



GEOTECHNICAL SUBSURFACE DATA REPORT

S-24-166 over Tributary to Henleys Creek
Greenwood 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: P043994

FME Project No.: G7100.007—Task 00004

November 7, 2024

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

Re: Geotechnical Subsurface Data Report
S-24-166 over Tributary to Henleys Creek
Greenwood County, South Carolina
SCDOT Project ID: P043994
FME Project No.: G7100.007 – Task 00004

Mr. Harris:

Submitted herein is F&ME Consultants, Inc.'s (FME) Geotechnical Subsurface Data Report for the S-24-166 over Tributary to Henleys Creek project. This report contains findings from our subsurface field exploration and laboratory testing program.

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

Respectfully Submitted,

F&ME CONSULTANTS, INC.

A handwritten signature in blue ink, appearing to read 'William A. Pitts'.

William A. Pitts, E.I.T.
Engineering Associate

A handwritten signature in blue ink, appearing to read 'Alex M. Abernethy'.

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

A handwritten signature in blue ink, appearing to read 'William J. Gieser'.

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

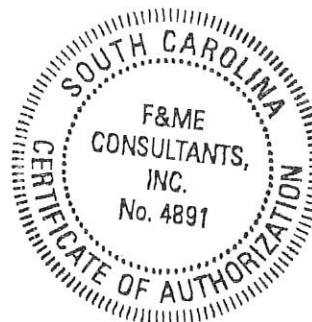


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1. INTRODUCTION

1.1. GENERAL

The project is located along S-24-166 (Tillman Territory Rd.) and is located approximately four and one half (4.5) miles south of Ninety-Six, South Carolina. We understand that this project will involve the demolition/removal of the existing bridge structure and the replacement with a new bridge structure on the existing roadway alignment. A Site Location Plan 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 October 18, 2024.

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 and rock samples collected from the Soil Test Borings and 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 October 21, 2024, through October 28, 2024, eight (8) Soil Test Borings were performed on site. Additionally, one (1) composite Bulk Soil Sample was created from auger cuttings encountered at Soil Test Borings P-2 and P-5. 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 45B trailer mounted drill rig. The measured energy transfer ratio was 86.4% utilizing an automatic hammer. SPT hammer calibration records are provided within Section 6 of the Appendix of this report. Soil Test Borings utilized Rotary Wash and Hollow Stem Auger drilling techniques to maintain a stable borehole. Borings were sampled continuously through the upper ten (10) feet, or to the termination depth, below the existing ground surface utilizing SPT testing.

Following the continuous sampling, SPT testing was performed on standard five (5) foot intervals thereafter. Once rollercone refusal was encountered within Soil Test Borings B-1 and B-2, NQ rock coring techniques were deployed to obtain rock core specimens for classification and laboratory testing purposes. 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.

Pavement core samples from each Soil Test Boring were bagged and transported to FME's laboratory following boring completion. These cores were measured and photographed to document thickness, distress, and surface condition. These photos are presented in Section 5 in the Appendix of this report.

Copies of the Soil Test Boring Logs are contained within Section 3 in the Appendix of this report. The following table is a summary of the Soil Test Boring depths, locations, and surface elevations.

Table 1 – Field Exploration Summary Table – Soil Test Borings

Test ID	Test Type	Soil Depth (ft)	Rock Core Depth (ft)	Total Boring Depth (ft)	Latitude	Longitude	Elevation (ft-MSL)
B-1	STB	72.8	20.5	93.3	34.10882773	-82.02251344	475.2
B-2	STB	62.2	20	82.2	34.10874526	-82.02230663	475.2
P-1	STB	2.2	--	2.2	34.10946735	-82.02358916	486.9
P-2	STB	2.3	--	2.3	34.10922805	-82.02323353	480.2
P-3	STB	2.2	--	2.2	34.10904186	-82.02283423	476.3
P-4	STB	2.3	--	2.3	34.10852528	-82.02198080	474.8
P-5	STB	2.2	--	2.2	34.10833472	-82.02156540	478.0
P-6	STB	2.3	--	2.3	34.10810052	-82.02119201	482.1
TOTALS		148.5	40.5	189.0			

2.2. BULK SOIL SAMPLES

One (1) composite Bulk Soil Sample, designated as BS-1@P-2/P-5, was created from the upper two (2) feet of auger trimmings encountered within Soil Test Borings P-2 and P-5. The following table is a summary of the Bulk Soil Sample's depths, locations, and surface elevations associated with its two (2) parent borehole locations.

Test ID	Test Type	Total Test Depth (ft)	Latitude	Longitude	Elevation (ft-MSL)
BS-1 @ P-2	STB/BS	2.0	34.10922805	-82.02323353	480.2
BS-1 @ P-5			34.10833472	-82.02156540	478.0
TOTALS		2.0			

2.3. GROUNDWATER

Groundwater depths were recorded at the time of boring (TOB) and twenty-four (24) hours following boring completion, where practical. 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 – Geotechnical Exploration Summary Table

Test ID	Test Type	Test Depth (ft)	Latitude	Longitude	Elevation (ft-MSL)
B-1	STB	93.3	34.10882773	-82.02251344	475.2
B-2	STB	82.2	34.10874526	-82.02230663	475.2
BS-1@P-2/P-5	STB	2.0	34.10922805	-82.02323353	480.2
			34.10833472	-82.02156540	478.0
P-1	STB	2.0	34.10946735	-82.02358916	486.9
P-2	STB	2.0	34.10922805	-82.02323353	480.2
P-3	STB	2.0	34.10904186	-82.02283423	476.3
P-4	STB	2.0	34.10852528	-82.02198080	474.8
P-5	STB	2.0	34.10833472	-82.02156540	478.0
P-6	STB	2.0	34.10810052	-82.02119201	482.1

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 Section 4C within the Appendix of this report.

Table 4 – Laboratory Testing Summary Table – Soil Test Boring Samples

Type of Test	Quantity	Procedure
Moisture Content	9	AASHTO T265 (ASTM D2216)
Atterberg Limits	9	AASHTO T89/T90 (ASTM D4318)
Grain-size Distribution w/ Wash 200	5	ASTM D6913/AASHTO T11 (ASTM D1140)
Hydrometer and Grain Size	4	ASTM D7928/ASTM D6913
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
Compressive Strength of Rock Cores	6	ASTM D7012

Laboratory testing performed on the Bulk Soil Sample is summarized in the table below. The 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	1	AASHTO T193 (ASTM D1883)

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APPENDIX

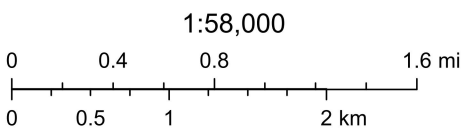
SECTION 1	SITE LOCATION PLAN
SECTION 2	BORING LOCATION PLAN
SECTION 3	SUBSURFACE EXPLORATION LOGS
SECTION 4	LABORATORY TEST RESULTS
SECTION 4A	SPLIT-SPOON SAMPLES
SECTION 4B	BULK SOIL SAMPLE
SECTION 4C	ROCK CORE SAMPLES
SECTION 5	PAVEMENT CORE PHOTOS
SECTION 6	SPT HAMMER CALIBRATION
SECTION 7	GEO-SCOPING FORM


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SECTION 1 SITE LOCATION PLAN





F&ME CONSULTANTS, INC.
COLUMBIA, SC

S-24-166 OVER TRIBUTARY TO HENLEYS CREEK
GREENWOOD COUNTY, SOUTH CAROLINA

SITE LOCATION PLAN

SCDOT PROJECT ID: P043994

FME JOB NO. G7100.007 Task 004

SCALE: AS NOTED

FIGURE 1

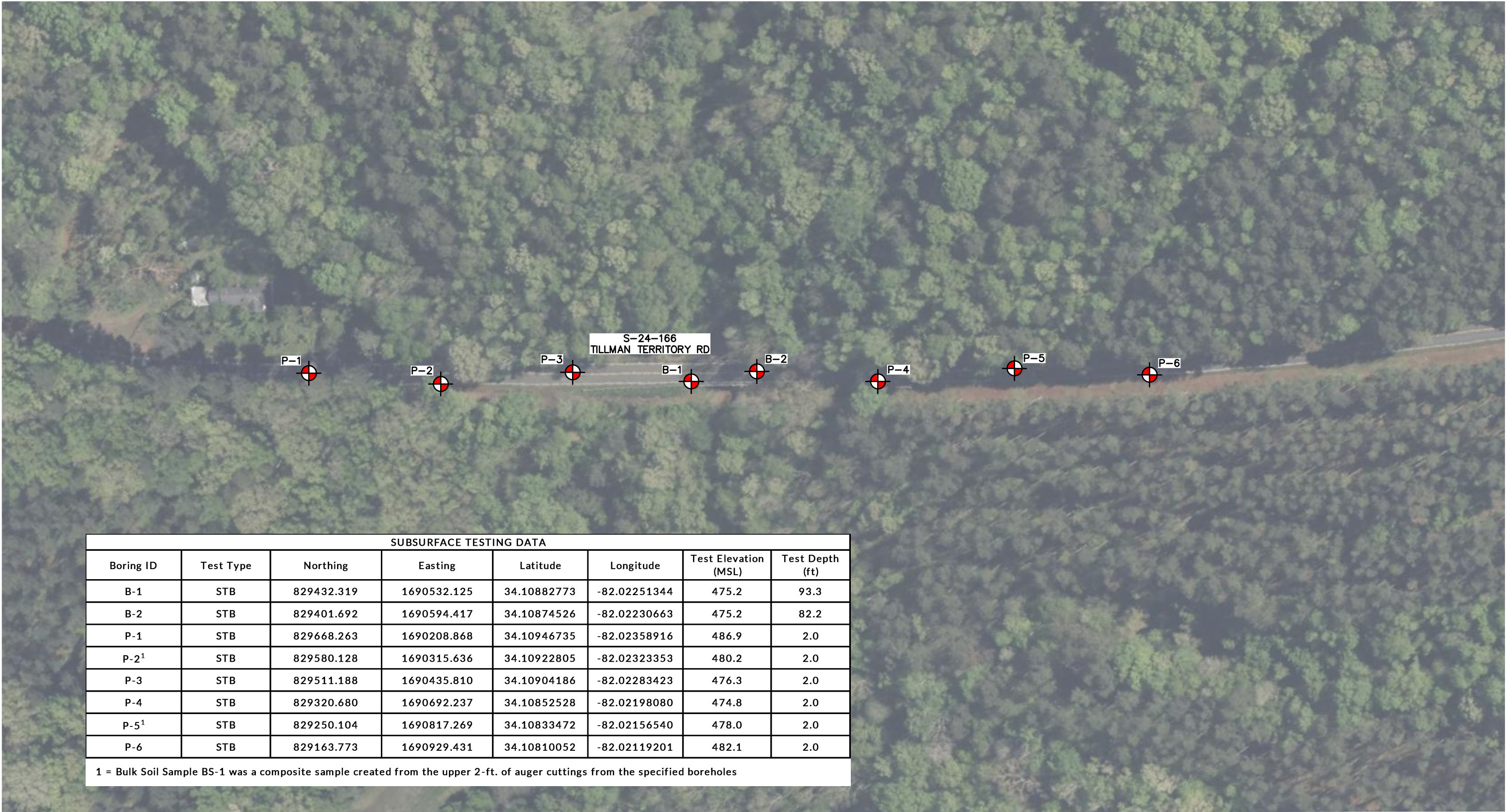
4			
3			
2			
1			
REV.	BY	DATE	DESCRIPTION OF REVISION
TOPO.		DATE	
DWG.	CTC	DATE 10.25.24	GROUP -- --
R/W		DATE	

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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	829432.319	1690532.125	34.10882773	-82.02251344	475.2	93.3
B-2	STB	829401.692	1690594.417	34.10874526	-82.02230663	475.2	82.2
P-1	STB	829668.263	1690208.868	34.10946735	-82.02358916	486.9	2.0
P-2 ¹	STB	829580.128	1690315.636	34.10922805	-82.02323353	480.2	2.0
P-3	STB	829511.188	1690435.810	34.10904186	-82.02283423	476.3	2.0
P-4	STB	829320.680	1690692.237	34.10852528	-82.02198080	474.8	2.0
P-5 ¹	STB	829250.104	1690817.269	34.10833472	-82.02156540	478.0	2.0
P-6	STB	829163.773	1690929.431	34.10810052	-82.02119201	482.1	2.0

1 = Bulk Soil Sample BS-1 was a composite sample created from the upper 2-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 10.25.24	GROUP ____ - ____
R/W		DATE	

 F&ME CONSULTANTS, INC.
COLUMBIA, SC

S-24-166 OVER TRIBUTARY TO HENLEYS CREEK
GREENWOOD COUNTY, SOUTH CAROLINA

BORING LOCATION PLAN

SCDOT PROJECT ID: P043994	FME JOB NO. G7100.007 Task 004
SCALE: 1" = 100'	FIGURE 2

S-24-166 over Tributary to Henleys Creek

Geotechnical Subsurface Data Report

APPENDIX

SECTION 3 SUBSURFACE EXPLORATION LOGS

Soil Test Boring Log Descriptors

Correlation of Penetration Resistance with Relative Density and Consistency














Coarse Grained Soils (Sands/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 ¾ inch
Coarse	¾ inch to 3 inch

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

Gravel	Sieve Size
Fines Content	< #200

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

SOIL CLASSIFICATION CHART

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

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS



Rock Description Legend

Discontinuity Type

F = Fault
J = Joint
Sh = Shear
Fo = Foliation
V = Vein
B = Bedding

Discontinuity Width (mm)

W = Wide (12.5 – 50)
MW = Moderately Wide
(2.5– 12.5)
N = Narrow (1.25 – 2.5)
VN = Very Narrow (<1.25)
T = Tight

Amount of Infilling

Su = Surface Stain
Sp = Spotty
Pa = Partially Filled
FI = Filled
No = None

Type of Infilling

Cl = Clay
Ca = Calcite
Ch = Chloride
Fe = Iron Oxide
Gy = Gypsum/Talc
H = Healed
No = None
Py = Pyrite
Qz = Quartz
Sd = Sand

Surface Shape of Joint

Wa = Wave
Pl = Planar
St = Stepped
Ir = Irregular

Discontinuity Spacing (ft)

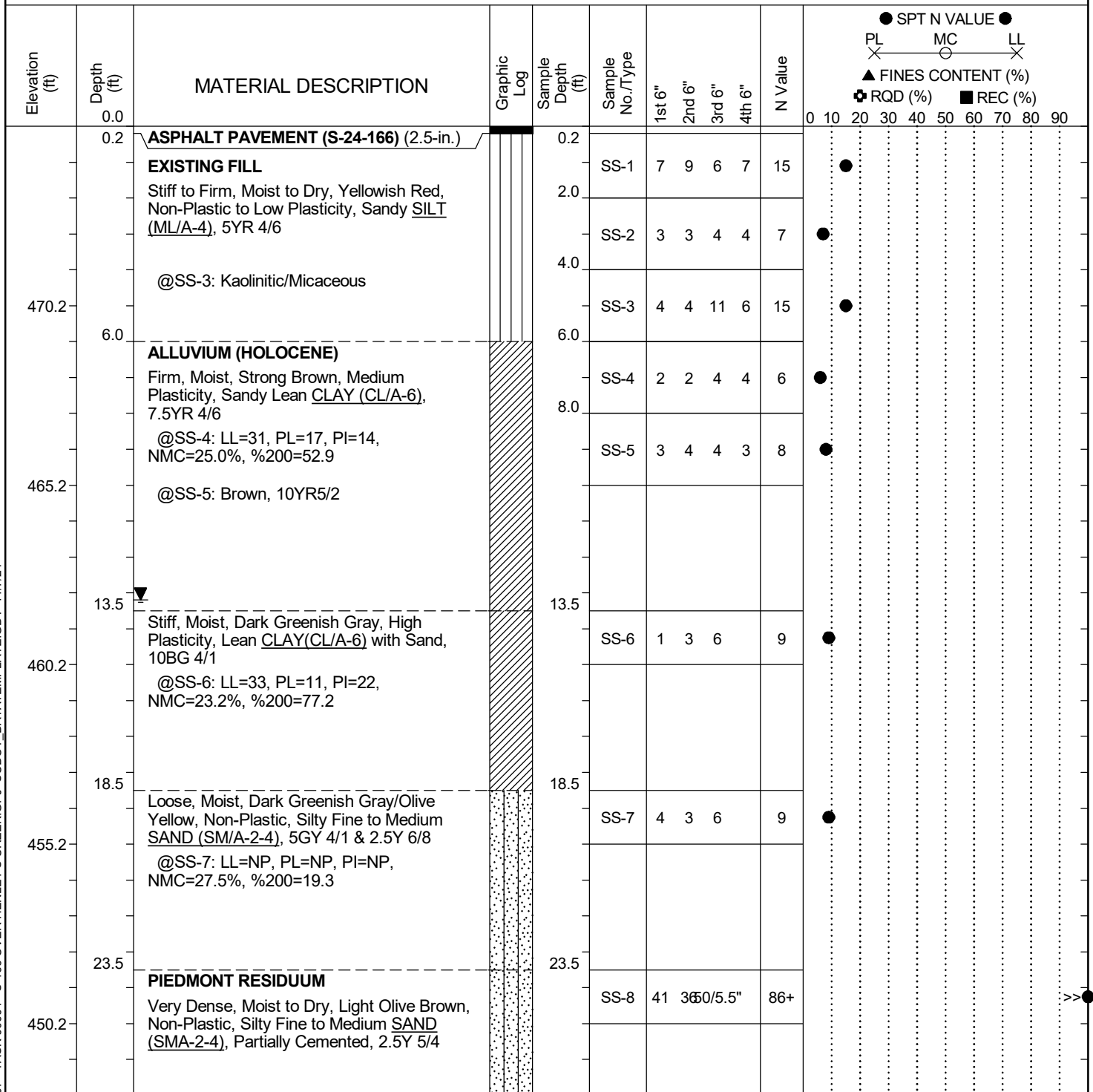
EW = Extremely Wide (>65)
W = Wide (22 – 65)
M = Moderate (7.5 – 22)
C = Close (2 – 7.5)
VC = Very Close (<2)

Roughness of Surface

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

SCDOT Soil Test Log

Project ID:	P043994	County:	Greenwood	Boring No.:	B-1
Site Description:	S-24-166 over Tributary to Henleys Creek			Route:	S-166
Eng./Geo.:	G. Cantelle/M. Miller	Boring Location:	N/A	Offset:	N/A
Elev.:	475.2 ft	Latitude:	34.10882773	Longitude:	-82.02251344
Date Started:	10/21/2024				
Total Depth:	93.3 ft	Soil Depth:	72.8 ft	Core Depth:	20.5 ft
Date Completed:	10/23/2024				
Bore Hole Diameter (in):	4	Sampler Configuration		Liner Required:	Y (N)
Liner Used:	Y (N)				
Drill Machine:	CME 45B	Drill Method:	RW/RC	Hammer Type:	Automatic
Energy Ratio:	86.4%				
Core Size:	NQ	Driller:	D. Harris	Groundwater:	TOB N/A
24HR	13.2 ft				



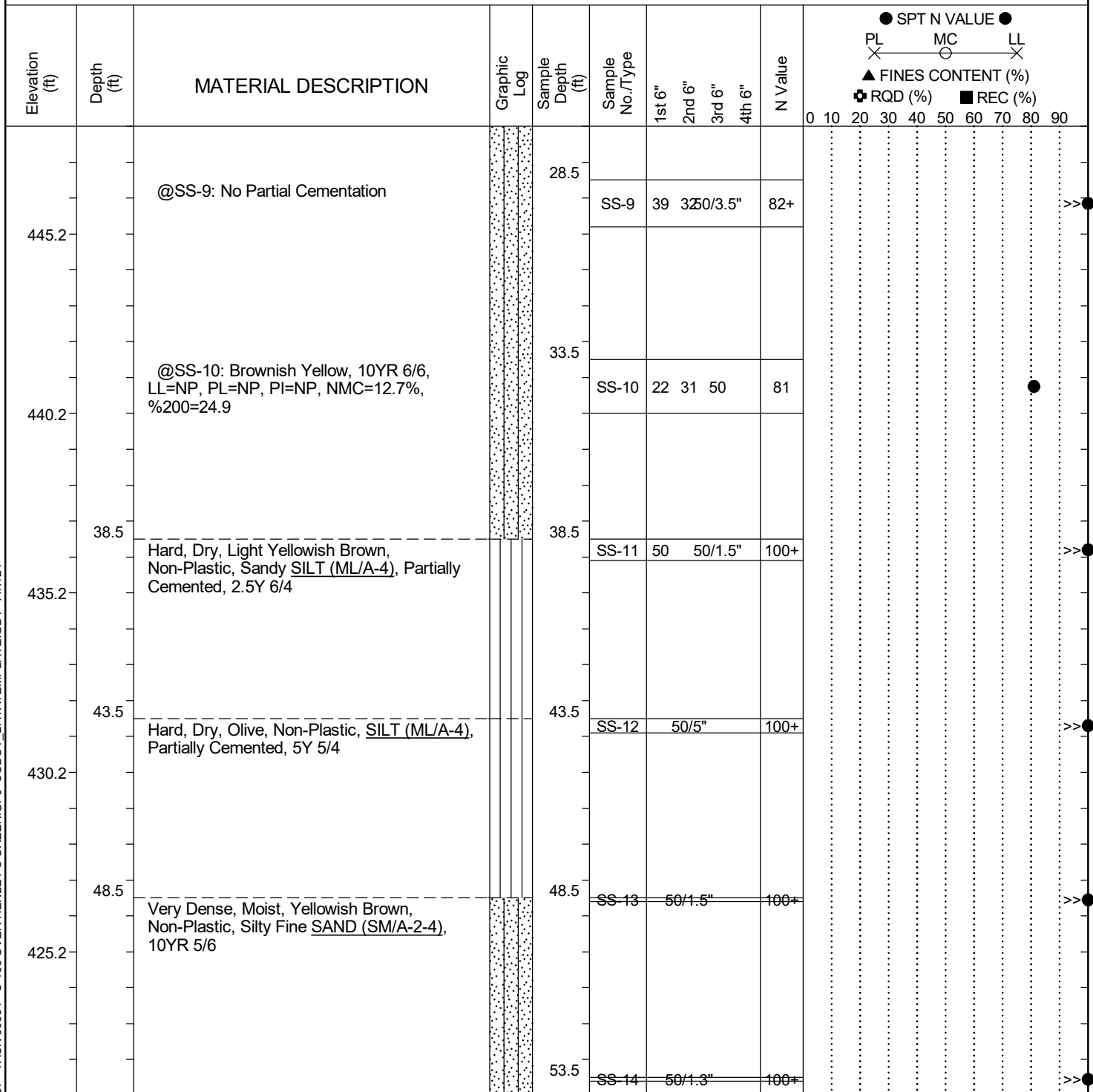
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SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving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

SCDOT Soil Test Log

Project ID:	P043994				County:	Greenwood		Boring No.:	B-1				
Site Description:		S-24-166 over Tributary to Henleys Creek						Route:	S-166				
Eng./Geo.:	G. Cantelle/M. Miller		Boring Location:			N/A		Offset:	N/A				
Alignment:									Existing CL				
Elev.:	475.2 ft		Latitude:	34.10882773		Longitude:	-82.02251344		Date Started:	10/21/2024			
Total Depth:	93.3 ft		Soil Depth:	72.8 ft		Core Depth:	20.5 ft		Date Completed:	10/23/2024			
Bore Hole Diameter (in):		4		Sampler Configuration			Liner Required:		Y (N)				
Liner Used:										Y (N)			
Drill Machine:	CME 45B		Drill Method:	RW/RC		Hammer Type:	Automatic			Energy Ratio:	86.4%		
Core Size:	NQ		Driller:	D. Harris		Groundwater:	TOB		N/A		24HR	13.2 ft	



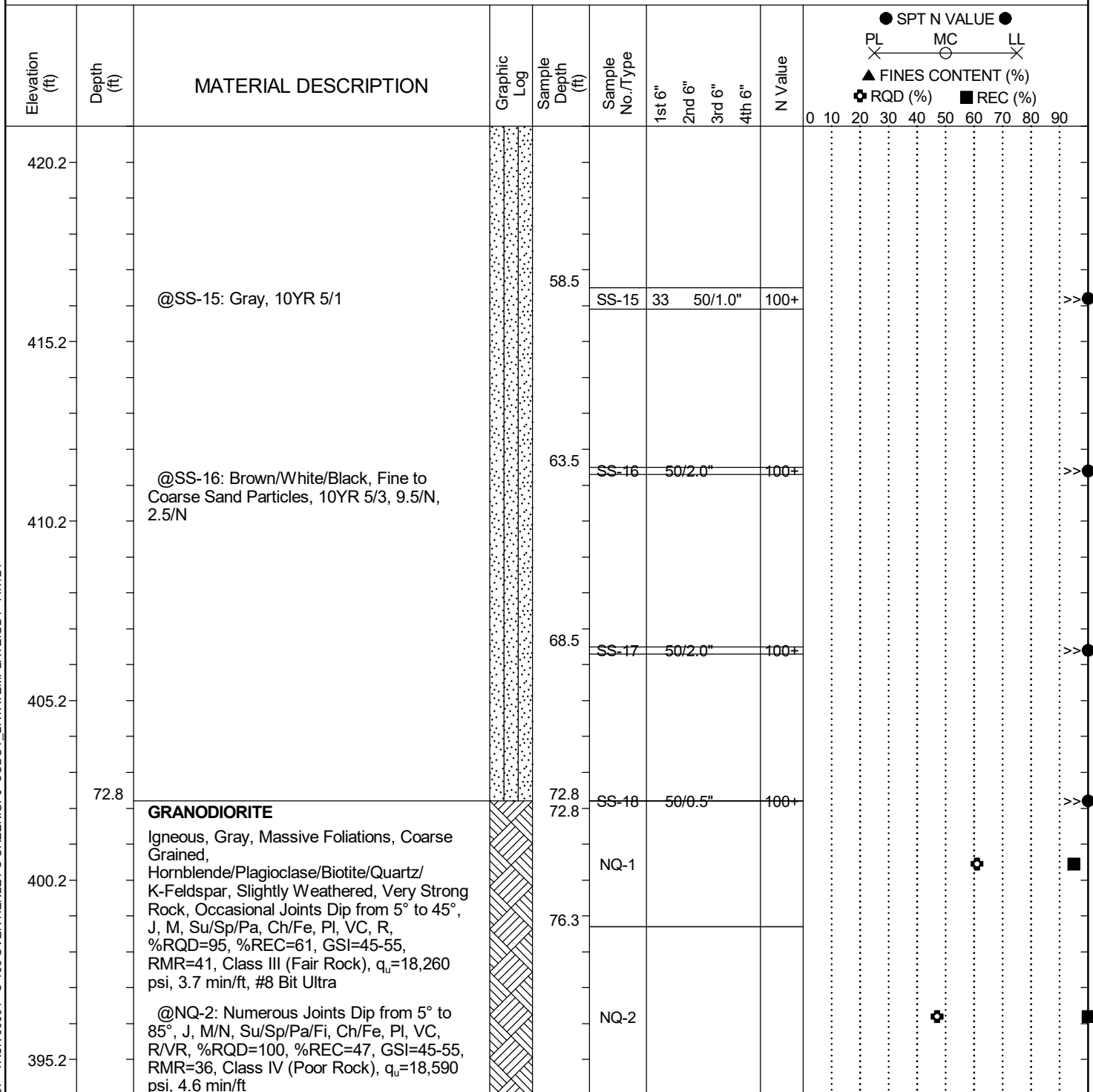
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SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving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

SCDOT Soil Test Log

Project ID:	P043994				County:	Greenwood		Boring No.:	B-1					
Site Description:		S-24-166 over Tributary to Henleys Creek							Route:	S-166				
Eng./Geo.:	G. Cantelle/M. Miller		Boring Location:			N/A		Offset:	N/A	Alignment:	Existing CL			
Elev.:	475.2 ft		Latitude:		34.10882773		Longitude:		-82.02251344		Date Started:	10/21/2024		
Total Depth:		93.3 ft		Soil Depth:		72.8 ft		Core Depth:		20.5 ft		Date Completed:	10/23/2024	
Bore Hole Diameter (in):			4		Sampler Configuration			Liner Required:		Y (N)		Liner Used:	Y (N)	
Drill Machine:		CME 45B		Drill Method:			RW/RC		Hammer Type:		Automatic		Energy Ratio:	86.4%
Core Size:		NQ		Driller:		D. Harris			Groundwater:		TOB N/A		24HR	13.2 ft



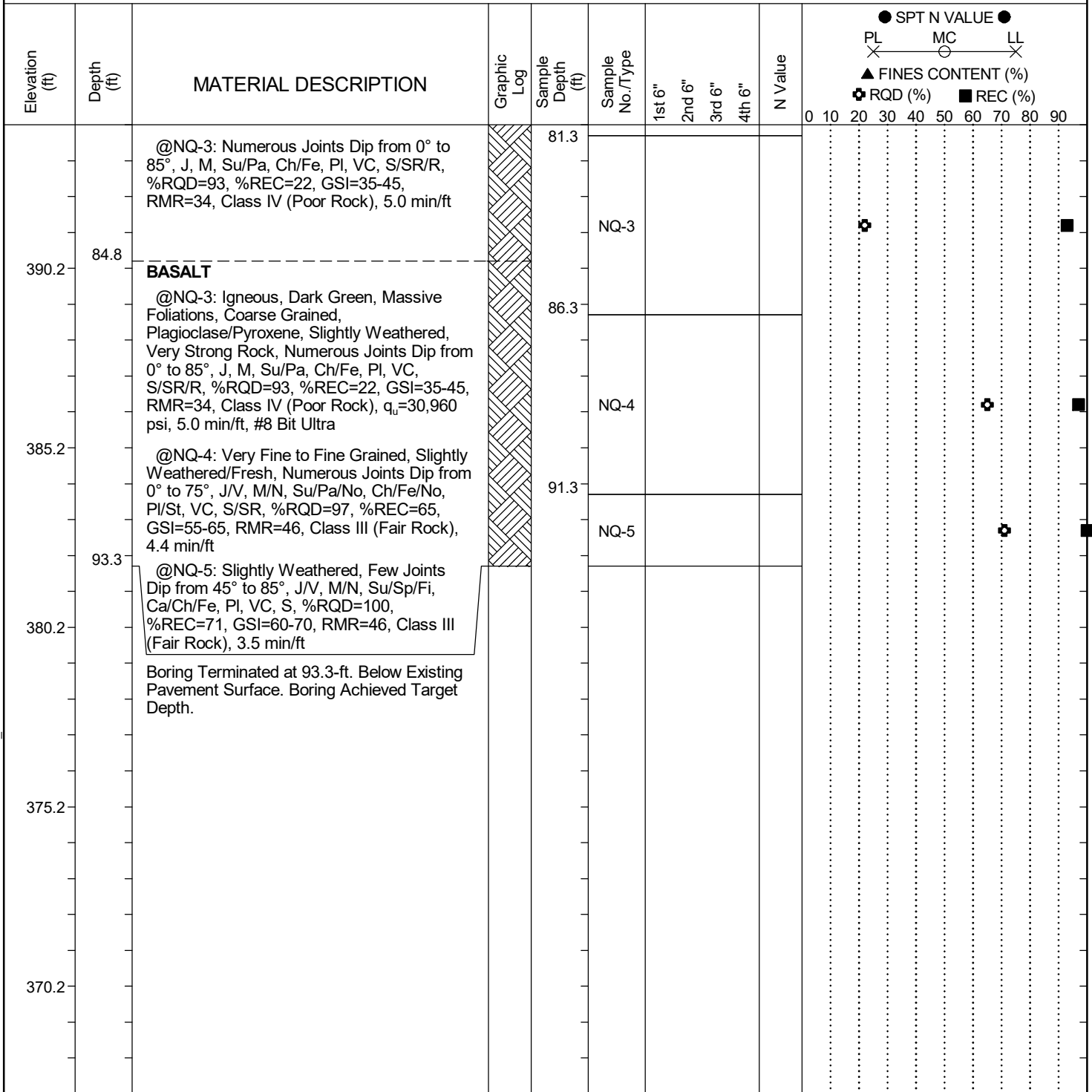
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SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving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

SCDOT Soil Test Log

Project ID: P043994				County: Greenwood		Boring No.: B-1		
Site Description:		S-24-166 over Tributary to Henleys Creek					Route: S-166	
Eng./Geo.: G. Cantelle/M. Miller		Boring Location: N/A			Offset: N/A		Alignment: Existing CL	
Elev.: 475.2 ft		Latitude: 34.10882773		Longitude: -82.02251344		Date Started: 10/21/2024		
Total Depth: 93.3 ft		Soil Depth: 72.8 ft		Core Depth: 20.5 ft		Date Completed: 10/23/2024		
Bore Hole Diameter (in): 4		Sampler Configuration			Liner Required: Y (N)		Liner Used: Y (N)	
Drill Machine: CME 45B		Drill Method: RW/RC		Hammer Type: Automatic		Energy Ratio: 86.4%		
Core Size: NQ		Driller: D. Harris		Groundwater: TOB N/A		24HR 13.2 ft		



