GEOTECHNICAL SUBSURFACE DATA REPORT

US 278 Grays Highway Emergency Repairs
Jasper 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: P043789
FME Project No.: G7100.006

October 31, 2024

October 31, 2024

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

Re: Geotechnical Subsurface Data Report
US 278 Grays Highway Emergency Repairs
Jasper County, South Carolina
SCDOT Project ID: P043789
FME Project No.: G7100.006

Mr. Harris:

Submitted herein is F&ME Consultants, Inc's (FME) Geotechnical Subsurface Data Report for the US 278 Grays Highway Emergency Repairs project. This report contains findings from our subsurface field exploration and laboratory testing program.

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

Respectfully Submitted,

F&ME CONSULTANTS, INC.

J. Trey Peterson
Geotechnical Staff Professional

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Materials Laboratory Manager

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APPENDIX

1. INTRODUCTION

1.1. GENERAL

The project is located approximately one (1) mile southeast of Grays, South Carolina in Jasper County. We understand that this project will involve the removal of two (2) adjacent culverts located over Beaverdam Creek #1 and Beaverdam Creek #2 and replaced with a single bridge that encompasses both creeks. 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 11, 2024. A copy of this request can be found in Section 8 of the Appendix attached to this report.

The field exploration consisted of ten (10) Soil Test Borings (STB), with Standard Penetration Testing (SPT), one (1) Manual Auger Borings (MAB), designated as P-1 through P-6, and four (4) Electro-Piezocone Soundings (CPT), designated as CPT-1 through CPT-4. Four (4) Bulk Soil Samples (BS) were also obtained via Manual Auger Boring (MAB) methodologies. 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 14, 2024, through October 21, 2024, ten (10) Soil Test Borings (STB) with Standard Penetration Testing (SPT), six (6) roadway Hand Auger Borings (HA), and four (4) Electro-Piezocone Soundings (CPT), and one (1) Manual Auger Boring (MAB) was performed on site. Additionally, four (4) Manual Auger Borins (MAB) were performed on site for the purpose of collecting Bulk Soil Samples.

The collected soil samples were examined and logged in the field by FME personnel, sealed in plastic bags, and transported to our laboratory for further examination and analyses. 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 (Figures 2 and Figure 3) displaying the test locations performed during the subsurface exploration is contained in Section 2 of the Appendix within this report.

2.1. SOIL TEST BORINGS

Soil Test Borings were performed with a CME 45B trailer mounted drill rig. FME utilized rotary wash drilling techniques to maintain a stable borehole. The Soil Test Borings, except for Soil Test Boring B-1, were sampled continuously through the upper ten (10) feet below the existing ground surface. Following the continuous sampling, SPT testing was performed on standard five (5) foot intervals thereafter to the boring termination depth. Soil Test Boring B-1 was sampled continuously through the upper fifty (50) feet below the existing ground surface. After continuous sampling, SPT testing was performed on standard five (5) foot intervals thereafter to the resulting boring termination depths. SPT

sampling was performed in general accordance with ASTM D1586 to determine the relative densities and consistencies of the subsurface soils, and to collect subsurface soil samples. An automatic hammer with a measured energy transfer ratio of 86.4% was used to perform the SPT's. Copies of the Soil Test Boring Logs are contained within Section 3A in the Appendix of this report. The locations, depths, and elevations of the Soil Test Borings performed for the subsurface investigation are provided in the following table.

Table 1 – Field Exploration Summary Table – Soil Test Borings

Test ID	Test Type	Route	Test Depth (ft)	Latitude	Longitude	Elevation (ft-MSL)
B-1	STB	US 278	120.0	32.65644451	-81.01105964	52.2
B-2	STB	US 278	100.0	32.65676034	-81.01130306	49.5
P-1	STB	US 278	2.4	32.65475992	-81.00990456	Not Measured[1]
P-2	STB	US 278	2.4	32.65535027	-81.01032068	70.7
P-3	STB	US 278	2.3	32.65592321	-81.01077084	60.3
P-4	STB	US 278	2.3	32.65730621	-81.01160655	49.2
P-5	STB	US 278	2.2	32.65790017	-81.01201539	50.6
P-6	STB	US 278	2.3	32.65852353	-81.01235992	55.3
R-1	STB	US 278	60.0	32.65622826	-81.01093772	54.9
R-2	STB	US 278	60.0	32.65700392	-81.01144398	49.4
Total			353.9			

[1]Test hole points were laid out in the field based on provided coordinates, but the existing surface elevation was not measured

2.2. ELECTRO-PIEZOCONE SOUNDING TESTS

Electro-Piezocone Sounding (CPT) Tests were advanced on site using a CME 45B Trailer Mounted drill rig. CPT tests were generally performed at 0.3-foot intervals. Copies of the Electro-Piezocone Sounding Logs are contained within Section 3C in the Appendix of this report. The following table is a summary of the Electro-Piezocone Sounding Test designations, depths, locations, and surface elevations.

Table 2 – Field Exploration Summary Table – Electro Piezocone Soundings

Test ID	Test Type	Route	Test Depth (ft)	Latitude	Longitude	Elevation
CPT-1	CPT	US 278	22.8	32.65636315	-81.01105051	53.1
CPT-2	CPT	US 278	23.4	32.65643833	-81.01106892	52.3
CPT-3	CPT	US 278	24.1	32.65675910	-81.01129313	50.1
CPT-4	CPT	US 278	24.8	32.65689115	-81.01132945	49.3
Total			95.1			

2.3. MANUAL AUGER BORINGS/ DYNAMIC CONE PENETROMETER TESTING

FME performed one (1) Manual Auger Boring with Dynamic Cone Penetrometer (DCP) testing, designated as MAB-1, within the proximity of the culvert failure remnants. Additionally, four (4) Manual Auger Borings, designated as BS-1 through BS-4, were performed as a means of collecting Bulk

Soil Samples. The following Table is a summary of the Manual Auger Boring location, depth, and surface elevation. A detailed description of the Manual Auger Boring is presented in section 3B within the Appendix of this report.

Table 3 – Field Exploration Summary Table – Manual Auger Borings

Test ID	Test Type	Route	Test Depth (ft)	Latitude	Longitude	Elevation (ft-MSL)
MAB-1	HA/DCP	US 278	2.5	32.65676561	-81.01114259	43.2
BS-1	MAB	US 278	5.0	32.65655503	-81.01120441	Not Measured[1]
BS-2	MAB	US 278	5.0	32.65673540	-81.01121589	49.8
BS-3	MAB	US 278	5.0	32.65536242	-81.01029992	70.2
BS-4	MAB	US 278	5.0	32.65789068	-81.01203580	50.1
Total			22.5			

[1]Test hole points were laid out in the field based on provided coordinates, but the existing surface elevation was not measured

2.4. 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.

2.5. 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 4 – Test Location Table

Test ID	Test Type	Northing	Easting	Latitude	Longitude	Elevation (ft-MSL)
B-1	STB	299493.527	1996596.152	32.65644451	-81.01105964	52.2
B-2	STB	299608.443	1996521.248	32.65676034	-81.01130306	49.5
R-1	STB	299414.849	1996633.667	32.65622826	-81.01093772	54.9
R-2	STB	299697.066	1996477.885	32.65700392	-81.01144398	49.4
P-1	STB	298880.604	1996951.595	32.65475992	-81.00990456	Not Measured[1]
P-2	STB	299095.396	1996823.545	32.65535027	-81.01032068	70.7
P-3	STB	299303.861	1996685.019	32.65592321	-81.01077084	60.3
P-4	STB	299807.050	1996427.864	32.65730621	-81.01160655	49.2
P-5	STB	300023.161	1996302.061	32.65790017	-81.01201539	50.6
P-6	STB	300249.965	1996196.053	32.65852353	-81.01235992	55.3
CPT-1	CPT	299463.928	1996598.960	32.65636315	-81.01105051	53.1
CPT-2	CPT	299491.281	1996593.296	32.65643833	-81.01106892	52.3
CPT-3	CPT	299607.990	1996524.303	32.65675910	-81.01129313	50.1
CPT-4	CPT	299656.033	1996513.130	32.65689115	-81.01132945	49.3

[1]Test hole points were laid out in the field based on provided coordinates, but the existing surface elevation was not measured

Table 5 – Test Location Table (Continued)

Test ID	Test Type	Northing	Easting	Latitude	Longitude	Elevation (ft-MSL)
MAB-1	HA/DCP	299610.355	1996570.637	32.65676561	-81.01114259	43.2
BS-1	MAB	299533.745	1996551.602	32.65655503	-81.01120441	Not Measured
BS-2	MAB	299599.365	1996548.076	32.65673540	-81.01121589	49.8
BS-3	MAB	299099.817	1996829.936	32.65536242	-81.01029992	70.2
BS-4	MAB	299610.355	1996570.637	32.65676561	-81.01114259	43.2

3. LABORATORY TESTING SUMMARY

Following completion of FME's field exploration, draft boring logs were submitted and on October 16, 2024, laboratory requests were submitted. The laboratory testing performed on the soil samples collected from the Soil Test Borings is summarized in the table below. Data sheets containing the results from this testing are provided in Section 5A within the Appendix of this report.

Table 6 – Laboratory Testing Summary Table – Soil Test Boring (Split-Spoon) Samples

Type of Test	Quantity	Procedure
Moisture Content	20	AASHTO T265 (ASTM D2216)
Atterberg Limits	20	AASHTO T89/T90 (ASTM D4318)
Grain-size Distribution w/ Wash 200	20	AASHTO D6913/AASHTO T11 (ASTM D1140)
pH	2	AASHTO T289 (ASTM G51)
Soil Sulfate Content	2	AASHTO T290 (ASTM C1580)
Soil Chloride Content	2	AASHTO T291
Soil Resistivity	2	AASHTO T288

Laboratory testing performed on the Manual Auger Boring samples are summarized in the table below. The data sheets containing the results from this testing are provided in Section 5B of the Appendix attached to this report.

Table 7 – Laboratory Testing Summary Table – Manual Auger Boring (Disturbed) Samples

Type of Test	Quantity	Procedure
Moisture Content	1	AASHTO T265 (ASTM D2216)
Atterberg Limit	1	AASHTO T89/AASHTO T90 (ASTM D4318)
Hydrometer and Grain Size	1	ASTM D7928/ASTM D6913

The laboratory testing performed for the Bulk Soil samples are summarized in the table below. Data sheets containing the results from this testing are provided in Section 5C of the Appendix attached to this report.

