



# GEOTECHNICAL SUBSURFACE DATA REPORT

S-38-634 over Cooper Swamp  
Orangeburg 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.: P044270

FME Project No.: G7100.009—Task 00040

February 14, 2024

February 14, 2025

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

Re: Geotechnical Subsurface Data Report  
S-38-634 over Cooper Swamp  
Orangeburg County, South Carolina  
SCDOT Project ID.: P044270  
FME Project No.: G7100.009 – Task 00040

Mr. Harris:

Submitted herein is F&ME Consultants, Inc.'s (FME) Geotechnical Subsurface Data Report for the S-38-634 over Cooper Swamp 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 blue ink signature of William A. Pitts, consisting of a stylized 'W' followed by a series of loops and a horizontal line.

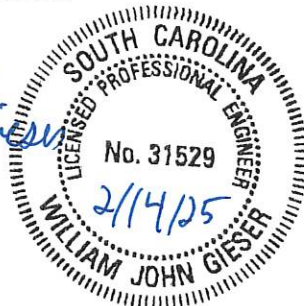
William A. Pitts, E.I.T.  
Geotechnical Staff Professional

A blue ink signature of Alex M. Abernethy, featuring a large, stylized 'A' followed by several loops and a long horizontal line.

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

A blue ink signature of William J. Gieser, written in a cursive style.

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



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## 1. INTRODUCTION

### 1.1. GENERAL

The project takes place along S-38-634 (Buffalo Pond Road) and is located approximately ten (10) miles southwest of Orangeburg, South Carolina. We understand that this project will involve the demolition/removal of the existing culvert structure and the replacement with a new bridge structure on the existing roadway alignment. A Site Location Plan (Figure 1) is presented in Section 1 of the Appendix of this report.

### 1.2. SCOPE

FME performed a geotechnical subsurface exploration and laboratory testing for the project. The South Carolina Department of Transportation (SCDOT) Scope of Services was issued on January 6, 2025. The field exploration consisted of Soil Test Borings (STB) with Standard Penetration Testing (SPT) and the collection of a Bulk Soil Sample (BS). Laboratory testing was performed on soil samples collected from the Soil Test Borings and the Bulk Soil Sample.

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 SUMMARY

From January 23, 2025, through January 29, 2025, FME performed eight (8) Soil Test Borings. Additionally, one (1) bulk soil sample was collected on site. 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 (Figure 2) displaying the test locations performed during the subsurface exploration is contained in Section 2 of the Appendix within to this report.

### 2.1. SOIL TEST BORINGS

Soil Test Borings were performed utilizing a CME 550X ATV-mounted drill rig. The measured energy transfer ratio for the CME 550X was 89.8% utilizing an automatic hammer. SPT hammer calibration records are provided within Section 7 of the Appendix of this report. Soil Test Borings B-1 and B-2 utilized rotary wash drilling techniques to maintain a stable borehole. Soil Test Borings were sampled continuously through the upper ten (10) feet, or termination depth, utilizing SPT testing. Following the continuous sampling, SPT testing was performed on standard five (5) foot intervals thereafter until the target boring depth was achieved. Soil Test Boring B-1 was terminated five (5) feet prior to its proposed test depth due to field staff sampling errors. 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.



FME also conducted six (6) roadway approach Soil Test Borings, designated as P-1 through P-6. These six (6) borings were performed using Hollow Stem Auger drilling methodologies. Pavement core samples from each Soil Test Boring were bagged and transported to FME's laboratory facility following boring completion. These cores were measured and photographed to document thickness, distress, and existing surface conditions. Copies of the Soil Test Boring Logs are contained within Section 3A in the Appendix of this report. Additionally, pavement core photographic documentation is presented within Section 6 of the Appendix of this report. The locations, depths, and elevations of the Soil Test Borings performed for the subsurface investigation are provided in the following table.

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

Test ID	Test Type	Total Boring Depth (ft)	Latitude	Longitude	Elevation (ft-MSL)
B-1	STB	94.4	33.40164380	-80.98468015	201.7
B-2	STB	98.8	33.40181839	-80.98451804	201.6
P-1	STB	6.0	33.40093440	-80.98571609	205.0
P-2	STB	6.0	33.40118016	-80.98532672	203.2
P-3	STB	6.0	33.40147168	-80.98498104	201.9
P-4	STB	6.0	33.40199128	-80.98421055	201.5
P-5	STB	6.0	33.40227527	-80.98385318	203.8
P-6	STB	6.0	33.40249296	-80.98343860	206.0
<b>Total</b>		<b>229.2</b>			

## 2.2. BULK SOIL SAMPLES

One (1) Bulk Soil Sample (designated as BS-1) was collected on-site. Bulk Soil Sample BS-1 was collected as a composite sample from the upper six (6) feet of auger cuttings encountered within the six (6) roadway approach Soil Test Borings. Locations where the material was sampled are presented in Section 2 in the Appendix. The table below summarizes test designations, depth, locations and existing surface elevations for the Bulk Soil Samples

**Table 2 – Field Exploration Summary Table – Bulk Soil Sample**

Test ID	Test Type	Test Depth (ft)	Latitude	Longitude	Elevation (ft-MSL)
BS-1	STP	6.0	N/A <sup>1</sup>	N/A <sup>1</sup>	N/A <sup>1</sup>
<b>TOTAL</b>		<b>6.0</b>			

<sup>1</sup>Composite Bulk Soil Sample BS-1 was created from upper six (6) feet of auger cuttings collected within Soil Test Borings P-1 through P-6.

## 2.3. GROUNDWATER

Groundwater depths were recorded at the time of boring (TOB) and/or twenty-four (24) hours following boring completion. Groundwater depth measurements are noted on the individual Subsurface Exploration Logs in Section 3 of the Appendix.

## 2.4. TEST LOCATION TABLE

The following table summarizes the state plane coordinates in feet, latitude-longitude in decimal degrees, and existing surface elevations of the test locations for the subsurface exploration.

Table 3 – Test Location Table

Test ID	Test Type	Northing	Easting	Latitude	Longitude	Elevation (ft-MSL)
B-1	STB	570605.760	2004674.830	33.40164380	-80.98468015	201.7
B-2	STB	570669.283	2004724.291	33.40181839	-80.98451804	201.6
BS-1	STB	N/A <sup>1</sup>	N/A <sup>1</sup>	N/A <sup>1</sup>	N/A <sup>1</sup>	N/A <sup>1</sup>
P-1	STB	570347.625	2004358.752	33.40093440	-80.98571609	205.0
P-2	STB	570437.053	2004477.554	33.40118016	-80.98532672	203.2
P-3	STB	570543.127	2004583.025	33.40147168	-80.98498104	201.9
P-4	STB	570732.200	2004818.111	33.40199128	-80.98421055	201.5
P-5	STB	570835.534	2004927.144	33.40227527	-80.98385318	203.8
P-6	STB	570914.751	2005053.639	33.40249296	-80.98343860	206.0

<sup>1</sup>Composite Bulk Soil Sample BS-1 was created from upper six (6) feet of auger cuttings collected within Soil Test Borings P-1 through P-6.

## 3. LABORATORY TESTING SUMMARY

Following completion of FME's field exploration, draft boring logs were generated and reviewed internally by FME. Based on the data represented in these logs, FME was authorized to designate soil samples for laboratory testing on behalf of the SCDOT. 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 4A and 4C within the Appendix of this report.

Table 4 – Laboratory Testing Summary Table – Soil Test Boring (Split-Spoon) Samples

Type of Test	Quantity	Procedure
Moisture Content	12	AASHTO T265 (ASTM D2216)
Atterberg Limits	12	AASHTO T89/T90 (ASTM D4318)
Hydrometer and Grain Size	6	ASTM D6913/AASHTO T11 (ASDM D1140)
Grain-Size Distribution w/ Wash 200	6	AASHTO D6913/AASHTO T11 (ASTM D1140)
pH	2	AASHTO T289 (ASTM G51)
Soil Sulfate Content	2	AASHTO T290 (ASTM C1580)
Soil Chloride Content	2	AASHTO T291
Soil Resistivity	2	AASHTO T288

The laboratory testing performed for the Bulk Soil samples are summarized in the table below. Data sheets containing the results from this testing are provided in Section 4B of the Appendix attached to this report.

**Table 5 – Laboratory Testing Summary Table – Bulk Soil Sample**

Type of Test	Quantity	Procedure
Moisture Content	1	AASHTO T265 (ASTM D2216)
Atterberg Limits	1	AASHTO T89/T90 (ASTM D4318)
Grain-size Distribution w/ Wash 200	1	ASTM D6913/AASHTO T11 (ASTM D1140)
Standard Proctor	1	AASHTO T99 (ASTM D698)
California Bearing Ratio Test	1	AASHTO T193

# **S-38-634 over Cooper Swamp**

## **Geotechnical Subsurface Data Report**

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### **APPENDIX**

<b>SECTION 1</b>	<b>SITE LOCATION PLAN</b>
<b>SECTION 2</b>	<b>BORING LOCATION PLAN</b>
<b>SECTION 3</b>	<b>SUBSURFACE EXPLORATION LOGS</b>
<b>SECTION 3A</b>	<b>SOIL TEST BORING (STB) LOGS</b>
<b>SECTION 3B</b>	<b>BULK SOIL SAMPLE (BS) LOGS</b>
<b>SECTION 4</b>	<b>LABORATORY TEST RESULTS</b>
<b>SECTION 4A</b>	<b>SPLIT SPOON SAMPLES (SS)</b>
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<b>SECTION 4C</b>	<b>CORROSION SERIES TESTING</b>
<b>SECTION 5</b>	<b>ON-SITE DRILL RIG PHOTOS</b>
<b>SECTION 6</b>	<b>PAVEMENT CORE PHOTOS</b>
<b>SECTION 7</b>	<b>SPT HAMMER CALIBRATION</b>
<b>SECTION 8</b>	<b>GEOSCOPING FORM</b>

# **S-38-634 over Cooper Swamp**

## **Geotechnical Subsurface Data Report**

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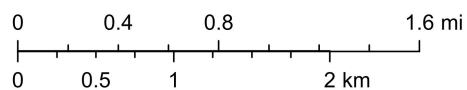
# **APPENDIX**

## **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 2.7.25	GROUP -- --
R/W		DATE	

S-38-634 OVER COOPER SWAMP  
ORANGEBURG COUNTY, SOUTH CAROLINA

SITE LOCATION PLAN

SCDOT PROJECT ID: P044270

FME JOB NO. G7100.009 Task 004

SCALE: AS NOTED

FIGURE 1

# **S-38-634 over Cooper Swamp**

## **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	570605.760	2004674.830	33.40164380	-80.98468015	201.7	100.0
B-2	STB	570669.283	2004724.291	33.40181839	-80.98451804	201.6	100.0
P-1 <sup>1</sup>	STB	570347.625	2004358.752	33.40093440	-80.98571609	205.0	6.0
P-2 <sup>1</sup>	STB	570437.053	2004477.554	33.40118016	-80.98532672	203.2	6.0
P-3 <sup>1</sup>	STB	570543.127	2004583.025	33.40147168	-80.98498104	201.9	6.0
P-4 <sup>1</sup>	STB	570732.200	2004818.111	33.40199128	-80.98421055	201.5	6.0
P-5 <sup>1</sup>	STB	570835.534	2004927.144	33.40227527	-80.98385318	203.8	6.0
P-6 <sup>1</sup>	STB	570914.751	2005053.639	33.40249296	-80.98343860	206.0	6.0
1 = Bulk Soil Sample BS-1 was a composite sample created from the upper 6-ft. of auger cuttings from the specified boreholes							



LEGEND:



SOIL TEST BORING LOCATION

4			
3			
2			
1			
REV.	BY	DATE	DESCRIPTION OF REVISION
TOPO.		DATE	
DWG.	CTC	DATE 2.7.25	GROUP ____ - ____
R/W		DATE	



F&ME CONSULTANTS, INC.  
COLUMBIA, SC

S-38-634 OVER COOPER SWAMP  
ORANGEBURG COUNTY, SOUTH CAROLINA

BORING LOCATION PLAN

SCDOT PROJECT ID: P044270	FME JOB NO. G7100.009 Task 004
SCALE: 1" = 100'	FIGURE 2

# **S-38-634 over Cooper Swamp**

## **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)		SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
		SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SP	POORLY-GRADED SANDS, GRAVELLY SAND, LITTLE OR NO FINES
				SM	SILTY SANDS, SAND-SILT MIXTURES
FINE GRAINED SOILS	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
				CH	INORGANIC CLAYS OF HIGH PLASTICITY
				OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS





## Rock Description Legend

Discontinuity Type		Discontinuity Width (mm)		Amount of Infilling	
<b>F</b>	Fault	<b>W</b>	Wide (12.5 – 50)	<b>Su</b>	Surface Stain
<b>J</b>	Joint	<b>MW</b>	Moderately Wide (2.5 – 12.5)	<b>Sp</b>	Spotty
<b>Sh</b>	Shear	<b>N</b>	Narrow (1.25 – 2.5)	<b>Pa</b>	Partially Filled
<b>Fo</b>	Foliation	<b>VN</b>	Very Narrow (<1.25)	<b>FI</b>	Filled
<b>V</b>	Vein	<b>T</b>	Tight	<b>No</b>	None
<b>B</b>	Bedding				

Type of Infilling		Surface Shape of Joint		Discontinuity Spacing (ft)	
<b>Cl</b>	Clay	<b>Wa</b>	Wave	<b>EW</b>	Extremely Wide (>65)
<b>Ca</b>	Calcite	<b>Pl</b>	Planar	<b>W</b>	Wide (22 – 65)
<b>Ch</b>	Chloride	<b>St</b>	Stepped	<b>M</b>	Moderate (7.5 – 22)
<b>Fe</b>	Iron Oxide	<b>Ir</b>	Irregular	<b>C</b>	Close (2 – 7.5)
<b>Gy</b>	Gypsum/Talc			<b>VC</b>	Very Close (<2)
<b>H</b>	Healed				
<b>No</b>	None				
<b>Py</b>	Pyrite				
<b>Qz</b>	Quartz				
<b>Sd</b>	Sand				

Roughness of Surface	
<b>Slk</b>	Slickensided (Surface has smooth, glassy finish with visual evidence of striations)
<b>S</b>	Smooth (Surface appears smooth and feels smooth to touch)
<b>SR</b>	Slightly Rough (Asperities on the discontinuity surfaces are distinguishable and can be felt)
<b>R</b>	Rough (some ridges and side-angle steps are evident; asperities are clearly visible, and discontinuity surface feels very abrasive)
<b>VE</b>	Very Rough (Near vertical steps and ridges occur on the discontinuity Surface)



# **S-38-634 over Cooper Swamp**

## **Geotechnical Subsurface Data Report**

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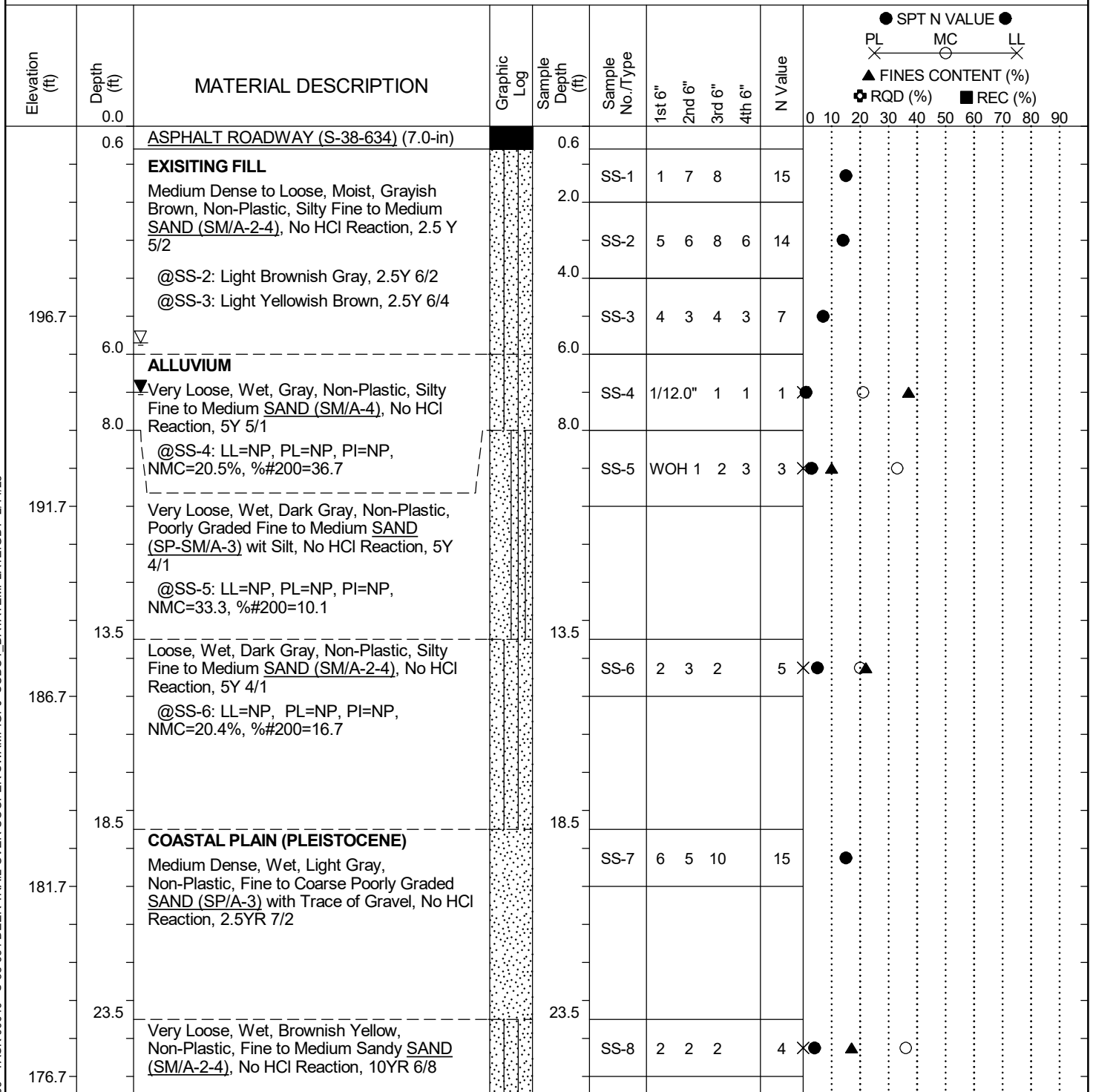
# **APPENDIX**

## **SECTION 3      SUBSURFACE EXPLORATION LOGS**

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

# SCDOT Soil Test Log

<b>Project ID:</b>	P044270	<b>County:</b>	Orangeburg	<b>Boring No.:</b>	B-1
<b>Site Description:</b>	S-38-634 over Cooper Swamp			<b>Route:</b>	S-38-634
<b>Eng./Geo.:</b>	G. Cantele	<b>Boring Location:</b>	N/A	<b>Offset:</b>	N/A
<b>Elev.:</b>	201.7 ft	<b>Latitude:</b>	33.4016438	<b>Longitude:</b>	-80.98468015
<b>Date Started:</b>	1/23/2025				
<b>Total Depth:</b>	100 ft	<b>Soil Depth:</b>	100 ft	<b>Core Depth:</b>	N/A ft
<b>Date Completed:</b>	1/28/2025				
<b>Bore Hole Diameter (in):</b>	4	<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>	RW	<b>Hammer Type:</b>	Automatic
<b>Energy Ratio:</b>	89.8%				
<b>Core Size:</b>	N/A	<b>Driller:</b>	L. Guempel	<b>Groundwater:</b>	TOB 5.7 ft
<b>24HR</b>	7 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: P044270				County: Orangeburg		Boring No.: B-1		
Site Description:		S-38-634 over Cooper Swamp					Route: S-38-634	
Eng./Geo.: G. Cantele		Boring Location: N/A			Offset: N/A		Alignment: Existing	
Elev.: 201.7 ft		Latitude: 33.4016438		Longitude: -80.98468015		Date Started: 1/23/2025		
Total Depth: 100 ft		Soil Depth: 100 ft		Core Depth: N/A ft		Date Completed: 1/28/2025		
Bore Hole Diameter (in): 4		Sampler Configuration			Liner Required: Y (N)		Liner Used: Y (N)	
Drill Machine: CME 550X		Drill Method: RW		Hammer Type: Automatic		Energy Ratio: 89.8%		
Core Size: N/A		Driller: L. Guempel		Groundwater: TOB 5.7 ft		24HR 7 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 X LL X  ▲ FINES CONTENT (%)  ⊕ RQD (%) ■ REC (%) </div>
	28.5	@SS-8: LL=NP, PL=NP, PI=NP, NMC=35.8%, %200=14.7									
171.7		<b>SANTEE LIMESTONE FORMATION (EOCENE)</b>		28.5	SS-9	2	3	3		6	●
		Loose to Medium Dense, Moist to Wet, White, Low Plasticity, Silty Clayey Fine SAND (SC-SM/A-2-4) with Trace of Gravel, Strong HCl Reaction, 5Y 8/1									
166.7		@SS-10: Light Greenish Gray, 10Y 8/1 LL=22, PL=16, PI=6, NMC=26.4%, %200=33.5		33.5	SS-10	3	3	4		7	● X X X ▲
		@SS-11: Light Gray, Cemented Gravel Present, 5Y 7/1		38.5	SS-11	3	6	7		13	●
156.7		@SS-12: Light Greenish Gray, 10GY 7/1		43.5	SS-12	4	6	9		15	●
151.7		@SS-13: Greenish Gray, with Trace Shells, 5Y 6/1 LL=21, PL=16, PI=5, NMC=33.6%, %200=31.3		48.5	SS-13	3	3	5		8	● X X X ▲

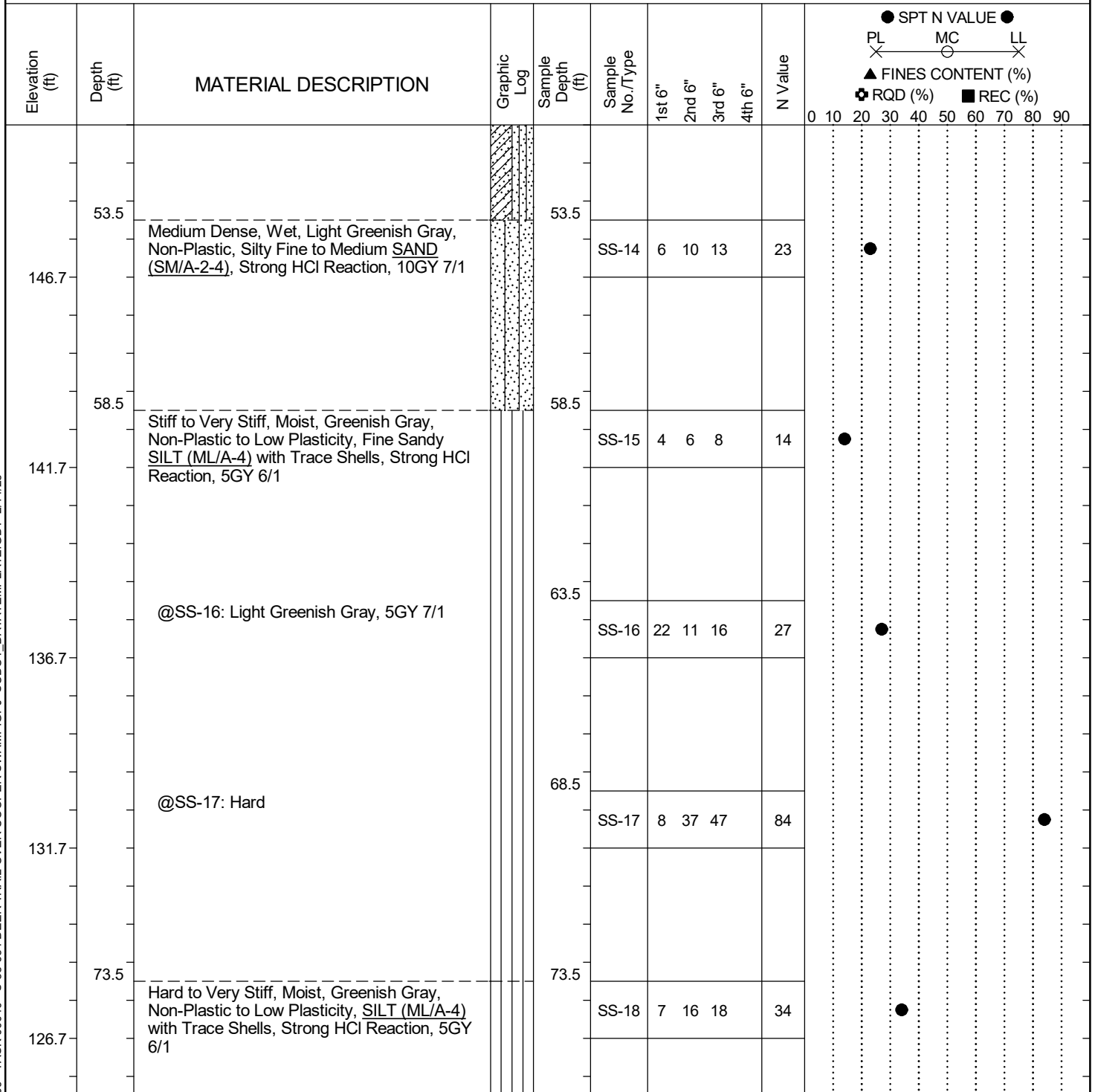
## LEGEND

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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>	P044270	<b>County:</b>	Orangeburg	<b>Boring No.:</b>	B-1
<b>Site Description:</b>	S-38-634 over Cooper Swamp			<b>Route:</b>	S-38-634
<b>Eng./Geo.:</b>	G. Cantele	<b>Boring Location:</b>	N/A	<b>Offset:</b>	N/A
<b>Elev.:</b>	201.7 ft	<b>Latitude:</b>	33.4016438	<b>Longitude:</b>	-80.98468015
<b>Date Started:</b>	1/23/2025				
<b>Total Depth:</b>	100 ft	<b>Soil Depth:</b>	100 ft	<b>Core Depth:</b>	N/A ft
<b>Date Completed:</b>	1/28/2025				
<b>Bore Hole Diameter (in):</b>	4	<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>	RW	<b>Hammer Type:</b>	Automatic
<b>Energy Ratio:</b>	89.8%				
<b>Core Size:</b>	N/A	<b>Driller:</b>	L. Guempel	<b>Groundwater:</b>	TOB 5.7 ft
<b>24HR</b>	7 ft				