LEGEND

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

SCDOT Soil Test Log

Project ID: P043994				County: Greenwood		Boring No.: B-2		
Site Description:		S-24-166 over Tributary to Henleys Creek					Route: S-166	
Eng./Geo.: M.Miller		Boring Location: N/A			Offset: N/A		Alignment: Existing CL	
Elev.: 475.2 ft		Latitude: 34.10874526		Longitude: -82.02230663		Date Started: 10/23/2024		
Total Depth: 82.2 ft		Soil Depth: 62.2 ft		Core Depth: 20 ft		Date Completed: 10/24/2024		
Bore Hole Diameter (in): 4		Sampler Configuration			Liner Required: Y (N)		Liner Used: Y (N)	
Drill Machine: CME 45B		Drill Method: RW/RC		Hammer Type: Automatic		Energy Ratio: 86.4%		
Core Size: NQ		Driller: D. Harris		Groundwater: TOB N/A		24HR: N/A		

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
	0.6	ASPHALT PAVEMENT (S-24-166) (7.3-in.)		0.6							
		EXISTING FILL									
		Loose, Moist, Reddish Brown, Medium Plasticity, Clayey Fine to Medium SAND (SC/A-6), 5YR 4/3		2.0	SS-1	6	4	4		8	●
		@SS-2: Yellowish Red, 5YR 4/6, LL=36, PL=19, PI=17, NMC=16.2%, %200=42.6		4.0	SS-2	3	2	3	4	5	●
		@SS-3: Reddish Brown, 5YR 4/3		6.0	SS-3	4	2	5	4	7	●
		@SS-4: Strong Brown, 7.5YR 5/6		8.0	SS-4	5	3	5	5	8	●
	8.0	ALLUVIUM (HOLOCENE)									
		Stiff, Moist, Strong Brown, Medium Plasticity, Sandy Lean CLAY (CL/A-6), 7.5YR 5/6			SS-5	6	4	5	5	9	●
		@SS-5: LL=37, PL=21, PI=16, NMC=28.6%, %200=60.8									
	13.5	Very Loose to Loose, Wet, Gray, Non-Plastic, Silty Fine to Medium SAND (SM/A-2-4), Trace Organics, 7.5YR 5/1		13.5	SS-6	WOH 1	1			2	●
		@SS-6: LL=NP, PL=NP, PI=NP, NMC=85.1%, %200=18.6									
		@SS-7: Light Gray, Non-Plastic, Silty Fine to Coarse SAND (SM/A-1-b), 7.5YR 7/1, LL=NP, PL=NP, PI=NP, NMC=25.9%, %200=19.0		18.5	SS-7	1	2	3		5	●
	23.5	PIEDMONT RESIDUUM									
		Very Stiff, Moist, Light Gray/Pale Yellow, Medium Plasticity, Lean CLAY (CL/A-6) with Sand, 5Y 7/2 & 5Y 7/4		23.5	SS-8	5	12	16		28	●
		@SS-8: LL=34, PL=22, PI=12, NMC=24.0%, %200=70.0									

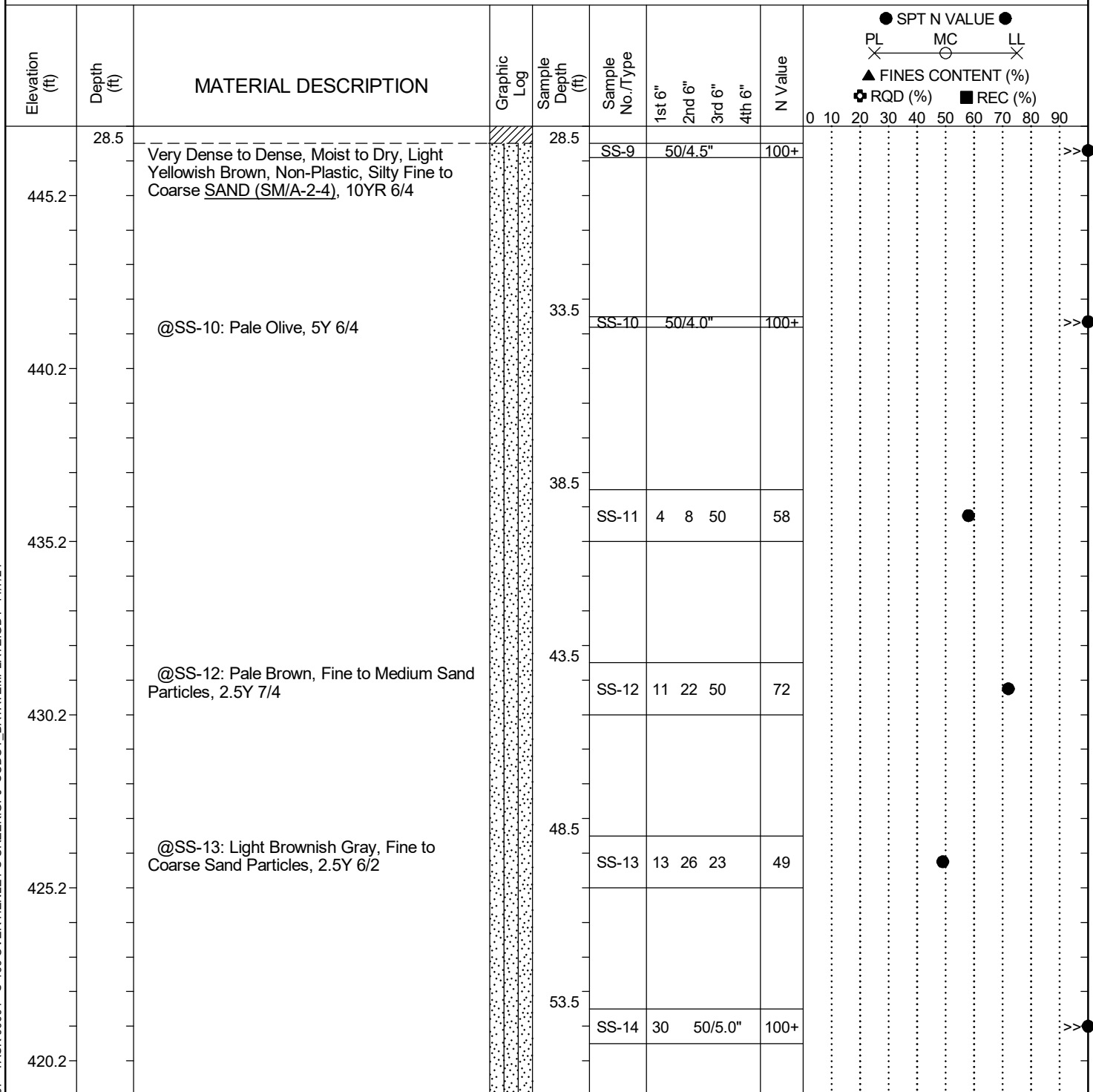
LEGEND

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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: P043994				County: Greenwood		Boring No.: B-2		
Site Description:		S-24-166 over Tributary to Henleys Creek					Route: S-166	
Eng./Geo.: M.Miller		Boring Location: N/A			Offset: N/A		Alignment: Existing CL	
Elev.: 475.2 ft		Latitude: 34.10874526		Longitude: -82.02230663		Date Started: 10/23/2024		
Total Depth: 82.2 ft		Soil Depth: 62.2 ft		Core Depth: 20 ft		Date Completed: 10/24/2024		
Bore Hole Diameter (in): 4		Sampler Configuration			Liner Required: Y (N)		Liner Used: Y (N)	
Drill Machine: CME 45B		Drill Method: RW/RC		Hammer Type: Automatic		Energy Ratio: 86.4%		
Core Size: NQ		Driller: D. Harris		Groundwater: TOB N/A		24HR: N/A		



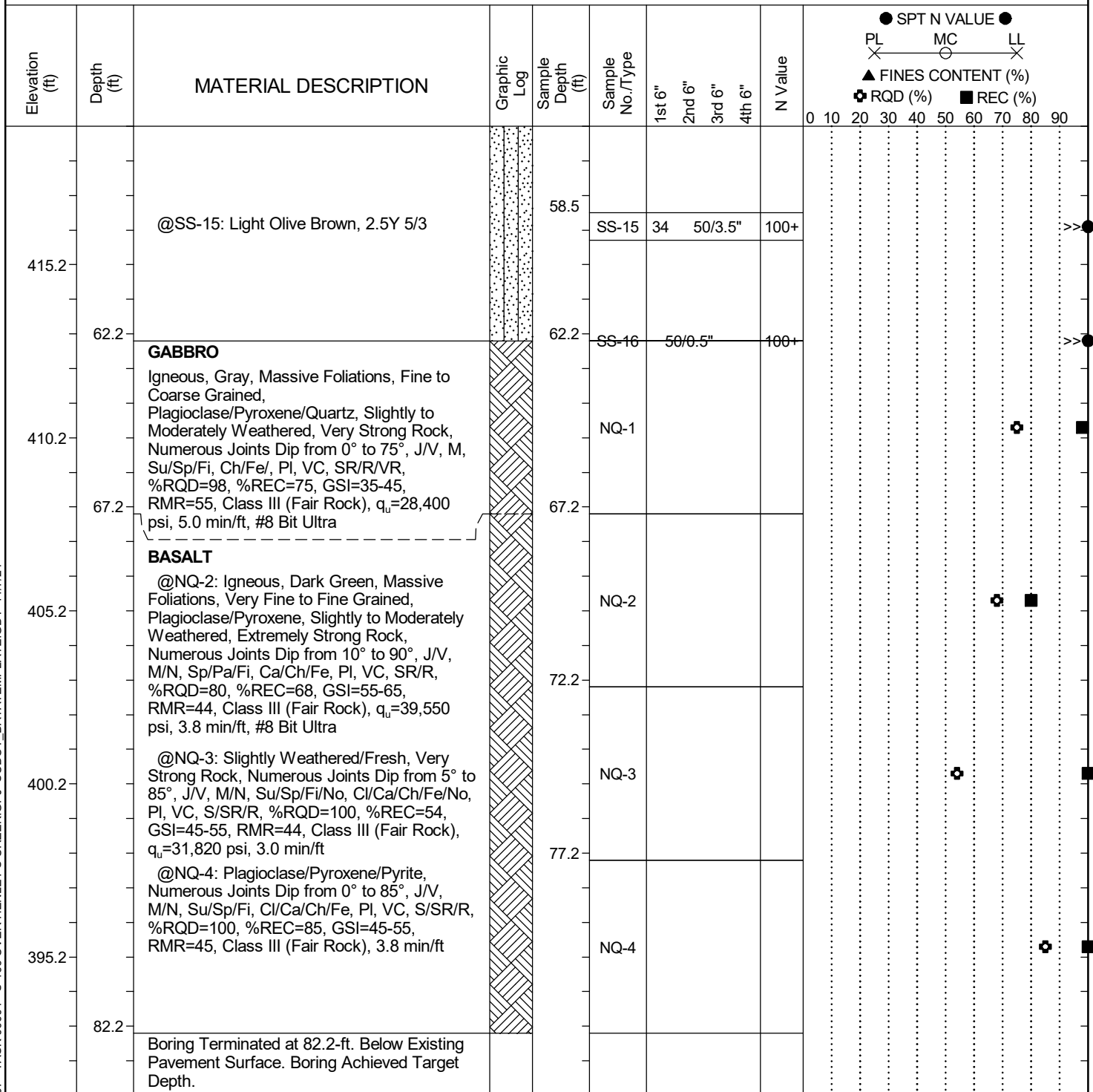
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SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving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

SCDOT Soil Test Log

Project ID:	P043994	County:	Greenwood	Boring No.:	B-2
Site Description:	S-24-166 over Tributary to Henleys Creek			Route:	S-166
Eng./Geo.:	M.Miller	Boring Location:	N/A	Offset:	N/A
Elev.:	475.2 ft	Latitude:	34.10874526	Longitude:	-82.02230663
Date Started:	10/23/2024				
Total Depth:	82.2 ft	Soil Depth:	62.2 ft	Core Depth:	20 ft
Date Completed:	10/24/2024				
Bore Hole Diameter (in):	4	Sampler Configuration		Liner Required:	Y (N)
Liner Used:	Y (N)				
Drill Machine:	CME 45B	Drill Method:	RW/RC	Hammer Type:	Automatic
Energy Ratio:	86.4%				
Core Size:	NQ	Driller:	D. Harris	Groundwater:	TOB N/A
24HR:	N/A				



LEGEND

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

SC.DOT G7100.007 - TASK 00004 - S-166 OVER HENLEY'S CREEK.GPJ SCDOT_DATATEMPLATE.GDT 11/7/24

SCDOT Soil Test Log

Project ID:	P043994	County:	Greenwood	Boring No.:	P-1
Site Description:	S-24-166 over Tributary to Henleys Creek			Route:	S-166
Eng./Geo.:	M.Miller	Boring Location:	N/A	Offset:	N/A
Elev.:	486.9 ft	Latitude:	34.10946735	Longitude:	-82.02358916
Date Started:	10/28/2024				
Total Depth:	2.2 ft	Soil Depth:	2.2 ft	Core Depth:	N/A ft
Date Completed:	10/28/2024				
Bore Hole Diameter (in):	4	Sampler Configuration	Liner Required: Y (N)		Liner Used: Y (N)
Drill Machine:	CME 45B	Drill Method:	HSA	Hammer Type:	Automatic
Energy Ratio:	86.4%				
Core Size:	N/A	Driller:	D. Harris	Groundwater:	TOB N/A
24HR	Backfilled				

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value	<div> ● SPT N VALUE ● PL X — MC ○ — LL X ▲ FINES CONTENT (%) ⊕ RQD (%) ■ REC (%) </div>
	0.0	ASPHALT PAVEMENT (S-24-166) (2.5-in.)									
	0.2	Medium Dense, Moist, Reddish Brown, Low Plasticity to Medium Plasticity, Clayey Fine to Medium SAND (SC/A-6), 2.5YR 5/3		0.2							
					SS-1	24	13	6	9	19	
	2.2	Boring Terminated at 2.2-ft. Below Existing Pavement Surface. Target Boring Depth Achieved.									

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

Project ID: P043994				County: Greenwood		Boring No.: P-2		
Site Description:		S-24-166 over Tributary to Henleys Creek					Route: S-166	
Eng./Geo.: M.Miller		Boring Location: N/A			Offset: N/A		Alignment: Existing CL	
Elev.: 480.2 ft		Latitude: 34.10922805		Longitude: -82.02323353		Date Started: 10/28/2024		
Total Depth: 2.3 ft		Soil Depth: 2.3 ft		Core Depth: N/A ft		Date Completed: 10/28/2024		
Bore Hole Diameter (in): 4		Sampler Configuration			Liner Required: Y (N)		Liner Used: Y (N)	
Drill Machine: CME 45B		Drill Method: HSA		Hammer Type: Automatic		Energy Ratio: 86.4%		
Core Size: N/A		Driller: D. Harris		Groundwater: TOB N/A		24HR Backfilled		

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value	● SPT N VALUE ● PL X MC ○ LL X ▲ FINES CONTENT (%) + RQD (%) ■ REC (%)
	0.0	ASPHALT PAVEMENT (S-24-166) (3-in.)									0 10 20 30 40 50 60 70 80 90
	0.3	Medium Dense, Moist, Reddish Brown, Low Plasticity to Medium Plasticity, Clayey Fine to Medium SAND (SC/A-6), 2.5YR 4/3		0.3							
	2.3	Boring Terminated at 2.3-ft. Below Existing Pavement Surface. Target Boring Depth Achieved.			SS-1	16	12	9	10	21	

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 G7100.007 - TASK 00004 - S-166 OVER HENLEY'S CREEK.GPJ SCDOT_DATATEMPLATE.GDT 11/7/24

SCDOT Soil Test Log

Project ID:	P043994	County:	Greenwood	Boring No.:	P-3
Site Description:	S-24-166 over Tributary to Henleys Creek			Route:	S-166
Eng./Geo.:	M.Miller	Boring Location:	N/A	Offset:	N/A
Elev.:	476.3 ft	Latitude:	34.10904186	Longitude:	-82.02283423
Date Started:	10/28/2024				
Total Depth:	2.2 ft	Soil Depth:	2.2 ft	Core Depth:	N/A ft
Date Completed:	10/28/2024				
Bore Hole Diameter (in):	4	Sampler Configuration	Liner Required: Y (N)		Liner Used: Y (N)
Drill Machine:	CME 45B	Drill Method:	HSA	Hammer Type:	Automatic
Energy Ratio:	86.4%				
Core Size:	N/A	Driller:	D. Harris	Groundwater:	TOB N/A
24HR	Backfilled				

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value	<div> ● SPT N VALUE ● PL — MC — LL X — X — X ▲ FINES CONTENT (%) + RQD (%) ■ REC (%) </div>
	0.0	ASPHALT PAVEMENT (S-24-166) (2.5-in.)									
	0.2	Medium Dense, Moist, Reddish Brown, Low Plasticity to Medium Plasticity, Clayey Fine to Medium SAND (SC/A-6), 2.5YR 5/3		0.2							
					SS-1	8	9	7	6	16	●
	2.2	Boring Terminated at 2.2-ft. Below Existing Pavement Surface. Target Boring Depth Achieved.									

LEGEND

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

SCDOT Soil Test Log

Project ID:	P043994	County:	Greenwood	Boring No.:	P-4
Site Description:	S-24-166 over Tributary to Henleys Creek			Route:	S-166
Eng./Geo.:	M.Miller	Boring Location:	N/A	Offset:	N/A
Elev.:	474.8 ft	Latitude:	34.10852528	Longitude:	-82.0219808
Date Started:	10/28/2024				
Total Depth:	2.3 ft	Soil Depth:	2.3 ft	Core Depth:	N/A ft
Date Completed:	10/28/2024				
Bore Hole Diameter (in):	4	Sampler Configuration	Liner Required: Y (N)		Liner Used: Y (N)
Drill Machine:	CME 45B	Drill Method:	HSA	Hammer Type:	Automatic
Energy Ratio:	86.4%				
Core Size:	N/A	Driller:	D. Harris	Groundwater:	TOB N/A
24HR	Backfilled				

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value	<div> <div> ● SPT N VALUE ● </div> <div> PL X MC ○ LL X </div> <div> ▲ FINES CONTENT (%) </div> <div> ⊕ RQD (%) ■ REC (%) </div> </div>
	0.0	ASPHALT PAVEMENT (S-24-166) (3-in.)									
	0.3	Medium Dense, Moist, Light Red/Brown, Low Plasticity to Medium Plasticity, Clayey Fine to Medium SAND (SC/A-6), 2.5YR 7/8 & 7.5YR 4/2		0.3							
	2.3	Boring Terminated at 2.3-ft. Below Existing Pavement Surface. Target Boring Depth Achieved.			SS-1	24	9	5	6	14	●

LEGEND

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

SC.DOT G7100.007 - TASK 00004 - S-166 OVER HENLEY'S CREEK.GPJ SCDOT_DATATEMPLATE.GDT 11/7/24

SCDOT Soil Test Log

Project ID:	P043994	County:	Greenwood	Boring No.:	P-5
Site Description:	S-24-166 over Tributary to Henleys Creek			Route:	S-166
Eng./Geo.:	M.Miller	Boring Location:	N/A	Offset:	N/A
Elev.:	478.0 ft	Latitude:	34.10833472	Longitude:	-82.0215654
Date Started:	10/28/2024				
Total Depth:	2.2 ft	Soil Depth:	2.2 ft	Core Depth:	N/A ft
Date Completed:	10/28/2024				
Bore Hole Diameter (in):	4	Sampler Configuration	Liner Required: Y (N)		Liner Used: Y (N)
Drill Machine:	CME 45B	Drill Method:	HSA	Hammer Type:	Automatic
Energy Ratio:	86.4%				
Core Size:	N/A	Driller:	D. Harris	Groundwater:	TOB N/A
24HR	Backfilled				

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value	<div> <div> ● SPT N VALUE ● </div> <div> PL X MC ○ LL X </div> <div> ▲ FINES CONTENT (%) </div> <div> ⊕ RQD (%) ■ REC (%) </div> </div>
	0.0	ASPHALT PAVEMENT (S-24-166) (2.5-in.)									
	0.2	Dense, Moist, Reddish Brown, Low Plasticity to Medium Plasticity, Clayey Fine to Medium SAND (SC/A-6), 2.5YR 5/3		0.2							
					SS-1	42	34	12	12	46	
	2.2	Boring Terminated at 2.2-ft. Below Existing Pavement Surface. Target Boring Depth Achieved.									

LEGEND

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

SCDOT Soil Test Log

Project ID:	P043994	County:	Greenwood	Boring No.:	P-6
Site Description:	S-24-166 over Tributary to Henleys Creek			Route:	S-166
Eng./Geo.:	M.Miller	Boring Location:	N/A	Offset:	N/A
Elev.:	482.1 ft	Latitude:	34.10810052	Longitude:	-82.02119201
Date Started:	10/28/2024				
Total Depth:	2.3 ft	Soil Depth:	2.3 ft	Core Depth:	N/A ft
Date Completed:	10/28/2024				
Bore Hole Diameter (in):	4	Sampler Configuration	Liner Required: Y (N)		Liner Used: Y (N)
Drill Machine:	CME 45B	Drill Method:	HSA	Hammer Type:	Automatic
Energy Ratio:	86.4%				
Core Size:	N/A	Driller:	D. Harris	Groundwater:	TOB N/A
24HR	Backfilled				

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value	<div> ● SPT N VALUE ● PL — MC — LL X — X — X ▲ FINES CONTENT (%) + RQD (%) ■ REC (%) </div>
	0.0	ASPHALT PAVEMENT (S-24-166) (3-in.)									
	0.3	Medium Dense, Moist, Light Red/Brown, Low Plasticity to Medium Plasticity, Clayey Fine to Medium SAND (SC/A-6), 2.5YR 6/8 & 7.5YR 5/4		0.3							
	2.3	Boring Terminated at 2.3-ft. Below Existing Pavement Surface. Target Boring Depth Achieved.			SS-1	10	7	5	6	12	●

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-24-166 over Tributary to Henleys Creek

Geotechnical Subsurface Data Report

APPENDIX

SECTION 4 LABORATORY TEST RESULTS

S-24-166 over Tributary to Henleys Creek

Geotechnical Subsurface Data Report

APPENDIX

SECTION 4 LABORATORY TEST RESULTS

SECTION 4A SPLIT-SPOON SAMPLES



SUMMARY OF LABORATORY RESULTS

PAGE 1 OF 1

PROJECT ID P043994

PROJECT NAME S-24-166 over Tributary to Henleys Creek

PROJECT COUNTY Greenwood

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	31	17	14	4.76	53	CL	25.0			
B-1	15.0	33	11	22	4.76	77	CL	23.2			
B-1	20.0	NP	NP	NP	19	19	SM	27.5			
B-1	35.0	NP	NP	NP	9.51	25	SM	12.7			
B-2	4.0	36	19	17	19	43	SC	16.2			
B-2	10.0	37	21	16	4.76	61	CL	28.6			
B-2	15.0	NP	NP	NP	19	19	SM	85.1			
B-2	20.0	NP	NP	NP	19	19	SM	25.9			
B-2	25.0	34	22	12	4.76	70	CL	24.0			



CORROSION SERIES SUMMARY (SPLIT-SPOON)

PAGE 1 OF 1

PROJECT ID P043994

PROJECT NAME S-24-166 over Tributary to Henleys Creek

PROJECT COUNTY Greenwood

Borehole	Sample No.	Sample Depth (ft.)	pH of Soil in Distilled Water	Electrical Resistivity (Ω -cm)	Chloride Content (mg/kg (ppm))	Sulfate Content (mg/kg (ppm))
B-1	SS-2/SS-3	(2.0 – 6.0) (Composite)	5.4	9,782	7.88	43.6
B-2	SS-3/SS-4	(4.0 – 8.0) (Composite)	5.2	4,636	56.58	47.6



INDEX PROPERTIES VERSUS DEPTH

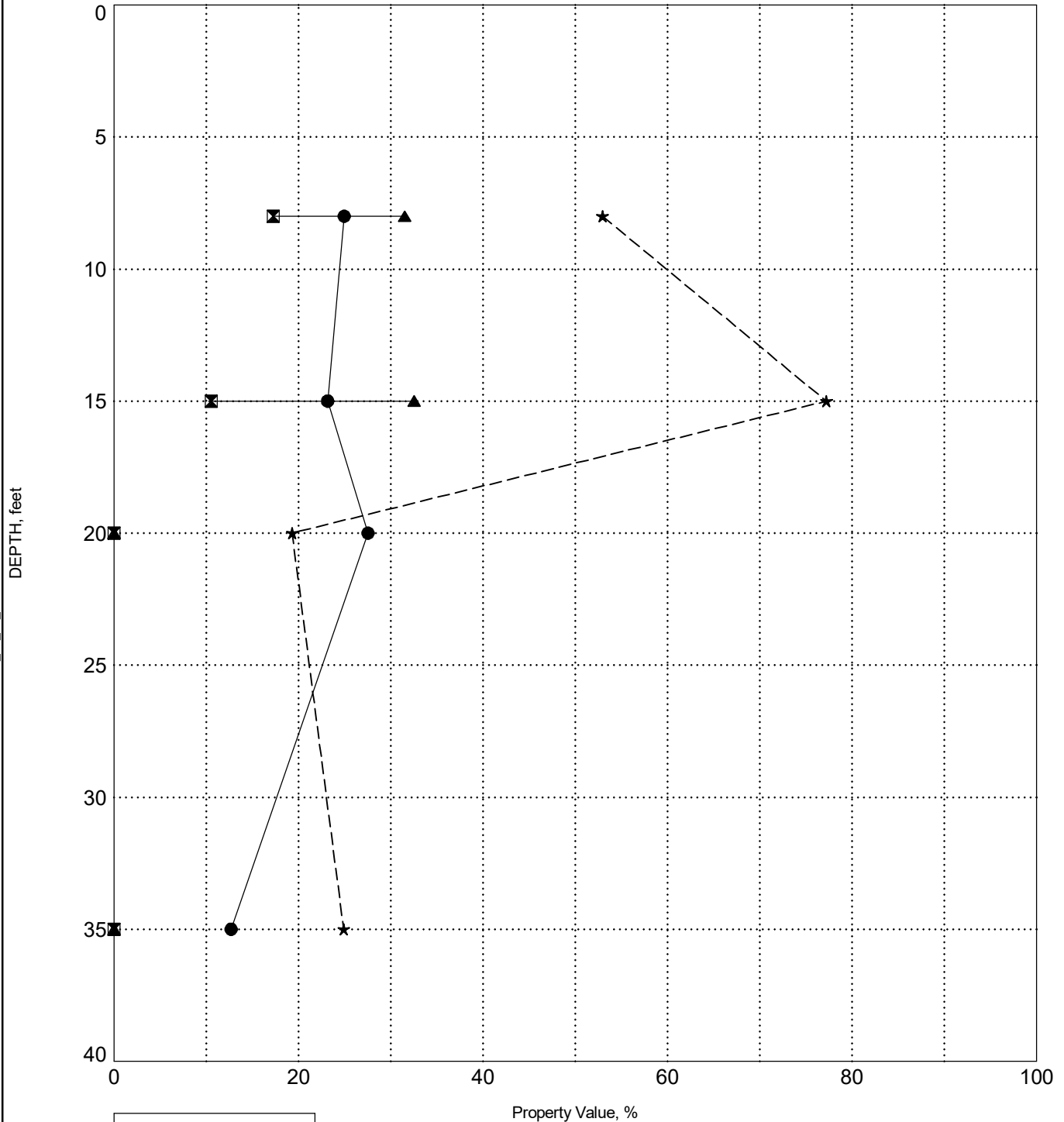
PROJECT ID P043994

PROJECT NAME S-24-166 over Tributary to Henleys Creek

PROJECT COUNTY Greenwood

SURFACE ELEVATION: 475.2

BORING B-1



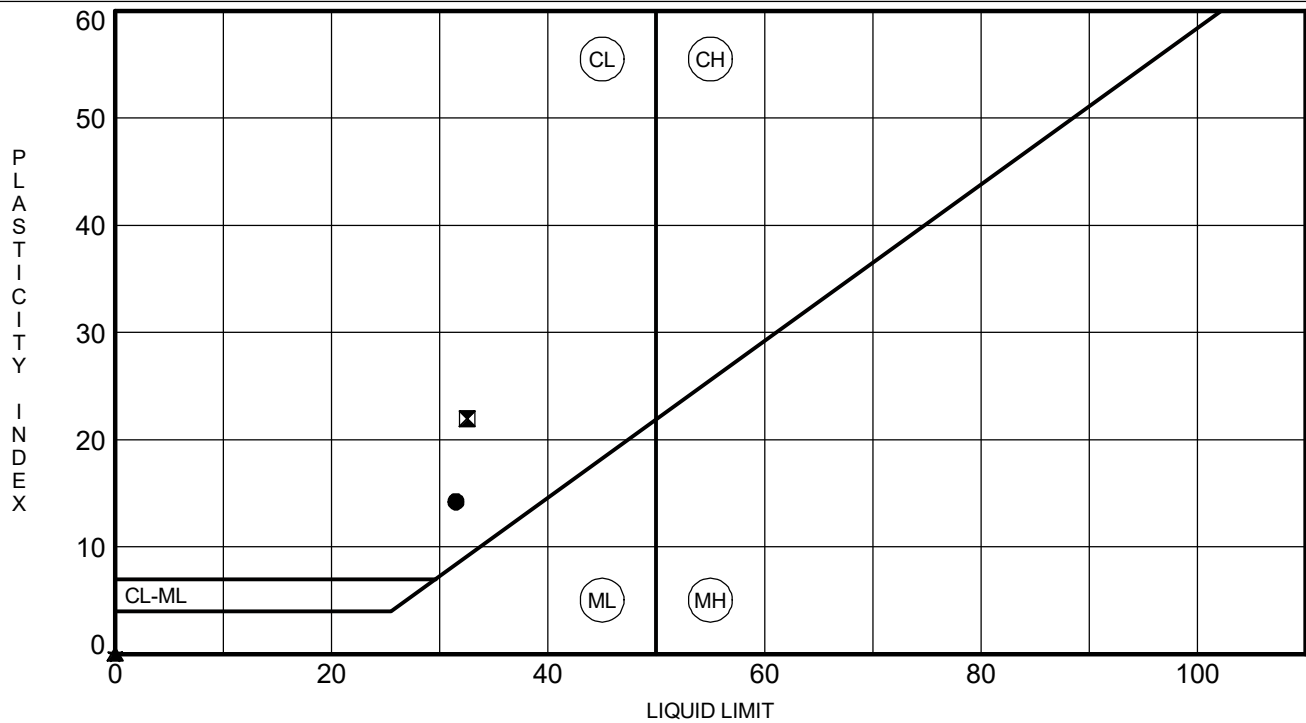
LEGEND	
●	Water Content
⊠	Plastic Limit
▲	Liquid Limit
★	Fines

ATTERBERG LIMITS' RESULTS

PROJECT ID P043994

PROJECT NAME S-24-166 over Tributary to Henleys Creek

PROJECT COUNTY Greenwood

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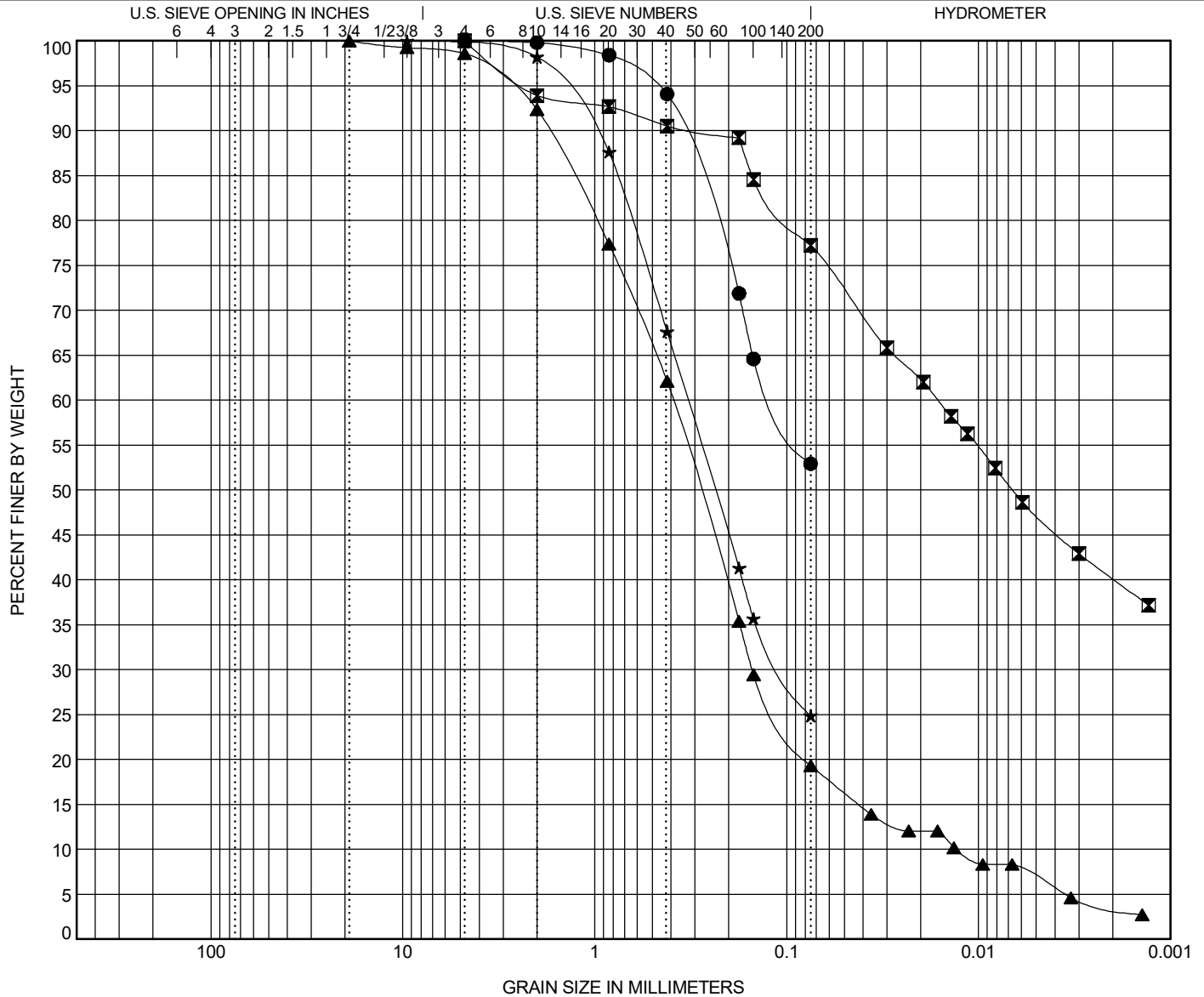