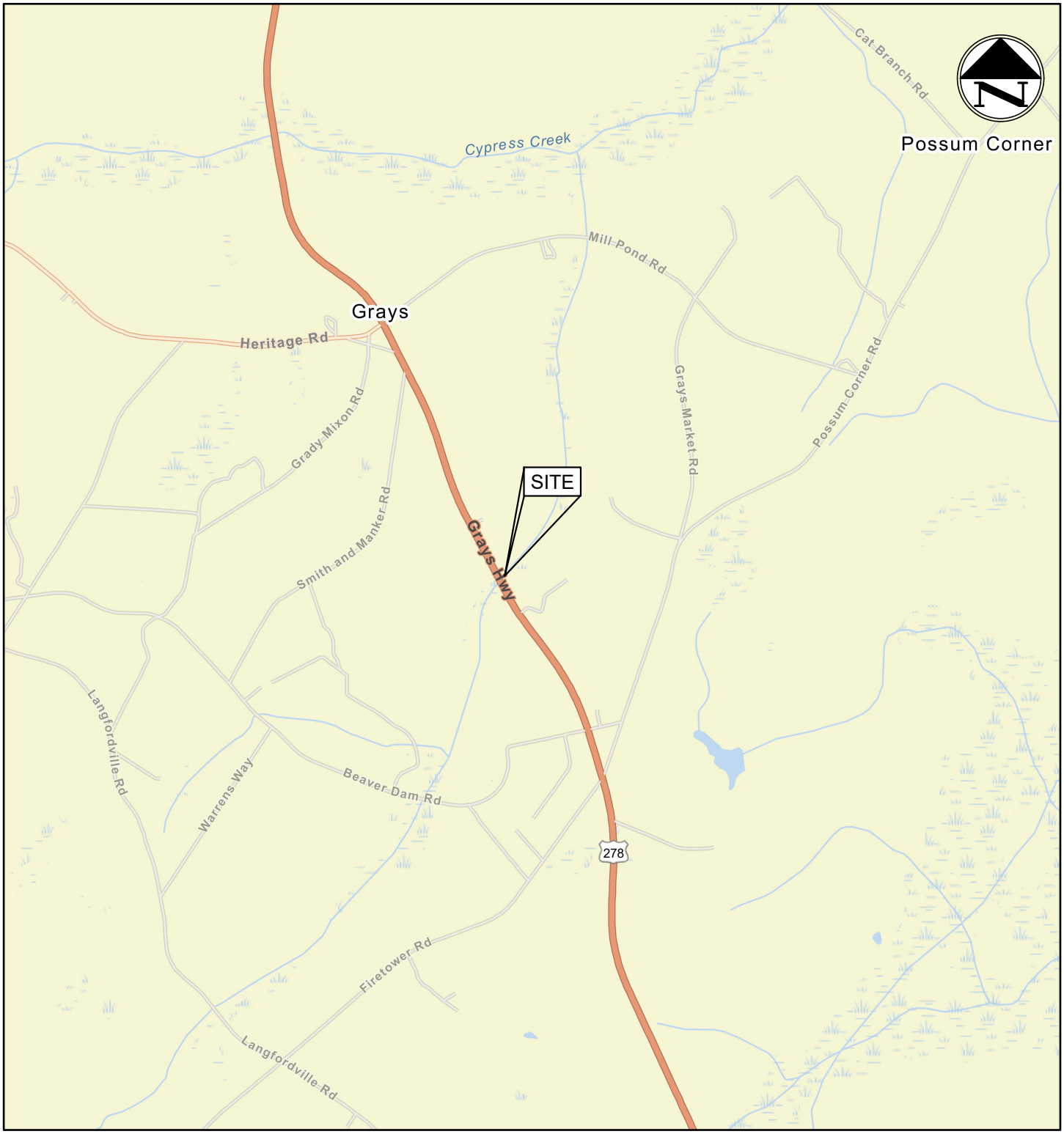
Table 8 – Laboratory Testing Summary Table – Bulk Soil Samples

Type of Test	Quantity	Procedure
Moisture Content	4	AASHTO T265 (ASTM D2216)
Atterberg Limits	4	AASHTO T89/T90 (ASTM D4318)
Grain-size Distribution w/ Wash 200	4	ASTM D6913/AASHTO T11 (ASTM D1140)
Standard Proctor	4	AASHTO T99 (ASTM D698)
California Bearing Ratio Test	2	AASHTO T193
Direct Shear	2	AASHTO T236 (ASTM D3080)
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

APPENDIX

APPENDIX

SECTION 1 SITE LOCATION PLAN



1:46,000

0 0.33 0.65 1.3 mi

0 0.5 1 2 km

F&ME CONSULTANTS, INC.
COLUMBIA, SC

REV.	BY	DATE	DESCRIPTION OF REVISION
4			
3			
2			
1			

TOPO. _____ DATE _____
DWG. CTC DATE 10.16.24 GROUP ____ – _____
R/W _____ DATE _____

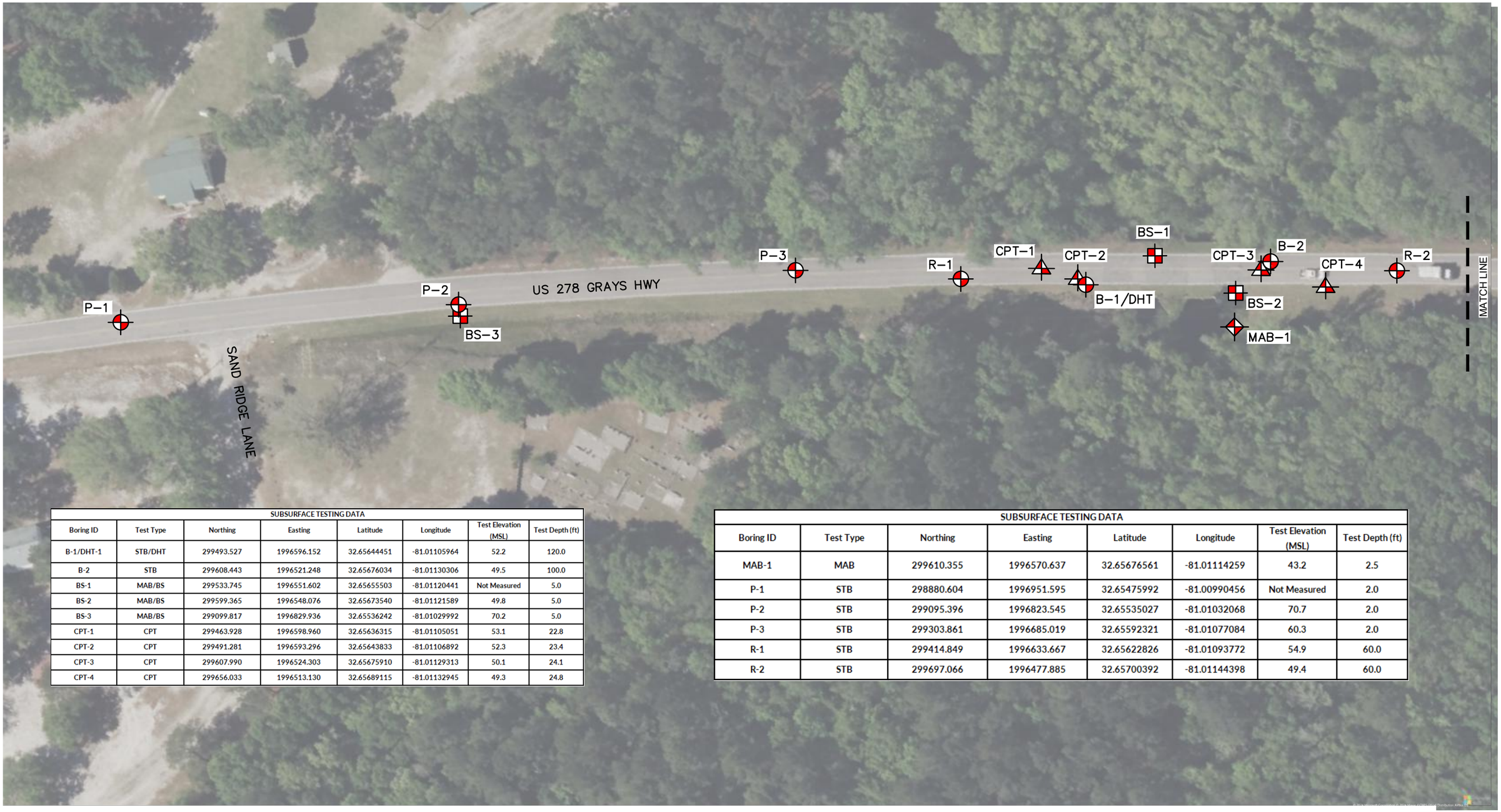
US 278 GRAYS HIGHWAY EMERGENCY REPAIRS
JASPER COUNTY, SOUTH CAROLINA

SITE LOCATION PLAN

SCDOT PROJECT ID: P043789	FME JOB NO. G7100.006
SCALE: AS NOTED	FIGURE 1

APPENDIX

SECTION 2 BORING LOCATION PLAN



SUBSURFACE TESTING DATA

Boring ID	Test Type	Northing	Easting	Latitude	Longitude	Test Elevation (MSL)	Test Depth (ft)
B-1/DHT-1	STB/DHT	299493.527	1996596.152	32.65644451	-81.01105964	52.2	120.0
B-2	STB	299608.443	1996521.248	32.65676034	-81.01130306	49.5	100.0
BS-1	MAB/BS	299533.745	1996551.602	32.65655503	-81.01120441	Not Measured	5.0
BS-2	MAB/BS	299599.365	1996548.076	32.65673540	-81.01121589	49.8	5.0
BS-3	MAB/BS	299099.817	1996829.936	32.65536242	-81.01029992	70.2	5.0
CPT-1	CPT	299463.928	1996598.960	32.65636315	-81.01105051	53.1	22.8
CPT-2	CPT	299491.281	1996593.296	32.65643833	-81.01106892	52.3	23.4
CPT-3	CPT	299607.990	1996524.303	32.65675910	-81.01129313	50.1	24.1
CPT-4	CPT	299656.033	1996513.130	32.65689115	-81.01132945	49.3	24.8

SUBSURFACE TESTING DATA

Boring ID	Test Type	Northing	Easting	Latitude	Longitude	Test Elevation (MSL)	Test Depth (ft)
MAB-1	MAB	299610.355	1996570.637	32.65676561	-81.01114259	43.2	2.5
P-1	STB	298880.604	1996951.595	32.65475992	-81.00990456	Not Measured	2.0
P-2	STB	299095.396	1996823.545	32.65535027	-81.01032068	70.7	2.0
P-3	STB	299303.861	1996685.019	32.65592321	-81.01077084	60.3	2.0
R-1	STB	299414.849	1996633.667	32.65622826	-81.01093772	54.9	60.0
R-2	STB	299697.066	1996477.885	32.65700392	-81.01144398	49.4	60.0

LEGEND:

