



# GEOTECHNICAL SUBSURFACE DATA REPORT

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



## PREPARED FOR

SCDOT

955 Park Street

Columbia, South Carolina 29201



## PREPARED BY

F&ME Consultants, Inc.

211 Business Park Boulevard

Columbia, South Carolina 29203

SCDOT Project ID: P042879

FME Project No.: G7100.010—Task 00001

April 7, 2025

April 7, 2025

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

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

Mr. Harris:

Submitted herein is F&ME Consultants, Inc.'s (FME) Geotechnical Subsurface Data Report for the SC 83 over Little Pee Dee River project. This report contains findings from our subsurface field exploration and laboratory testing program

It has been a pleasure working with you on this project and we appreciate the opportunity to be of service. Please notify us if there are any questions or if we can be of further assistance.

Respectfully Submitted,

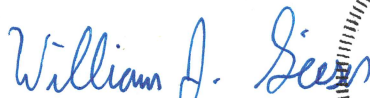
**F&ME CONSULTANTS, INC.**

A handwritten signature in blue ink that reads 'J. Trey Peterson'.

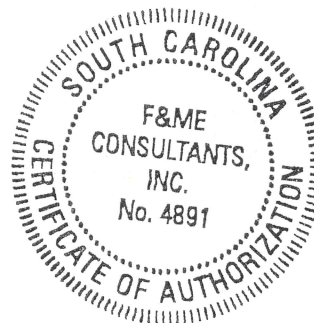
J. Trey Peterson, E.I.T.  
Geotechnical Staff Professional

A handwritten signature in blue ink that reads 'Alex M. Abernethy'.

Alex M. Abernethy, E.I.T.  
Materials Laboratory Manager

A handwritten signature in blue ink that reads 'William J. Gieser'.

William J. Gieser, P.E.  
Senior Project Engineer



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# 1. PROJECT DESCRIPTION

## 1.1. GENERAL

The project site is located along SC Highway 83, near the North Carolina border in Marlboro County, South Carolina. We understand that this project will involve the demolition/removal of the existing bridge structure and the replacement with a new, multi-span, bridge structure. A Site Location Plan is presented in the Appendix.

## 1.2. SCOPE

FME performed geotechnical subsurface exploration and laboratory testing for the project. The field exploration consisted of Soil Test Borings (STB) with Standard Penetration Testing (SPT), Electro-Piezocene Sounding (CPT), Downhole Shear Wave Velocity (DHT) testing, and Bulk Soil Samples (BS). Laboratory testing was performed on select soil samples collected from the Soil Test Borings and the Bulk Soil Samples.

Field exploration methods and laboratory 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. This report was prepared in general accordance with the 2022 SCDOT Geotechnical Design Manual (GDM).

# 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-Piezocene Soundings (2) and collected two (2) bulk soil samples.

The soils were visually classified in the field based upon the Unified Soil Classification System (USCS) in general accordance with ASTM D2488. Testing 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 SCDOT 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 was used to perform the SPTs. The measured energy transfer ratio 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/Water Gap (ft)	Total Boring Depth (ft)	Latitude	Longitude	Elevation (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 (CPT) TESTS

Electro-Piezcone Sounding (CPT) Tests 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 CPT Logs are presented in Section 3D of the Appendix. The following table provides a summary of the Electro-Piezcone Sounding Test designations, depths, locations, and surface elevations.

**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 manual auger boring logs are contained within Section 3B of the Appendix of this report. The photos of the pavement cores are also provided in Section 7 of the Appendix. The following table summarizes the performed pavement coring and manual auger borings.

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

Test ID	Test Type	Test Depth (ft)	Latitude	Longitude	Elevation (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. 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>
<b>Total</b>		<b>10.0</b>			

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

**Table 5 – Field Exploration Summary Table – Downhole Shear Wave Velocity Testing**

Test ID	Test Type	Test Depth (ft)	Latitude	Longitude	Elevation (ft-MSL)
B-4/DHT	STB/DHT	95.0	34.61123386	-79.50064937	100.0

## 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.

### 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. Data sheets containing the results from this testing are provided in Section 5A 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. Data sheets containing the results from this testing are provided in Section 5B and Section 5C within the Appendix of this report.

**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)

# SC 83 over Little Pee Dee River

## Geotechnical Subsurface Data 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
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SECTION 4	DOWNHOLE SHEAR WAVE VELOCITY TESTING (DHT)
SECTION 5	LABORATORY TEST RESULTS
SECTION 5A	SPLIT-SPOON SAMPLES (SS)
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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 Subsurface Data Report

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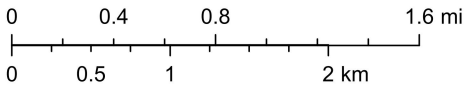
# APPENDIX

## 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**

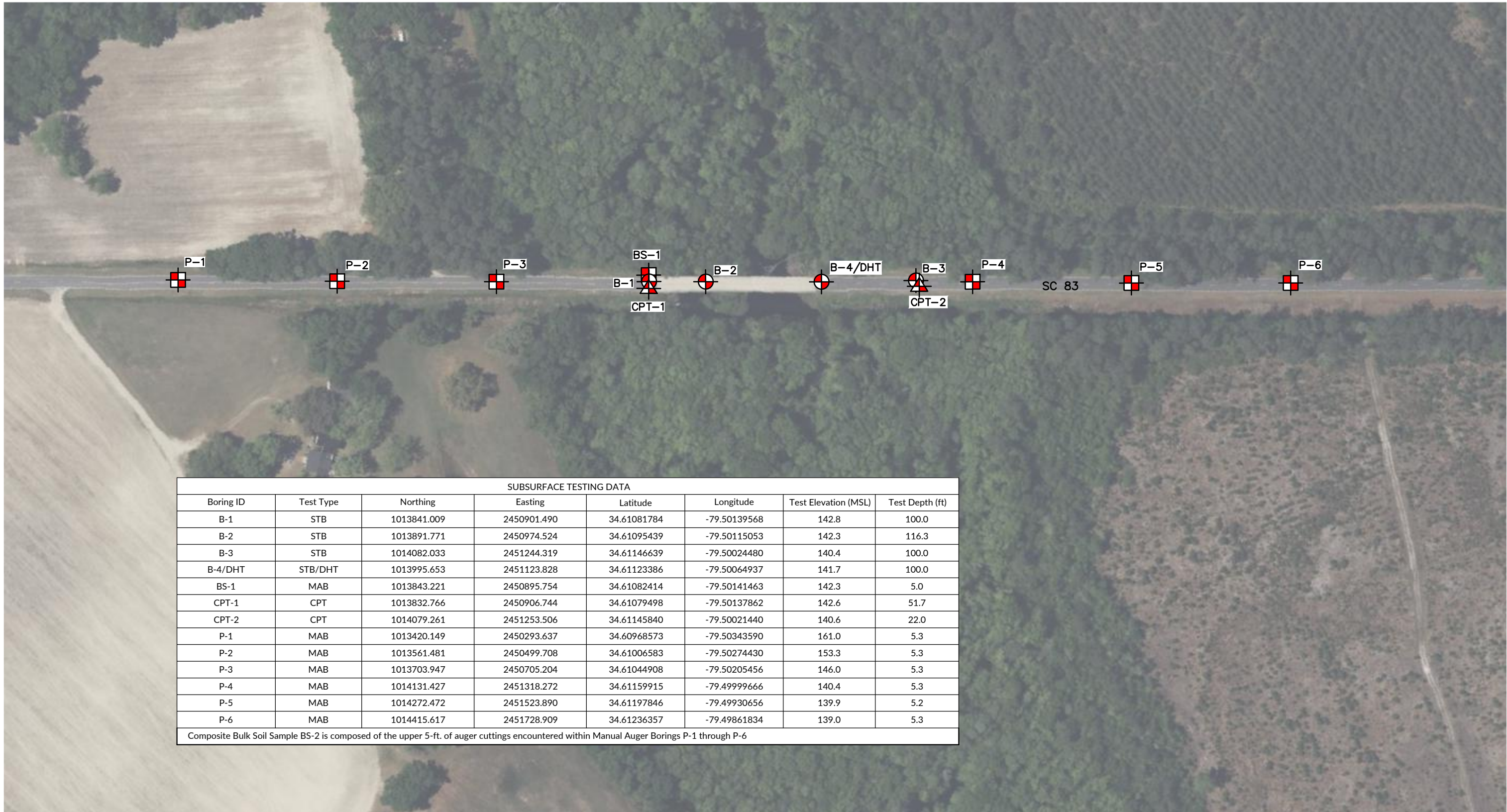
## **Geotechnical Subsurface Data Report**

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# **APPENDIX**

## **SECTION 2      BORING LOCATION PLAN**

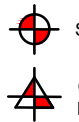




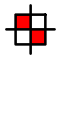
SUBSURFACE TESTING DATA							
Boring ID	Test Type	Northing	Easting	Latitude	Longitude	Test Elevation (MSL)	Test Depth (ft)
B-1	STB	1013841.009	2450901.490	34.61081784	-79.50139568	142.8	100.0
B-2	STB	1013891.771	2450974.524	34.61095439	-79.50115053	142.3	116.3
B-3	STB	1014082.033	2451244.319	34.61146639	-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 Subsurface Data 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 (LITTLE OR NO FINES)		GW	WELL-GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES
		GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GP	POORLY-GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES
				GM	SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURES
	SAND AND SANDY SOILS	CLEAN SANDS (LITTLE OR NO FINES)		GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES
		SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
				SP	POORLY-GRADED SANDS, GRAVELLY SAND, LITTLE OR NO FINES
FINE GRAINED SOILS	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		SM	SILTY SANDS, SAND-SILT MIXTURES
				SC	CLAYEY SANDS, SAND-CLAY MIXTURES
				ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50		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
				MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
HIGHLY ORGANIC SOILS				CH	INORGANIC CLAYS OF HIGH PLASTICITY
				OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
				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 Subsurface Data 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 10 20 30 40 50 60 70 80 90
	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	● X
	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	● X
	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

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 (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 ●  PL X MC O LL X  ▲ 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> 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  @SS-12: Light Gray, 7/N 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 (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>
		Medium Plasticity, Sandy Lean <u>CLAY</u> (CL/A-6) with Trace Organics, Micaceous, 5Y4/1									
87.8		@SS-14: Light Gray, Medium Plasticity to High Plasticity, with Decreased Presence of Organics, 7/N		53.5	SS-14	9	13	17		30	
58.5		Dense, Moist, Light Gray, Non-Plastic to Low Plasticity, Silty Fine to Medium <u>SAND</u> (SM/A-2-4), Micaceous, 7/N		58.5	SS-15	12	18	19		37	
82.8											
63.5		Medium Dense to Dense, Moist, Light Gray, Non-Plastic, Fine to Medium Poorly Graded <u>SAND</u> (SP/A-3), Micaceous, 7/N		63.5	SS-16	14	14	16		30	
77.8											
68.5		@SS-17: with Decreased Presence of Mica		68.5	SS-17	16	18	22		40	
72.8											
73.5		<b>MIDDENDORF FORMATION (CRETACEOUS)</b>		73.5	SS-18	13	14	21		35	
67.8		Dense, Moist, Light Gray, Non-Plastic to Low Plasticity, Silty Fine to Medium <u>SAND</u> (SM/A-2-4), 7/N									

## 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>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>
78.5	62.8	Medium Dense, Moist, Gray, Low Plasticity, Silty Clayey Fine to Coarse SAND (SC-SM/A-2-4) with Trace Gravel, 6/N		78.5	SS-19	11	13	15		28	●
83.5	57.8	Very Dense to Dense, Moist, Light Gray, Non-Plastic to Low Plasticity, Poorly Graded Fine to Medium SAND (SP/A-3), 5Y7/1		83.5	SS-20	50/6.0"				100+	>>●
		@SS-21: Gray, 5Y6/1 & 5/N		88.5	SS-21	30	50/5.0"			100+	>>●
		@SS-22: Gray, Micaceous, 5Y6/1		93.5	SS-22	16	20	28		48	●
				98.5							
98.5	42.8	Very Dense, Moist, Gray, Non-Plastic to Low Plasticity, Fine to Medium Poorly Graded SAND (SP-SM/A-3), 5Y6/1 & 6/N		98.5	SS-23	29	28	23		51	●
		Boring Terminated at 100.0-ft. Below Existing Pavement Surface. Boring Achieved Target Depth.									

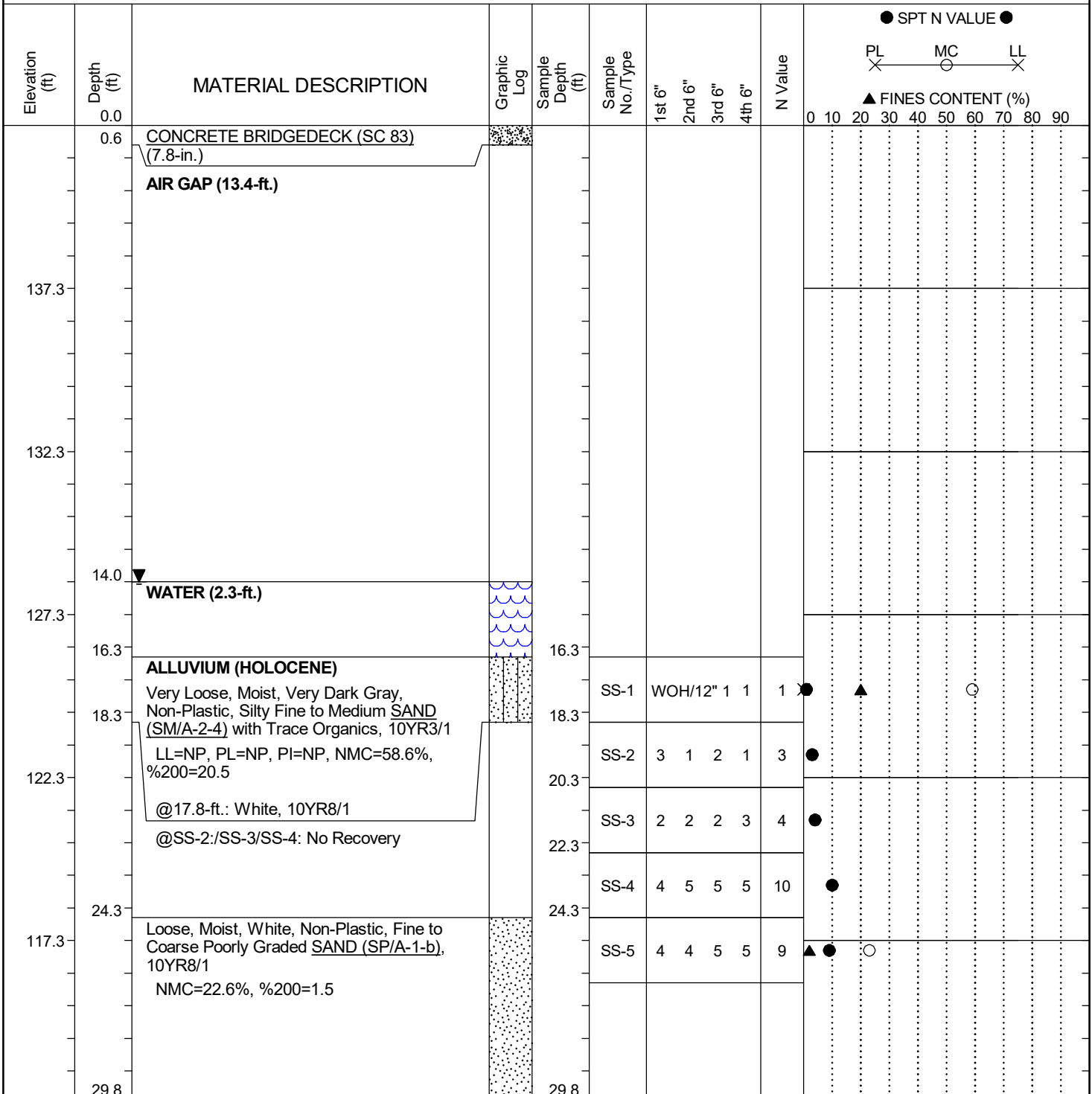
## LEGEND

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

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 @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> Moist, Light Gray, Medium Plasticity, Clayey Fine to Medium SAND (SC/A-2-6), Micaceous, 7/N @SS-7: Medium Dense, Light Bluish Gray, with Trace Gravel, 10B7/1 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 @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	●

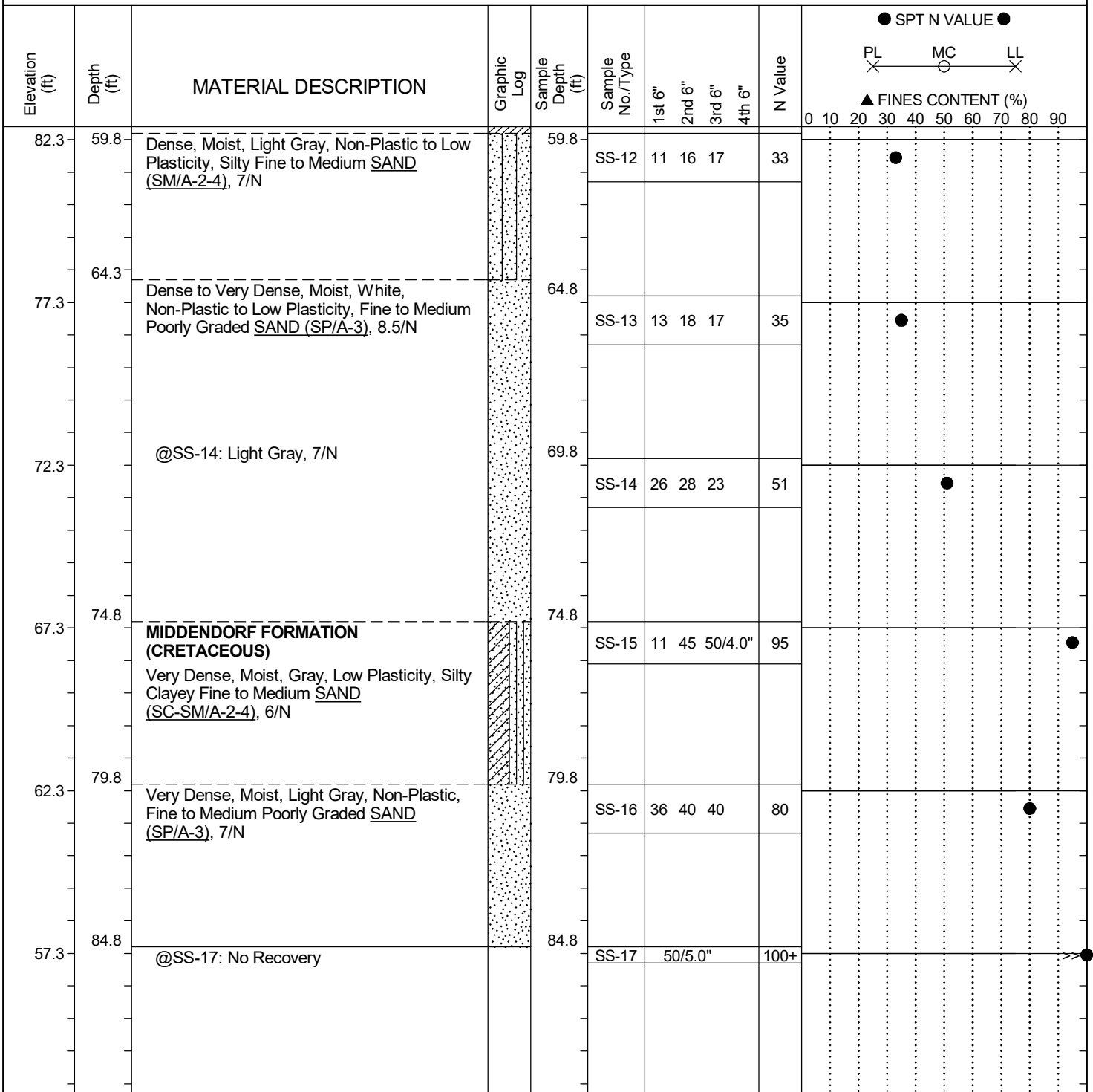
## LEGEND

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	



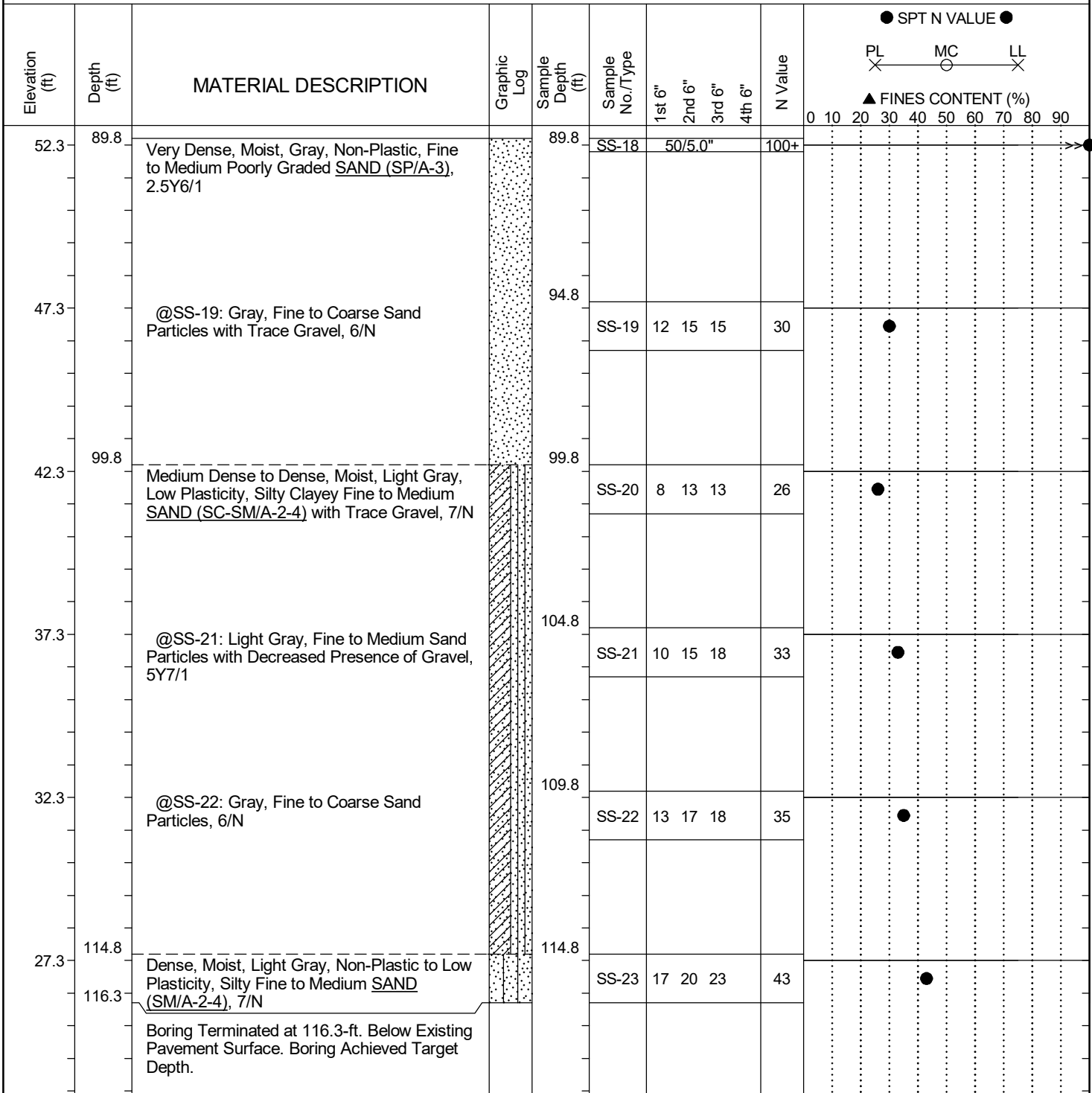
## LEGEND

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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

