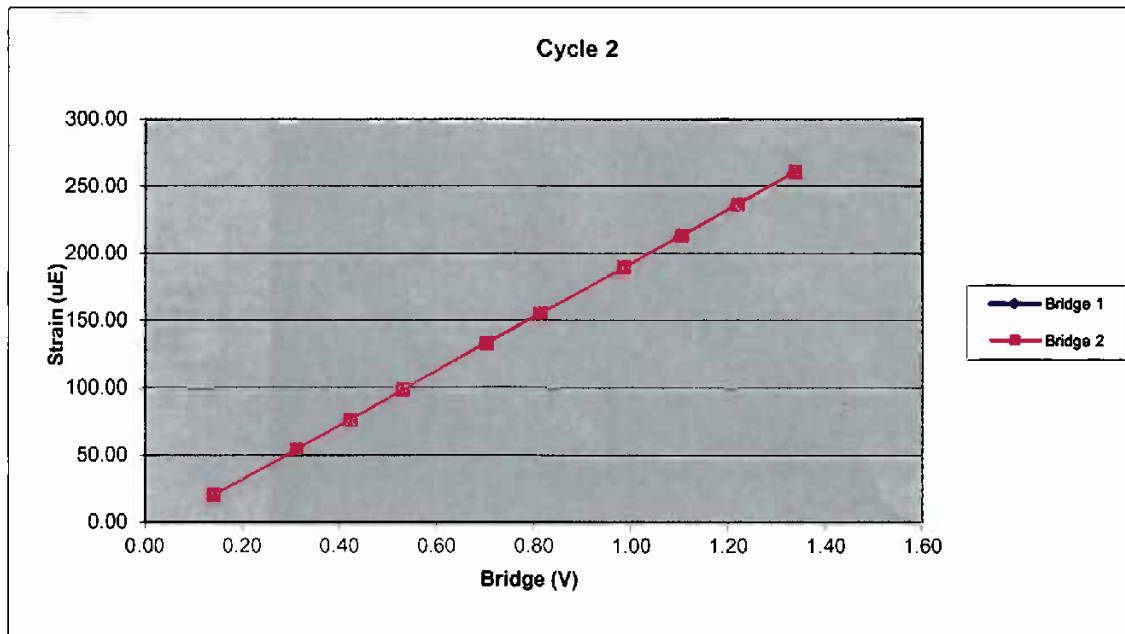
| Force Strain Calibration |          |
|--------------------------|----------|
| EA (Kips)                | 35735.87 |
| Offset                   | 59.29    |
| Correlation              | 0.999995 |



| 528AWJ |            | Cycle 2           |              |              |
|--------|------------|-------------------|--------------|--------------|
| Sample | Force (lb) | Strain ( $\mu$ E) | Bridge 1 (V) | Bridge 2 (V) |
| 1      | 0.00       | 0.00              | 0.00         | 0.00         |
| 2      | 1038.71    | 19.60             | 0.14         | 0.14         |
| 3      | 2288.25    | 53.30             | 0.31         | 0.31         |
| 4      | 3093.11    | 75.49             | 0.42         | 0.42         |
| 5      | 3893.00    | 97.84             | 0.53         | 0.53         |
| 6      | 5167.50    | 132.26            | 0.70         | 0.70         |
| 7      | 5988.25    | 154.39            | 0.81         | 0.81         |
| 8      | 7248.72    | 188.87            | 0.98         | 0.98         |
| 9      | 8125.71    | 212.29            | 1.10         | 1.10         |
| 10     | 8976.19    | 235.45            | 1.22         | 1.22         |
| 11     | 9854.85    | 259.50            | 1.33         | 1.34         |

| Bridge 1                        |          | Bridge 2                        |          |
|---------------------------------|----------|---------------------------------|----------|
| Force Calibration (lb/V)        | 7381.92  | Force Calibration (lb/V)        | 7365.94  |
| Offset                          | -0.76    | Offset                          | 4.69     |
| Correlation                     | 0.999998 | Correlation                     | 0.999999 |
| Strain Calibration ( $\mu$ E/V) | 200.83   | Strain Calibration ( $\mu$ E/V) | 200.40   |
| Offset                          | -8.59    | Offset                          | -8.44    |
| Correlation                     | 0.999997 | Correlation                     | 0.999996 |