- SOIL TEST BORING LOCATION
- BULK SAMPLE TEST LOCATION
- CONE PENETRATION TEST LOCATION
- MANUAL AUGER BORING LOCATION

REV.	BY	DATE	DESCRIPTION OF REVISION
4			
3			
2			
1			

TOPO. ____ DATE ____
DWG. CTC DATE 10.16.24 GROUP ____ – ____
R/W ____ DATE ____

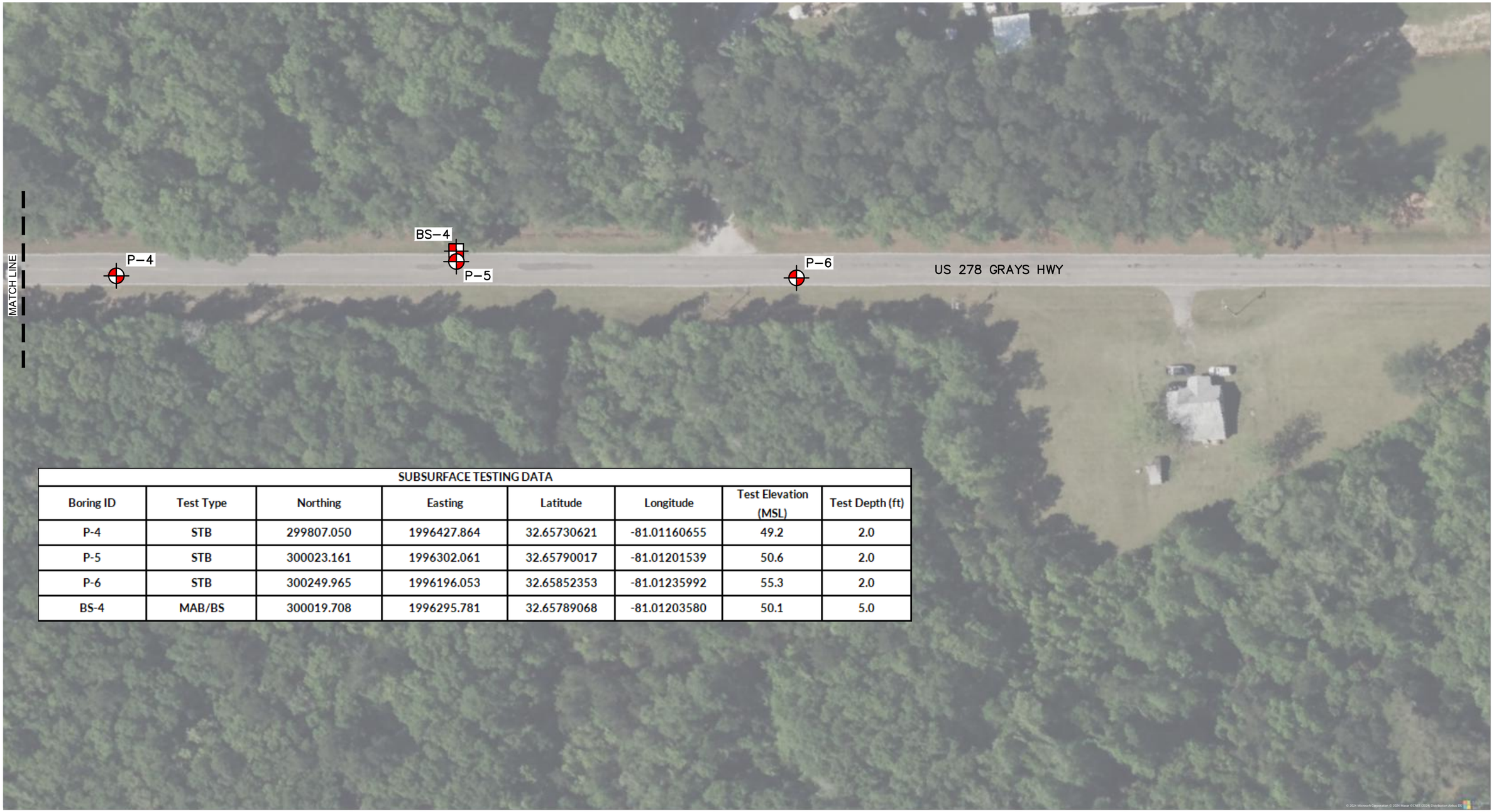
F&ME CONSULTANTS, INC.
COLUMBIA, SC

US 278 GRAYS HIGHWAY EMERGENCY REPAIRS
JASPER COUNTY, SOUTH CAROLINA

BORING LOCATION PLAN

SCDOT PROJECT ID: P043789 | FME JOB NO. G7100.006

SCALE: NTS | FIGURE 2



SUBSURFACE TESTING DATA							
Boring ID	Test Type	Northing	Easting	Latitude	Longitude	Test Elevation (MSL)	Test Depth (ft)
P-4	STB	299807.050	1996427.864	32.65730621	-81.01160655	49.2	2.0
P-5	STB	300023.161	1996302.061	32.65790017	-81.01201539	50.6	2.0
P-6	STB	300249.965	1996196.053	32.65852353	-81.01235992	55.3	2.0
BS-4	MAB/BS	300019.708	1996295.781	32.65789068	-81.01203580	50.1	5.0

LEGEND:

- SOIL TEST BORING LOCATION
- BULK SAMPLE TEST LOCATION
- CONE PENETRATION TEST LOCATION
- MANUAL AUGER BORING LOCATION

REV.	BY	DATE	DESCRIPTION OF REVISION
4			
3			
2			
1			

TOPO. ____ DATE ____
DWG. CTC DATE 10.16.24 GROUP ____ – ____
R/W ____ DATE ____

F&ME CONSULTANTS, INC.
COLUMBIA, SC

US 278 GRAYS HIGHWAY EMERGENCY REPAIRS
JASPER COUNTY, SOUTH CAROLINA

BORING LOCATION PLAN

SCDOT PROJECT ID: P043789	FME JOB NO. G7100.006
SCALE: NTS	FIGURE 3

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: GRAPH	SYMBOLS: LETTER	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS (MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE)	GRAVEL AND GRAVELLY SOILS (MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE)	CLEAN GRAVELS (LITTLE OR NO FINES)		GW	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
				GP	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
		GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
				GC	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES
	SAND AND SANDY SOILS (MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE)	CLEAN SANDS (LITTLE OR NO FINES)		SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
				SP	POORLY-GRADED SANDS, GRAVELLY SAND, LITTLE OR NO FINES
		SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SM	SILTY SANDS, SAND - SILT MIXTURES
				SC	CLAYEY SANDS, SAND - CLAY MIXTURES
FINE GRAINED SOILS (MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE)	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
				CH	INORGANIC CLAYS OF HIGH PLASTICITY
				OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

APPENDIX

SECTION 3 SUBSURFACE EXPLORATION LOGS

SECTION 3A SOIL TEST BORING (STB) LOGS

SCDOT Soil Test Log

Project ID:	P043789	**County:**	Jasper	**Boring No.:**	B-1/DHT-1		
Site Description:	US 278 Grays Highway Emergency Repairs			**Route:**	US 278		
Eng./Geo.:	G. Cantelle	**Boring Location:**	N.M.	**Offset:**	N.M.	**Alignment:**	Existing CL
Elev.:	52.2 ft	**Latitude:**	32.65644451	**Longitude:**	-81.01105964	**Date Started:**	10/18/2024
Total Depth:	120 ft	**Soil Depth:**	120 ft	**Core Depth:**	N/A ft	**Date Completed:**	10/19/2024
Bore Hole Diameter (in):	4.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.4%
Core Size:	N/A	**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
	0.0									
	0.4	ASPHALT (GRAYS HIGHWAY) (5.0-in.)		0.4						
		EXISTING FILL			SS-1	1	7	12	15	19
		Medium Dense to Dense, Moist to Dry, Pale Brown, Non-Plastic to Low Plasticity, Silty Fine to Medium SAND (SM/A-2-4), No HCl Reaction, 2.5Y7/4		2.0						
					SS-2	7	20	12	12	32
47.2		@SS-2: Light Brownish Gray, 2.5Y6/2		4.0						
		@SS-3: Grayish Brown, 2.5Y5/2			SS-3	8	9	8	11	17
		@SS-4: Moist, Light Brownish Gray, Fine to Coarse Sand Particles with Trace Gravel, 2.5Y6/2		6.0						
	8.0				SS-4	5	6	5	4	11
		LL=NP, PL=NP, PI=NP, NMC=11.8, %200=12.3		8.0						
					SS-5	2	3	2	3	5
42.2		**ALLUVIUM (HOLOCENE)**								
		Loose to Very Loose, Moist, Light Brownish Gray, Non-Plastic, Poorly Graded SAND (SP-SM/A-3) with Silt, 2.5Y6/2		13.5						
		@SS-5: LL=NP, PL=NP, PI=NP, NMC=22.1, %200=10.3			SS-6	WOH	2	2		4
37.2		@SS-6: No Recovery								
				18.5						
		@SS-7: Loose, , Black, Non-Plastic, Non-Reactive HCl Reaction, 2.5Y2.5/1			SS-7	2	3	3		6
32.2		LL=NP, PL=NP, PI=NP, NMC=24.4, %200= 5.8								
	23.5			23.5						
		HAWTHORNE FORMATION (MIOCENE)			SS-8	7	10	12		22
27.2		Medium Dense, Moist, Greenish Gray, Non-Plastic to Low Plasticity, Silty Fine to Coarse SAND (SM/A-2-4), Calcereous, Non-Reactive to Weak HCl Reaction, 5GY6/1								
	28.5			28.5						
		Stiff to Very Stiff, Moist, Greenish Gray, Medium Plasticity, Clayey SAND (SC/A-2-6), 5GY5/1			SS-9	4	5	9		14
22.2		@SS-9: LL= 36, PL=23, PI= 13, NMC= 36.0, %200= 16.0								

SPT N VALUE — PL — MC — LL

FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90

LEGEND

Continued Next Page

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

SCDOT Soil Test Log

Project ID:	P043789	**County:**	Jasper	**Boring No.:**	B-1/DHT-1		
Site Description:	US 278 Grays Highway Emergency Repairs			**Route:**	US 278		
Eng./Geo.:	G. Cantelle	**Boring Location:**	N.M.	**Offset:**	N.M.	**Alignment:**	Existing CL
Elev.:	52.2 ft	**Latitude:**	32.65644451	**Longitude:**	-81.01105964	**Date Started:**	10/18/2024
Total Depth:	120 ft	**Soil Depth:**	120 ft	**Core Depth:**	N/A ft	**Date Completed:**	10/19/2024
Bore Hole Diameter (in):	4.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.4%
Core Size:	N/A	**Driller:**	D. Harris	**Groundwater:**	**TOB** N/A	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
		@SS-10: Fine to Medium Sand Particles, Glaucenitic, No HCl Reaction	33.5	SS-10	5	8	13		21
17.2									
	38.5	Very Stiff, Moist to Dry, Dark Grayish Olive, Non-Plastic to Low Plasticity, Sandy SILT (ML/A-4), No HCl Reaction, 10Y4/2	38.5	SS-11	8	9	13		22
12.2									
	43.5	Very Stiff, Moist to Dry, Dark Grayish Olive, High Plasticity, Clayey SAND (SC/A-7-6), No HCl Reaction, 10Y4/2	43.5	SS-12	11	9	12		21
7.2		@SS-12: LL= 54, PL= 23, PI= 31, NMC= 42.8%, %200= 42.2							
		@SS-13: Weak HCl Reaction	48.5	SS-13	5	8	17		25
2.2									
	54.3	Very Dense, Moist to Dry, White, Non-Plastic to Low Plasticity, Silty Fine to Coarse SAND (SM/A-2-4), Cap Rock Lense, Strong HCl Reaction, N8/White	53.5	SS-14	4	50/5"			100+
-2.8									
		@SS-15: Medium Dense, Moist, Dark Grayish Olive, Calcereous, Weak HCl Reaction, 10Y4/2	58.5	SS-15	5	6	11		17
-7.8									
	63.5	Stiff to Very Stiff, Moist, Dark Grayish Olive, Non-Plastic to Low Plasticity, Sandy SILT (ML/A-4), No HCl Reaction, 10Y4/2	63.5	SS-16	4	5	10		15
-12.8									