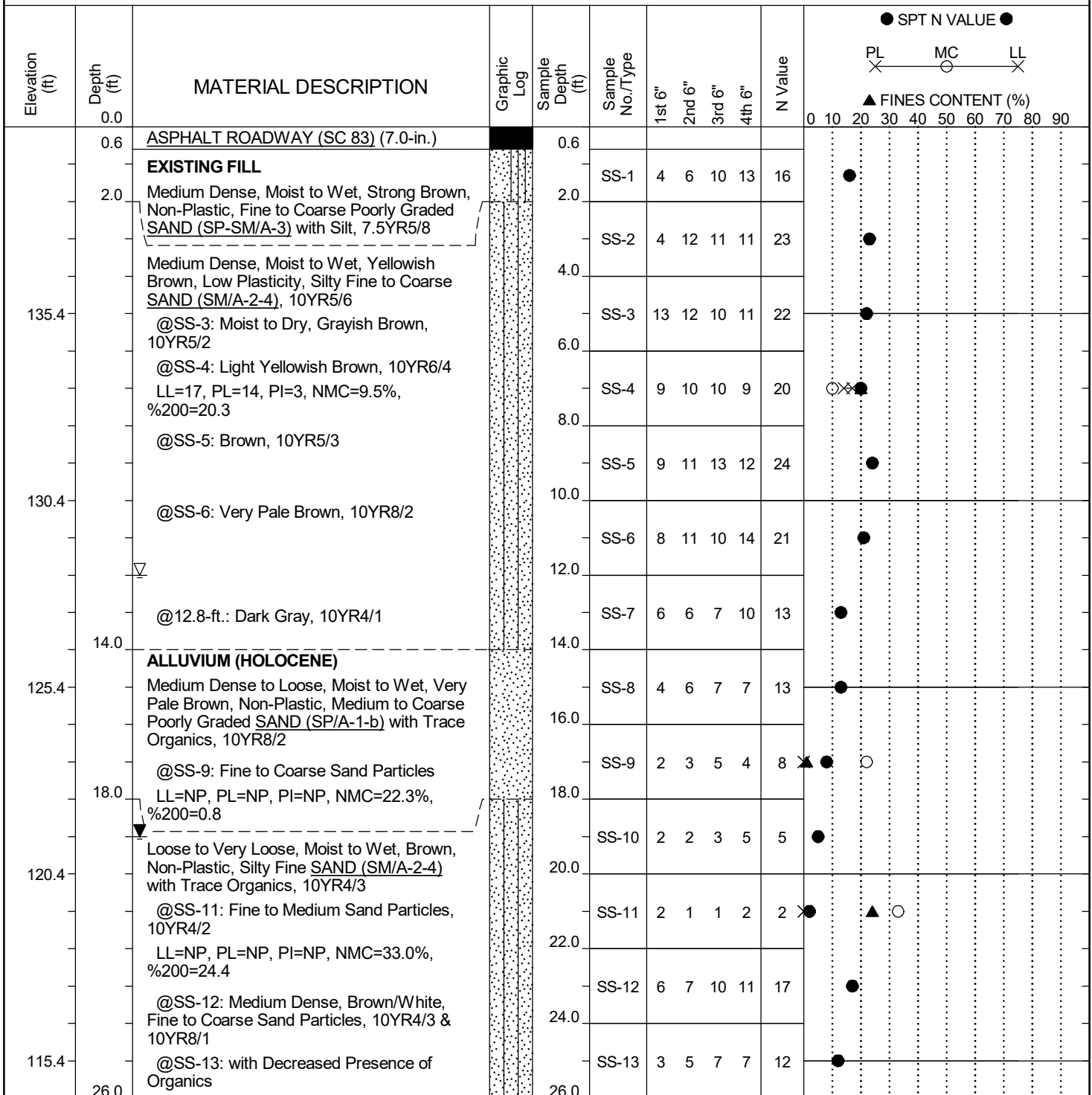
Project ID: P042879				County: Marlboro		Boring No.: B-2	
Site Description:		SC 83 over Little Pee Dee River				Route: SC 83	
Eng./Geo.: B. Vogel		Boring Location: 103+48		Offset: 5.2-L		Alignment: Existing	
Elev.: 142.3 ft		Latitude: 34.61095439		Longitude: -79.50115053		Date Started: 3/13/2025	
Total 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	

<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

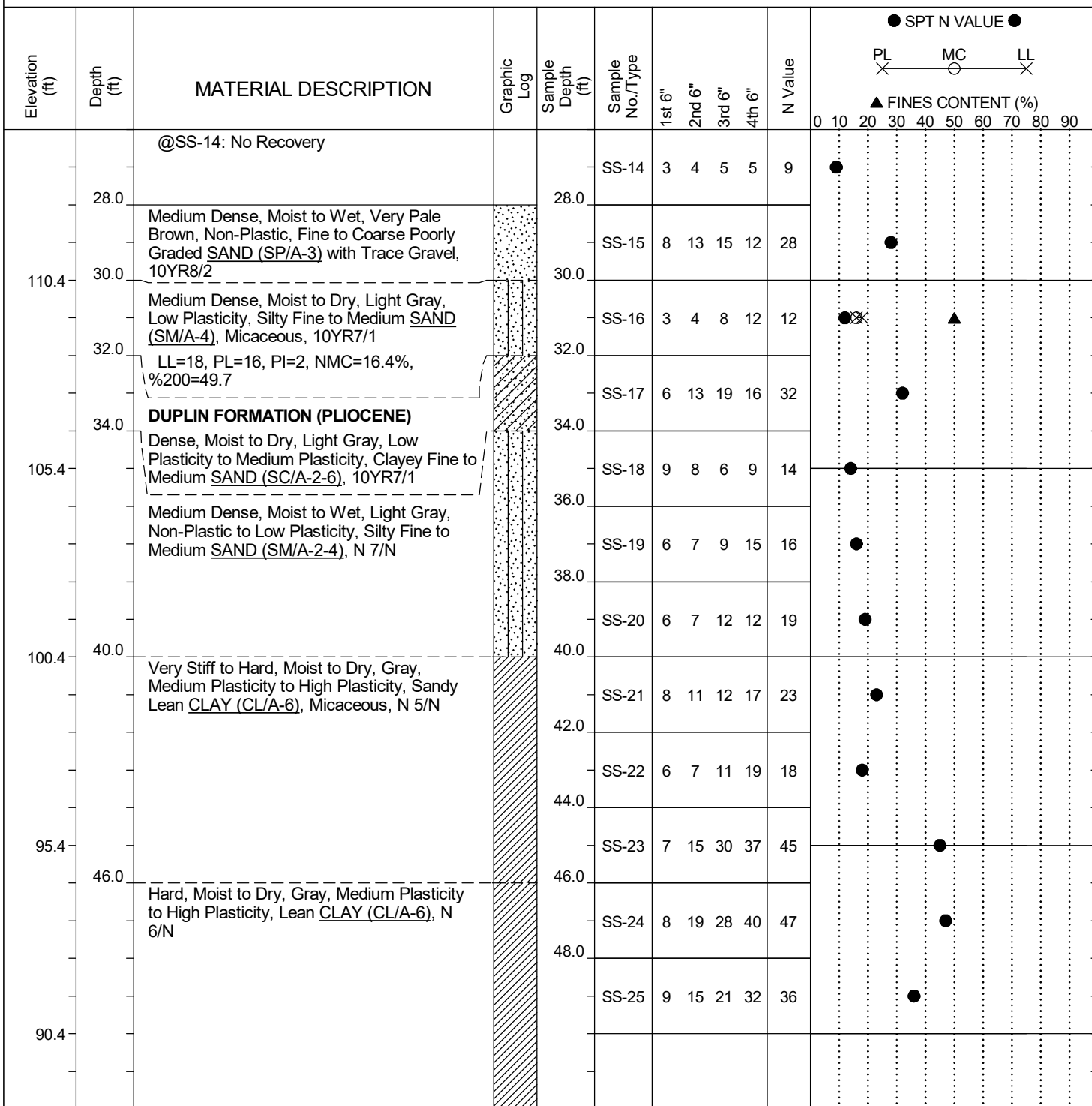


## LEGEND

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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

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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-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>Elev.:</b>	140.4 ft	<b>Latitude:</b>	34.61146639	<b>Longitude:</b>	-79.5002448
<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 12 ft
				<b>24HR</b>	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>
85.4	53.5	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	
80.4	58.5	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	
75.4	63.5	@SS-28: Light Gray, Fine Sand Particles, Micaceous, 10YR7/1		63.5	SS-28	17	22	25		47	
70.4	68.5	@SS-29: Fine to Medium Sand Particles		68.5	SS-29	15	23	31		54	
65.4	73.5	<b>MIDDENDORF FORMATION (CRETACEOUS)</b> 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

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

<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 		<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 12 ft			<b>24HR</b> 19 ft

[illegible]

## 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/DHT	
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/DHT	
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 10 20 30 40 50 60 70 80 90</div> </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 NMC=14.7%, %200=3.7			SS-9	9	10	9		19	▲ ●
33.5		<b>DUPLIN FORMATION (PLIOCENE)</b>									
106.7		Hard, Moist, Gray, Medium Plasticity to High Plasticity, Sandy Lean CLAY (CL/A-6) with Trace Gravel, 6/N		33.5	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 LL=24, PL=14, PI=10, NMC=22.4%, %200=11.2		38.5	SS-11	6	6	6		12	▲ ●
101.7		@SS-12: No Recovery		43.5	SS-12	5	6	5		11	●
43.5											
96.7											
48.5		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		48.5	SS-13	11	16	21		37	●
91.7		@SS-14: Gray/Light Olive Brown, 6/N & 2.5Y5/4		53.5	SS-14	8	11	15		26	●
86.7											

## 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/DHT	
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 SAND (SP/A-3), 8/N		58.5	SS-15	19	23	22		45	●
76.7	63.5	Stiff, Moist, Gray, Medium Plasticity to High Plasticity, Lean CLAY (CL/A-6) 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 CLAY (CL/A-6) 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 SAND (SP-SC/A-2-4) 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 SAND (SM/A-2-4), Micaceous, 7/N		83.5	SS-20	8	7	9		16	●
56.7											

## 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/DHT			
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 Subsurface Data 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 (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type					N Value	● SPT N VALUE ● PL X — MC — LL X ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
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	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 10 20 30 40 50 60 70 80 90</div> </div>
	0.0	ASPHALT ROADWAY (SC 83) (3.5-in.)									
	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>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	SPT N VALUE				PL MC LL																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
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134.9	0.0	ASPHALT ROADWAY (SC 83) (2.0-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-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 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 Subsurface Data 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 ● PL X      MC ○      LL X ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
	0.0	Moist, Non-Plastic, Silty Fine to Medium SAND (SM/A-2-4) @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 ● PL X      MC ○      LL X ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
	0.0	Moist, Non-Plastic, Silty Fine to Medium SAND (SM/A-2-4) @BS-1: LL=NP, PL=NP, PI=NP, NMC=11.1, %200=18.2  <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	○ ▲

## 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 Subsurface Data Report**

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# **APPENDIX**

## **SECTION 3      SUBSURFACE EXPLORATION LOGS**

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

# Cone Penetration Test



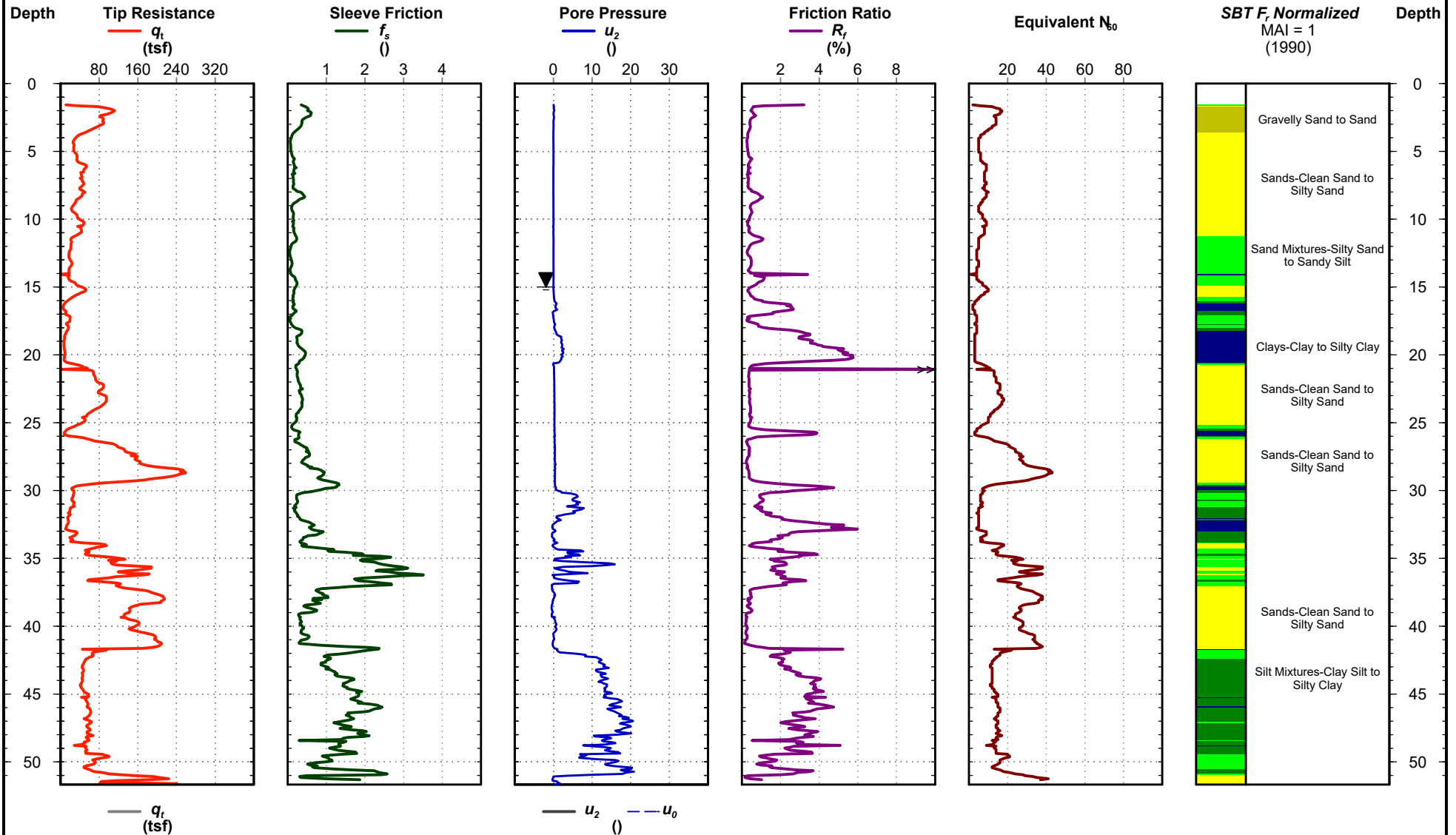
SC 83 over Little Pee Dee River  
Marlboro County (South Carolina)  
Project No. :P042879

**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



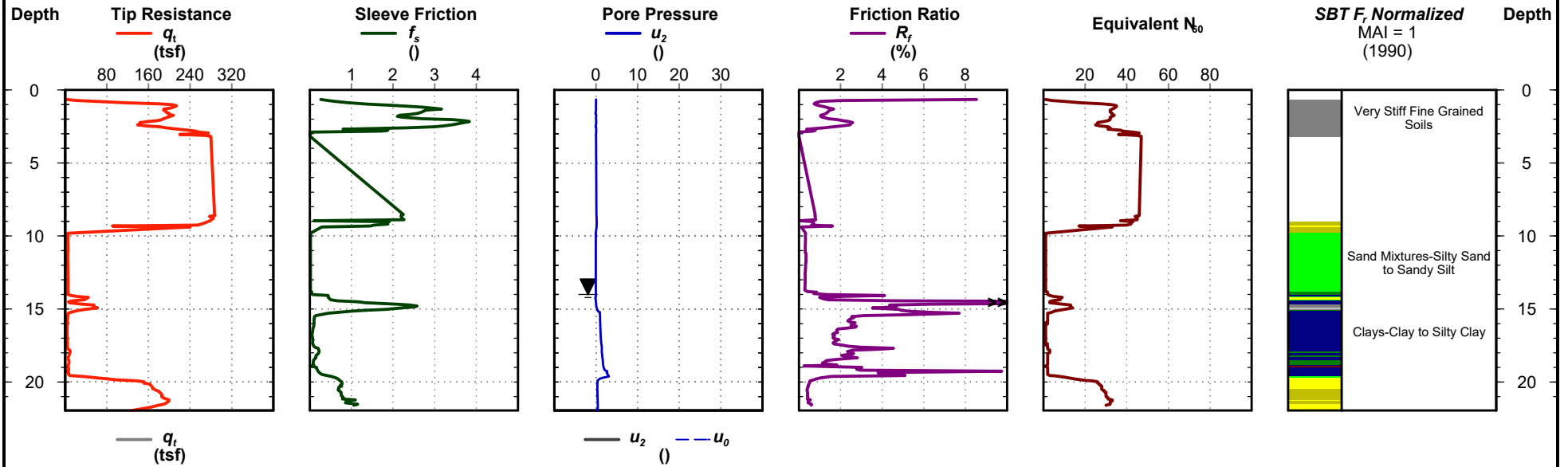
SC 83 over Little Pee Dee River  
Marlboro County (South Carolina)  
Project No. :P042879

**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 REPORT - STANDARD G7100.010 - TASK 00001 - SC 83 OVER LITTLE PEEDEE GPJ FME2017.GDT 3/20/25

**CPT-2**

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

## **Geotechnical Subsurface Data 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

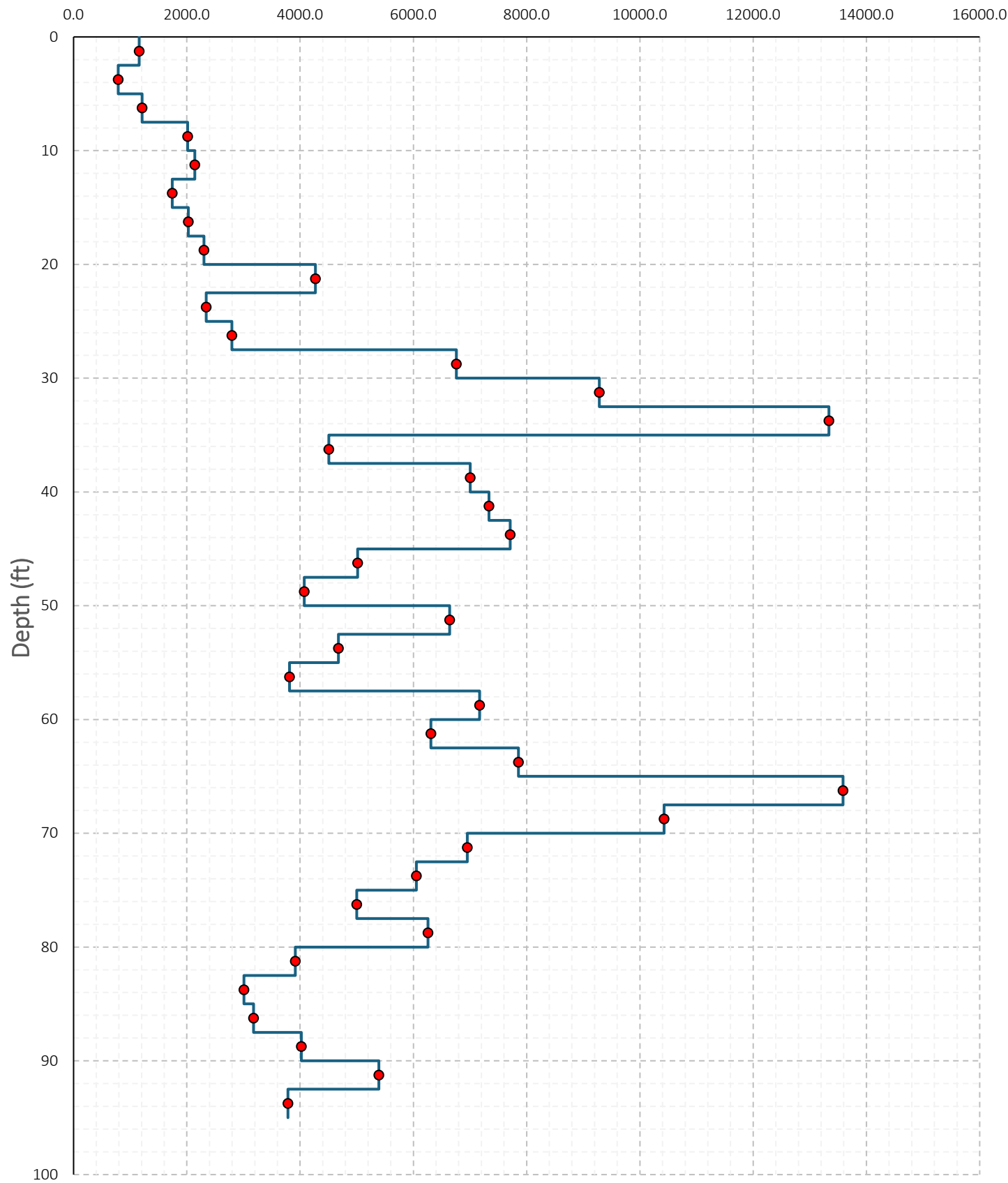


SC 83 RBO Little Pee Dee River B-4/DHT			
Compression (P) Wave Velocity		Shear (S) Wave Velocity	
<u>Depth(ft)</u>	<u>Interval Velocity(ft/sec)</u>	<u>Depth(ft)</u>	<u>Interval Velocity(ft/sec)</u>
0	--	0	--
2.5	1,160	2.5	559
5	788	5	422
7.5	1,208	7.5	514
10	2,015	10	1,086
12.5	2,140	12.5	591
15	1,741	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	



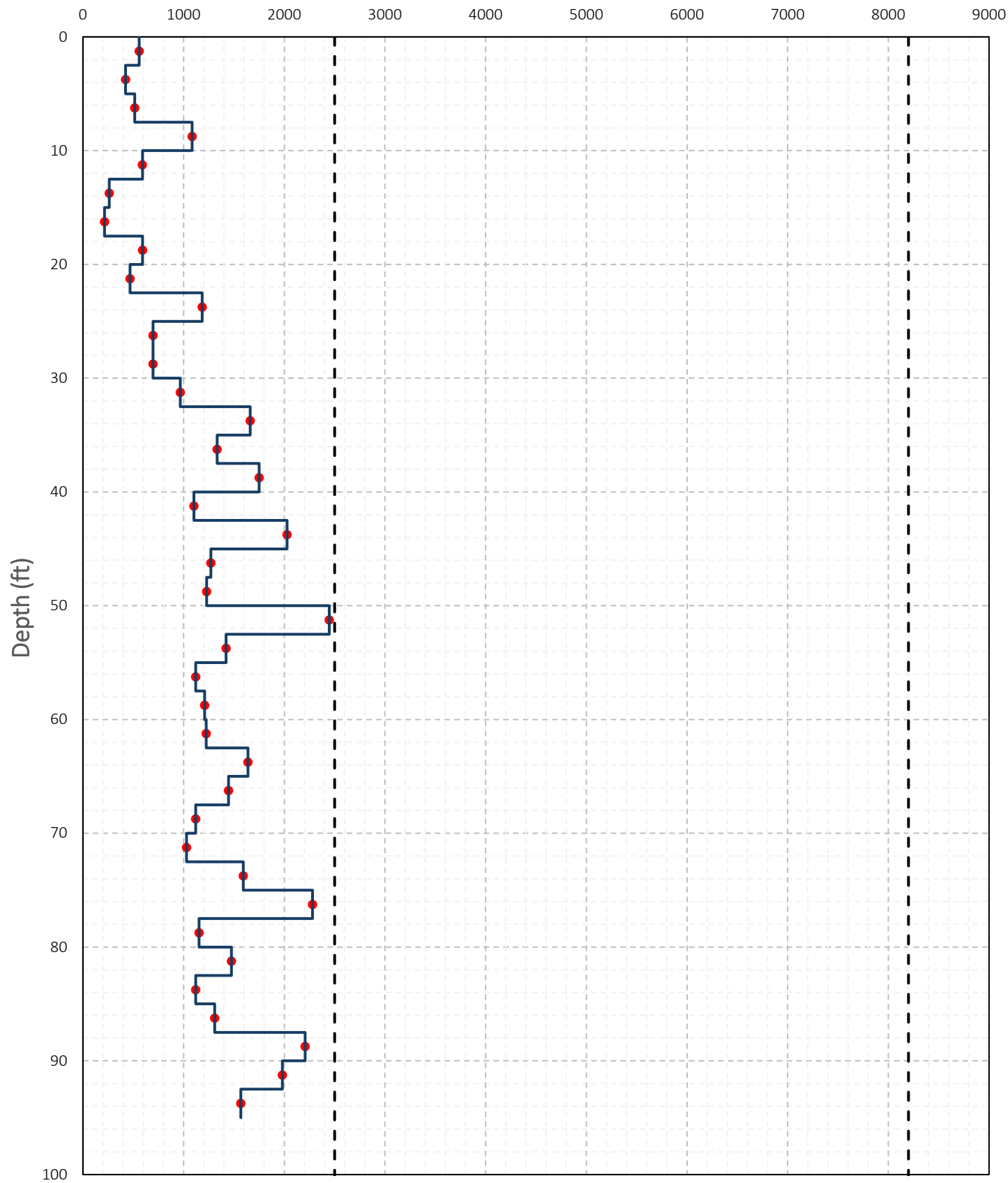


Compression Wave Velocity,  $V_p$  (ft/sec)