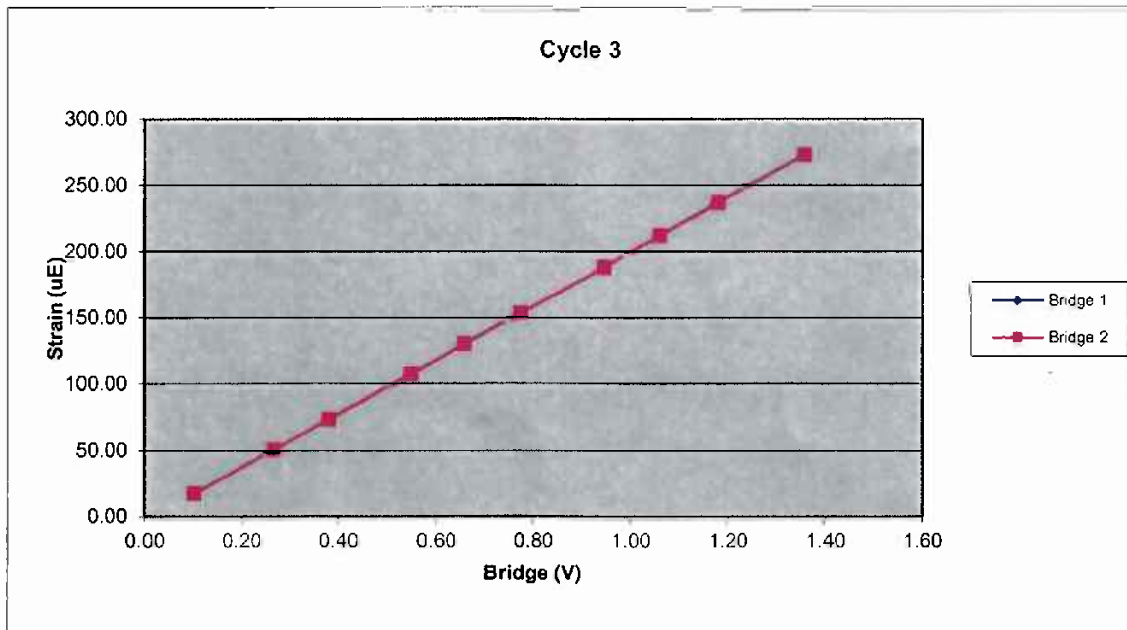
| Force Strain Calibration |          |
|--------------------------|----------|
| EA (Kips)                | 36756.34 |
| Offset                   | 315.07   |
| Correlation              | 0.999995 |



| 528AWJ |            | Cycle 3                  |              |              |
|--------|------------|--------------------------|--------------|--------------|
| Sample | Force (lb) | Strain ( $\mu\text{E}$ ) | Bridge 1 (V) | Bridge 2 (V) |
| 1      | 0.00       | 0.00                     | 0.00         | 0.00         |
| 2      | 734.68     | 18.74                    | 0.10         | 0.10         |
| 3      | 1943.58    | 51.94                    | 0.26         | 0.26         |
| 4      | 2781.29    | 75.07                    | 0.38         | 0.38         |
| 5      | 4027.81    | 108.88                   | 0.55         | 0.55         |
| 6      | 4829.55    | 131.78                   | 0.66         | 0.66         |
| 7      | 5689.29    | 155.36                   | 0.77         | 0.77         |
| 8      | 6956.49    | 190.12                   | 0.95         | 0.95         |
| 9      | 7799.46    | 214.09                   | 1.06         | 1.06         |
| 10     | 8693.90    | 238.78                   | 1.18         | 1.18         |
| 11     | 10007.88   | 275.06                   | 1.36         | 1.36         |

| Bridge 1                                      |          | Bridge 2                                      |          |
|---|----------|---|----------|
| Force Calibration (lb/V)                      | 7366.71  | Force Calibration (lb/V)                      | 7364.49  |
| Offset  | -6.17    | Offset  | -9.40    |
| Correlation                                   | 0.999998 | Correlation                                   | 0.999999 |
| Strain Calibration ( $\mu\text{E}/\text{V}$ ) | 203.78   | Strain Calibration ( $\mu\text{E}/\text{V}$ ) | 203.72   |
| Offset  | -2.08    | Offset  | -2.17    |
| Correlation                                   | 0.999989 | Correlation                                   | 0.999993 |

| Force Strain Calibration |          |
|--------------------------|----------|
| EA (Kips)                | 36149.33 |
| Offset                   | 69.26    |
| Correlation              | 0.999994 |



Bridge Excitation (V) 5  
Shunt Resistor (ohm) 60.4k

|                              |          |                              |        |
|------------------------------|----------|------------------------------|--------|
| Calibration Factors          | 528AWJ   |                              |        |
| Bridge 1 ( $\mu\text{E/V}$ ) | 203.51   | Bridge 2 ( $\mu\text{E/V}$ ) | 203.28 |
| EA Factor (Kips)             | 36213.85 | Area ( $\text{in}^2$ )       | 1.21   |

Calibrated by:



Calibrated Date:

7/18/2022

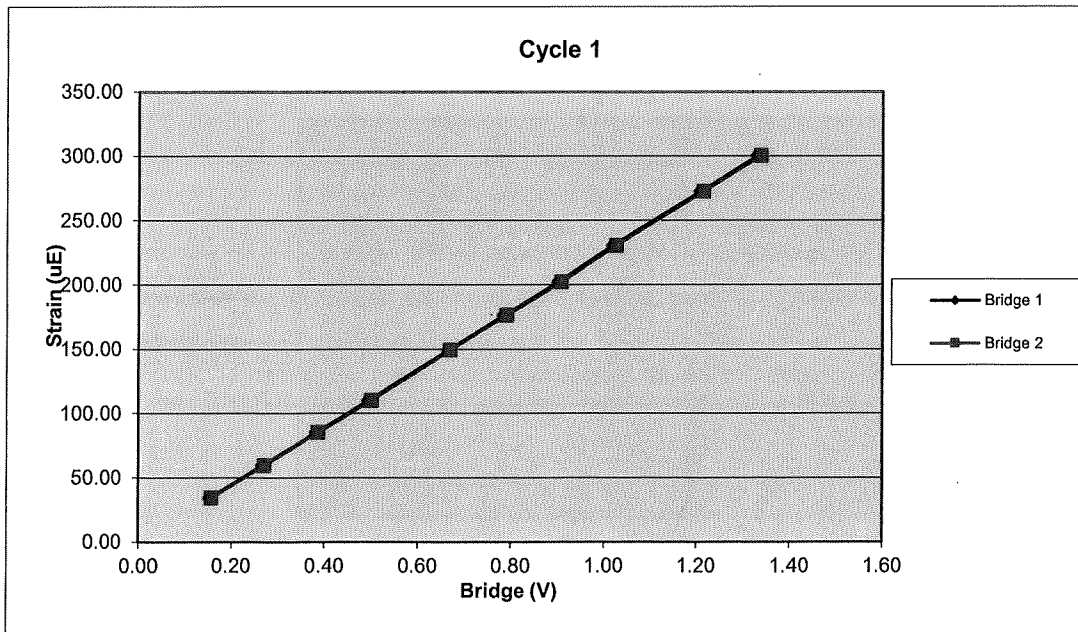
Pile Dynamics Inc  
30725 Aurora Rd  
Solon, OH 44139