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

Continued Next Page

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

SCDOT Soil Test Log

Project ID:	P043789	**County:**	Jasper	**Boring No.:**	B-1/DHT-1		
Site Description:	US 278 Grays Highway Emergency Repairs			**Route:**	US 278		
Eng./Geo.:	G. Cantelle	**Boring Location:**	N.M.	**Offset:**	N.M.	**Alignment:**	Existing CL
Elev.:	52.2 ft	**Latitude:**	32.65644451	**Longitude:**	-81.01105964	**Date Started:**	10/18/2024
Total Depth:	120 ft	**Soil Depth:**	120 ft	**Core Depth:**	N/A ft	**Date Completed:**	10/19/2024
Bore Hole Diameter (in):	4.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.4%
Core Size:	N/A	**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
		@SS-17: Calcereous, Non-Reactive to Weak HCl Reaction		68.5	SS-17	9	8	12		20
-17.8										
		@SS-18: Very Dark Grayish Green, Slight HCl Reaction, 5GY3/2		73.5	SS-18	7	13	12		15
-22.8										
	78.5	Medium Dense, Moist, Dark Grayish Olive, Medium Plasticity, Clayey SAND (SC/A-7-6), Non-Reactive HCl Reaction, 10Y4/2		78.5	SS-19	4	4	7		11
-27.8		@SS-19: LL=43, PL= 25, PI= 18, NMC= 44.8%, %200= 40.6								
				83.5	SS-20	5	6	8		14
-32.8										
		@SS-21: Very Dark Grayish Olive, 10Y3/2		88.5	SS-21	4	7	10		17
-37.8										
	93.5	Stiff, Moist, Very Dark Grayish Olive, Non-Plastic to Low Plasticity, SILT (ML/A-4), Calcereous, Non-Reactive to Weak HCl Reaction, 10Y3/2		93.5	SS-22	6	6	9		15
-42.8										
	98.5			98.5						

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

Continued Next Page

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:	P043789	**County:**	Jasper	**Boring No.:**	B-1/DHT-1		
Site Description:	US 278 Grays Highway Emergency Repairs			**Route:**	US 278		
Eng./Geo.:	G. Cantelle	**Boring Location:**	N.M.	**Offset:**	N.M.	**Alignment:**	Existing CL
Elev.:	52.2 ft	**Latitude:**	32.65644451	**Longitude:**	-81.01105964	**Date Started:**	10/18/2024
Total Depth:	120 ft	**Soil Depth:**	120 ft	**Core Depth:**	N/A ft	**Date Completed:**	10/19/2024
Bore Hole Diameter (in):	4.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.4%
Core Size:	N/A	**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
-47.8		Very Stiff, Moist, Very Dark Grayish Olive, Non-Plastic to Low Plasticity, Sandy SILT (ML/A-4), Calcereous, Non-Reactive to Weak HCl Reaction, 10Y3/2			SS-23	9	12	15		27
	103.5			103.5						
		SUWANEE LIMESTONE (EOCENE)			SS-24	10	9	11		20
-52.8		Medium Dense, Moist, White, Non-Plastic, Silty Fine to Coarse SAND (SM/A-2-4) with Trace Shells (Limestone), Strong HCl Reaction N8/1								
		@SS-24: LL= NP, PL=NP, PI=NP, NMC= 26.3%, %200= 13.1		108.5						
		@SS-25: with Trace Gravel			SS-25	9	10	11		21
-57.8										
				113.5						
					SS-24	10	10	12		22
-62.8										
				118.5						
					SS-25	11	9	13		22
-67.8	120.0	Boring Terminated at Target Depth of 120.0-ft Below the Existing Ground Surface. Boring Achieved Target Depth.								
-72.8										
-77.8										

SPT N VALUE ● PL × MC ○ LL × ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90

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:	P043789	**County:**	Jasper	**Boring No.:**	B-2		
Site Description:	US 278 Grays Highway Emergency Repairs			**Route:**	US 278		
Eng./Geo.:	G. Cantelle	**Boring Location:**	N.M.	**Offset:**	N.M.	**Alignment:**	Existing CL
Elev.:	49.5 ft	**Latitude:**	32.65676034	**Longitude:**	-81.01130306	**Date Started:**	10/15/2024
Total Depth:	100 ft	**Soil Depth:**	100 ft	**Core Depth:**	N/A ft	**Date Completed:**	10/17/2024
Bore Hole Diameter (in):	4.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.4%
Core Size:	N/A	**Driller:**	D. Harris	**Groundwater:**	**TOB** 7.3(CV@7.3)	**24HR**	NR

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0								
	0.3	ASPHALT (GRAYS HIGHWAY) (4.0-in.)	0.3						
		EXISTING FILL		SS-1	4	12	19	16	31
		Dense to Medium Dense, Moist to Dry, Light Olive Brown, Non-Plastic to Low Plasticity, Silty Fine to Medium SAND (SM/A-2-4), No HCl Reaction, 2.5Y4/4	2.0						
				SS-2	10	11	10	9	21
44.5		@SS-2: Olive Yellow, 2.5Y6/6	4.0						
	6.0	@SS-3: Grayish Brown, 2.5Y5/2		SS-3	7	7	6	5	13
		ALLUVIUM (HOLOCENE)	6.0						
		Very Loose, Moist, White, Non-Plastic, Fine to Medium Poorly Graded SAND (SP-SM/A-3) with Silt, No HCl Reaction, 5Y8/1		SS-4	3	2	2	4	4
			8.0						
				SS-5	2	1	1	2	2
39.5	10.0	@SS-4: LL=NP, PL= NP, PI= NP. NMC=20.7%, %200= 9.5	10.0						
	12.0	@SS-5: Gray, Fine to Medium Poorly Graded SAND (SP-SM/A-2-4) with Silt, 10YR6/1		SS-6	1	3	6	12	9
			12.0						
				SS-7	3	4	11	13	15
34.5		LL= NP, PL= NP, PI= NP, NMC= 19.6%, %200= 11.2	14.0						
				SS-8	4	4	4	3	8
		Loose, Moist, Very Dark Gray, Non-Plastic, Silty Fine to Medium SAND (SM/A-2-4), No HCl Reaction, 7.5YR3/1	16.0						
				SS-9	2	4	4	5	8
	18.0	LL= NP, PL= NP, PI= NP, NMC= 22.4%, %200= 17.1	18.0						
				SS-10	4	4	4	6	8
29.5	20.0		20.0						
		Medium Dense to Loose, Moist to Wet, Dark Gray, Non-Plastic, Fine to Medium Poorly Graded SAND (SP/A-3), No HCl Reaction, 7.5YR4/1		SS-11	2	3	6	15	9
			22.0						
		@SS-8: Very Dark Gray, 10YR3/1		SS-12	10	12	14	18	26
		@SS-9: Gray, 2.5Y3/1	24.0						
24.5		Loose, Moist, Very Dark Gray, Non-Plastic, Fine to Coarse Poorly Graded SAND (SP-SM/A-3) with Silt, 10YR3/1		SS-13	4	7	10	14	17
			26.0						
		@SS-10: LL=NP, PL= NP, PI= NP, NMC= 19.9%, %200= 5.1		SS-14	14	16	22	27	38
			28.0						
		HAWTHORNE FORMATION (MIOCENE)		SS-15	5	8	11	17	19
19.5		Medium Dense to Dense, Moist, Dark Greenish Gray, Medium Plasticity, Fine Clayey SAND (SC/A-2-6) , Calcerous, Weak HCl Reaction, 10Y4/1	30.0						
				SS-16	24	23	34	31	57
		@SS-11: LL= 36, PL= 21, PI= 15, NMC=	32.0						

SPT N VALUE ● PL × MC ○ LL × ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90

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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:	P043789	**County:**	Jasper	**Boring No.:**	B-2		
Site Description:	US 278 Grays Highway Emergency Repairs			**Route:**	US 278		
Eng./Geo.:	G. Cantelle	**Boring Location:**	N.M.	**Offset:**	N.M.	**Alignment:**	Existing CL
Elev.:	49.5 ft	**Latitude:**	32.65676034	**Longitude:**	-81.01130306	**Date Started:**	10/15/2024
Total Depth:	100 ft	**Soil Depth:**	100 ft	**Core Depth:**	N/A ft	**Date Completed:**	10/17/2024
Bore Hole Diameter (in):	4.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.4%
Core Size:	N/A	**Driller:**	D. Harris	**Groundwater:**	**TOB** 7.3(CV@7.3)	**24HR**	NR

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
		30.3%, %200= 32.3		34.0	SS-17	8	10	20	26	30
		@SS-14: Moist to Dry								
14.5		@SS-15: Fine to Medium Sand Particles			SS-18	5	8	17	21	25
	36.0	@SS-16: Very Dense, Moist, Non-Reactive to Slight HCl Reaction		36.0						
		@SS-17: Medium Dense			SS-19	10	15	26	31	41
	38.5	@SS-18: Dark Grayish Green, 5GY4/2		38.5						
		Hard to Very Stiff, Moist, Very Dark Grayish Green, Non-Plastic to Low Plasticity, Sandy SILT (ML/A-4), Calcereous, Slight HCl Reaction, 5GY3/2			SS-20	9	11	14		25
9.5										
		Very Sitff to Hard, Wet, Very Dark Greenish Gray, Very Plastic, Fat CLAY (CH/A-7-5), Slight HCl Reaction, 5GY3/2		43.5						
		@SS-20: LL=107, PL= 43, PI= 64, NMC= 74.4%, %200= 86.4			SS-21	6	17	50/5.5"		67+
4.5										
				48.5						
					SS-22	6	9	12		21
-0.5										
	53.5			53.5						
		Very Stiff, Moist, Dark Grayish Olive, High Plasticity, Clayey SAND (SC/A-2-7), Slight HCl Reaction, 10Y4/2			SS-23	5	7	9		16
-5.5		@SS-23: LL= 65, PL= 26, PI= 39, NMC= 46.1, %200= 27.6								
	58.5			58.5						
		Very Stiff, Moist to Dry, Dark Grayish Olive, Low Plasticity to Medium Plasticity, SILT (ML/A-4), Calcereous, Weak HCl Reaction, 10Y4/2			SS-24	5	8	11		19
-10.5										
				63.5						
					SS-25	6	10	15		25
-15.5										

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

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Continued Next Page

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:	P043789	**County:**	Jasper	**Boring No.:**	B-2		
Site Description:	US 278 Grays Highway Emergency Repairs			**Route:**	US 278		
Eng./Geo.:	G. Cantelle	**Boring Location:**	N.M.	**Offset:**	N.M.	**Alignment:**	Existing CL
Elev.:	49.5 ft	**Latitude:**	32.65676034	**Longitude:**	-81.01130306	**Date Started:**	10/15/2024
Total Depth:	100 ft	**Soil Depth:**	100 ft	**Core Depth:**	N/A ft	**Date Completed:**	10/17/2024
Bore Hole Diameter (in):	4.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.4%
Core Size:	N/A	**Driller:**	D. Harris	**Groundwater:**	**TOB** 7.3(CV@7.3)	**24HR**	NR

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	68.5			68.5						
-20.5		Very Stiff, Moist to Dry, Dark Grayish Olive, Non-Plastic to Low Plasticity, Sandy SILT (ML/A-4), Calcereous, Slight HCl Reaction, 10Y4/2			SS-26	7	8	12		20
		@SS-27: Low Plasticity to Medium Plasticity		73.5	SS-27	6	7	12		19
-25.5	78.5			78.5						
-30.5		Medium Dense, Moist, Dark Grayish Olive, High Plasticity, Clayey SAND (SC/A-7-6), Calcereous, Weak HCl Reaction, 10Y4/2			SS-28	5	5	8		13
		@SS-28: LL=41, PL= 15, PI= 26, NMC= 43.6%, %200= 38.3								
	83.5			83.5						
-35.5		Very Stiff to Stiff, Dry, Dark Grayish Olive, Non-Plastic to Low Plasticity, SILT (ML/A-4), Calcereous, Weak HCl Reaction, 10Y4/2			SS-29	5	6	9		15
				88.5	SS-30	5	5	8		13
-40.5	93.5			93.5						
-45.5		Very Stiff, Dry, Dark Grayish Olive, Non-Plastic to Low Plasticity, Sandy SILT (ML/A-4), Calcereous, Weak HCl Reaction, 10Y4/2			SS-31	7	8	9		17
	98.5			98.5						