Shear Wave Velocity, Vs (ft/sec)



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

## **Geotechnical Subsurface Data Report**

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# **APPENDIX**

## **SECTION 5**

## **LABORATORY TEST RESULTS**

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

## **Geotechnical Subsurface Data 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			



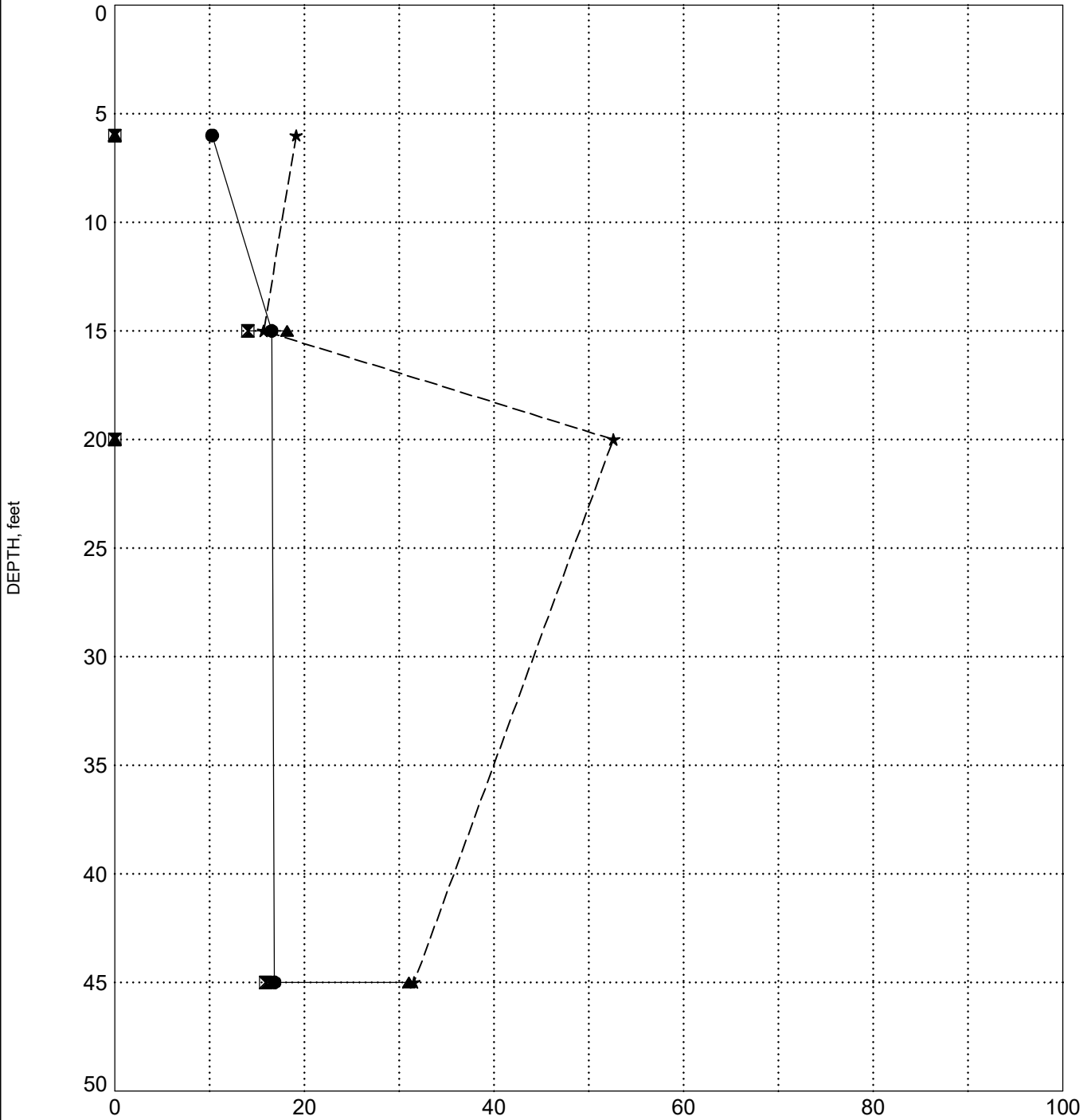
# INDEX PROPERTIES VERSUS DEPTH

PROJECT ID P042879

PROJECT NAME SC 83 over Little Pee Dee River

PROJECT COUNTY Marlboro

## BORING B-1



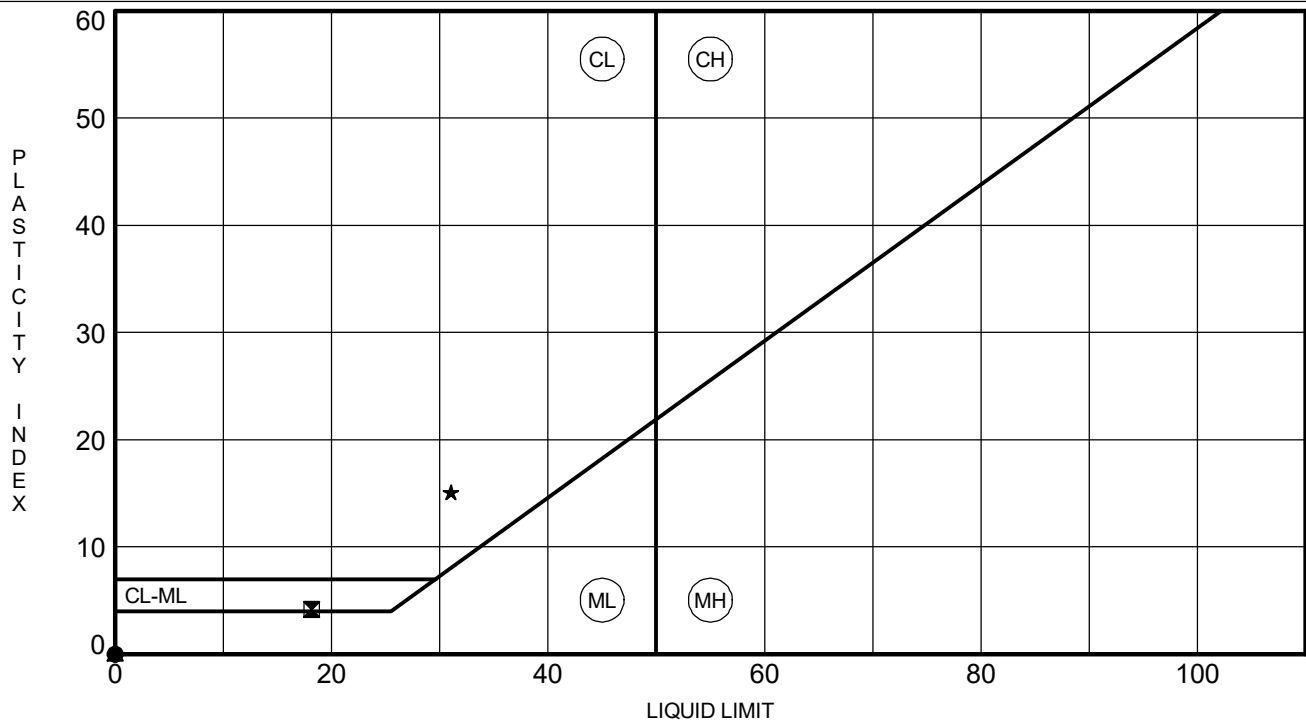
LEGEND	
●	Water Content
⊠	Plastic Limit
▲	Liquid Limit
★	Fines

## ATTERBERG LIMITS' RESULTS

**PROJECT ID** P042879

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

**PROJECT COUNTY** Marlboro

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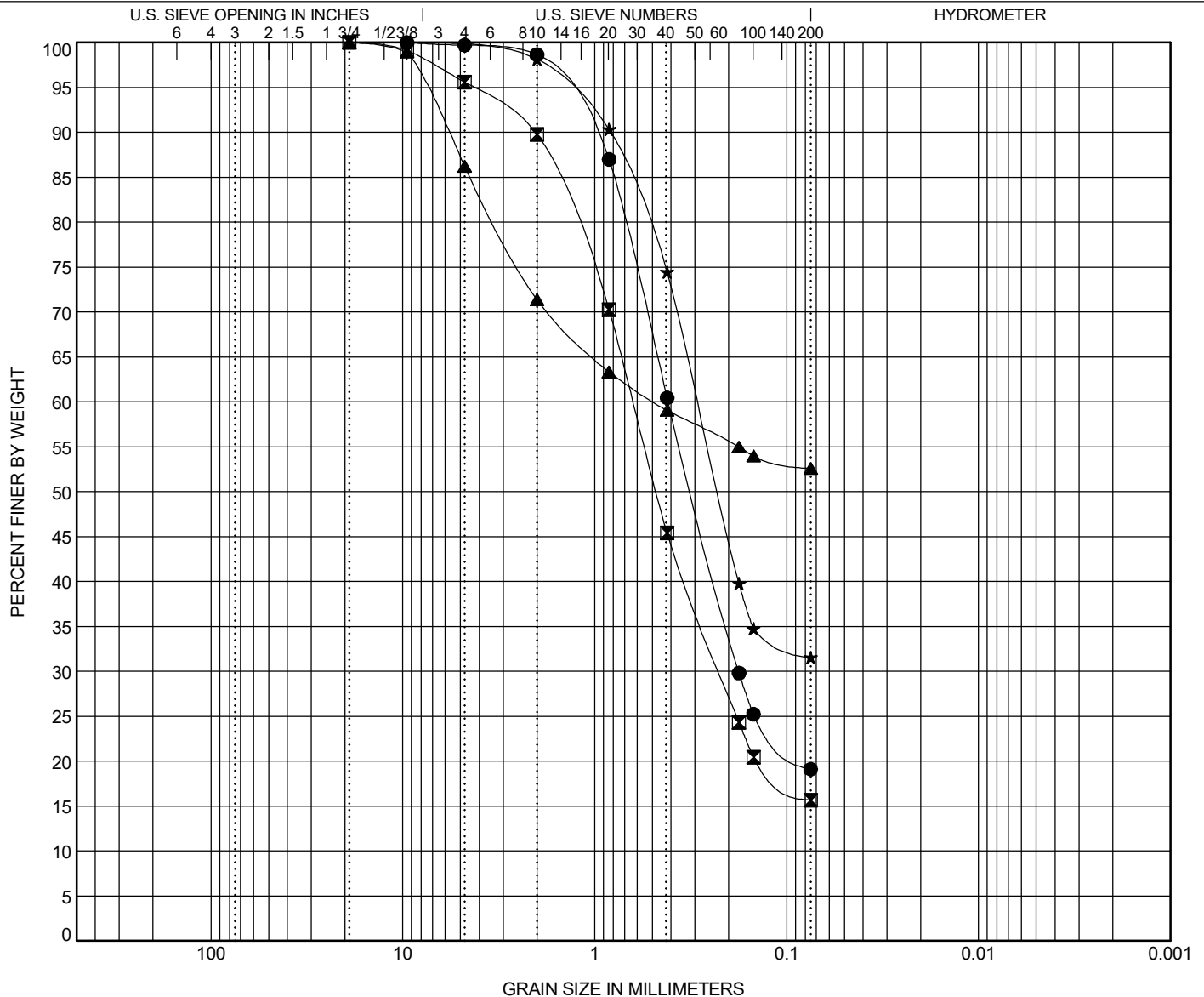


# GRAIN SIZE DISTRIBUTION

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%					



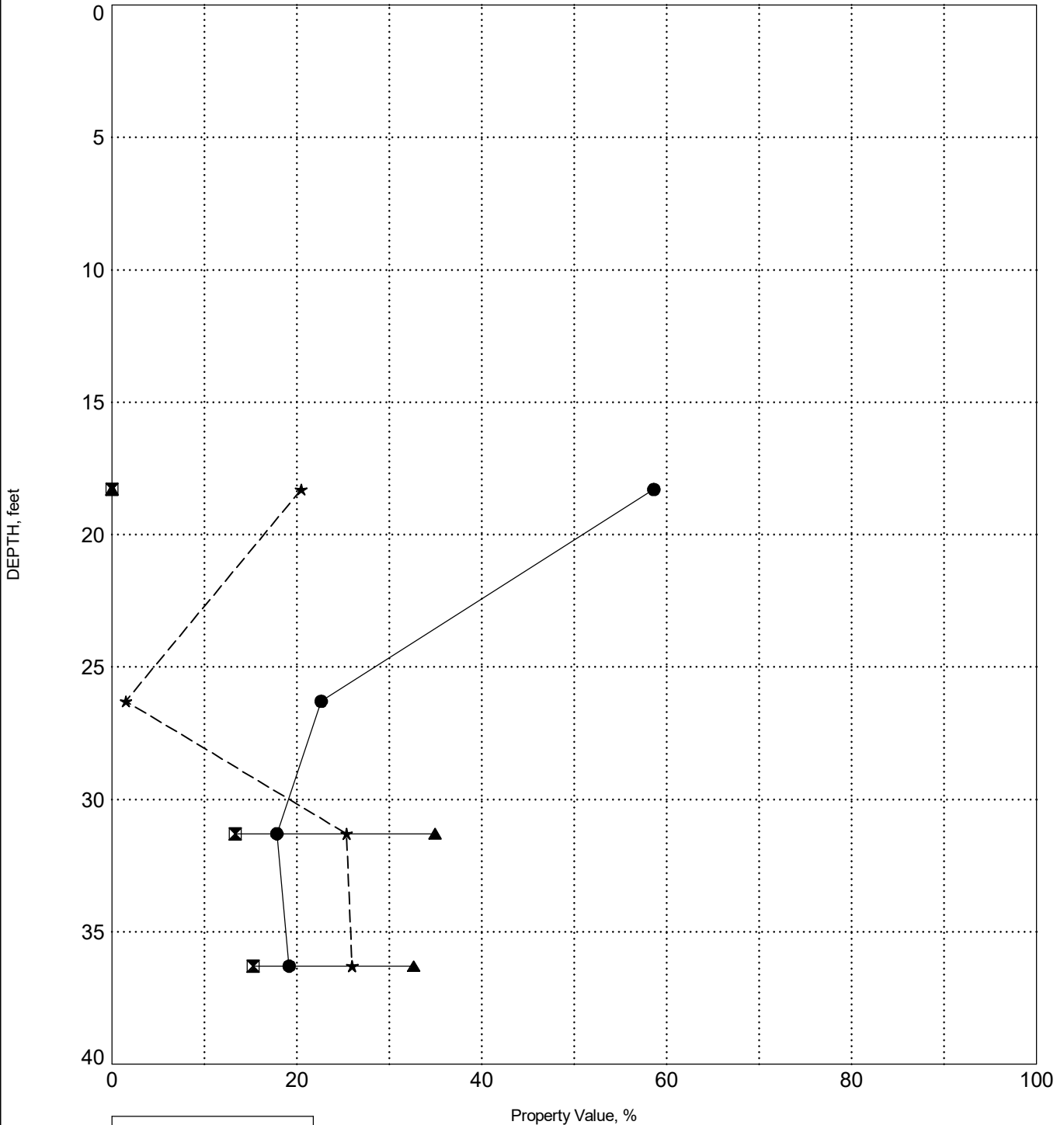
# INDEX PROPERTIES VERSUS DEPTH

PROJECT ID P042879

PROJECT NAME SC 83 over Little Pee Dee River

PROJECT COUNTY Marlboro

## BORING B-2



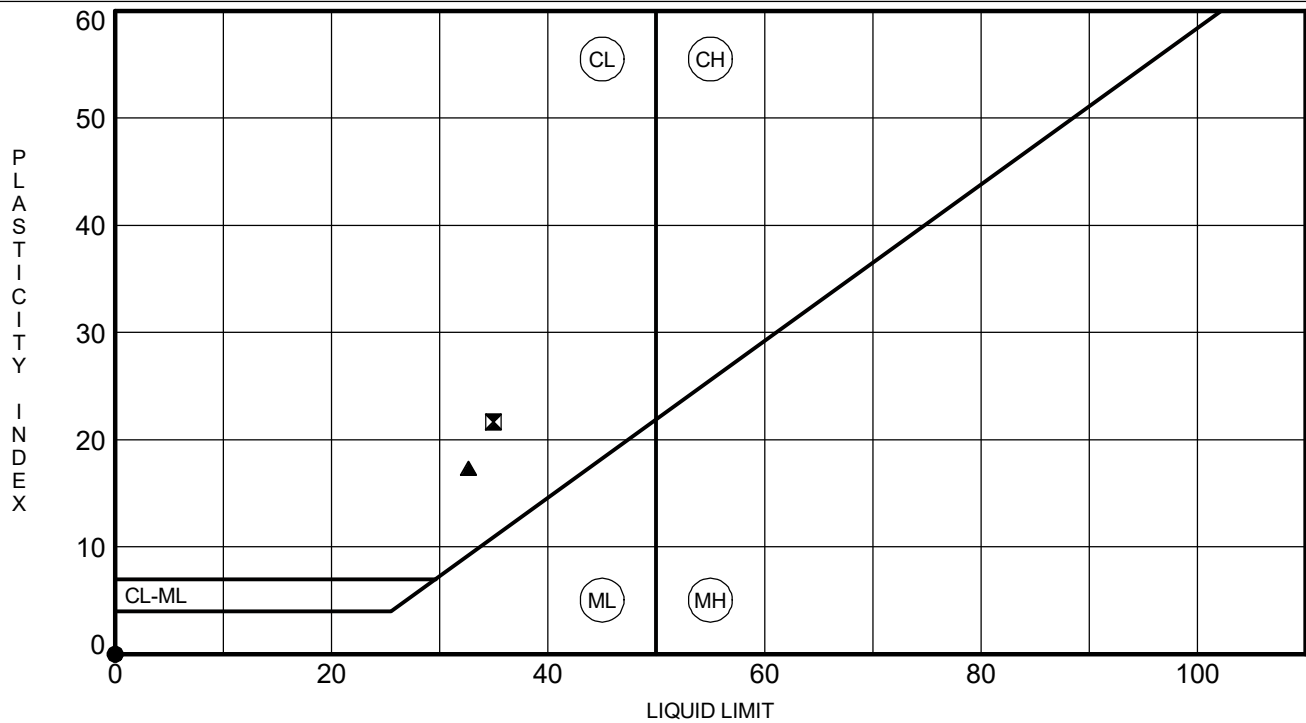
LEGEND	
●	Water Content
⊠	Plastic Limit
▲	Liquid Limit
★	Fines

## ATTERBERG LIMITS' RESULTS

**PROJECT ID** P042879

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

**PROJECT COUNTY** Marlboro

[illegible]

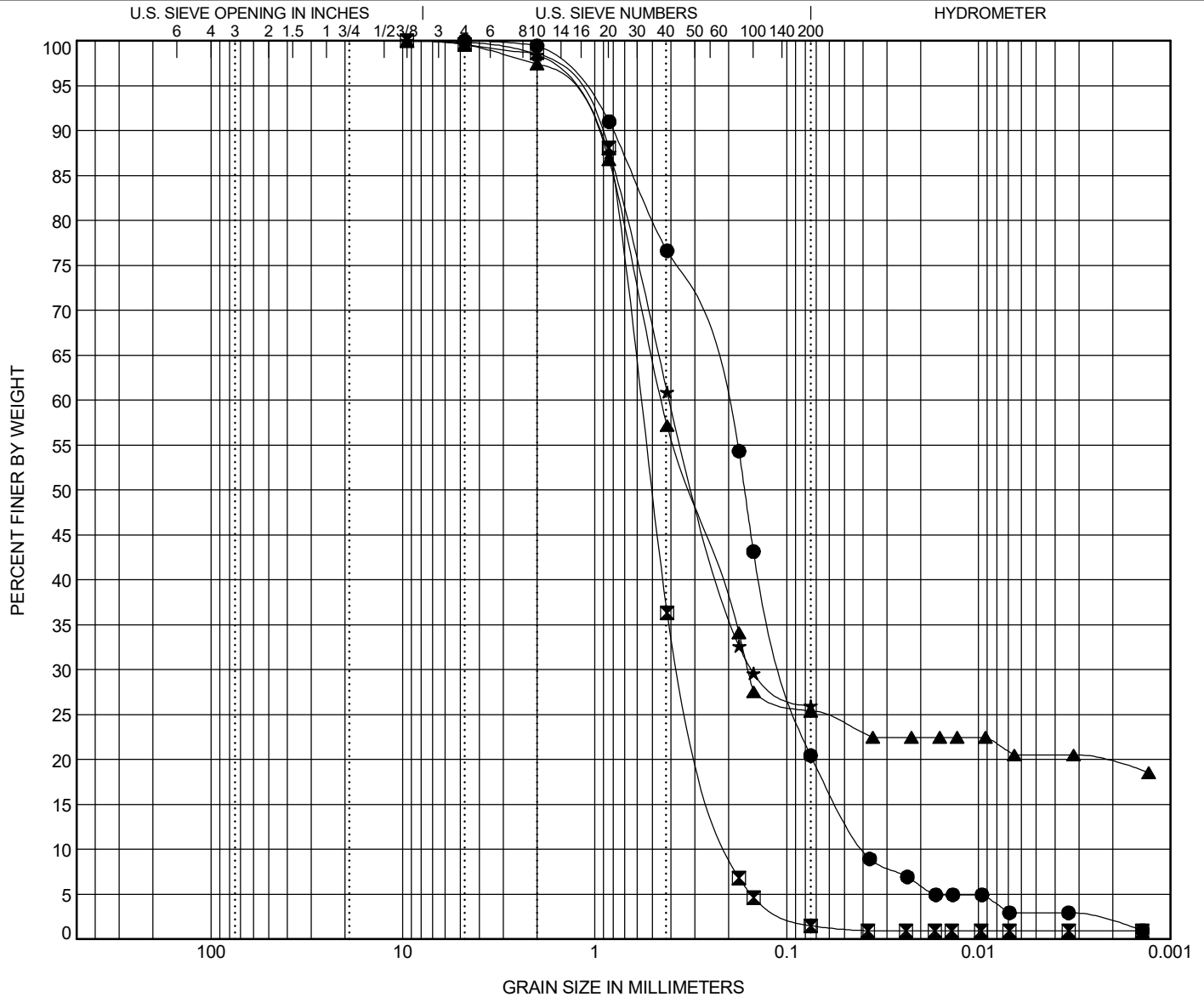


# GRAIN SIZE DISTRIBUTION

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-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			

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**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%					