## LEGEND

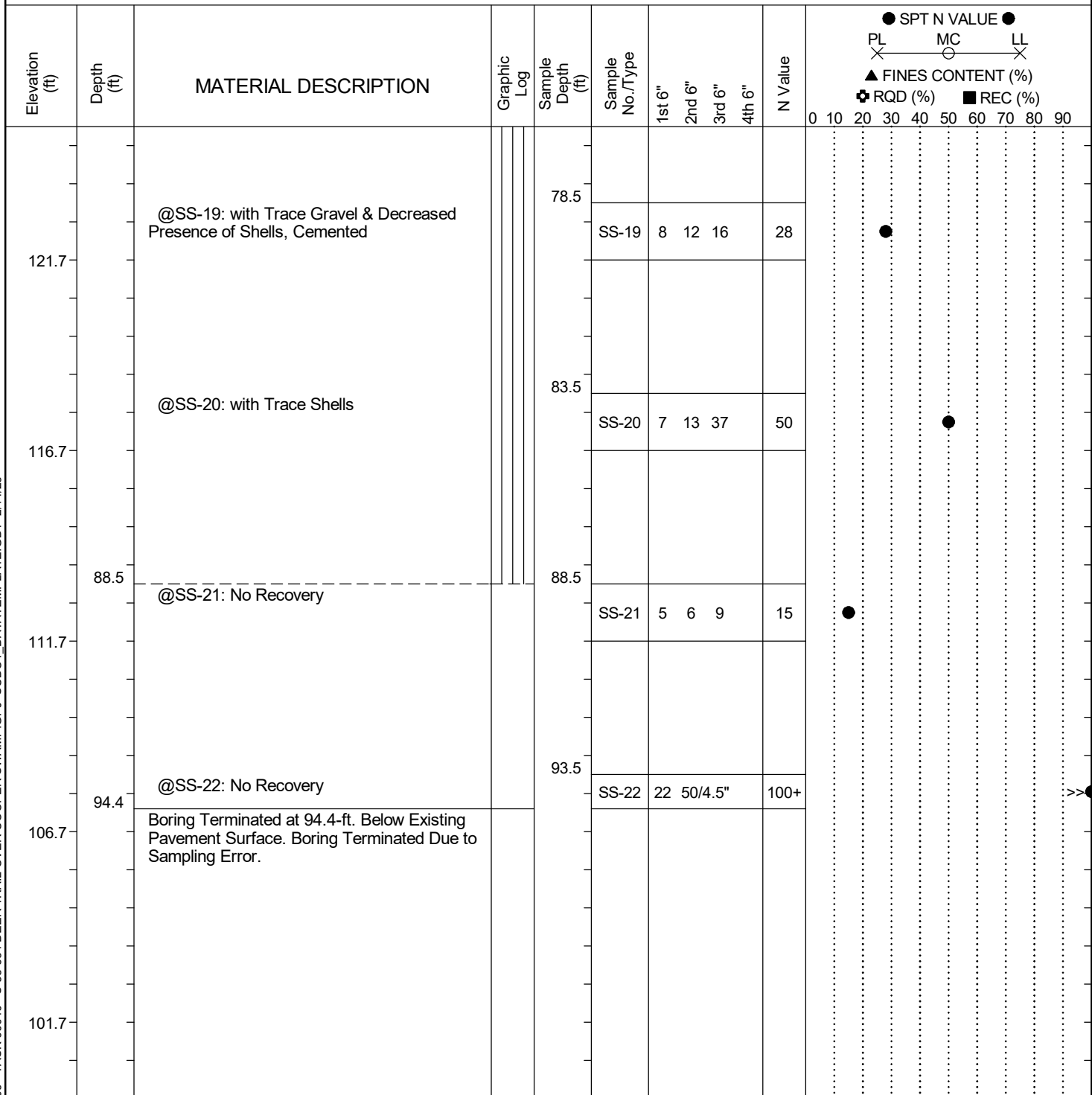
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SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving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



# SCDOT Soil Test Log

Project ID: P044270				County: Orangeburg		Boring No.: B-1		
Site Description:		S-38-634 over Cooper Swamp					Route: S-38-634	
Eng./Geo.: G. Cantele		Boring Location: N/A			Offset: N/A		Alignment: Existing	
Elev.: 201.7 ft		Latitude: 33.4016438		Longitude: -80.98468015		Date Started: 1/23/2025		
Total Depth: 100 ft		Soil Depth: 100 ft		Core Depth: N/A ft		Date Completed: 1/28/2025		
Bore Hole Diameter (in): 4		Sampler Configuration			Liner Required: Y (N)		Liner Used: Y (N)	
Drill Machine: CME 550X		Drill Method: RW		Hammer Type: Automatic		Energy Ratio: 89.8%		
Core Size: N/A		Driller: L. Guempel		Groundwater: TOB 5.7 ft		24HR 7 ft		

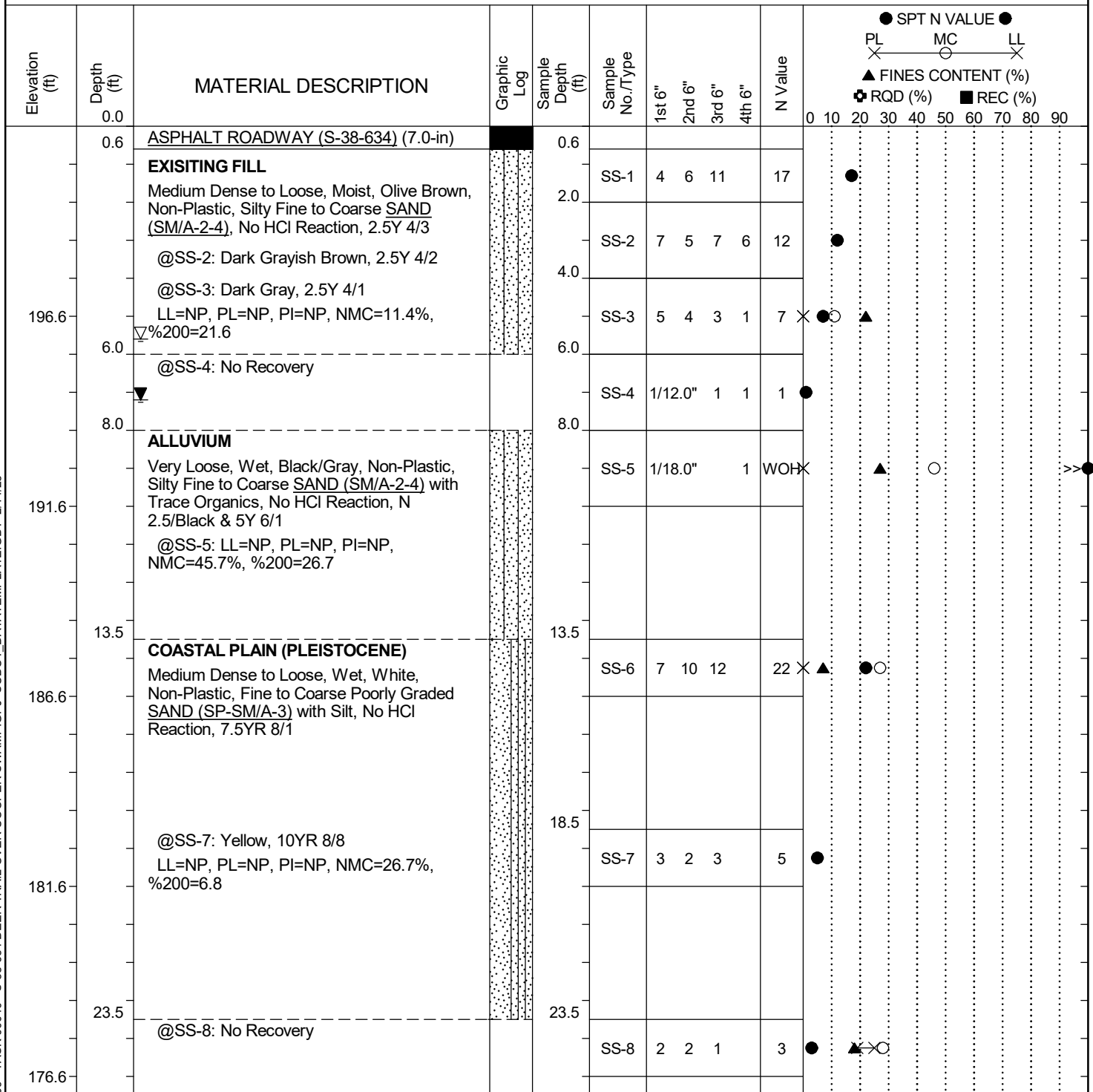


## LEGEND

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

# SCDOT Soil Test Log

<b>Project ID:</b>	P044270	<b>County:</b>	Orangeburg	<b>Boring No.:</b>	B-2
<b>Site Description:</b>	S-38-634 over Cooper Swamp			<b>Route:</b>	S-38-634
<b>Eng./Geo.:</b>	G. Cantele	<b>Boring Location:</b>	N/A	<b>Offset:</b>	N/A
<b>Elev.:</b>	201.6 ft	<b>Latitude:</b>	33.40181839	<b>Longitude:</b>	-80.98451804
<b>Date Started:</b>	1/28/2025				
<b>Total Depth:</b>	100 ft	<b>Soil Depth:</b>	100 ft	<b>Core Depth:</b>	N/A ft
<b>Date Completed:</b>	1/29/2025				
<b>Bore Hole Diameter (in):</b>	4	<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>	RW	<b>Hammer Type:</b>	Automatic
<b>Energy Ratio:</b>	89.8%				
<b>Core Size:</b>	N/A	<b>Driller:</b>	L. Guempel	<b>Groundwater:</b>	TOB 5.6 ft
<b>24HR:</b>	7.2 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: P044270				County: Orangeburg		Boring No.: B-2		
Site Description:		S-38-634 over Cooper Swamp					Route: S-38-634	
Eng./Geo.: G. Cantele		Boring Location: N/A		Offset: N/A		Alignment: Existing		
Elev.: 201.6 ft		Latitude: 33.40181839		Longitude: -80.98451804		Date Started: 1/28/2025		
Total Depth: 100 ft		Soil Depth: 100 ft		Core Depth: N/A ft		Date Completed: 1/29/2025		
Bore Hole Diameter (in): 4		Sampler Configuration		Liner Required: Y (N)		Liner Used: Y (N)		
Drill Machine: CME 550X		Drill Method: RW		Hammer Type: Automatic		Energy Ratio: 89.8%		
Core Size: N/A		Driller: L. Guempel		Groundwater: TOB 5.6 ft		24HR 7.2 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 LL X  ▲ FINES CONTENT (%)  ⊕ RQD (%) ■ REC (%) </div>
171.6	28.5	<b>SANTEE LIMESTONE FORMATION (EOCENE)</b> Loose, Moist, Pale Yellow, Low Plasticity, Silty Clayey Fine to Coarse SAND (SC-SM/A-2-4) with Gravel & Shells, Calcareous, Strong HCl Reaction, 5Y 7/4 @SS-9: LL=25, PL=19, PI=6, NMC=27.7%, %200=17.9 @SS-10: Pale Yellow, 5Y 8/4		28.5	SS-9	1	3	3		6	●
166.6	33.5			33.5	SS-10	1	3	3		6	● X X ○ ▲
161.6	38.5	@SS-11: LL=18, PL=13, PI=5, NMC=26.7%, %200=42.1		38.5	SS-11	3	5	5		10	●
156.6	43.5	@SS-12: No Recovery		43.5	SS-12	3	3	4		7	●
151.6	48.5	@SS-13: No Recovery		48.5	SS-13	1	1	3		4	●

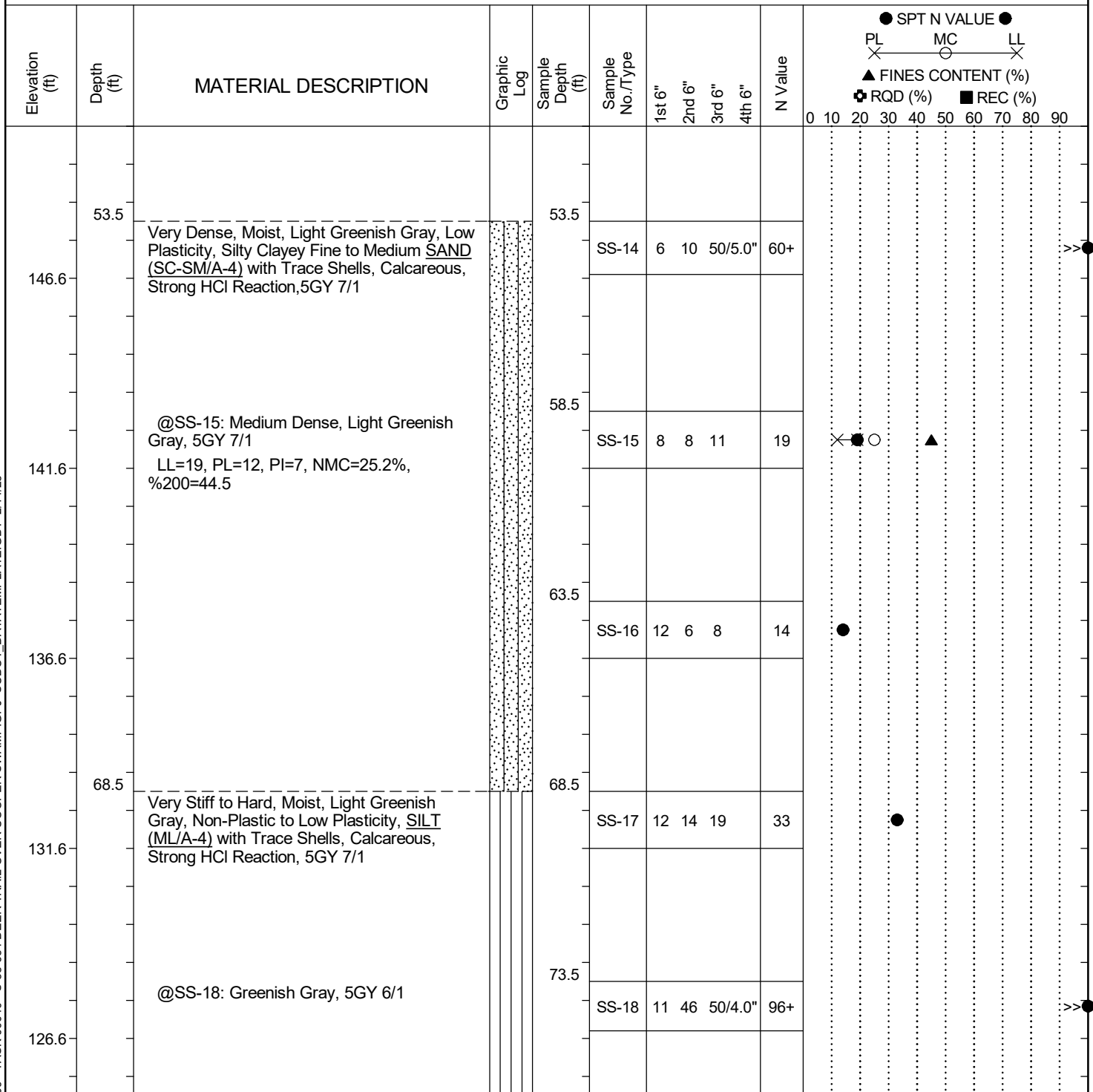
## LEGEND

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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: P044270				County: Orangeburg		Boring No.: B-2		
Site Description:		S-38-634 over Cooper Swamp					Route: S-38-634	
Eng./Geo.: G. Cantele		Boring Location: N/A		Offset: N/A		Alignment: Existing		
Elev.: 201.6 ft		Latitude: 33.40181839		Longitude: -80.98451804		Date Started: 1/28/2025		
Total Depth: 100 ft		Soil Depth: 100 ft		Core Depth: N/A ft		Date Completed: 1/29/2025		
Bore Hole Diameter (in): 4		Sampler Configuration		Liner Required: Y (N)		Liner Used: Y (N)		
Drill Machine: CME 550X		Drill Method: RW		Hammer Type: Automatic		Energy Ratio: 89.8%		
Core Size: N/A		Driller: L. Guempel		Groundwater: TOB 5.6 ft		24HR 7.2 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	

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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>	P044270	<b>County:</b>	Orangeburg	<b>Boring No.:</b>	P-1
<b>Site Description:</b>	S-38-634 over Cooper Swamp			<b>Route:</b>	S-38-634
<b>Eng./Geo.:</b>	G. Cantele	<b>Boring Location:</b>	N/A	<b>Offset:</b>	N/A
<b>Elev.:</b>	205.0 ft	<b>Latitude:</b>	33.4009344	<b>Longitude:</b>	-80.98571609
<b>Date Started:</b>	1/23/2025				
<b>Total Depth:</b>	6 ft	<b>Soil Depth:</b>	6 ft	<b>Core Depth:</b>	N/A ft
<b>Date Completed:</b>	1/23/2025				
<b>Bore Hole Diameter (in):</b>	4	<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>	RW	<b>Hammer Type:</b>	Automatic
<b>Energy Ratio:</b>	89.8%				
<b>Core Size:</b>	N/A	<b>Driller:</b>	L. Guempel	<b>Groundwater:</b>	TOB 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> PL X      MC ○      LL X </div> <div> ▲ FINES CONTENT (%) </div> <div> ⊕ RQD (%)      ■ REC (%) </div> </div>
	0.0										0 10 20 30 40 50 60 70 80 90
	0.2	ASPHALT ROADWAY (S-38-634) (2.0-in)		0.2							
		Loose to Medium Dense, Dry to Moist, Yellowish Brown, Non-Plastic to Low Plasticity, Silty Medium to Coarse SAND (SM/A-2-4), No HCl Reaction, 10YR 5/8			SS-1	9	4	5		9	●
	2.0	Firm, Dry to Moist, Brownish Yellow, Non-Plastic to Low Plasticity, Medium to Coarse Sandy SILT (ML/A-4), No HCl Reaction, 10YR 6/6		2.0	SS-2	3	3	3	5	6	●
	4.0	Medium Dense, Dry to Moist, Red/Brownish Yellow, Non-Plastic to Low Plasticity, Silty Fine to Coarse SAND (SM/A-2-4), No HCl reaction, 2.5YR 4/8 & 10YR 6/6		4.0	SS-3	4	6	11	18	17	●
200.0	6.0	Boring Terminated at 6.0-ft. Below Existing Pavement Surface. Boring Achieved Target Depth.									

## LEGEND

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

SC.DOT G7100.009 - TASK 00040 - S-38-634 DEER TRAIL OVER COOPER SWAMP.GPJ SCDOT\_DATATEMPLATE.GDT 2/14/25

# SCDOT Soil Test Log

<b>Project ID:</b>	P044270	<b>County:</b>	Orangeburg	<b>Boring No.:</b>	P-2
<b>Site Description:</b>	S-38-634 over Cooper Swamp			<b>Route:</b>	S-38-634
<b>Eng./Geo.:</b>	G. Cantele	<b>Boring Location:</b>	N/A	<b>Offset:</b>	N/A
<b>Elev.:</b>	203.2 ft	<b>Latitude:</b>	33.40118016	<b>Longitude:</b>	-80.98532672
<b>Date Started:</b>	1/23/2025				
<b>Total Depth:</b>	6 ft	<b>Soil Depth:</b>	6 ft	<b>Core Depth:</b>	N/A ft
<b>Date Completed:</b>	1/23/2025				
<b>Bore Hole Diameter (in):</b>	4	<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>	RW	<b>Hammer Type:</b>	Automatic
<b>Energy Ratio:</b>	89.8%				
<b>Core Size:</b>	N/A	<b>Driller:</b>	L. Guempel	<b>Groundwater:</b>	TOB 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> ● SPT N VALUE ●  PL X MC X LL X  ▲ FINES CONTENT (%)  + RQD (%) ■ REC (%) </div>
	0.0										0 10 20 30 40 50 60 70 80 90
	0.2	ASPHALT ROADWAY (S-38-634) (2.0-in)		0.2							
		Medium Dense, Dry to Moist, Light Olive Brown, Non-Plastic, Fine to Coarse SAND (SP/A-3), No HCl Reaction, 2.5Y5/4			SS-1	8	10	10		20	
	2.0	Loose to Medium Dense, Dry to Moist, Brownish Yellow, Non-Plastic to Low Plasticity, Silty Fine to Coarse SAND (SM/A-2-4), No HCl Reaction, 10YR 6/8		2.0	SS-2	5	3	4	6	7	
				4.0	SS-3	6	8	12	27	20	
198.2	6.0	Boring Terminated at 6.0-ft. Below Existing Pavement Surface. Boring Achieved Target Depth.									

## LEGEND

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

# SCDOT Soil Test Log

<b>Project ID:</b>	P044270	<b>County:</b>	Orangeburg	<b>Boring No.:</b>	P-3
<b>Site Description:</b>	S-38-634 over Cooper Swamp			<b>Route:</b>	S-38-634
<b>Eng./Geo.:</b>	G. Cantele	<b>Boring Location:</b>	N/A	<b>Offset:</b>	N/A
<b>Elev.:</b>	201.9 ft	<b>Latitude:</b>	33.40147168	<b>Longitude:</b>	-80.98498104
<b>Date Started:</b>	1/23/2025				
<b>Total Depth:</b>	6 ft	<b>Soil Depth:</b>	6 ft	<b>Core Depth:</b>	N/A ft
<b>Date Completed:</b>	1/23/2025				
<b>Bore Hole Diameter (in):</b>	4	<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>	RW	<b>Hammer Type:</b>	Automatic
<b>Energy Ratio:</b>	89.8%				
<b>Core Size:</b>	N/A	<b>Driller:</b>	L. Guempel	<b>Groundwater:</b>	TOB 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> PL X      MC ○      LL X </div> <div> ▲ FINES CONTENT (%) </div> <div> ⊕ RQD (%)      ■ REC (%) </div> </div>
	0.0										0 10 20 30 40 50 60 70 80 90
	0.2	ASPHALT ROADWAY (S-38-634) (1.5-in)		0.2							
		Medium Dense, Dry to Moist, Light Olive Brown, Non-Plastic, Poorly Graded Fine to Medium SAND (SP/A-3), No HCl Reaction, 2.5Y 5/3			SS-1	4	11	15	12	26	
	2.0	Medium Dense, Dry to Moist, Light Olive Brown, Non-Plastic to Low Plasticity, Silty Fine to Medium SAND (SM/A-2-4), No HCl Reaction, 2.5Y 5/3		2.0							
					SS-2	7	4	8	9	12	
		@SS-3: Dark Gray, 2.5Y 4/1		4.0							
					SS-3	6	6	7	6	13	
196.9	6.0	Boring Terminated at 6.0-ft. Below Existing Pavement Surface. Boring Achieved Target Depth.									

## LEGEND

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

SC.DOT G7100.009 - TASK 00040 - S-38-634 DEER TRAIL OVER COOPER SWAMP.GPJ SCDOT\_DATATEMPLATE.GDT 2/14/25

# SCDOT Soil Test Log

<b>Project ID:</b>	P044270	<b>County:</b>	Orangeburg	<b>Boring No.:</b>	P-4
<b>Site Description:</b>	S-38-634 over Cooper Swamp			<b>Route:</b>	S-38-634
<b>Eng./Geo.:</b>	G. Cantele	<b>Boring Location:</b>	N/A	<b>Offset:</b>	N/A
<b>Elev.:</b>	201.5 ft	<b>Latitude:</b>	33.40199128	<b>Longitude:</b>	-80.98421055
<b>Date Started:</b>	1/28/2025				
<b>Total Depth:</b>	6 ft	<b>Soil Depth:</b>	6 ft	<b>Core Depth:</b>	N/A ft
<b>Date Completed:</b>	1/28/2025				
<b>Bore Hole Diameter (in):</b>	4	<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>	RW	<b>Hammer Type:</b>	Automatic
<b>Energy Ratio:</b>	89.8%				
<b>Core Size:</b>	N/A	<b>Driller:</b>	L. Guempel	<b>Groundwater:</b>	TOB N/A
<b>24HR</b>	Backfilled				

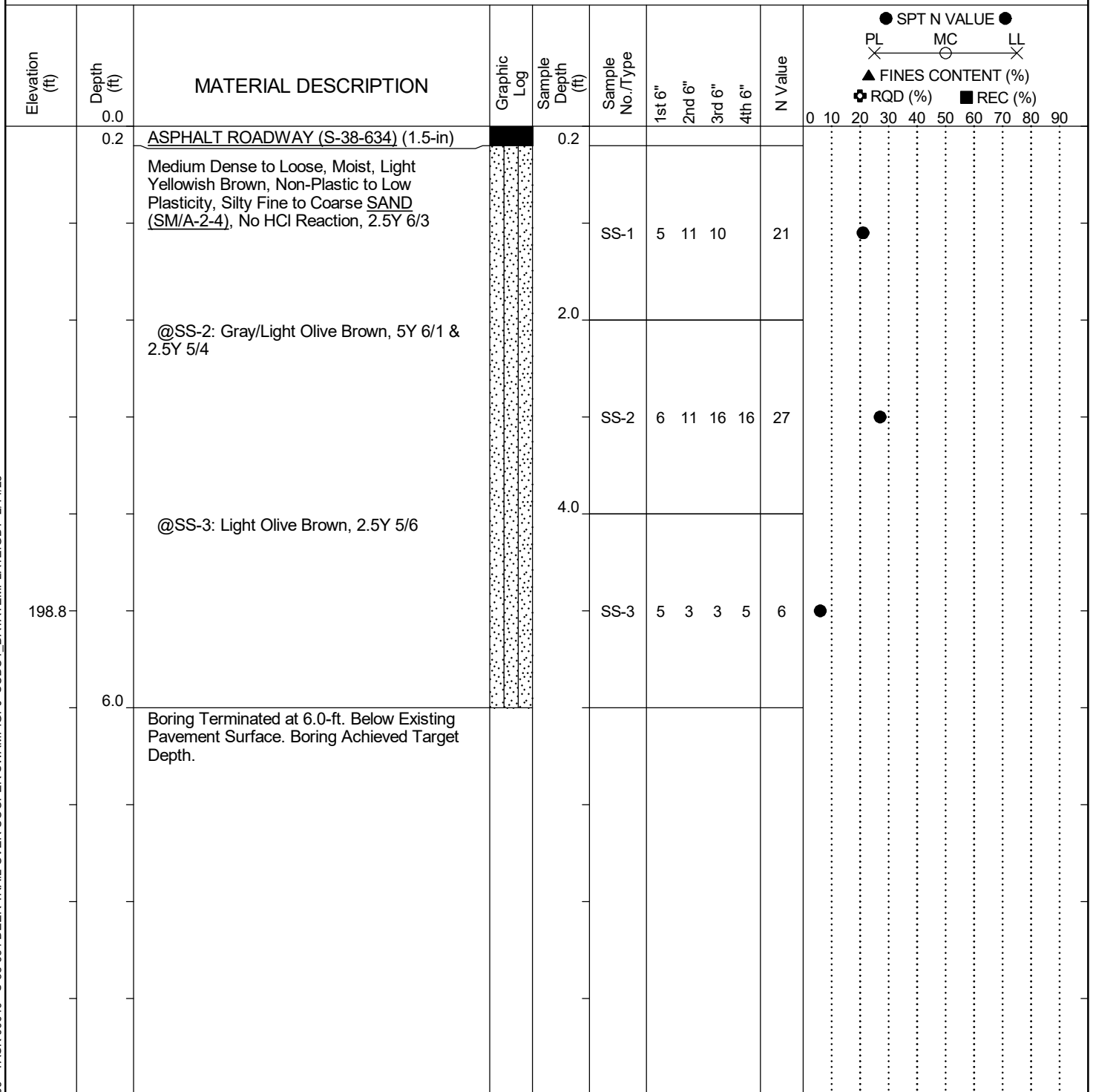
Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value	<div> ● SPT N VALUE ●  PL X — MC — LL X  ▲ FINES CONTENT (%)  ⊕ RQD (%) ■ REC (%) </div>
	0.0										0 10 20 30 40 50 60 70 80 90
	0.2	ASPHALT ROADWAY (S-38-634) (2.0-in)		0.2							
		Medium Dense, Moist, Grayish Brown, Non-Plastic to Low Plasticity, Silty Fine to Medium SAND (SM/A-2-4), No HCl Reaction, 2.5Y 5/2			SS-1	4	5	10	11	15	●
	2.0	@SS-2: Very Dark Grayish Brown, 2.5Y 3/2									
					SS-2	8	4	7	7	11	●
	4.0	@SS-3: Dark Grayish Brown, 2.5Y 4/2									
					SS-3	6	7	5	4	12	●
196.5	6.0	Boring Terminated at 6.0-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