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

Continued Next Page

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

SCDOT Soil Test Log

Project ID:	P043789	**County:**	Jasper	**Boring No.:**	B-2		
Site Description:	US 278 Grays Highway Emergency Repairs			**Route:**	US 278		
Eng./Geo.:	G. Cantelle	**Boring Location:**	N.M.	**Offset:**	N.M.	**Alignment:**	Existing CL
Elev.:	49.5 ft	**Latitude:**	32.65676034	**Longitude:**	-81.01130306	**Date Started:**	10/15/2024
Total Depth:	100 ft	**Soil Depth:**	100 ft	**Core Depth:**	N/A ft	**Date Completed:**	10/17/2024
Bore Hole Diameter (in):	4.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.4%
Core Size:	N/A	**Driller:**	D. Harris	**Groundwater:**	**TOB** 7.3(CV@7.3)	**24HR**	NR

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 MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
-50.5	100.0	**SUWANEE LIMESTONE (EOCENE)** Medium Dense, Wet, White, Non-Plastic, Silty Fine to Coarse SAND (SM/A-2-4) with Gravel and Trace Shells, Strong HCl Reaction, N8/White @SS-32: LL= NP, PL= NP, PI= NP, NMC= 27.9%, %200= 13.8			SS-32	10	11	13		24	●
-55.5		Boring Terminated at 100.0-feet Below the Existing Roadway Surface. Boring Achieved Target Depth.									
-60.5											
-65.5											
-70.5											
-75.5											
-80.5											

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 G7100.006 - US 278 BEAVERDAM BRANCH.GPJ FME2017.GDT 10/30/24

SCDOT Soil Test Log

Project ID:	P043789			**County:**	Jasper	**Boring No.:**	P-1
Site Description:	US 278 Grays Highway Emergency Repairs					**Route:**	US 278
Eng./Geo.:	G. Cantelle	**Boring Location:**	N.M.	**Offset:**	N.M.	**Alignment:**	Existing CL
Elev.:	NM ft	**Latitude:**	32.65475992	**Longitude:**	-81.00990456	**Date Started:**	10/17/2024
Total Depth:	2.4 ft	**Soil Depth:**	2 ft	**Core Depth:**	N/A ft	**Date Completed:**	10/17/2024
Bore Hole Diameter (in):	4.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW	**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
	0.0	ASPHALT (GRAYS HIGHWAY) (4.5-in.)								
	0.4	**EXISTING FILL** Very Stiff, Moist to Dry, Light Yellowish Brown, Non-Plastic to Low Plasticity, Sandy SILT (ML/A-4) with Sand Lenses, 10YR6/4		0.4	SS-1	1	10	10	9	20
	2.4	Boring Terminated at Target Depth of 2.4-ft. Boring Achieved Target Depth.								

● SPT N VALUE ●

PL MC LL

▲ FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

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 G7100.006 - US 278 BEAVERDAM BRANCH.GPJ FME2017.GDT 10/31/24

SCDOT Soil Test Log

Project ID:	P043789	**County:**	Jasper	**Boring No.:**	P-2		
Site Description:	US 278 Grays Highway Emergency Repairs			**Route:**	US 278		
Eng./Geo.:	G. Cantelle	**Boring Location:**	N.M.	**Offset:**	N.M.	**Alignment:**	Existing CL
Elev.:	70.7 ft	**Latitude:**	32.65535027	**Longitude:**	-81.01032068	**Date Started:**	10/17/2024
Total Depth:	2.4 ft	**Soil Depth:**	2 ft	**Core Depth:**	N/A ft	**Date Completed:**	10/17/2024
Bore Hole Diameter (in):	4.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW	**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
	0.0	ASPHALT (GRAYS HIGHWAY)(4.5-in.)								
	0.4	**EXISTING FILL** Very Stiff, Moist to Dry, Grayish Brown, Non-Plastic to Low Plasticity, Sandy SILT (ML/A-4) with Sand Lenses, 10YR5/2		0.4	SS-1	3	8	13	9	21
	2.4	Boring Terminated at Target Depth of 2.4-ft. Boring Achieved Target Depth.								

● SPT N VALUE ●

PL MC LL

▲ FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

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 G7100.006 - US 278 BEAVERDAM BRANCH.GPJ FME2017.GDT 10/31/24

SCDOT Soil Test Log

Project ID:	P043789	**County:**	Jasper	**Boring No.:**	P-3		
Site Description:	US 278 Grays Highway Emergency Repairs			**Route:**	US 278		
Eng./Geo.:	G. Cantelle	**Boring Location:**	N.M.	**Offset:**	N.M.	**Alignment:**	Existing CL
Elev.:	60.3 ft	**Latitude:**	32.65592321	**Longitude:**	-81.01077084	**Date Started:**	10/17/2024
Total Depth:	2.3 ft	**Soil Depth:**	2 ft	**Core Depth:**	N/A ft	**Date Completed:**	10/17/2024
Bore Hole Diameter (in):	4.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW	**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
	0.0	ASPHALT (GRAYS HIGHWAY) (4.0-in.)								
	0.3	**EXISTING FILL** Medium Dense, Moist to Dry, Light Brownish Gray, Non-Plastic to Low Plasticity, Silty Fine to Medium SAND (SM/A-2-4), 2.5Y6/2		0.3	SS-1	3	8	14	19	22
	2.3	Boring Terminated at Target Depth of 2.3-ft. Boring Achieved Target Depth.								

● SPT N VALUE ●

PL MC LL

▲ FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

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 G7100.006 - US 278 BEAVERDAM BRANCH.GPJ FME2017.GDT 10/31/24

SCDOT Soil Test Log

Project ID:	P043789			**County:**	Jasper	**Boring No.:**	P-4
Site Description:	US 278 Grays Highway Emergency Repairs					**Route:**	US 278
Eng./Geo.:	G. Cantelle	**Boring Location:**	N.M.	**Offset:**	N.M.	**Alignment:**	Existing CL
Elev.:	49.2 ft	**Latitude:**	32.65730621	**Longitude:**	-81.01160655	**Date Started:**	10/17/2024
Total Depth:	2.3 ft	**Soil Depth:**	2 ft	**Core Depth:**	N/A ft	**Date Completed:**	10/17/2024
Bore Hole Diameter (in):	4.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW	**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
	0.0	ASPHALT (GRAYS HIGHWAY) (3.0-in.)								
	0.3	**EXISTING FILL** Dense, Moist to Dry, Light Olive Brown, Non-Plastic to Low Plasticity, Silty Fine to Medium SAND (SM/A-2-4), 2.5Y5/4		0.3	SS-1	1	13	18	22	31
	2.3	Boring Terminated at Target Depth of 2.3-ft. Boring Achieved Target Depth.								

● SPT N VALUE ●

PL MC LL

▲ FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

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 G7100.006 - US 278 BEAVERDAM BRANCH.GPJ FME2017.GDT 10/31/24

SCDOT Soil Test Log

Project ID:	P043789			**County:**	Jasper	**Boring No.:**	P-5
Site Description:	US 278 Grays Highway Emergency Repairs					**Route:**	US 278
Eng./Geo.:	G. Cantelle	**Boring Location:**	N.M.	**Offset:**	N.M.	**Alignment:**	Existing CL
Elev.:	50.6 ft	**Latitude:**	32.65790017	**Longitude:**	-81.01201539	**Date Started:**	10/17/2024
Total Depth:	2.2 ft	**Soil Depth:**	2 ft	**Core Depth:**	N/A ft	**Date Completed:**	10/17/2024
Bore Hole Diameter (in):	4.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW	**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
	0.0	ASPHALT (GRAYS HIGHWAY) (2.0-in.)								
	0.2	**EXISTING FILL** Medium Dense, Moist to Dry, Grayish Brown, Non-Plastic to Low Plasticity, Silty Fine to Medium SAND (SM/A-2-4), 2.5Y5/2		0.2	SS-1	5	14	16	26	30
	2.2	Boring Terminated at Target Depth of 2.2-ft. Boring Achieved Target Depth.								

● SPT N VALUE ●

PL MC LL

▲ FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

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 G7100.006 - US 278 BEAVERDAM BRANCH.GPJ FME2017.GDT 10/31/24

SCDOT Soil Test Log

Project ID:	P043789			**County:**	Jasper	**Boring No.:**	P-6
Site Description:	US 278 Grays Highway Emergency Repairs					**Route:**	US 278
Eng./Geo.:	G. Cantelle	**Boring Location:**	N.M.	**Offset:**	N.M.	**Alignment:**	Existing CL
Elev.:	55.3 ft	**Latitude:**	32.65852353	**Longitude:**	-81.01235992	**Date Started:**	10/17/2024
Total Depth:	2.3 ft	**Soil Depth:**	2 ft	**Core Depth:**	N/A ft	**Date Completed:**	10/17/2024
Bore Hole Diameter (in):	4.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW	**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
	0.0	ASPHALT (GRAYS HIGHWAY)(3.5-in.)								
	0.3	**EXISTING FILL** Medium Dense, Moist to Dry, Dark Gray/Strong Brown, Non-Plastic to Low Plasticity, Silty Fine to Medium SAND (SM/A-2-4), 2.5Y4/1 & 7.5YR5/8		0.3	SS-1	3	12	16	20	28
	2.3	Boring Terminated at Target Depth of 2.3-ft. Boring Achieved Target Depth.								

● SPT N VALUE ●

PL MC LL

▲ FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

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 G7100.006 - US 278 BEAVERDAM BRANCH.GPJ FME2017.GDT 10/31/24

SCDOT Soil Test Log

Project ID:	P043789	**County:**	Jasper	**Boring No.:**	R-1		
Site Description:	US 278 Grays Highway Emergency Repairs			**Route:**	US 278		
Eng./Geo.:	G. Cantelle	**Boring Location:**	N.M.	**Offset:**	N.M.	**Alignment**	Existing CL
Elev.:	54.9 ft	**Latitude:**	32.65622826	**Longitude:**	-81.01093772	**Date Started:**	10/21/2024
Total Depth:	60 ft	**Soil Depth:**	60 ft	**Core Depth:**	N/A ft	**Date Completed:**	10/21/2024
Bore Hole Diameter (in):	4.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.4%
Core Size:	N/A	**Driller:**	D. Harris	**Groundwater:**	**TOB** 5.9(CV@59)	**24HR**	Backfilled