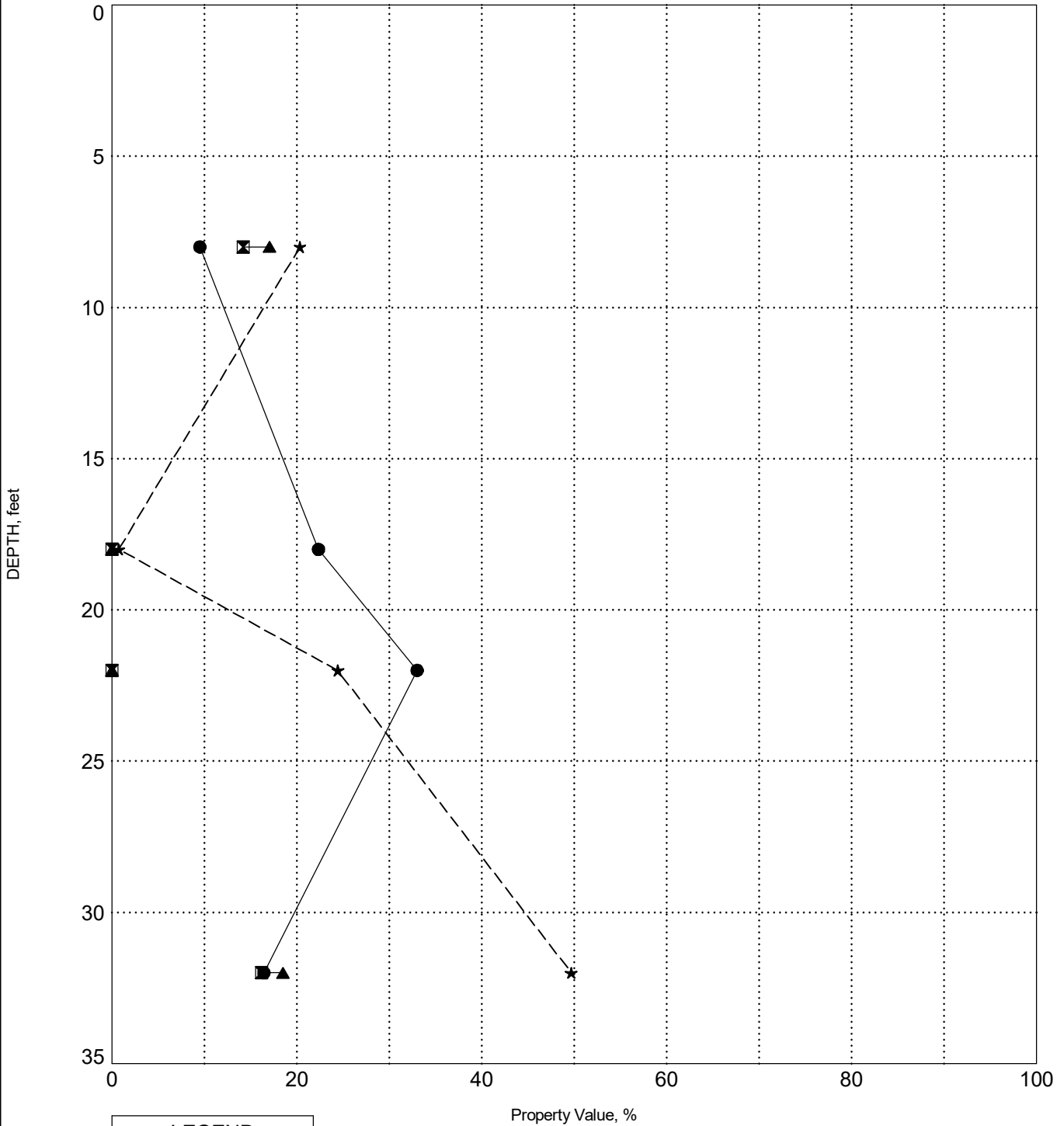
# INDEX PROPERTIES VERSUS DEPTH

PROJECT ID P042879

PROJECT NAME SC 83 over Little Pee Dee River

PROJECT COUNTY Marlboro

## BORING B-3



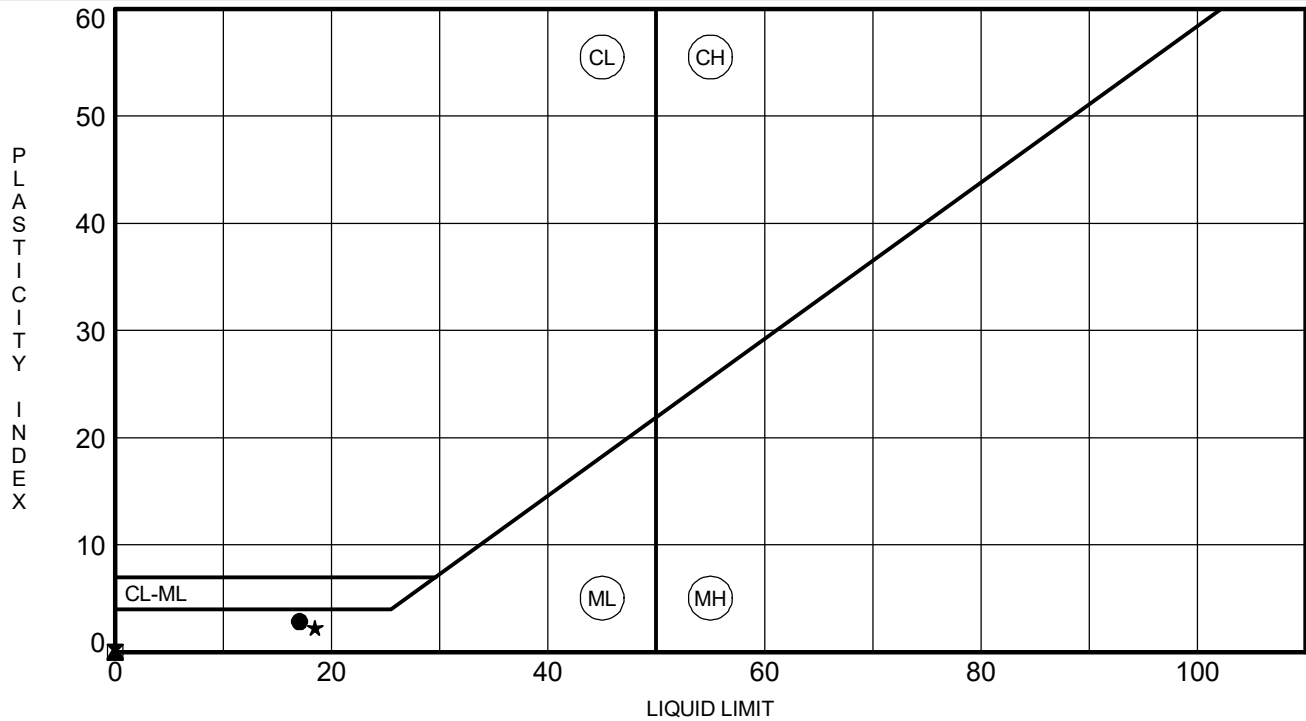
LEGEND	
●	Water Content
■	Plastic Limit
▲	Liquid Limit
★	Fines

## ATTERBERG LIMITS' RESULTS

**PROJECT ID** P042879

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

**PROJECT COUNTY** Marlboro

[illegible]

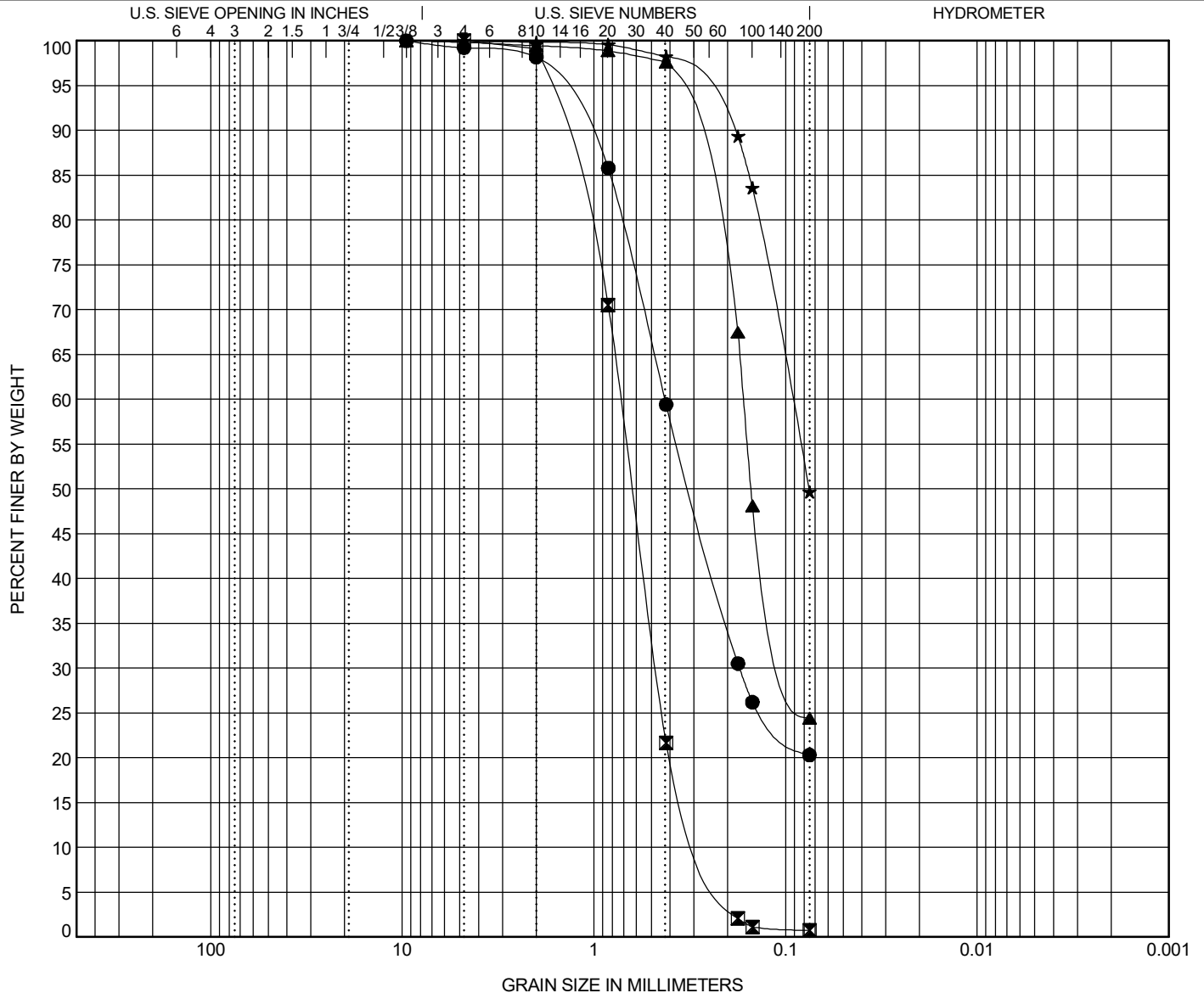


# GRAIN SIZE DISTRIBUTION

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				



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**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%					



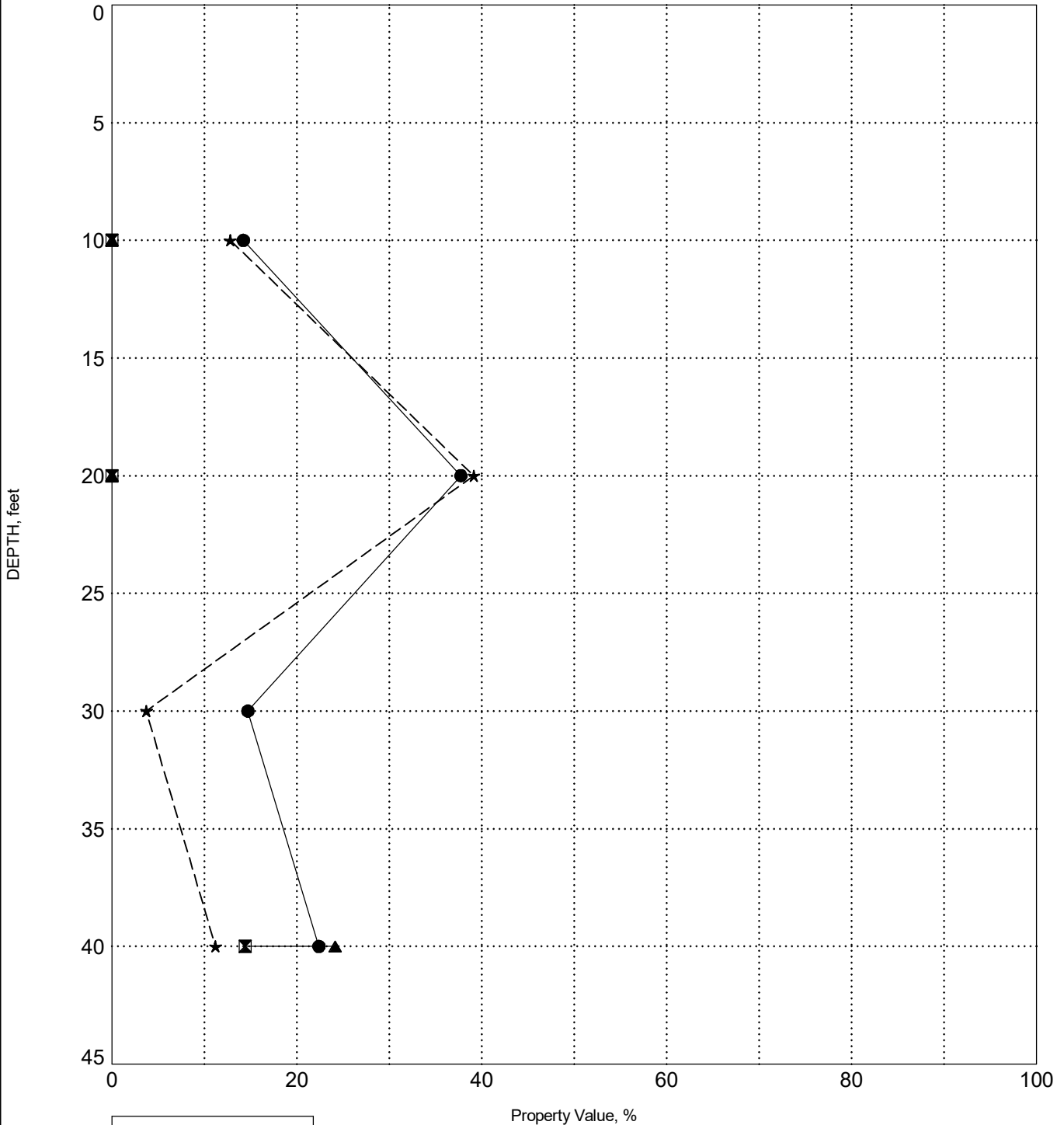
# INDEX PROPERTIES VERSUS DEPTH

PROJECT ID P042879

PROJECT NAME SC 83 over Little Pee Dee River

PROJECT COUNTY Marlboro

## BORING B-4/DHT



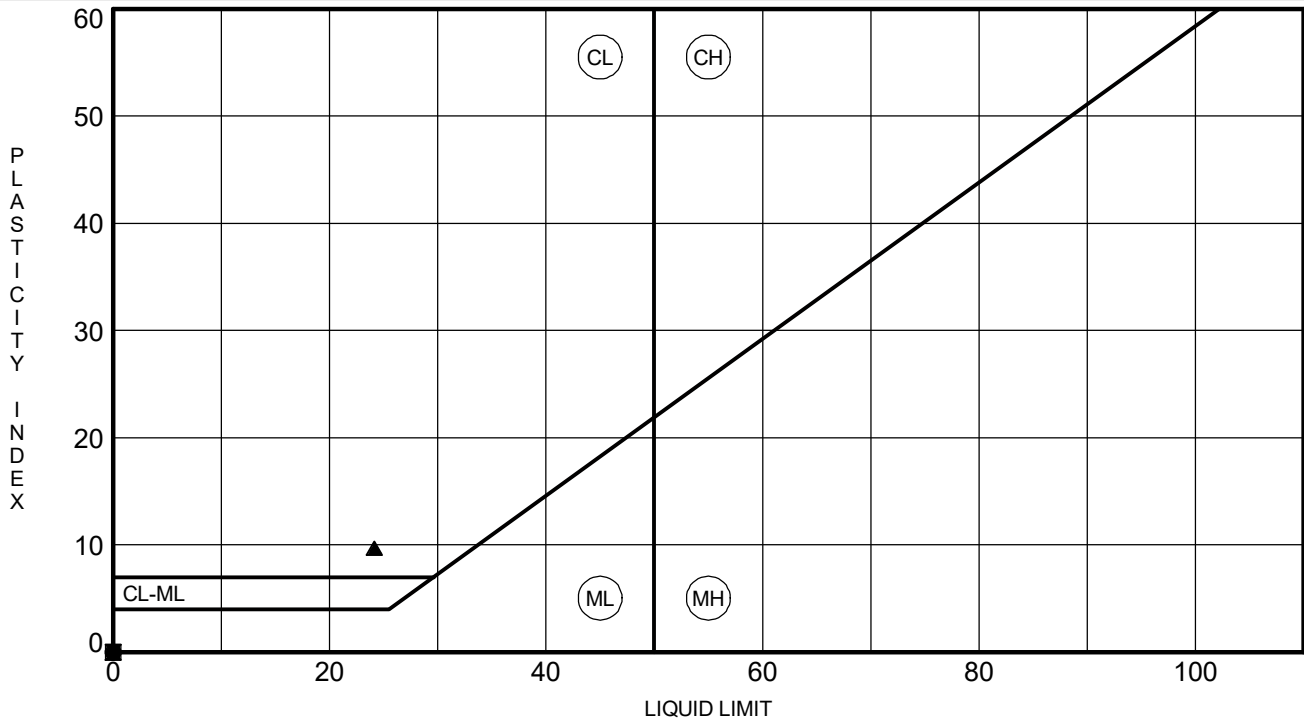
LEGEND	
●	Water Content
☒	Plastic Limit
▲	Liquid Limit
★	Fines

## ATTERBERG LIMITS' RESULTS

**PROJECT ID** P042879

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

**PROJECT COUNTY** Marlboro

[illegible]

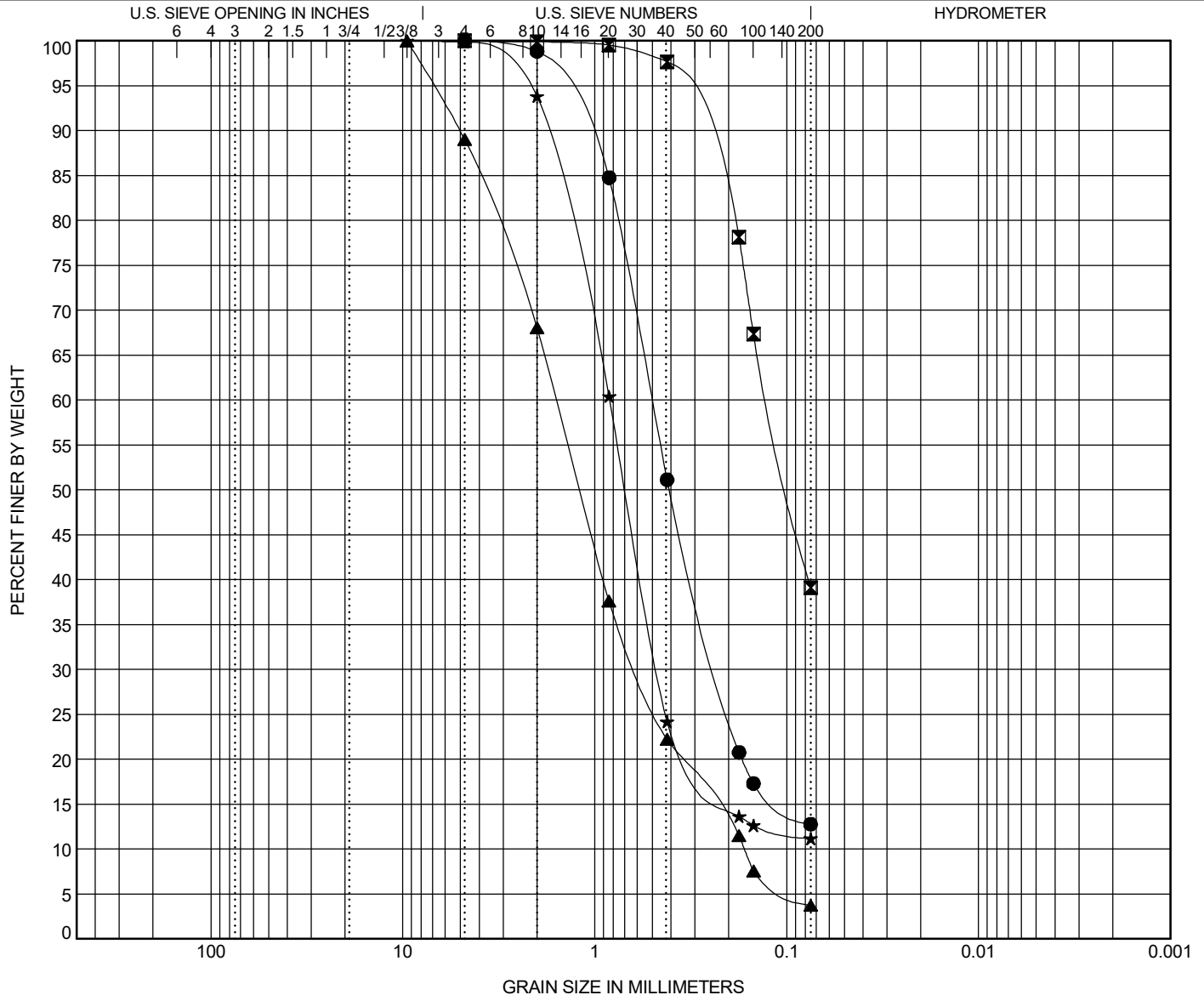


# GRAIN SIZE DISTRIBUTION

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-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 Subsurface Data 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	--	--	--	--



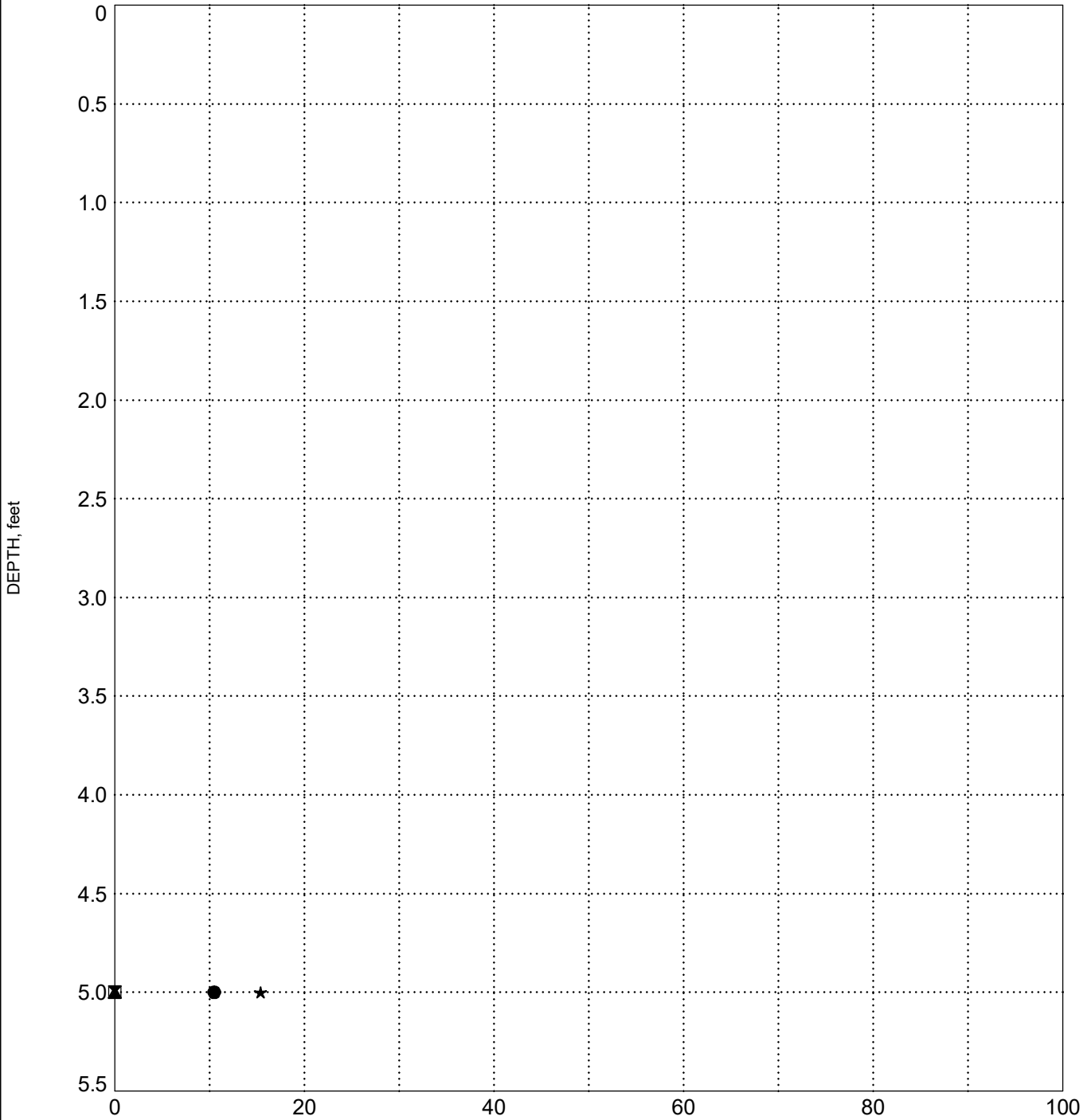
# INDEX PROPERTIES VERSUS DEPTH

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



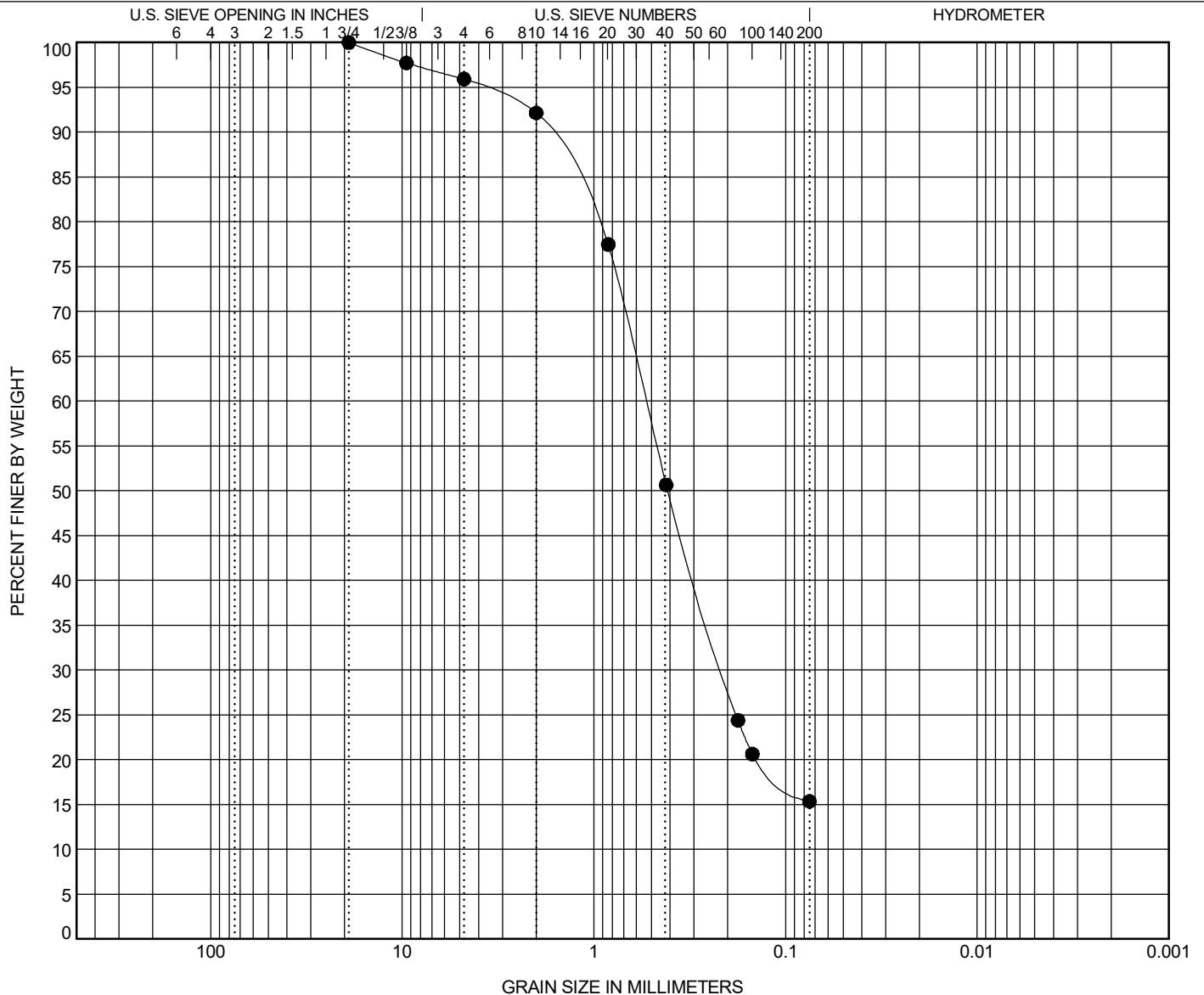


# GRAIN SIZE DISTRIBUTION

PROJECT ID P042879

PROJECT NAME SC 83 over Little Pee Dee River

PROJECT COUNTY Marlboro



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

BOREHOLE	DEPTH	Classification					LL	PL	PI	Cc	Cu
● BS-1	5.0	SILTY SAND (SM/A-2-4)					NP	NP	NP		
BOREHOLE	DEPTH	D90	D60	D30	D10	%Gravel	%Sand	%Silt		%Clay	
● BS-1	5.0	1.762	0.535	0.213		4.1	80.6	15.4			