Traceable to N.I.S.T.

| 728AWJ | Cycle 1    |                   |              |              |
|--------|------------|-------------------|--------------|--------------|
| Sample | Force (lb) | Strain ( $\mu$ E) | Bridge 1 (V) | Bridge 2 (V) |
| 1      | 0.00       | 0.00              | 0.00         | 0.00         |
| 2      | 1199.06    | 34.33             | 0.16         | 0.16         |
| 3      | 2052.76    | 59.72             | 0.27         | 0.27         |
| 4      | 2924.20    | 85.27             | 0.38         | 0.39         |
| 5      | 3782.68    | 110.02            | 0.50         | 0.50         |
| 6      | 5074.34    | 149.22            | 0.67         | 0.67         |
| 7      | 5985.06    | 176.19            | 0.79         | 0.79         |
| 8      | 6869.47    | 202.19            | 0.90         | 0.91         |
| 9      | 7768.10    | 230.48            | 1.02         | 1.03         |
| 10     | 9202.28    | 272.31            | 1.21         | 1.22         |
| 11     | 10126.06   | 300.27            | 1.33         | 1.34         |

| Bridge 1                        |          | Bridge 2                        |          |
|---------------------------------|----------|---------------------------------|----------|
| Force Calibration (lb/V)        | 7583.03  | Force Calibration (lb/V)        | 7557.58  |
| Offset                          | 20.67    | Offset                          | 0.95     |
| Correlation                     | 1.000000 | Correlation                     | 0.999999 |
| Strain Calibration ( $\mu$ E/V) | 226.02   | Strain Calibration ( $\mu$ E/V) | 225.27   |
| Offset                          | -1.27    | Offset                          | -1.86    |
| Correlation                     | 0.999984 | Correlation                     | 0.999979 |

| Force Strain Calibration |          |
|--------------------------|----------|
| EA (Kips)                | 33548.47 |
| Offset                   | 63.54    |
| Correlation              | 0.999983 |