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0								
	0.4	ASPHALT (GRAYS HIGHWAY) (5.0-in.)	0.0	SS-1	1	11	21	25	32
		EXISTING FILL							
		Dense to Medium Dense, Moist to Dry, Pale Brown/Light Olive Brown, Non-Plastic to Low Plasticity, Silty Fine to Coarse SAND (SM/A-2-4), No HCl Reaction, 2.5Y8/2 &2.5Y5/3	2.0						
	4.0		4.0	SS-2	14	14	16	14	30
49.9		@SS-2: Dark Gray, Fine to Medium Sand Particles with Trace Organics (Tree Root), 2.5Y4/1		SS-3	5	5	4	5	9
	6.0		6.0	SS-4	5	3	3	3	6
	8.0	**ALLUVIUM (HOLOCENE)**	8.0	SS-5	3	4	3	2	7
44.9		Loose, Moist to Dry, Grayish Brown, Non-Plastic to Low Plasticity, Silty Fine to Medium SAND (SM/A-2-4), Non-Reactive HCl Reaction, 2.5Y3/2							
		Loose, Moist, Dark Gray, Fine to Coarse Poorly Graded SAND (SP-SM/A-3) with Silt and Trace Organics (Tree Root), 5Y4/1							
		@SS-4: LL=NP, PL= NP, PI= NP, NMC= 24.7%, %200= 10.4	13.5	SS-6	2	2	2		4
39.9		Loose to Very Loose, Moist, Black, Non-Plastic, Silty Fine to Coarse SAND (SM/A-2-4), Increased Organic Content, No HCl Reaction, 2.5Y/1							
		@SS-6: Very Dark Greenish Gray, With Trace Gravel & Decreased Presence of Organics							
	18.5		18.5	SS-7	1	1	2		3
34.9		LL=NP, PL= NP, PI= NP, NMC= 50.9%, %200= 32.7							
		Very Loose, Moist, Dark Greenish Gray, Medium Plasticity, Clayey Fine to Medium SAND (SC/A-2-6), No HCl Reaction, 10G4/1							
	23.5		23.5	SS-8	50/1"				100+
		@SS-7: LL= 36, PL, 21, PI= 15, NMC= 47.1%, %200= 19.3							
29.9		**HAWTHORN FORMATION (MIOCENE)**							
		@SS-8: No Recovery							
	28.5		28.5	SS-9	4	5	9		14
24.9		Medium Dense, Moist, Greenish Gray, Non-Plastic to Low Plasticity, Silty Fine to Coarse SAND (SM/A-2-4), Non-Reactive HCl Reaction, 10GY5/1							

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

Continued Next Page

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:	P043789	**County:**	Jasper	**Boring No.:**	R-1		
Site Description:	US 278 Grays Highway Emergency Repairs			**Route:**	US 278		
Eng./Geo.:	G. Cantelle	**Boring Location:**	N.M.	**Offset:**	N.M.	**Alignment**	Existing CL
Elev.:	54.9 ft	**Latitude:**	32.65622826	**Longitude:**	-81.01093772	**Date Started:**	10/21/2024
Total Depth:	60 ft	**Soil Depth:**	60 ft	**Core Depth:**	N/A ft	**Date Completed:**	10/21/2024
Bore Hole Diameter (in):	4.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.4%
Core Size:	N/A	**Driller:**	D. Harris	**Groundwater:**	**TOB** 5.9(CV@59)	**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
				33.5	SS-10	5	7	13		20
19.9										
		@SS-11: Fine to Medium Sand Particles		38.5	SS-11	7	8	13		21
14.9										
	43.5	Stiff, Moist to Dry, Dark Grayish Olive, Very Plastic, Fat CLAY (CH/A-7-5), Weak HCl Reaction, 10Y4/2		43.5	SS-12	6	9	16		15
9.9		@SS-12: LL= 129, PL= 49, PI= 80, NMC= 67.5, %200= 81.5								
	48.5	Hard, Moist to Dry, Very Dark Grayish Olive, Non-Plastic, SILT (ML/A-4), Partially Cemented, Non-Reactive HCl Reaction, 10Y3/2		48.5	SS-13	50/4.5"				100+
4.9										
	53.5	Very Stiff, Moist to Dry, Very Dark Grayish Olive, Non-Plastic to Low Plasticity, Sandy SILT (ML/A-6), No to Weak HCl Reaction, 10Y3/2		53.5	SS-14	6	7	10		17
-0.1										
		@SS-15: No HCl Reaction		58.5	SS-15	6	7	13		20
-5.1	60.0	Boring Terminated at 60.0-ft Below the Existing Roadway Surface. Boring Achieved Target Depth.								

SPT N VALUE: PL, MC, LL

FINES CONTENT (%): 0 10 20 30 40 50 60 70 80 90

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SC_DOT G7100.006 - US 278 BEAVERDAM BRANCH.GPJ FME2017.GDT 10/30/24

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:	P043789	**County:**	Jasper	**Boring No.:**	R-2		
Site Description:	US 278 Grays Highway Emergency Repairs			**Route:**	US 278		
Eng./Geo.:	G. Cantelle	**Boring Location:**	N.M	**Offset:**	N.M	**Alignment**	Existing CL
Elev.:	49.4 ft	**Latitude:**	32.65700392	**Longitude:**	-81.01144398	**Date Started:**	10/14/2024
Total Depth:	60 ft	**Soil Depth:**	60 ft	**Core Depth:**	N/A ft	**Date Completed:**	10/15/2024
Bore Hole Diameter (in):	4.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.4%
Core Size:	N/A	**Driller:**	D. Harris	**Groundwater:**	**TOB** 8 ft	**24HR**	Backfilled

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0								
	0.1	ASPHALT (GRAYS HIGHWAY) (1.5-in.)	0.1						
		EXISTING FILL		SS-1	1	14	19	21	33
		Dense, Moist to Wet, Light Olive Brown, Non-Plastic to Low Plasticity, Silty Fine to Medium SAND (SM/A-2-4), No HCl Reaction, 2.5Y5/3	2.0						
				SS-2	19	18	17	7	35
		@SS-2: Moist, Olive Gray, 5Y5/2	4.0						
44.4				SS-3	3	4	4	5	8
	6.0	@SS-3: Loose, Light Olive Gray, 5Y6/2	6.0						
		ALLUVIUM (HOLOCENE)		SS-4	3	3	3	3	6
		Loose, Moist to Wet, Gray, Non-Plastic, Silty Fine to Medium SAND (SC-SM/A-2-4), Non-Reacitive HCl Reaction, 5Y5/1	8.0						
				SS-5	2	2	3	3	5
		@SS-5: Light Olive Gray, 5Y6/2, LL=NP, PL=NP, PI=NP, NMC=25.4%, %200=23.2							
39.4									
		@9.5-ft.: Black, 10YR2/1							
	13.5		13.5						
		Medium Dense, Moist to Wet, Dark Olive Gray, Non-Plastic to Low Plasticity, Fine to Coarse Poorly Graded SAND (SP/A-3), Non-Reactive HCl Reaction, 5Y3/2		SS-6	6	6	7		13
34.4									
	18.5		18.5						
		Loose, Moist, Greenish Gray, High Plasticity, Clayey Fine to Coarse SAND (SC/A-2-7), No HCl Reaction, 5GY5/1		SS-7	2	2	4		6
29.4									
		@SS-7: LL=52, PL=20, PI=32, NMC=36.7%, %200=17.8							
	23.5		23.5						
		HAWTHORNE FORMATION (MIOCENE)		SS-8	5	7	10		17
24.4		Medium Dense, Moist, Greenish Gray, High Plasticity, Clayey Fine to Medium SAND (SC/A-2-7), Slight HCl Reaction, 5GY5/1							
			28.5						
		@SS-9: LL=47, PL=23, PI=24, NMC=34.0, %200=28.8		SS-9	7	11	13		24
19.4									

SPT N VALUE ● PL × MC ○ LL × ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90

Continued Next Page

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:	P043789	**County:**	Jasper	**Boring No.:**	R-2		
Site Description:	US 278 Grays Highway Emergency Repairs			**Route:**	US 278		
Eng./Geo.:	G. Cantelle	**Boring Location:**	N.M.	**Offset:**	N.M.	**Alignment**	Existing CL
Elev.:	49.4 ft	**Latitude:**	32.65700392	**Longitude:**	-81.01144398	**Date Started:**	10/14/2024
Total Depth:	60 ft	**Soil Depth:**	60 ft	**Core Depth:**	N/A ft	**Date Completed:**	10/15/2024
Bore Hole Diameter (in):	4.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.4%
Core Size:	N/A	**Driller:**	D. Harris	**Groundwater:**	**TOB** 8 ft	**24HR**	Backfilled

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	33.5			33.5						
14.4		Medium Dense, Moist, Greenish Gray, Non-Plastic to Low Plastiicty, Silty Fine to Medium SAND (SM/A-2-4), No HCl Reaction, 5GY3/2			SS-10	6	9	19		28
	38.5			38.5						
9.4		Very Stiff, Moist, Dark Greenish Gray, Non-Plastic to Low Plastiicty, Fine Sandy SILT (ML/A-4), Slight HCl Reaction, 5GY4/2			SS-11	6	10	17		27
				43.5						
4.4					SS-12	7	9	17		26
	48.5			48.5						
-0.6		Medium Dense, Moist, Dark Greenish Gray, High Plasticity, Clayey Fine to Medium SAND (SC/A-2-7), No HCl Reaction, 5GY3/2			SS-13	9	10	13		23
				53.5						
		@SS-14: LL=60, PL=23, PI=37, NMC=49.2%, %200=30.0			SS-14	5	6	9		15
-5.6										
				58.5						
		@SS-15: Slight HCl Reaction			SS-15	6	8	13		21
-10.6	60.0	Boring Terminated at 60.0-ft Below the Existing Roadway Surface. Boring Achieved Target Depth.								

SPT N VALUE ● PL × MC ○ LL × ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90

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 G7100.006 - US 278 BEAVERDAM BRANCH.GPJ FME2017.GDT 10/30/24

APPENDIX

SECTION 3 SUBSURFACE EXPLORATION LOGS

SECTION 3B MANUAL AUGER BORING (MAB) LOGS

SCDOT Manual Auger Log

Project ID:	P043789			**County:**	Jasper	**Boring No.:**	MAB-1
Site Description:	US 278 Grays Highway Emergency Repairs					**Route:**	US 278
Driller:	D. Harris	**Boring Location:**	Not Measured	**Offset:**	N/A	**Alignment:**	Existng Alignment
Elev.:	43.2 ft	**Latitude:**	32.65676561	**Longitude:**	-81.01114259	**Date Started:**	10/17/2024
Total Depth:	2.5 ft	**Groundwater:**	**TOB** N/A	**24 hr**	Backfilled	**Date Completed:**	10/17/2024
Dynamic Cone Penetrometer Test Procedure:		Sowers and Hedges (1966)					

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 1.75"	2nd 1.75"	3rd 1.75"	DCP-Value	● DCP-VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
	0.0	**ALLUVIUM (HOLOCENE** Very Loose to Loose, Dry, Pale Yellow, Non-Plastic, Fine to Medium Poorly Graded SAND (SP/A-3), 5Y8/2		0.0	DS-1	1	1	1	2	●
		@DS-2: Dry to Moist, Pale Brown, 2.5Y8/2 LL=NP, PL= NP, PI= NP, NMC= 22.6%, %200= 1.9		1.0	DS-2	2	2	1	2	●
		@DS-3: Moist to Wet, Olive Brown, 2.5Y4/4		2.0	DS-3	2	5	4	7	▲● ○
	2.5	Boring Terminated at Target Depth of 2.5-ft. Due to Hole Collapse.								

MANUAL AUGER LOG G7100.006 - US 278 BEAVERDAM BRANCH.GPJ FME2017.GDT 10/30/24

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	DCP Dynamic Cone Penetrometer	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 Manual Auger Log

Project ID:	P043789			**County:**	Jasper	**Boring No.:**	BS-1
Site Description:	US 278 Grays Highway Emergency Repairs					**Route:**	US 278
Driller:	D. Harris	**Boring Location:**	N/A	**Offset:**	N/A	**Alignment:**	Existing CL
Elev.:	Not Measured	**Latitude:**	32.65655503	**Longitude:**	-81.01120441	**Date Started:**	10/14/2024
Total Depth:	5 ft	**Groundwater:**	**TOB** N/A	**24 hr**	Backfilled	**Date Completed:**	10/14/2024
Dynamic Cone Penetrometer Test Procedure:		Sowers and Hedges (1966)					

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 1.75"	2nd 1.75"	3rd 1.75"	DCP-Value	● DCP-VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
	0.0	Moist, Non-Plastic, Silty Fine to Medium SAND (SM/A-2-4) @BS-1: LL=NP, PL=NP, PI=NP, NMC=13.6%, %200=8.5		0.0	BS-1					
	5.0	Boring Terminated 5.0-ft. Below Existing Ground Surface. Target Boring Depth Achieved.								