GRAIN SIZE DISTRIBUTION

PROJECT ID P043994

PROJECT NAME S-24-166 over Tributary to Henleys Creek

PROJECT COUNTY Greenwood



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

BOREHOLE	DEPTH	Classification					LL	PL	PI	Cc	Cu
● B-1	8.0	SANDY LEAN CLAY (CL/A-6)					31	17	14		
■ B-1	15.0	LEAN CLAY with SAND (CL/A-6)					33	11	22		
▲ B-1	20.0	SILTY SAND (SM/A-2-4)					NP	NP	NP	4.51	30.28
★ B-1	35.0	SILTY SAND (SM/A-2-4)					NP	NP	NP		
BOREHOLE	DEPTH	D100	D60	D30	D10	%Gravel	%Sand	%Silt		%Clay	
● B-1	8.0	4.76	0.114			0.0	47.1	52.9			
■ B-1	15.0	4.76	0.016			0.0	22.8	30.0		47.2	
▲ B-1	20.0	19	0.392	0.151	0.013	1.4	79.3	12.5		6.8	
★ B-1	35.0	9.51	0.327	0.104		0.1	75.0	24.9			

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

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	S-24-166 over Tributary to Henleys Creek	SCDOT PROJECT ID:	P043994
SAMPLE NUMBER:	24-3826	DATE REQUESTED:	10/24/2024
DESCRIPTION OF SOIL:	Various		
TESTED BY:	DH	DATE OF TESTING:	10/25/2024
WEIGHED BY:	AC	DATE OF WEIGHING:	10/28/2024

BORING NO.	B-1	B-1	B-1	B-1	
SAMPLE NO.	SS-4	SS-6	SS-7	SS-10	
SAMPLE DEPTH	6.0 - 8.0	13.5 - 15.0	18.5 - 20.0	33.5 - 35.0	
WATER CONTENT, W%	25.0	23.2	27.5	12.7	

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%					

**pH DETERMINATION
(AASHTO T289)**

Project Name:	S-24-166 over Tributary to Henleys Creek	Project Number:	P043994
Sample Location:	B-1	Sample Elevation/Depth:	2.0 - 6.0
Description of Sample:	Sandy SILT (ML/A-4)	Date Received	10/24/2024
Tested By:	L. Johnson	Date Tested:	10/30/2024

SCDOT Sample ID	B-1			
Boring Depth	2.0 - 6.0			
FME Lab ID No.	24-3826			
pH Value	5.42			
Temperature (°C)	21.2			

Date Reviewed: 11/4/2024Reviewed By: J.Hiers

**SOIL RESISTIVITY
(AASHTO T288)**

Project Name:	S-24-166 over Tributary to Henlys Creek	Project ID:	P043994
Location:	B-1	FME Lab ID No.:	24-3826
Sampled By:	MM	Date Sampled:	10/24/2024
Soil Description:	Sandy SILT (ML/A-4)	Date Received:	10/24/2024
Tested By:	AGB	Date Tested:	11/4/2024

Boring No.	Sample Depth (ft.)	Minimum Soil Resistivity, Ω -cm
B-1	2.0 - 6.0	9,782

Date Reviewed:	11/7/2024	Reviewed By:	J. Hiers
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CHLORIDE ION CONTENT IN SOILS

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

Client: F&ME Consultants, Inc.
 Client Reference: Trib to Henleys G7100.007
 Project No.: 2024-799-001
 Lab ID: 2024-799-001-001

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

(- # 10 Sieve material)

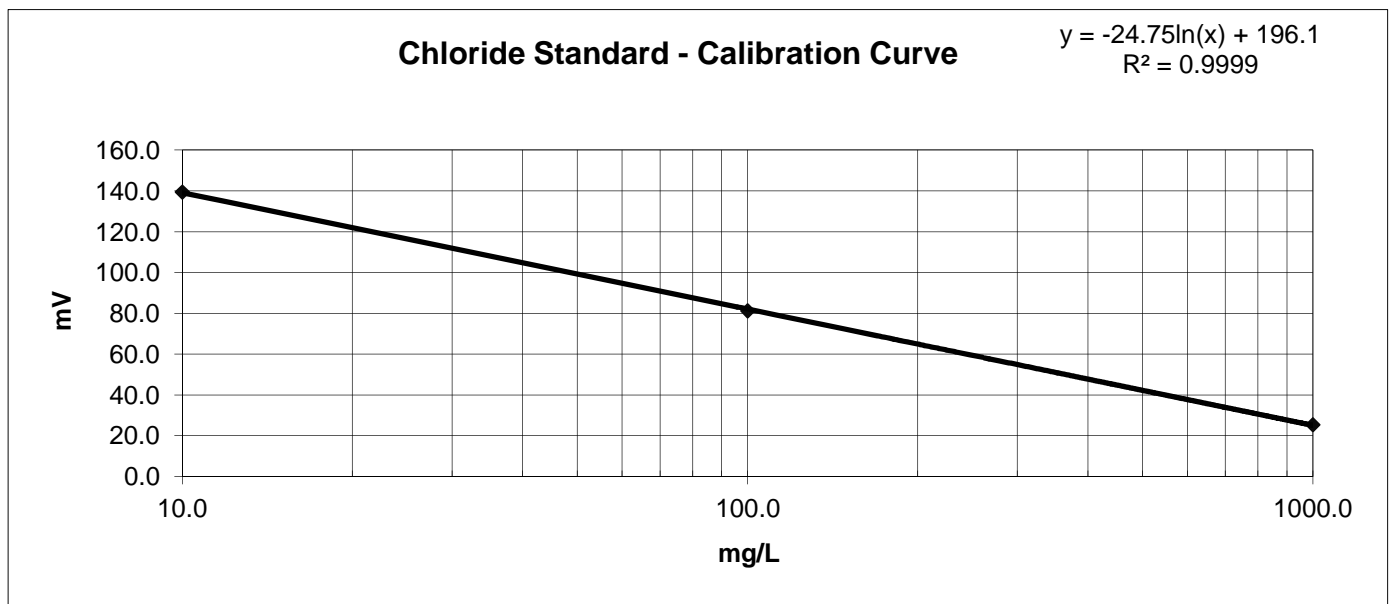
CHLORIDE STANDARD: CALIBRATION CURVE

STANDARD	MILLIVOLTS (mV)
10.0 mg/L	139.5
100.0 mg/L	81.3
1000.0 mg/L	25.5

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):	145.0	7.88	7.88

Notes: 1) Samples and standards were buffered by the addition of an equal volume of the 0.2 M KNO₃ solution (1:1 volume).
 2) Samples were dried for a minimum of 12 hours at 110 ± 5°C.



Notes:

Tested By JAM Date 11/1/24 Checked By JLK Date 11/1/24

Water-Soluble Sulfate Ion Content in Soil

AASHTO T 290-95 (2020)

Client:	F&ME Consultants, Inc.	Boring No.:	B-1
Client Reference:	Trib to Henleys G7100.007	Depth (ft):	2.0-6.0'
Project No.:	2024-799-001	Sample No.:	SS-2/SS-3
Lab ID:	2024-799-001-001	Soil Description:	Orange Brown

Sulfate Standard - Calibration Curve Spectrophotometer Readings

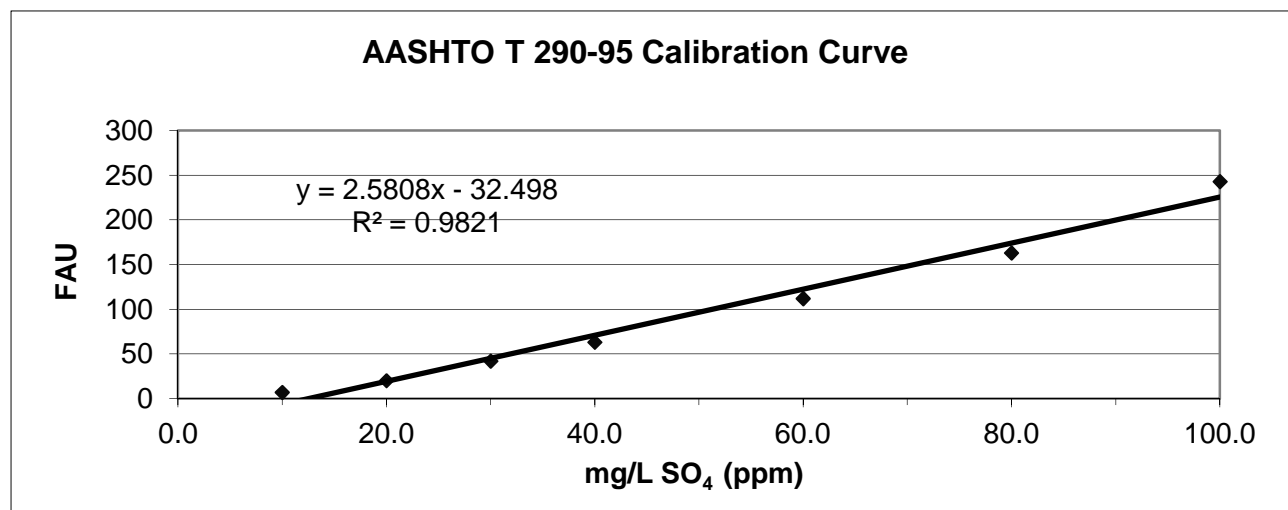
<u>Sulfate Ion Concentrations (mg/L)</u>								
0.0	4.0	10.0	20.0	30.0	40.0	60.0	80.0	100.0
<u>Spectrophotometer Readings (FAU)</u>								
Underrange	Underrange	7	20	42	63	112	163	243

Measurement of Barium Chloride Turbidity

(Sample contains 5.0 mL NaCl solution and 0.3 g BaCl₂·2H₂O)

<p>Sample Weight (g): 100.0</p> <p>Water added to Sample (mL): 300.0</p> <p>Size of Sample Aliquot (mL): 50.0</p> <p>Sample Reading (FAU): 6</p> <p>Sample Diluted: No</p> <p>Sulfate Solution Added (ml): 5</p>	<p><u>Sample Moisture Content</u></p> <p>Tare Number: 1718</p> <p>Weight of Tare & Wet Sample (g): 125.85</p> <p>Weight of Tare & Dry Sample (g): 125.48</p> <p>Weight of Tare (g): 81.51</p> <p>Weight of Water (g): 0.37</p> <p>Weight of Dry Sample (g): 43.97</p> <p>Moisture Content (%): 0.84</p>
--	--

Sample Sulfate Ion Concentration:	14.42	mg/L SO ₄ (ppm)
Sample Sulfate Ion Content:	43.3	mg/Kg SO ₄ (not corrected for moisture)
Sample Sulfate Ion Content:	43.6	mg/Kg SO ₄ (corrected for moisture)



Tested by: JAM	Date: 10/31/24	Checked by: JLK	Date: 11/1/24
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INDEX PROPERTIES VERSUS DEPTH

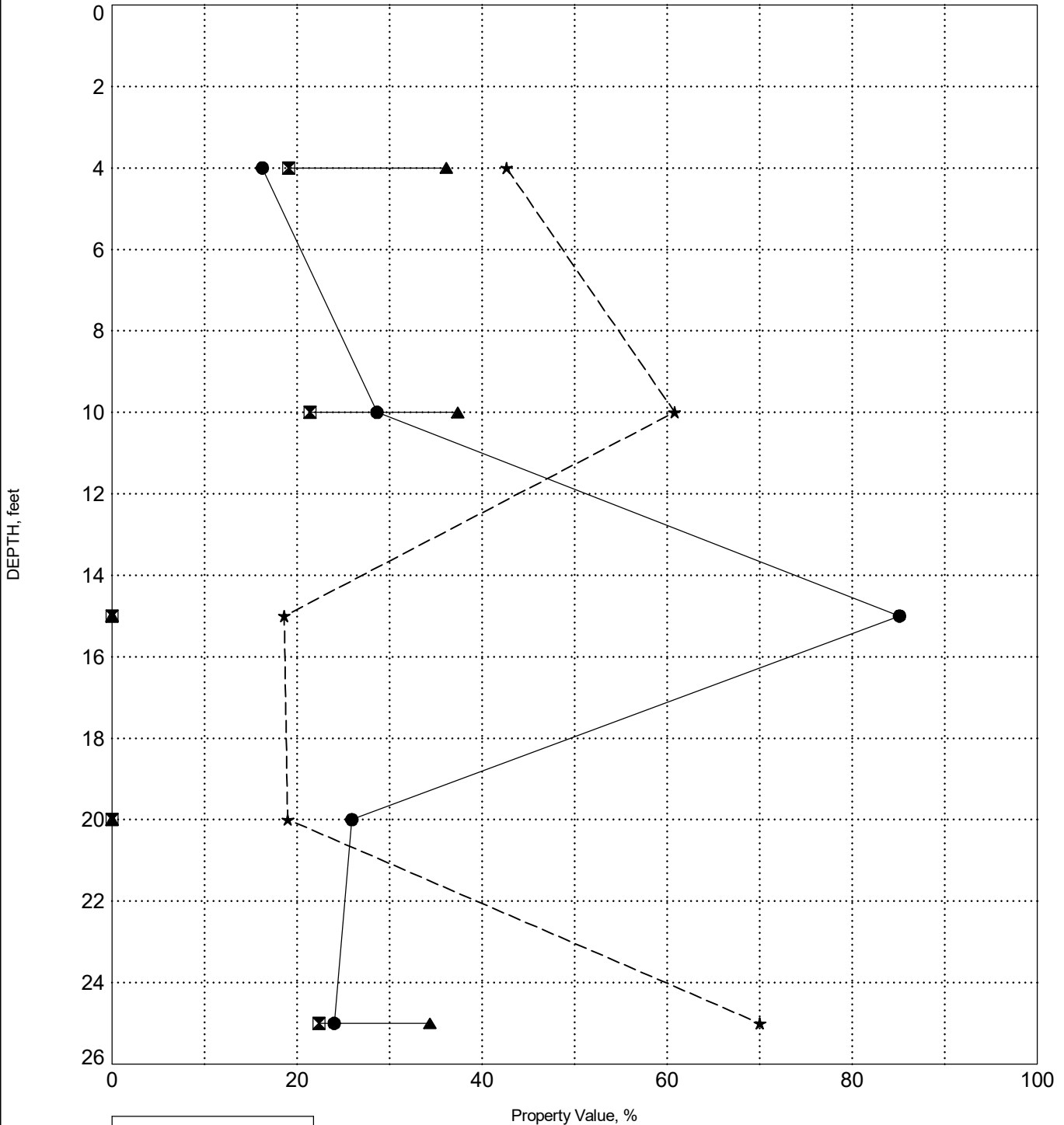
PROJECT ID P043994

PROJECT NAME S-24-166 over Tributary to Henleys Creek

PROJECT COUNTY Greenwood

SURFACE ELEVATION: 475.2

BORING B-2



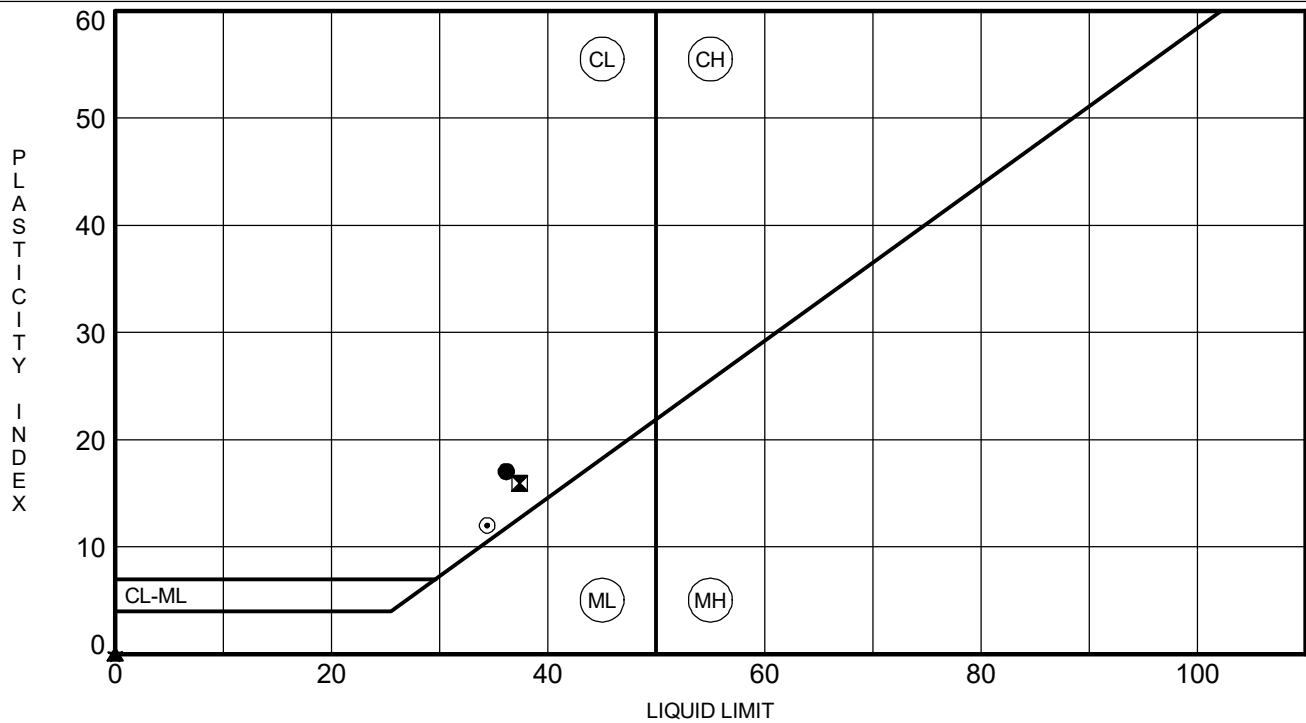
LEGEND	
●	Water Content
⊠	Plastic Limit
▲	Liquid Limit
★	Fines

ATTERBERG LIMITS' RESULTS

PROJECT ID P043994

PROJECT NAME S-24-166 over Tributary to Henleys Creek

PROJECT COUNTY Greenwood

[illegible]

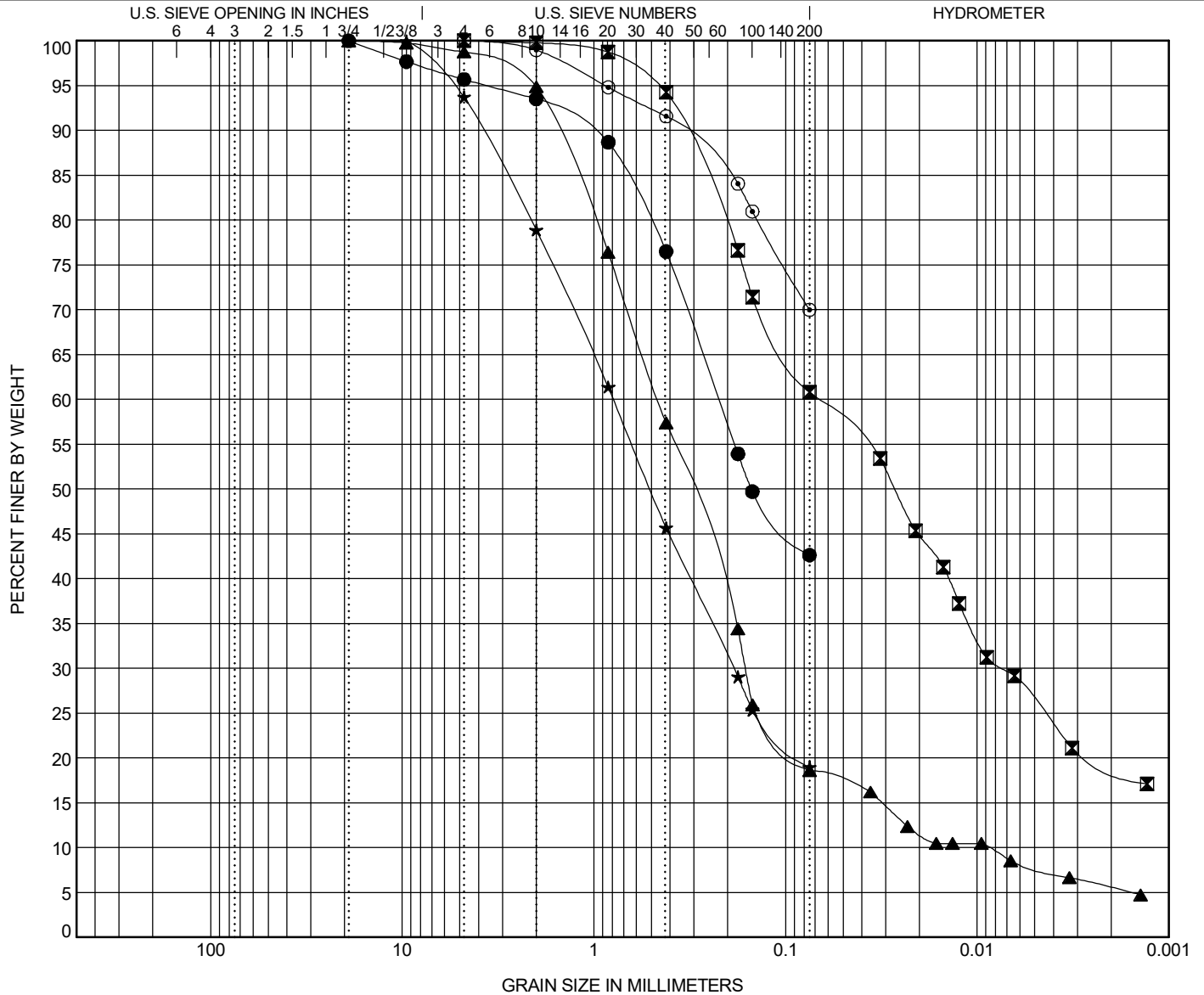


GRAIN SIZE DISTRIBUTION

PROJECT ID P043994

PROJECT NAME S-24-166 over Tributary to Henleys Creek

PROJECT COUNTY Greenwood



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

BOREHOLE	DEPTH	Classification					LL	PL	PI	Cc	Cu
● B-2	4.0	CLAYEY SAND (SC/A-6)					36	19	17		
⊠ B-2	10.0	SANDY LEAN CLAY (CL/A-6)					37	21	16		
▲ B-2	15.0	SILTY SAND (SM/A-2-4)					NP	NP	NP	6.51	52.99
★ B-2	20.0	SILTY SAND (SM/A-1-b)					NP	NP	NP		
⊙ B-2	25.0	LEAN CLAY with SAND (CL/A-6)					34	22	12		
BOREHOLE	DEPTH	D100	D60	D30	D10	%Gravel	%Sand	%Silt		%Clay	
● B-2	4.0	19	0.223			4.3	53.0	42.6			
⊠ B-2	10.0	4.76	0.068	0.007		0.0	39.2	34.5		26.3	
▲ B-2	15.0	19	0.462	0.162	0.009	1.3	80.1	10.8		7.8	
★ B-2	20.0	19	0.791	0.186		6.3	74.7			19.0	
⊙ B-2	25.0	4.76				0.0	30.0			70.0	

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Columbia, SC 29203

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	S-24-166 over Tributary to Henleys Creek	SCDOT PROJECT ID:	P043994
SAMPLE NUMBER:	24-3837	DATE REQUESTED:	10/24/2024
DESCRIPTION OF SOIL:	Various		
TESTED BY:	AAB	DATE OF TESTING:	10/25/2024
WEIGHED BY:	AC	DATE OF WEIGHING:	10/28/2024

BORING NO.	B-2	B-2	B-2	B-2	B-2
SAMPLE NO.	SS-2	SS-5	SS-6	SS-7	SS-8
SAMPLE DEPTH	2.0 - 4.0	8.0 - 10.0	13.5 - 15.0	18.5 - 20.0	23.5 - 25.0
WATER CONTENT, W%	16.2	28.6	85.1	25.9	24.0

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%					

**pH DETERMINATION
(AASHTO T289)**

Project Name:	S-24-166 over Tributary to Henleys Creek	Project Number:	P043994
Sample Location:	B-2	Sample Elevation/Depth:	4.0 - 8.0
Description of Sample:	Clayey SAND (SC/A-6)	Date Received	10/24/2024
Tested By:	L. Johnson	Date Tested:	10/30/2024

SCDOT Sample ID	B-2			
Boring Depth	4.0 - 8.0			
FME Lab ID No.	24-3837			
pH Value	5.19			
Temperature (°C)	21.3			

Date Reviewed: 11/4/2024Reviewed By: J.Hiers

**SOIL RESISTIVITY
(AASHTO T288)**

Project Name:	S-24-166 over Tributary to Henleys Creek	Project ID:	P043994
Location:	B-2	FME Lab ID No.:	24-3837
Sampled By:	GC	Date Sampled:	10/24/2024
Soil Description:	Clayey SAND (SC/A-6)	Date Received:	10/24/2024
Tested By:	AGB	Date Tested:	11/1/2024

Boring No.	Sample Depth (ft.)	Minimum Soil Resistivity, Ω -cm
B-2	4.0 - 8.0	4,636

Date Reviewed:	11/7/2024	Reviewed By:	J. Hiers
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CHLORIDE ION CONTENT IN SOILS

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

Client: F&ME Consultants, Inc.
 Client Reference: Trib to Henleys G7100.007
 Project No.: 2024-799-001
 Lab ID: 2024-799-001-002

Boring No.: B-2
 Depth (ft): 4.0-8.0'
 Sample No.: SS-3/SS-4
 Description: Orange Brown

(- # 10 Sieve material)

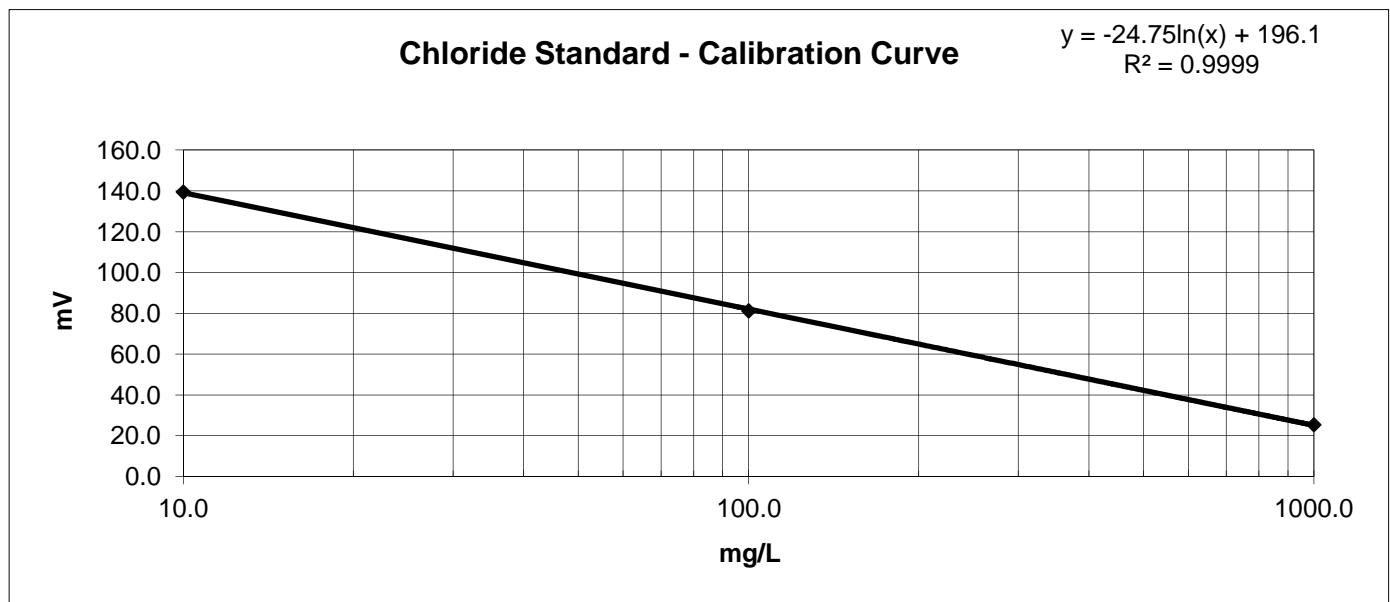
CHLORIDE STANDARD: CALIBRATION CURVE

STANDARD	MILLIVOLTS (mV)
10.0 mg/L	139.5
100.0 mg/L	81.3
1000.0 mg/L	25.5

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):	96.2	56.58	56.58

Notes: 1) Samples and standards were buffered by the addition of an equal volume of the 0.2 M KNO₃ solution (1:1 volume).
 2) Samples were dried for a minimum of 12 hours at 110 ± 5°C.