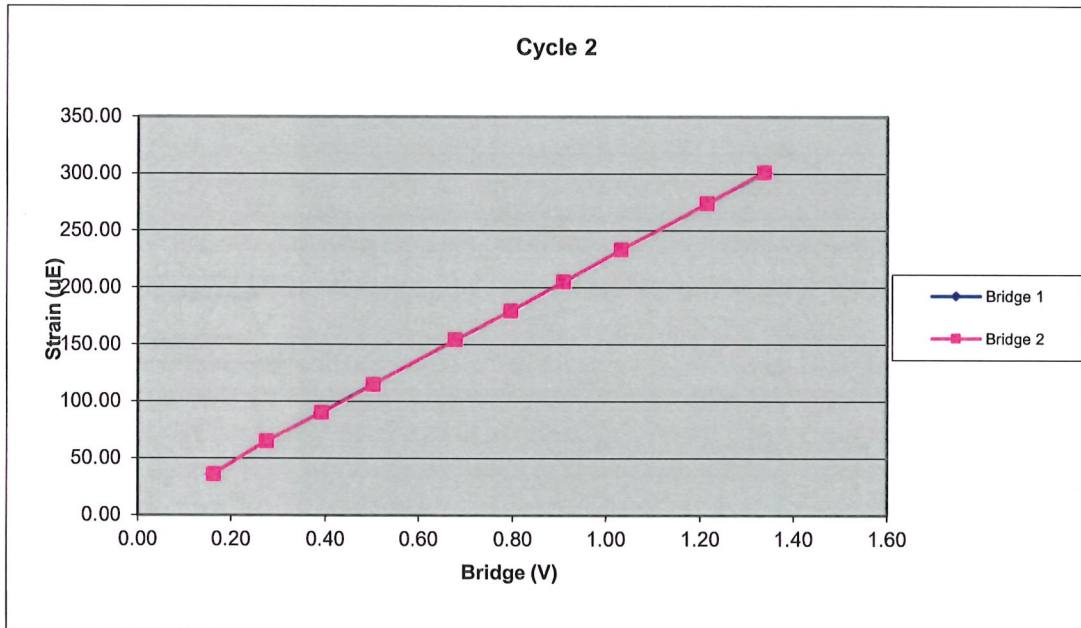




| 728AWJ |            | Cycle 2           |              |              |
|--------|------------|-------------------|--------------|--------------|
| Sample | Force (lb) | Strain ( $\mu$ E) | Bridge 1 (V) | Bridge 2 (V) |
| 1      | 0.00       | 0.00              | 0.00         | 0.00         |
| 2      | 1236.98    | 35.69             | 0.16         | 0.16         |
| 3      | 2108.61    | 64.71             | 0.28         | 0.28         |
| 4      | 2976.64    | 89.52             | 0.39         | 0.39         |
| 5      | 3811.14    | 114.45            | 0.50         | 0.50         |
| 6      | 5141.89    | 153.54            | 0.68         | 0.68         |
| 7      | 6032.24    | 178.92            | 0.80         | 0.80         |
| 8      | 6903.48    | 204.54            | 0.91         | 0.91         |
| 9      | 7825.42    | 232.64            | 1.03         | 1.03         |
| 10     | 9217.58    | 273.43            | 1.22         | 1.22         |
| 11     | 10151.02   | 300.79            | 1.34         | 1.34         |

| Bridge 1                        |          | Bridge 2                        |          |
|---------------------------------|----------|---------------------------------|----------|
| Force Calibration (lb/V)        | 7561.16  | Force Calibration (lb/V)        | 7576.28  |
| Offset                          | 14.33    | Offset                          | 4.68     |
| Correlation                     | 0.999997 | Correlation                     | 0.999995 |
| Strain Calibration ( $\mu$ E/V) | 223.39   | Strain Calibration ( $\mu$ E/V) | 223.84   |
| Offset                          | 1.55     | Offset                          | 1.27     |
| Correlation                     | 0.999945 | Correlation                     | 0.999943 |

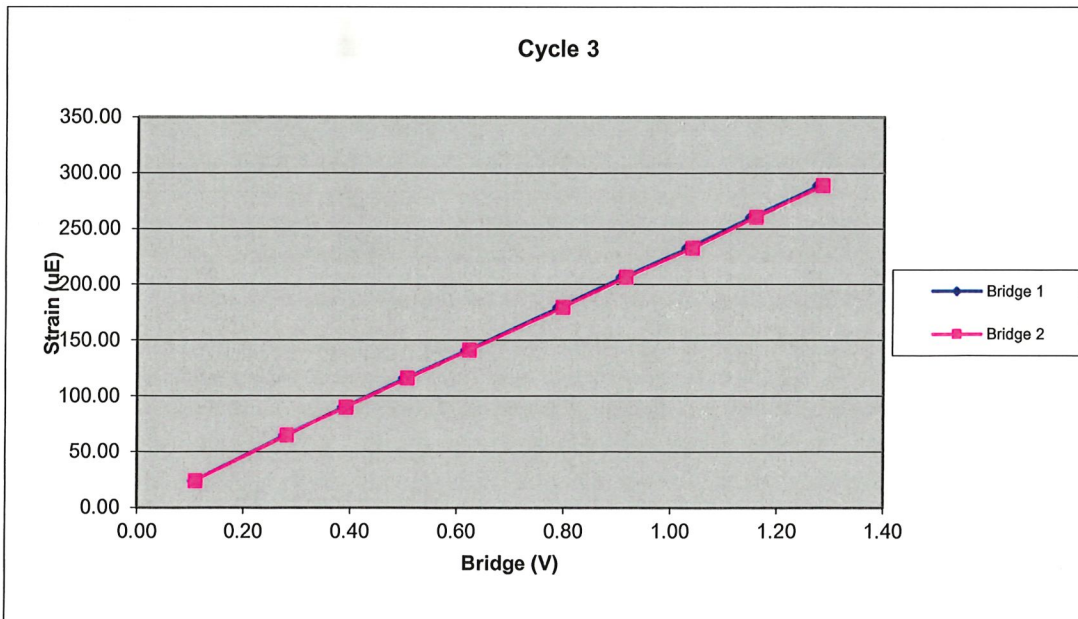
| Force Strain Calibration |          |
|--------------------------|----------|
| EA (Kips)                | 33843.24 |
| Offset                   | -37.68   |
| Correlation              | 0.999950 |



| 728AWJ |            | Cycle 3                  |              |              |
|--------|------------|--------------------------|--------------|--------------|
| Sample | Force (lb) | Strain ( $\mu\text{E}$ ) | Bridge 1 (V) | Bridge 2 (V) |
| 1      | 0.00       | 0.00                     | 0.00         | 0.00         |
| 2      | 822.90     | 24.10                    | 0.11         | 0.11         |
| 3      | 2132.69    | 64.89                    | 0.28         | 0.28         |
| 4      | 2972.74    | 89.98                    | 0.39         | 0.39         |
| 5      | 3841.65    | 115.75                   | 0.50         | 0.51         |
| 6      | 4741.16    | 141.06                   | 0.62         | 0.62         |
| 7      | 6043.35    | 179.33                   | 0.79         | 0.80         |
| 8      | 6961.58    | 206.39                   | 0.91         | 0.92         |
| 9      | 7901.94    | 232.60                   | 1.03         | 1.04         |
| 10     | 8816.85    | 260.36                   | 1.15         | 1.16         |
| 11     | 9759.65    | 288.75                   | 1.28         | 1.29         |

| Bridge 1                                      |          | Bridge 2                                      |          |
|---|----------|---|----------|
| Force Calibration (lb/V)                      | 7644.24  | Force Calibration (lb/V)                      | 7602.69  |
| Offset  | -5.25    | Offset  | -12.15   |
| Correlation                                   | 0.999999 | Correlation                                   | 0.999997 |
| Strain Calibration ( $\mu\text{E}/\text{V}$ ) | 224.53   | Strain Calibration ( $\mu\text{E}/\text{V}$ ) | 223.31   |
| Offset  | 1.57     | Offset  | 1.37     |
| Correlation                                   | 0.999950 | Correlation                                   | 0.999942 |

| Force Strain Calibration |          |
|--------------------------|----------|
| EA (Kips)                | 34041.33 |
| Offset                   | -58.11   |
| Correlation              | 0.999945 |