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	DCP Dynamic Cone Penetrometer	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	

MANUAL AUGER LOG G7100.006 - US 278 BEAVERDAM BRANCH.GPJ FME2017.GDT 10/30/24

SCDOT Manual Auger Log

Project ID:	P043789			**County:**	Jasper	**Boring No.:**	BS-2
Site Description:	US 278 Grays Highway Emergency Repairs					**Route:**	US 278
Driller:	D. Harris	**Boring Location:**	N/A	**Offset:**	N/A	**Alignment:**	Existing CL
Elev.:	49.8 ft	**Latitude:**	32.6567354	**Longitude:**	-81.01121589	**Date Started:**	10/14/2024
Total Depth:	5 ft	**Groundwater:**	**TOB** N/A	**24 hr**	Backfilled	**Date Completed:**	10/14/2024
Dynamic Cone Penetrometer Test Procedure:		Sowers and Hedges (1966)					

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 1.75"	2nd 1.75"	3rd 1.75"	DCP-Value	● DCP-VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
	0.0	Moist, Non-Plastic, Silty Fine to Medium SAND (SM/A-2-4) @BS-2: LL=NP, PL=NP, PI=NP, NMC=12.1%, %200=17.5		0.0	BS-2					
44.8	5.0	Boring Terminated 5.0-ft. Below Existing Ground Surface. Target Boring Depth Achieved.								

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	DCP Dynamic Cone Penetrometer	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	

MANUAL AUGER LOG G7100.006 - US 278 BEAVERDAM BRANCH.GPJ FME2017.GDT 10/30/24

SCDOT Manual Auger Log

Project ID:	P043789			**County:**	Jasper	**Boring No.:**	BS-3
Site Description:	US 278 Grays Highway Emergency Repairs					**Route:**	US 278
Driller:	D. Harris	**Boring Location:**	N/A	**Offset:**	N/A	**Alignment:**	Existing CL
Elev.:	70.2 ft	**Latitude:**	32.65536242	**Longitude:**	-81.01029992	**Date Started:**	10/14/2024
Total Depth:	5 ft	**Groundwater:**	**TOB** N/A	**24 hr**	Backfilled	**Date Completed:**	10/14/2024
Dynamic Cone Penetrometer Test Procedure:		Sowers and Hedges (1966)					

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 1.75"	2nd 1.75"	3rd 1.75"	DCP-Value	● DCP-VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
	0.0	Moist, Non-Plastic, Silty Fine to Medium SAND (SM/A-2-4) @BS-3: LL=NP, PL=NP, PI=NP, NMC=18.4%, %200=16.7		0.0	BS-3					
65.2	5.0	Boring Terminated 5.0-ft. Below Existing Ground Surface. Target Boring Depth Achieved.								

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	DCP Dynamic Cone Penetrometer	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	

MANUAL AUGER LOG G7100.006 - US 278 BEAVERDAM BRANCH.GPJ FME2017.GDT 10/30/24

SCDOT Manual Auger Log

Project ID:	P043789			**County:**	Jasper	**Boring No.:**	BS-4
Site Description:	US 278 Grays Highway Emergency Repairs					**Route:**	US 278
Driller:	D. Harris	**Boring Location:**	N/A	**Offset:**	N/A	**Alignment:**	Existing CL
Elev.:	50.1 ft	**Latitude:**	32.65789068	**Longitude:**	-81.0120358	**Date Started:**	10/14/2024
Total Depth:	5 ft	**Groundwater:**	**TOB** N/A	**24 hr**	Backfilled	**Date Completed:**	10/14/2024
Dynamic Cone Penetrometer Test Procedure:		Sowers and Hedges (1966)					

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 1.75"	2nd 1.75"	3rd 1.75"	DCP-Value	● DCP-VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
	0.0	Moist, Non-Plastic, Poorly Graded Fine to Medium SAND (SP-SM/A-2-4) @BS-4: LL=NP, PL=NP, PI=NP, NMC=14.5%, %200=11.0		0.0	BS-4					
45.1	5.0	Boring Terminated 5.0-ft. Below Existing Ground Surface. Target Boring Depth Achieved.								

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	DCP Dynamic Cone Penetrometer	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	

MANUAL AUGER LOG G7100.006 - US 278 BEAVERDAM BRANCH.GPJ FME2017.GDT 10/30/24

APPENDIX

SECTION 3 SUBSURFACE EXPLORATION LOGS

SECTION 3C ELECTRO-PIEZOCONE SOUNDING (CPT) LOGS

F&ME CONSULTANTS

US 278 Grays Highway Emergency Repairs
Jasper County (South Carolina)

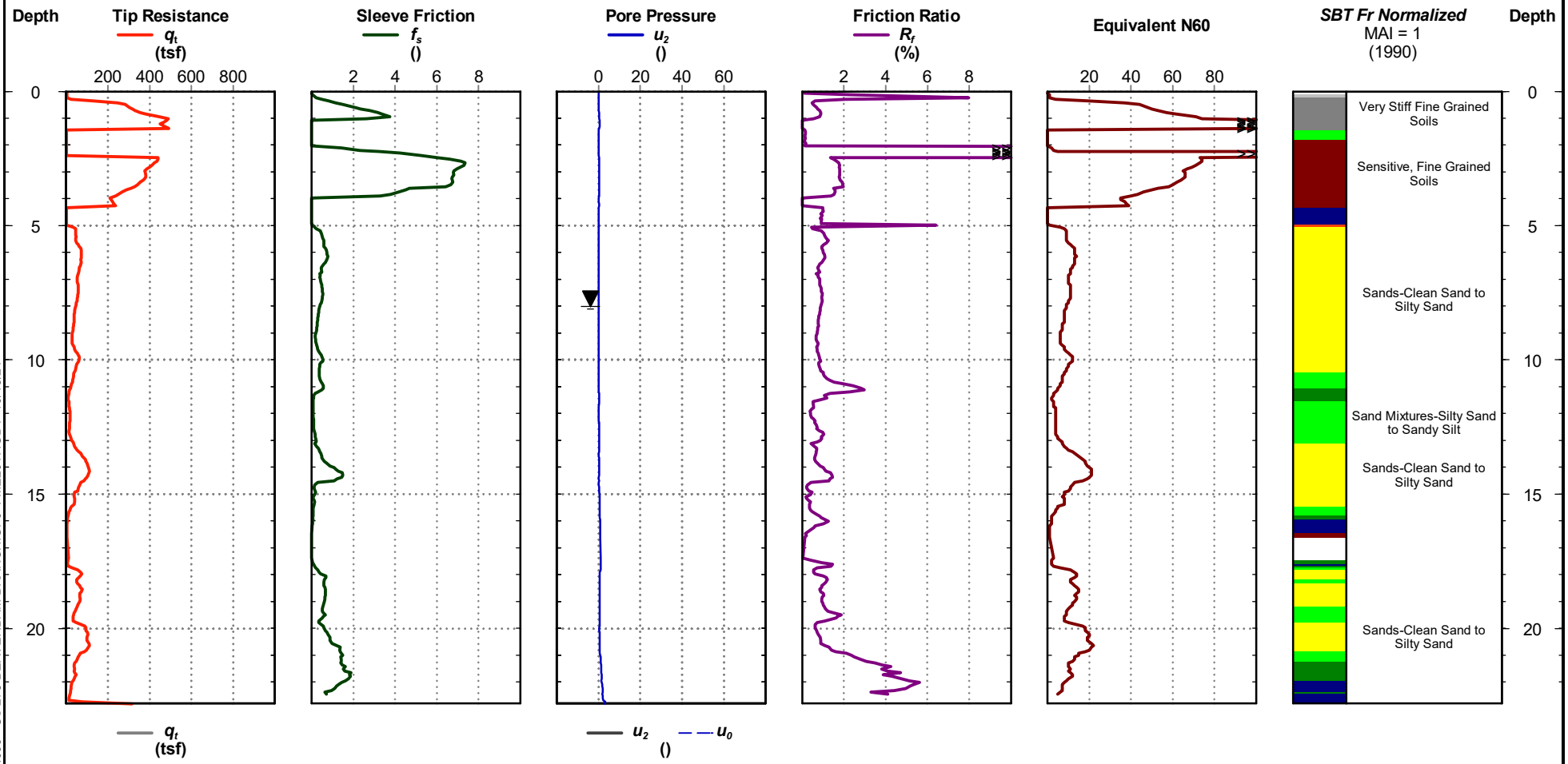
Project Number :P043789

CPT-1

Date: Oct. 14, 2024
Estimated Water Depth: 8 ft
Rig/Operator: G. Cantele

Station:
Offset:
Elevation: ft-MSL

Total Depth: 22.8 ft
Termination Criteria: Maximum Reaction Force
CPT Probe ID: DDG1329



CPT-1

US 278 Grays Highway Emergency Repairs
Jasper County (South Carolina)

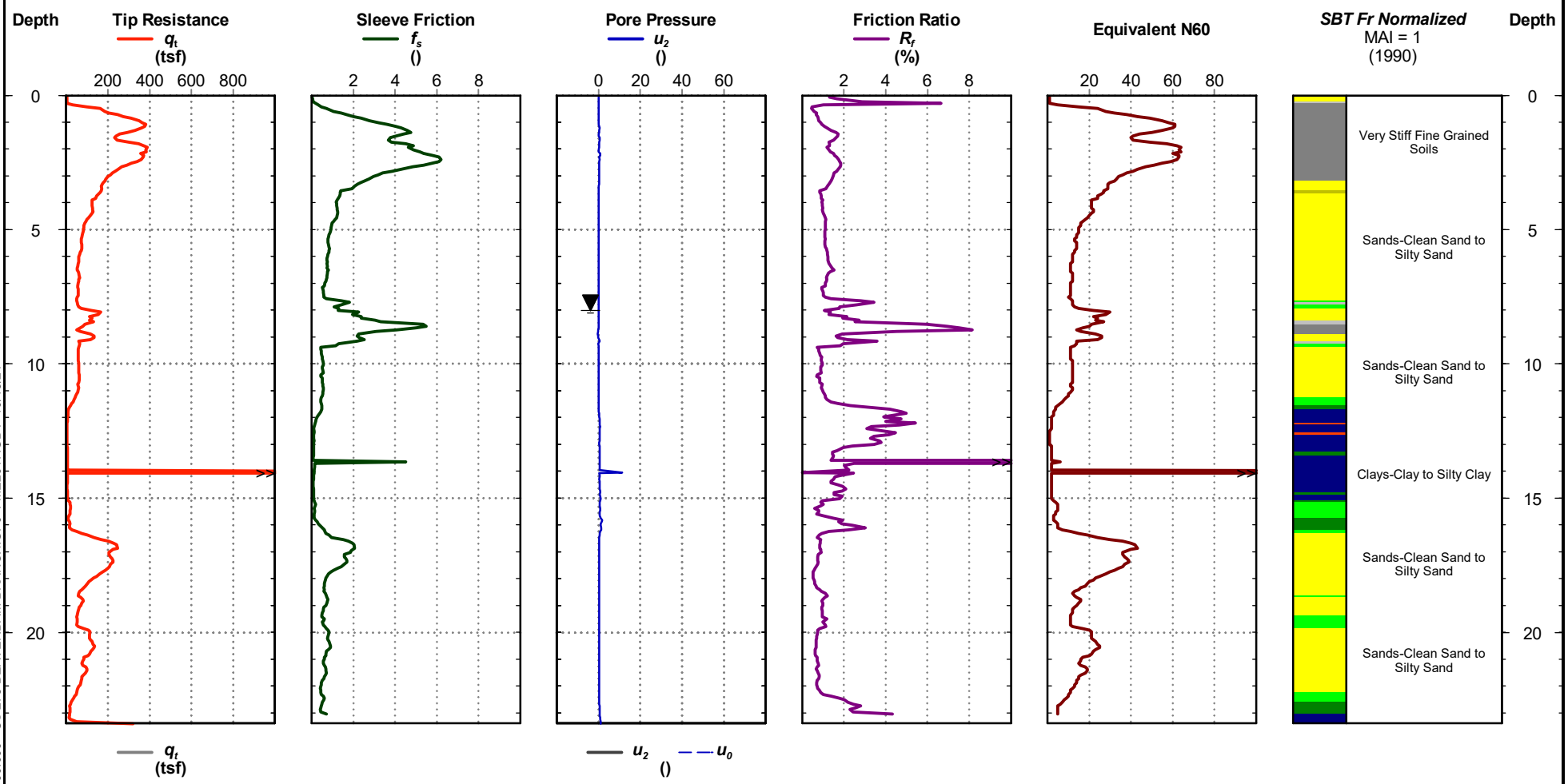
Project Number :P043789

CPT-2

Date: Oct. 14, 2024
Estimated Water Depth: 8 ft
Rig/Operator: G. Cantele

Station:
Offset:
Elevation: ft-MSL

Total Depth: 23.4 ft
Termination Criteria: Maximum Reaction Force
CPT Probe ID: DDG1329