<b>Project ID:</b>	P044270	<b>County:</b>	Orangeburg	<b>Boring No.:</b>	P-5
<b>Site Description:</b>	S-38-634 over Cooper Swamp			<b>Route:</b>	S-38-634
<b>Eng./Geo.:</b>	G. Cantele	<b>Boring Location:</b>	N/A	<b>Offset:</b>	N/A
<b>Elev.:</b>	203.8 ft	<b>Latitude:</b>	33.40227527	<b>Longitude:</b>	-80.98385318
<b>Date Started:</b>	1/28/2025				
<b>Total Depth:</b>	6 ft	<b>Soil Depth:</b>	6 ft	<b>Core Depth:</b>	N/A ft
<b>Date Completed:</b>	1/28/2025				
<b>Bore Hole Diameter (in):</b>	4	<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>	RW	<b>Hammer Type:</b>	Automatic
<b>Energy Ratio:</b>	89.8%				
<b>Core Size:</b>	N/A	<b>Driller:</b>	L. Guempel	<b>Groundwater:</b>	TOB N/A
<b>24HR</b>	Backfilled				



## 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>	P044270	<b>County:</b>	Orangeburg	<b>Boring No.:</b>	P-6
<b>Site Description:</b>	S-38-634 over Cooper Swamp			<b>Route:</b>	S-38-634
<b>Eng./Geo.:</b>	G. Cantele	<b>Boring Location:</b>	N/A	<b>Offset:</b>	N/A
<b>Elev.:</b>	206.0 ft	<b>Latitude:</b>	33.40249296	<b>Longitude:</b>	-80.9834386
<b>Date Started:</b>	1/28/2025				
<b>Total Depth:</b>	6 ft	<b>Soil Depth:</b>	6 ft	<b>Core Depth:</b>	N/A ft
<b>Date Completed:</b>	1/28/2025				
<b>Bore Hole Diameter (in):</b>	4	<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>	RW	<b>Hammer Type:</b>	Automatic
<b>Energy Ratio:</b>	89.8%				
<b>Core Size:</b>	N/A	<b>Driller:</b>	L. Guempel	<b>Groundwater:</b>	TOB 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> PL X      MC ○      LL X </div> <div> ▲ FINES CONTENT (%) </div> <div> ⊕ RQD (%)      ■ REC (%) </div> </div>
	0.0										0 10 20 30 40 50 60 70 80 90
	0.3	ASPHALT ROADWAY (S-38-634) (2.0-in)		0.3							
		Loose, Moist, Yellowish Brown, Non-Plastic to Low Plasticity, Silty Fine to Coarse SAND (SM/A-2-4), No HCl Reaction, 10YR 5/6			SS-1	6	4	5		9	
	2.0	Stiff, Moist, Yellowish Brown, Non-Plastic to Low Plasticity, Fine to Coarse Sandy SILT (ML) with Trace Gravel, No HCl Reaction, 10YR 5/6		2.0	SS-2	4	6	8	12	14	
		@SS-3: Hard, Brownish Yellow/Pale Brown, 10YR 6/6 & 2.5Y 7/3		4.0	SS-3	14	15	25	31	40	
201.0	6.0	Boring Terminated at 6.0-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	

# **S-38-634 over Cooper Swamp**

## **Geotechnical Subsurface Data Report**

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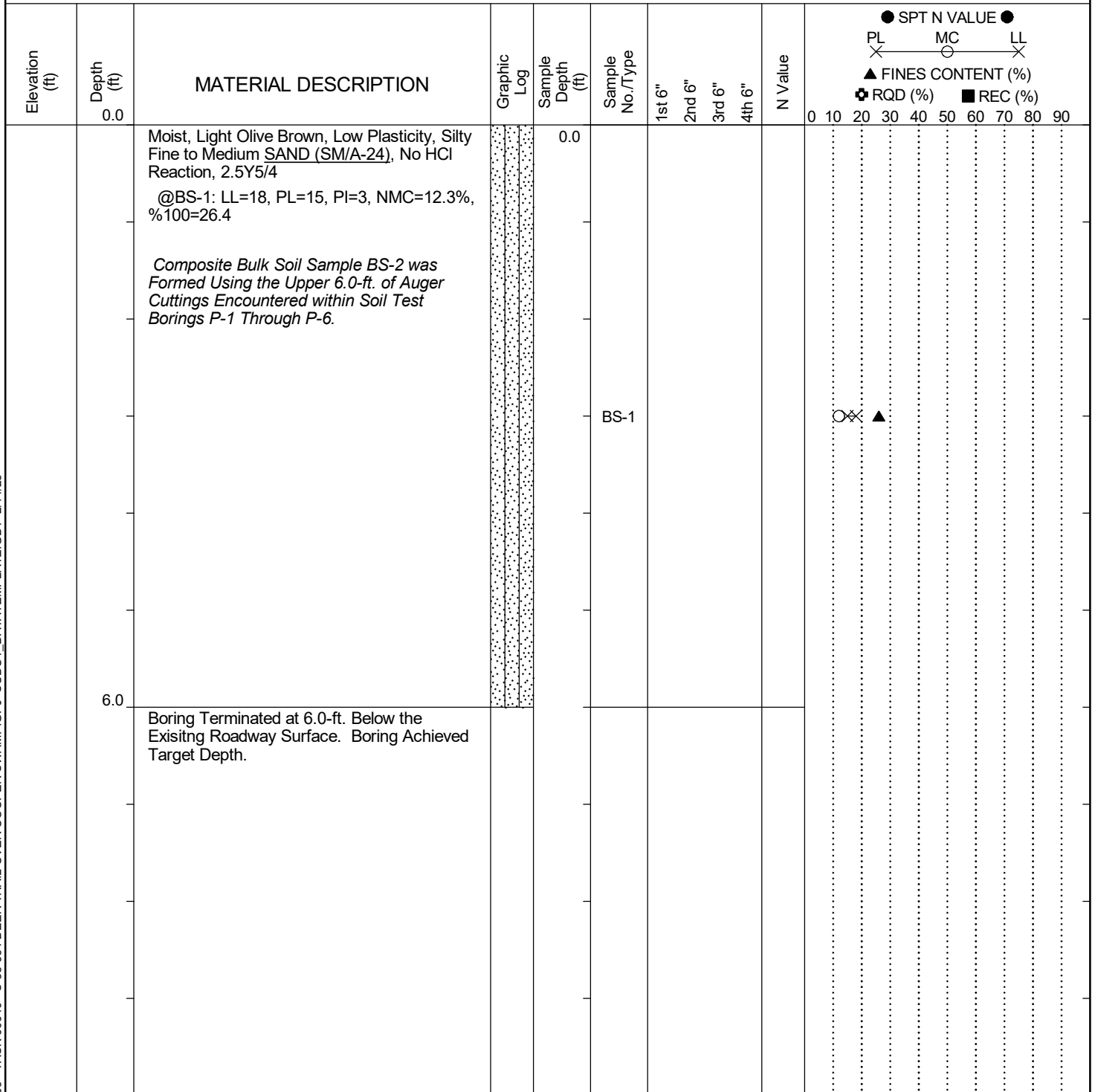
# **APPENDIX**

## **SECTION 3          SUBSURFACE EXPLORATION LOGS**

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

# SCDOT Soil Test Log

<b>Project ID:</b> P044270		<b>County:</b> Orangeburg		<b>Boring No.:</b> BS-1	
<b>Site Description:</b> S-38-634 over Cooper Swamp				<b>Route:</b> S-38-634	
<b>Eng./Geo.:</b> T. Peterson		<b>Boring Location:</b> N/A		<b>Offset:</b> N/A	
<b>Elev.:</b> N/A ft		<b>Latitude:</b> 0		<b>Longitude:</b> 0	
<b>Total Depth:</b> 6 ft		<b>Soil Depth:</b> 6 ft		<b>Core Depth:</b> N/A ft	
<b>Date Started:</b> 1/23/2025		<b>Date Completed:</b> 1/23/2025			
<b>Bore Hole Diameter (in):</b> 4		<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> RW		<b>Hammer Type:</b> Automatic	
<b>Energy Ratio:</b> 89.8%					
<b>Core Size:</b> N/A		<b>Driller:</b> L. Guempel		<b>Groundwater:</b> TOB N/A	
<b>24HR</b>		<b>Backfilled</b>			



## 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	



# **S-38-634 over Cooper Swamp**

## **Geotechnical Subsurface Data Report**

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# **APPENDIX**

## **SECTION 4      LABORATORY TEST RESULTS**

# **S-38-634 over Cooper Swamp**

## **Geotechnical Subsurface Data Report**

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# **APPENDIX**

## **SECTION 4      LABORATORY TEST RESULTS**

### **SECTION 4A      SPLIT SPOON SAMPLES (SS)**



# SUMMARY OF LABORATORY RESULTS

PAGE 1 OF 1

PROJECT ID P044270

PROJECT NAME S-38-634 over Cooper Swamp

PROJECT COUNTY Orangeburg

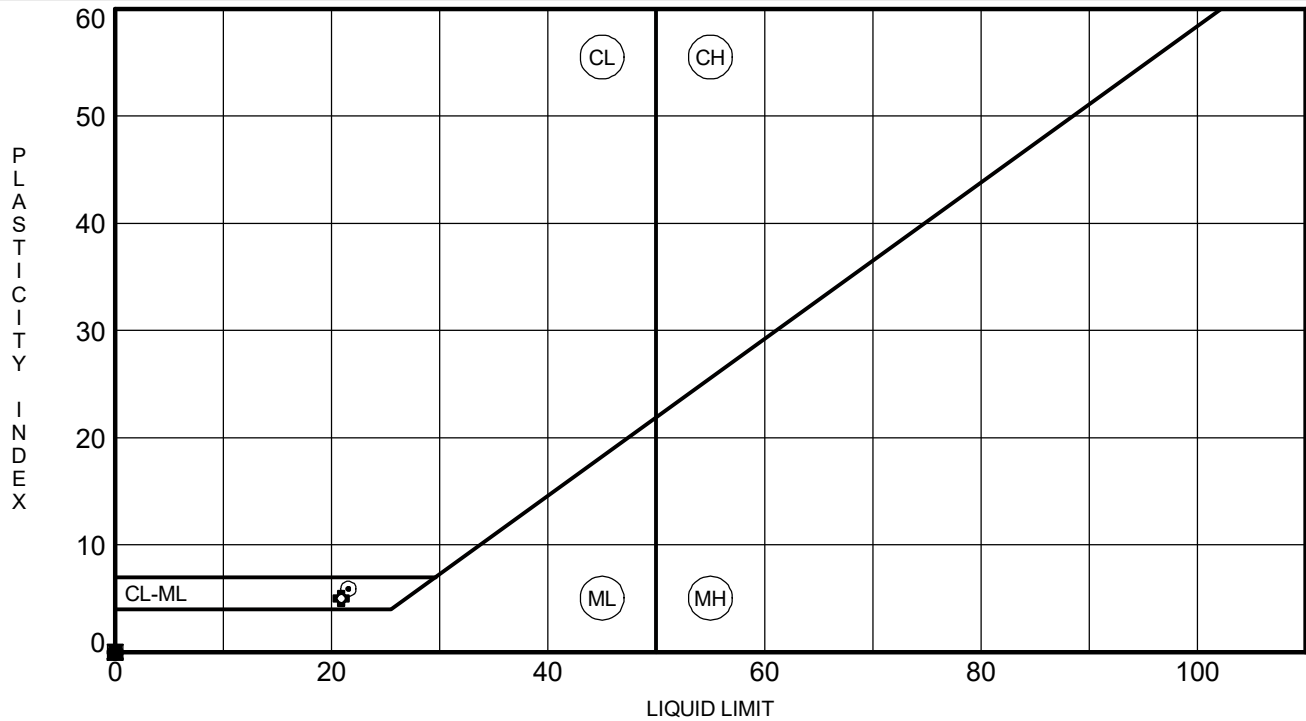
Borehole	Depth	Liquid Limit	Plastic Limit	Plasticity Index	Maximum Size (mm)	%<#200 Sieve	Classification	Water Content (%)	Dry Density (pcf)	Saturation (%)	Void Ratio
B-1	8.0	NP	NP	NP	4.76	37	SM	20.5			
B-1	10.0	NP	NP	NP	9.51	10	SP-SM	33.3			
B-1	15.0	NP	NP	NP	9.51	17	SM	20.4			
B-1	25.0	NP	NP	NP	4.76	15	SM	35.8			
B-1	35.0	22	16	6	19	33	SC-SM	26.4			
B-1	50.0	21	16	5	9.51	31	SC-SM	33.6			
B-2	6.0	NP	NP	NP	9.51	22	SM	11.4			
B-2	10.0	NP	NP	NP	9.51	27	SM	45.7			
B-2	20.0	NP	NP	NP	4.76	7	SP-SM	26.7			
B-2	30.0	25	19	6	25	18	SC-SM	27.7			
B-2	40.0	18	13	5	19	42	SC-SM	26.7			
B-2	60.0	19	12	7	9.51	45	SC-SM	25.2			

## ATTERBERG LIMITS' RESULTS

**PROJECT ID** P044270

**PROJECT NAME** S-38-634 over Cooper Swamp

**PROJECT COUNTY** Orangeburg

[illegible]

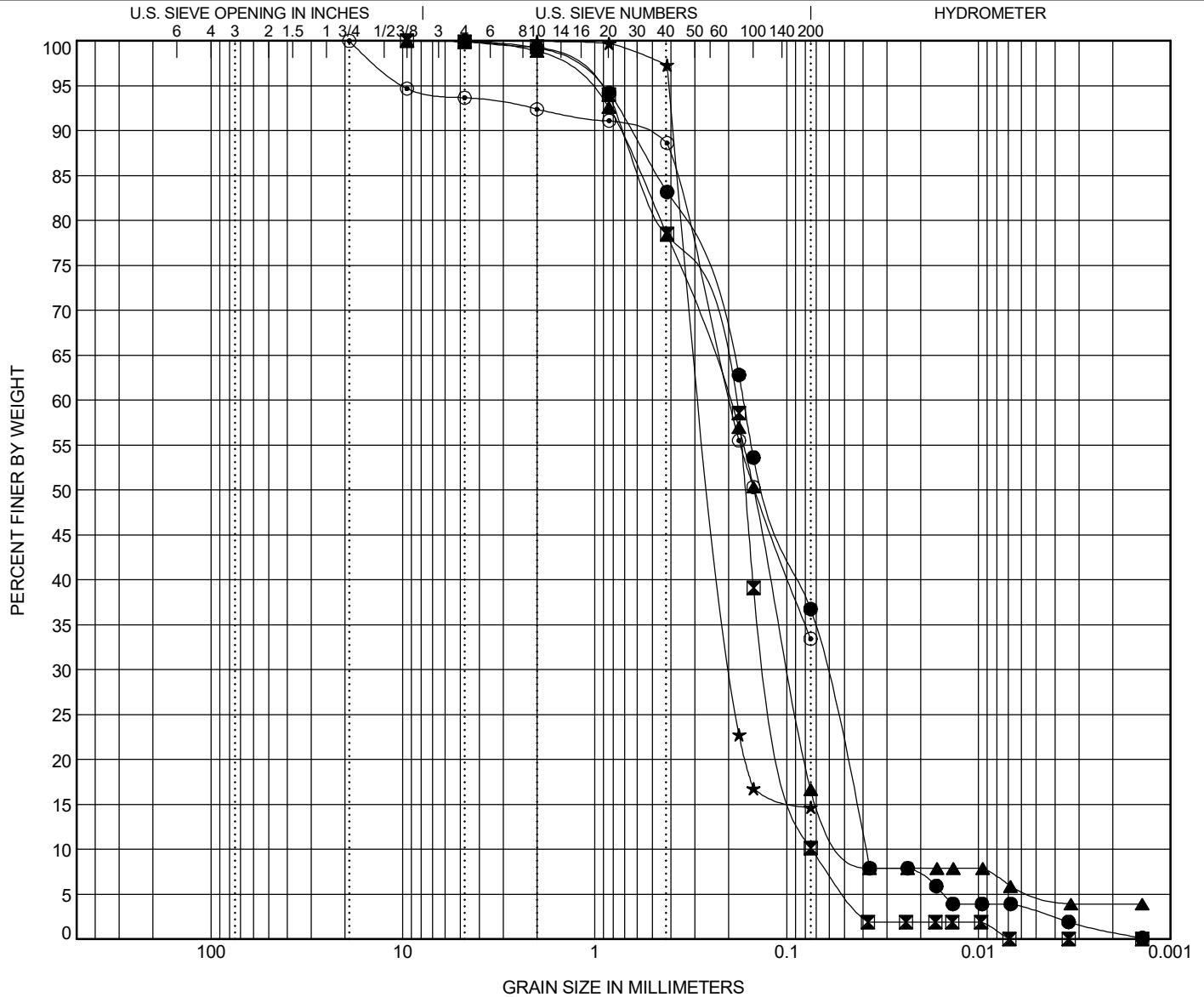


# GRAIN SIZE DISTRIBUTION

PROJECT ID P044270

PROJECT NAME S-38-634 over Cooper Swamp

PROJECT COUNTY Orangeburg



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

BOREHOLE	DEPTH	Classification					LL	PL	PI	Cc	Cu
● B-1	8.0	SILTY SAND (SM/A-4)					NP	NP	NP	0.62	4.32
☒ B-1	10.0	POORLY GRADED SAND with SILT (SP-SM/A-3)					NP	NP	NP	1.03	2.54
▲ B-1	15.0	SILTY SAND (SM/A-2-4)					NP	NP	NP	1.11	4.57
★ B-1	25.0	SILTY SAND (SM/A-2-4)					NP	NP	NP		
◎ B-1	35.0	SILTY, CLAYEY SAND (SC-SM/A-2-4)					22	16	6		
BOREHOLE	DEPTH	D90	D60	D30	D10	%Gravel	%Sand	%Silt		%Clay	
● B-1	8.0	0.645	0.168	0.064	0.039	0.0	63.2	33.7		3.0	
☒ B-1	10.0	0.703	0.188	0.12	0.074	0.1	89.8	10.1		0.0	
▲ B-1	15.0	0.741	0.2	0.098	0.044	0.1	83.3	11.6		5.1	
★ B-1	25.0	0.386	0.273	0.192		0.0	85.3	14.7			
◎ B-1	35.0	0.614	0.199			6.3	60.2	33.5			

GRAIN SIZE G7100.009 - TASK 00040 - S-38-634 DEER TRAIL OVER COOPER SWAMP.GPJ SCDOT DATA TEMPLATE\_01\_30\_2015.GDT 2/6/25

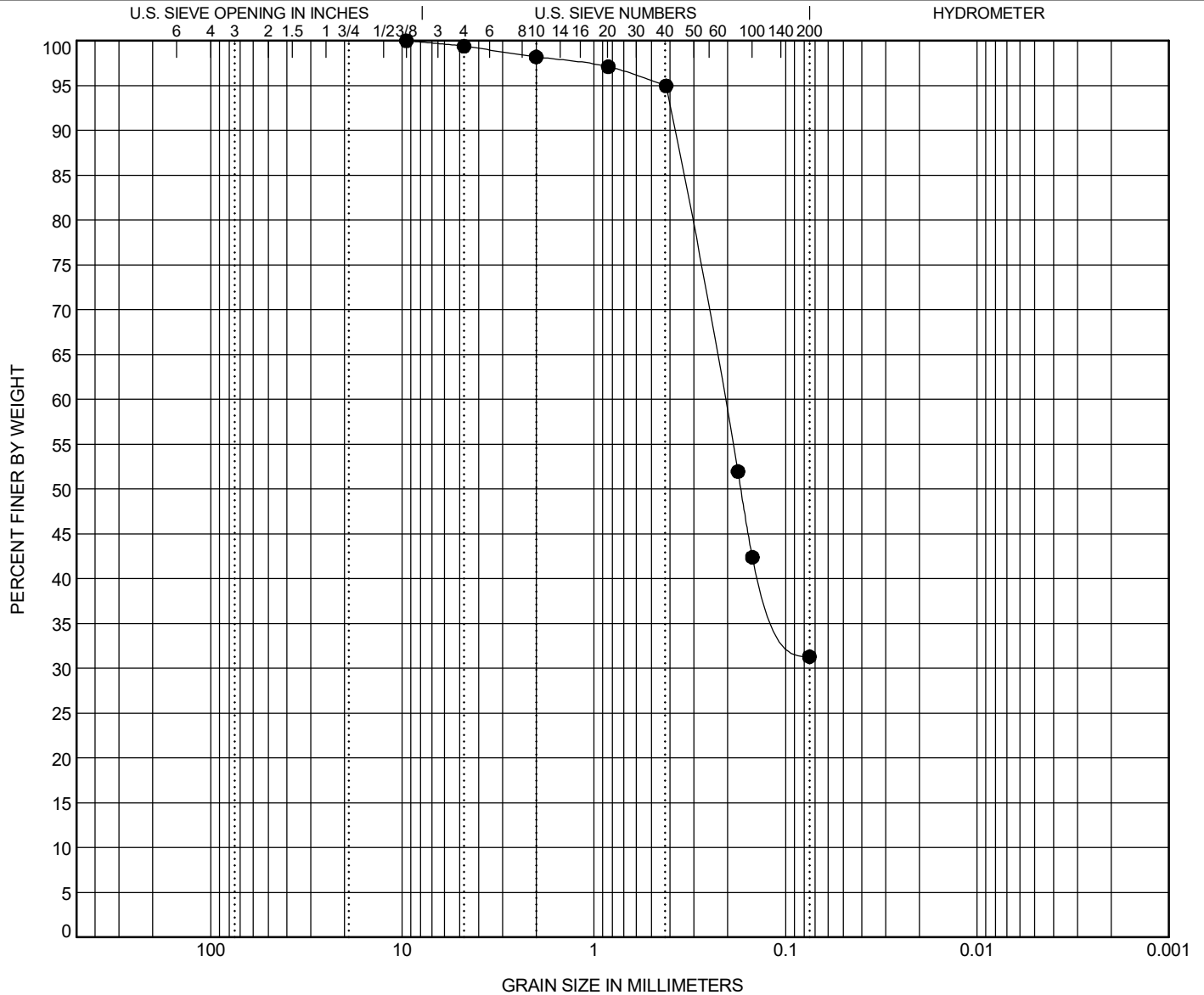


# GRAIN SIZE DISTRIBUTION

PROJECT ID P044270

PROJECT NAME S-38-634 over Cooper Swamp

PROJECT COUNTY Orangeburg



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

BOREHOLE	DEPTH	Classification					LL	PL	PI	Cc	Cu
● B-1	50.0	SILTY, CLAYEY SAND (SC-SM/A-2-4)					21	16	5		
BOREHOLE	DEPTH	D90	D60	D30	D10	%Gravel	%Sand	%Silt		%Clay	
● B-1	50.0	0.38	0.208			0.6	68.1	31.3			

GRAIN SIZE G7100.009 - TASK 00040 - S-38-634 DEER TRAIL OVER COOPER SWAMP.GPJ SCDOT DATA TEMPLATE\_01\_30\_2015.GDT 2/6/25

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

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

<b>PROJECT:</b>	S-38-634 over Cooper Swamp	<b>SCDOT PROJECT ID:</b>	P044270
<b>SAMPLE NUMBER:</b>	25-0235	<b>DATE REQUESTED:</b>	1/30/2025
<b>DESCRIPTION OF SOIL:</b>	Various		
<b>TESTED BY:</b>	Valerie Sims/Ashleigh Burgess	<b>DATE OF TESTING:</b>	1/30/2025
<b>WEIGHED BY:</b>	Ashleigh Burgess	<b>DATE OF WEIGHING:</b>	1/31/2025

BORING NO.	B-1	B-1	B-1	B-1	B-1
SAMPLE NO.	SS-4	SS-5	SS-6	SS-8	SS-10
SAMPLE DEPTH	6.0 - 8.0	8.0 - 10.0	13.5 - 15.0	23.5 - 25.0	33.5 - 35.0
WATER CONTENT, W%	20.5	33.3	20.4	35.8	26.4

BORING NO.	B-1				
SAMPLE NO.	SS-13				
SAMPLE DEPTH	48.5 - 50.0				
WATER CONTENT, W%	33.6				

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

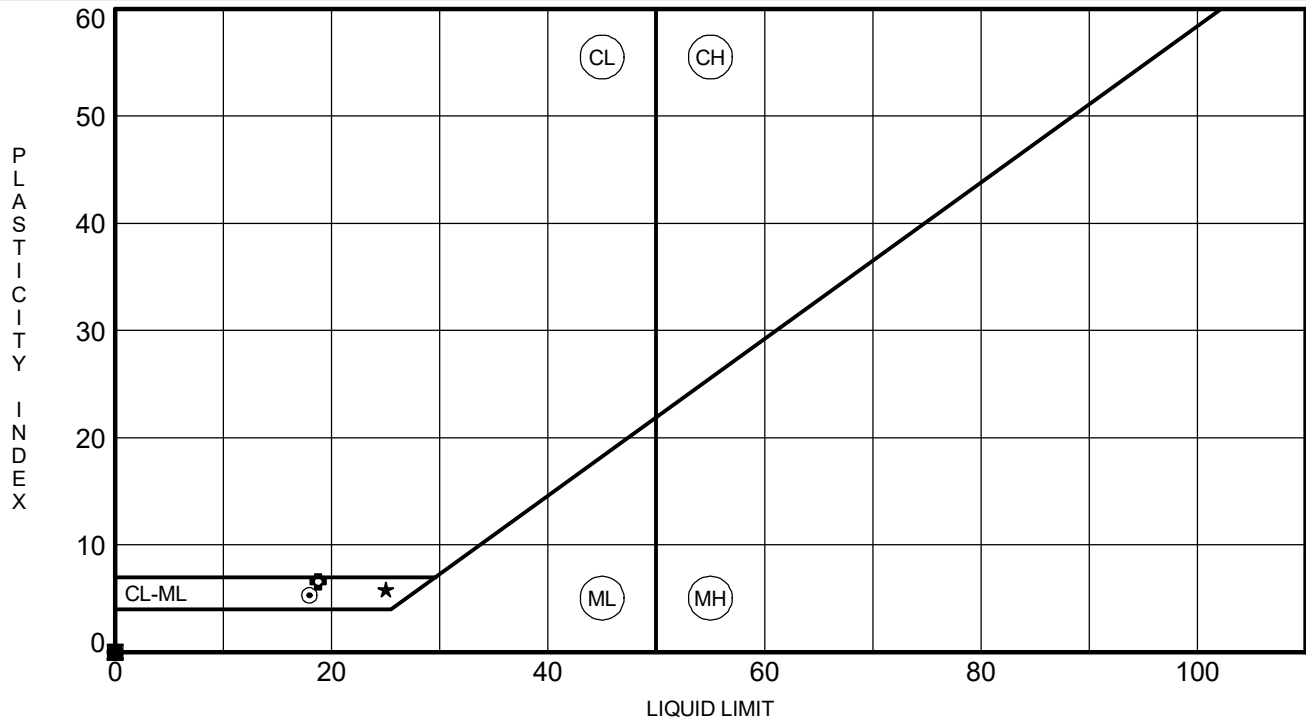
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