Bridge Excitation (V) 5  
Shunt Resistor (ohm) 60.4k

|                              |          |                              |        |
|------------------------------|----------|------------------------------|--------|
| Calibration Factors          | 728AWJ   |                              |        |
| Bridge 1 ( $\mu\text{E/V}$ ) | 224.65   | Bridge 2 ( $\mu\text{E/V}$ ) | 224.14 |
| EA Factor (Kips)             | 33811.01 | Area ( $\text{in}^2$ )       | 1.13   |

Calibrated by: Sean Bannon  
Calibrated Date: 2/6/2024

Pile Dynamics Inc  
30725 Aurora Rd  
Solon, OH 44139

Traceable to N.I.S.T.

# Accelerometer Calibration Certificate

## Pile Dynamics, Inc.



Calibrated by Pile Dynamics, Inc.  
Calibration performed on 14Jun2022

Serial No: K10959 Temperature: 79.0 °F

Model: PR Humidity: 50%

Calibrated on: Channel 3 on 8G 5161 LE

### PDA CALIBRATION FACTOR

413.8 mv/5000g

(82.8  $\mu$ v/g)

R<sup>2</sup>: 0.999956 [Chip programmed]

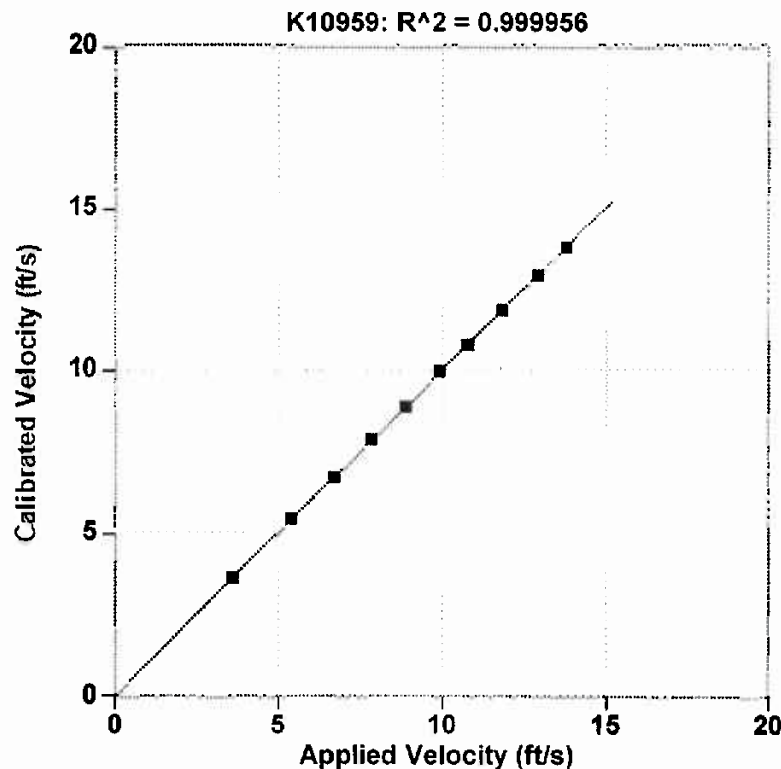
Ref Acc 1: 72517! Cal on: 24Mar2022  
1049 g's/volt

Ref Acc 2: 72505! Cal on: 24Mar2022  
1035 g's/volt

Operator: William Johnson

  
Signed

Reference accelerometer calibrations are traceable to  
the United States National Institute of Standards and  
Technology (NIST).



| Reference Velocity | S/N K10959 Velocity |
|--------------------|---------------------|
| ft/s               | ft/s                |
| 3.605              | 3.589               |
| 5.397              | 5.412               |
| 6.705              | 6.699               |
| 7.841              | 7.862               |
| 8.877              | 8.913               |
| 9.904              | 9.929               |
| 10.746             | 10.721              |
| 11.807             | 11.815              |
| 12.910             | 12.889              |
| 13.783             | 13.762              |

Maximum Acceleration: 935 g's

# Accelerometer Calibration Certificate

## Pile Dynamics, Inc.



Calibrated by Pile Dynamics, Inc.  
Calibration performed on 14Jun2022

Serial No: K10960 Temperature: 79.0 °F

Model: PR Humidity: 50%

Calibrated on: Channel 3 on 8G 5161 LE

### PDA CALIBRATION FACTOR

**419.9 mv/5000g**

(84.0  $\mu$ v/g)

R<sup>2</sup>: 0.999944 [Chip programmed]