GRAIN SIZE G7100.010 - TASK 00001 - SC 83 OVER LITTLE PEEDEE.GPJ SCDOT DATA TEMPLATE\_01\_30\_2015.GDT 3/6/25

**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%					

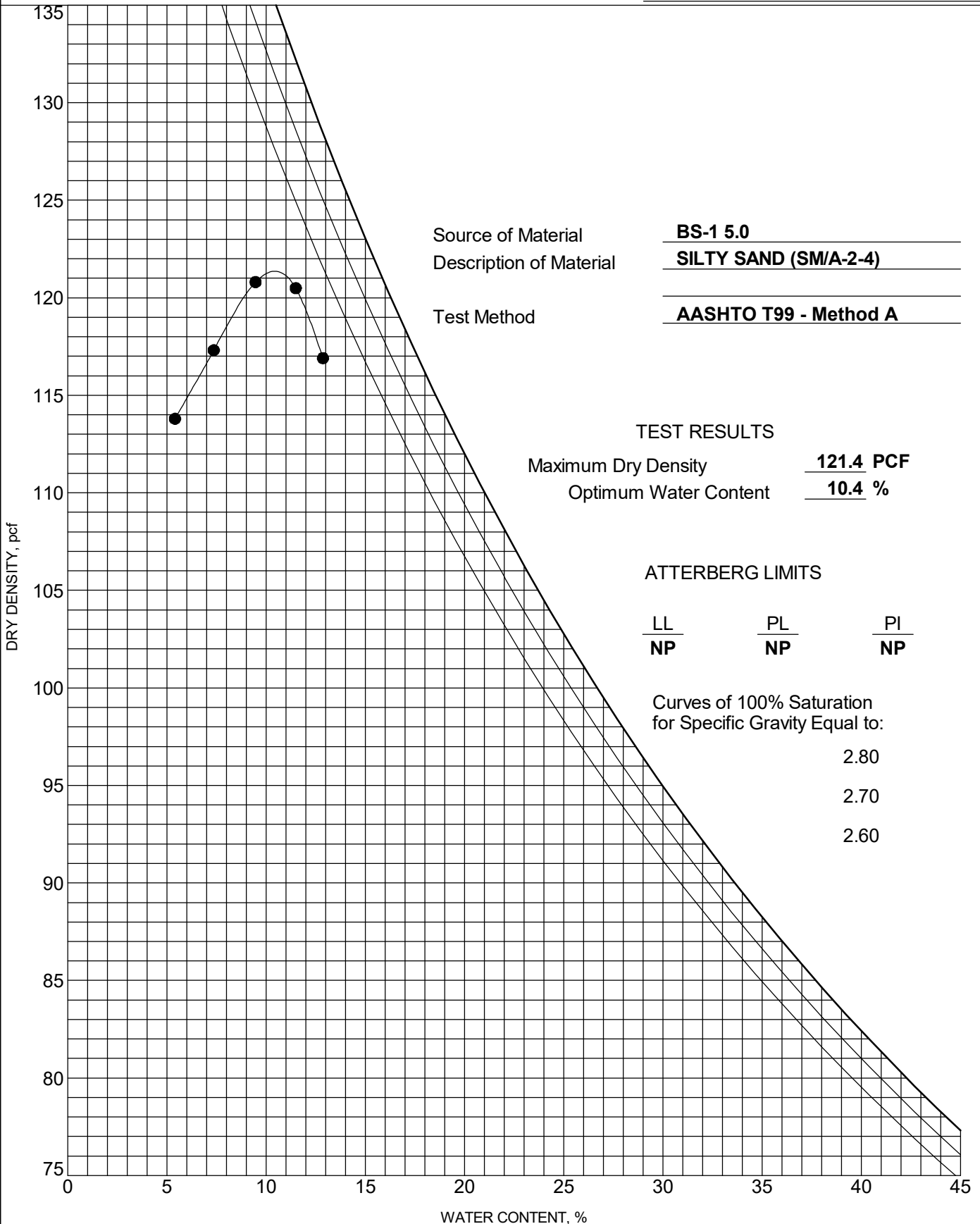


# MOISTURE-DENSITY RELATIONSHIP

PROJECT ID P042879

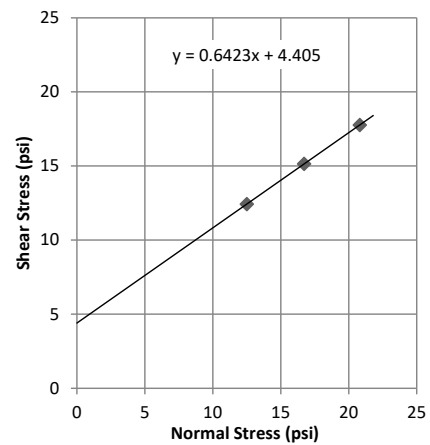
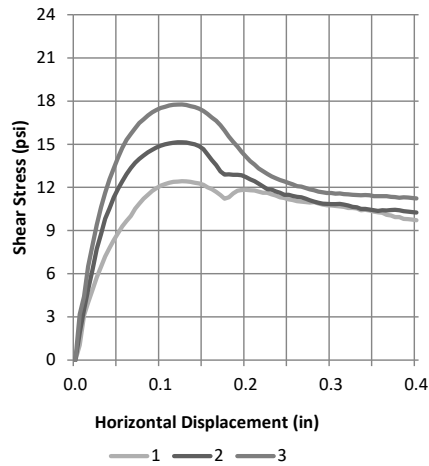
PROJECT NAME SC 83 over Little Pee Dee River

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°  $C_{\text{apparent}}$ = 4.41 psi



211 Business Park Blvd. Columbia, SC 29203

Geotechnical · Environmental · Materials



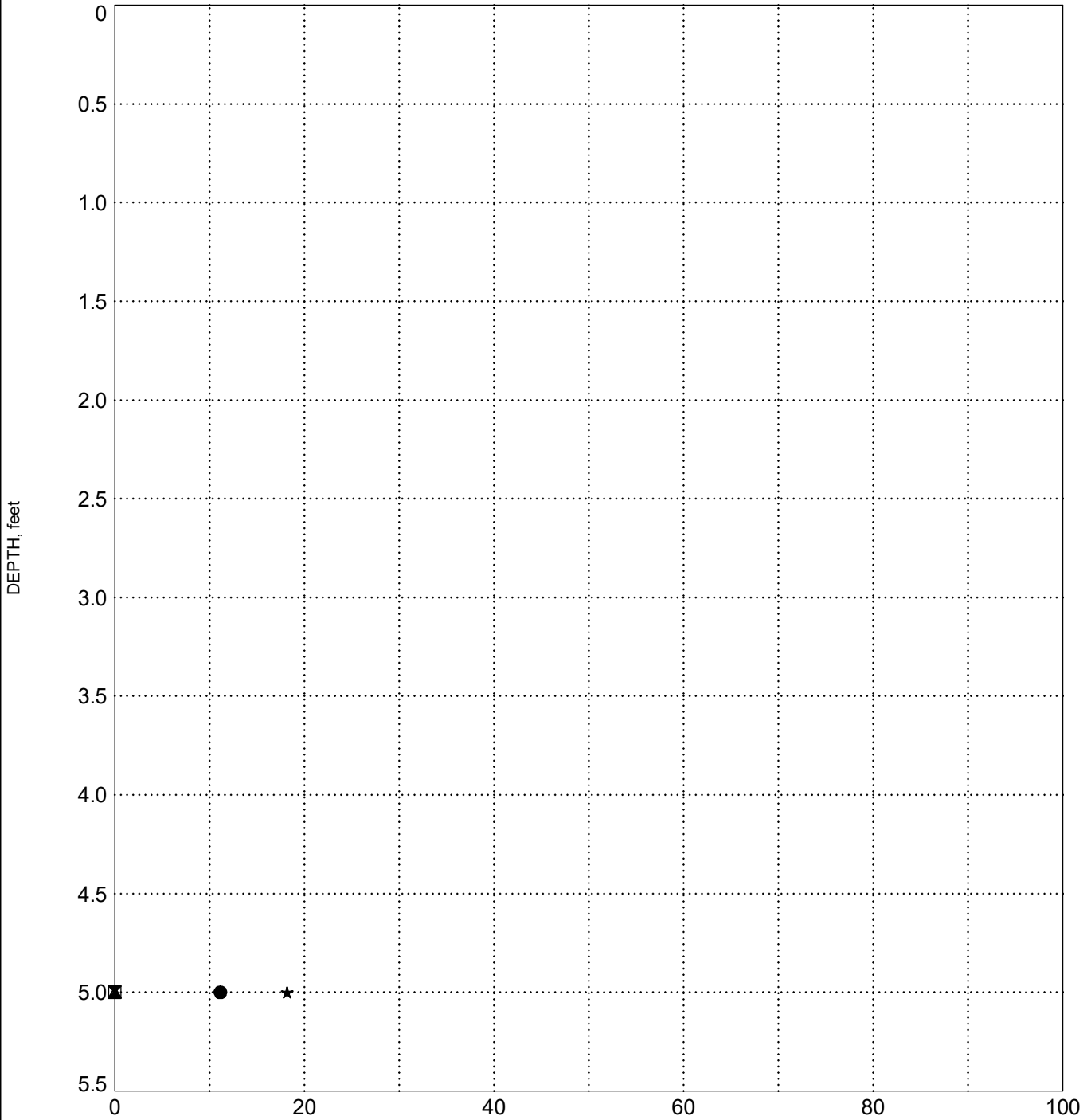
# INDEX PROPERTIES VERSUS DEPTH

PROJECT ID P042879

PROJECT NAME SC 83 over Little Pee Dee River

PROJECT COUNTY Marlboro

## BORING BS-2



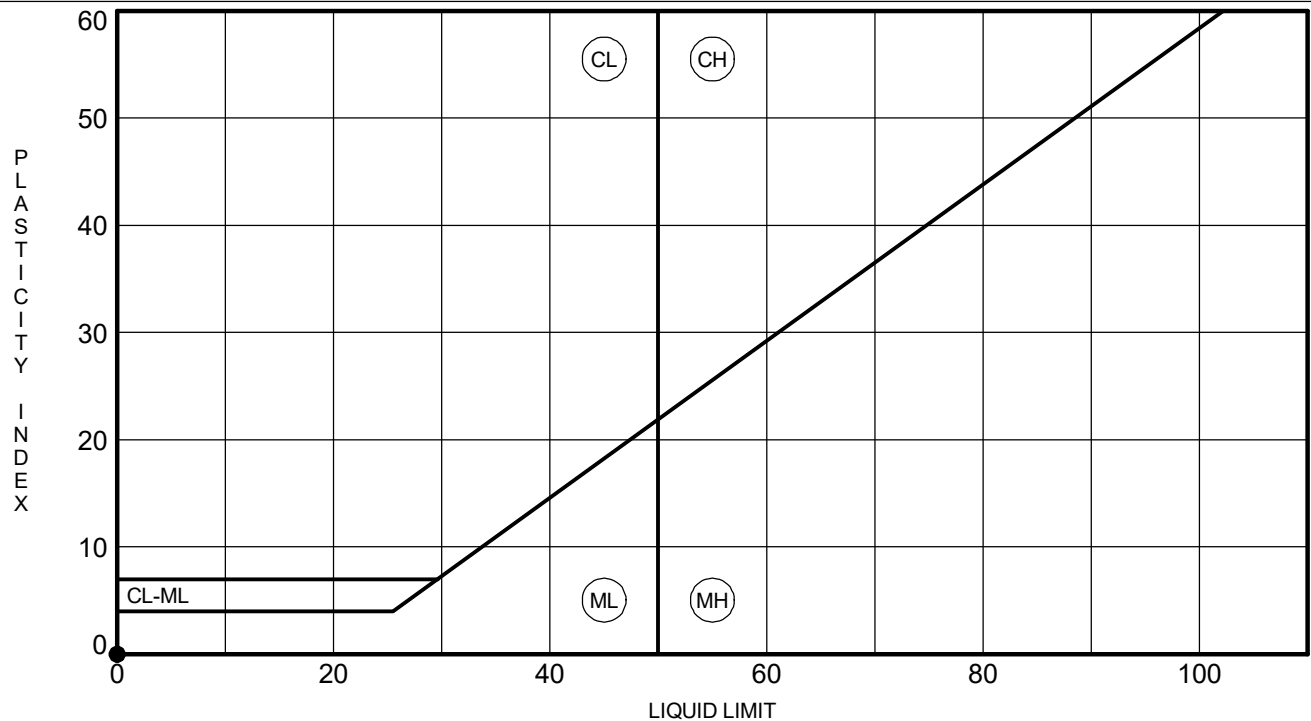
LEGEND	
●	Water Content
☒	Plastic Limit
▲	Liquid Limit
★	Fines



**PROJECT ID** P042879

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

**PROJECT COUNTY** Marlboro

[illegible]

ATTERBERG LIMITS G7100.010 - TASK 00001 - SC 83 OVER LITTLE PEEDEE.GPJ SCDOT DATA TEMPLATE 01 30 2015.GDT 3/6/25

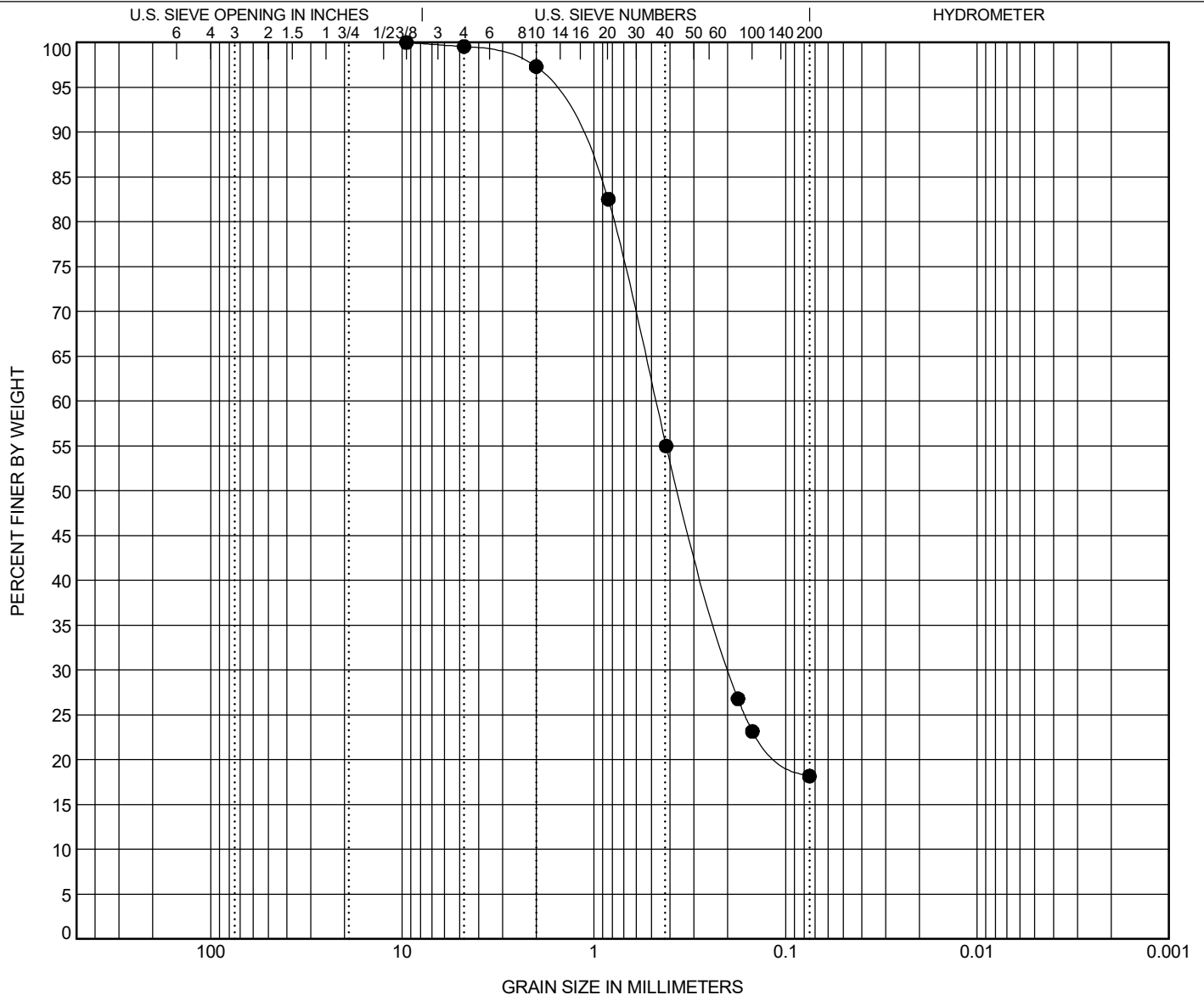


# GRAIN SIZE DISTRIBUTION

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%					



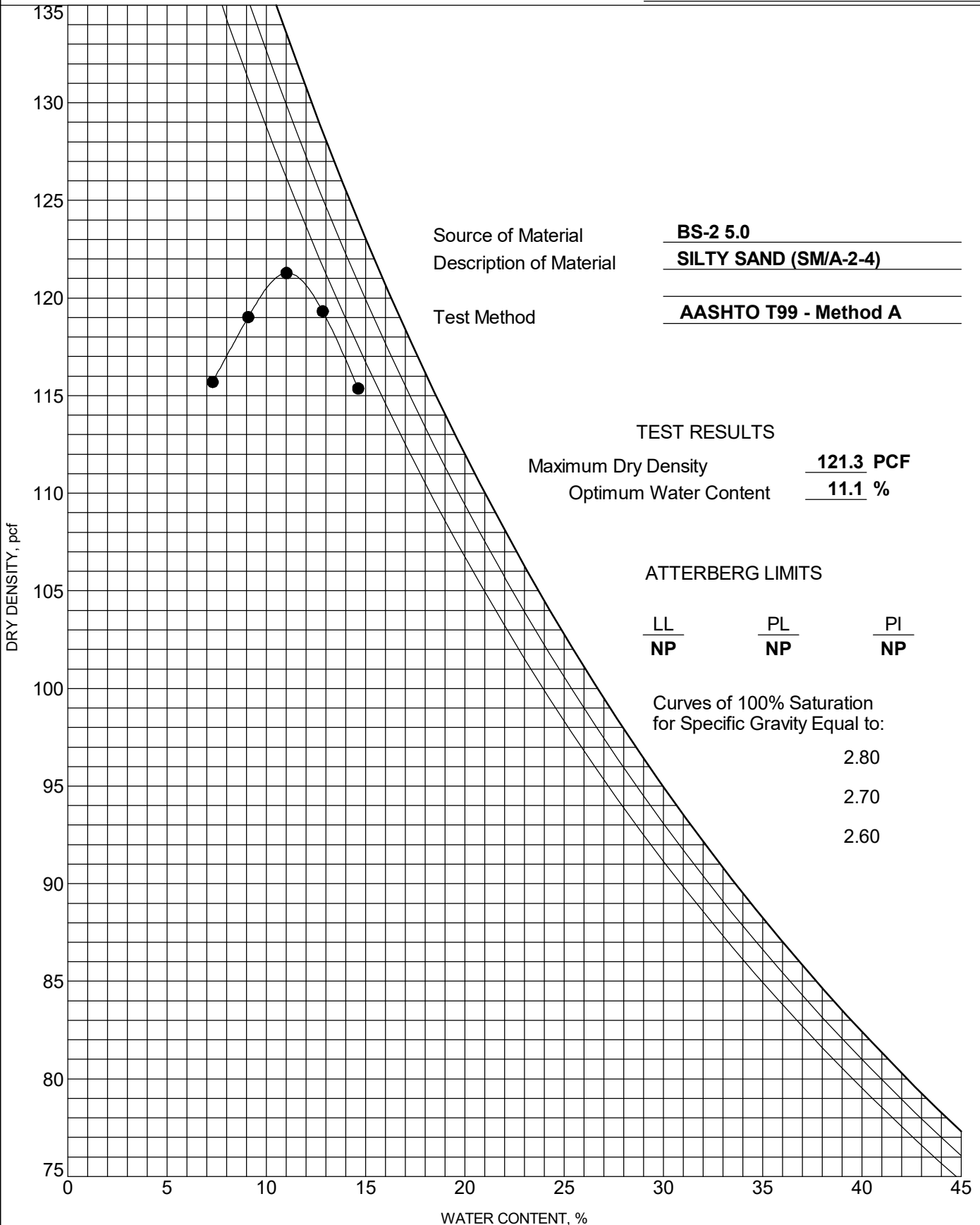


# MOISTURE-DENSITY RELATIONSHIP

PROJECT ID P042879

PROJECT NAME SC 83 over Little Pee Dee River

PROJECT COUNTY Marlboro



# CALIFORNIA BEARING RATIO (CBR) AASHTO T193

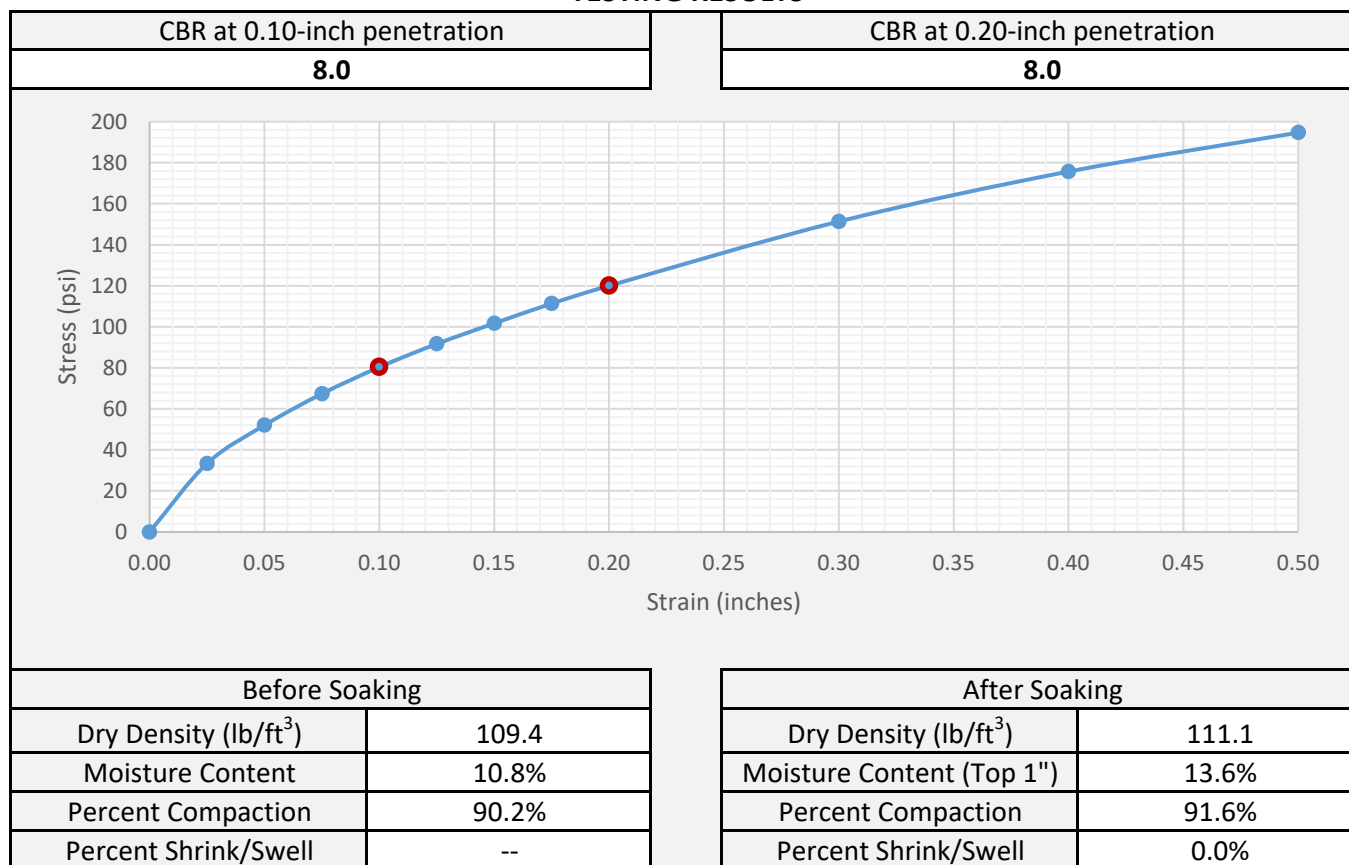
## SAMPLE INFORMATION

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> <small>211 Business Park Blvd., Columbia, South Carolina 29203</small>	 <hr/> Reviewed By	<hr/> 4/3/25 Date
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# CALIFORNIA BEARING RATIO (CBR) AASHTO T193