Notes:

Tested By JAM Date 11/1/24 Checked By JLK Date 11/1/24

Water-Soluble Sulfate Ion Content in Soil

AASHTO T 290-95 (2020)

Client:	F&ME Consultants, Inc.	Boring No.: B-2
Client Reference:	Trib to Henleys G7100.007	Depth (ft): 4.0-8.0'
Project No.:	2024-799-001	Sample No.: SS-3/SS-4
Lab ID:	2024-799-001-002	Soil Description: Orange Brown

Sulfate Standard - Calibration Curve Spectrophotometer Readings

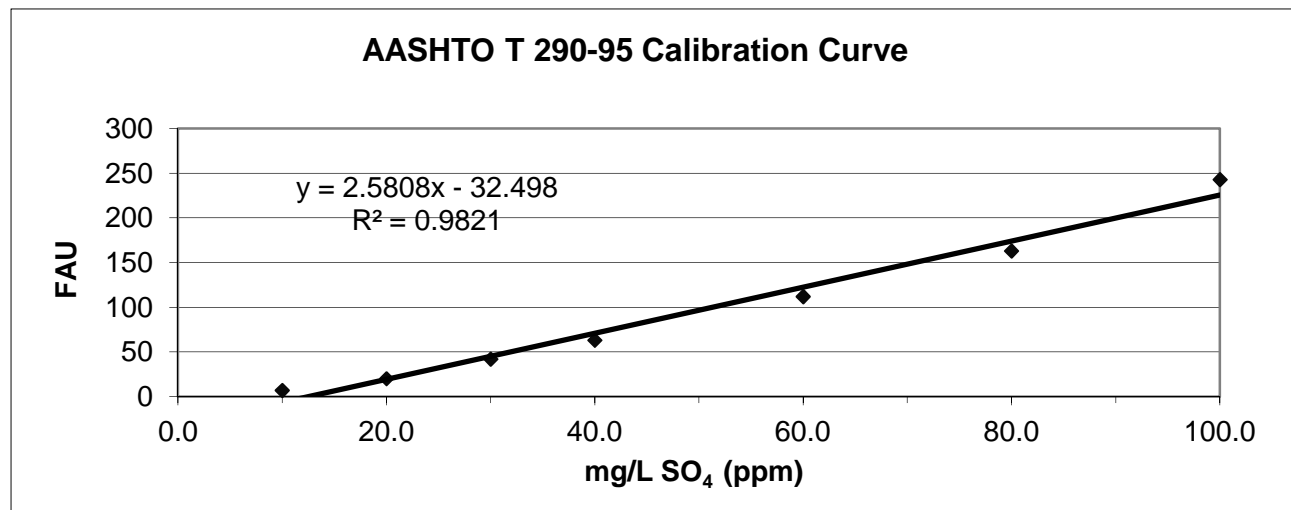
<u>Sulfate Ion Concentrations (mg/L)</u>								
0.0	4.0	10.0	20.0	30.0	40.0	60.0	80.0	100.0
<u>Spectrophotometer Readings (FAU)</u>								
Underrange	Underrange	7	20	42	63	112	163	243

Measurement of Barium Chloride Turbidity

(Sample contains 5.0 mL NaCl solution and 0.3 g BaCl₂·2H₂O)

<p>Sample Weight (g): 100.0</p> <p>Water added to Sample (mL): 300.0</p> <p>Size of Sample Aliquot (mL): 50.0</p> <p>Sample Reading (FAU): 9</p> <p>Sample Diluted: No</p> <p>Sulfate Solution Added (ml): 5</p>	<p><u>Sample Moisture Content</u></p> <p>Tare Number: 888</p> <p>Weight of Tare & Wet Sample (g): 188.81</p> <p>Weight of Tare & Dry Sample (g): 187.39</p> <p>Weight of Tare (g): 110.00</p> <p>Weight of Water (g): 1.42</p> <p>Weight of Dry Sample (g): 77.39</p> <p>Moisture Content (%): 1.83</p>
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Sample Sulfate Ion Concentration:	15.58	mg/L SO ₄ (ppm)
Sample Sulfate Ion Content:	46.7	mg/Kg SO ₄ (not corrected for moisture)
Sample Sulfate Ion Content:	47.6	mg/Kg SO ₄ (corrected for moisture)



Tested by: JAM	Date: 10/31/24	Checked by: JLK	Date: 11/1/24
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S-24-166 over Tributary to Henleys Creek

Geotechnical Subsurface Data Report

APPENDIX

SECTION 4 LABORATORY TEST RESULTS

SECTION 4B BULK SOIL SAMPLE



SUMMARY OF LABORATORY RESULTS

PROJECT ID P043994

PROJECT NAME S-24-166 over Tributary to Henleys Creek

PROJECT COUNTY Greenwood

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)	ϕ (Degrees)	C' (psi)	ϕ' (Degrees)
BS-1@P-2/P-5	0.0 – 2.0	38	21	17	47	SC	17.8	111.8	16.6	--	--	--	--



INDEX PROPERTIES VERSUS DEPTH

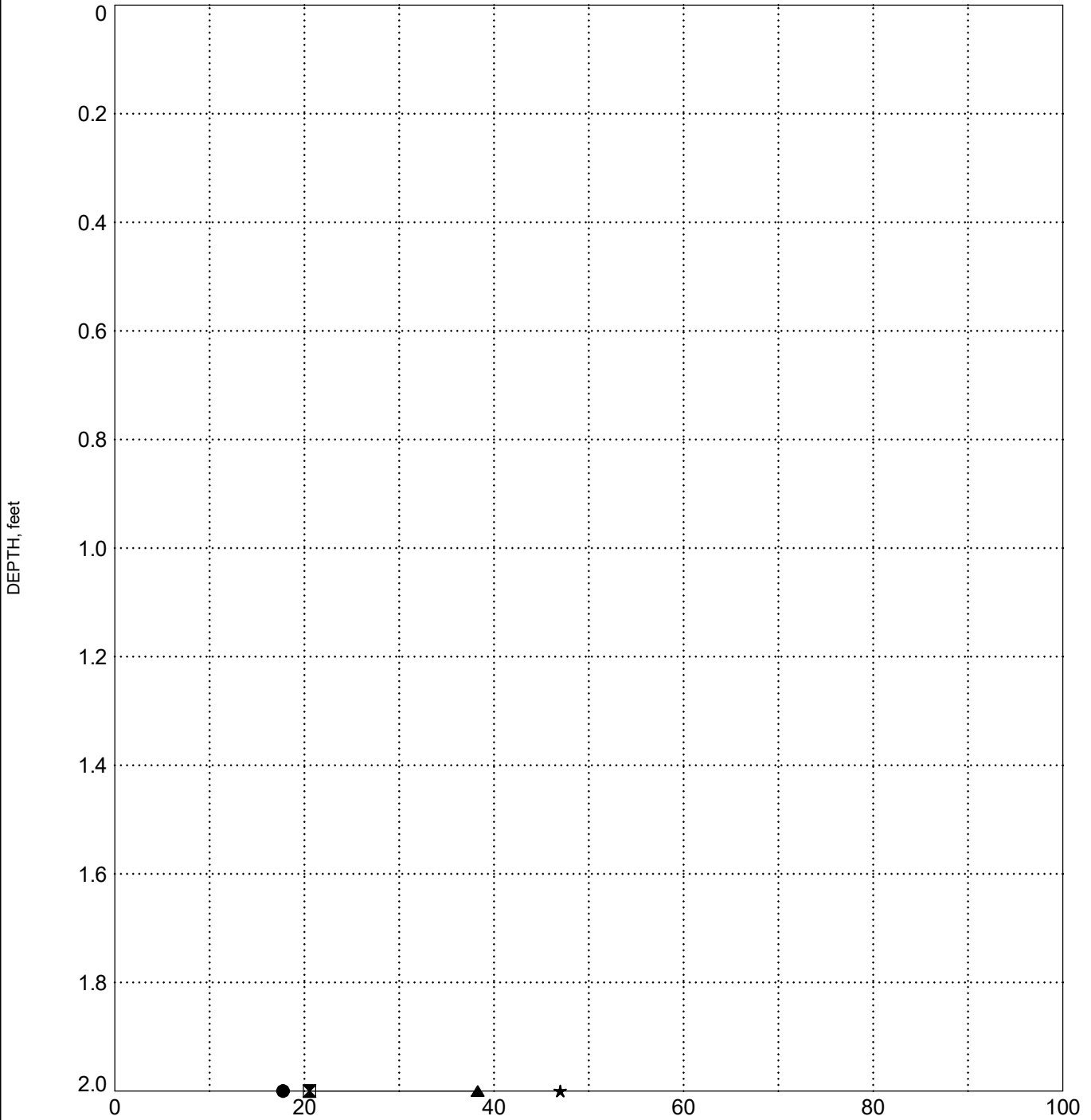
PROJECT ID P043994

PROJECT NAME S-24-166 over Tributary to Henleys Creek

PROJECT COUNTY Greenwood

SURFACE ELEVATION: N/A

BORING BS-1@P-2/P-5



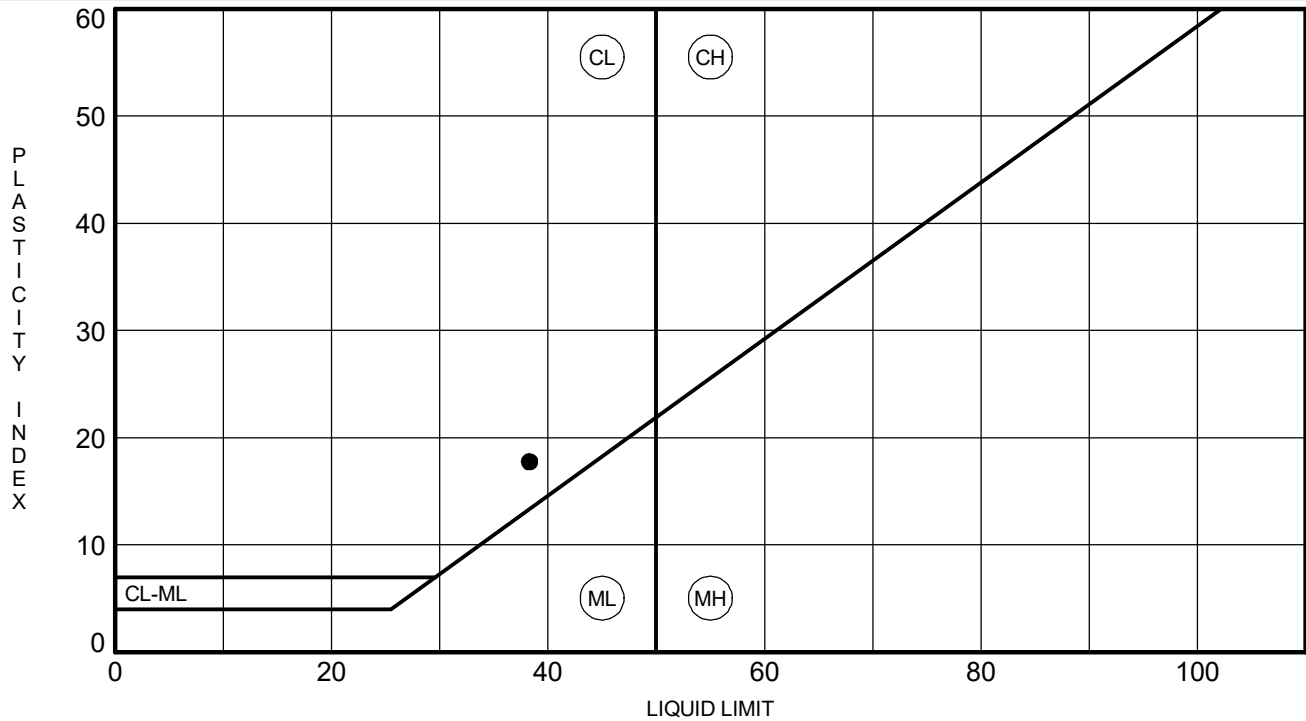
LEGEND	
●	Water Content
☒	Plastic Limit
▲	Liquid Limit
★	Fines

ATTERBERG LIMITS' RESULTS

PROJECT ID P043994

PROJECT NAME S-24-166 over Tributary to Henleys Creek

PROJECT COUNTY Greenwood

[illegible]

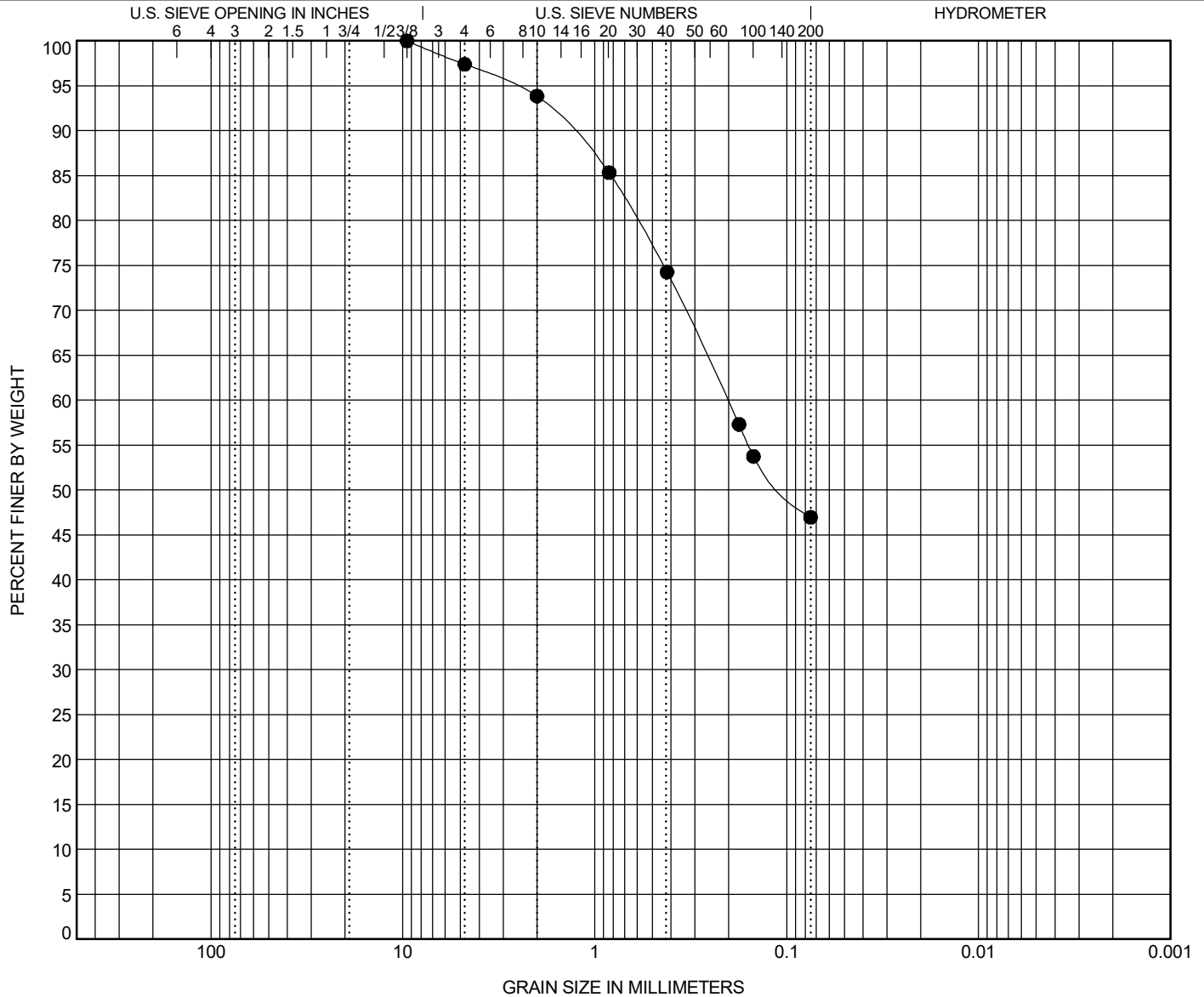


GRAIN SIZE DISTRIBUTION

PROJECT ID P043994

PROJECT NAME S-24-166 over Tributary to Henleys Creek

PROJECT COUNTY Greenwood



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

BOREHOLE	DEPTH	Classification					LL	PL	PI	Cc	Cu
● BS-1@P-2/P-5	2.0	CLAYEY SAND (SC/A-6)					38	21	17		
BOREHOLE	DEPTH	D100	D60	D30	D10	%Gravel	%Sand	%Silt		%Clay	
● BS-1@P-2/P-5	2.0	9.51	0.203			2.6	50.4	47.0			

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Columbia, SC 29203

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	S-24-166 over Tributary to Henleys Creek	SCDOT PROJECT ID:	P043994
SAMPLE NUMBER:	24-3824	DATE REQUESTED:	10/24/2024
DESCRIPTION OF SOIL:	CLAYEY SAND (SC/A-6)		
TESTED BY:	AAB/AGB	DATE OF TESTING:	10/25/2024
WEIGHED BY:	JM	DATE OF WEIGHING:	10/28/2024

BORING NO.	BS-1 @ P-2/P-5				
SAMPLE NO.	--				
SAMPLE DEPTH	0.0 - 2.0				
WATER CONTENT, W%	17.8				

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%					

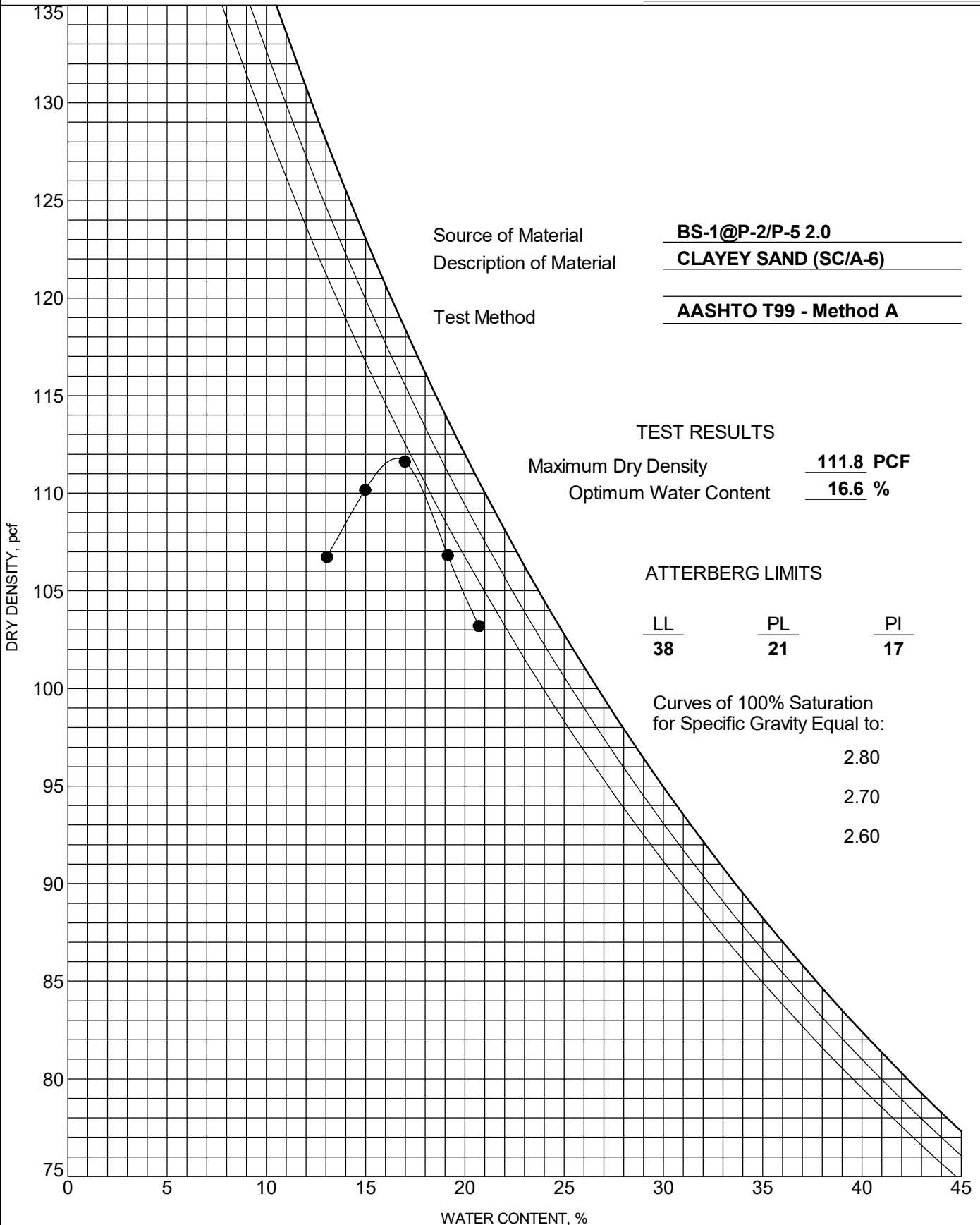


MOISTURE-DENSITY RELATIONSHIP

PROJECT ID P043994

PROJECT NAME S-24-166 over Tributary to Henleys Creek

PROJECT COUNTY Greenwood



CALIFORNIA BEARING RATIO (CBR)
AASHTO T193

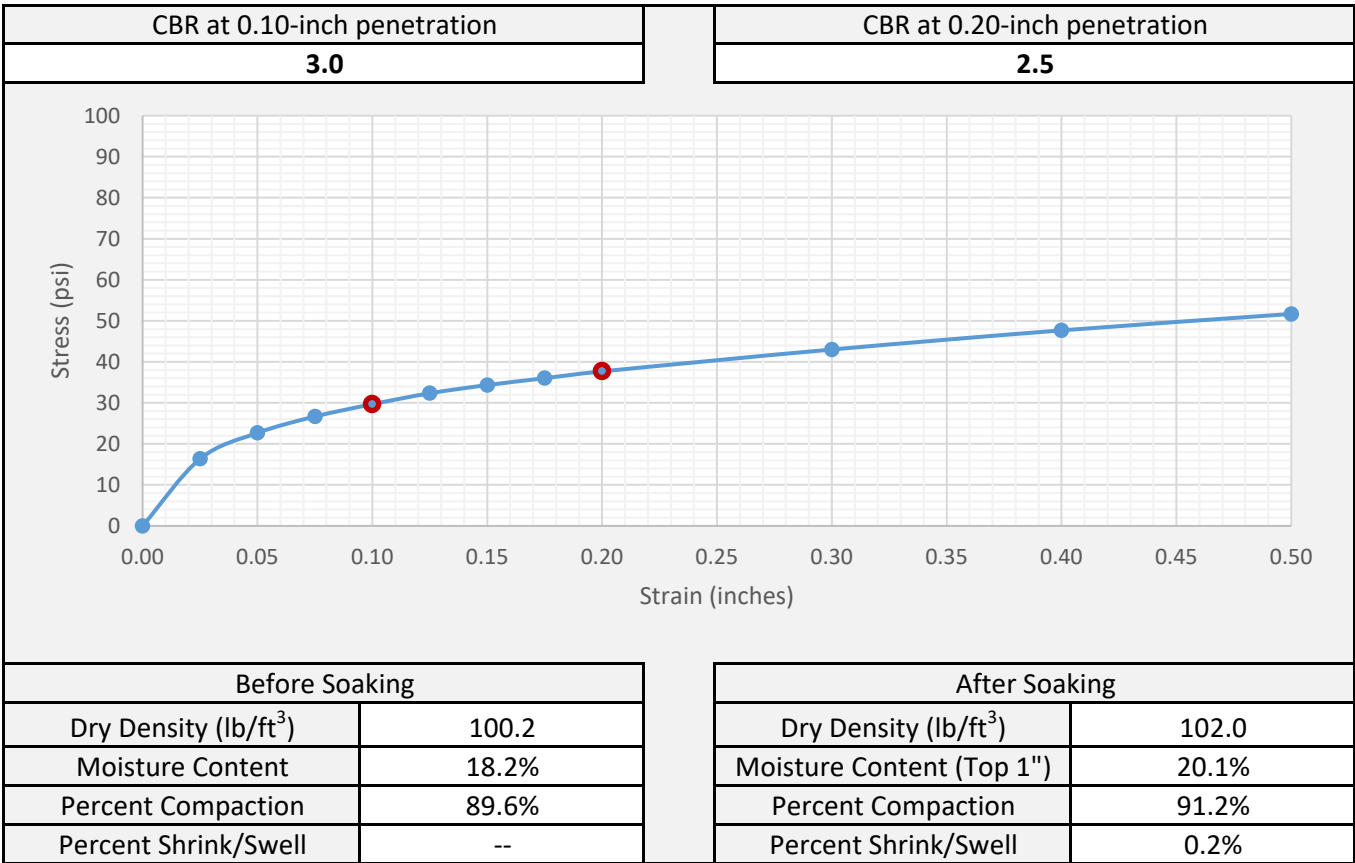
SAMPLE INFORMATION

Project Name	S-24-166 over Tributary to Henleys Creek			Project No.	G7100.007 - Task00004
Sample Location	BS-1			FME Lab ID	24-3824
Soil Description	Clayey SAND (SC/A-6)			Depth/Elev.	0.0 - 2.0
Date Sampled	--	Sampled By:	F&ME	Date Received	10/24/2024
Date Test Began	11/1/2024	Date Completed	11/5/24	Tested By	DH/JJ/TE

MOLDING CHARACTERISTICS

Method	AASHTO T99 - Method A	% Retained on 3/4" Sieve	0%
Max Dry Density (lb/ft ³)	111.8	Optimum Moisture Content (%)	16.6
Soak Time (hr)	96	Surcharge Weight (lb)	10.0

TESTING RESULTS



ADDITIONAL COMMENTS

Target %Compaction = 90%

 <div>F&ME Consultants, Inc. 211 Business Park Blvd., Columbia, South Carolina 29203</div>		11/6/24
	Reviewed By	Date

CALIFORNIA BEARING RATIO (CBR)
AASHTO T193

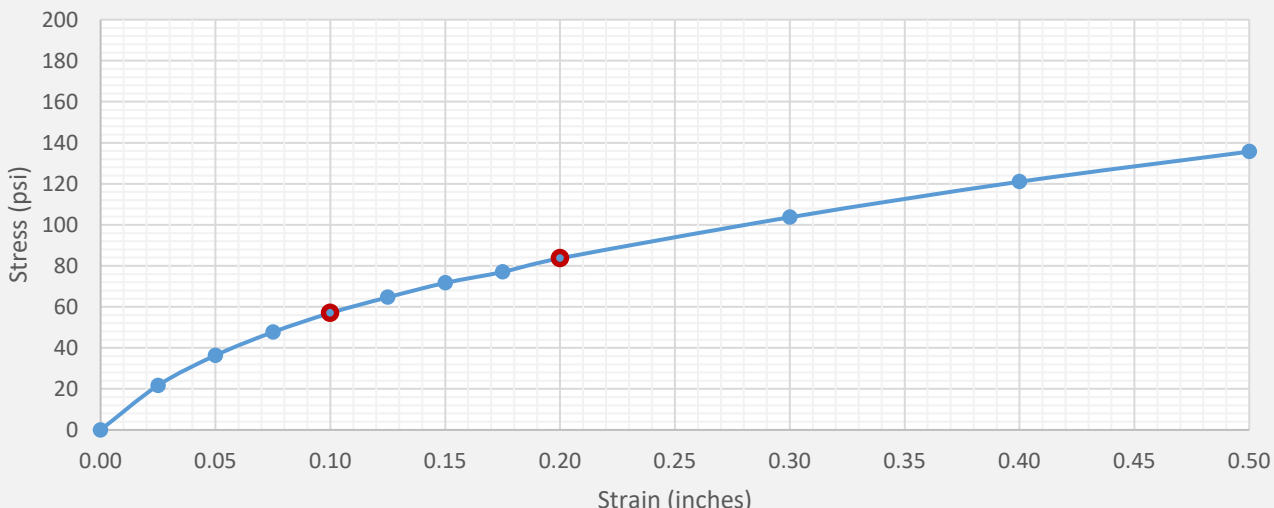
SAMPLE INFORMATION

Project Name	S-24-166 over Tributary to Henleys Creek			Project No.	G7100.007 - Task00004
Sample Location	BS-1			FME Lab ID	24-3824
Soil Description	Clayey SAND (SC/A-6)			Depth/Elev.	0.0 - 2.0
Date Sampled	--	Sampled By:	F&ME	Date Received	10/24/2024
Date Test Began	11/1/2024	Date Completed	11/5/24	Tested By	DH/TE/JJ

MOLDING CHARACTERISTICS

Method	AASHTO T99 - Method A	% Retained on 3/4" Sieve	0%
Max Dry Density (lb/ft ³)	111.8	Optimum Moisture Content (%)	16.6
Soak Time (hr)	96	Surcharge Weight (lb)	10.0

TESTING RESULTS

CBR at 0.10-inch penetration		CBR at 0.20-inch penetration	
5.7		5.6	
			
Before Soaking		After Soaking	
Dry Density (lb/ft³)	106.0	Dry Density (lb/ft³)	105.9
Moisture Content	16.9%	Moisture Content (Top 1")	19.5%
Percent Compaction	94.8%	Percent Compaction	94.7%
Percent Shrink/Swell	--	Percent Shrink/Swell	0.3%

ADDITIONAL COMMENTS

Target %Compaction = 95%

	F&ME Consultants, Inc. 211 Business Park Blvd., Columbia, South Carolina 29203		11/6/24
			Reviewed By Date

CALIFORNIA BEARING RATIO (CBR) AASHTO T193

SAMPLE INFORMATION

Project Name	S-24-166 over Tributary to Henleys Creek			Project No.	G7100.007 - Task00004
Sample Location	BS-1			FME Lab ID	24-3824
Soil Description	Clayey SAND (SC/A-6)			Depth/Elev.	0.0 - 2.0
Date Sampled	--	Sampled By:	F&ME	Date Received	10/24/2024
Date Test Began	11/1/2024	Date Completed	11/5/24	Tested By	DH/TE/JJ

MOLDING CHARACTERISTICS

Method	AASHTO T99 - Method A	% Retained on 3/4" Sieve	0%
Max Dry Density (lb/ft ³)	111.8	Optimum Moisture Content (%)	16.6
Soak Time (hr)	96	Surcharge Weight (lb)	10.0

TESTING RESULTS

CBR at 0.10-inch penetration		CBR at 0.20-inch penetration	
4.3		5.1	
<p>Stress (psi)</p> <p>Strain (inches)</p>			
Before Soaking		After Soaking	
Dry Density (lb/ft ³)	111.1	Dry Density (lb/ft ³)	110.8
Moisture Content	17.5%	Moisture Content (Top 1")	18.9%
Percent Compaction	99.4%	Percent Compaction	99.1%
Percent Shrink/Swell	--	Percent Shrink/Swell	0.4%

ADDITIONAL COMMENTS

Target %Compaction = 100%

	F&ME Consultants, Inc. 211 Business Park Blvd., Columbia, South Carolina 29203		11/6/24
			Reviewed By Date

S-24-166 over Tributary to Henleys Creek

Geotechnical Subsurface Data Report

APPENDIX

SECTION 4 LABORATORY TEST RESULTS

SECTION 4C ROCK CORE SAMPLES



Rock Coring Summary

PAGE 1 OF 1

PROJECT ID P043994

PROJECT NAME S-24-166 over Tributary to Henleys Creek

PROJECT COUNTY Greenwood

Borehole	Core Run Number	Core Run Top Depth	REC (%)	RQD (%)	q _u (psi)	Poisson's Ratio	Elastic Modulus (ksi)	Unit Weight (pcf)	RMR	GSI
B-1	NQ-1	72.8	95	61	18,260	0.20 ¹	6,220	167	41	50
B-1	NQ-2	76.3	100	47	18,590	0.27 ¹	9,320	167	36	50
B-1	NQ-3	81.3	93	22	30,960	0.40 ²	12,100	184	34	40
B-1	NQ-4	86.3	97	65	N/A	N/A	N/A	N/A	46	60
B-1	NQ-5	91.3	100	71	N/A	N/A	N/A	N/A	46	65
B-2	NQ-1	62.2	98	75	28,400	0.29 ³	10,300	174	55	40
B-2	NQ-2	67.2	80	68	39,550	0.31 ³	11,600	185	44	60
B-2	NQ-3	72.2	100	54	31,820	1.52 ⁴	14,900	185	44	50
B-2	NQ-4	77.2	100	85	N/A	N/A	N/A	N/A	45	50

¹Elastic range was taken as between 0.0005 and 0.002 inches of axial strain. This range was chosen to avoid any non—linear behavior from the initial loading and the inflection point at the end of the elastic range.

²Elastic range was taken as between 0.001 and 0.003 inches of axial strain. This range was chosen to avoid any non—linear behavior from the initial loading and the inflection point at the end of the elastic range.

³Elastic range was taken as between 0.001 and 0.004 inches of axial strain. This range was chosen to avoid any non—linear behavior from the initial loading and the inflection point at the end of the elastic range.

⁴Elastic range was taken as between 0.001 and 0.003 inches of axial strain. This range was chosen to avoid any non—linear behavior from the initial loading and the inflection point at the end of the elastic range. Please note that Poisson's Ratio is abnormally high and should consider further evaluation.