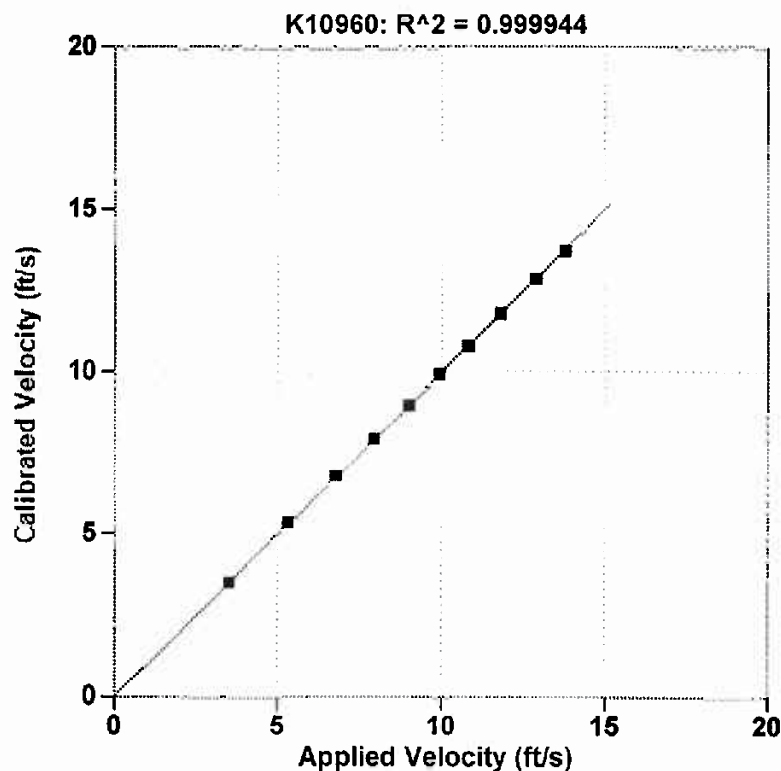
Operator: William Johnson

Ref Acc 1: 72517! Cal on: 24Mar2022  
1049 g's/volt

Ref Acc 2: 72505! Cal on: 24Mar2022  
1035 g's/volt

Signed

Reference accelerometer calibrations are traceable to  
the United States National Institute of Standards and  
Technology (NIST).



| Reference Velocity | S/N K10960 Velocity |
|--------------------|---------------------|
| ft/s               | ft/s                |
| 3.513              | 3.540               |
| 5.322              | 5.345               |
| 6.769              | 6.796               |
| 7.933              | 7.937               |
| 8.998              | 9.037               |
| 9.912              | 9.923               |
| 10.788             | 10.775              |
| 11.781             | 11.779              |
| 12.877             | 12.863              |
| 13.771             | 13.732              |

Maximum Acceleration: 934 g's

# Accelerometer Calibration Certificate

## Pile Dynamics, Inc.



Calibrated by Pile Dynamics, Inc.  
Calibration performed on 14Jun2022

Serial No: K11957 Temperature: 79.0 °F

Model: PR Humidity: 50%

Calibrated on: Channel 3 on 8G 5161 LE

### PDA CALIBRATION FACTOR

409.6 mv/5000g

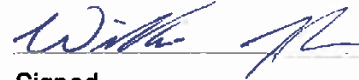
(81.9  $\mu$ v/g)

R<sup>2</sup>: 0.999919 [Chip programmed]

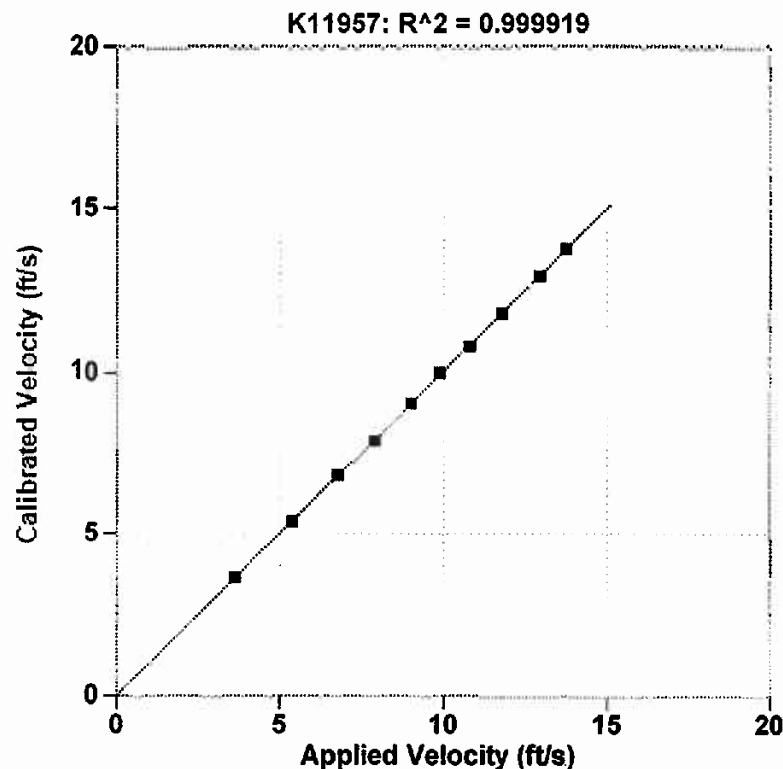
Operator: William Johnson

Ref Acc 1: 72517! Cal on: 24Mar2022  
1049 g's/volt

Ref Acc 2: 72505! Cal on: 24Mar2022  
1035 g's/volt

  
Signed

Reference accelerometer calibrations are traceable to  
the United States National Institute of Standards and  
Technology (NIST).