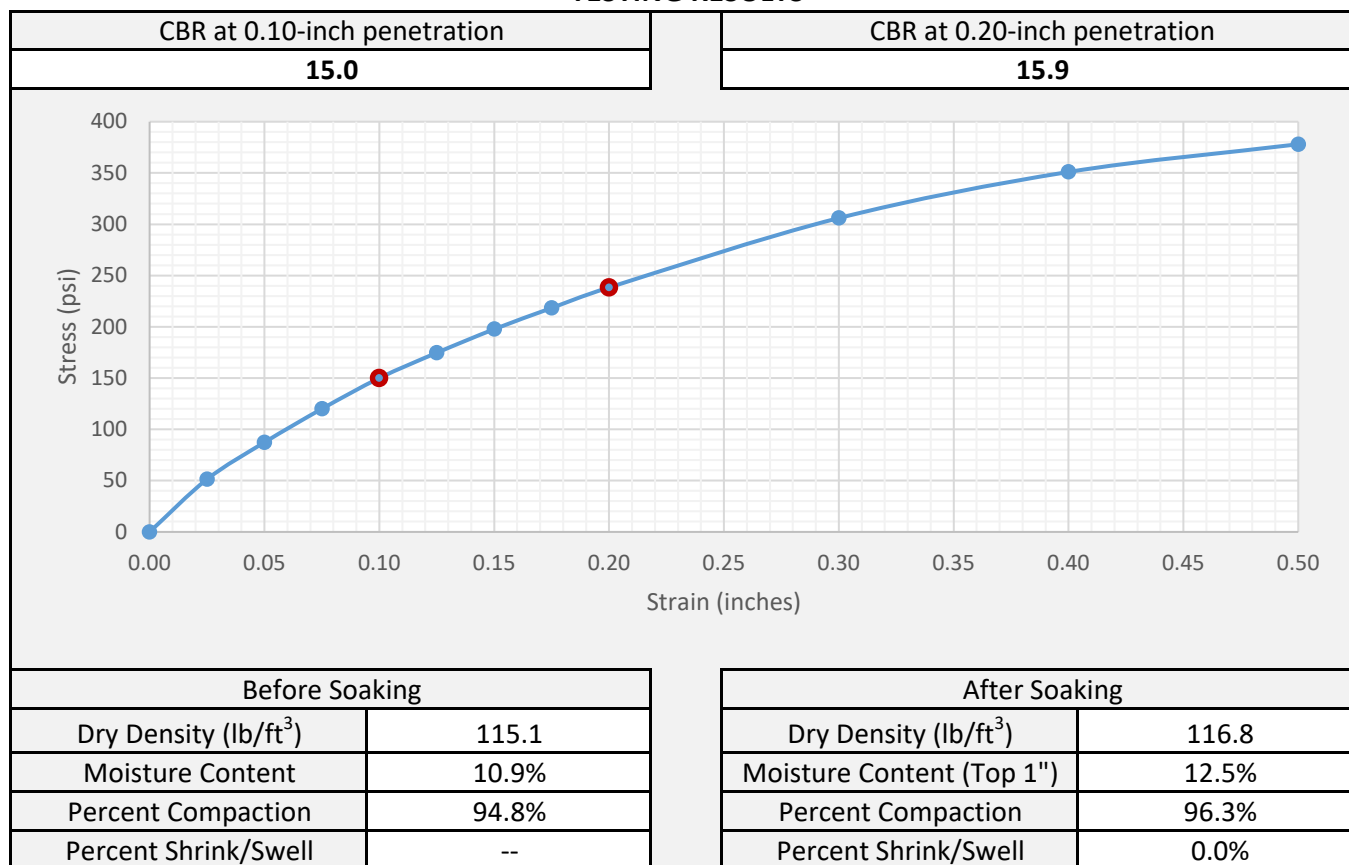
## SAMPLE INFORMATION

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> <small>211 Business Park Blvd., Columbia, South Carolina 29203</small>	 <hr/> Reviewed By	<hr/> 4/3/25 Date
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# CALIFORNIA BEARING RATIO (CBR) AASHTO T193

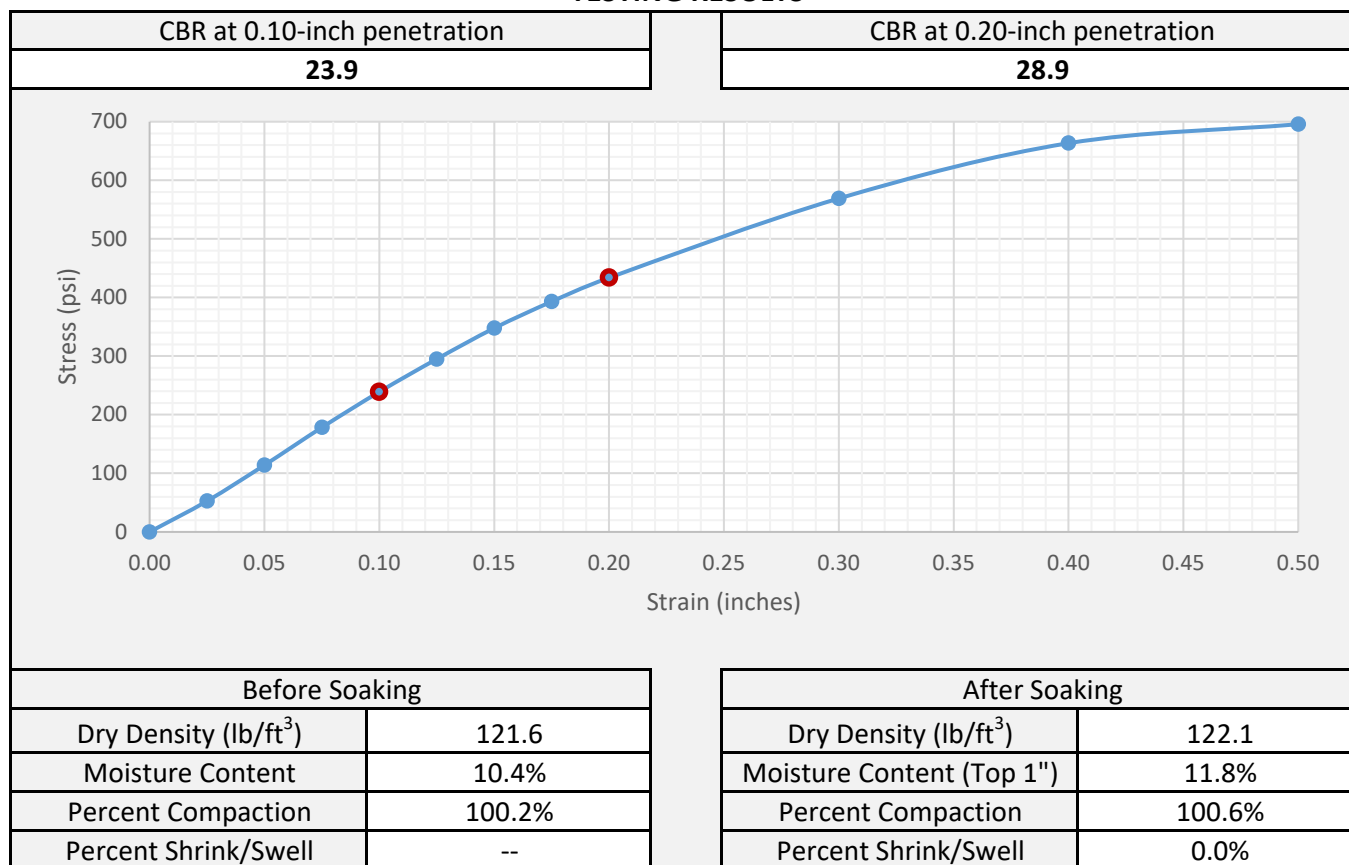
## SAMPLE INFORMATION

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> <small>211 Business Park Blvd., Columbia, South Carolina 29203</small>	 <hr/> Reviewed By	<hr/> 4/3/25 Date
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# **SC 83 over Little Pee Dee River**

## **Geotechnical Subsurface Data 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 (ft.)	pH of Soil in Distilled Water	Electrical Resistivity ( $\Omega$ -cm)	Chloride Content (mg/kg (ppm))	Sulfate Content (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, $\Omega$ -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 )

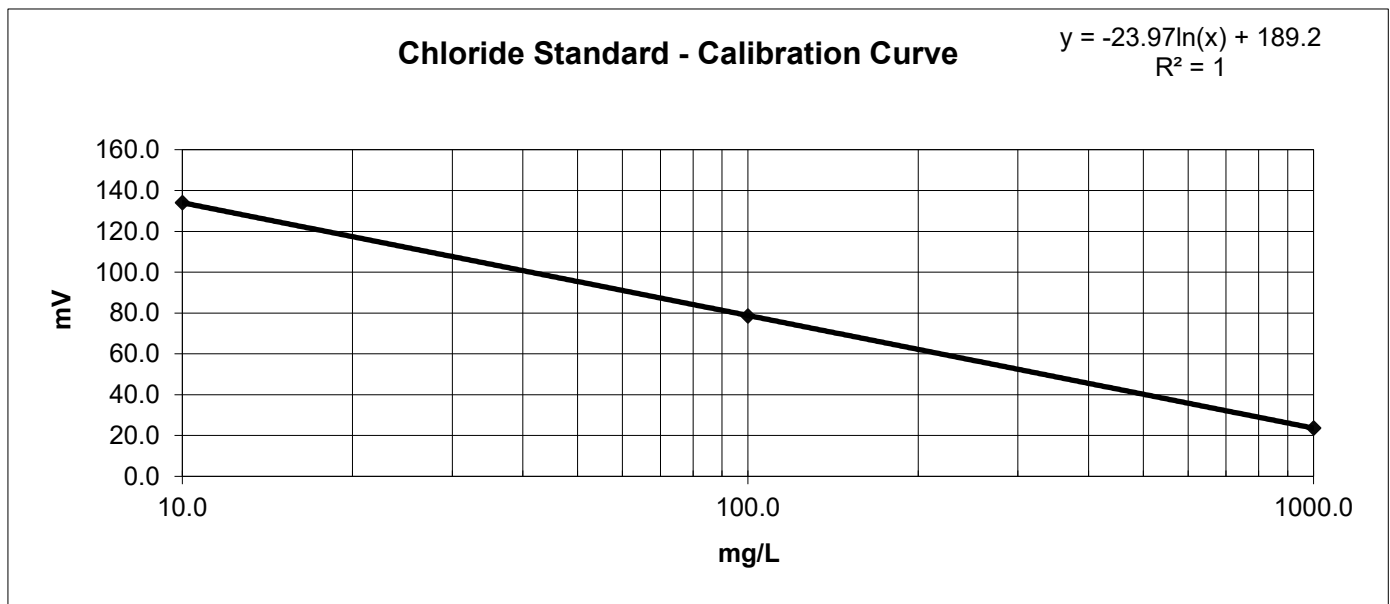
### CHLORIDE STANDARD: CALIBRATION CURVE

STANDARD	MILLIVOLTS (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)

**Sample Weight (g):** 100.0  
**Water added to Sample (mL):** 300.0  
**Size of Sample Aliquot (mL):** 50.0  
**Sample Reading (FAU):** 29

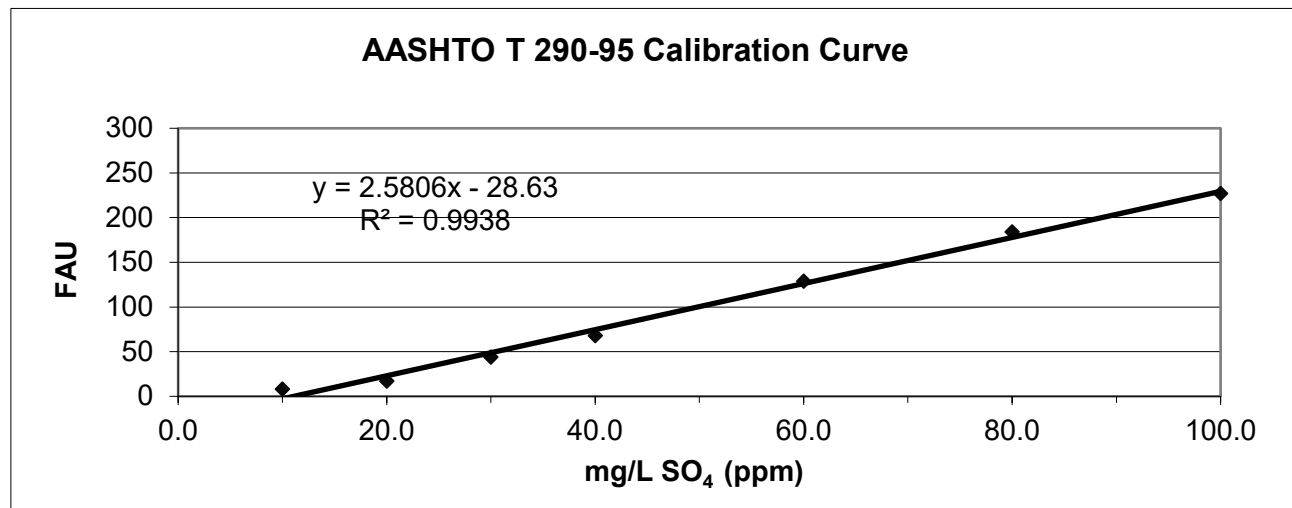
**Sample Diluted:** No

#### Sample Moisture Content

**Tare Number:** 566  
**Weight of Tare & Wet Sample (g):** 210.27  
**Weight of Tare & Dry Sample (g):** 210.10  
**Weight of Tare (g):** 84.34  
**Weight of Water (g):** 0.17  
**Weight of Dry Sample (g):** 125.76  
**Moisture Content (%):** 0.14

**Sulfate Solution Added (ml):** 0

<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

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

## **Geotechnical Subsurface Data 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



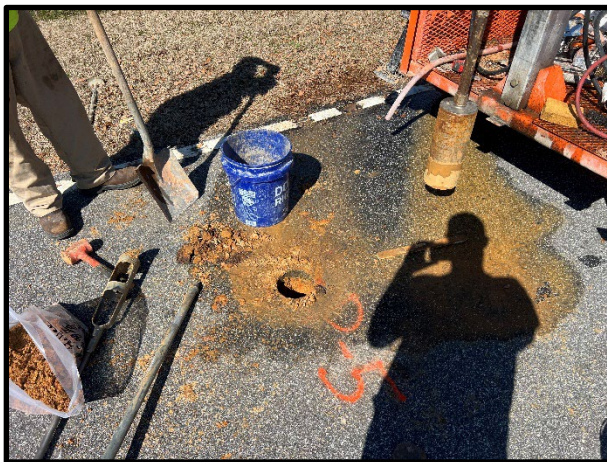
P-2



P-3



P-4



P-5



P-6





# SC 83 over Little Pee Dee River

## Geotechnical Subsurface Data Report

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# APPENDIX

## SECTION 7

## PAVEMENT CORE PHOTOS

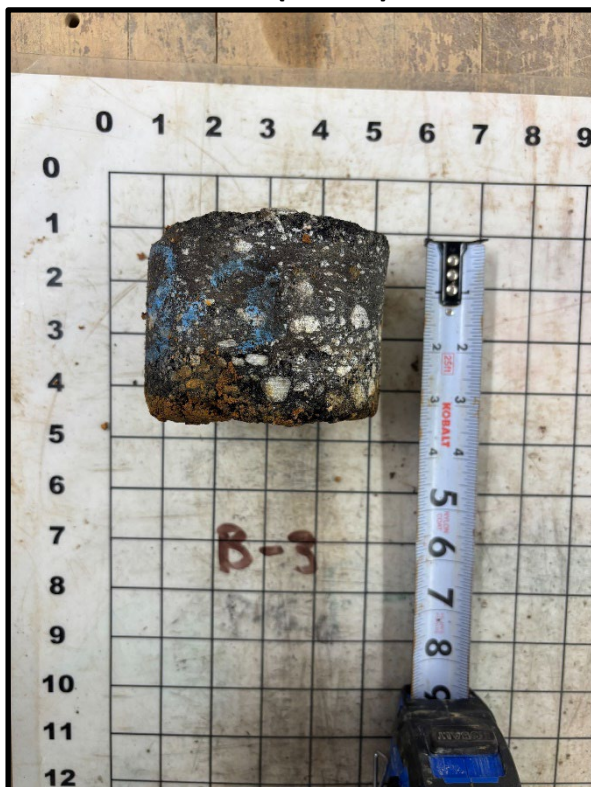
## Pavement Core Photographs



**B-1 (Side 1)**



**B-1 (Side 2)**



**B-3 (Side 1)**



**B-3 (Side 2)**





## Pavement Core Photographs



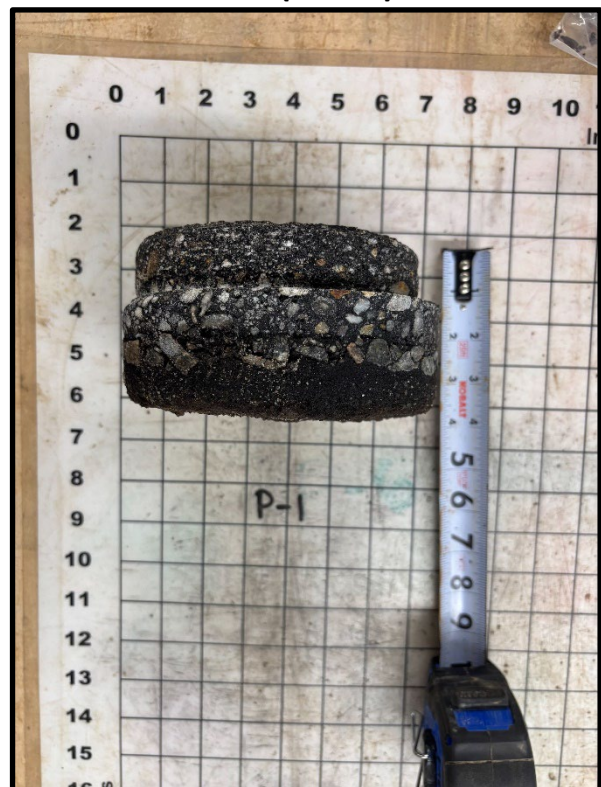
B-4 (Side 1)



B-4 (Side 2)



P-1 (Side 1)



P-1 (Side 2)





## Pavement Core Photographs



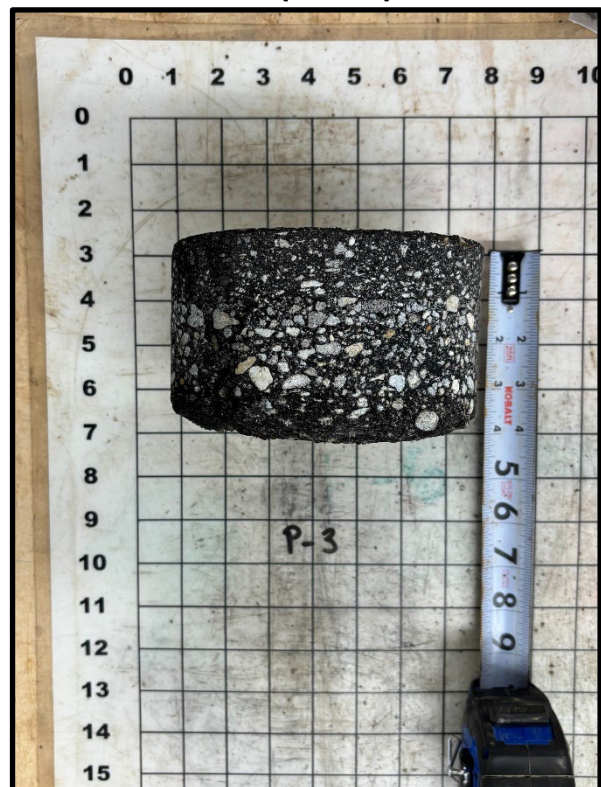
P-2 (Side 1)