## ATTERBERG LIMITS' RESULTS

**PROJECT ID** P044270

**PROJECT NAME** S-38-634 over Cooper Swamp

**PROJECT COUNTY** Orangeburg

[illegible]



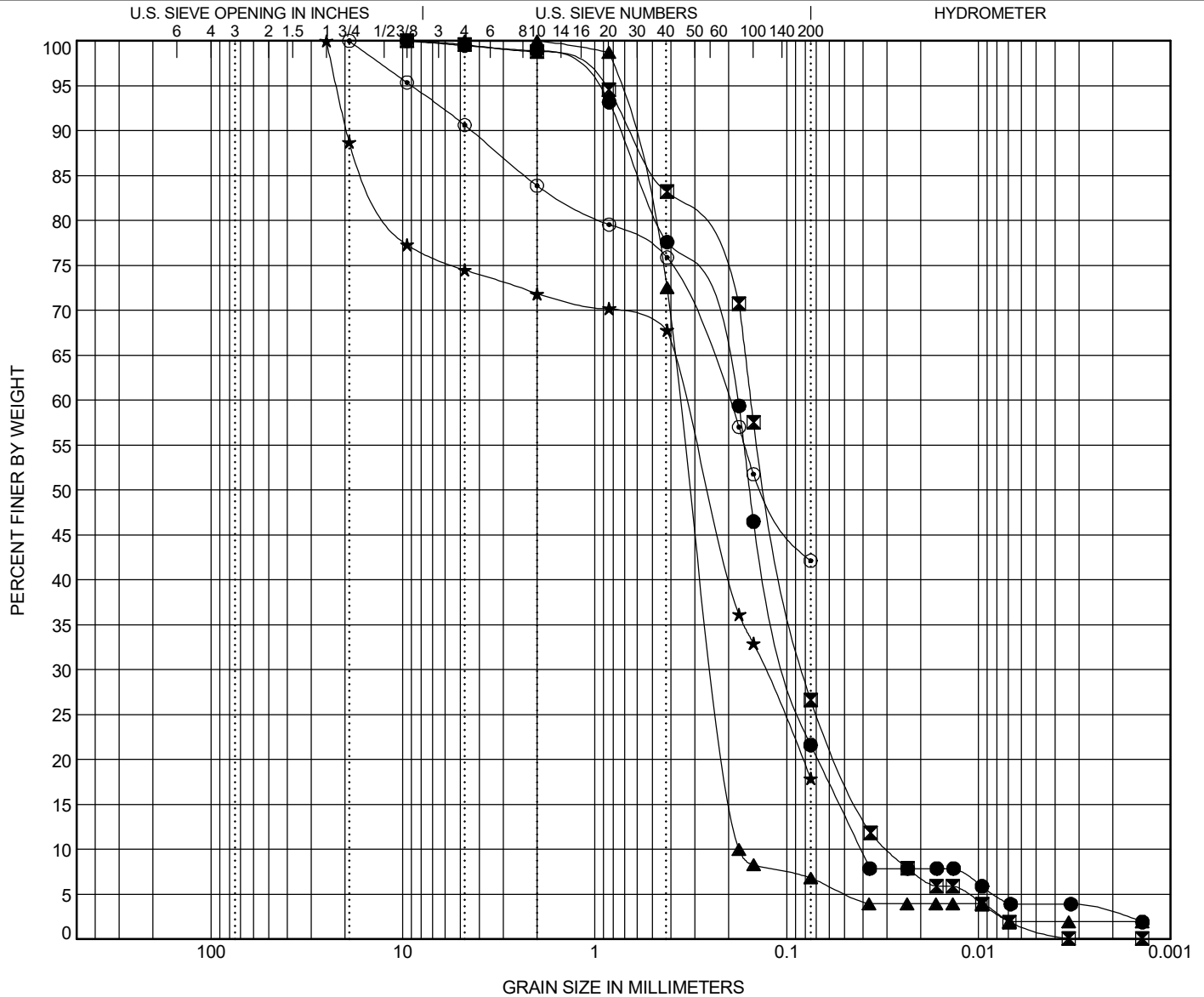


# GRAIN SIZE DISTRIBUTION

PROJECT ID P044270

PROJECT NAME S-38-634 over Cooper Swamp

PROJECT COUNTY Orangeburg



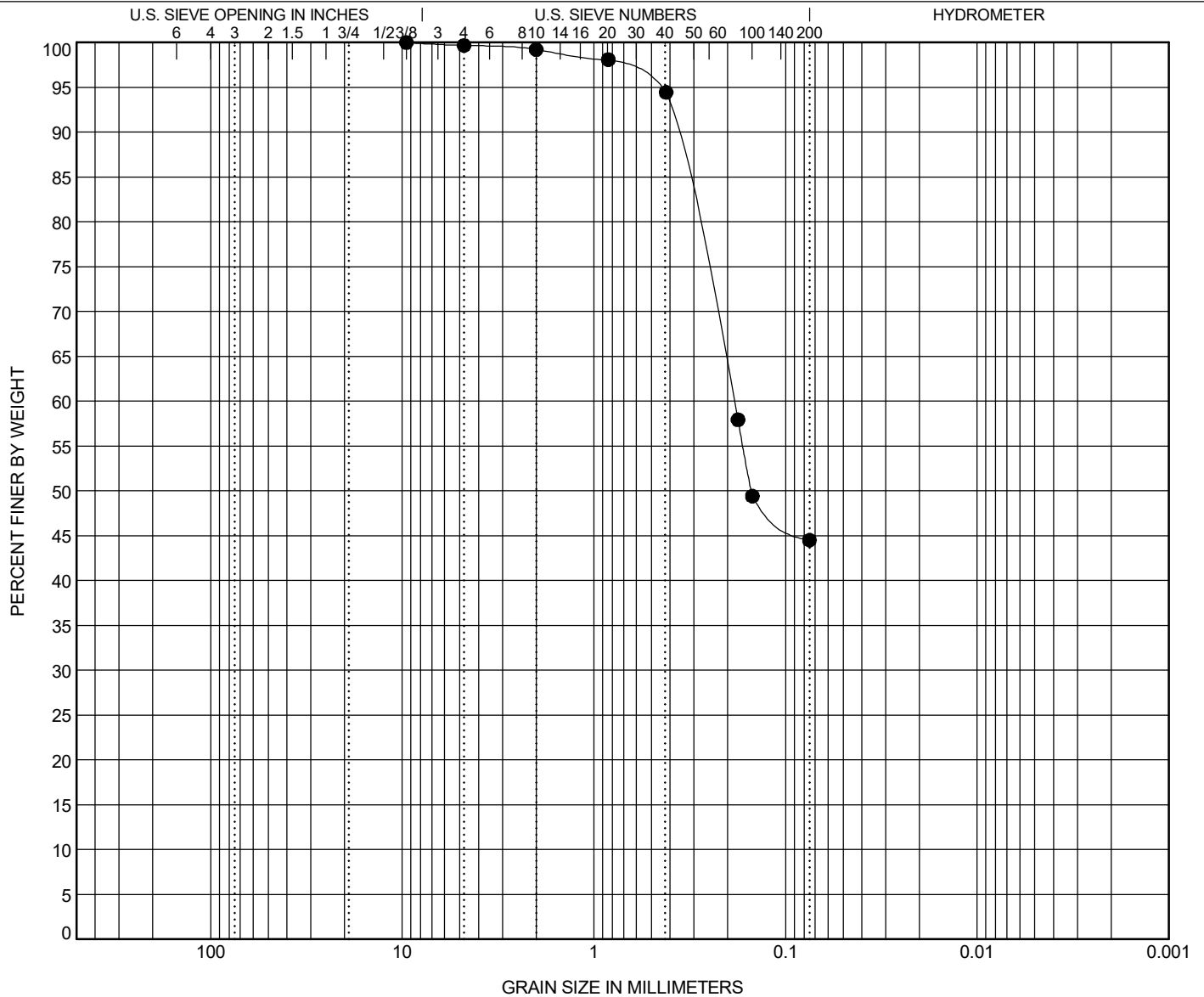


# GRAIN SIZE DISTRIBUTION

PROJECT ID P044270

PROJECT NAME S-38-634 over Cooper Swamp

PROJECT COUNTY Orangeburg



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

BOREHOLE	DEPTH	Classification					LL	PL	PI	Cc	Cu
● B-2	60.0	SILTY, CLAYEY SAND (SC-SM/A-4)					19	12	7		
BOREHOLE	DEPTH	D90	D60	D30	D10	%Gravel	%Sand	%Silt		%Clay	
● B-2	60.0	0.378	0.186			0.3	55.2	44.5			

GRAIN SIZE G7100.009 - TASK 00040 - S-38-634 DEER TRAIL OVER COOPER SWAMP.GPJ SCDOT DATA TEMPLATE\_01\_30\_2015.GDT 2/6/25

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

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

<b>PROJECT:</b>	S-38-634 over Cooper Swamp	<b>SCDOT PROJECT ID:</b>	P044270
<b>SAMPLE NUMBER:</b>	25-0236	<b>DATE REQUESTED:</b>	1/30/2025
<b>DESCRIPTION OF SOIL:</b>	Various		
<b>TESTED BY:</b>	Valerie Sims/Ashleigh Burgess	<b>DATE OF TESTING:</b>	1/30/2025
<b>WEIGHED BY:</b>	Ashleigh Burgess	<b>DATE OF WEIGHING:</b>	1/31/2025

BORING NO.	B-2	B-2	B-2	B-2	B-2
SAMPLE NO.	SS-3	SS-5	SS-7	SS-9	SS-11
SAMPLE DEPTH	6.0 - 8.0	8.0 - 10.0	13.5 - 15.0	28.5 - 30.0	38.5 - 40.0
WATER CONTENT, W%	11.4	45.7	26.7	27.7	26.7

BORING NO.	B-2				
SAMPLE NO.	SS-16				
SAMPLE DEPTH	58.5 - 60.0				
WATER CONTENT, W%	25.2				

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

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

# **S-38-634 over Cooper Swamp**

## **Geotechnical Subsurface Data Report**

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# **APPENDIX**

## **SECTION 4      LABORATORY TEST RESULTS**

### **SECTION 4B      BULK SOIL SAMPLES (BS)**



## SUMMARY OF LABORATORY RESULTS

PROJECT ID P044270

PROJECT NAME S-38-634 over Cooper Swamp

PROJECT COUNTY Orangeburg

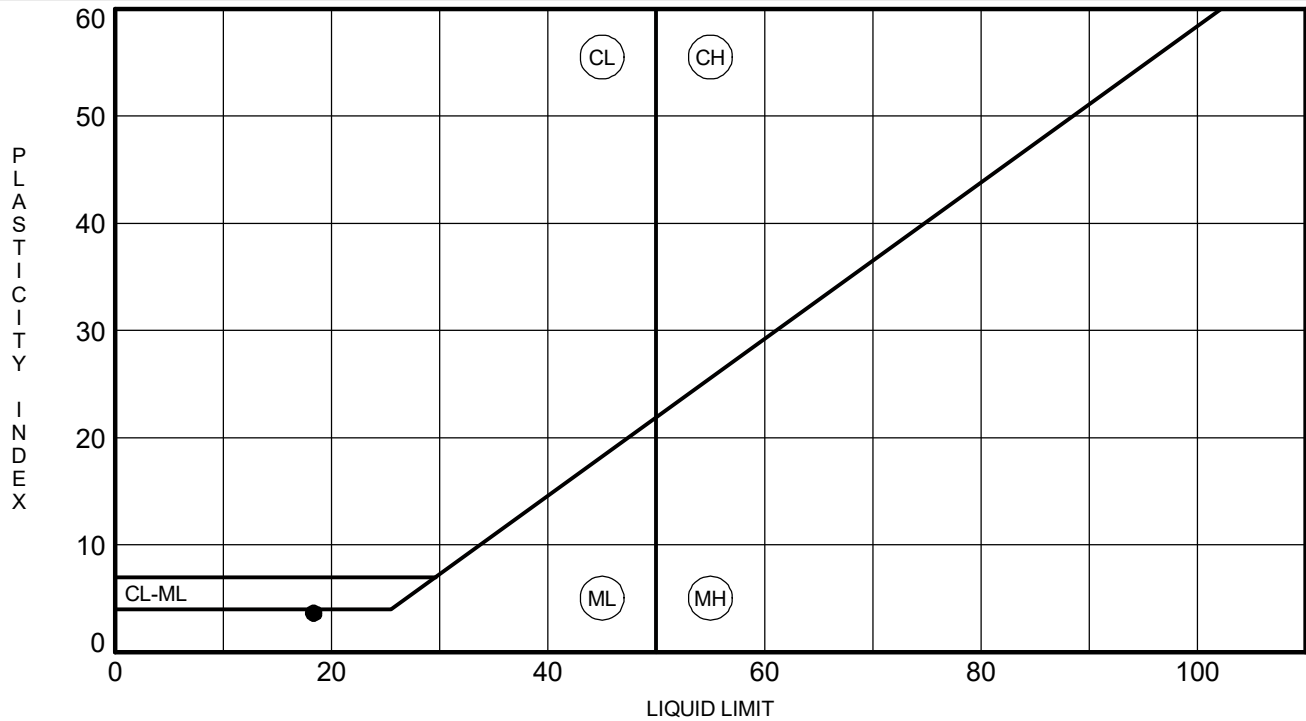
Boring No.	Sample Depth (ft.)	Liquid Limit	Plastic Limit	Plasticity Index	%<#200 Sieve	Soil Classification	Moisture Content (%)	Max Dry Density (PCF)	Optimum Moisture Content (%)	C (psi)	$\phi$ (Degrees)	C' (psi)	$\phi'$ (Degrees)
BS-1	0.0 – 6.0	18	15	3	26.4	SM	12.3	123.7	10.5	N/A	N/A	N/A	N/A

## ATTERBERG LIMITS' RESULTS

**PROJECT ID** P044270

**PROJECT NAME** S-38-634 over Cooper Swamp

**PROJECT COUNTY** Orangeburg

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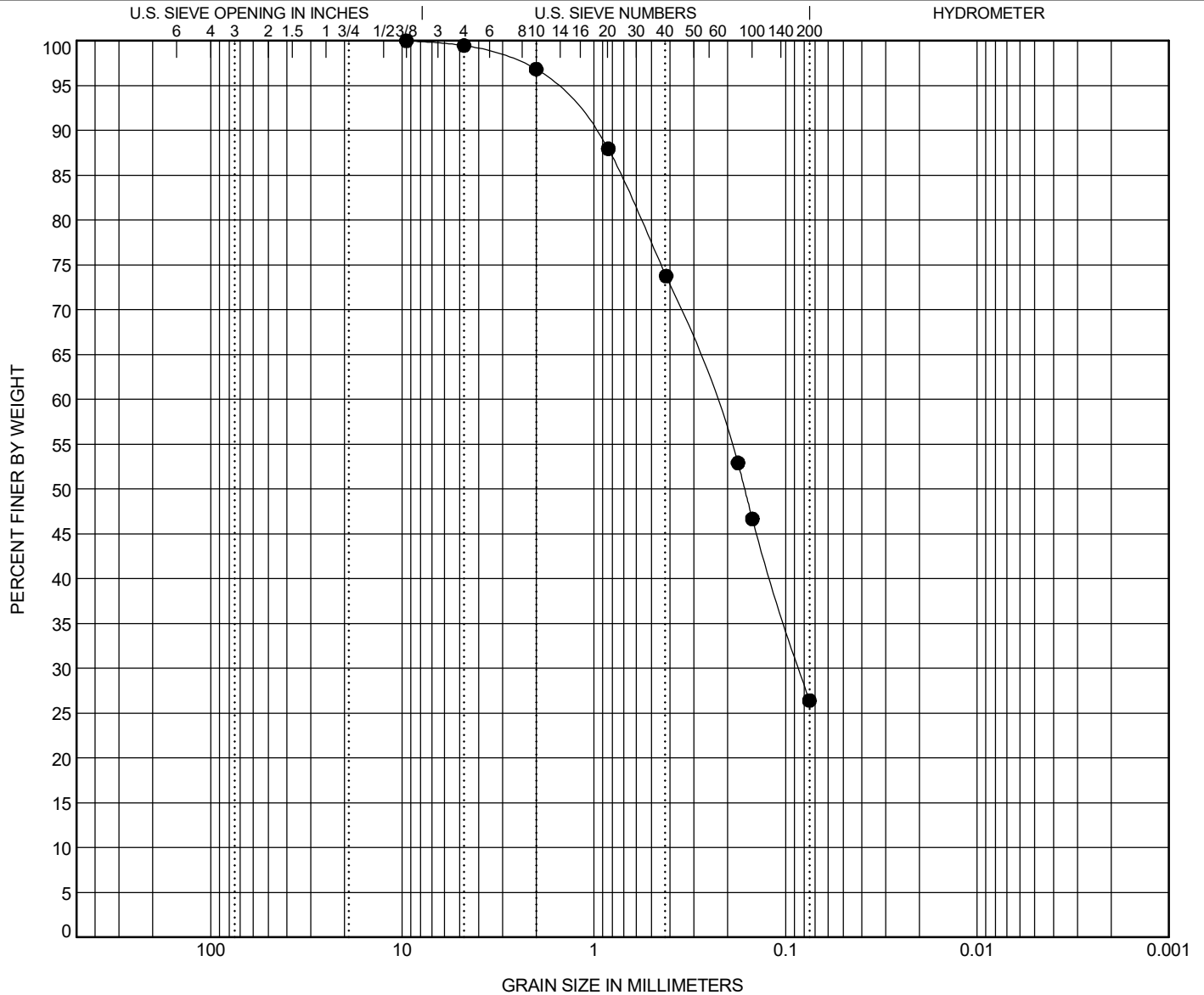


# GRAIN SIZE DISTRIBUTION

PROJECT ID P044270

PROJECT NAME S-38-634 over Cooper Swamp

PROJECT COUNTY Orangeburg



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

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

<b>PROJECT:</b>	S-38-634 over Cooper Swamp	<b>SCDOT PROJECT ID:</b>	P044270
<b>SAMPLE NUMBER:</b>	25-0218	<b>DATE REQUESTED:</b>	1/29/2025
<b>DESCRIPTION OF SOIL:</b>	Silty SAND (SM/A-2-4)		
<b>TESTED BY:</b>	LiAnn Johnson	<b>DATE OF TESTING:</b>	1/30/2025
<b>WEIGHED BY:</b>	Ashleigh Burgess	<b>DATE OF WEIGHING:</b>	1/31/2025

BORING NO.	BS-1				
SAMPLE NO.	--				
SAMPLE DEPTH	0.0 - 6.0				
WATER CONTENT, W%	12.3				

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%					



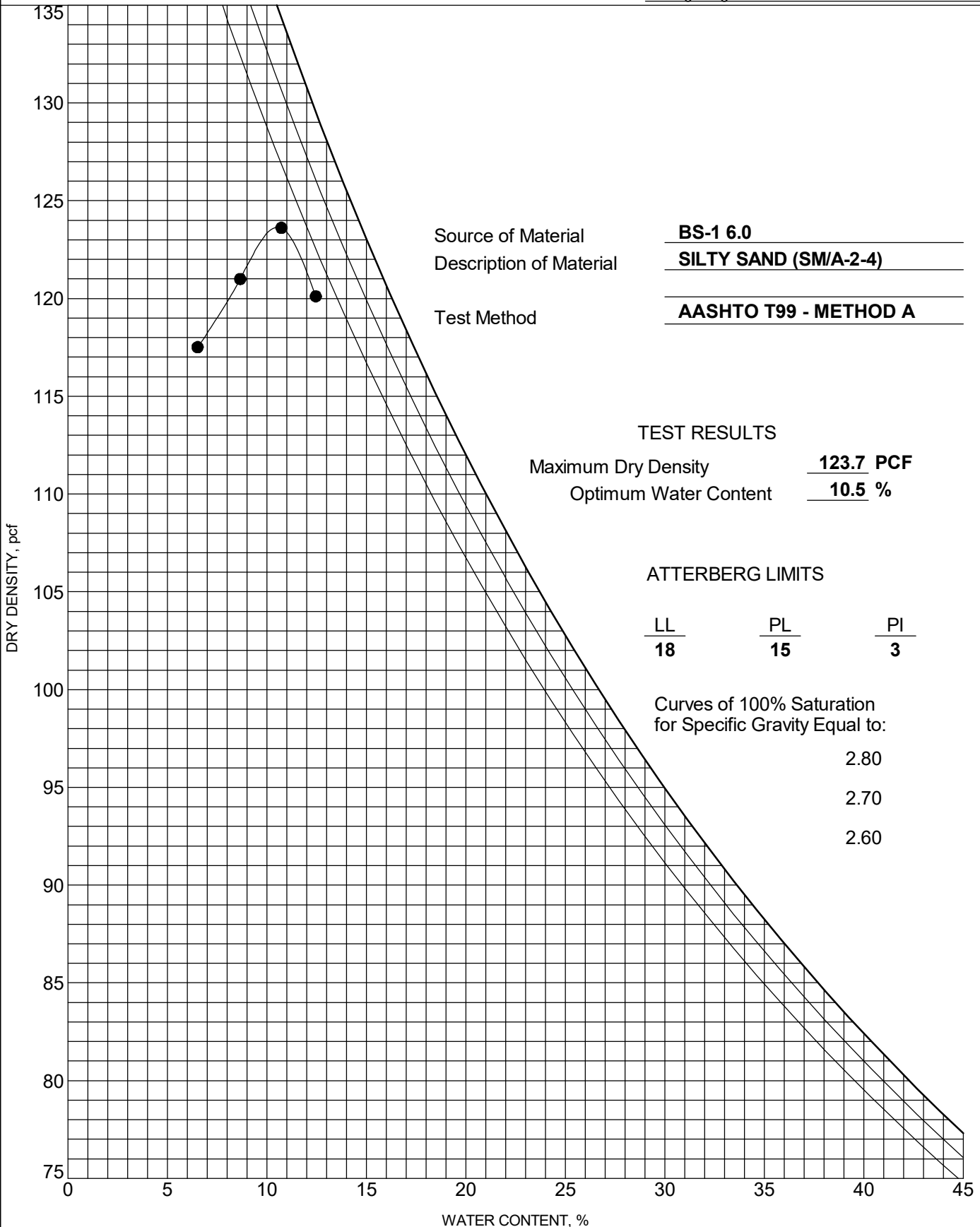


# MOISTURE-DENSITY RELATIONSHIP

PROJECT ID P044270

PROJECT NAME S-38-634 over Cooper Swamp

PROJECT COUNTY Orangeburg



# CALIFORNIA BEARING RATIO (CBR) AASHTO T193

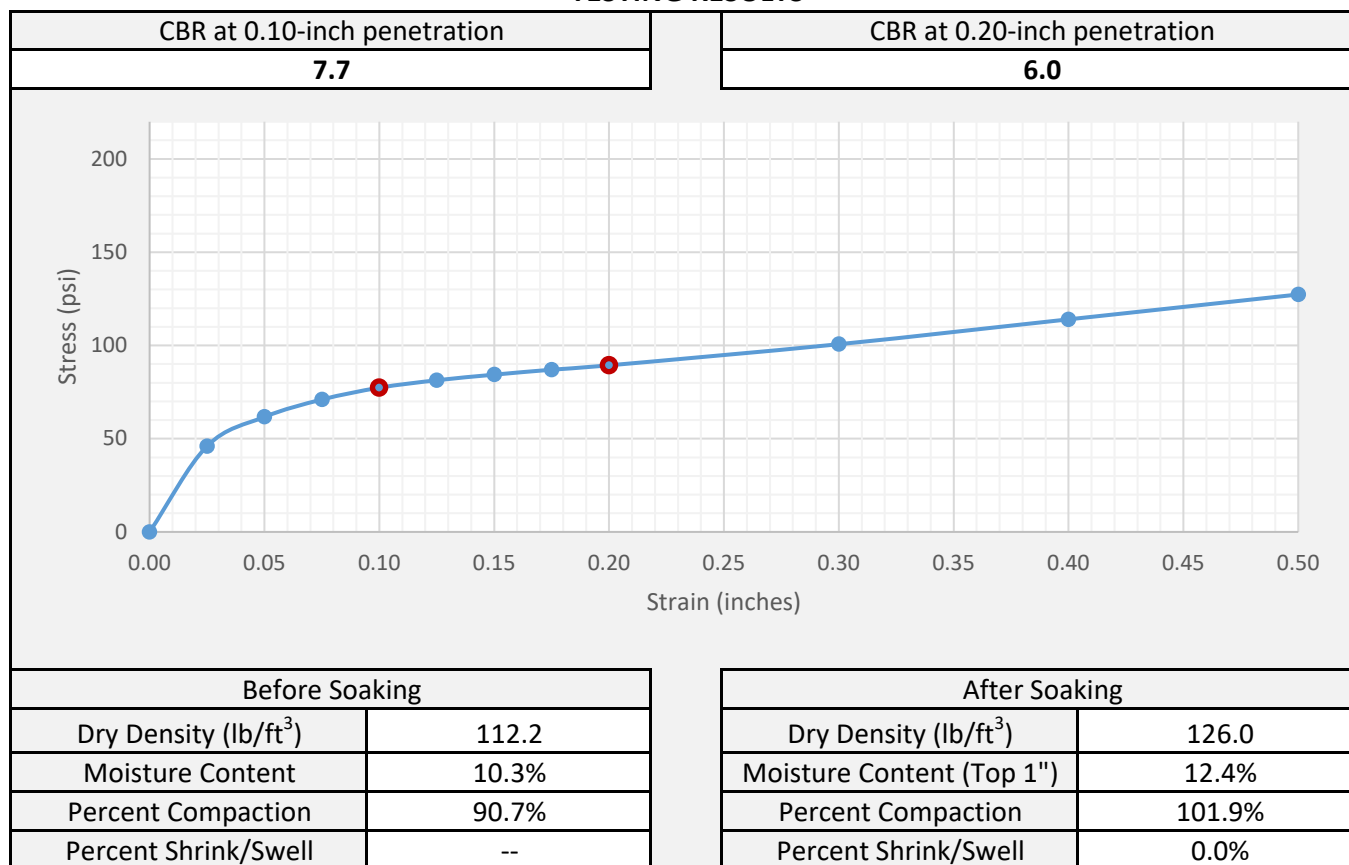
## SAMPLE INFORMATION

Project Name	S-38-634 over Cooper Swamp			Project No.	G7100.009 - Task 00040
Sample Location	BS-1			FME Lab ID	25-0218
Soil Description	Silty SAND (SM/A-2-4)			Depth/Elev.	0.0 - 6.0
Date Sampled	--	Sampled By:	F&ME	Date Received	1/24/2025
Date Test Began	2/6/2025	Date Completed	2/10/25	Tested By	DH