| Reference Velocity<br>ft/s | S/N K11957<br>Velocity<br>ft/s |
|----------------------------|--------------------------------|
| 3.643                      | 3.661                          |
| 5.377                      | 5.363                          |
| 6.761                      | 6.783                          |
| 7.895                      | 7.905                          |
| 8.973                      | 8.989                          |
| 9.864                      | 9.918                          |
| 10.780                     | 10.730                         |
| 11.763                     | 11.749                         |
| 12.920                     | 12.894                         |
| 13.735                     | 13.746                         |

Maximum Acceleration: 931 g's



## APPENDIX IV





This documents that  
**Robert E. Kral**  
**Carolinas Geotechnical Group**  
has on May 20, 2016 achieved the rank of  
**ADVANCED**


**on the Dynamic Measurement and Analysis Proficiency Test.**

The individual identified on this document demonstrated to the degree granted above an understanding of theory, data quality evaluation, interpretation and signal matching for high strain dynamic testing of deep foundations. ***It is recommended that individuals at the Advanced level seek Master or Expert levels through additional study within six years of the date of this document.***

The ability of the individual named to provide appropriate knowledge and advice on a specific project is not implied or warranted by the Pile Driving Contractors Association or Pile Dynamics, Inc. **This certificate can be verified at [www.PDAproficiencytest.com](http://www.PDAproficiencytest.com).** The Pile Driving Contractors Association or Pile Dynamics, Inc. assumes no liability for foundation testing and analysis work performed by the bearer of this certificate.

  
Steven A. Hall, Executive Director  
Pile Driving Contractors Association



  
Garland Likins, Senior Partner  
Pile Dynamics, Inc.

No. 2072

# SC 83 over Little Pee Dee River

## Geotechnical Baseline Report

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# APPENDIX

## SECTION 9      GEOSCOPING FORM



# GeoScoping Form

| PROJECT INFORMATION            |   |
|--------------------------------|---|
| Project ID: 67100.010 Task 001 | Date of Trip: 2-28-2025                     |
| County: Marlboro County        | Location: NE of Clio, SC & nearby NC border |
| Rd/Route: 56-83                | Local Name: 56-83 (no local name seen)      |
| Attendees: Benjamin Vogel      |   |

| EXISTING BRIDGE INFORMATION                            |   |
|--|---|
| Bridge Length: 250'                                    | Bridge Width: ~22.5' (21' road width + 2x 10" railing bases)                  |
| Superstructure Type: [redacted]                        | Substructure Type: [redacted]   |
| Begin Bridge Sta.: [redacted]                          | End Bridge Sta.: [redacted]   |
| Begin Bridge Embankment Sta. <sup>1</sup> : [redacted] | End Bridge Embankment Sta. <sup>1</sup> : [redacted]                          |
| Structure Number: 00814                                | Posted Weight Limit: See Comments...  |
| Crossing: Little Pee Dee River                         | Skew: <del>30°</del> NW-pointing side: square w/ river; S-pointing side: ~30° |
| Latitude: 34.61082° N                                  | Longitude: 74.50137° W  |
| Existing Fill Height: [redacted]                       | Approximate Existing Slope Angle: [redacted]                                  |

<sup>1</sup>Begin and End Bridge Embankment 100 feet down station or up station from bridge, respectively

| EXISTING ROADWAY EMBANKMENT INFORMATION   |   |
|---|---|
| Begin Project Sta.: [redacted]  | Begin Bridge Embankment Sta. <sup>1</sup> : [redacted]      |
| Accessibility Issues: S-pointing side: steep & pitched b/w hills = manual descent or very rocky ATV down slope travel into slightly more          |   |
| Ground Cover: Field → wooded → wooded wetlands → river, both sides  |   |
| Existing Fill Height: [redacted]  | Approximate Existing Slope Angle: 40° ish → 30-35°          |
| Local Development (undeveloped, developed residential, developed commercial, developed industrial, etc.): Undeveloped, residential & agricultural |   |
| Topography (level, flat, rolling, steep, hillside, valley, swamp, gully, etc.): Rolling → steep down → level swamp (more gradual on NE side)      |   |
| Traffic Control Necessary (Y/N): No, bridge is closed off   |   |
| Surface Soil: Silty F-M SAND  | Muck (Y/N): No (at least not in top 10') (later, yes)       |
| Exposed Rock (Y/N): No  | In Stream Bed (Y/N): No, [redacted] on NE side              |
| Wetlands On-Site (Y/N): Yes, NE side especially   | In Banks (Y/N): Mostly yes, could be bed                    |
| Depth EG to Water: 15.5' both sides   | Wetlands Adjacent (Y/N): Yes, wetlands all around           |
| Depth to Existing Ground: 15.5' both sides (gradual approach to water)  | Water Depth: 0-2' both sides                                |
| Scour Condition at EB: Mild   | Scour Condition at IB: Mild                                 |
| End Bridge Embankment Sta. <sup>1</sup> : [redacted]  | End Project Sta.: [redacted]                                |
| Accessibility Issues: S-pointing side: Too steep & river cuts close near bridge → manual descent needed; NW-pointing side: Steep, but ATV         |   |
| Ground Cover: Wooded wetlands into river on both S-pointing & NW-pointing sides near river  |   |
| Existing Fill Height: [redacted]  | Approximate Existing Slope Angle: 27° → 5° → 30-40°         |
| Local Development (undeveloped, developed residential, developed commercial, developed industrial, etc.): Undeveloped, S & NW-pointing sides      |   |
| Topography (level, flat, rolling, steep, hillside, valley, swamp, gully, etc.): Both sides: level swamp aside from raised road                    |   |
| Traffic Control Necessary (Y/N): No, bridge is closed off   |   |
| Surface Soil: Silty F-M SAND  | Muck (Y/N): No, at least not in top 10', later yes though   |
| Exposed Rock (Y/N): No  | In Stream Bed (Y/N): No, [redacted] on S-pointing side      |
| Wetlands On-Site (Y/N): Yes, pretty close near river  | In Banks (Y/N): Mostly yes, could be bed on S-pointing side |
| Depth EG to Water: ~14.5' both S & NW-pointing sides  | Wetlands Adjacent (Y/N): Yes, plus wetlands all around      |
| Depth to Existing Ground: 14.5' too, to NW-pointing bank; more like 13.5' on S-pointing bank (depress vs. gradual to water)                       | Water Depth: 0-3' on both sides                             |
| Scour Condition at EB: Mild (higher end)  | Scour Condition at IB: Mild (higher end)                    |