S-24-166 over Tributary to Henleys Creek CORE PHOTOGRAPHS: B-1



Begin Run 1
72.8 Feet

End Run 1
Begin Run 2
76.3 Feet

End Run 2
Begin Run 3
81.3 Feet

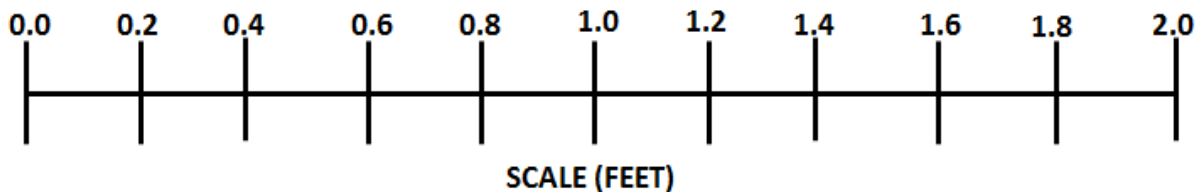


Run 3
Continued

End Run 4
Begin Run 5
91.3 Feet

End Run 3
Begin Run 4
86.3 Feet

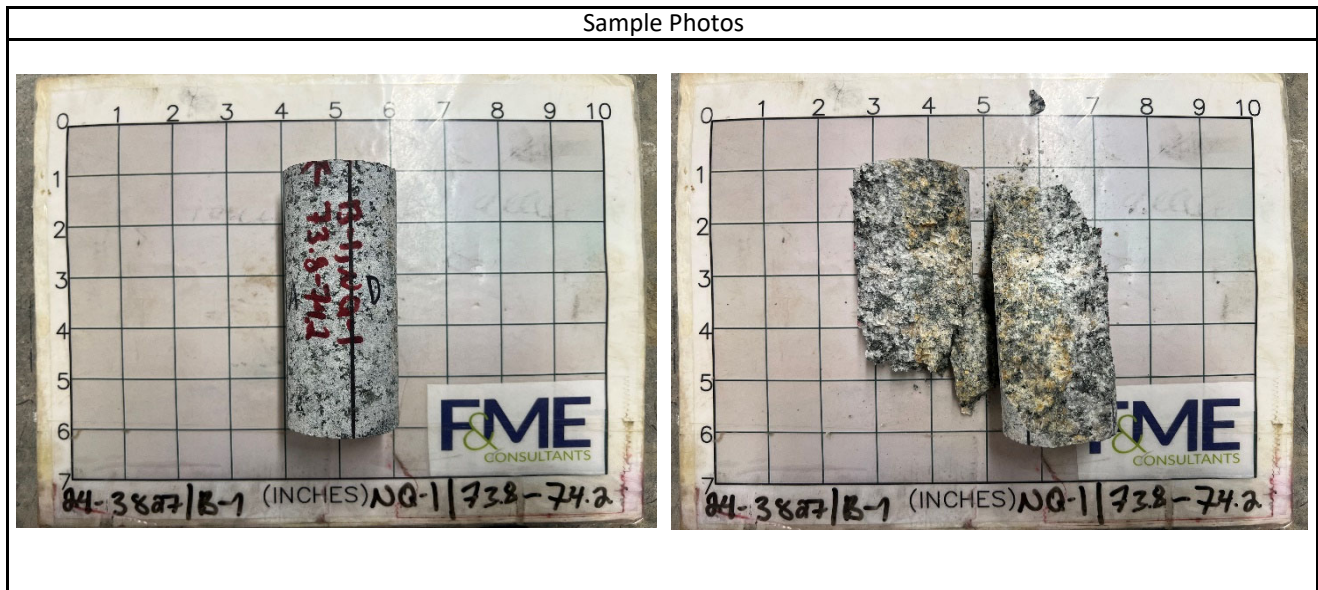
End Run 5
93.3 Feet



Compressive Strength and Elastic Moduli of Intact Rock Core Specimens
ASTM D7012 - Method D / SC-T-39

Project	S-24-166 over Tributary to Henleys Creek			Date	10/31/2024
Project No.	G7100.007 - Task 00004	Sample Diameter (in.)	1.844	Tested By	TP
SCDOT ID	P043994	Sample Length (in.)	4.329	Reviewed By	WJG
Boring	B-1	Unit Weight (pcf)	167.0	Core Size	NQ
Sample No.	NQ-1 / 24-3827	L/D Ratio	2.35	Recovery	95%
Depth	73.8' - 74.2'	Load Rate (psi/sec)	20	RQD	61%
Description	Gray Granodiorite				

Test Data						
Percent of Failure Load	Strain (10^{-6})		Load (lbs)	Compressive Stress (psi)	Secant Modulus $\times 10^6$ (psi)	Poisson's Ratio
	Axial	Radial				
10%	-610	110	4,887	1,830	6.00	0.18
20%	-1160	233	9,746	3,649	6.29	0.20
30%	-1718	375	14,634	5,480	6.38	0.22
40%	-2260	510	19,474	7,292	6.45	0.23
50%	421	875	24,389	9,132	43.40	2.08
60%	-150	1078	29,263	10,957	146.21	7.20
70%	-755	1326	34,144	12,785	33.89	1.76
80%	-1398	1658	39,019	14,611	20.90	1.19
90%	-2112	2212	43,885	16,433	15.56	1.05
100%	-3136	7022	48,773	18,263		



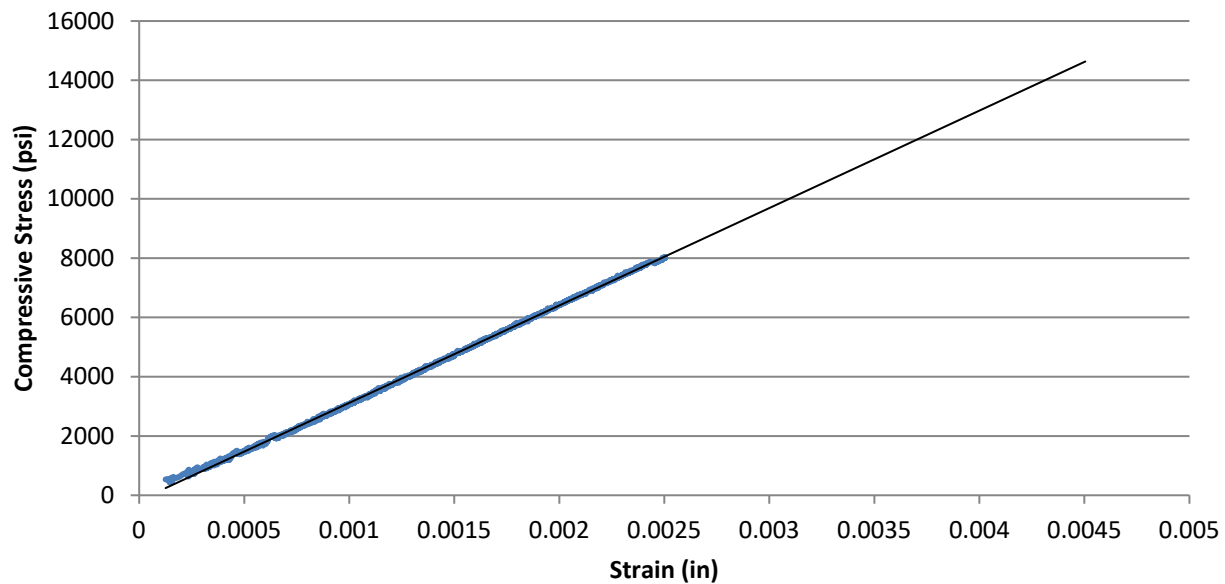
Test Results				
Unconfined Compressive Strength (psi)		18,260	Elastic Modulus (psi)	6.22E+06
			Poisson's Ratio in Elastic Range	0.20
Comments	Elastic range was taken as between 0.0005 and 0.002 inches of axial strain. This range was chosen to avoid any non-linear behavior from the initial loading and the inflection point at the end of the elastic range.			



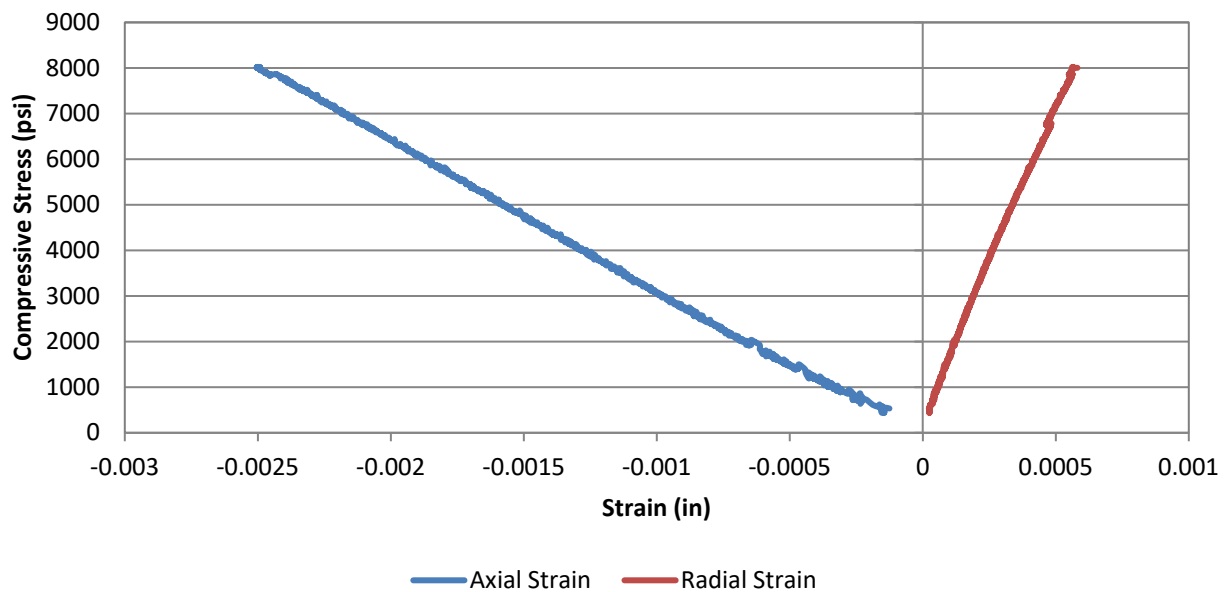
Compressive Strength and Elastic Moduli of Intact Rock Core Specimens
ASTM D7012 - Method D / SC-T-39

Project	S-24-166 over Tributary to Henleys Creek			Date	10/31/2024
Project No.	G7100.007 - Task 00004	Sample Diameter (in.)	1.844	Tested By	TP
SCDOT ID	P043994	Sample Length (in.)	4.329	Reviewed By	WJG
Boring	B-1	Unit Weight (pcf)	167.0	Core Size	NQ
Sample No.	NQ-1 / 24-3827	L/D Ratio	2.35	Recovery	95%
Depth	73.8' - 74.2'	Load Rate (psi/sec)	20	RQD	61%
Description	Gray Granodiorite				

Axial Stress vs. Strain



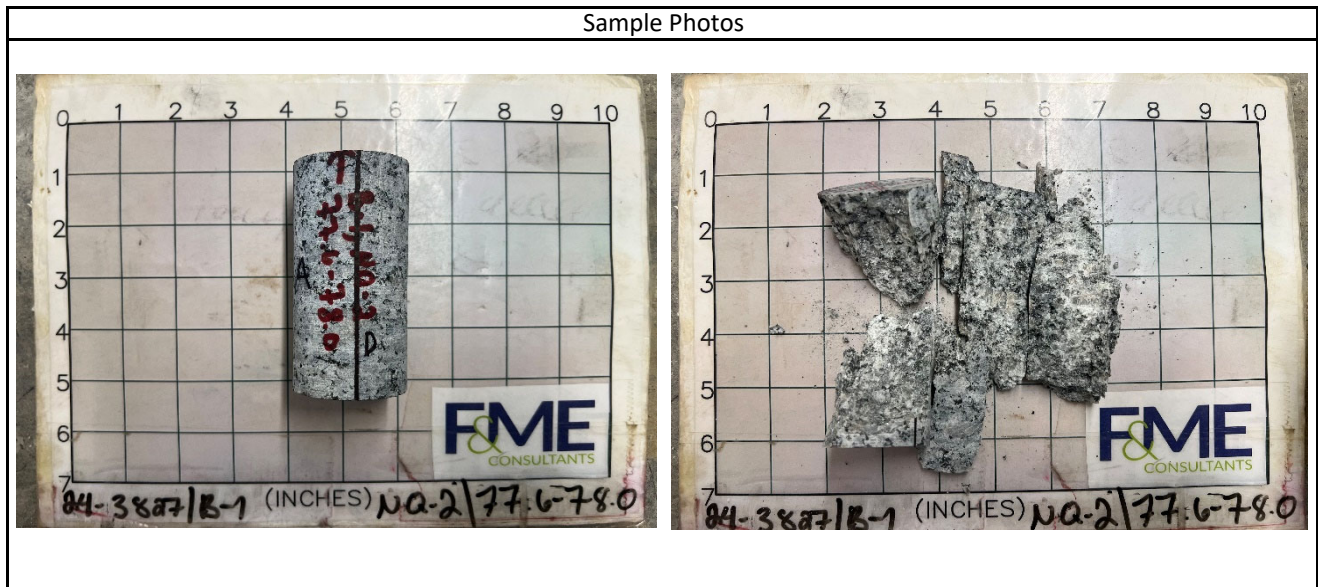
Stress vs. Strain



Compressive Strength and Elastic Moduli of Intact Rock Core Specimens
ASTM D7012 - Method D / SC-T-39

Project	S-24-166 over Tributary to Henleys Creek			Date	10/31/2024
Project No.	G7100.007 - Task 00004	Sample Diameter (in.)	1.857	Tested By	TP
SCDOT ID	P043994	Sample Length (in.)	3.812	Reviewed By	WJG
Boring	B-1	Unit Weight (pcf)	166.8	Core Size	NQ
Sample No.	NQ-2 / 24-3827	L/D Ratio	2.05	Recovery	100%
Depth	77.6' - 78.0'	Load Rate (psi/sec)	20	RQD	47%
Description	Gray Granodiorite				

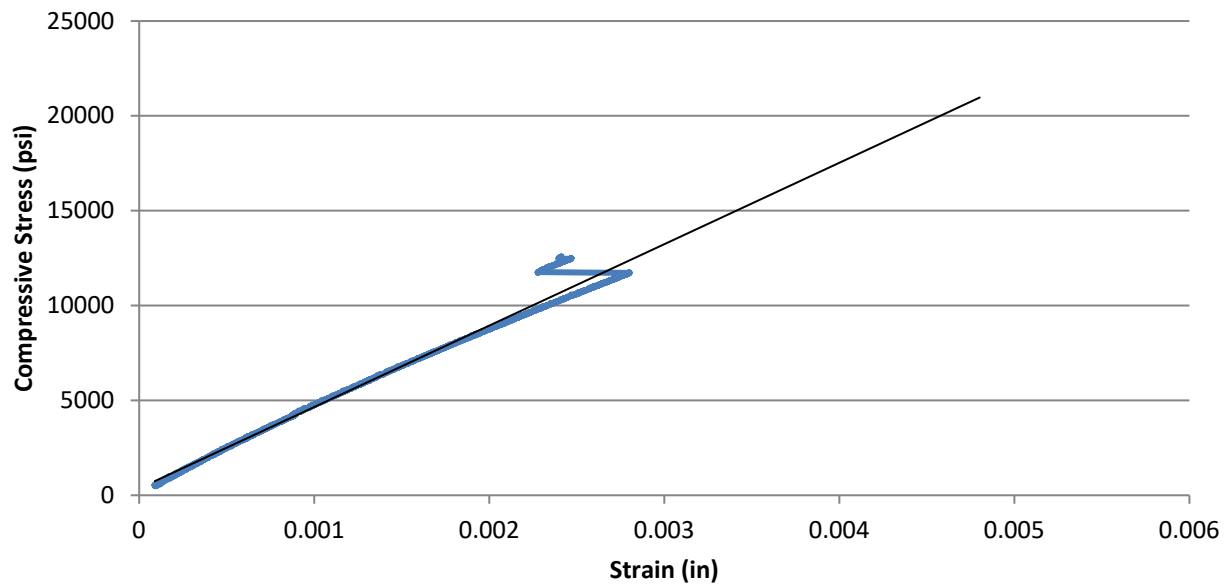
Test Data						
Percent of Failure Load	Strain (10^{-6})		Load (lbs)	Compressive Stress (psi)	Secant Modulus $\times 10^6$ (psi)	Poisson's Ratio
	Axial	Radial				
10%	-363	92	5,035	1,859	10.24	0.25
20%	-771	203	10,069	3,718	9.65	0.26
30%	-1194	325	15,105	5,577	9.34	0.27
40%	-1652	460	20,137	7,435	9.00	0.28
50%	-2145	618	25,172	9,294	8.67	0.29
60%	-2639	796	30,207	11,153	8.45	0.30
70%	-597	1015	35,244	13,013	43.63	1.70
80%	-1130	1340	40,276	14,871	26.32	1.19
90%	-1736	2002	45,313	16,731	19.27	1.15
100%	-3112	6502	50,348	18,589		



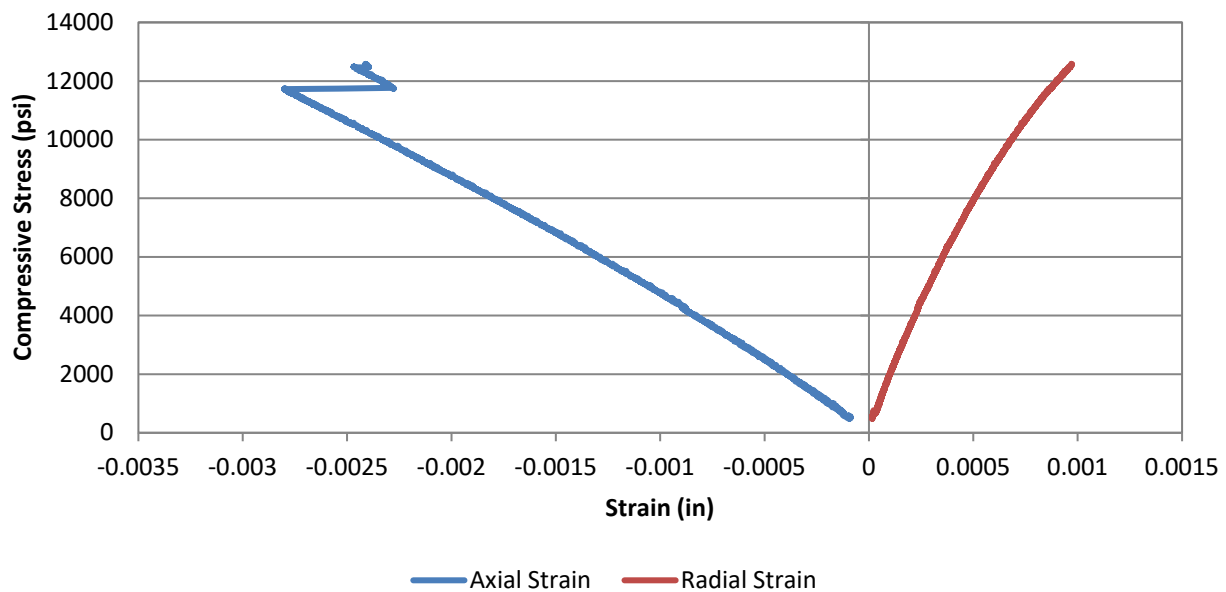
Test Results				
Unconfined Compressive Strength (psi)		18,590	Elastic Modulus (psi)	9.32E+06
			Poisson's Ratio in Elastic Range	0.27
Comments	Elastic range was taken as between 0.0005 and 0.002 inches of axial strain. This range was chosen to avoid any non-linear behavior from the initial loading and the inflection point at the end of the elastic range.			

Project	S-24-166 over Tributary to Henleys Creek			Date	10/31/2024
Project No.	G7100.007 - Task 00004	Sample Diameter (in.)	1.857	Tested By	TP
SCDOT ID	P043994	Sample Length (in.)	3.812	Reviewed By	WJG
Boring	B-1	Unit Weight (pcf)	166.8	Core Size	NQ
Sample No.	NQ-2 / 24-3827	L/D Ratio	2.05	Recovery	100%
Depth	77.6' - 78.0'	Load Rate (psi/sec)	20	RQD	47%
Description	Gray Granodiorite				

Axial Stress vs. Strain



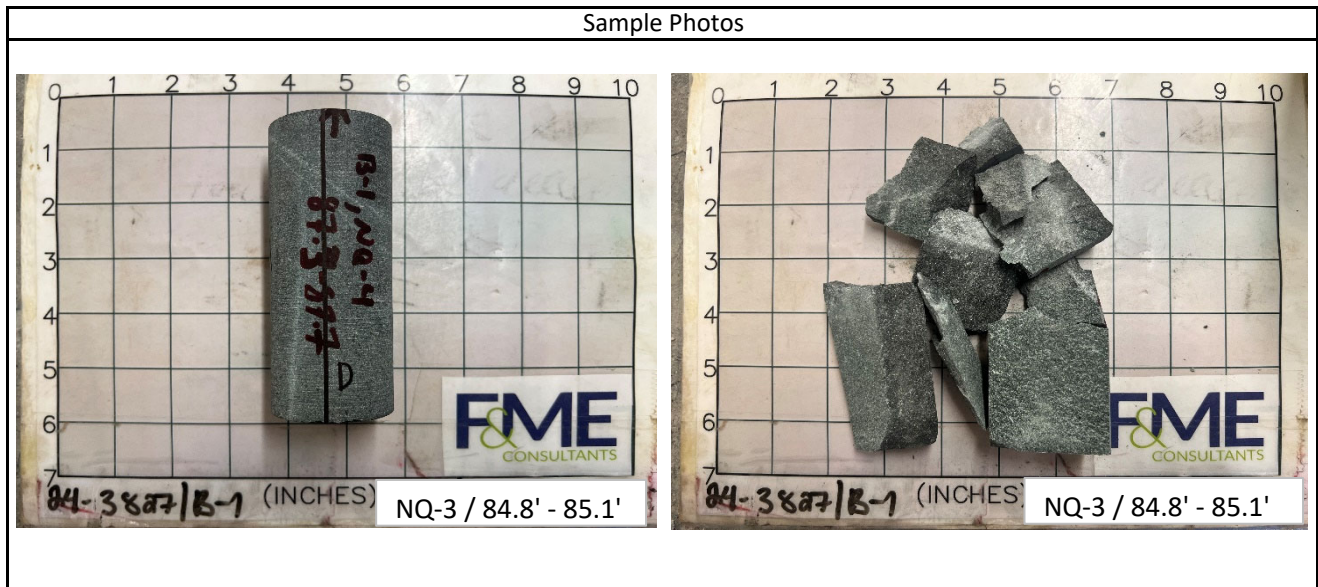
Stress vs. Strain



Compressive Strength and Elastic Moduli of Intact Rock Core Specimens
ASTM D7012 - Method D / SC-T-39

Project	S-24-166 over Tributary to Henleys Creek			Date	10/31/2024
Project No.	G7100.007 - Task 00004	Sample Diameter (in.)	1.856	Tested By	TP
SCDOT ID	P043994	Sample Length (in.)	4.443	Reviewed By	WJG
Boring	B-1	Unit Weight (pcf)	184.0	Core Size	NQ
Sample No.	NQ-3 / 24-3827	L/D Ratio	2.39	Recovery	93%
Depth	84.8' - 85.1'	Load Rate (psi/sec)	20	RQD	22%
Description	Dark Green Basalt				

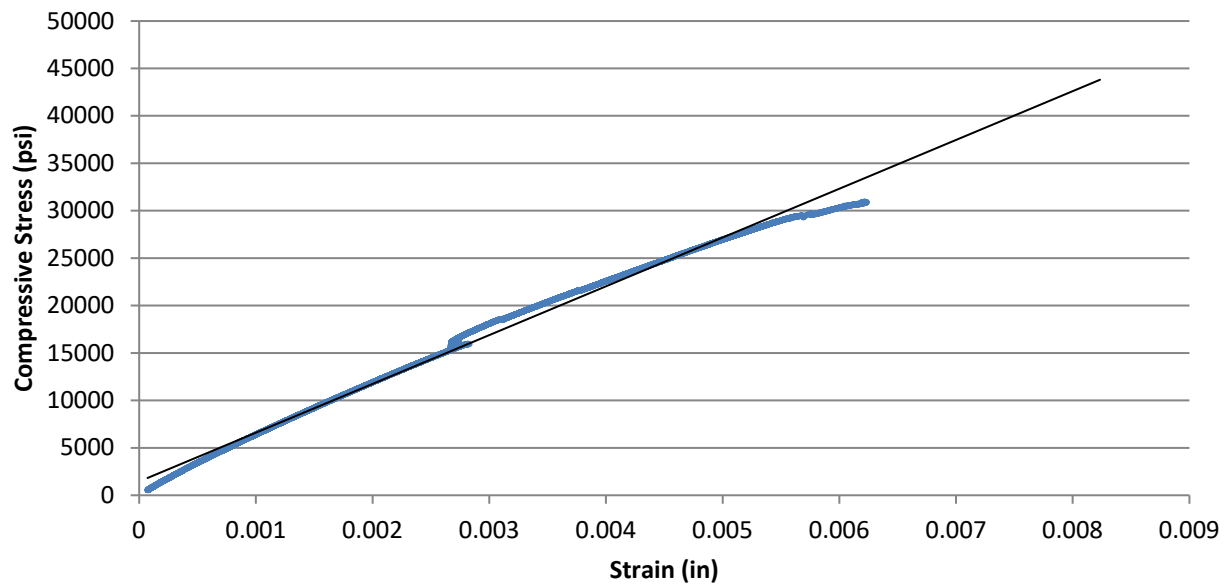
Test Data						
Percent of Failure Load	Strain (10^{-6})		Load (lbs)	Compressive Stress (psi)	Secant Modulus $\times 10^6$ (psi)	Poisson's Ratio
	Axial	Radial				
10%	-448	168	8,381	3,098	13.84	0.38
20%	-961	342	16,756	6,193	12.88	0.36
30%	-1509	508	25,134	9,290	12.31	0.34
40%	-2090	687	33,509	12,385	11.85	0.33
50%	-2703	878	41,876	15,478	11.45	0.32
60%	-3125	2149	50,261	18,578	11.89	0.69
70%	-3801	2798	58,637	21,674	11.41	0.74
80%	-4494	3312	67,017	24,771	11.02	0.74
90%	-5219	3819	75,393	27,867	10.68	0.73
100%	-6219	4634	83,769	30,963		



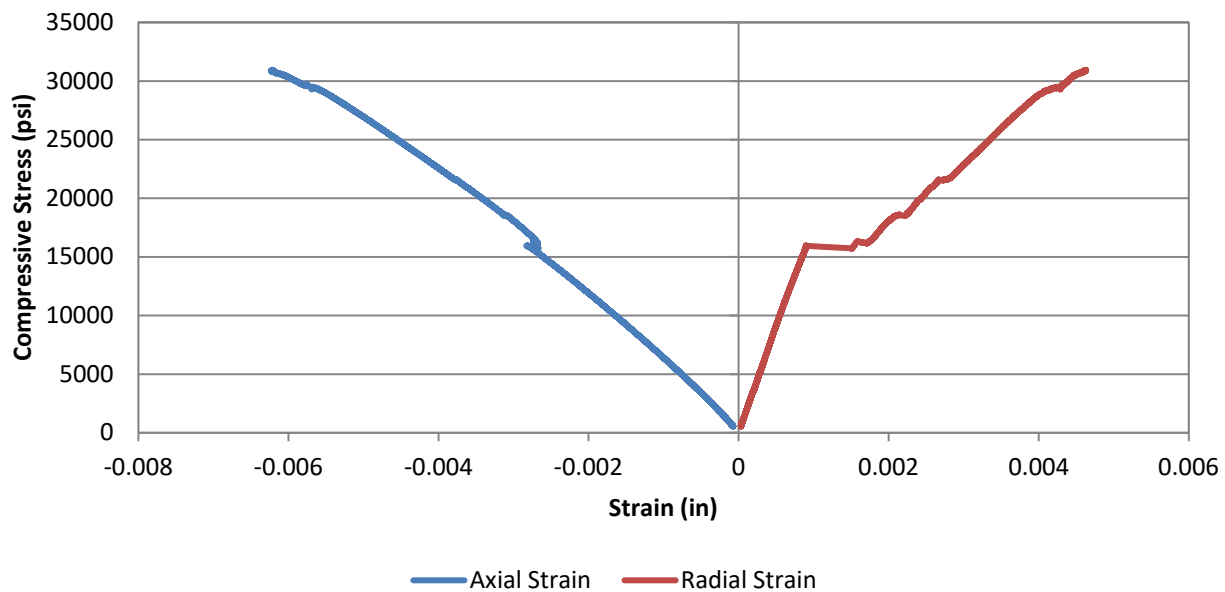
Test Results				
Unconfined Compressive Strength (psi)		30,960	Elastic Modulus (psi)	1.21E+07
			Poisson's Ratio in Elastic Range	0.40
Comments	Elastic range was taken as between 0.001 and 0.003 inches of axial strain. This range was chosen to avoid any non-linear behavior from the initial loading and the inflection point at the end of the elastic range.			

Project	S-24-166 over Tributary to Henleys Creek			Date	10/31/2024
Project No.	G7100.007 - Task 00004	Sample Diameter (in.)	1.856	Tested By	TP
SCDOT ID	P043994	Sample Length (in.)	4.443	Reviewed By	WJG
Boring	B-1	Unit Weight (pcf)	184.0	Core Size	NQ
Sample No.	NQ-3 / 24-3827	L/D Ratio	2.39	Recovery	93%
Depth	84.8' - 85.1'	Load Rate (psi/sec)	20	RQD	22%
Description	Dark Green Basalt				

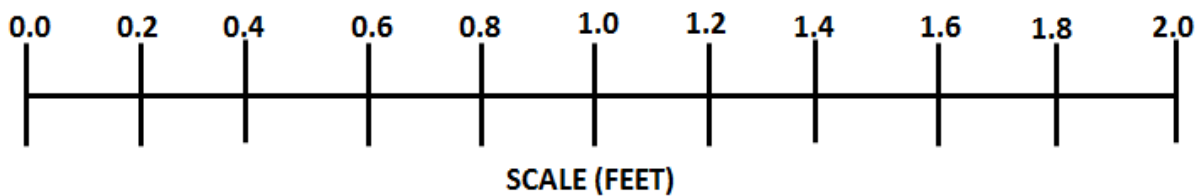
Axial Stress vs. Strain



Stress vs. Strain



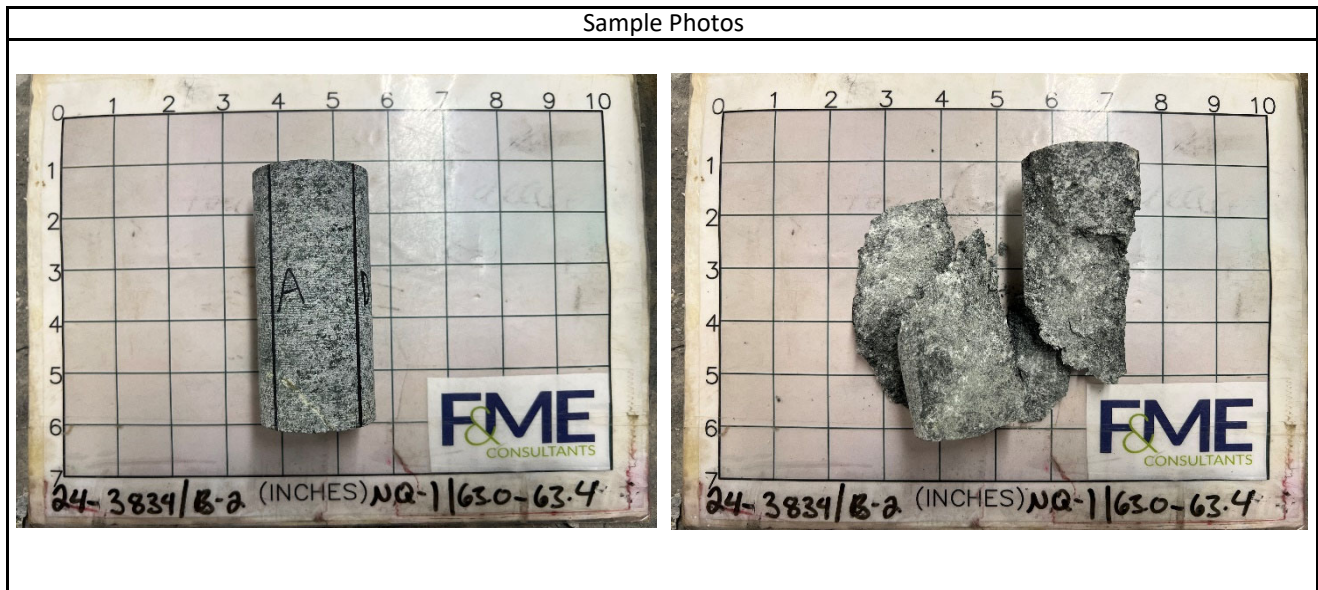
S-24-166 over Tributary to Henleys Creek CORE PHOTOGRAPHS: B-2



Compressive Strength and Elastic Moduli of Intact Rock Core Specimens
ASTM D7012 - Method D / SC-T-39

Project	S-24-166 over Tributary to Henleys Creek			Date	10/31/2024
Project No.	G7100.007 - Task 00004	Sample Diameter (in.)	1.852	Tested By	TP
SCDOT ID	P043994	Sample Length (in.)	4.147	Reviewed By	WJG
Boring	B-2	Unit Weight (pcf)	174.0	Core Size	NQ
Sample No.	NQ-1 / 24-3834	L/D Ratio	2.24	Recovery	98%
Depth	63.0' - 63.4'	Load Rate (psi/sec)	20	RQD	75%
Description	Gray Gabbro				

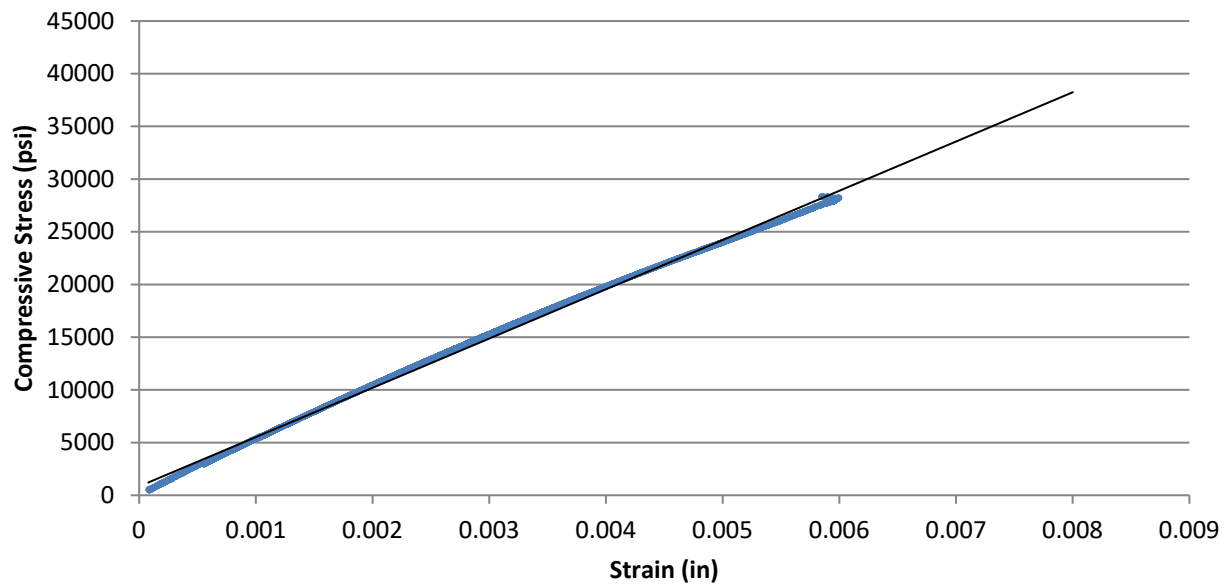
Test Data						
Percent of Failure Load	Strain (10^{-6})		Load (lbs)	Compressive Stress (psi)	Secant Modulus $\times 10^6$ (psi)	Poisson's Ratio
	Axial	Radial				
10%	-500	146	7,650	2,840	11.36	0.29
20%	-1073	304	15,323	5,688	10.60	0.28
30%	-1613	459	22,947	8,518	10.56	0.28
40%	-2179	625	30,606	11,361	10.43	0.29
50%	-2767	803	38,253	14,200	10.27	0.29
60%	-3382	1000	45,953	17,059	10.09	0.30
70%	-4009	1225	53,555	19,881	9.92	0.31
80%	-4683	1503	61,206	22,721	9.70	0.32
90%	-5376	1913	68,857	25,561	9.51	0.36
100%	-5851	4153	76,511	28,402		



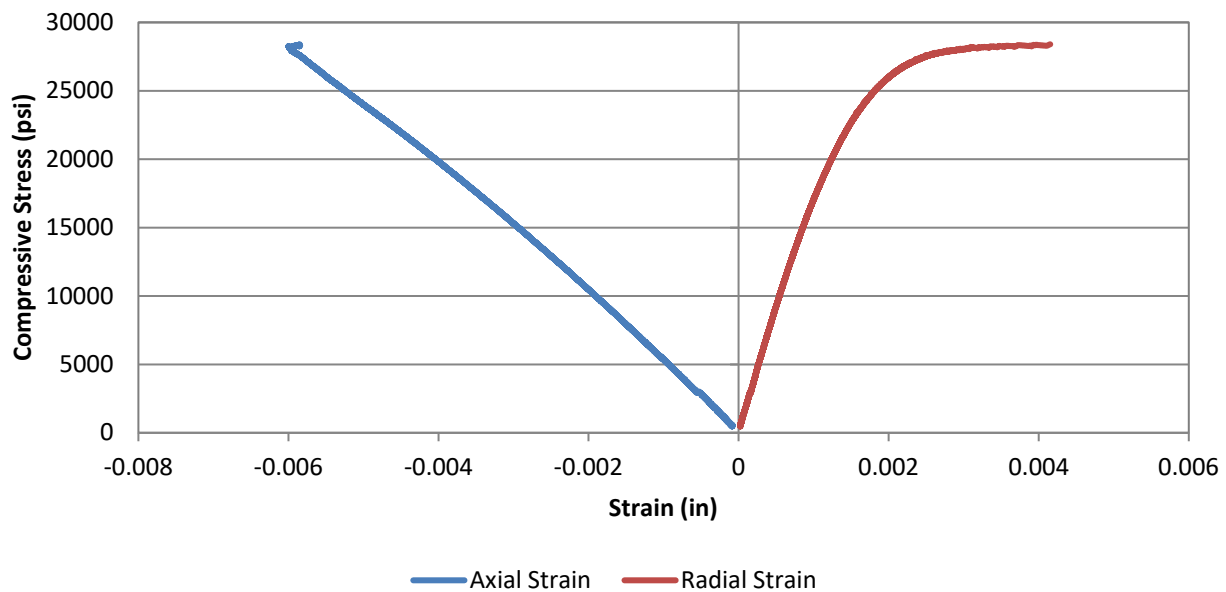
Test Results				
Unconfined Compressive Strength (psi)		28,400	Elastic Modulus (psi)	1.03E+07
			Poisson's Ratio in Elastic Range	0.29
Comments	Elastic range was taken as between 0.001 and 0.004 inches of axial strain. This range was chosen to avoid any non-linear behavior from the initial loading and the inflection point at the end of the elastic range.			