## MOLDING CHARACTERISTICS


Method	AASHTO T99 - Method A	% Retained on 3/4" Sieve	0%
Max Dry Density (lb/ft <sup>3</sup> )	123.7	Optimum Moisture Content (%)	10.5
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/> 2/11/25 Date
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# CALIFORNIA BEARING RATIO (CBR) AASHTO T193

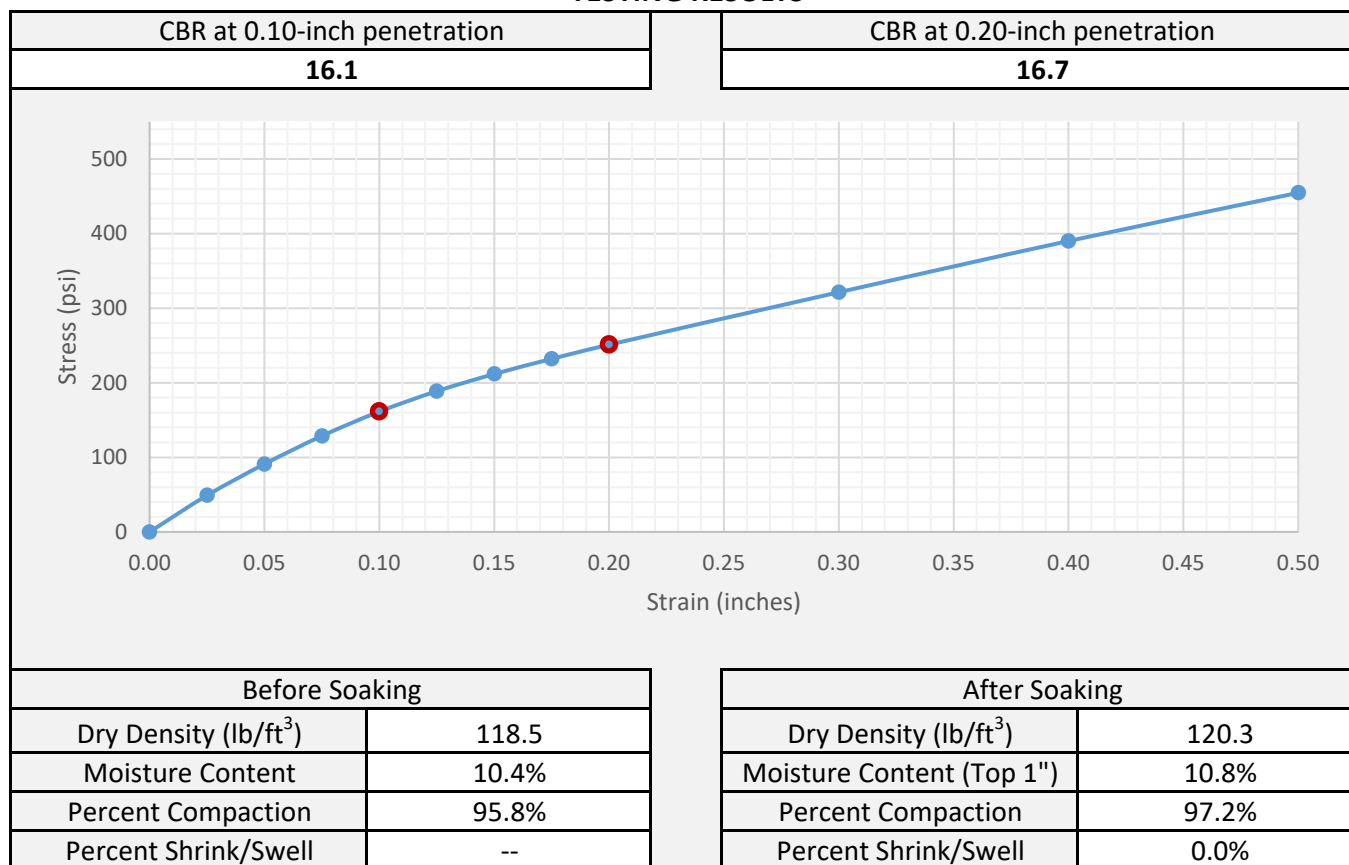
## SAMPLE INFORMATION

Project Name	S-38-634 over Cooper Swamp			Project No.	G7100.009 - Task 00040
Sample Location	BS-1			FME Lab ID	25-0218
Soil Description	Silty SAND (SM/A-2-4)			Depth/Elev.	0.0 - 6.0
Date Sampled	--	Sampled By:	F&ME	Date Received	1/24/2025
Date Test Began	2/6/2025	Date Completed	2/10/25	Tested By	DH

## MOLDING CHARACTERISTICS

Method	AASHTO T99 - Method A	% Retained on 3/4" Sieve	0%
Max Dry Density (lb/ft <sup>3</sup> )	123.7	Optimum Moisture Content (%)	10.5
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/> 2/11/25 Date
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# CALIFORNIA BEARING RATIO (CBR) AASHTO T193

## SAMPLE INFORMATION

Project Name	S-38-634 over Cooper Swamp			Project No.	G7100.009 - Task 00040
Sample Location	BS-1			FME Lab ID	25-0218
Soil Description	Silty SAND (SM/A-2-4)			Depth/Elev.	0.0 - 6.0
Date Sampled	--	Sampled By:	F&ME	Date Received	1/24/2025
Date Test Began	2/6/2025	Date Completed	2/10/25	Tested By	DH

## MOLDING CHARACTERISTICS

Method	AASHTO T99 - Method A	% Retained on 3/4" Sieve	0%
Max Dry Density (lb/ft <sup>3</sup> )	123.7	Optimum Moisture Content (%)	10.5
Soak Time (hr)	96	Surcharge Weight (lb)	10.0

## TESTING RESULTS

Corrected CBR at 0.10-inch penetration		Corrected CBR at 0.20-inch penetration																							
20.0		26.3																							
<table border="1"><caption>Stress-Strain Data Points (Estimated)</caption><thead><tr><th>Strain (inches)</th><th>Stress (psi)</th></tr></thead><tbody><tr><td>0.05</td><td>0</td></tr><tr><td>0.07</td><td>40</td></tr><tr><td>0.10</td><td>90</td></tr><tr><td>0.12</td><td>120</td></tr><tr><td>0.15</td><td>160</td></tr><tr><td>0.17</td><td>200</td></tr><tr><td>0.20</td><td>250</td></tr><tr><td>0.30</td><td>450</td></tr><tr><td>0.40</td><td>620</td></tr><tr><td>0.50</td><td>780</td></tr></tbody></table>				Strain (inches)	Stress (psi)	0.05	0	0.07	40	0.10	90	0.12	120	0.15	160	0.17	200	0.20	250	0.30	450	0.40	620	0.50	780
Strain (inches)	Stress (psi)																								
0.05	0																								
0.07	40																								
0.10	90																								
0.12	120																								
0.15	160																								
0.17	200																								
0.20	250																								
0.30	450																								
0.40	620																								
0.50	780																								
Before Soaking		After Soaking																							
Dry Density (lb/ft <sup>3</sup> )	124.7	Dry Density (lb/ft <sup>3</sup> )	124.6																						
Moisture Content	10.3%	Moisture Content (Top 1")	11.4%																						
Percent Compaction	100.8%	Percent Compaction	100.8%																						
Percent Shrink/Swell	--	Percent Shrink/Swell	0.0%																						

## ADDITIONAL COMMENTS

Target %Compaction = 100%

	<b>F&amp;ME Consultants, Inc.</b> 211 Business Park Blvd., Columbia, South Carolina 29203		2/11/25
			Date

# **S-38-634 over Cooper Swamp**

## **Geotechnical Subsurface Data Report**

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# **APPENDIX**

## **SECTION 4      LABORATORY TEST RESULTS**

### **SECTION 4C      CORROSION SERIES TESTING**



# CORROSION SERIES SUMMARY (SPLIT-SPOON)

PAGE 1 OF 1

PROJECT ID P044270

PROJECT NAME S-38-634 over Cooper Swamp

PROJECT COUNTY Orangeburg

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))
B-1	SS-2/SS-3	(2.0 – 6.0) (Composite)	5.7	46,431	4.51	46.0
B-2	SS-1/SS-2	(0.0 – 4.0) (Composite)	5.9	32,830	3.86	89.1

**pH DETERMINATION  
(AASHTO T289)**

Project Name:	<u>S-38-634 Deer Trail RBO Cooper Swamp</u>	Project Number:	<u>G7100.009 - Task 00040</u>
Description of Sample:	<u>Soil (Composite)</u>	Date Received	<u>1/29/2025</u>
Tested By:	<u>A. Grier</u>	Date Tested:	<u>1/31/2025</u>

Boring Number	B-1			
Boring Depth	2.0 - 6.0			
FME Lab ID No.	25-0235			
pH Value	5.73			
Temperature (°C)	20.6			

Date Reviewed: 2/12/2025Reviewed By: J.Hiers

**SOIL RESISTIVITY  
(AASHTO T288)**

Project Name:	S-38-634 Deer Trail RBO Cooper Swamp	Project ID:	G7100.009 - Task 00040
Location:	--	FME Lab ID No.:	25-0235
Sampled By:	G. Cantele	Date Sampled:	1/29/2025
Soil Description:	Soil (Composite)	Date Received:	1/29/2025
Tested By:	A. Broskey	Date Tested:	2/4/2025

Boring No.	Sample Depth (ft.)	Minimum Soil Resistivity, $\Omega$ -cm
B-1	2.0 - 6.0	46,431 $\Omega$ -cm

Date Reviewed: 2/12/2025 Reviewed By: J. Hiers



## CHLORIDE ION CONTENT IN SOILS

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

Client: F&ME Consultants, Inc.  
 Client Reference: Cooper Swamp G7100.009  
 Project No.: 2025-080-001  
 Lab ID: 2025-080-001-001

Boring No.: B-1  
 Depth (ft): 2.0-6.0'  
 Sample No.: SS-2/SS-3  
 Description: Brown

( - # 10 Sieve material )

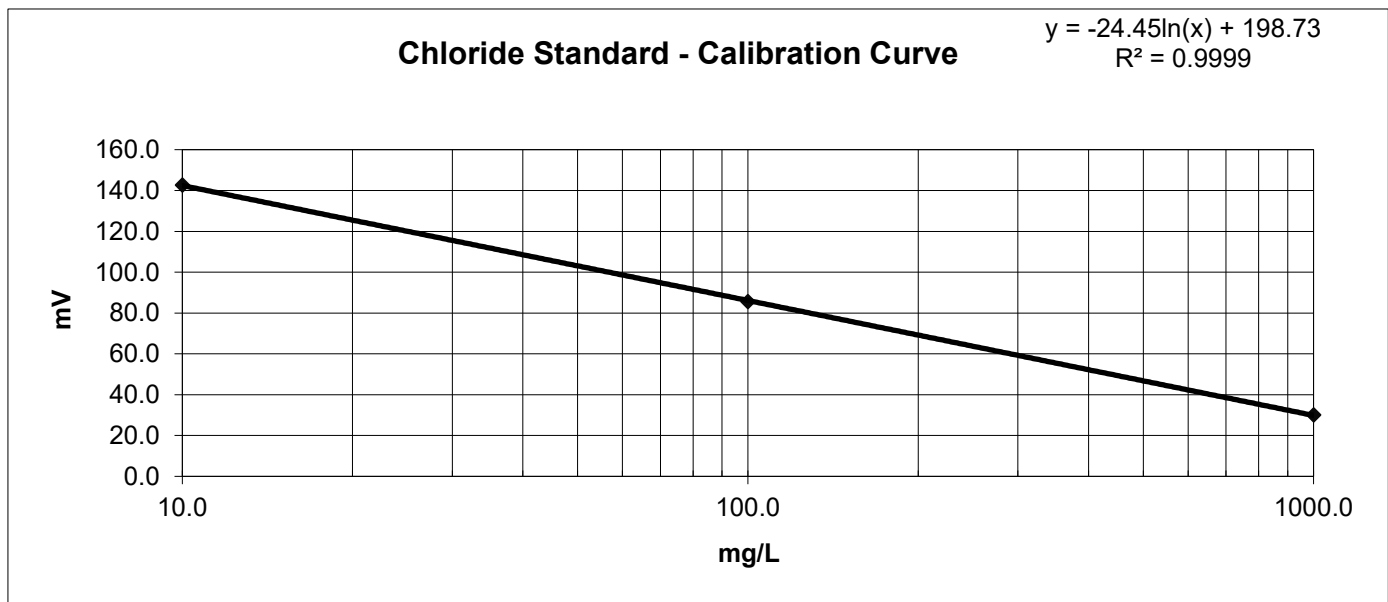
### CHLORIDE STANDARD: CALIBRATION CURVE

STANDARD	MILLIVOLTS (mV)
10.0 mg/L	142.7
100.0 mg/L	85.6
1000.0 mg/L	30.1

### 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):	161.9	4.51	4.51

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 ± 5°C.



Notes:

Tested By JAM Date 2/11/25 Checked By EG Date 2/12/25

## Water-Soluble Sulfate Ion Content in Soil

### AASHTO T 290-95 (2020)

Client: F&ME Consultants, Inc.  
 Client Reference: Cooper Swamp G7100.009  
 Project No.: 2025-080-001  
 Lab ID: 2025-080-001-001

Boring No.: B-1  
 Depth (ft): 2.0-6.0'  
 Sample No.: SS-2/SS-3  
 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	7	20	42	63	112	163	243

#### 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): 7

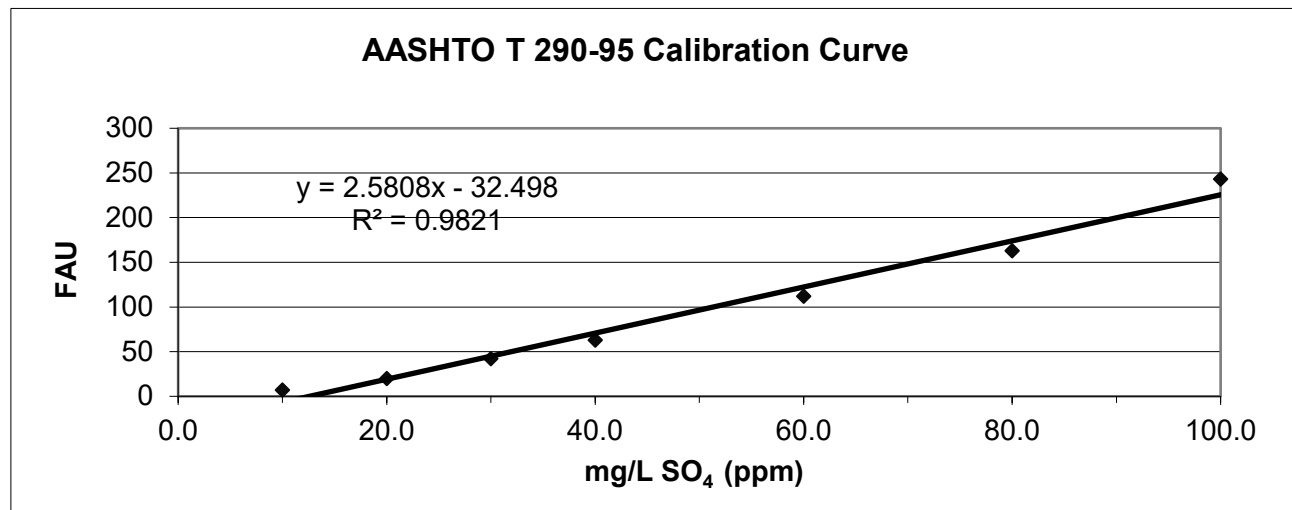
Sample Diluted: No

Sulfate Solution Added (ml): 0

#### Sample Moisture Content

Tare Number: 904  
 Weight of Tare & Wet Sample (g): 238.67  
 Weight of Tare & Dry Sample (g): 238.51  
 Weight of Tare (g): 109.42  
 Weight of Water (g): 0.16  
 Weight of Dry Sample (g): 129.09  
 Moisture Content (%): 0.12

Sample Sulfate Ion Concentration:	15.30	mg/L SO <sub>4</sub> (ppm)
Sample Sulfate Ion Content:	45.9	mg/Kg SO <sub>4</sub> (not corrected for moisture)
Sample Sulfate Ion Content:	46.0	mg/Kg SO <sub>4</sub> (corrected for moisture)



Tested by: JAM      Date: 2/12/25      Checked by: EG      Date: 2/12/2025

**pH DETERMINATION  
(AASHTO T289)**

Project Name:	<u>S-38-634 Deer Trail RBO Cooper Swamp</u>	Project Number:	<u>G7100.009 - Task 00040</u>
Description of Sample:	<u>Soil (Composite)</u>	Date Received	<u>1/29/2025</u>
Tested By:	<u>A. Grier</u>	Date Tested:	<u>1/31/2025</u>

Boring Number	B-2			
Boring Depth	0.0 - 4.0			
FME Lab ID No.	25-0236			
pH Value	5.89			
Temperature (°C)	20.6			

Date Reviewed: 2/12/2025Reviewed By: J.Hiers

**SOIL RESISTIVITY  
(AASHTO T288)**

Project Name:	S-38-634 Deer Trail RBO Cooper Swamp	Project ID:	G7100.009 - Task 00040
Location:	--	FME Lab ID No.:	25-0236
Sampled By:	G. Cantele	Date Sampled:	1/29/2025
Soil Description:	Soil (Composite)	Date Received:	1/29/2025
Tested By:	A. Broskey	Date Tested:	2/4/2025

Boring No.	Sample Depth (ft.)	Minimum Soil Resistivity, $\Omega$ -cm
B-2	0.0 - 4.0	32,830 $\Omega$ -cm

Date Reviewed: 2/12/2025 Reviewed By: J. Hiers

## CHLORIDE ION CONTENT IN SOILS

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

Client: F&ME Consultants, Inc.  
 Client Reference: Cooper Swamp G7100.009  
 Project No.: 2025-080-001  
 Lab ID: 2025-080-001-002

Boring No.: B-2  
 Depth (ft): 0.0-4.0'  
 Sample No.: SS-1/SS-2  
 Description: Brown

( - # 10 Sieve material )

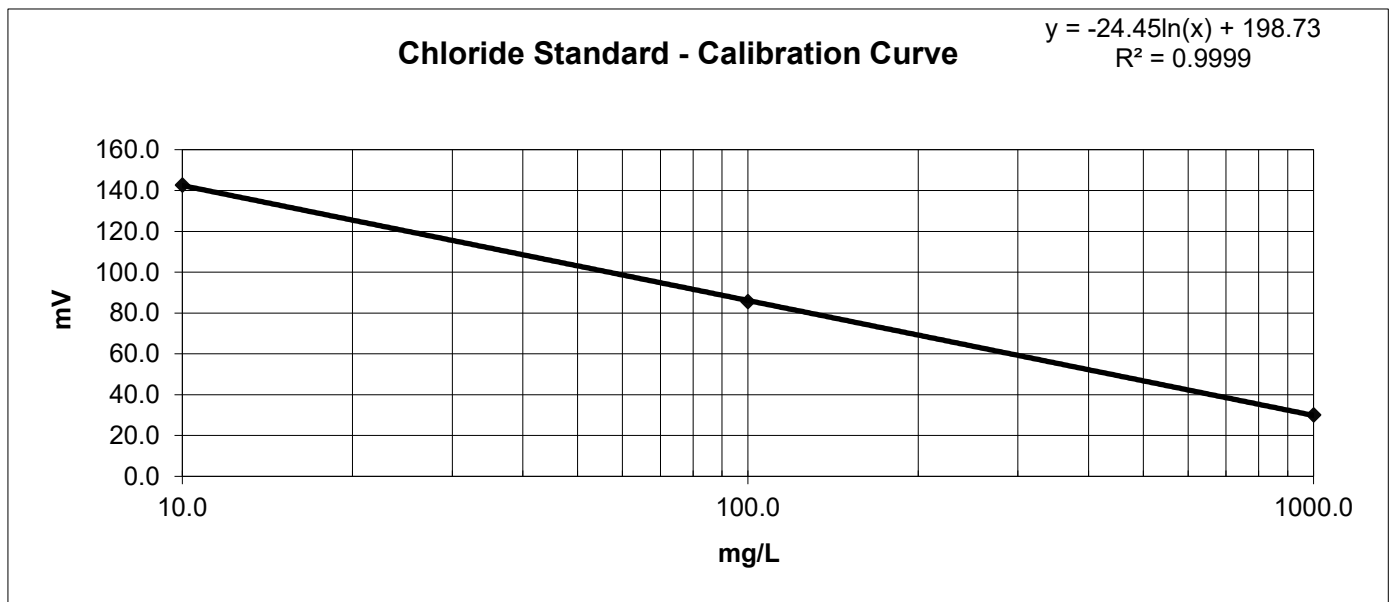
### CHLORIDE STANDARD: CALIBRATION CURVE

STANDARD	MILLIVOLTS (mV)
10.0 mg/L	142.7
100.0 mg/L	85.6
1000.0 mg/L	30.1

### 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):	165.7	3.86	3.86

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 2/11/25 Checked By EG Date 2/12/25

## Water-Soluble Sulfate Ion Content in Soil

### AASHTO T 290-95 (2020)

Client: F&ME Consultants, Inc.  
 Client Reference: Cooper Swamp G7100.009  
 Project No.: 2025-080-001  
 Lab ID: 2025-080-001-002

Boring No.: B-2  
 Depth (ft): 0.0-4.0'  
 Sample No.: SS-1/SS-2  
 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	7	20	42	63	112	163	243

#### 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): 44

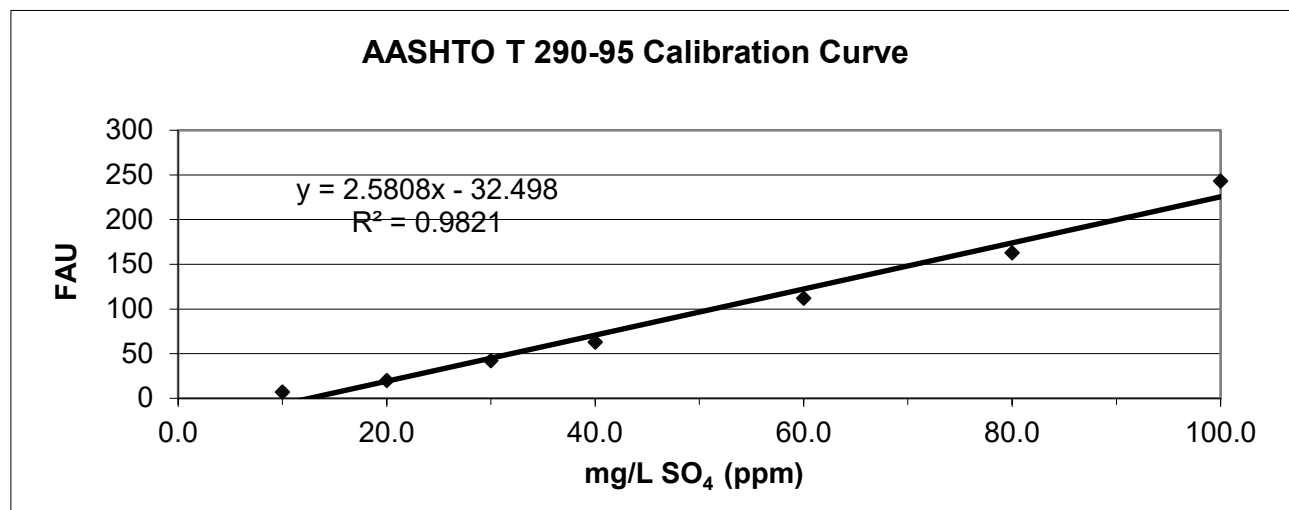
Sample Diluted: No

Sulfate Solution Added (ml): 0

#### Sample Moisture Content

Tare Number: 483  
 Weight of Tare & Wet Sample (g): 232.84  
 Weight of Tare & Dry Sample (g): 232.64  
 Weight of Tare (g): 97.29  
 Weight of Water (g): 0.20  
 Weight of Dry Sample (g): 135.35  
 Moisture Content (%): 0.15

Sample Sulfate Ion Concentration:	29.64	mg/L SO <sub>4</sub> (ppm)
Sample Sulfate Ion Content:	88.9	mg/Kg SO <sub>4</sub> (not corrected for moisture)
Sample Sulfate Ion Content:	89.1	mg/Kg SO <sub>4</sub> (corrected for moisture)



Tested by: JAM      Date: 2/12/25      Checked by: EG      Date: 2/12/2025

# **S-38-634 over Cooper Swamp**

## **Geotechnical Subsurface Data Report**

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# **APPENDIX**

## **SECTION 5**

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



## On-Site Drill Rig Photographs



**B-1**



**B-2**



**P-4**



**P-5**



# **S-38-634 over Cooper Swamp**

## **Geotechnical Subsurface Data Report**

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# **APPENDIX**

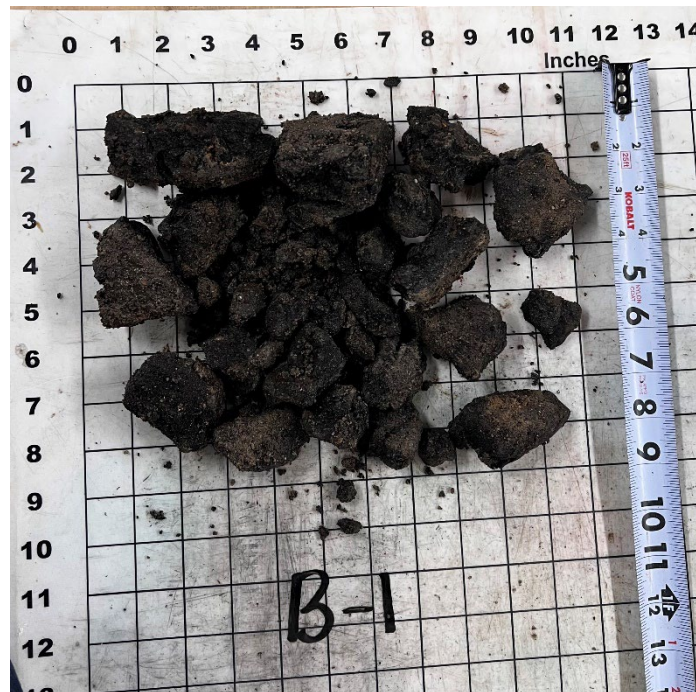
## **SECTION 6**

## **PAVEMENT CORE PHOTOS**

## Pavement Core Photos



B-1 (Side 1)

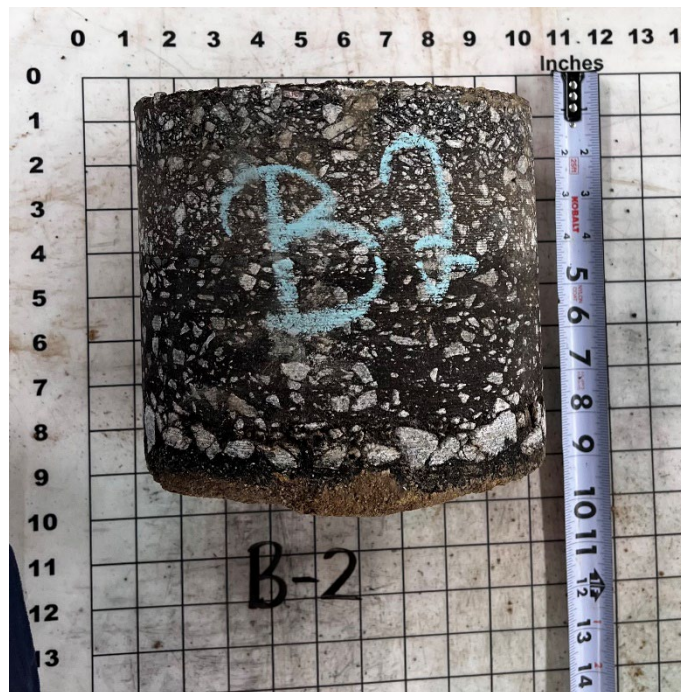


B-1 (Side 2)