GDF 000

Missing soil beneath concrete & has a big erosive chasm from top to bottom of slope

Mostly okay but some soil eroded around, more severe for posts near river

Rev. 01/2019

(\*) Dirt mound obstructing road on B-4 side, open & clear road on B-1/DH-1 side



## GeoScoping Form

| UTILITIES INFORMATION   |  |
|-------------------------|--|
| Attached:               | <u>Metal pipe attached on NE/NW-painting side</u> : possible <u>fiber optic</u> cables   |
| Above Ground/ Overhead: | On S-painting side : <u>power lines</u> overhead, running adjacent   |
| Underground:            | Likely <u>fiber optic</u> on both sides of bridge underground → the whole area is swarming w/ orange markers & fiber optic messaging |

| COMMENTS   |                |  |              |    |           |    |              |    |  |                                |    |        |    |       |    |
|--|----------------|--|--------------|----|-----------|----|--------------|----|--|--------------------------------|----|--------|----|-------|----|
| <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <p style="text-align: center;">Bridge Weight<br/>Limit - Tons</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 2px;">Single Vehicle</td> <td style="padding: 2px;"></td> </tr> <tr> <td style="padding: 2px;">2 or 3 Axles</td> <td style="padding: 2px; text-align: center;">2T</td> </tr> <tr> <td style="padding: 2px;">4 or More</td> <td style="padding: 2px; text-align: center;">2T</td> </tr> <tr> <td style="padding: 2px;">Combinations</td> <td style="padding: 2px; text-align: center;">3T</td> </tr> </table> </div> | Single Vehicle |  | 2 or 3 Axles | 2T | 4 or More | 2T | Combinations | 3T | <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <p style="text-align: center;">Emergency<br/>Vehicle<br/>Weight Limits</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 2px;">Single <del>Vehicle</del> Axle</td> <td style="padding: 2px; text-align: center;">2T</td> </tr> <tr> <td style="padding: 2px;">Tandem</td> <td style="padding: 2px; text-align: center;">2T</td> </tr> <tr> <td style="padding: 2px;">Gross</td> <td style="padding: 2px; text-align: center;">3T</td> </tr> </table> </div> | Single <del>Vehicle</del> Axle | 2T | Tandem | 2T | Gross | 3T |
| Single Vehicle   |                |  |              |    |           |    |              |    |  |                                |    |        |    |       |    |
| 2 or 3 Axles   | 2T             |  |              |    |           |    |              |    |  |                                |    |        |    |       |    |
| 4 or More  | 2T             |  |              |    |           |    |              |    |  |                                |    |        |    |       |    |
| Combinations   | 3T             |  |              |    |           |    |              |    |  |                                |    |        |    |       |    |
| Single <del>Vehicle</del> Axle   | 2T             |  |              |    |           |    |              |    |  |                                |    |        |    |       |    |
| Tandem   | 2T             |  |              |    |           |    |              |    |  |                                |    |        |    |       |    |
| Gross  | 3T             |  |              |    |           |    |              |    |  |                                |    |        |    |       |    |

### Instructions:

1. Attach boring location plan for bridge and roadway.
2. Attach all photographs taken, photographs to be labeled as to direction looking in and what is being depicted.
3. Fill out GeoScoping Form as completely as possible, using additional sheets as necessary to describe site conditions.
4. If representative of GEC on site during GeoScoping, include GEC representative's name and contact number in Attendees block.



# GeoScoping Form



**Embankment Near B-4, Facing Southwest at Side Profile**



**Bridge Asset ID**



**Bridge Signage**



**Bridge Signage**



**Bridge Signage**



**Northeastern Portion of Bridge, Facing Southwest**



# GeoScoping Form



**Underside Southwest Side of Bridge**



**Underside Southwest Side of Bridge**



**Underside Northeast Side of Bridge**



**Underside Northeast Side of Bridge**



**Utility Pipe**



**Utility Pipe**



## GeoScoping Form



**Southwestern Portion of Bridge,  
Facing Northeast**



**Southwestern Portion of Bridge,  
Facing Northeast**



**Buried Fiber Optic Cable**



**Buried Fiber Optic Cable**



**AT&T/Time Warner Cable Utility  
Markings**