Project	S-24-166 over Tributary to Henleys Creek			Date	10/31/2024
Project No.	G7100.007 - Task 00004	Sample Diameter (in.)	1.852	Tested By	TP
SCDOT ID	P043994	Sample Length (in.)	4.147	Reviewed By	WJG
Boring	B-2	Unit Weight (pcf)	174.0	Core Size	NQ
Sample No.	NQ-1 / 24-3834	L/D Ratio	2.24	Recovery	98%
Depth	63.0' - 63.4'	Load Rate (psi/sec)	20	RQD	75%
Description	Gray Gabbro				

Axial Stress vs. Strain



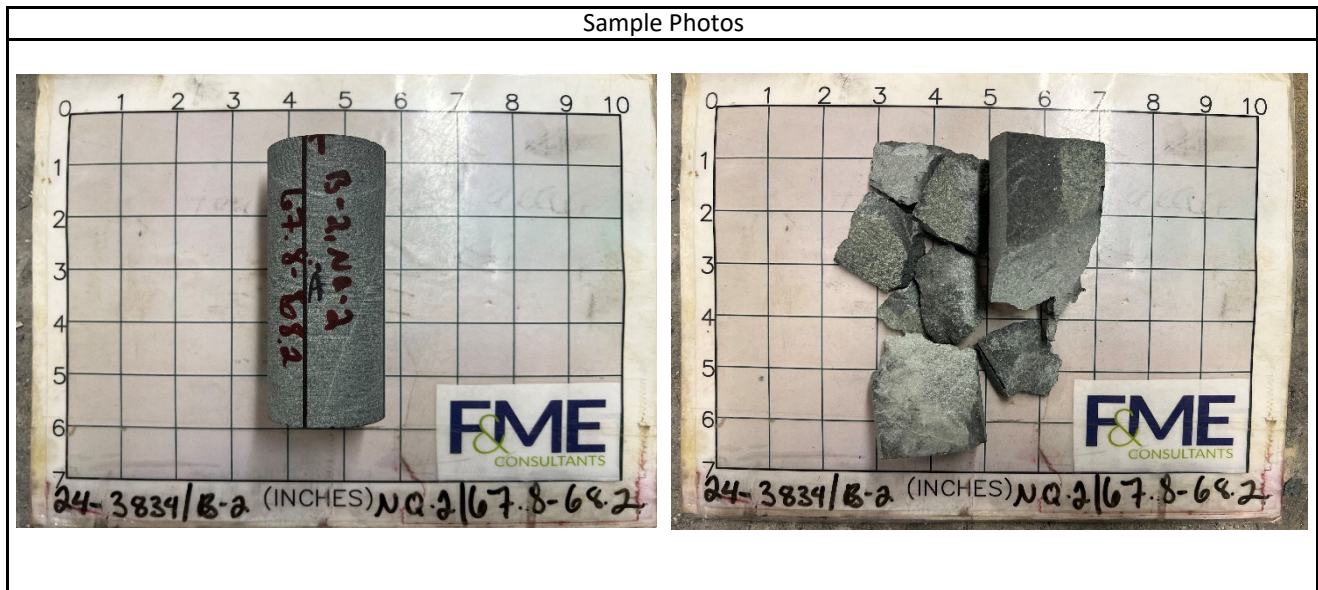
Stress vs. Strain



Compressive Strength and Elastic Moduli of Intact Rock Core Specimens
ASTM D7012 - Method D / SC-T-39

Project	S-24-166 over Tributary to Henleys Creek			Date	10/31/2024
Project No.	G7100.007 - Task 00004	Sample Diameter (in.)	1.86	Tested By	TP
SCDOT ID	P043994	Sample Length (in.)	4.348	Reviewed By	WJG
Boring	B-2	Unit Weight (pcf)	184.6	Core Size	NQ
Sample No.	NQ-2 / 24-3834	L/D Ratio	2.34	Recovery	80%
Depth	67.8' - 68.2'	Load Rate (psi/sec)	30	RQD	68%
Description	Dark Green Basalt				

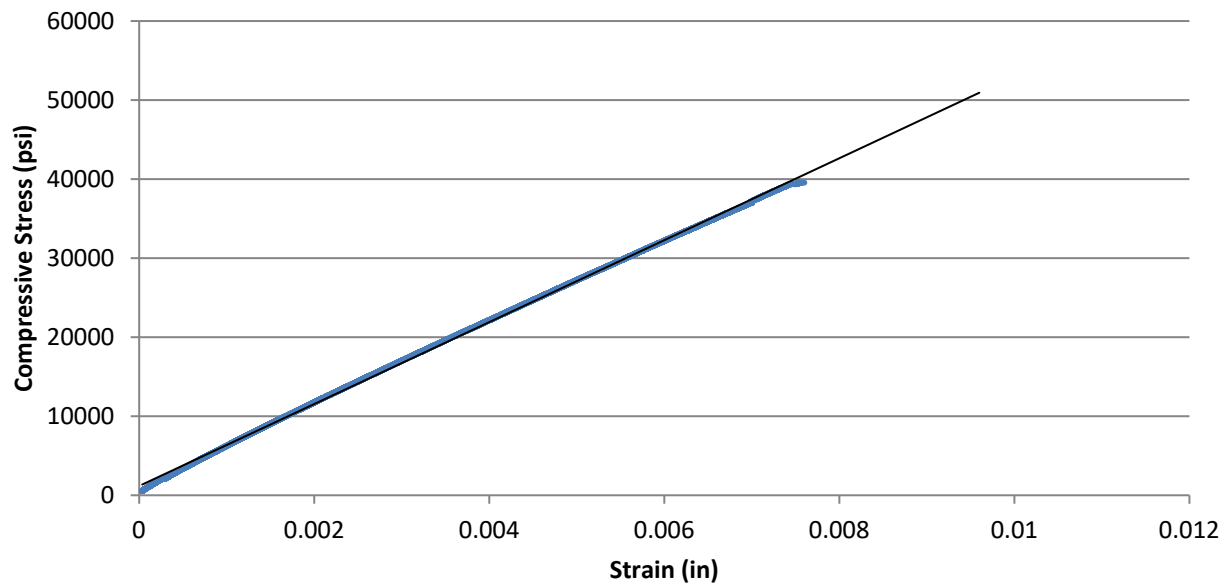
Test Data						
Percent of Failure Load	Strain (10^{-6})		Load (lbs)	Compressive Stress (psi)	Secant Modulus $\times 10^6$ (psi)	Poisson's Ratio
	Axial	Radial				
10%	-601	184	10,745	3,954	13.16	0.31
20%	-1289	398	21,485	7,907	12.26	0.31
30%	-2019	621	32,248	11,868	11.76	0.31
40%	-2765	855	42,989	15,821	11.44	0.31
50%	-3531	1101	53,731	19,775	11.20	0.31
60%	-4307	1368	64,476	23,729	11.02	0.32
70%	-5093	1660	75,232	27,688	10.87	0.33
80%	-5884	2002	85,985	31,645	10.76	0.34
90%	-6700	2386	96,727	35,599	10.63	0.36
100%	-7600	3038	107,475	39,554		



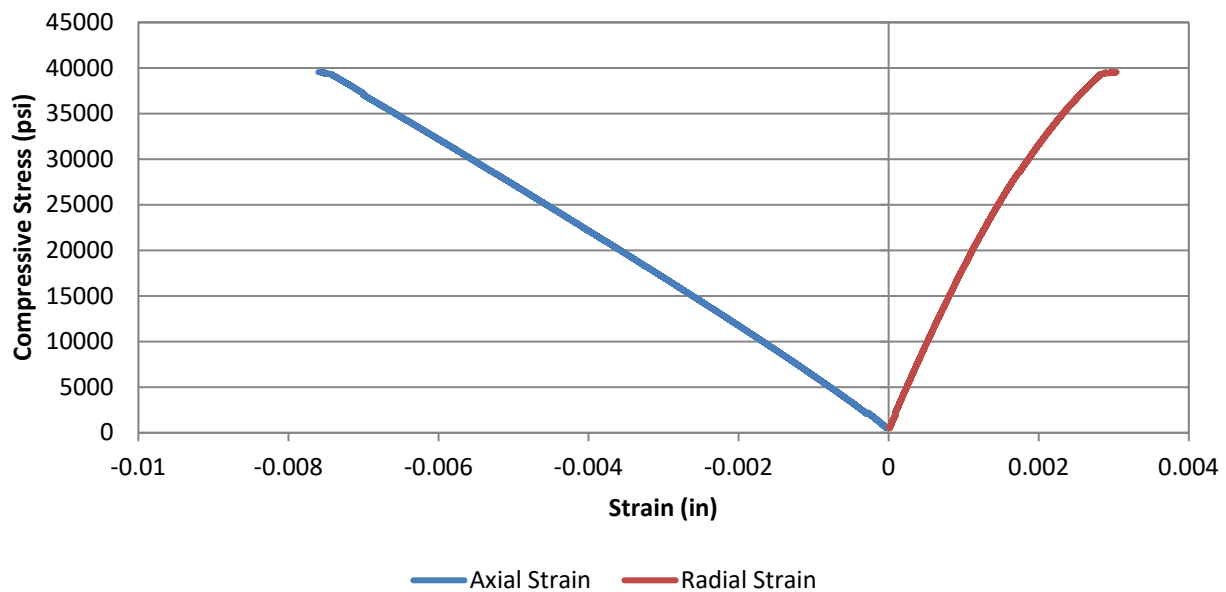
Test Results				
Unconfined Compressive Strength (psi)		39,550	Elastic Modulus (psi)	1.16E+07
			Poisson's Ratio in Elastic Range	0.31
Comments	Elastic range was taken as between 0.001 and 0.004 inches of axial strain. This range was chosen to avoid any non-linear behavior from the initial loading and the inflection point at the end of the elastic range.			

Project	S-24-166 over Tributary to Henleys Creek			Date	10/31/2024
Project No.	G7100.007 - Task 00004	Sample Diameter (in.)	1.86	Tested By	TP
SCDOT ID	P043994	Sample Length (in.)	4.348	Reviewed By	WJG
Boring	B-2	Unit Weight (pcf)	184.6	Core Size	NQ
Sample No.	NQ-2 / 24-3834	L/D Ratio	2.34	Recovery	80%
Depth	67.8' - 68.2'	Load Rate (psi/sec)	30	RQD	68%
Description	Dark Green Basalt				

Axial Stress vs. Strain



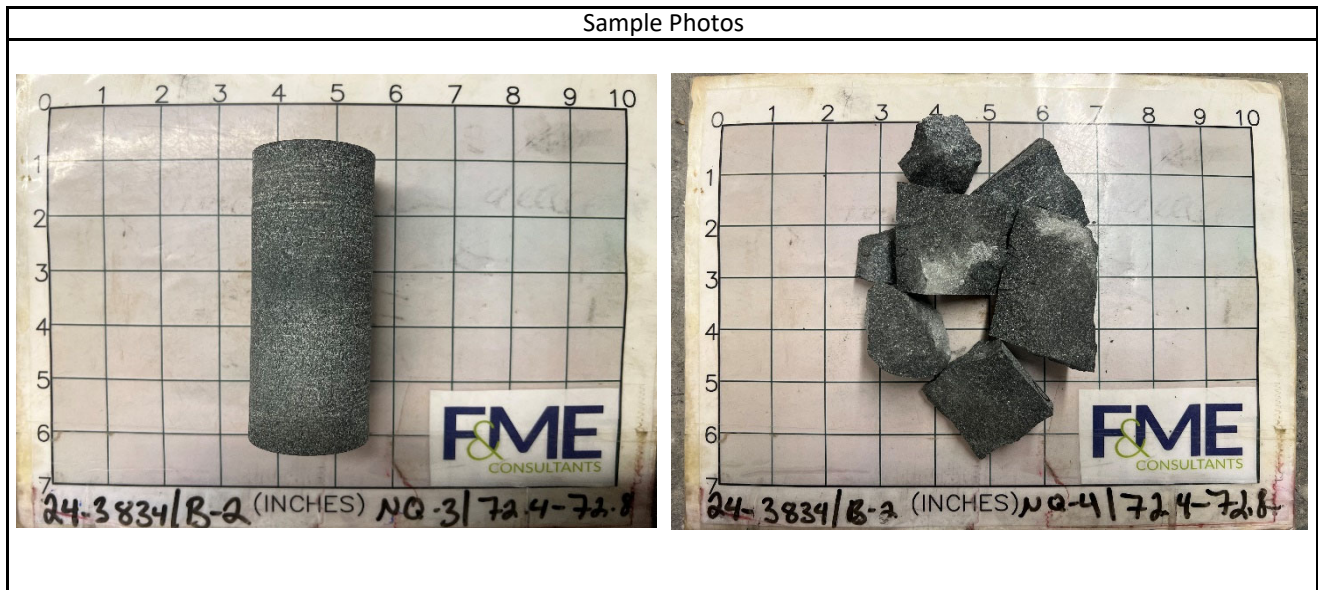
Stress vs. Strain



Compressive Strength and Elastic Moduli of Intact Rock Core Specimens
ASTM D7012 - Method D / SC-T-39

Project	S-24-166 over Tributary to Henleys Creek			Date	10/31/2024
Project No.	G7100.007 - Task 00004	Sample Diameter (in.)	1.86	Tested By	TP
SCDOT ID	P043994	Sample Length (in.)	4.338	Reviewed By	WJG
Boring	B-2	Unit Weight (pcf)	185.0	Core Size	NQ
Sample No.	NQ-3 / 24-3834	L/D Ratio	2.33	Recovery	100%
Depth	72.4' - 72.8'	Load Rate (psi/sec)	30	RQD	54%
Description	Dark Green Basalt				

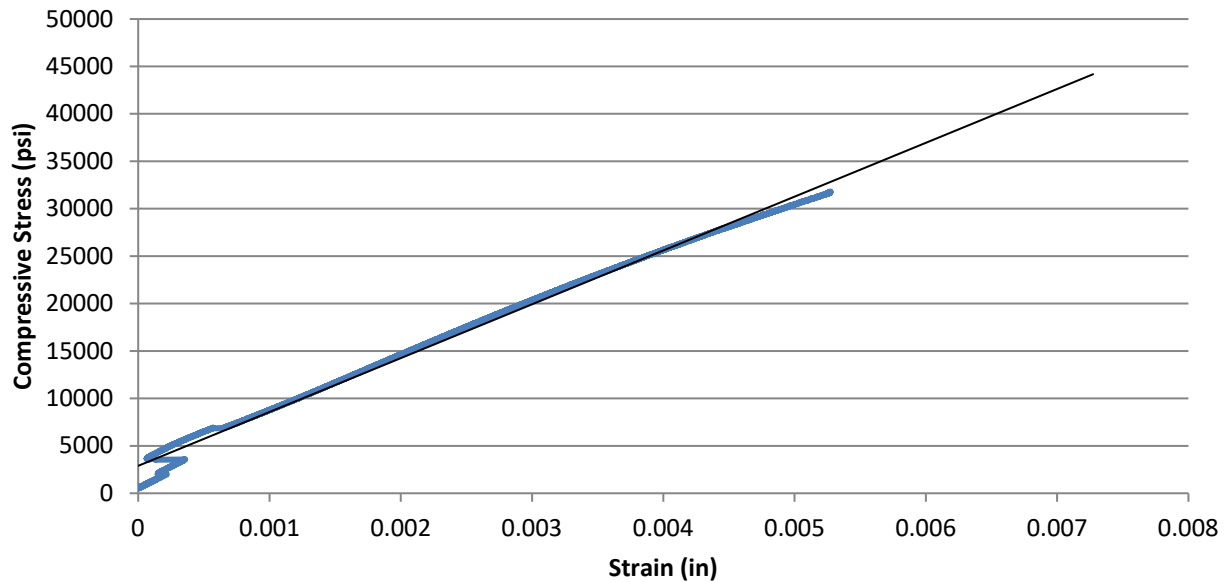
Test Data						
Percent of Failure Load	Strain (10^{-6})		Load (lbs)	Compressive Stress (psi)	Secant Modulus $\times 10^6$ (psi)	Poisson's Ratio
	Axial	Radial				
10%	-303	1380	8,648	3,183	21.03	4.56
20%	-474	2163	17,292	6,364	26.82	4.56
30%	-1136	2408	25,937	9,546	16.81	2.12
40%	-1681	2704	34,581	12,727	15.14	1.61
50%	-2220	3022	43,230	15,910	14.34	1.36
60%	-2771	3354	51,874	19,091	13.78	1.21
70%	-3351	3708	60,517	22,272	13.29	1.11
80%	-3961	4065	69,159	25,453	12.85	1.03
90%	-4614	4448	77,808	28,636	12.41	0.96
100%	-5274	4929	86,452	31,817		



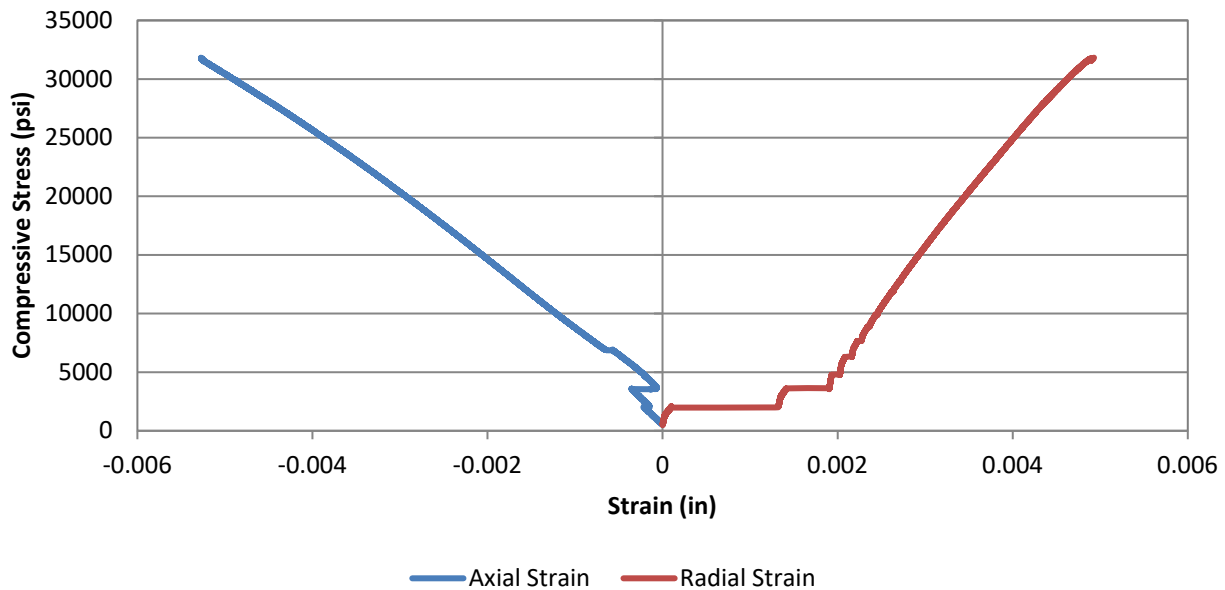
Test Results				
Unconfined Compressive Strength (psi)		31,820	Elastic Modulus (psi)	1.49E+07
			Poisson's Ratio in Elastic Range	1.52
Comments	Elastic range was taken as between 0.001 and 0.003 inches of axial strain. This range was chosen to avoid any non-linear behavior from the initial loading and the inflection point at the end of the elastic range. Please note that Poisson's Ratio is abnormally high and should consider futher evaluation.			

Project	S-24-166 over Tributary to Henleys Creek			Date	10/31/2024
Project No.	G7100.007 - Task 00004	Sample Diameter (in.)	1.86	Tested By	TP
SCDOT ID	P043994	Sample Length (in.)	4.338	Reviewed By	WJG
Boring	B-2	Unit Weight (pcf)	185.0	Core Size	NQ
Sample No.	NQ-3 / 24-3834	L/D Ratio	2.33	Recovery	100%
Depth	72.4' - 72.8'	Load Rate (psi/sec)	30	RQD	54%
Description	Dark Green Basalt				

Axial Stress vs. Strain



Stress vs. Strain



S-24-166 over Tributary to Henleys Creek

Geotechnical Subsurface Data Report

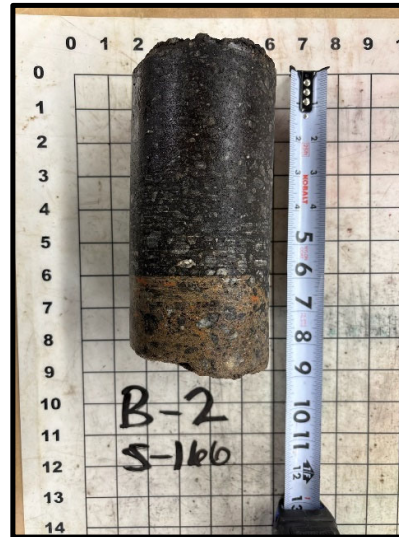
APPENDIX

SECTION 5 PAVEMENT CORE PHOTOS

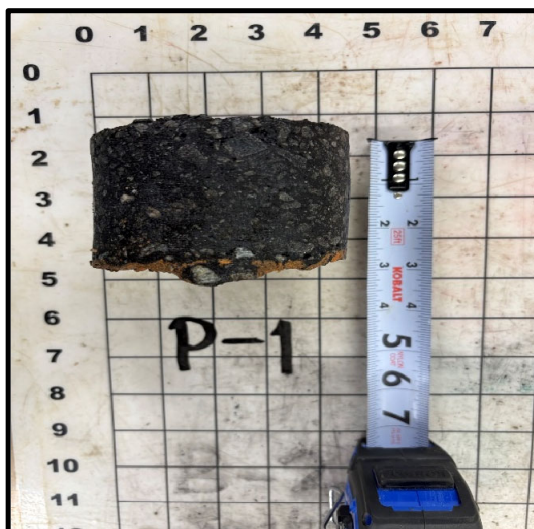
Pavement Core Photos



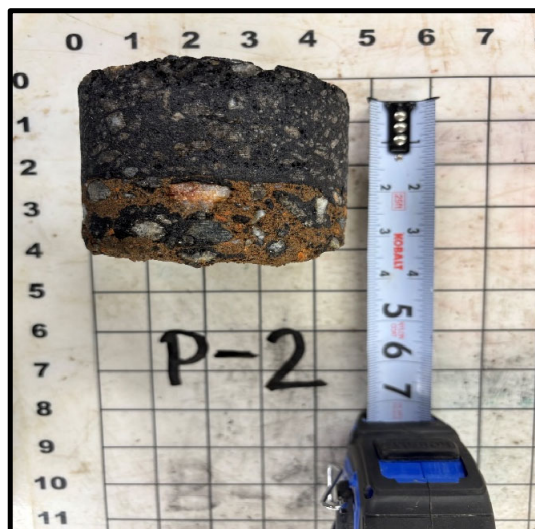
B-1



B-2



P-1

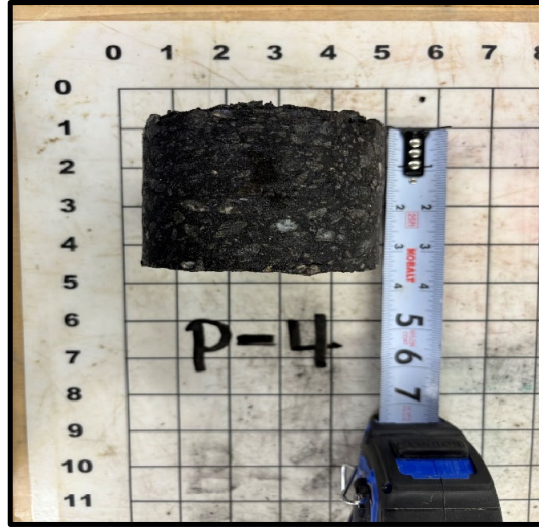


P-2

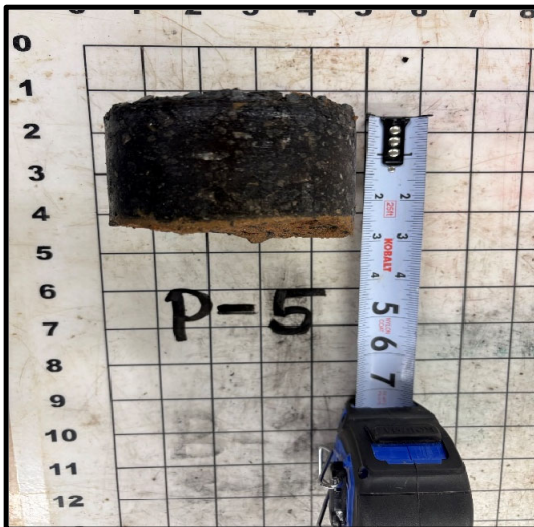
Pavement Core Photos



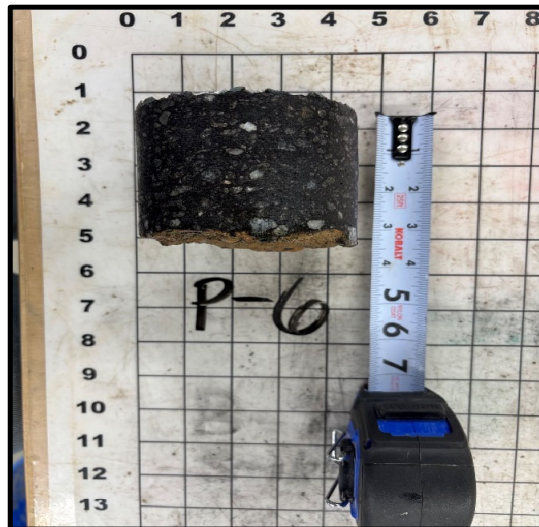
P-3



P-4



P-5



P-6

S-24-166 over Tributary to Henleys Creek

Geotechnical Subsurface Data Report

APPENDIX

SECTION 6

SPT HAMMER CALIBRATION

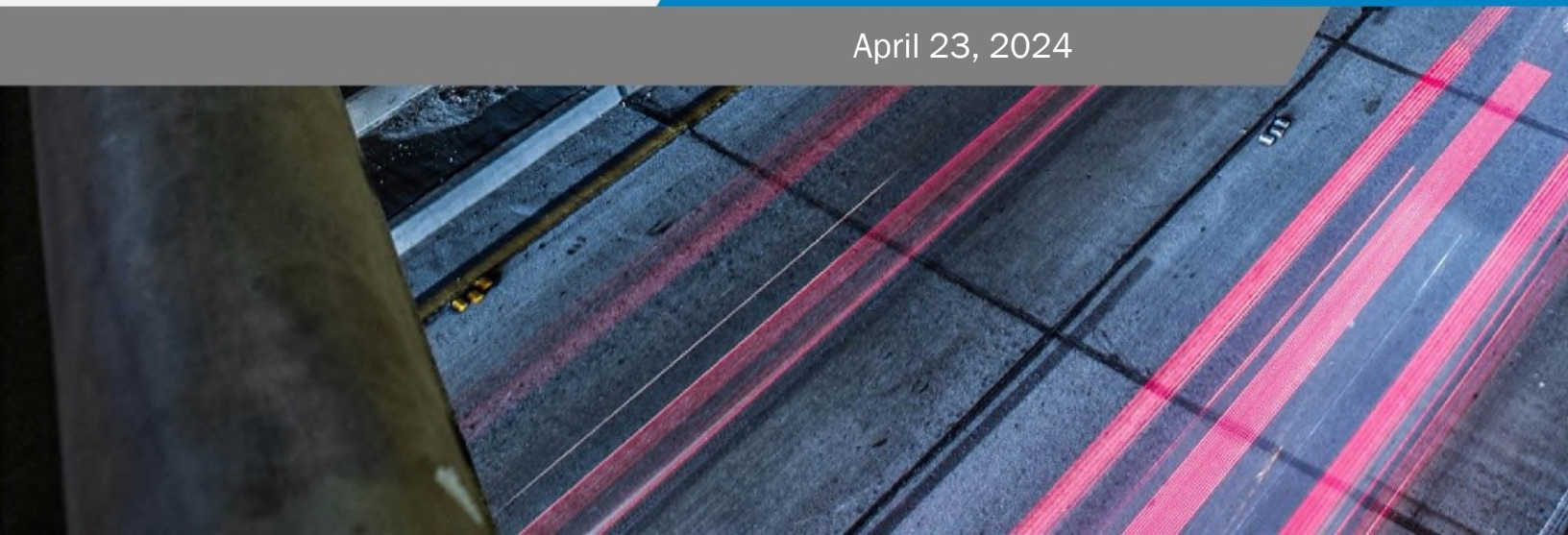


**CAROLINAS
GEOTECHNICAL
GROUP**

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



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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 45B Trailer Rig (SN 303304)
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 45B trailer-mounted drill rig with a serial number of 303304, 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 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 45B trailer-mounted drill rig operated by D. Harris 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 34.7704252, -81.2454632. 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	45B
Serial Number	303304
Operator	D. Harris
Carrier	Trailer
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 ²)	1.13
Typical Lengths (feet)	5
Instrumented Rod Type	AWJ (SN 728)
OD (inches)	1.75
ID (inches)	1.25
Cross-Sectional Area (in ²)	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 recorded, the automatic hammer on the CME 45B trailer-mounted drill rig operated at a rate of about 53.3 to 58.8 BPM during dynamic testing. The measured transferred hammer energy (EFV) ranged from 288.7 to 323.1 foot-pounds, which corresponds to Energy Transfer Ratio (ETR) values of 82.5 to 92.3%, respectively. These data ranges are based on the overall minimum and maximum values for the last 12 inches of each sample interval.