## Pavement Core Photos



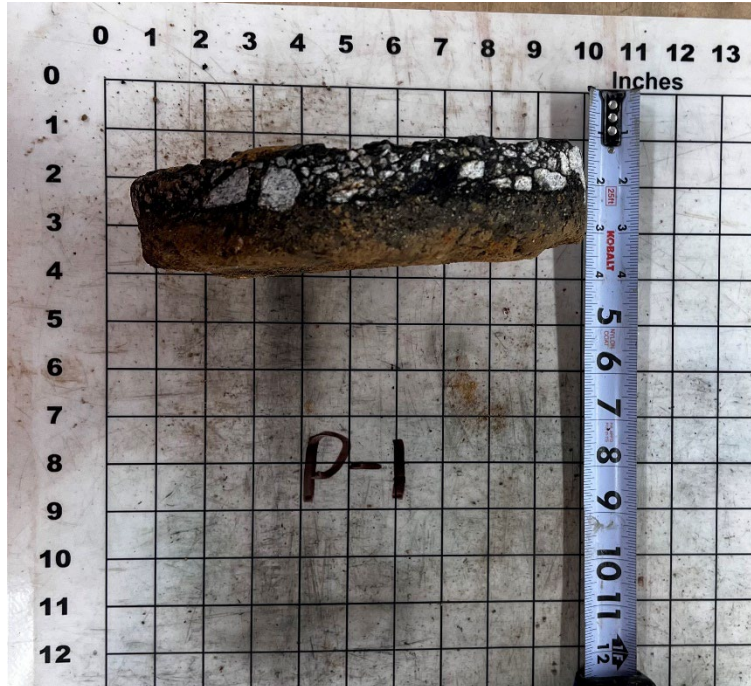
B-2 (Side 1)



B-2 (Side 2)



## Pavement Core Photos

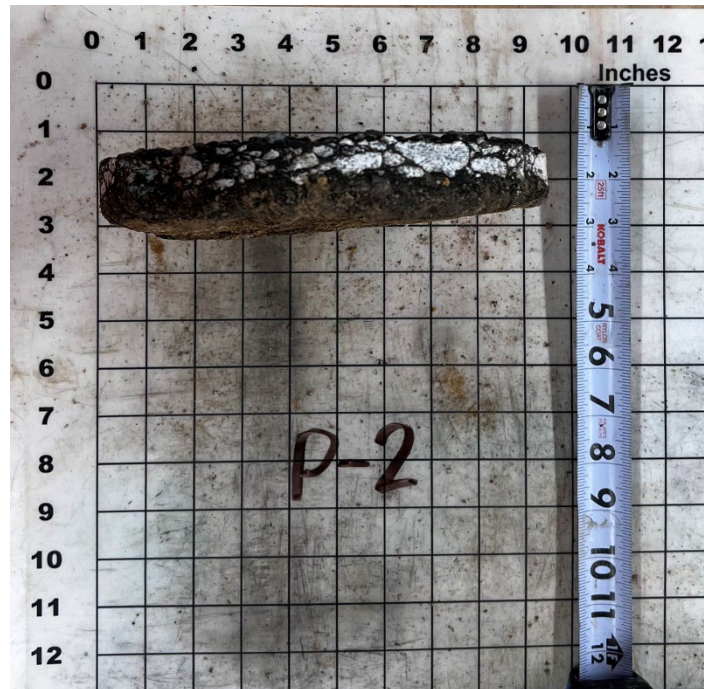


P-1 (Side 1)

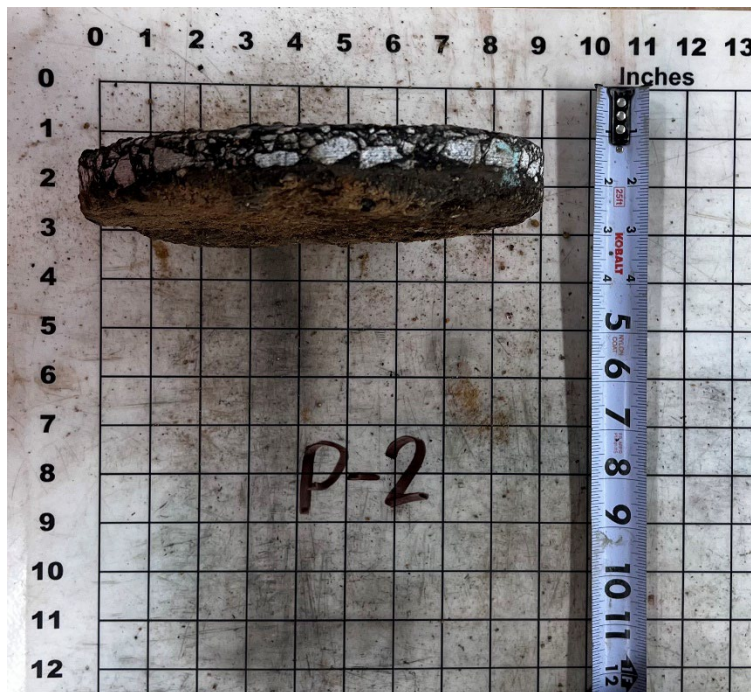


P-1 (Side 2)

## Pavement Core Photos



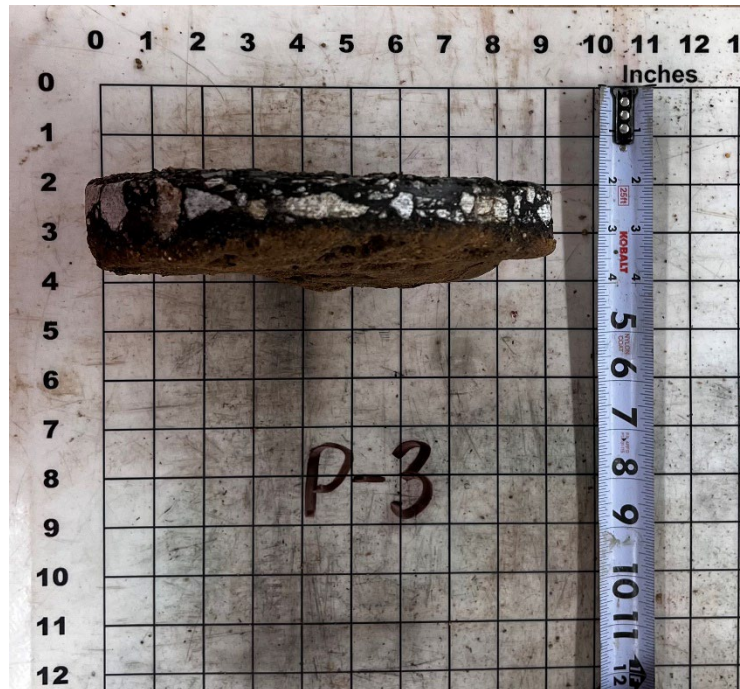
P-2 (Side 1)



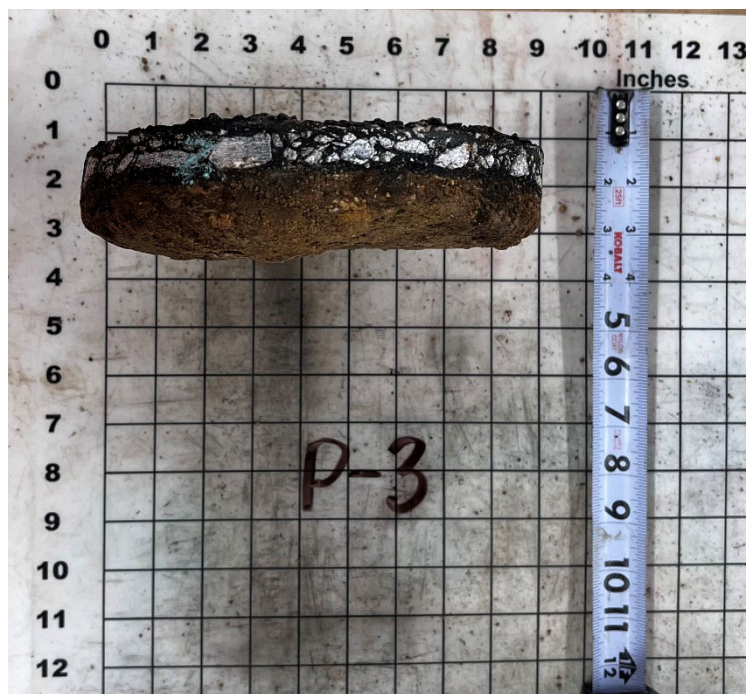
P-2 (Side 2)



## Pavement Core Photos

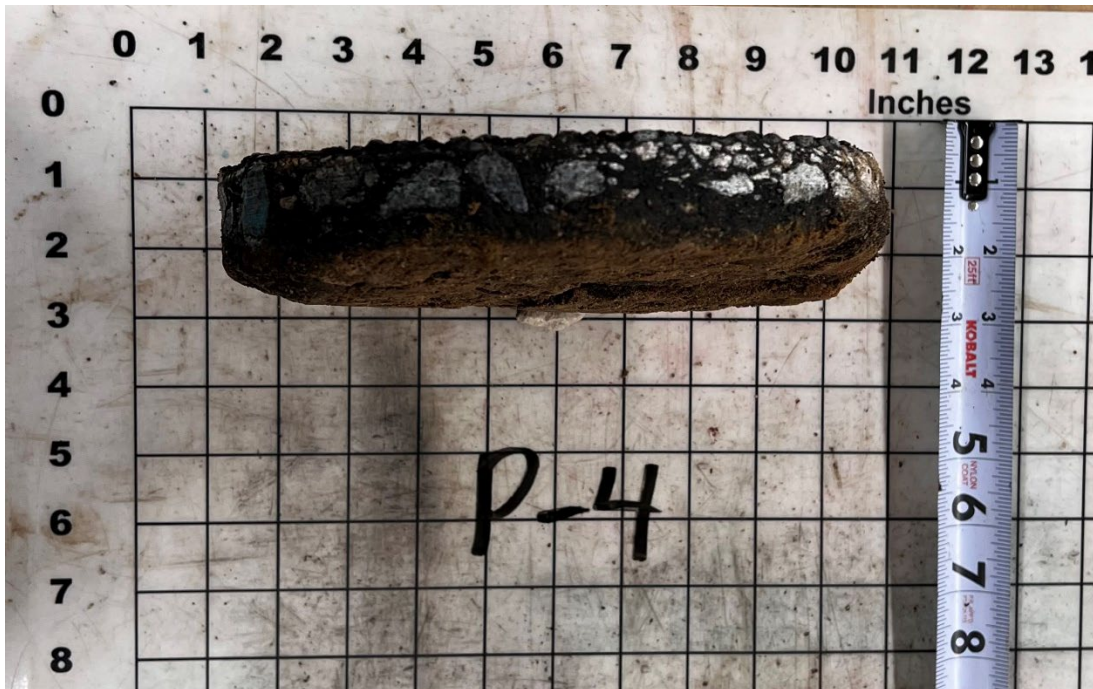


P-3 (Side 1)



P-3 (Side 2)

## Pavement Core Photos



P-4 (Side 1)



P-4 (Side 2)



## Pavement Core Photos



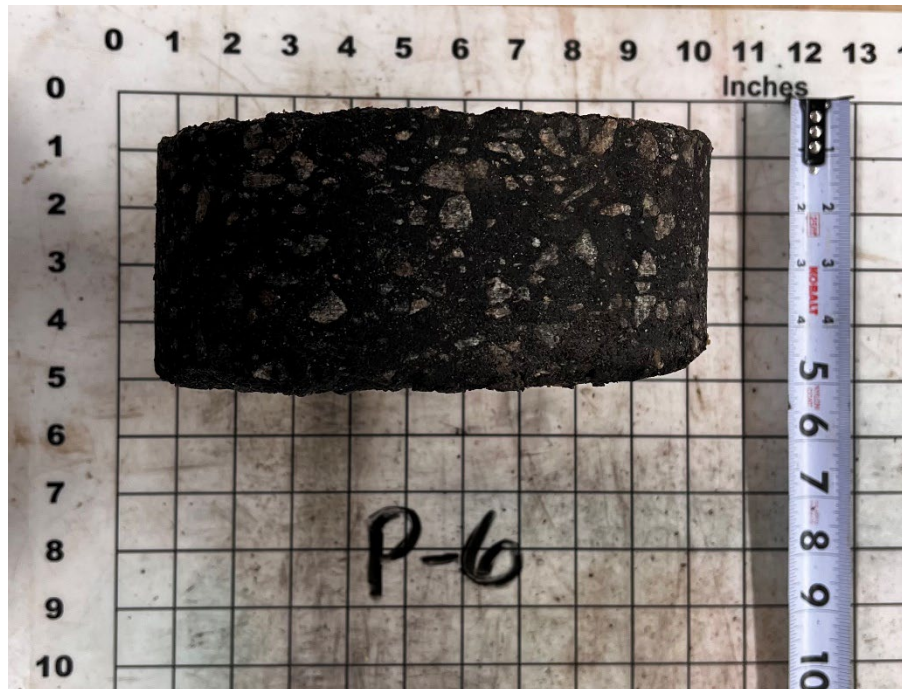
P-5 (Side 1)



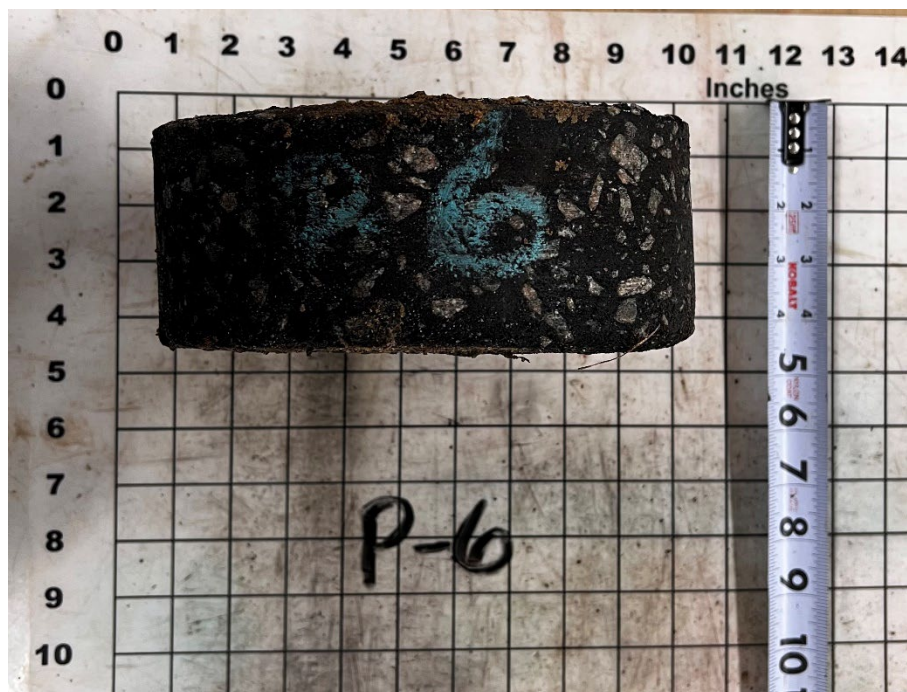
P-5 (Side 2)



## Pavement Core Photos



P-6 (Side 1)



P-6 (Side 2)

# **S-38-634 over Cooper Swamp**

## **Geotechnical Subsurface Data Report**

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# **APPENDIX**

## **SECTION 7      SPT HAMMER CALIBRATION**



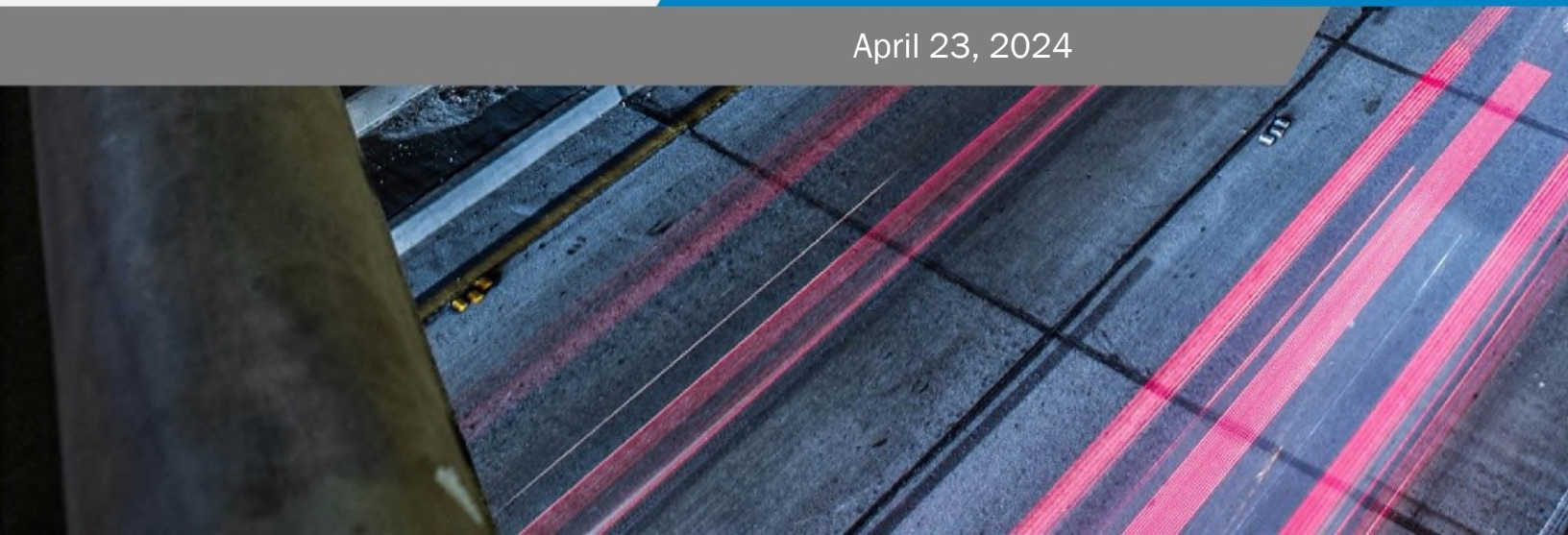


**CAROLINAS  
GEOTECHNICAL  
GROUP**

## **Report of SPT Hammer Energy**

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

April 23, 2024





2400 Crownpoint Executive Drive  
Suite 800  
Charlotte, NC 28227



(980) 339-8684



contact@carolinasgeotech.com



www.carolinasgeotech.com

April 23, 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 294593)  
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 294593, 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 L. Guempel 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 34.7704428, -81.2454626. 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	294593
Operator	L. Guempel
Carrier	ATV
Hammer Information	
Model / Type	CME / Auto
Serial Number	N/A
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 52.3 to 59.6 blows per minute (BPM) during dynamic testing. The measured transferred hammer energy (EFV) ranged from 285.7 to 331.4 foot-pounds, which corresponds to Energy Transfer Ratio (ETR) values of 81.6 to 94.7%, 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	3-6-9 / 15	SA SILT	59.2	318.5	91.0
2	33½ - 35	35	38.6	2-4-6 / 10	SA SILT	54.9	300.5	85.9
3	38½ - 40	40	43.6	3-5-9 / 14	SA SILT	56.1	319.7	91.3
Overall Average						57.0	314.3	89.8

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 314.3 foot-pounds, with an average ETR of 89.8%.

## 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:

  
F926DBFBA80F4FE...  
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 294593) 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

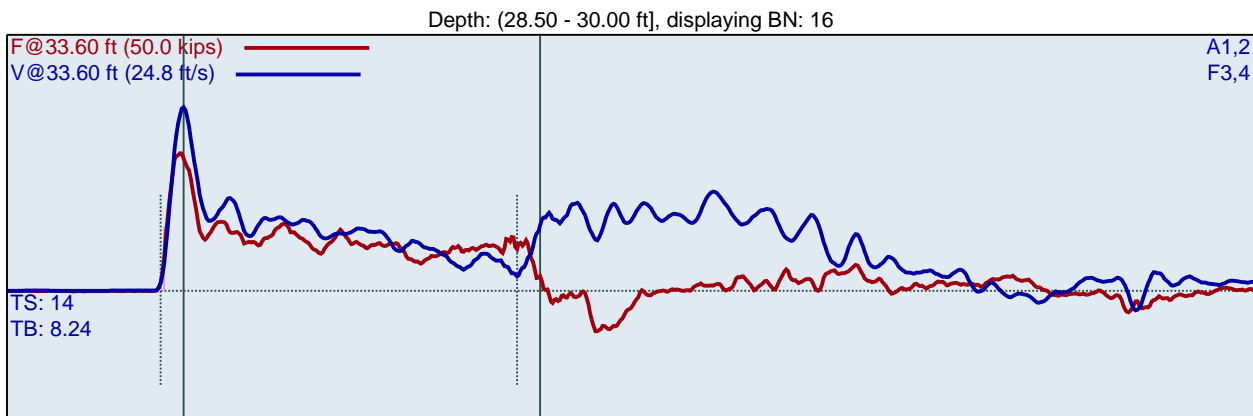


CME 550X (SN 294593)  
REK  
B-1

B-1  
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	%
28.67	1	3	61.3	28.2	17.7	2.0	25.0	2.0	296.2	84.6
28.83	2	3	56.1	28.3	18.4	2.0	25.1	2.0	314.9	90.0
29.00	3	3	56.9	28.5	18.4	2.0	25.2	2.0	317.3	90.7
29.08	4	6	58.7	28.7	18.6	1.2	25.4	1.0	310.7	88.8
29.17	5	6	59.0	28.7	18.5	1.2	25.4	1.0	320.5	91.6
29.25	6	6	58.8	28.8	18.7	1.2	25.5	1.0	328.6	93.9
29.33	7	6	59.1	29.1	18.4	1.1	25.7	1.0	311.1	88.9
29.42	8	6	58.9	29.0	18.3	1.1	25.7	1.0	310.6	88.8
29.50	9	6	59.4	29.1	18.3	1.0	25.8	1.0	318.2	90.9
29.56	10	9	59.2	28.8	18.3	0.9	25.4	0.7	318.6	91.0
29.61	11	9	59.1	28.1	17.9	0.8	24.9	0.7	315.6	90.2
29.67	12	9	59.5	28.1	18.1	0.9	24.9	0.7	318.1	90.9
29.72	13	9	59.0	28.2	18.0	0.8	24.9	0.7	314.6	89.9
29.78	14	9	59.4	27.9	18.0	0.9	24.7	0.7	331.4	94.7
29.83	15	9	59.2	27.7	18.3	0.8	24.5	0.7	325.5	93.0
29.89	16	9	59.6	26.9	17.8	0.8	23.8	0.7	318.9	91.1
29.94	17	9	59.0	27.0	17.9	0.7	23.9	0.7	322.3	92.1
30.00	18	9	59.5	27.2	17.8	0.7	24.1	0.7	312.8	89.4
Average			59.2	28.2	18.2	0.9	25.0	0.8	318.5	91.0
Std Dev			0.3	0.7	0.3	0.2	0.6	0.2	6.2	1.8
Maximum			59.6	29.1	18.7	1.2	25.8	1.0	331.4	94.7
Minimum			58.7	26.9	17.8	0.7	23.8	0.7	310.6	88.8

N-value: 15

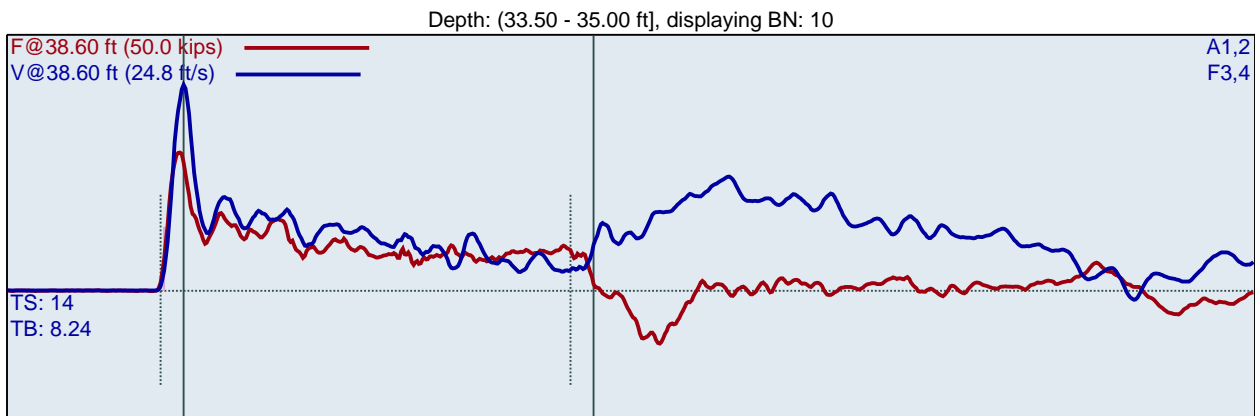
Sample Interval Time: 17.36 seconds.

CME 550X (SN 294593)  
REK  
B-1

B-1  
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 %
33.75	1	2	1.9	26.2	17.4	3.0	23.2	3.0	287.1	82.0
34.00	2	2	48.1	26.7	18.6	3.0	23.6	3.0	321.2	91.8
34.13	3	4	52.3	27.1	18.6	1.5	24.0	1.5	285.7	81.6
34.25	4	4	52.3	26.5	18.4	1.5	23.5	1.5	299.0	85.4
34.38	5	4	54.1	26.9	19.2	1.5	23.8	1.5	298.6	85.3
34.50	6	4	55.3	27.1	19.8	1.5	24.0	1.5	296.8	84.8
34.58	7	6	56.3	26.7	20.0	1.1	23.7	1.0	300.1	85.7
34.67	8	6	55.6	27.2	19.6	1.1	24.1	1.0	299.6	85.6
34.75	9	6	55.8	26.8	19.7	1.1	23.7	1.0	300.6	85.9
34.83	10	6	55.8	27.0	19.9	1.1	23.9	1.0	305.7	87.3
34.92	11	6	56.0	26.3	20.3	1.1	23.2	1.0	311.8	89.1
35.00	12	6	55.8	26.4	20.0	1.0	23.3	1.0	307.0	87.7
Average			54.9	26.8	19.6	1.3	23.7	1.2	300.5	85.9
Std Dev			1.4	0.3	0.6	0.2	0.3	0.2	6.6	1.9
Maximum			56.3	27.2	20.3	1.5	24.1	1.5	311.8	89.1
Minimum			52.3	26.3	18.4	1.0	23.2	1.0	285.7	81.6

N-value: 10

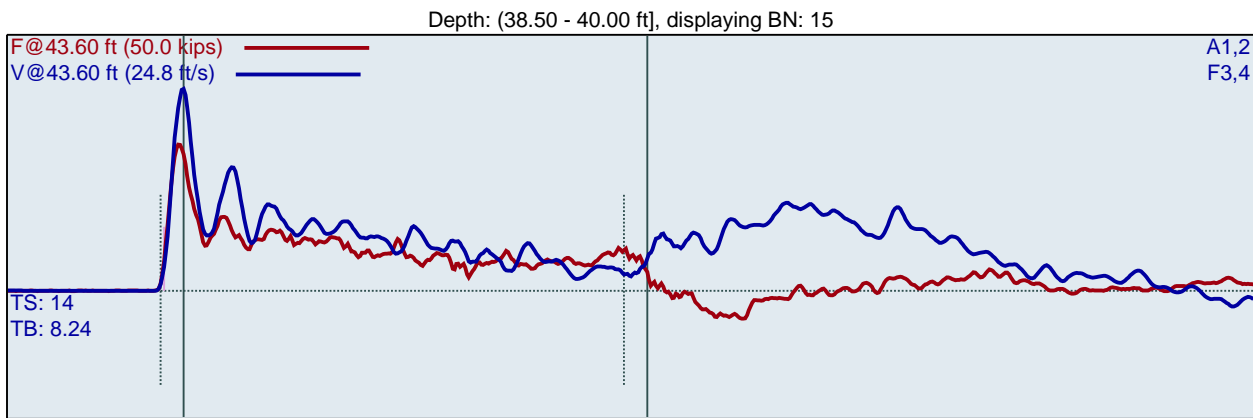
Sample Interval Time: 12.20 seconds.