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 Subsurface Data Report**

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# **APPENDIX**

## **SECTION 8      SPT HAMMER CALIBRATION**



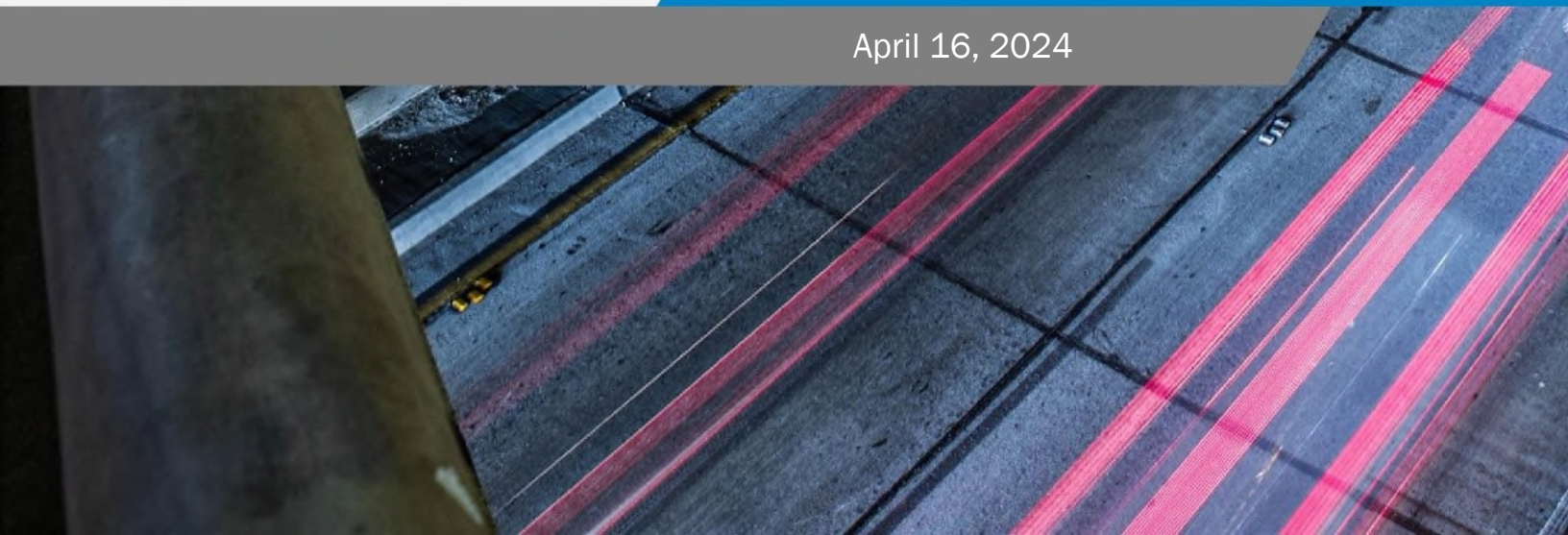


**CAROLINAS  
GEOTECHNICAL  
GROUP**

## **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



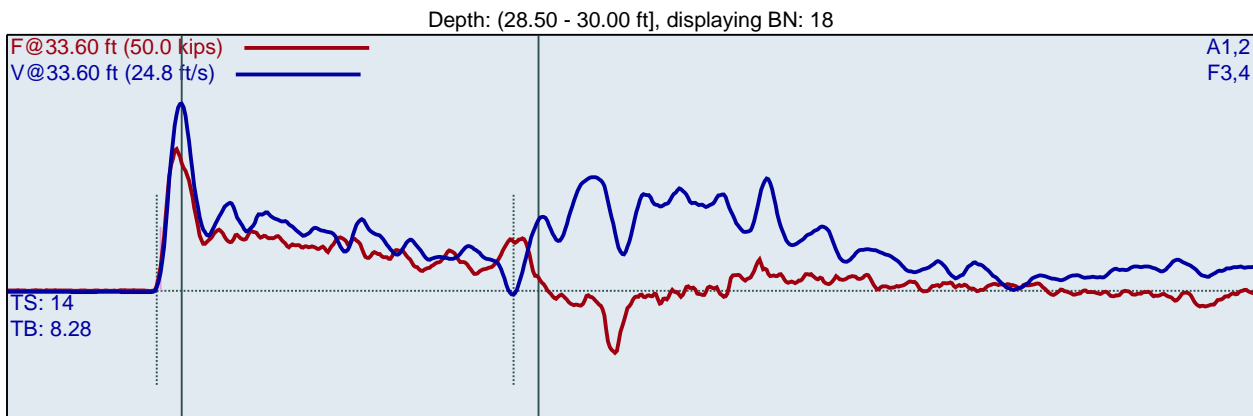
# APPENDIX I

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

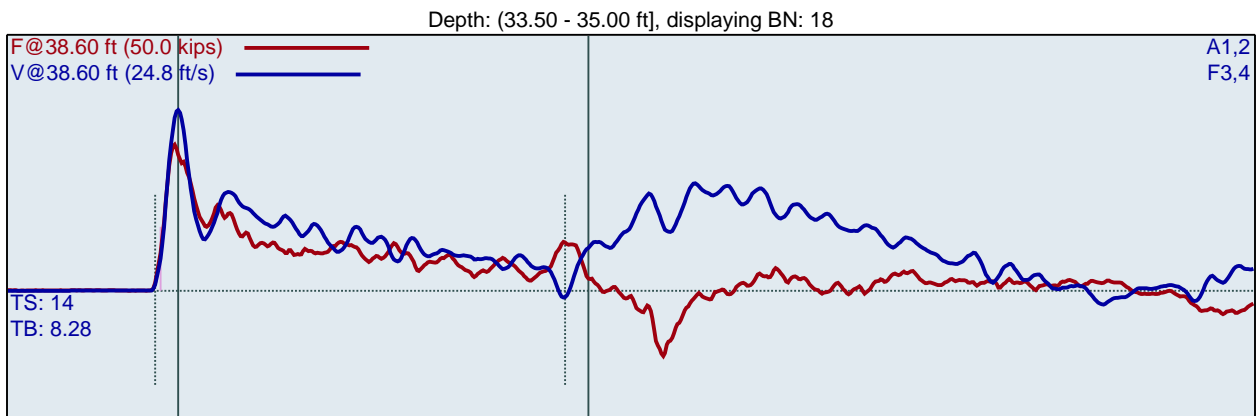
Sample Interval Time: 21.70 seconds.

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 ft	BL#	BC /6"	BPM bpm	FMX kips	VMX ft/s	DMX in	CSX ksi	DFN in	EFV ft-lb	ETR %
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

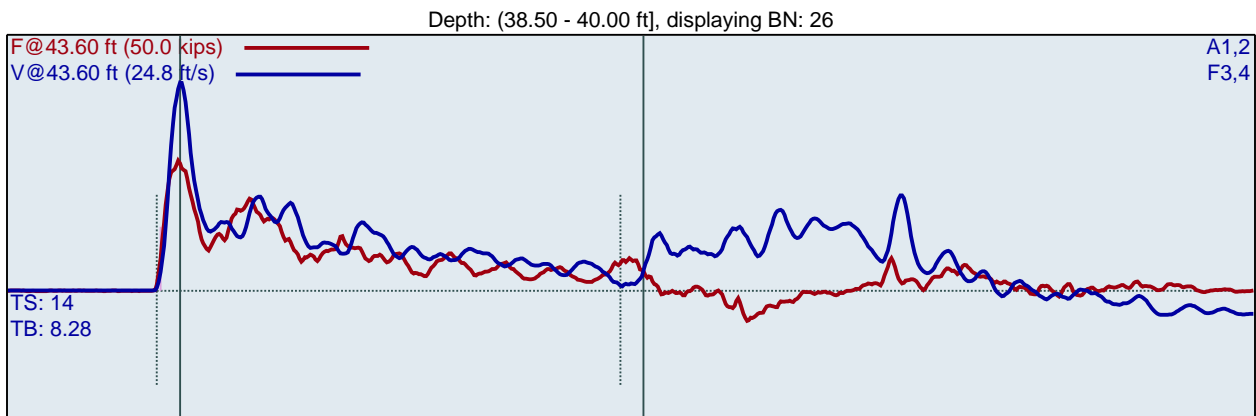
Sample Interval Time: 21.22 seconds.

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 ft	BL#	BC /6"	BPM bpm	FMX kips	VMX ft/s	DMX in	CSX ksi	DFN in	EFV ft-lb	ETR %
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**

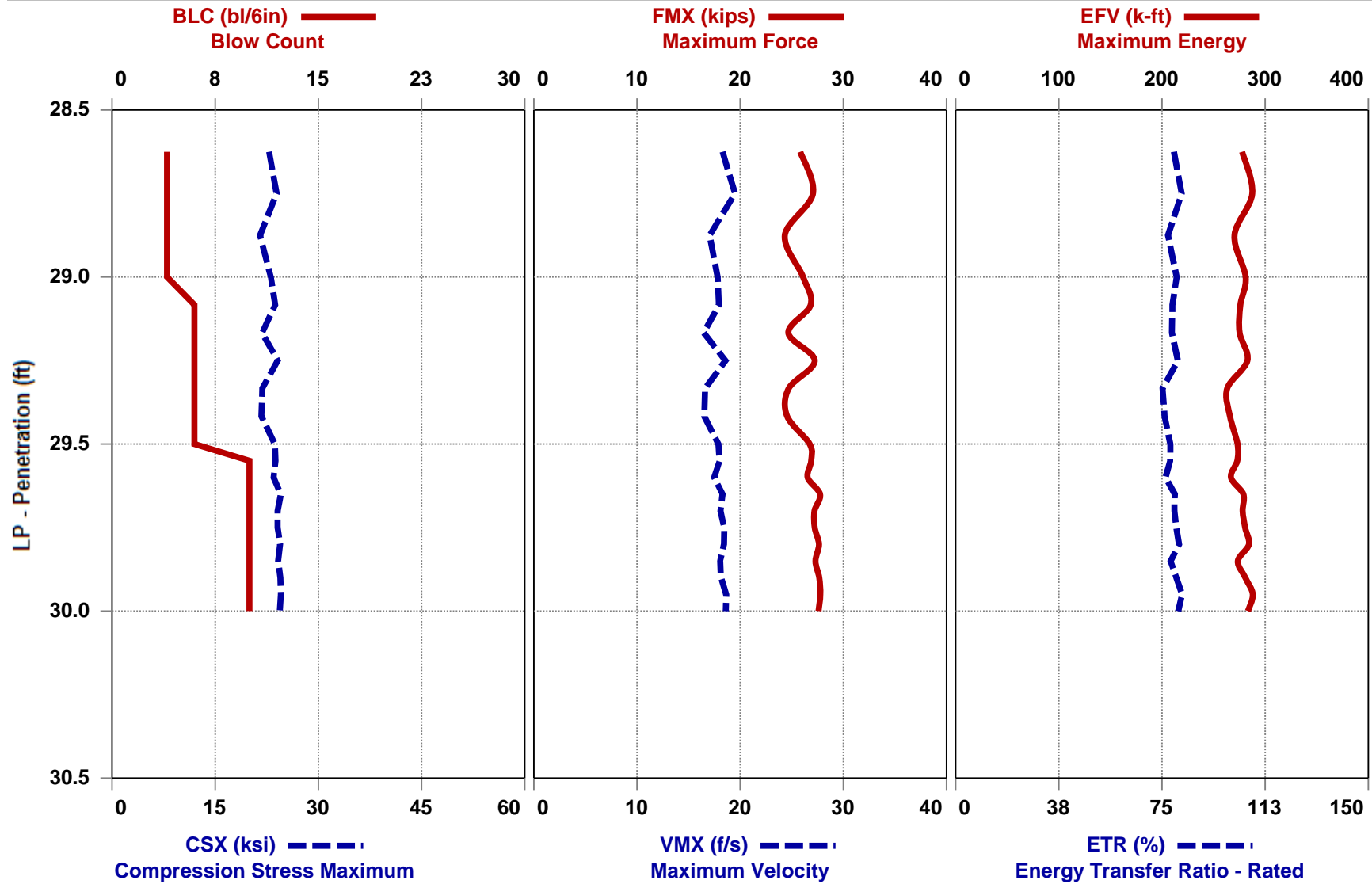
Project: CME 550X (SN 249533), Test Date: 4/12/2024

BPM: Blows/Minute											CSX: Compression Stress Maximum		
FMX: Maximum Force											DFN: Final Displacement		
VMX: Maximum Velocity											EFV: Maximum Energy		
DMX: Maximum Displacement											ETR: Energy Transfer Ratio - Rated		
Instr. Length ft	Start Depth ft	Final Depth ft	Blows Applied /6"	N Value	N60 Value	Average BPM bpm	Average FMX kips	Average VMX ft/s	Average DMX in	Average CSX ksi	Average DFN in	Average EFV ft-lb	Average ETR %
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

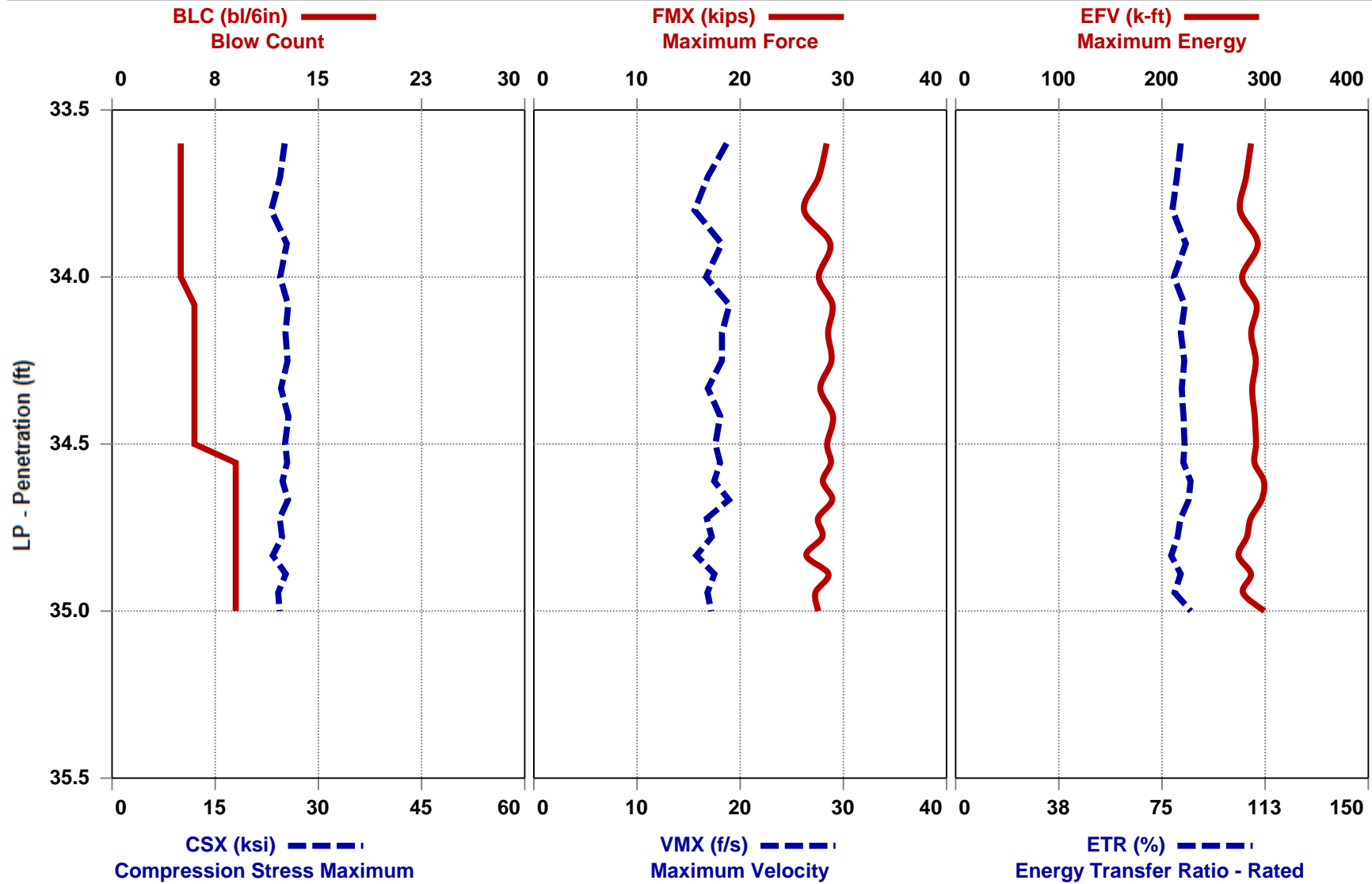
B-3





CME 550X (SN 249533) - 33.5 TO 35.0

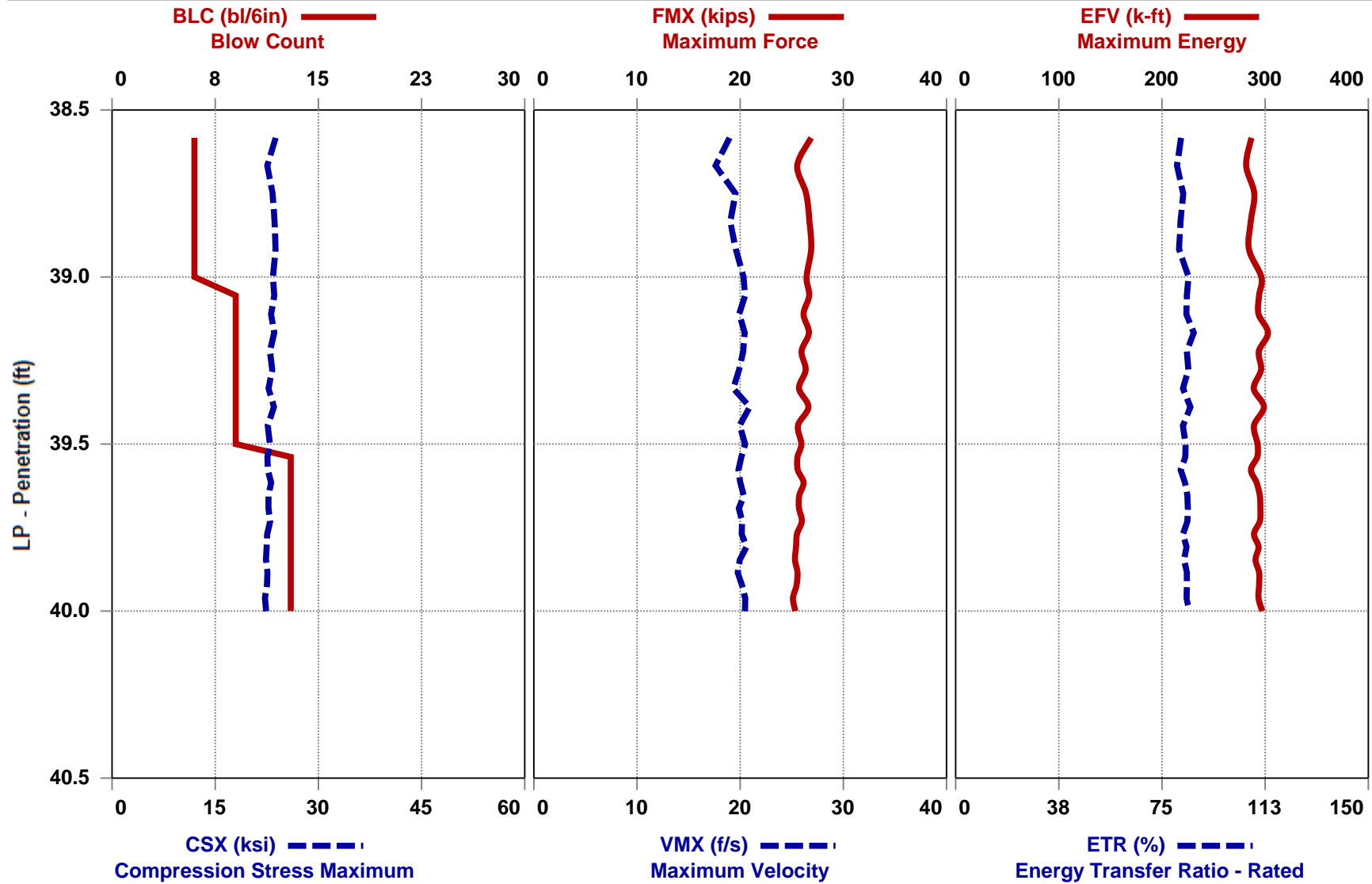
B-3

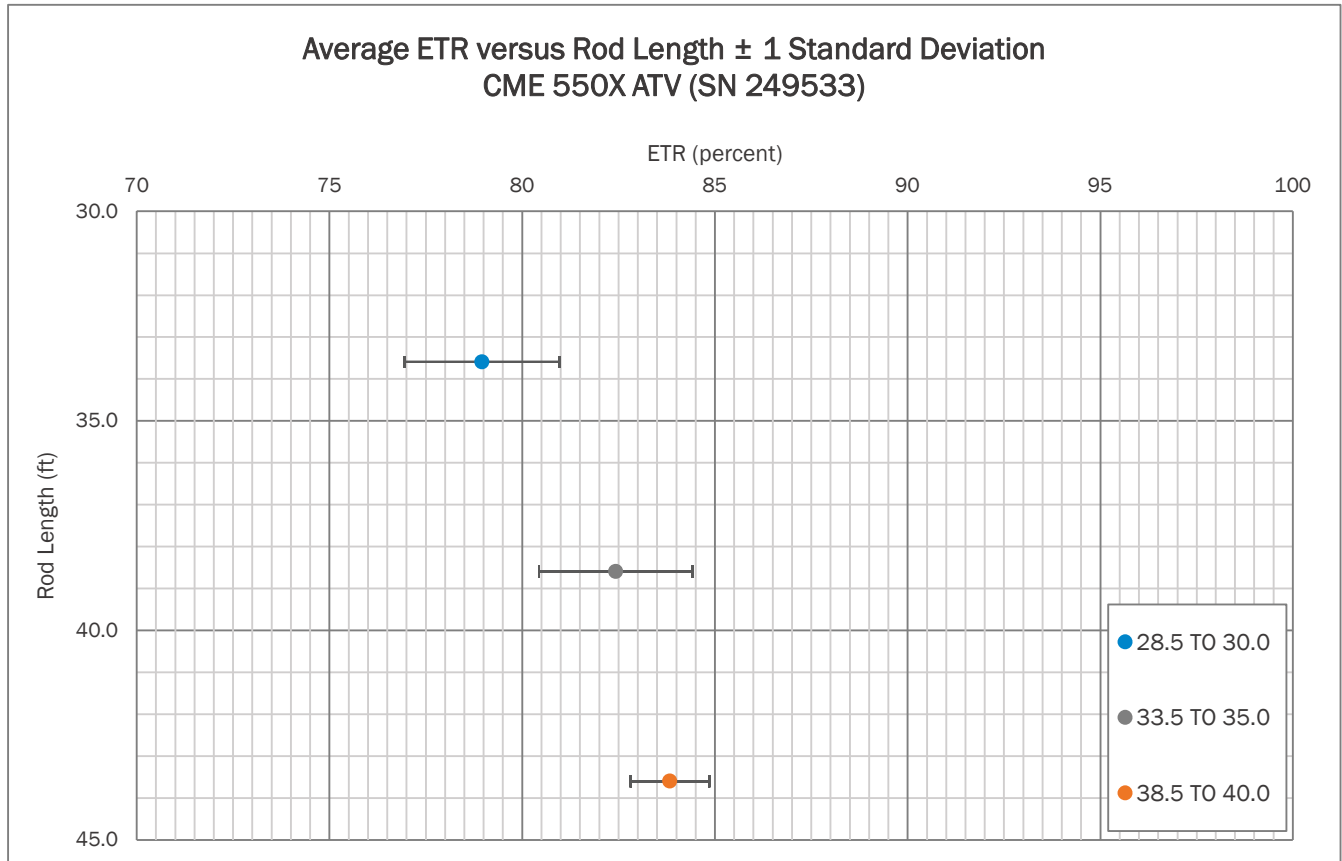
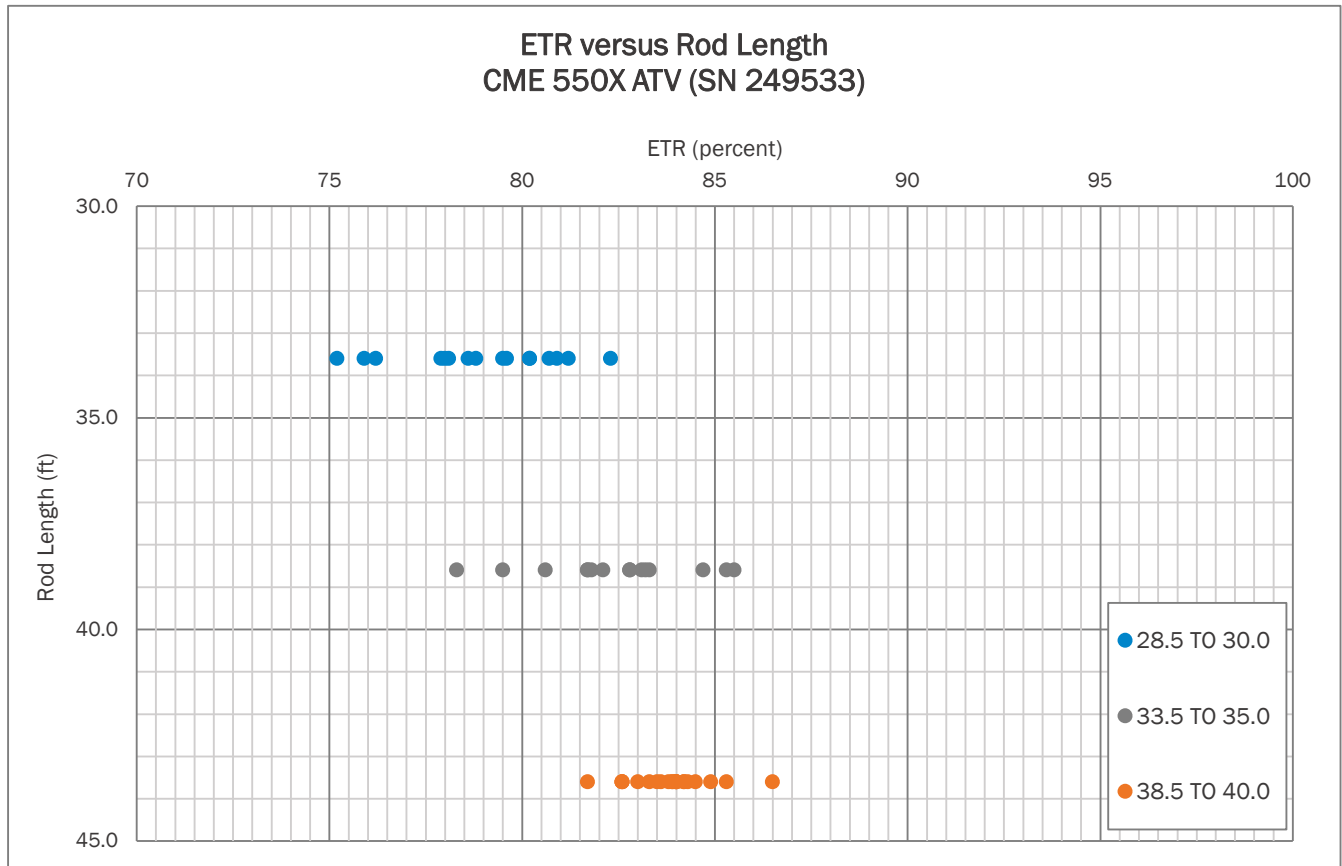