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

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

Table 2: Summary of Dynamic Testing Results

Data Set ID	Sample Depth (ft)	Drill Rod Length (ft)	Instrumentation to Sampler Tip Length (ft)	Blows per 6" Increment / N-value	Soil Sample Description (Piedmont Residual)	Avg. BPM	Avg. EFV (ft-lbs)	Avg. ETR (%)
1	28½ - 30	30	33.6	4-9-11 / 20	SA SILT	53.8	299.4	85.5
2	33½ - 35	35	38.6	4-7-10 / 17	SA SILT	58.3	311.7	89.1
3	38½ - 40	40	43.6	5-7-10 / 17	SA SILT	54.5	297.0	84.9
Overall Average						55.4	302.5	86.4

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 45B truck-mounted drill rig (for all the depth intervals included in Table 2) was 302.5 foot-pounds, with an average ETR of 86.4%.

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 45B Trailer Rig (SN 303304) 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



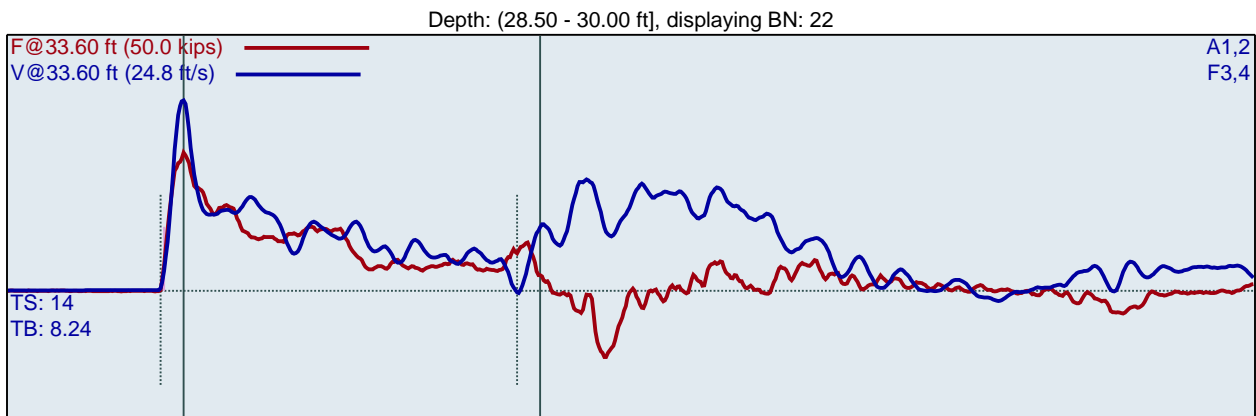
APPENDIX I

CME 45B (SN 303304)
REK
B-2

B-2
Interval start: 4/12/2024

AR: 1.13 in²
LE: 33.60 ft
WS: 16807.9 ft/s

SP: 0.492 k/ft³
EM: 30000 ksi



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

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

BPM: Blows/Minute

FMX: Maximum Force

VMX: Maximum Velocity

DMX: Maximum Displacement

CSX: Compression Stress Maximum

DFN: Final Displacement

EFV: Maximum Energy

ETR: Energy Transfer Ratio - Rated

LP	BL#	BC	BPM	FMX	VMX	DMX	CSX	DFN	EFV	ETR
ft		/6"	bpm	kips	ft/s	in	ksi	in	ft-lb	%
28.63	1	4	8.8	27.6	15.9	2.3	24.5	1.5	291.9	83.4
28.75	2	4	52.7	26.6	16.0	1.7	23.5	1.5	292.4	83.5
28.88	3	4	53.3	27.4	17.6	1.5	24.2	1.5	293.9	84.0
29.00	4	4	53.6	27.0	15.9	1.5	23.9	1.5	288.7	82.5
29.06	5	9	53.4	27.4	17.4	1.3	24.3	0.7	294.5	84.1
29.11	6	9	53.8	27.6	16.9	1.2	24.4	0.7	291.2	83.2
29.17	7	9	54.1	27.6	17.8	1.1	24.5	0.7	296.5	84.7
29.22	8	9	53.3	27.3	18.3	1.1	24.1	0.7	299.4	85.5
29.28	9	9	53.8	28.3	16.9	1.0	25.1	0.7	288.7	82.5
29.33	10	9	53.9	28.1	17.8	1.0	24.9	0.7	295.3	84.4
29.39	11	9	53.5	26.9	18.1	1.0	23.8	0.7	298.1	85.2
29.44	12	9	54.1	27.3	17.8	1.0	24.2	0.7	298.6	85.3
29.50	13	9	53.6	27.5	17.9	0.9	24.4	0.7	298.4	85.3
29.55	14	11	54.2	27.6	17.1	0.9	24.4	0.5	290.2	82.9
29.59	15	11	53.5	27.7	16.4	0.9	24.5	0.5	291.8	83.4
29.64	16	11	53.6	27.4	16.5	0.8	24.3	0.5	293.2	83.8
29.68	17	11	54.1	28.0	16.3	0.9	24.8	0.5	304.3	86.9
29.73	18	11	53.6	28.1	17.7	0.8	24.8	0.5	306.1	87.4
29.77	19	11	54.0	26.4	19.2	0.8	23.4	0.5	309.1	88.3
29.82	20	11	53.4	27.7	18.0	0.7	24.6	0.5	303.1	86.6
29.86	21	11	54.0	28.4	17.7	0.8	25.1	0.5	311.9	89.1
29.91	22	11	53.4	27.0	18.4	0.7	23.9	0.5	307.9	88.0
29.95	23	11	53.7	28.3	17.4	0.7	25.1	0.5	308.5	88.1
30.00	24	11	54.2	27.7	17.8	0.7	24.5	0.5	301.3	86.1

Average	53.8	27.6	17.6	0.9	24.4	0.6	299.4	85.5
Std Dev	0.3	0.5	0.7	0.2	0.4	0.1	6.7	1.9
Maximum	54.2	28.4	19.2	1.3	25.1	0.7	311.9	89.1
Minimum	53.3	26.4	16.3	0.7	23.4	0.5	288.7	82.5

N-value: 20

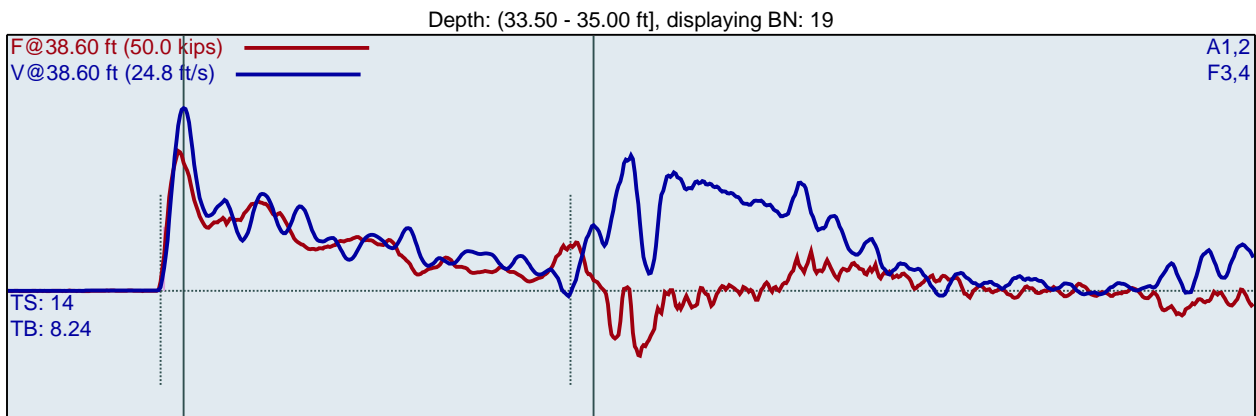
Sample Interval Time: 24.64 seconds.

CME 45B (SN 303304)
REK
B-2

B-2
Interval start: 4/12/2024

AR: 1.13 in²
LE: 38.60 ft
WS: 16807.9 ft/s

SP: 0.492 k/ft³
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 %
33.63	1	4	1.9	27.9	18.1	1.9	24.7	1.5	312.2	89.2
33.75	2	4	57.9	27.8	18.5	1.6	24.6	1.5	310.4	88.7
33.88	3	4	57.8	28.1	17.7	1.6	24.8	1.5	306.4	87.5
34.00	4	4	57.9	28.2	17.9	1.6	25.0	1.5	311.8	89.1
34.07	5	7	57.7	28.0	17.8	1.2	24.7	0.9	309.4	88.4
34.14	6	7	58.8	27.5	17.3	1.2	24.3	0.9	301.7	86.2
34.21	7	7	57.9	27.5	17.5	1.1	24.3	0.9	305.5	87.3
34.29	8	7	58.5	27.8	17.7	1.1	24.6	0.9	313.5	89.6
34.36	9	7	58.3	27.8	17.6	1.1	24.6	0.9	320.7	91.6
34.43	10	7	58.5	27.8	17.7	1.0	24.6	0.9	311.8	89.1
34.50	11	7	58.5	28.7	18.4	0.9	25.4	0.9	319.2	91.2
34.55	12	10	58.3	28.1	17.8	0.9	24.9	0.6	311.0	88.9
34.60	13	10	58.5	27.8	17.6	0.9	24.6	0.6	313.5	89.6
34.65	14	10	58.3	26.9	16.8	1.1	23.8	0.6	303.2	86.6
34.70	15	10	58.5	27.4	17.5	0.9	24.2	0.6	309.0	88.3
34.75	16	10	58.3	27.2	17.3	1.0	24.1	0.6	310.8	88.8
34.80	17	10	58.1	28.0	18.2	0.8	24.8	0.6	310.6	88.7
34.85	18	10	58.7	27.8	17.7	0.7	24.6	0.6	307.0	87.7
34.90	19	10	58.4	27.3	17.7	0.9	24.1	0.6	315.2	90.0
34.95	20	10	58.0	28.2	18.5	0.9	25.0	0.6	323.1	92.3
35.00	21	10	58.5	27.7	18.6	0.8	24.5	0.6	313.3	89.5
Average			58.3	27.7	17.7	1.0	24.5	0.7	311.7	89.1
Std Dev			0.3	0.4	0.4	0.1	0.4	0.1	5.6	1.6
Maximum			58.8	28.7	18.6	1.2	25.4	0.9	323.1	92.3
Minimum			57.7	26.9	16.8	0.7	23.8	0.6	301.7	86.2

N-value: 17

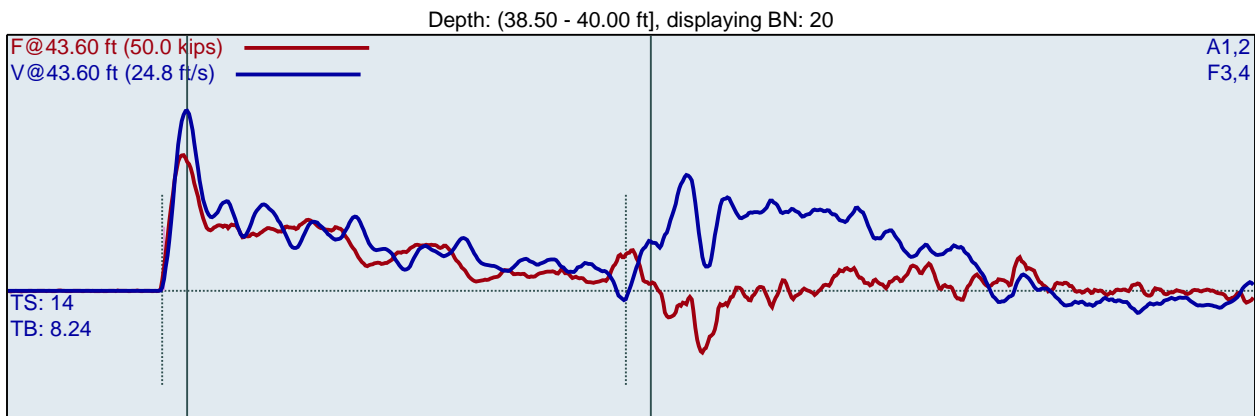
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CME 45B (SN 303304)
REK
B-2

B-2
Interval start: 4/12/2024

AR: 1.13 in²
LE: 43.60 ft
WS: 16807.9 ft/s

SP: 0.492 k/ft³
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 %
38.60	1	5	1.9	27.8	18.7	2.0	24.6	1.2	310.8	88.8
38.70	2	5	52.2	26.3	17.6	1.6	23.3	1.2	298.0	85.1
38.80	3	5	53.0	26.7	18.9	1.5	23.6	1.2	311.1	88.9
38.90	4	5	54.7	26.7	19.0	1.3	23.6	1.2	304.6	87.0
39.00	5	5	54.5	26.4	17.6	1.4	23.4	1.2	295.3	84.4
39.07	6	7	54.5	27.2	18.7	1.2	24.0	0.9	304.9	87.1
39.14	7	7	54.5	26.9	18.7	1.1	23.8	0.9	306.3	87.5
39.21	8	7	54.4	26.9	17.8	1.1	23.8	0.9	298.2	85.2
39.29	9	7	54.4	26.8	18.0	1.0	23.7	0.9	295.3	84.4
39.36	10	7	54.3	26.8	17.7	0.9	23.7	0.9	292.1	83.5
39.43	11	7	54.5	27.1	18.5	1.0	24.0	0.9	302.1	86.3
39.50	12	7	54.6	26.7	17.9	0.9	23.7	0.9	294.1	84.0
39.55	13	10	54.1	26.6	17.9	0.8	23.5	0.6	290.0	82.9
39.60	14	10	54.8	26.5	17.9	0.9	23.5	0.6	294.1	84.0
39.65	15	10	54.9	26.2	17.6	0.9	23.2	0.6	290.8	83.1
39.70	16	10	54.8	26.3	17.4	0.7	23.3	0.6	289.7	82.8
39.75	17	10	54.4	26.3	17.3	0.8	23.3	0.6	289.3	82.7
39.80	18	10	54.5	26.4	17.3	0.8	23.4	0.6	297.0	84.9
39.85	19	10	54.3	26.4	17.4	0.8	23.4	0.6	299.3	85.5
39.90	20	10	54.8	26.5	17.4	0.8	23.4	0.6	297.4	85.0
39.95	21	10	54.3	27.7	18.0	0.8	24.5	0.6	308.1	88.0
40.00	22	10	54.6	27.3	17.7	0.7	24.2	0.6	300.9	86.0
Average			54.5	26.7	17.8	0.9	23.7	0.7	297.0	84.9
Std Dev			0.2	0.4	0.4	0.1	0.3	0.1	5.8	1.6
Maximum			54.9	27.7	18.7	1.2	24.5	0.9	308.1	88.0
Minimum			54.1	26.2	17.3	0.7	23.2	0.6	289.3	82.7
N-value: 17										

Sample Interval Time: 23.19 seconds.

Summary of SPT Test Results

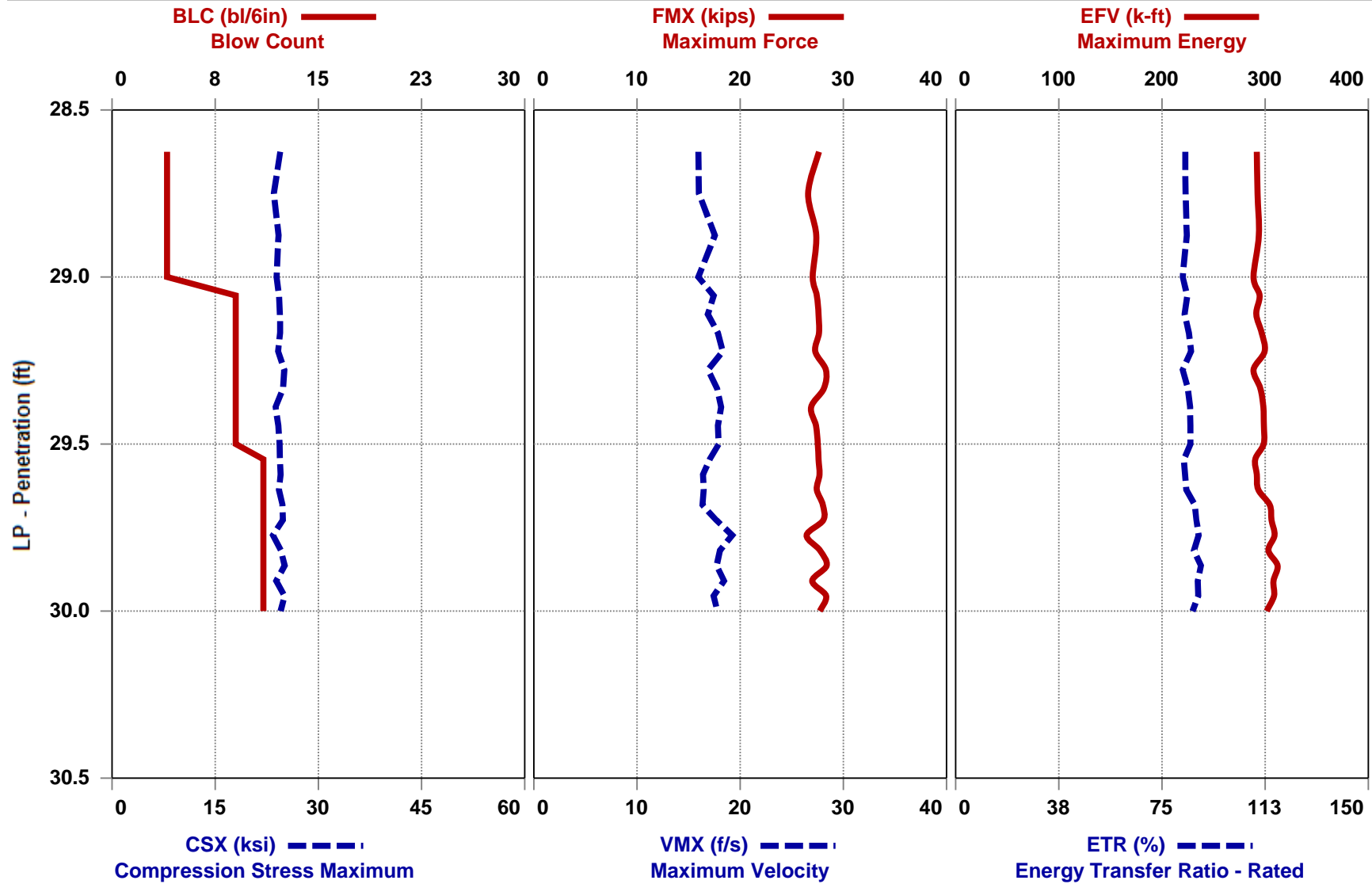
Project: CME 45B (SN 303304), Test Date: 4/12/2024

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	4-9-11	20	28	53.8	27.6	17.6	0.9	24.4	0.6	299.4	85.5
38.60	33.50	35.00	4-7-10	17	24	58.3	27.7	17.7	1.0	24.5	0.7	311.7	89.1
43.60	38.50	40.00	5-7-10	17	24	54.5	26.7	17.8	0.9	23.7	0.7	297.0	84.9
Overall Average Values:						55.4	27.4	17.7	0.9	24.2	0.7	302.5	86.4
Standard Deviation:						2.0	0.6	0.6	0.1	0.5	0.1	8.8	2.5
Overall Maximum Value:						58.8	28.7	19.2	1.3	25.4	0.9	323.1	92.3
Overall Minimum Value:						53.3	26.2	16.3	0.7	23.2	0.5	288.7	82.5



CME 45B (SN 303304) - 28.5 TO 30.0

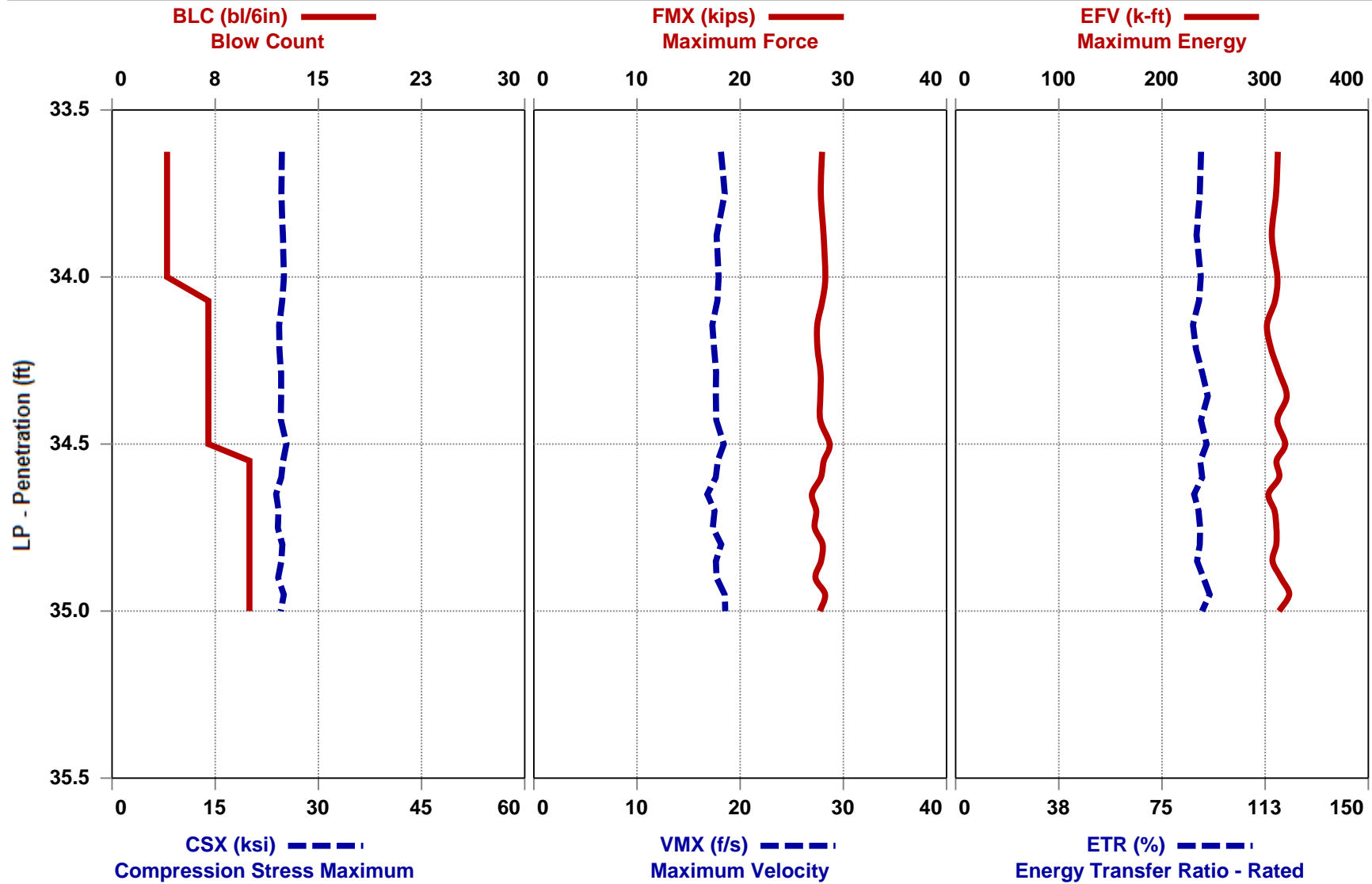
B-2





CME 45B (SN 303304) - 33.5 TO 35.0

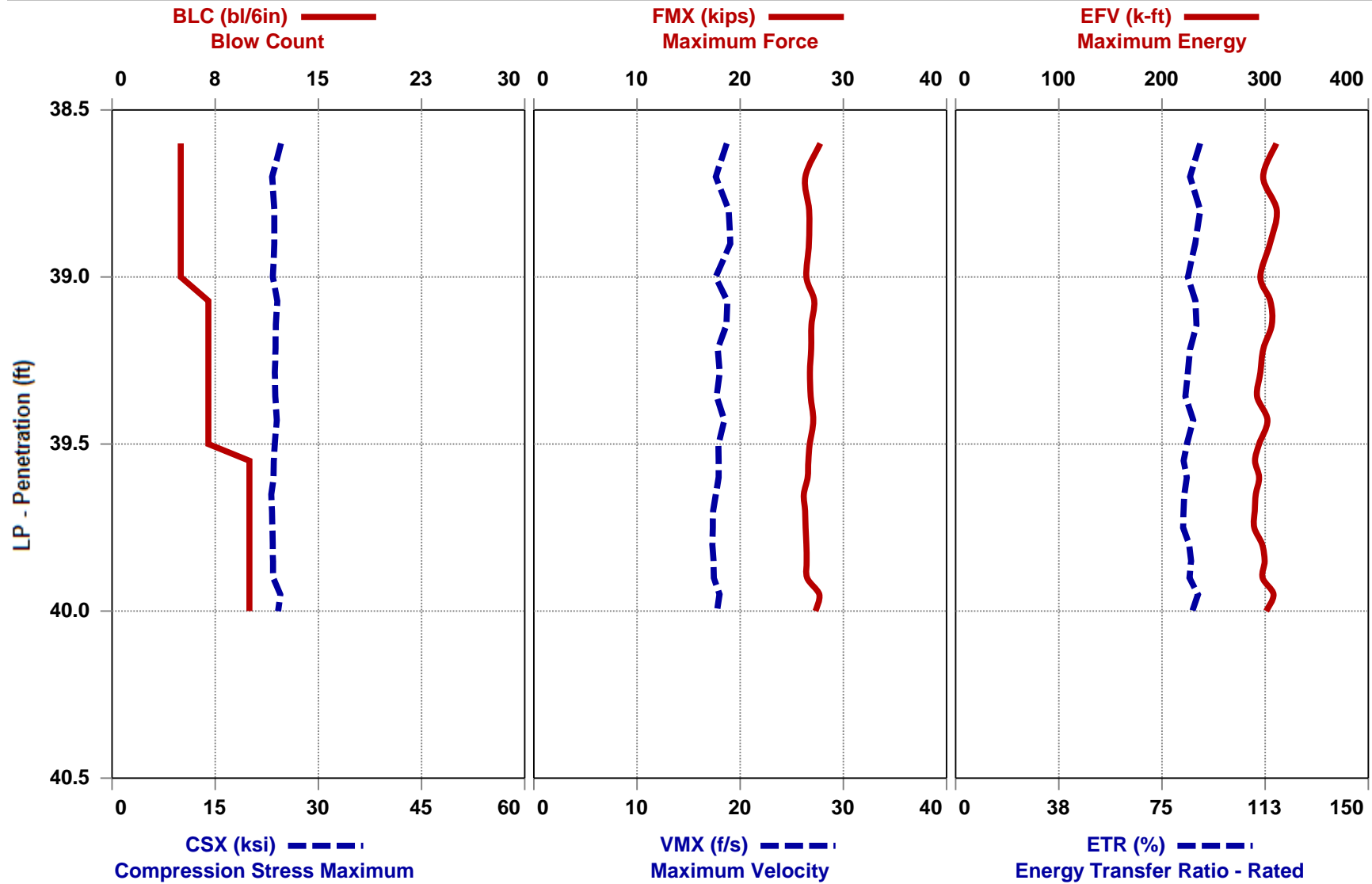
B-2

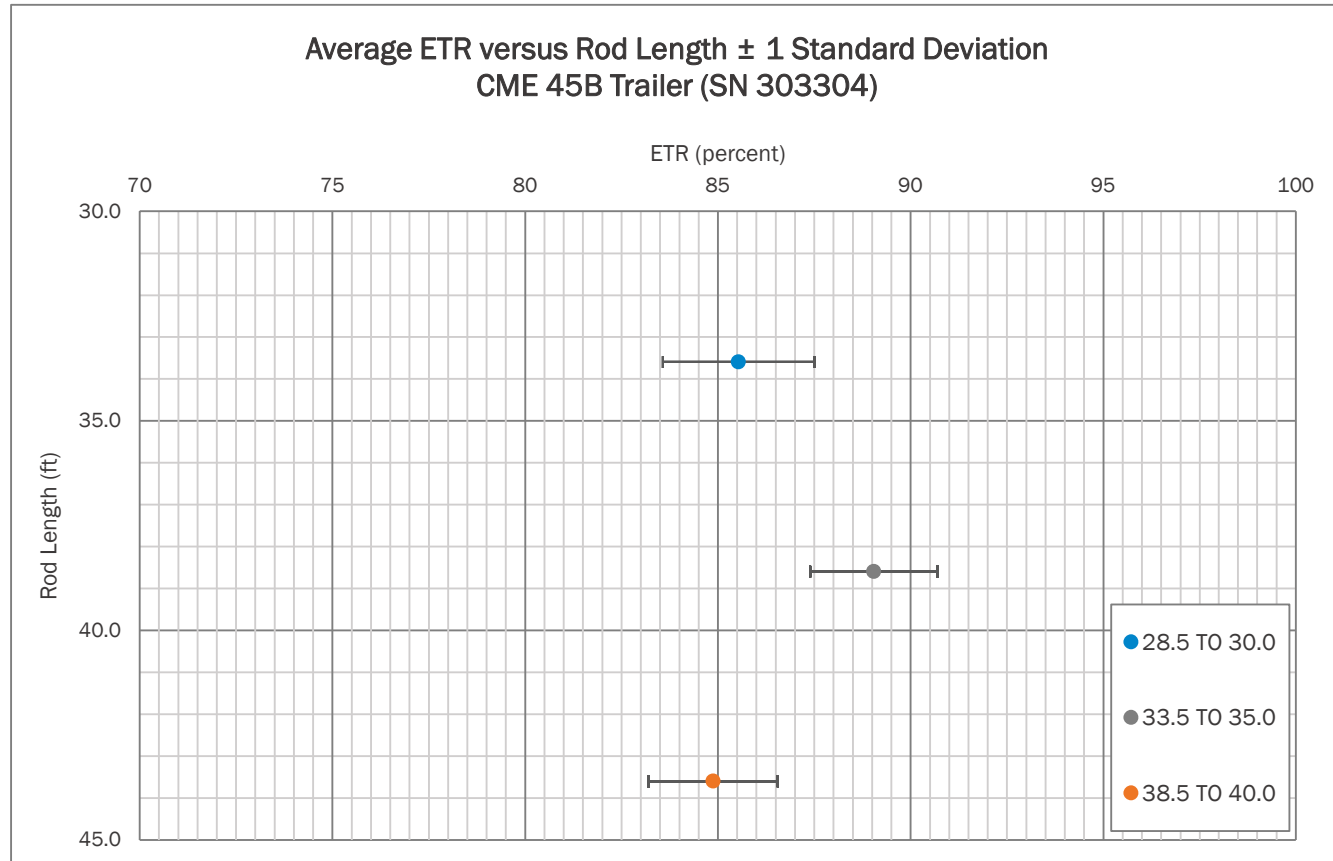
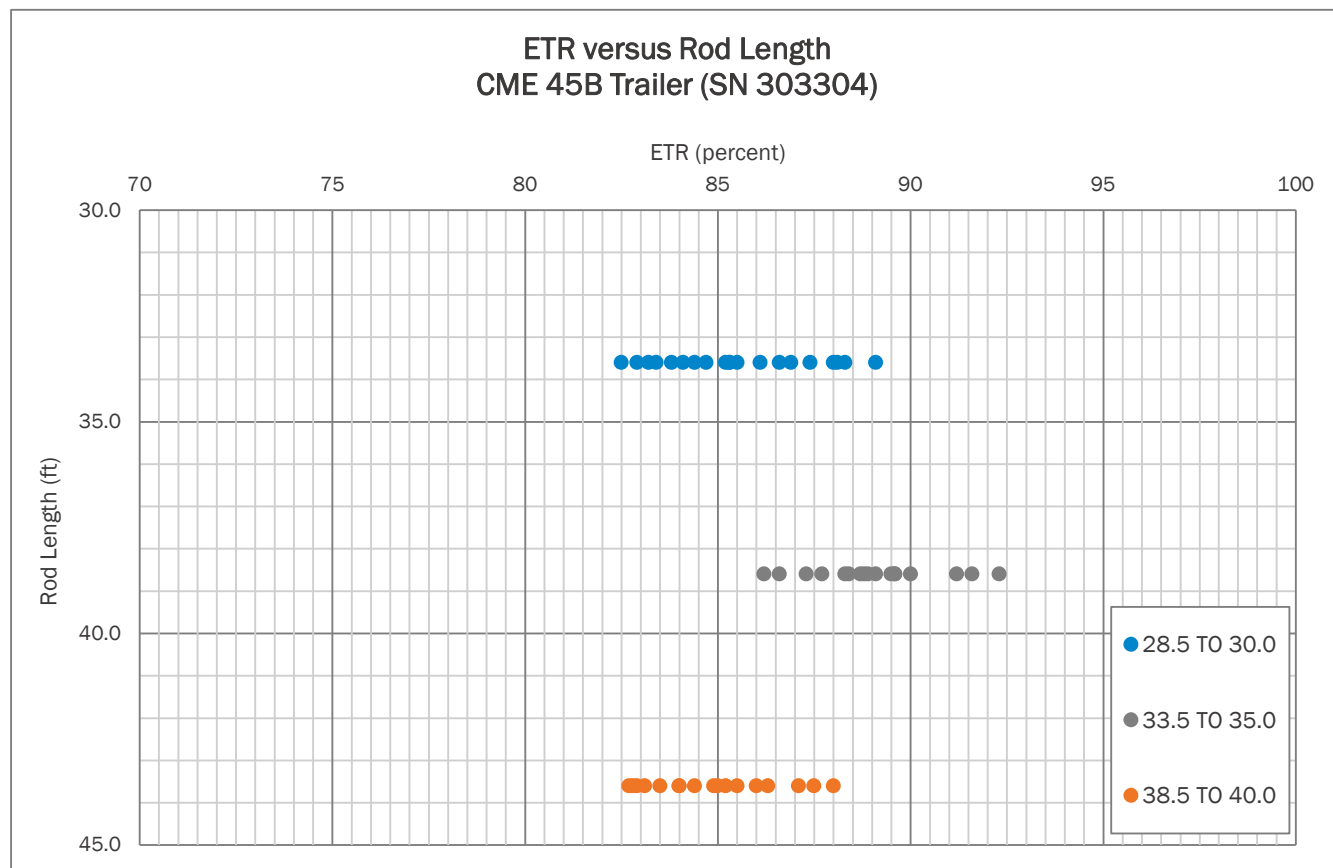




CME 45B (SN 303304) - 38.5 TO 40.0

B-2







APPENDIX II

SPT Hammer Energy Field Form

Project: SPT HAMMER ENERGY
Project No.: 240021095
Boring No.: B-2

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

On-site Personnel

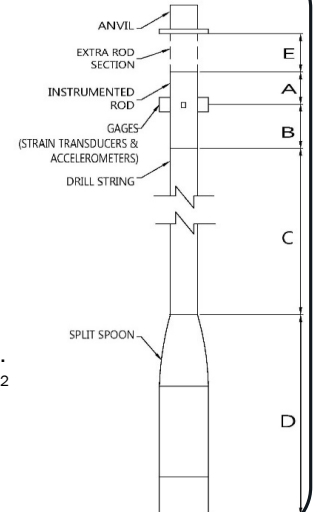
Drilling Company: BRECCIA CONSTRUCTION, LLC
 Rig Operator: D. HARRIS
 Engr/Geologist: N/A
 Client Rep.: N/A
 Analyzer Oper.: R. KRAL

Rig/Hammer Info

Drill Rig Make/Model: CME 45B
 Carrier Type: TRAILER
 Rig Serial No.: 303304
 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 in²
 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	0822/0822	30	33.6	53	4	9	11	20	Y	SA SI
12-Apr	33.5 TO 35.0	0830/0831	35	38.6	57	4	7	10	17	Y	SA SI
12-Apr	38.5 TO 40.0	0838/0838	40	43.6	54	5	7	10	17	Y	SA SI

Notes:

TESTING PERFORMED AT 1817 LOWRYS HIGHWAY IN CHESTER, SOUTH CAROLINA (CHESTER COUNTY). THE APPROXIMATE COORDINATES ARE 34.7704252, - 81.2454632.