CME 550X (SN 294593)  
REK  
B-1

B-1  
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 %
38.67	1	3	1.9	27.7	19.3	2.5	24.5	2.0	320.5	91.6
38.83	2	3	50.9	27.5	19.5	2.1	24.4	2.0	310.0	88.6
39.00	3	3	52.4	27.8	19.9	2.2	24.6	2.0	322.8	92.2
39.10	4	5	54.3	27.1	20.2	1.8	24.0	1.2	317.2	90.6
39.20	5	5	54.4	26.9	20.9	1.6	23.8	1.2	315.5	90.1
39.30	6	5	55.1	26.9	19.4	1.5	23.8	1.2	316.1	90.3
39.40	7	5	56.5	26.7	20.8	1.3	23.7	1.2	324.6	92.7
39.50	8	5	56.3	26.8	20.5	1.3	23.7	1.2	323.6	92.5
39.56	9	9	56.7	26.9	20.2	1.1	23.8	0.7	318.2	90.9
39.61	10	9	55.9	27.1	20.1	1.0	24.0	0.7	325.1	92.9
39.67	11	9	56.5	27.4	20.0	1.0	24.2	0.7	324.0	92.6
39.72	12	9	56.2	27.5	20.0	0.9	24.4	0.7	324.4	92.7
39.78	13	9	56.9	27.6	19.5	0.8	24.5	0.7	315.7	90.2
39.83	14	9	56.5	28.3	19.5	0.9	25.0	0.7	325.3	92.9
39.89	15	9	56.4	28.5	19.6	0.8	25.3	0.7	320.5	91.6
39.94	16	9	56.5	28.2	19.8	0.9	24.9	0.7	319.8	91.4
40.00	17	9	56.5	27.9	19.1	0.8	24.7	0.7	305.9	87.4
Average			56.1	27.4	20.0	1.1	24.3	0.9	319.7	91.3
Std Dev			0.8	0.6	0.5	0.3	0.5	0.3	5.3	1.5
Maximum			56.9	28.5	20.9	1.8	25.3	1.2	325.3	92.9
Minimum			54.3	26.7	19.1	0.8	23.7	0.7	305.9	87.4

N-value: 14

Sample Interval Time: 17.34 seconds.

**Summary of SPT Test Results**

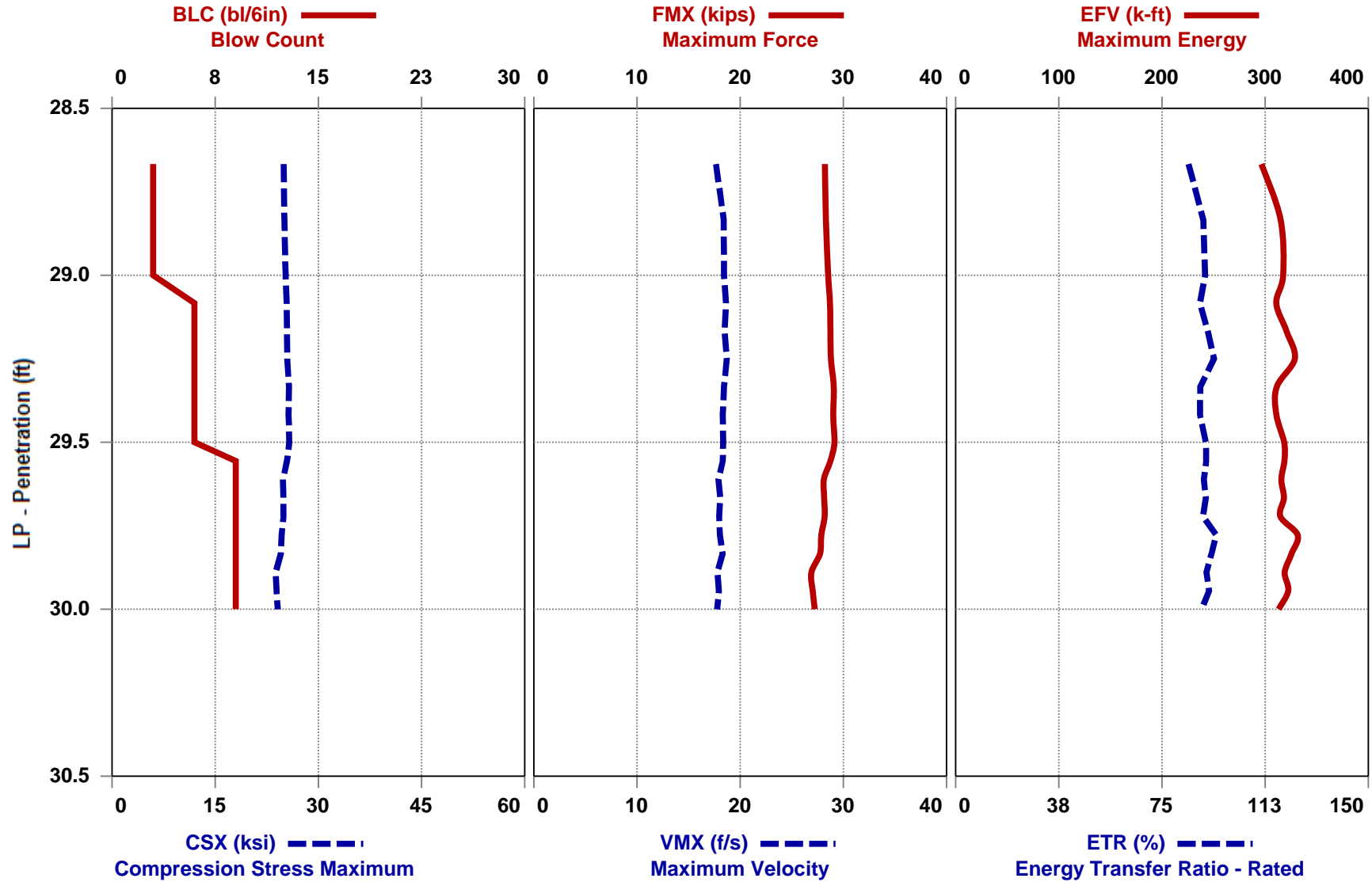
Project: CME 550X (SN 294593), Test Date: 4/12/2024

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	3-6-9	15	22	59.2	28.2	18.2	0.9	25.0	0.8	318.5	91.0
38.60	33.50	35.00	2-4-6	10	14	54.9	26.8	19.6	1.3	23.7	1.2	300.5	85.9
43.60	38.50	40.00	3-5-9	14	20	56.1	27.4	20.0	1.1	24.3	0.9	319.7	91.3
Overall Average Values:						57.0	27.6	19.2	1.1	24.4	0.9	314.3	89.8
Standard Deviation:						2.0	0.8	0.9	0.3	0.7	0.3	10.1	2.9
Overall Maximum Value:						59.6	29.1	20.9	1.8	25.8	1.5	331.4	94.7
Overall Minimum Value:						52.3	26.3	17.8	0.7	23.2	0.7	285.7	81.6



CME 550X (SN 294593) - 28.5 TO 30.0

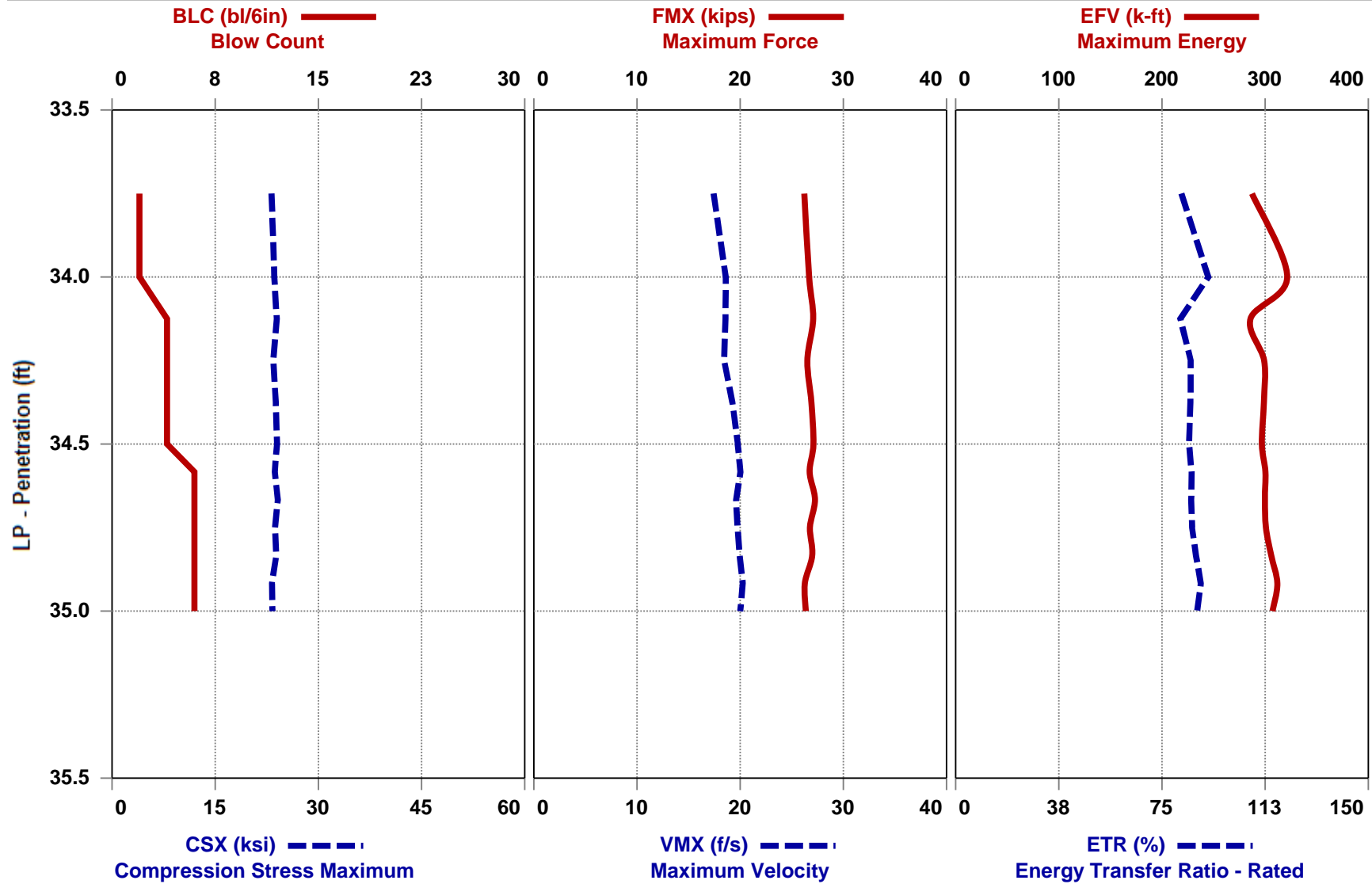
B-1





CME 550X (SN 294593) - 33.5 TO 35.0

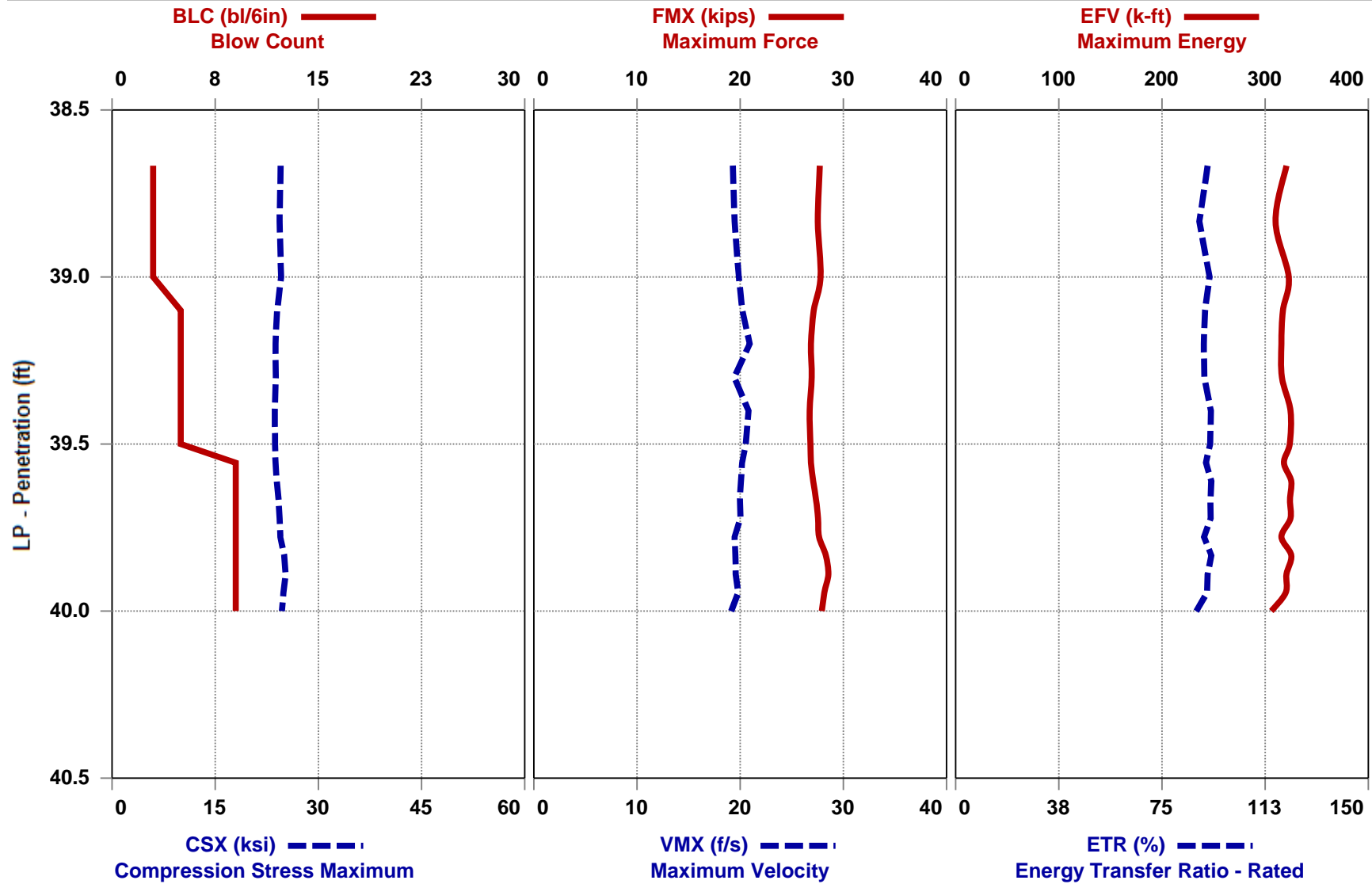
B-1

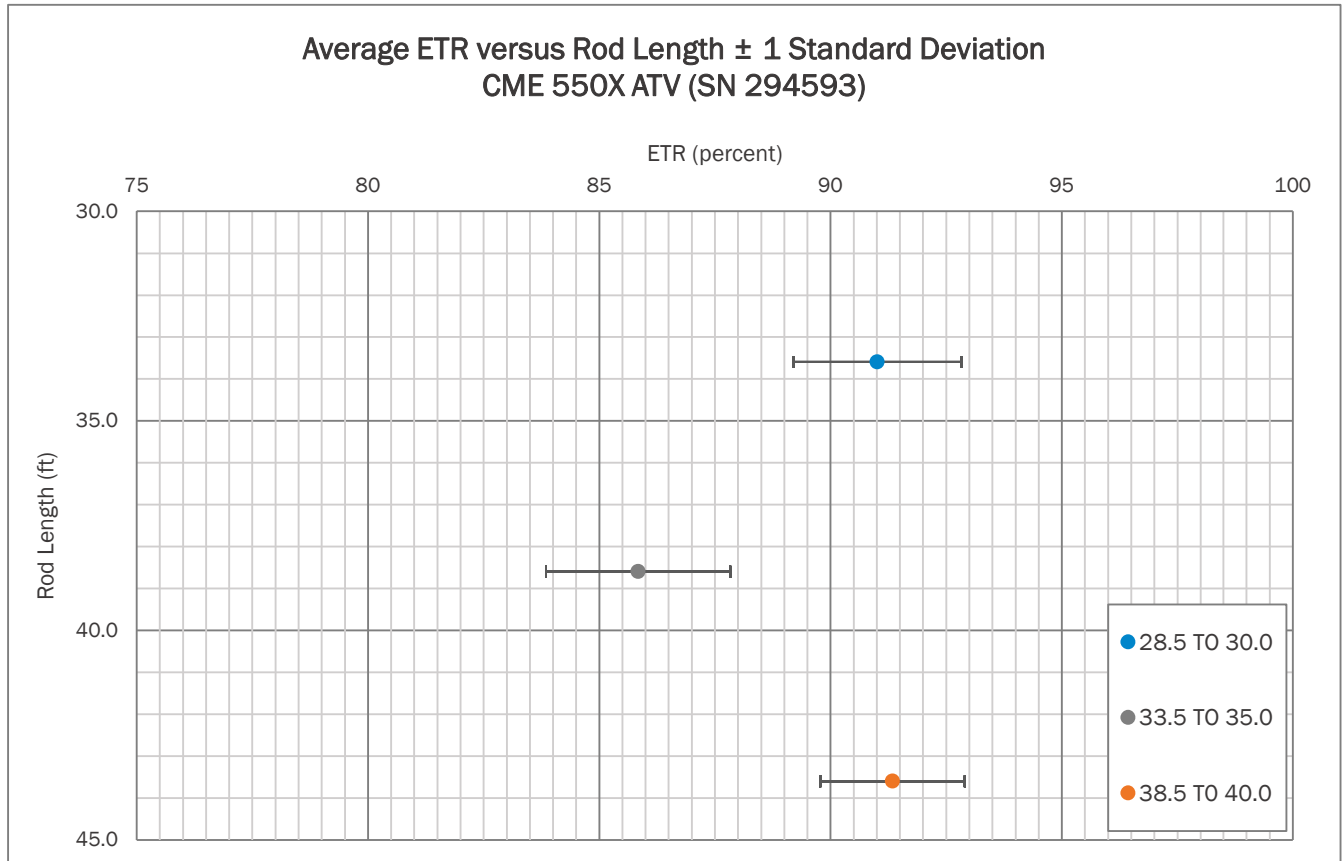
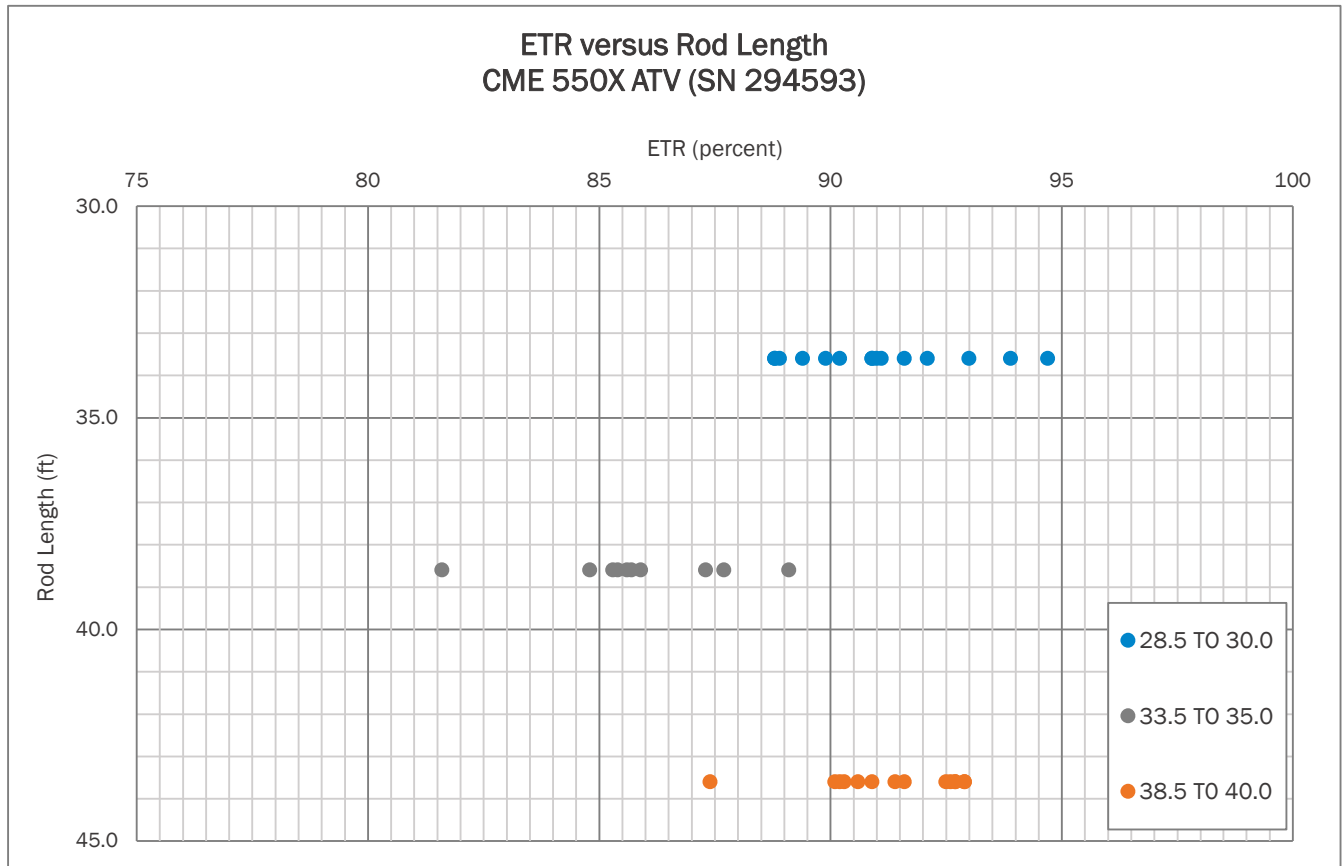




CME 550X (SN 294593) - 38.5 TO 40.0

B-1









## APPENDIX II

# SPT Hammer Energy Field Form

**Project:** SPT HAMMER ENERGY  
**Project No.:** 240021095  
**Boring No.:** B-1

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

## On-site Personnel

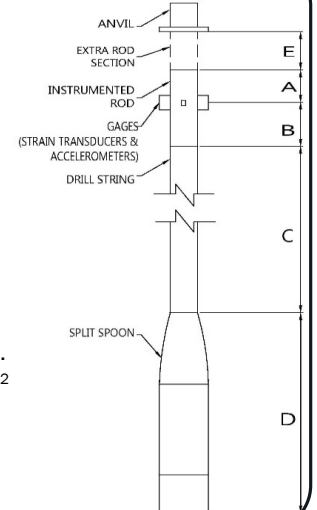
Drilling Company: BRECCIA CONSTRUCTION, LLC  
 Rig Operator: L. GUEMPEL  
 Engr/Geologist: N/A  
 Client Rep.: N/A  
 Analyzer Oper.: R. KRAL

## Rig/Hammer Info

Drill Rig Make/Model: CME 550X  
 Carrier Type: ATV  
 Rig Serial No.: 294593  
 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	0820/0821	30	33.6	59	3	6	9	15	Y	SA SI
12-Apr	33.5 TO 35.0	0825/0825	35	38.6	55	2	4	6	10	Y	SA SI
12-Apr	38.5 TO 40.0	0832/0832	40	43.6	56	3	5	9	14	Y	SA SI

## Notes:

TESTING PERFORMED AT 1817 LOWRYS HIGHWAY IN CHESTER, SOUTH CAROLINA (CHESTER COUNTY). THE APPROXIMATE COORDINATES ARE 34.7704428, -81.2454626.