CME 550X (SN 249533) - 38.5 TO 40.0

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

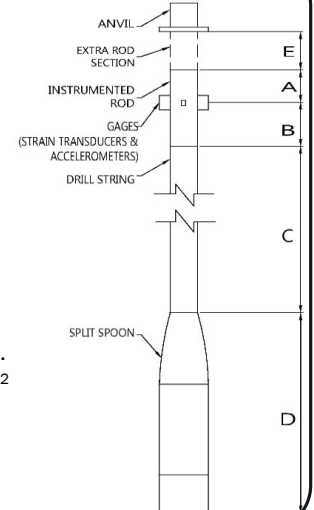
Drilling Company: BRECCIA CONSTRUCTION, LLC  
 Rig Operator: J. PHILLIPS  
 Engr/Geologist: N/A  
 Client Rep.: N/A  
 Analyzer Oper.: R. KRAL

## 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

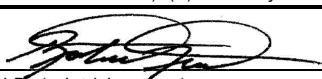
Gage		Serial No.	Calibration No.
Accel.	A3	K10959	413.83
	A4	K10960	419.89
Strain	F3	728AWJ-1	224.65
	F4	728AWJ-2	224.14

Date of Test	Test Depth Increment (ft to ft)	Test Time Start / Stop (military)	Length of Drill String (ft) (C)	(LE) Length below Gages (ft) (B) + (C) + (D)	Avg. Meas. Hammer Rate (BPM)	SPT Blow Counts				Drop Height in Tolerance (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

*MCQ*



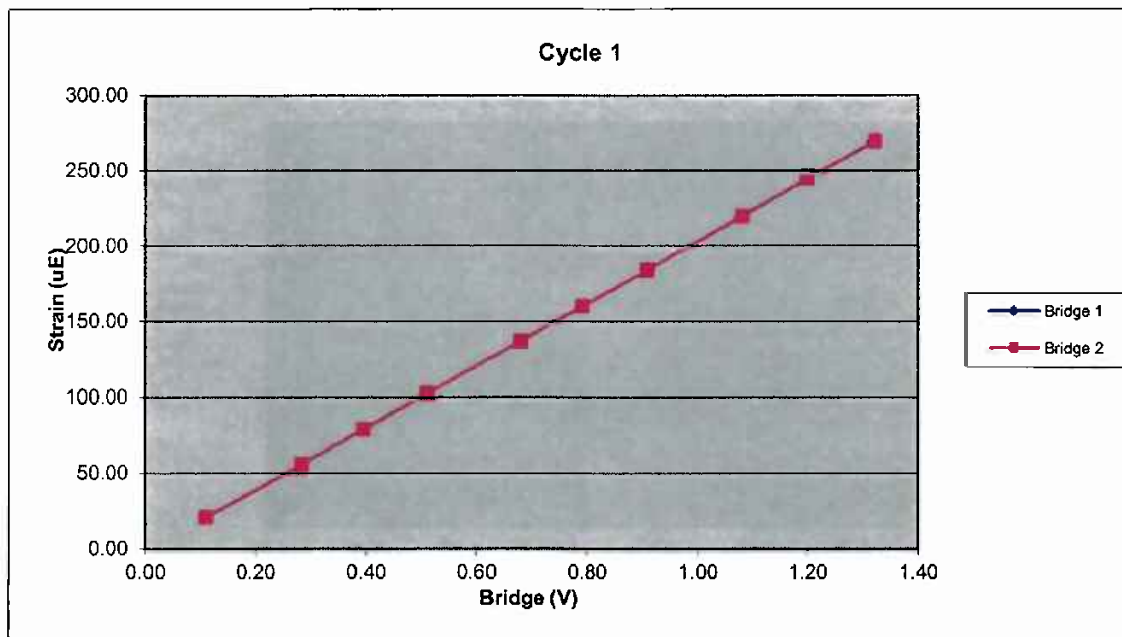
Pile Dynamics, Inc.  
30725 Aurora Road  
Cleveland, Ohio 44139 USA



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

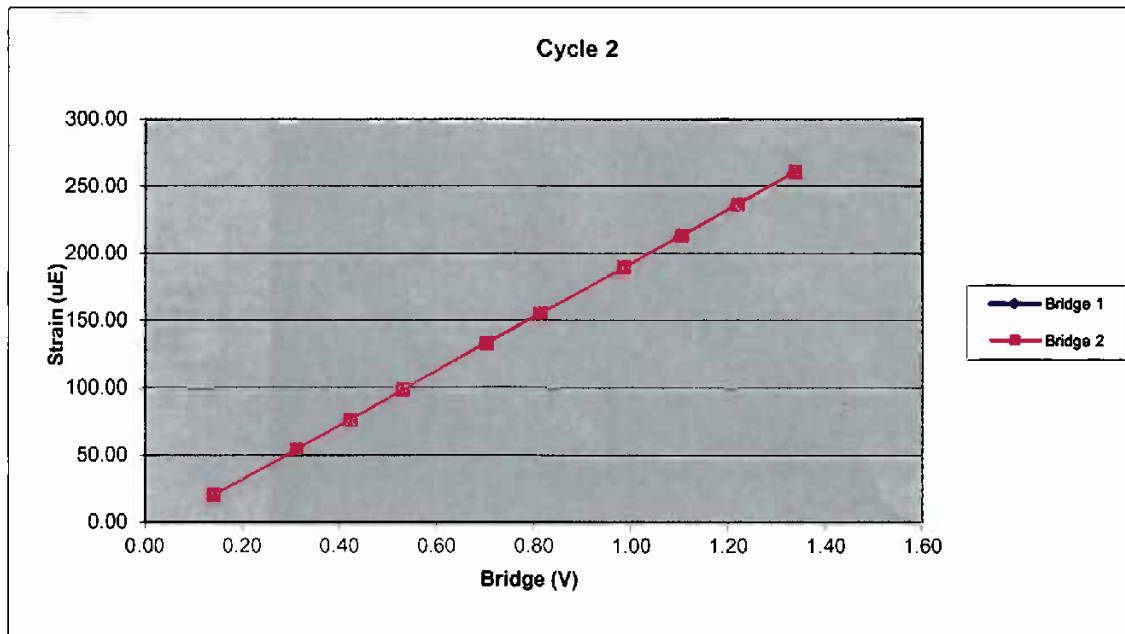
Force Strain Calibration	
EA (Kips)	35735.87
Offset	59.29
Correlation	0.999995



528AWJ		Cycle 2		
Sample	Force (lb)	Strain ( $\mu\text{E}$ )	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 ( $\mu\text{E}/\text{V}$ )	200.83	Strain Calibration ( $\mu\text{E}/\text{V}$ )	200.40
Offset	-8.59	Offset	-8.44
Correlation	0.999997	Correlation	0.999996

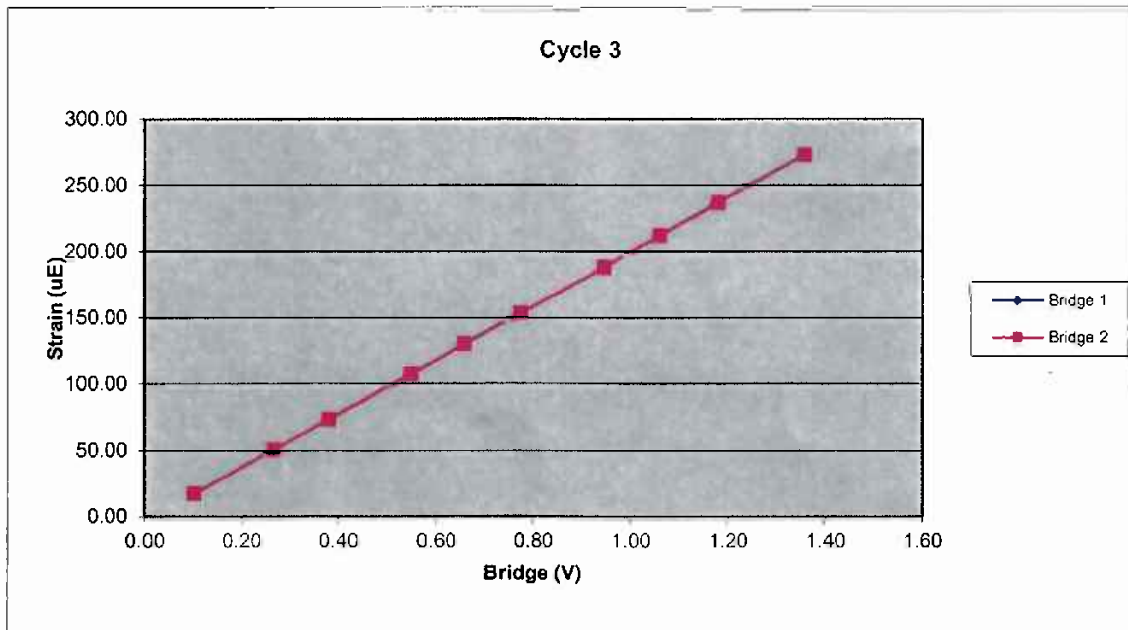
Force Strain Calibration	
EA (Kips)	36756.34
Offset	315.07
Correlation	0.999995



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 ( $\mu\text{E/V}$ )	203.78	Strain Calibration ( $\mu\text{E/V}$ )	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

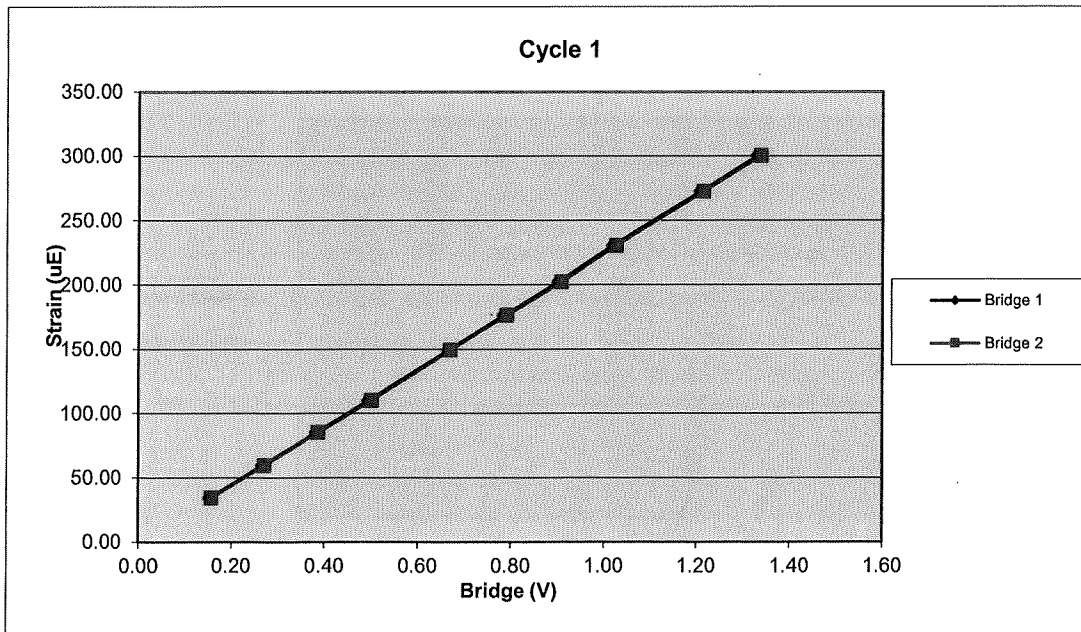
Pile Dynamics Inc  
30725 Aurora Rd  
Solon, OH 44139

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

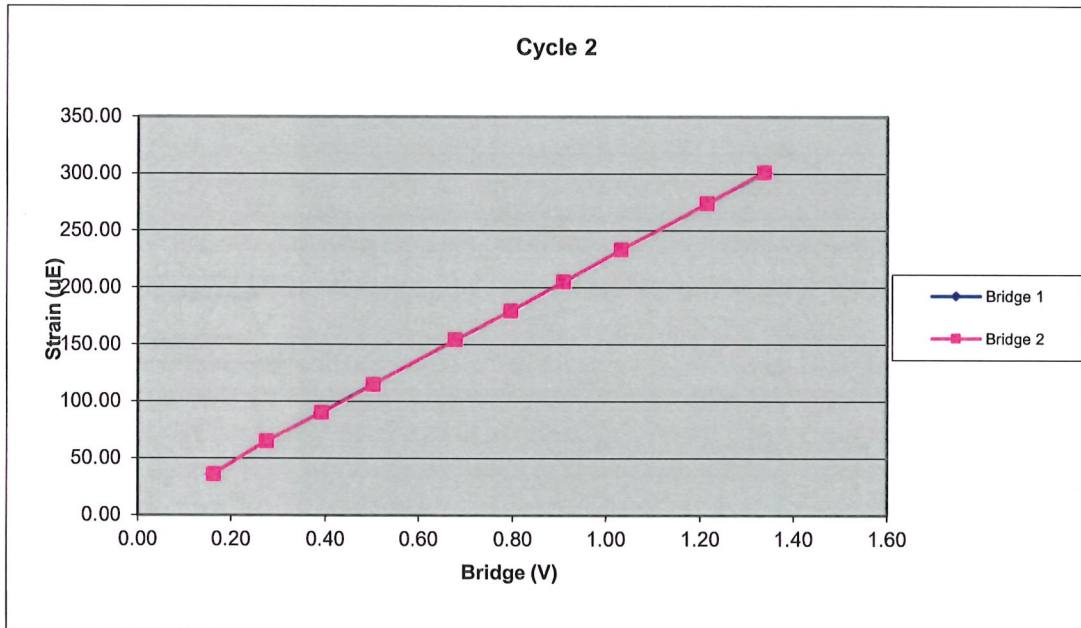




728AWJ		Cycle 2		
Sample	Force (lb)	Strain ( $\mu$ E)	Bridge 1 (V)	Bridge 2 (V)
1	0.00	0.00	0.00	0.00
2	1236.98	35.69	0.16	0.16
3	2108.61	64.71	0.28	0.28
4	2976.64	89.52	0.39	0.39
5	3811.14	114.45	0.50	0.50
6	5141.89	153.54	0.68	0.68
7	6032.24	178.92	0.80	0.80
8	6903.48	204.54	0.91	0.91
9	7825.42	232.64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

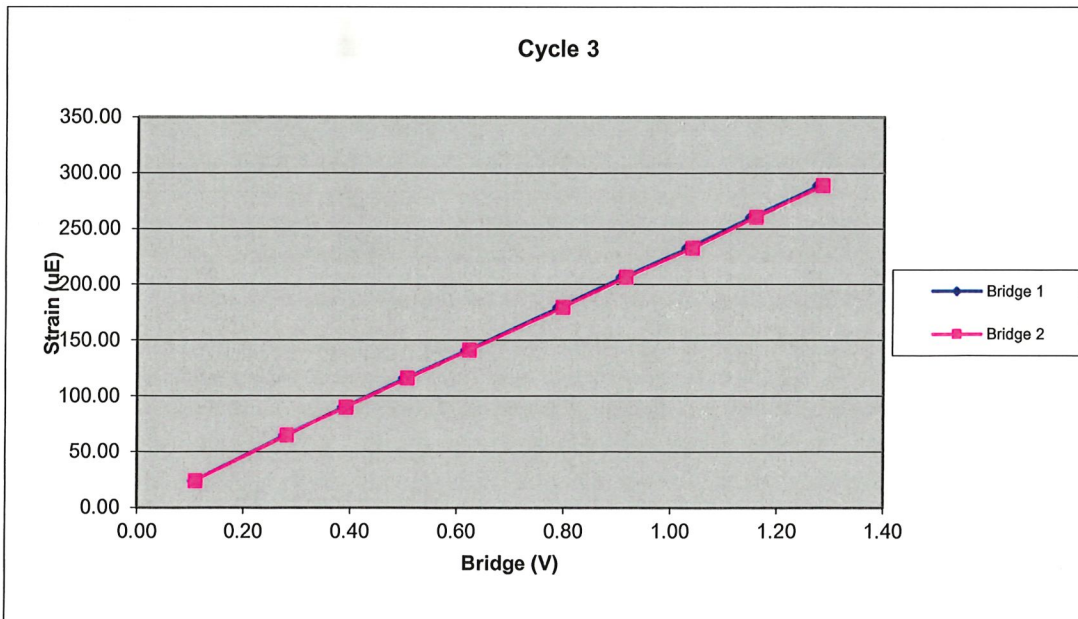
Force Strain Calibration	
EA (Kips)	33843.24
Offset	-37.68
Correlation	0.999950



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 (µE/V)	224.65	Bridge 2 (µE/V)	224.14
EA Factor (Kips)	33811.01	Area (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]

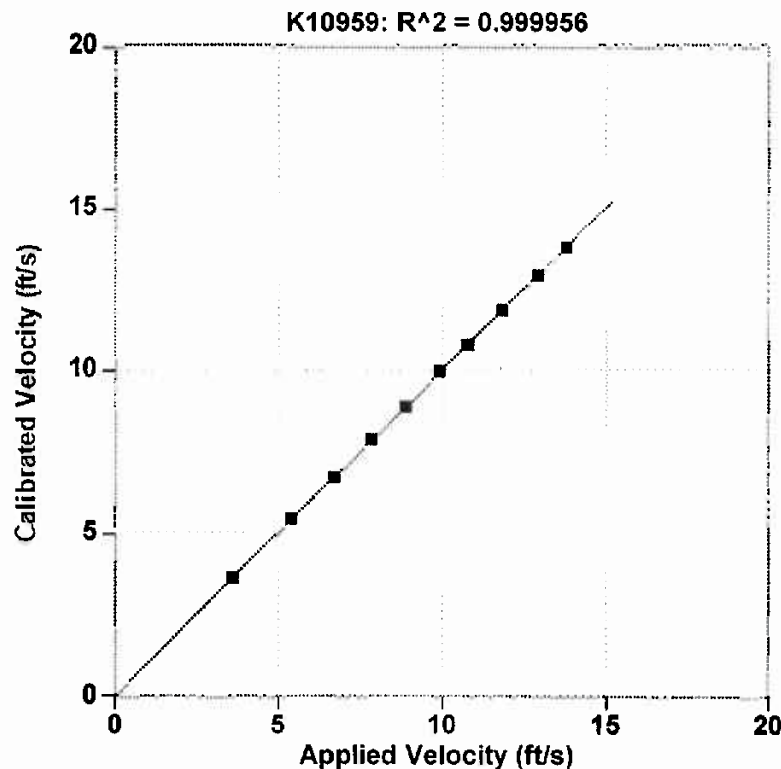
Ref Acc 1: 72517! Cal on: 24Mar2022  
1049 g's/volt

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  $\mu\text{v/g}$ )

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

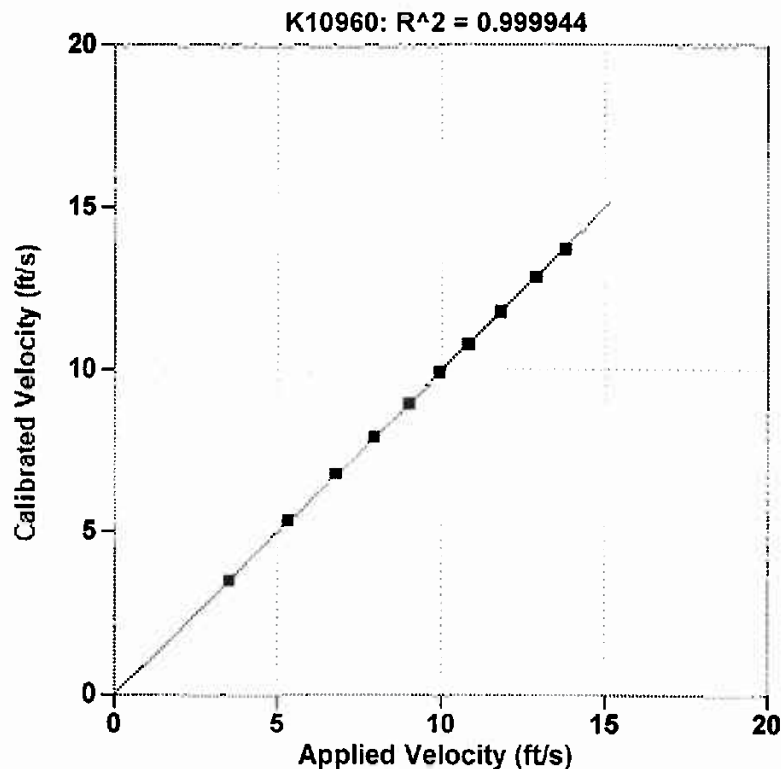
Operator: William Johnson

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

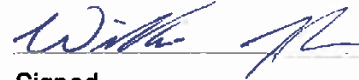
(81.9  $\mu$ v/g)

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

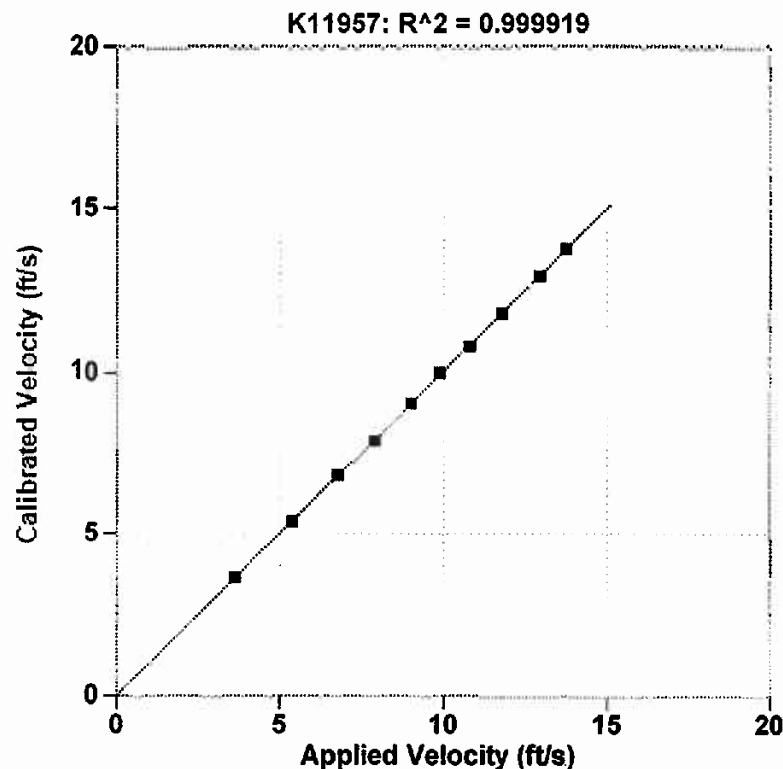
Operator: William Johnson

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 ft/s	S/N K11957 Velocity 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 Subsurface Data 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 wooded wetlands; NE-side: manual descent but could be done if you went back for clearing	
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 (graded 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 could get up there if started near back of bridge & tons of tree clearing, otherwise needs manual descent	
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-pavement side: possible fiber optic cables</u>
Above Ground/ Overhead: <u>On S-pavement side: power lines overhead, running edge of</u>
Underground: <u>Likely fiber optic on both sides of bridge underground → the whole area is swarming w/ orange markers</u>

fiber optic mess

COMMENTS															
<div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <p style="text-align: center; margin: 0;">Bridge Weight 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; margin: 0;">Emergency Vehicle 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**