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

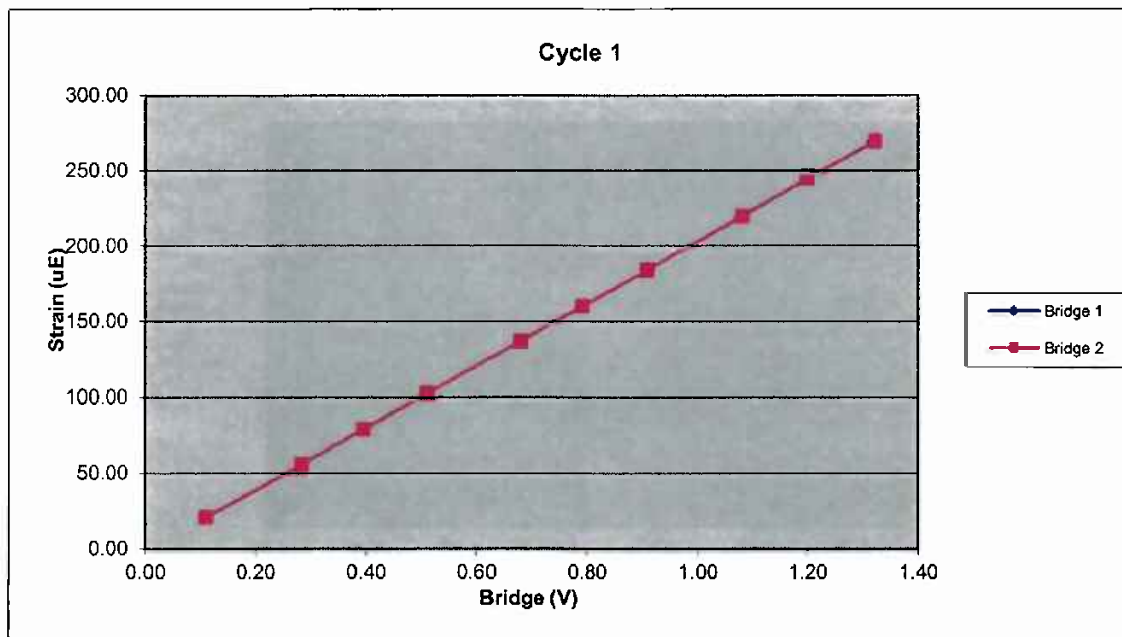


Pile Dynamics, Inc.
30725 Aurora Road
Cleveland, Ohio 44139 USA

528AWJ		Cycle 1		
Sample	Force (lb)	Strain (μE)	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

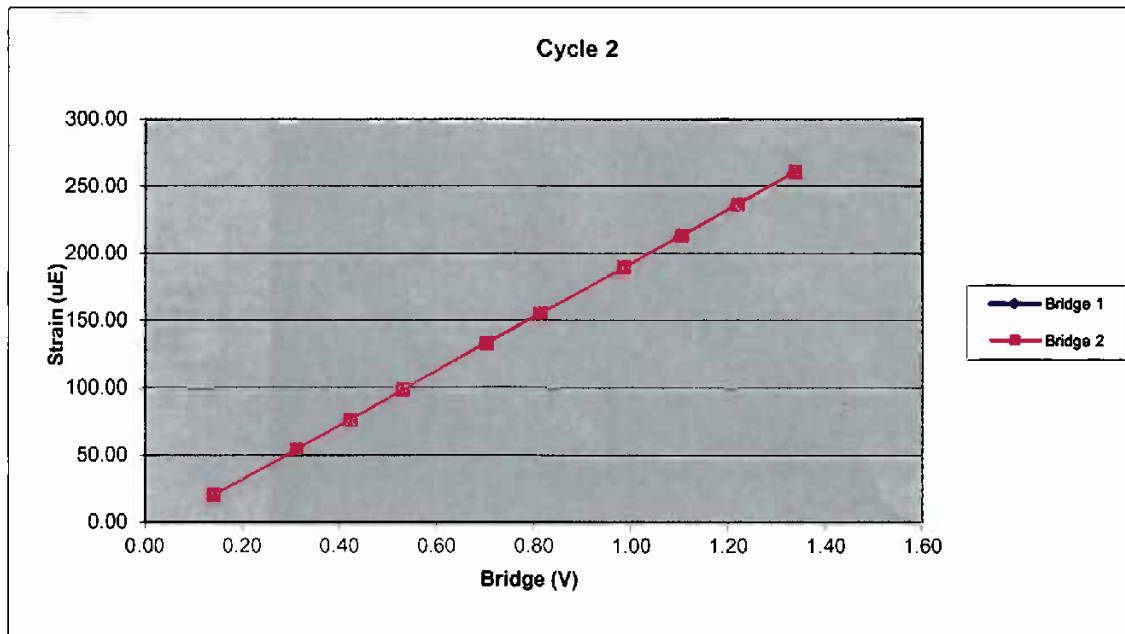
Force Strain Calibration	
EA (Kips)	35735.87
Offset	59.29
Correlation	0.999995



528AWJ		Cycle 2		
Sample	Force (lb)	Strain (μE)	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

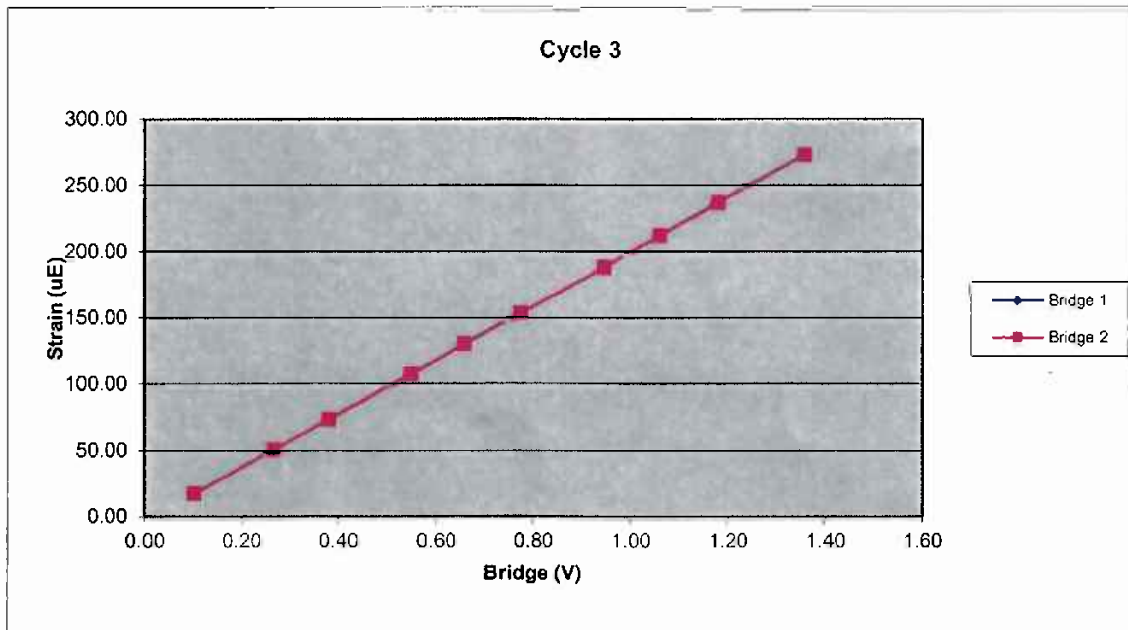
Force Strain Calibration	
EA (Kips)	36756.34
Offset	315.07
Correlation	0.999995



528AWJ		Cycle 3		
Sample	Force (lb)	Strain (μE)	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 (in^2)	1.21

Calibrated by:



Calibrated Date:

7/18/2022

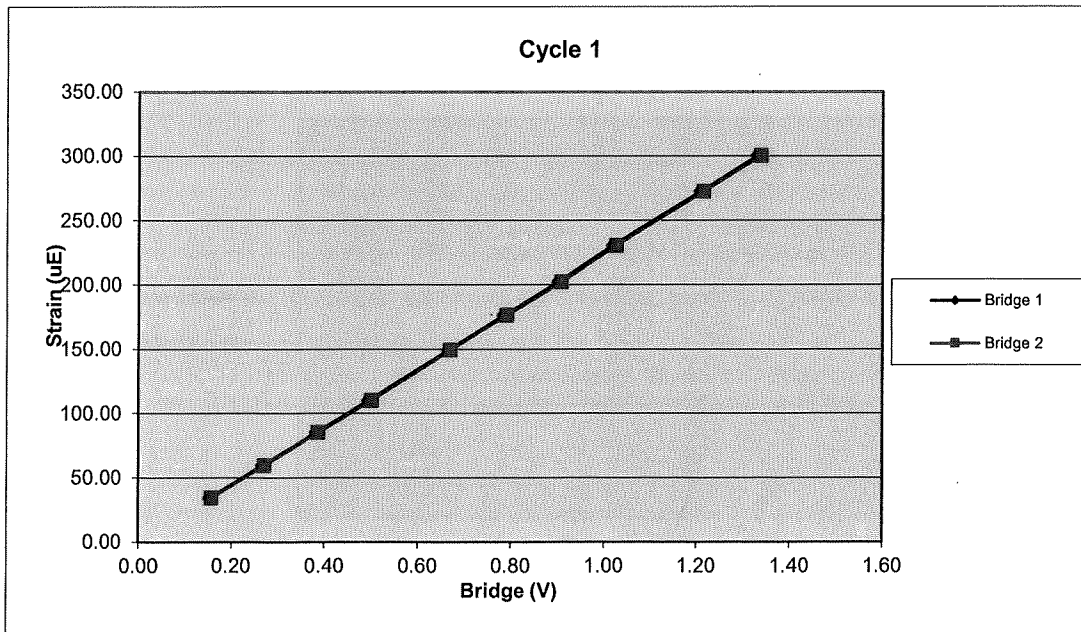
Pile Dynamics Inc
30725 Aurora Rd
Solon, OH 44139

Traceable to N.I.S.T.

728AWJ	Cycle 1			
Sample	Force (lb)	Strain (μ 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 (μ E/V)	226.02	Strain Calibration (μ E/V)	225.27
Offset	-1.27	Offset	-1.86
Correlation	0.999984	Correlation	0.999979

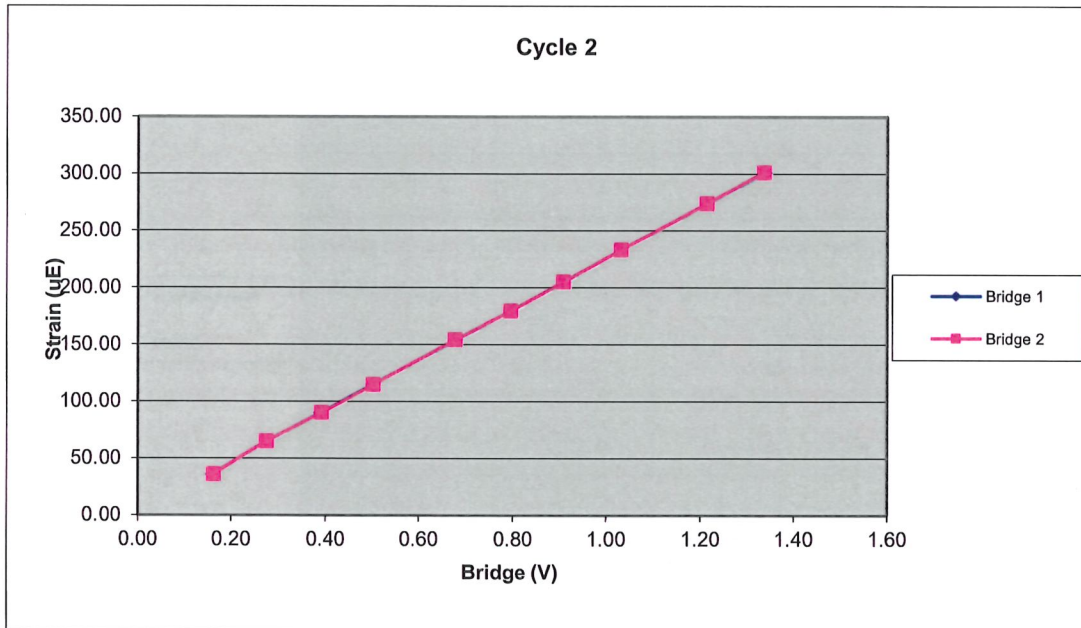
Force Strain Calibration	
EA (Kips)	33548.47
Offset	63.54
Correlation	0.999983



728AWJ		Cycle 2		
Sample	Force (lb)	Strain (μ 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 (μ E/V)	223.39	Strain Calibration (μ E/V)	223.84
Offset	1.55	Offset	1.27
Correlation	0.999945	Correlation	0.999943

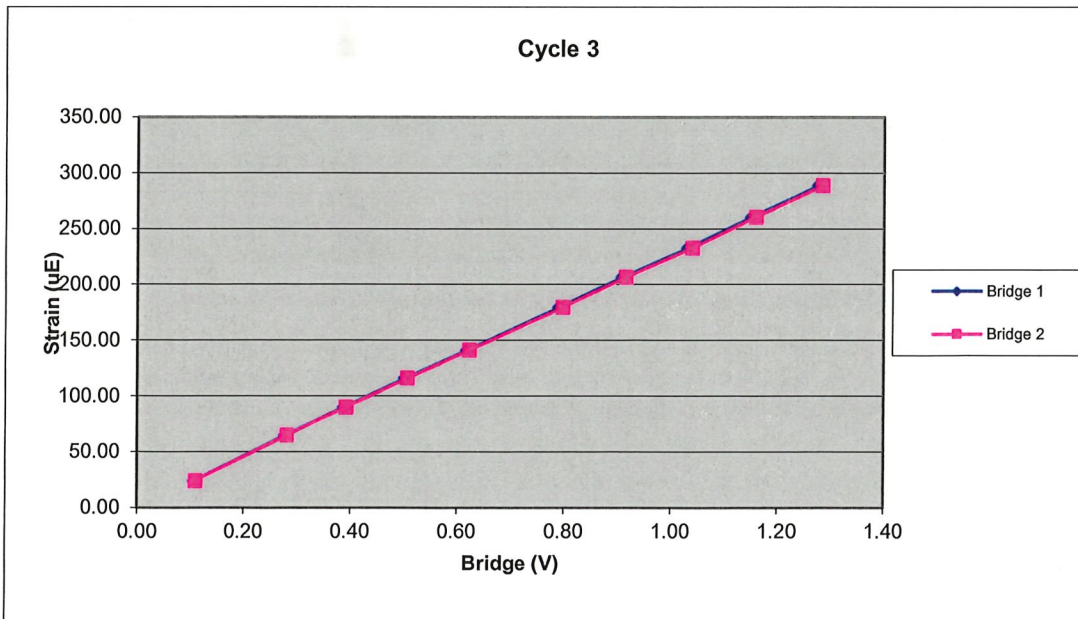
Force Strain Calibration	
EA (Kips)	33843.24
Offset	-37.68
Correlation	0.999950



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

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

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



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

Calibration Factors	728AWJ		
Bridge 1 (µE/V)	224.65	Bridge 2 (µE/V)	224.14
EA Factor (Kips)	33811.01	Area (in^2)	1.13

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

Pile Dynamics Inc
30725 Aurora Rd
Solon, OH 44139

Traceable to N.I.S.T.

Accelerometer Calibration Certificate

Pile Dynamics, Inc.



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

Serial No: K10959 Temperature: 79.0 °F

Model: PR Humidity: 50%

Calibrated on: Channel 3 on 8G 5161 LE

PDA CALIBRATION FACTOR

413.8 mv/5000g

(82.8 μ v/g)

R²: 0.999956 [Chip programmed]

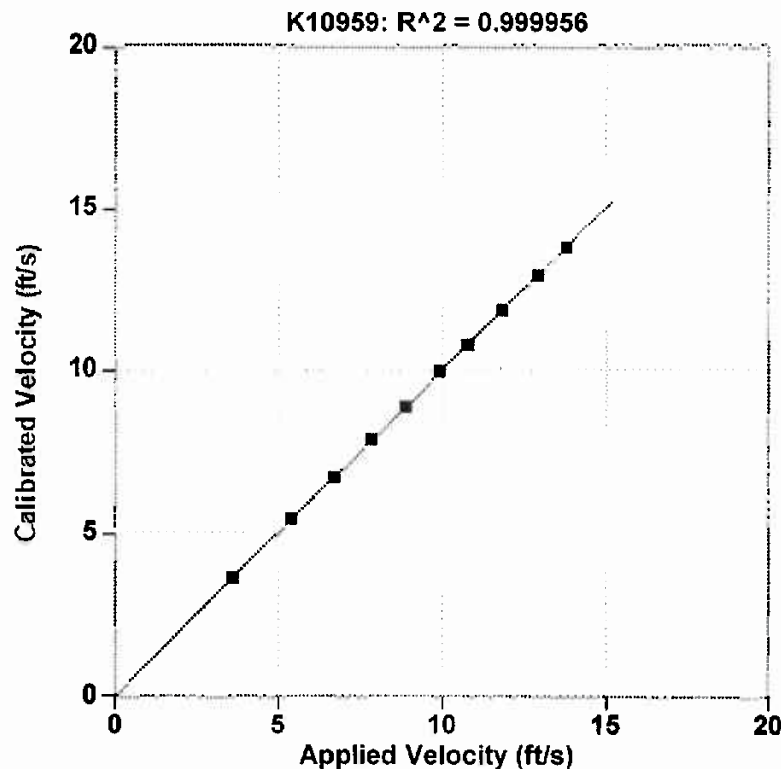
Ref Acc 1: 72517! Cal on: 24Mar2022
1049 g's/volt

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

Operator: William Johnson


Signed

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



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

Maximum Acceleration: 935 g's

Accelerometer Calibration Certificate

Pile Dynamics, Inc.



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

Serial No: K10960 Temperature: 79.0 °F

Model: PR Humidity: 50%

Calibrated on: Channel 3 on 8G 5161 LE

PDA CALIBRATION FACTOR

419.9 mv/5000g

(84.0 $\mu\text{v/g}$)

R²: 0.999944 [Chip programmed]

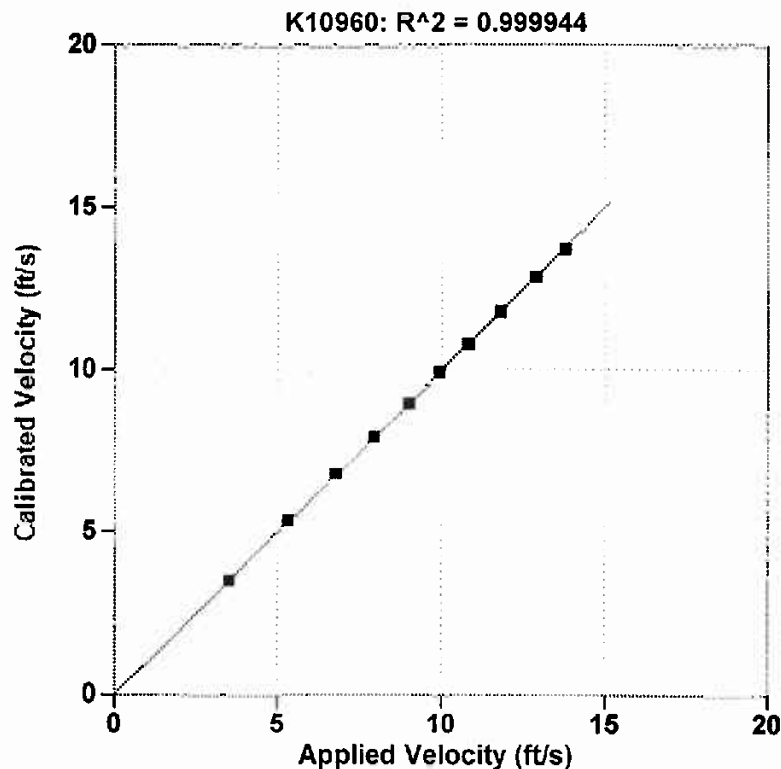
Operator: William Johnson

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

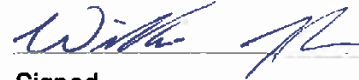
(81.9 μ v/g)

R²: 0.999919 [Chip programmed]

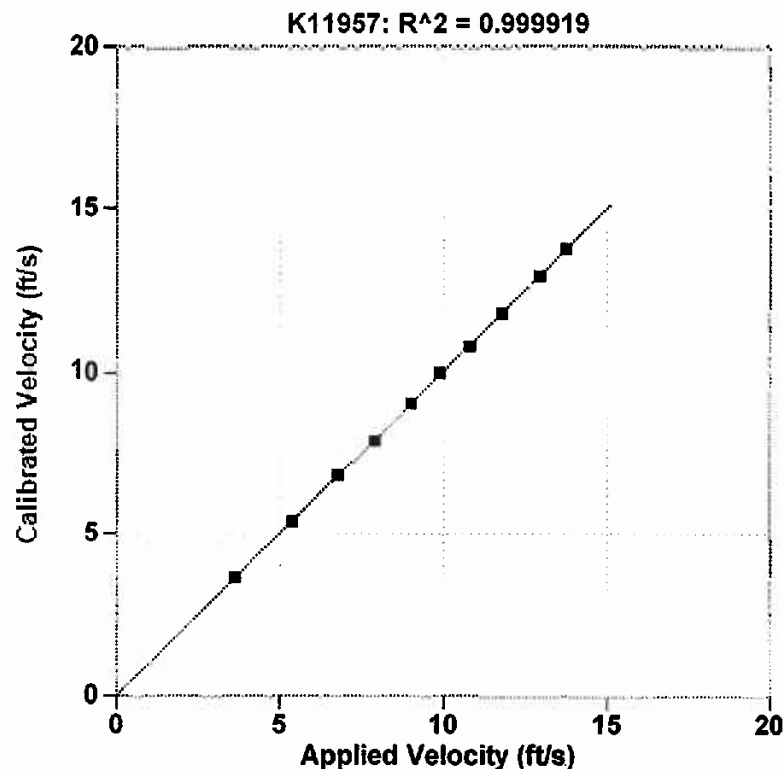
Operator: William Johnson

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



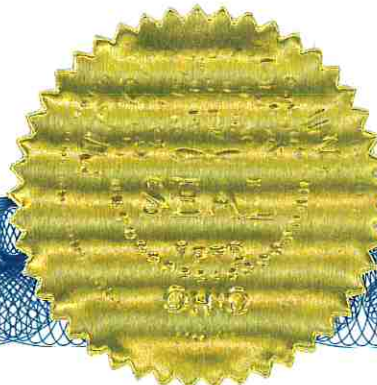
This documents that
Robert E. Kral
Carolinas Geotechnical Group
has on May 20, 2016 achieved the rank of
ADVANCED


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.** 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-24-166 over Tributary to Henleys Creek

Geotechnical Subsurface Data Report

APPENDIX

SECTION 7 GEOSCOPING FORM

GeoScoping Form

PROJECT INFORMATION	
Project ID:	Date of Trip:
County:	Location:
Rd/Route:	Local Name:
Attendees:	

EXISTING BRIDGE INFORMATION	
Bridge Length:	Bridge Width:
Superstructure Type:	Substructure Type:
Begin Bridge Sta.:	End Bridge Sta.:
Begin Bridge Embankment Sta. ¹ :	End Bridge Embankment Sta. ¹ :
Structure Number:	Posted Weight Limit:
Crossing:	Skew:
Latitude:	Longitude:
Existing Fill Height:	Approximate Existing Slope Angle:

¹Begin 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. ¹ :	
Accessibility Issues:		
Ground Cover:		
Existing Fill Height:	Approximate Existing Slope Angle:	
Local Development (undeveloped, developed residential, developed commercial, developed industrial, etc.): Undeveloped/Rural Residential		
Topography (level, flat, rolling, steep, hillside, valley, swamp, gully, etc.):		
Traffic Control Necessary (Y/N): Yes		
Surface Soil:	Muck (Y/N):	
Exposed Rock (Y/N):	In Stream Bed (Y/N):	In Banks (Y/N):
Wetlands On-Site (Y/N):	Wetlands Adjacent (Y/N):	
Depth FG to Water:	Water Depth:	
Depth to Existing Ground:		
Scour Condition at EB:	Scour Condition at IB:	
End Bridge Embankment Sta. ¹ : East Side	End Project Sta.:	
Accessibility Issues:		
Ground Cover:		
Existing Fill Height:	Approximate Existing Slope Angle:	
Local Development (undeveloped, developed residential, developed commercial, developed industrial, etc.): Undeveloped/Rural Residential		
Topography (level, flat, rolling, steep, hillside, valley, swamp, gully, etc.):		
Traffic Control Necessary (Y/N):		
Surface Soil:	Muck (Y/N):	
Exposed Rock (Y/N):	In Stream Bed (Y/N):	In Banks (Y/N):
Wetlands On-Site (Y/N):	Wetlands Adjacent (Y/N):	
Depth FG to Water:	Water Depth:	
Depth to Existing Ground:		
Scour Condition at EB:	Scour Condition at IB:	

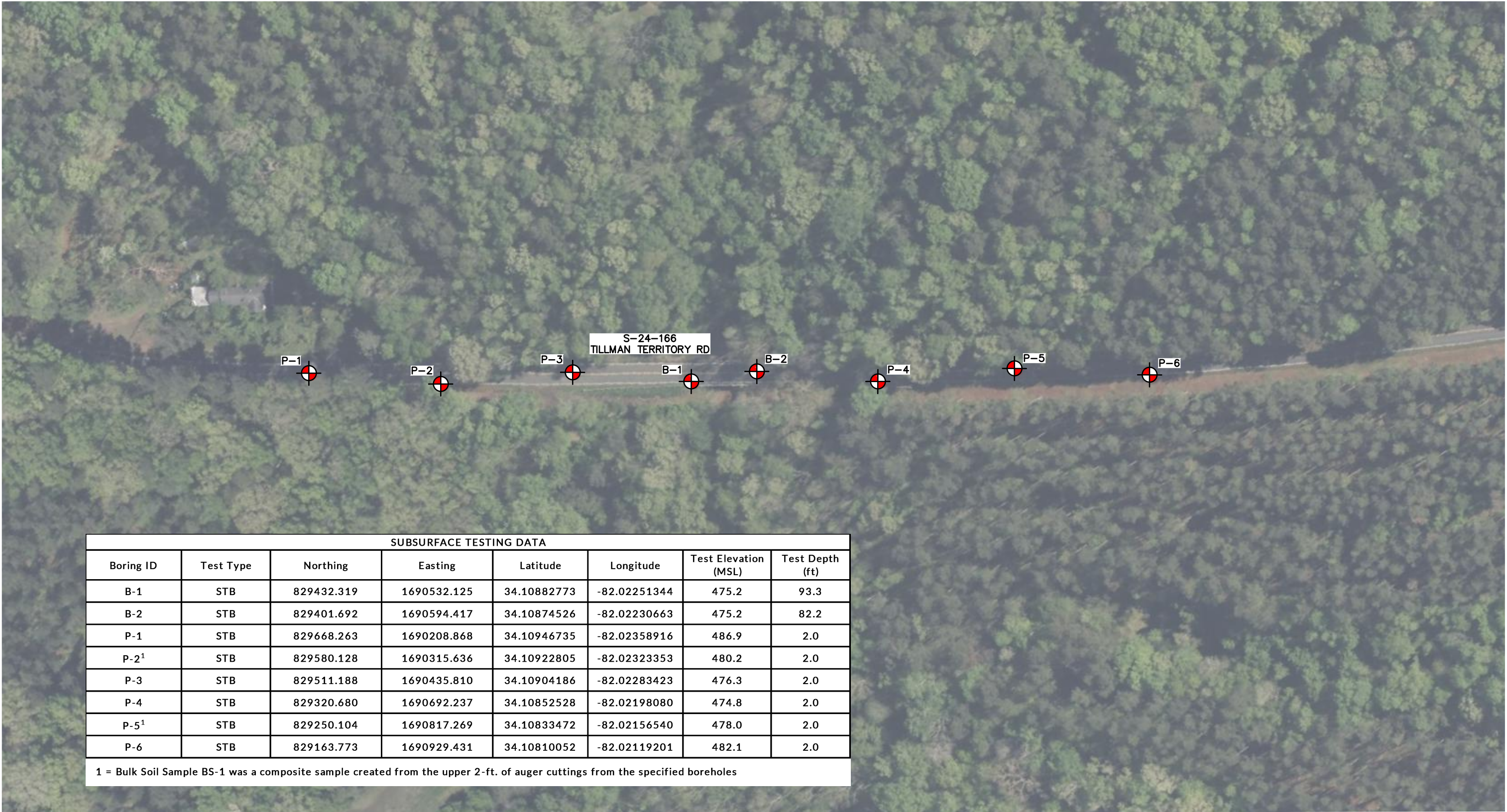
GeoScoping Form

UTILITIES INFORMATION
Attached:
Above Ground/ Overhead:
Underground:

COMMENTS	

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	829432.319	1690532.125	34.10882773	-82.02251344	475.2	93.3
B-2	STB	829401.692	1690594.417	34.10874526	-82.02230663	475.2	82.2
P-1	STB	829668.263	1690208.868	34.10946735	-82.02358916	486.9	2.0
P-2 ¹	STB	829580.128	1690315.636	34.10922805	-82.02323353	480.2	2.0
P-3	STB	829511.188	1690435.810	34.10904186	-82.02283423	476.3	2.0
P-4	STB	829320.680	1690692.237	34.10852528	-82.02198080	474.8	2.0
P-5 ¹	STB	829250.104	1690817.269	34.10833472	-82.02156540	478.0	2.0
P-6	STB	829163.773	1690929.431	34.10810052	-82.02119201	482.1	2.0

1 = Bulk Soil Sample BS-1 was a composite sample created from the upper 2-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 10.25.24	GROUP ____ - ____
R/W		DATE	

 F&ME CONSULTANTS, INC.
COLUMBIA, SC

S-24-166 OVER TRIBUTARY TO HENLEYS CREEK
GREENWOOD COUNTY, SOUTH CAROLINA

BORING LOCATION PLAN

SCDOT PROJECT ID: P043994	FME JOB NO. G7100.007 task 004
SCALE: 1" = 100'	FIGURE 2

Geo-Scoping Form



Westbound



North Bridge Face Looking SW



North Bridge Face Looking S



Timber Pile Foundation

Geo-Scoping Form



Timber Pile Support Brace



West Side Embankment Under Bridge



Steel Utility Conduit Adjacent South Side of
Bridge



Bridge Structural Number