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

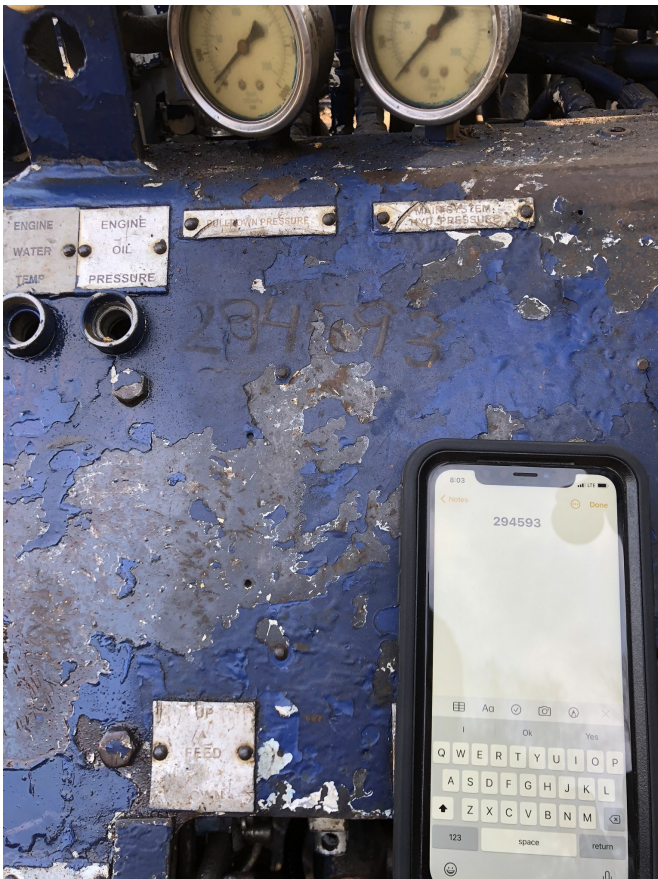


Figure No. 3: Serial Number Plate



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*



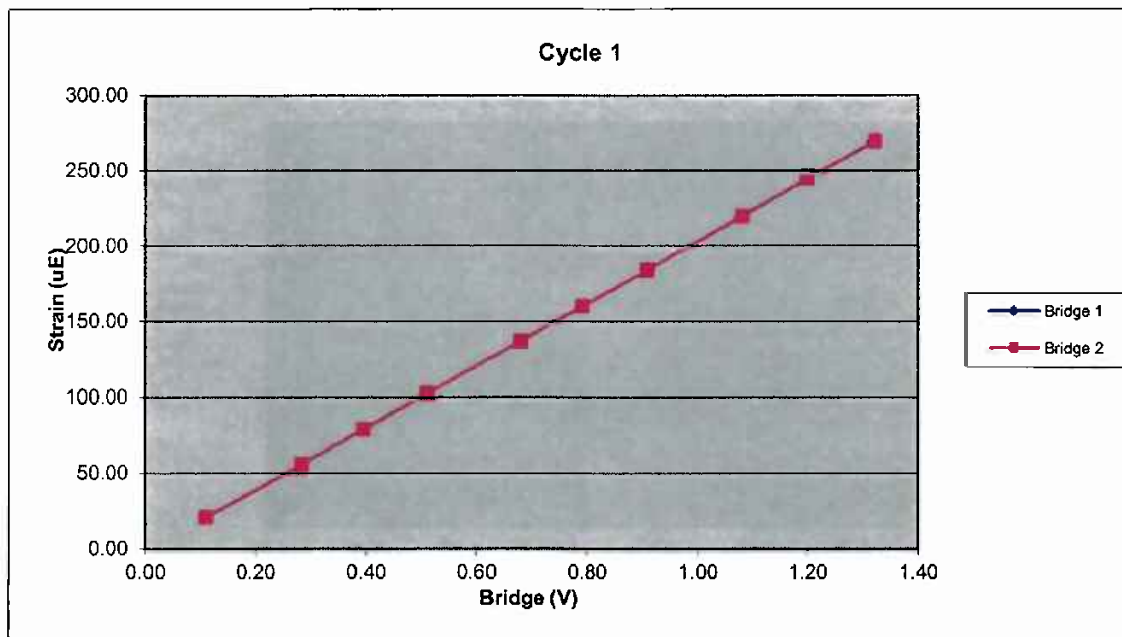
Pile Dynamics, Inc.  
30725 Aurora Road  
Cleveland, Ohio 44139 USA



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

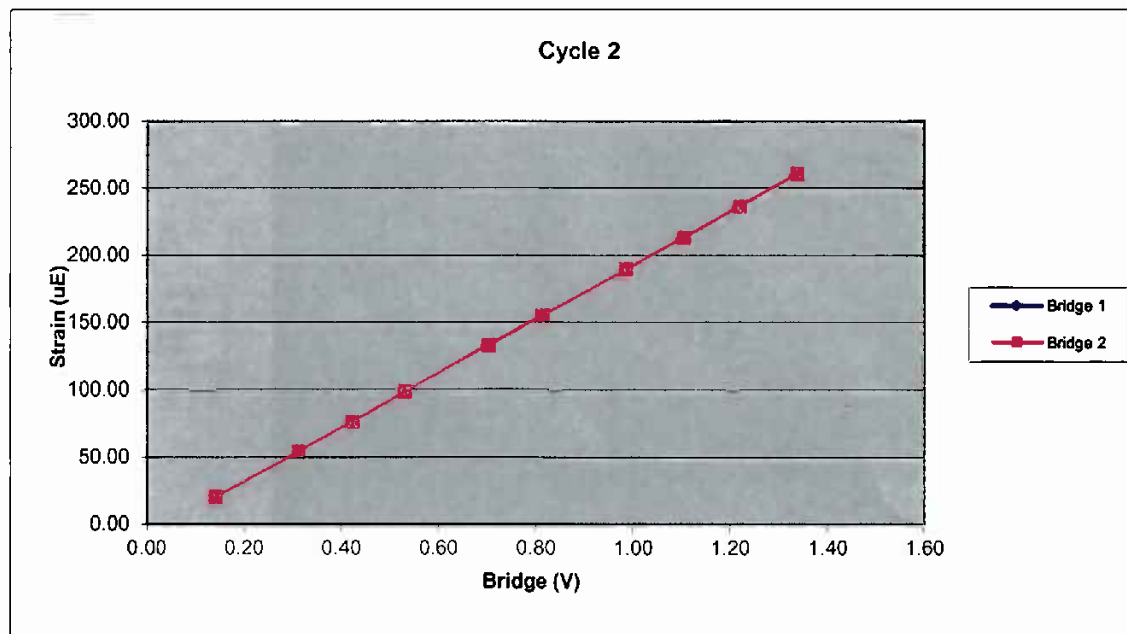
Force Strain Calibration	
EA (Kips)	35735.87
Offset	59.29
Correlation	0.999995



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

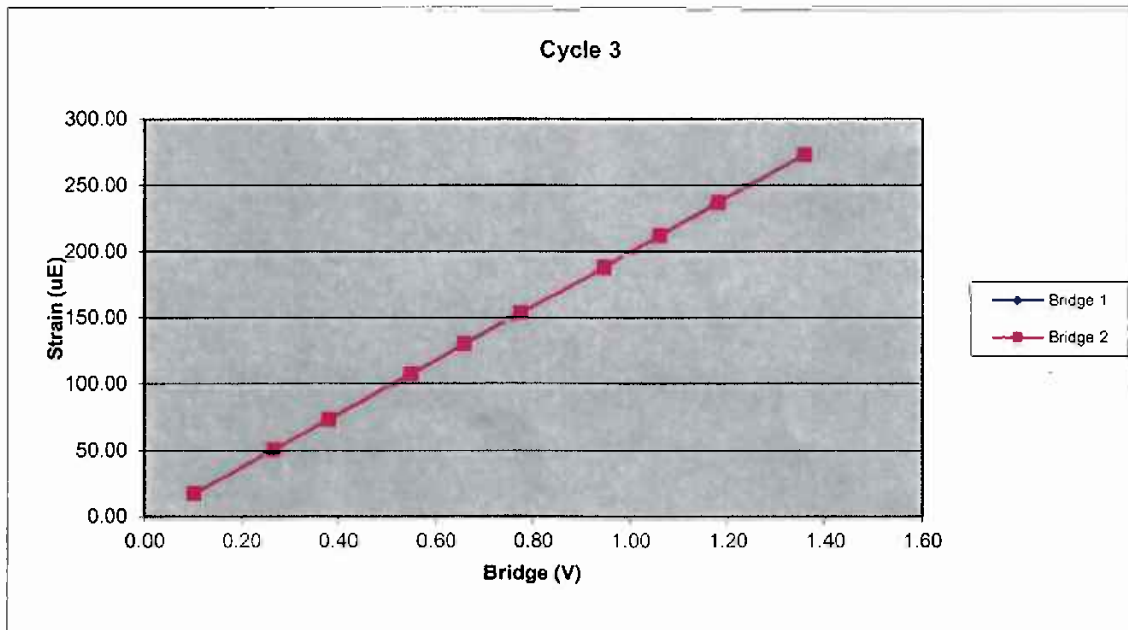




528AWJ		Cycle 3		
Sample	Force (lb)	Strain ( $\mu\text{E}$ )	Bridge 1 (V)	Bridge 2 (V)
1	0.00	0.00	0.00	0.00
2	734.68	18.74	0.10	0.10
3	1943.58	51.94	0.26	0.26
4	2781.29	75.07	0.38	0.38
5	4027.81	108.88	0.55	0.55
6	4829.55	131.78	0.66	0.66
7	5689.29	155.36	0.77	0.77
8	6956.49	190.12	0.95	0.95
9	7799.46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

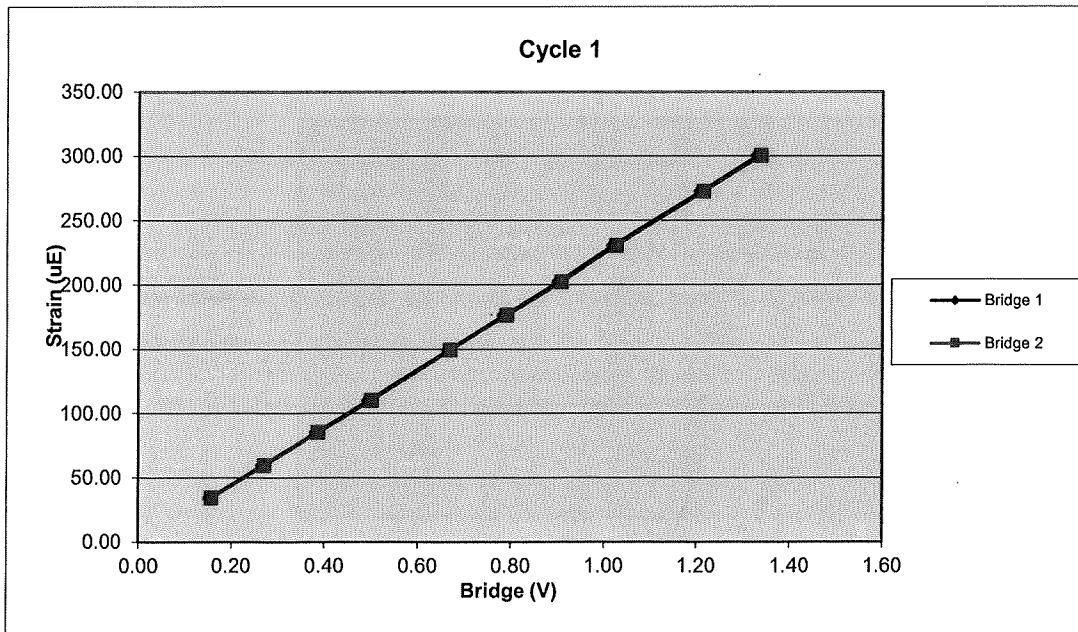
Pile Dynamics Inc  
30725 Aurora Rd  
Solon, OH 44139

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

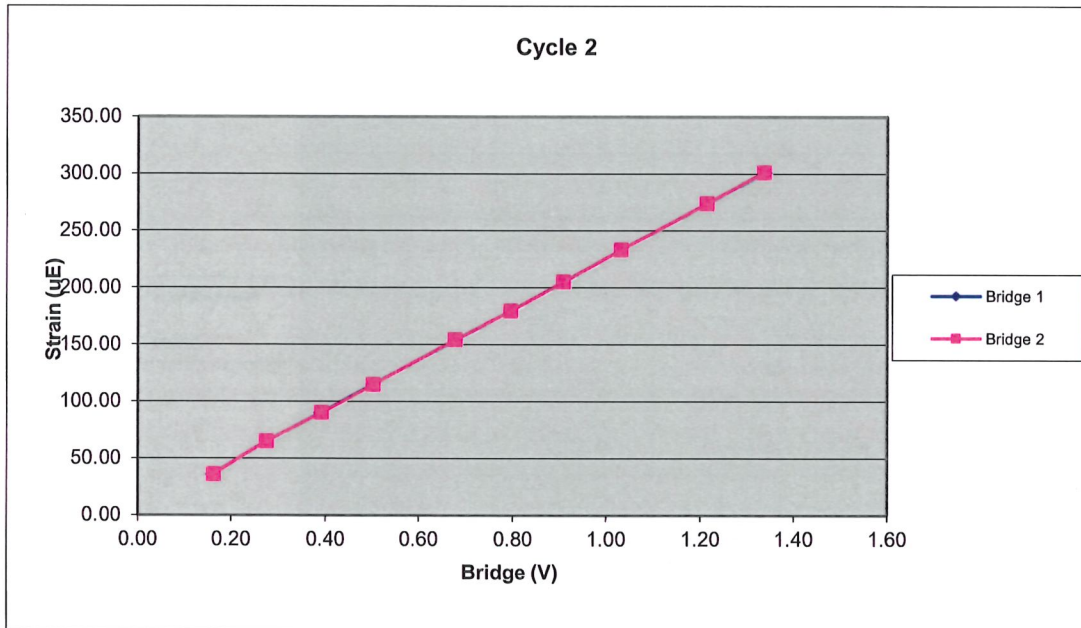
Force Strain Calibration	
EA (Kips)	33548.47
Offset	63.54
Correlation	0.999983



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

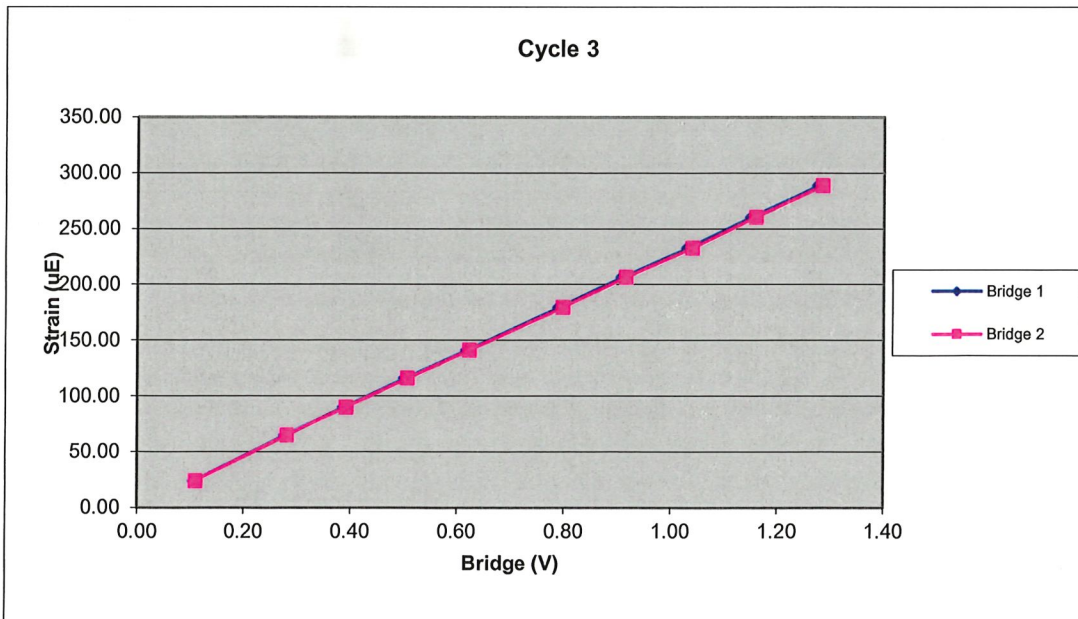
Force Strain Calibration	
EA (Kips)	33843.24
Offset	-37.68
Correlation	0.999950



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 Bonner  
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]

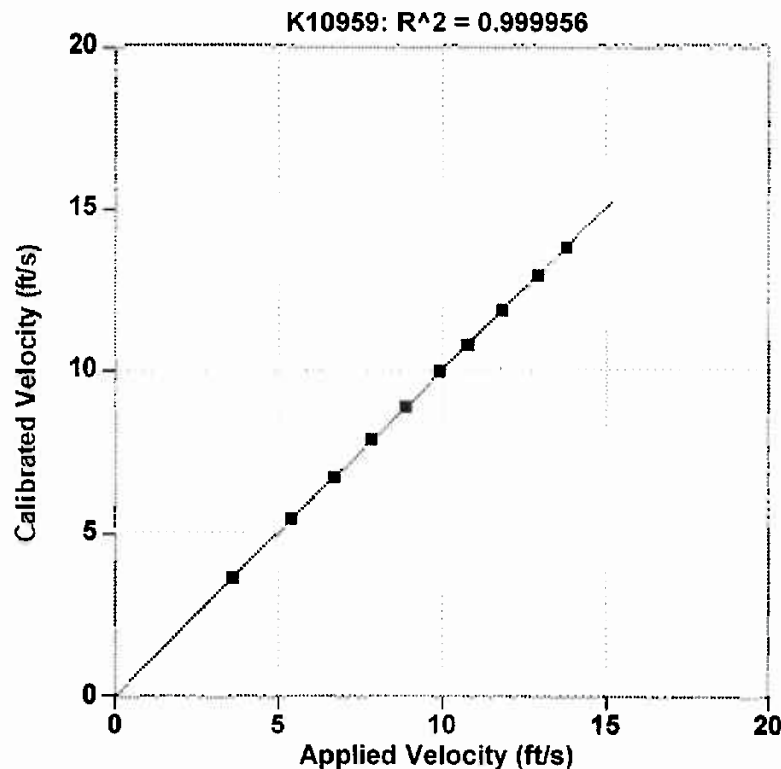
Operator: William Johnson

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

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

  
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]

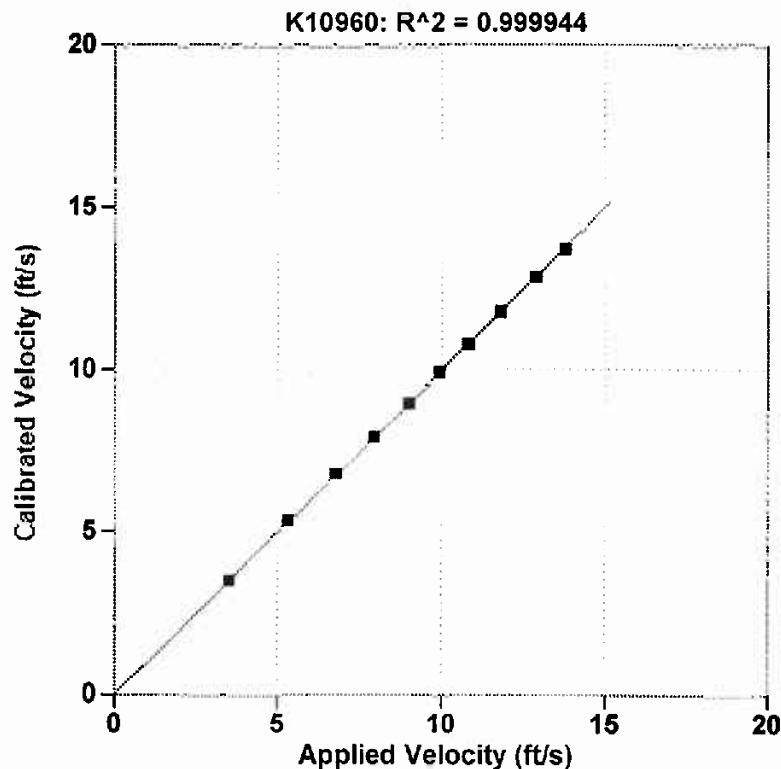
Operator: William Johnson

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

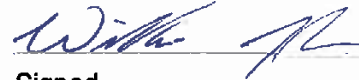
(81.9  $\mu$ v/g)

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

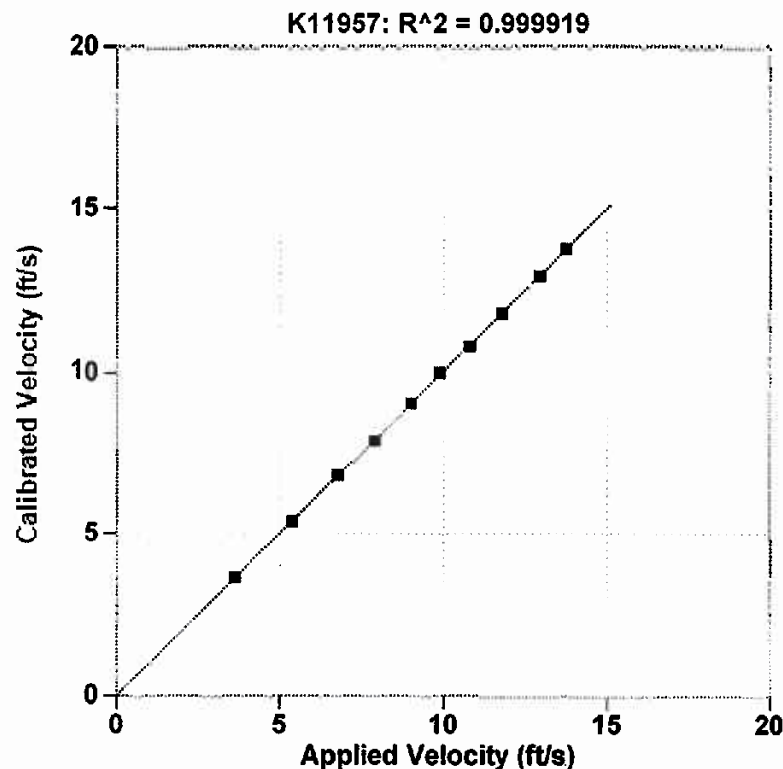
Operator: William Johnson

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

# **S-38-634 over Cooper Swamp**

## **Geotechnical Subsurface Data Report**

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# **APPENDIX**

## **SECTION 8      GEOSCOPING FORM**



# GeoScoping Form

PROJECT INFORMATION	
Project ID: 67100.009 Task 00040	Date of Trip: 1-17-2025
County: Orangeburg County	Location: Farmlands NE of Cape, SC & SW of Cordova, SC
Rd/Route: S-38-634	Local Name: Deer Trail Road
Attendees: Benjamin Vogel	

EXISTING BRIDGE INFORMATION	
Bridge Length: ~6.5m (~21 ft) per Google Earth	Bridge Width: ~8m (~26' per Earth), on-site looked like two 3'-4' margins on a 20' wide road so 8m makes sense...
Superstructure Type:	Substructure Type:
Begin Bridge Sta.:	End Bridge Sta.:
Begin Bridge Embankment Sta. <sup>1</sup> :	End Bridge Embankment Sta. <sup>1</sup> :
Structure Number:	Posted Weight Limit: None observed/present
Crossing: Snake Swamp	Skew: Road is ~10° skew to creek on Earth
Latitude: 33.40166°	Longitude: -80.98469°
Existing Fill Height:	Approximate Existing Slope Angle:

<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.:	Begin Bridge Embankment Sta. <sup>1</sup> :
Accessibility Issues: NW-side: car-accessible until drop-off, side is too swampy & needs manual trekking if not marshy & SE-side: car-accessible until drop-off & sandy enough on side to support ATV but not car	
Ground Cover: NW-side: Agri. fields into woods into paper swamp; SE-side: Agri. fields → woods → sandy beach plain → swamp creek	
Existing Fill Height:	Approximate Existing Slope Angle: -10° to -60°
Local Development (undeveloped, developed residential, developed commercial, developed industrial, etc.): Semi-dev agri. & res.	
Topography (level, flat, rolling, steep, hillside, valley, swamp, gully, etc.): Flat into swamp on both NW & SE sides	
Traffic Control Necessary (Y/N): No - road already closed due to chasm	
Surface Soil:	Muck (Y/N):
Exposed Rock (Y/N): No	In Stream Bed (Y/N): Yes, possible when intact
Wetlands On-Site (Y/N): Embankment in swamp, yes	Wetlands Adjacent (Y/N): Yes, swamp all around
Depth EG to Water: NW-side: ~6-7.5'; SE-side: ~7-7.5'	Water Depth: NW-side: 0.5-4'; SE-side: 0.5-1.5'-ish
Depth to Existing Ground: NW-side: 2' to rubble pile, 5-6' to sand; SE-side: 5' to sand pile, ~6-6.5' to ground/shore	
Scour Condition at EB: Catastrophic	Scour Condition at IB: Catastrophic
End Bridge Embankment Sta. <sup>1</sup> :	End Project Sta.:
Accessibility Issues: NW-side: car-accessible until drop-off, need manual trekking if not marshy & SE-side: car-accessible until drop-off but the side is more walkable, solid & ATV friendly in the sand	
Ground Cover: NW & SE sides: Agri. fields into wooded brush into swamp; SE-side has sandy beach plain area on swamp edge	
Existing Fill Height:	Approximate Existing Slope Angle: (40°-65° on wall, 5-25° on shore)
Local Development (undeveloped, developed residential, developed commercial, developed industrial, etc.): Semi-dev agri. & res.	
Topography (level, flat, rolling, steep, hillside, valley, swamp, gully, etc.): Flat into swamp on both NW & SE sides	
Traffic Control Necessary (Y/N): No, road already closed due to chasm	
Surface Soil:	Muck (Y/N):
Exposed Rock (Y/N): No	In Stream Bed (Y/N): Possible when intact
Wetlands On-Site (Y/N): Embankment in swamp, yes	Wetlands Adjacent (Y/N): Yes, swamp all around to
Depth EG to Water: NW-side: 7-7.5' ish; SE-side: 7-8' ish	Water Depth: NW-side: ~1-4'; SE-side: ~0-3'
Depth to Existing Ground: NW-side: 3' to debris pile, ~6-6.5' to shore; SE-side: 3.5' to debris pile, ~6' to shore	
Scour Condition at EB: Catastrophic	Scour Condition at IB: Catastrophic

\* Dirt piles both sides = B-2 side surmountable by car, B-1 side requires ATV



## GeoScoping Form

UTILITIES INFORMATION
Attached: <i>None observed</i>
Above Ground/ Overhead: <i>On NW side: adjacent-running power lines + poles - appears undamaged</i>
Underground: <i>On SE-side: adjacent-running now-exposed pipe (possibly water? by virtue of blue paint in prior buried area)</i>

COMMENTS
<p><i>This culvert is destroyed and mirrors Robert's Swamp in appearance of destruction. It is, however, *less* destroyed w/ only one visible exposed/uprooted utility + power lines still intact. This is probably just because it is smaller + has less to destroy.</i></p> <p><i>On <sup>Google</sup> Earth, much of this pipe, in retrospect, is already above water, running adjacent (not the blue paint section though)</i></p>

### 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.



SUBSURFACE TESTING DATA							
Boring ID	Test Type	Northing	Easting	Latitude	Longitude	Test Elevation (MSL)	Test Depth (ft)
B-1	STB	570605.760	2004674.830	33.40164380	-80.98468015	201.7	100.0
B-2	STB	570669.283	2004724.291	33.40181839	-80.98451804	201.6	100.0
P-1 <sup>1</sup>	STB	570347.625	2004358.752	33.40093440	-80.98571609	205.0	6.0
P-2 <sup>1</sup>	STB	570437.053	2004477.554	33.40118016	-80.98532672	203.2	6.0
P-3 <sup>1</sup>	STB	570543.127	2004583.025	33.40147168	-80.98498104	201.9	6.0
P-4 <sup>1</sup>	STB	570732.200	2004818.111	33.40199128	-80.98421055	201.5	6.0
P-5 <sup>1</sup>	STB	570835.534	2004927.144	33.40227527	-80.98385318	203.8	6.0
P-6 <sup>1</sup>	STB	570914.751	2005053.639	33.40249296	-80.98343860	206.0	6.0
1 = Bulk Soil Sample BS-1 was a composite sample created from the upper 6-ft. of auger cuttings from the specified boreholes							



LEGEND:



SOIL TEST BORING LOCATION

4			
3			
2			
1			
REV.	BY	DATE	DESCRIPTION OF REVISION
TOPO.		DATE	
DWG.	CTC	DATE 2.7.25	GROUP ____ - ____
R/W		DATE	



F&ME CONSULTANTS, INC.  
COLUMBIA, SC

S-38-634 OVER COOPER SWAMP  
ORANGEBURG COUNTY, SOUTH CAROLINA

BORING LOCATION PLAN

SCDOT PROJECT ID: P044270	FME JOB NO. G7100.009 Task 004
SCALE: 1" = 100'	FIGURE 2



## GeoScoping Form



**Pointing Southwest at B-1, Adjacent to Northwest side of Culvert**



**Pointing Northeast at B-2**



**Side Profile from B-2 Bank Pointing Northwest**



**Side Profile From B-2 Bank, Pointing South**



**Pointing Southwest from B-2 Bank, Adjacent to Southeast Side of Culvert**



**Pointing Southw from B-2 Bank, Adjacent to Southeast Side of Culvert (Blue Utility Pipe)**