CPT-2

US 278 Grays Highway Emergency Repairs
Jasper County (South Carolina)

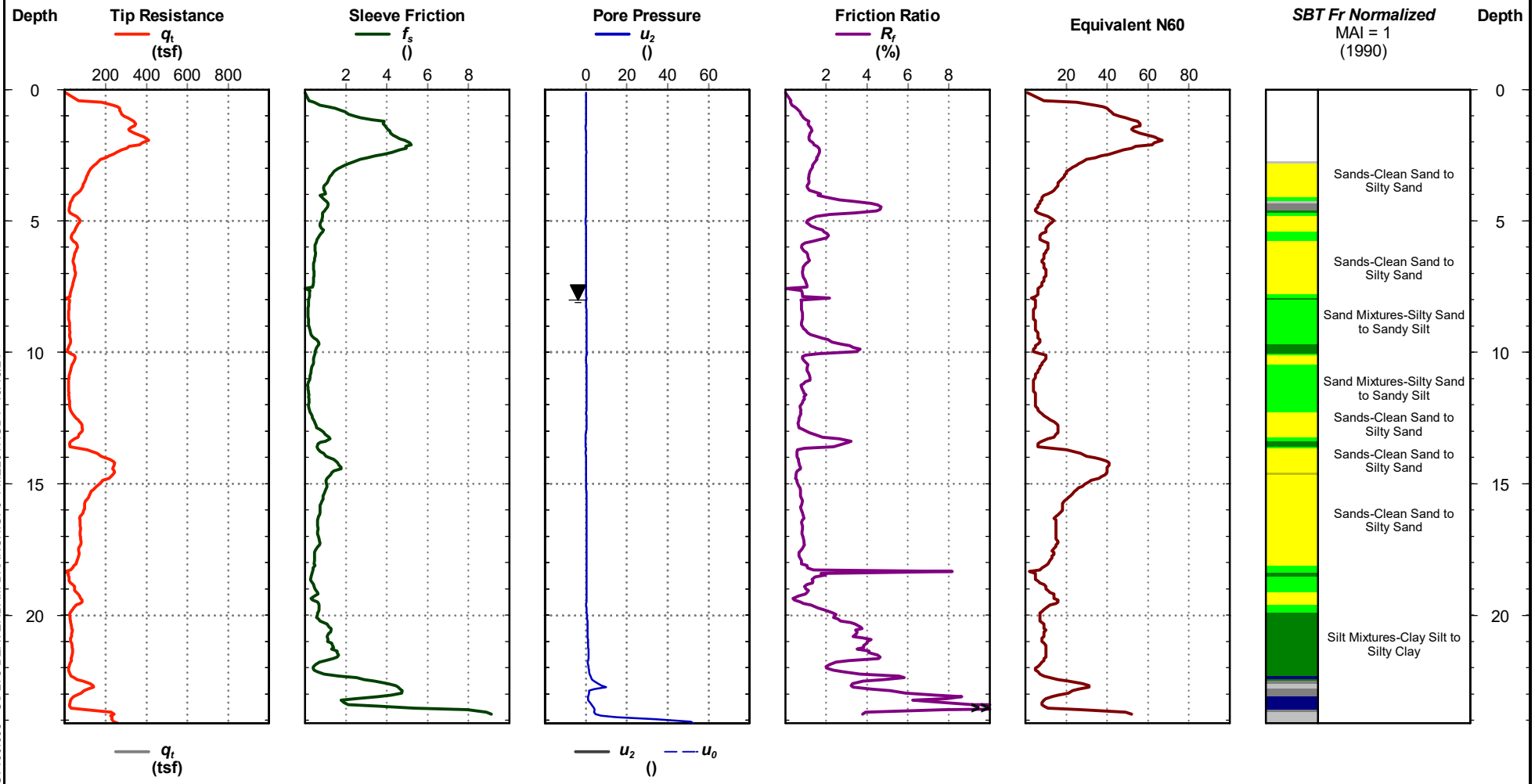
Project Number :P043789

CPT-3

Date: Oct. 14, 2024
Estimated Water Depth: 8 ft
Rig/Operator: G. Cantele

Station:
Offset:
Elevation: ft-MSL

Total Depth: 24.1 ft
Termination Criteria: Maximum Reaction Force
CPT Probe ID: DDG1329



CPT-3

US 278 Grays Highway Emergency Repairs
Jasper County (South Carolina)

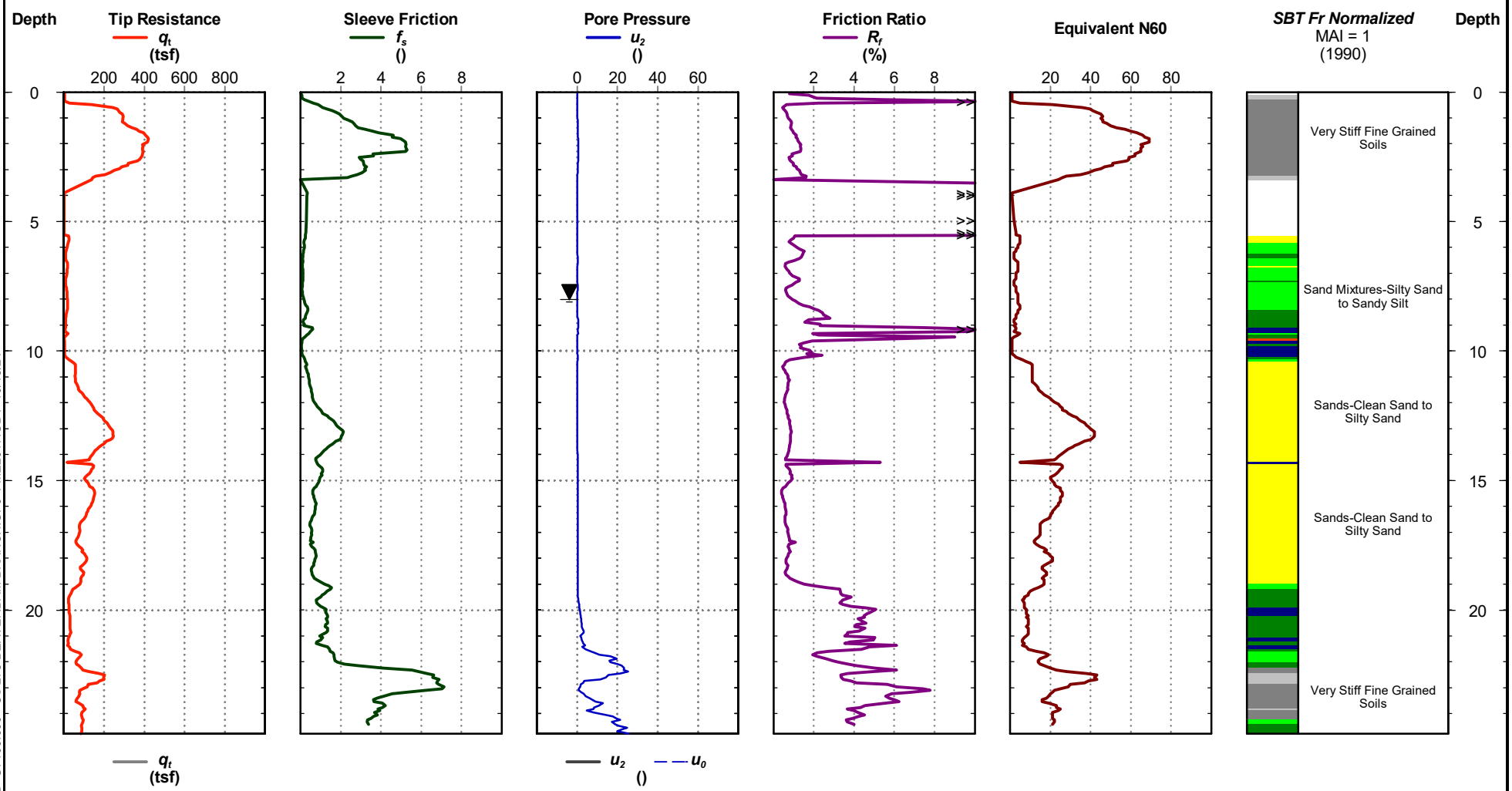
Project Number :P043789

CPT-4

Date: Oct. 14, 2024
Estimated Water Depth: 8 ft
Rig/Operator: G. Cantele

Station:
Offset:
Elevation: ft-MSL

Total Depth: 24.8 ft
Termination Criteria: Maximum Reaction Force
CPT Probe ID: DDG1329



CPT REPORT - STANDARD G7100.006 - US 278 BEAVERDAM BRANCH.GPJ FME2017.GDT 10/15/24

CPT-4

APPENDIX

SECTION 4 DOWNHOLE SHEAR WAVE VELOCITY TESTING (DHT)

October 29, 2024

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

Re: Downhole Seismic Test Report
US 278 Grays Highway Emergency Repairs
Jasper County, South Carolina
SCDOT Project ID: P043789
FME Project No.: G7100.006

Mr. Harris:

A Downhole Seismic Test, designated as Borehole B-1/DHT, was conducted at US 278 Grays Highway Emergency Repairs on October 22,2024 to determine shear-wave velocities at 2.5-foot intervals for the proposed bridge project. This report summarizes the downhole testing method and presents the shear-wave and compression-wave velocity results.

The boring was cased with a two-inch PVC pipe and grouted in the annulus between the casing and the borehole wall, the deepest depth reading for the downhole test was at 112.5 ft. The grout setup a minimum of 72 hours before testing. Water was pumped from the downhole pipe prior to testing.

Seismic data for the downhole testing was collected by recording seismic shear-waves and compression waves with a Geometrics Geode seismograph paired with a GeoStuff triaxial BHG-3 geophone. Seismic waves were generated by using a sixteen-pound sledgehammer to horizontally strike both ends of a 7-foot-long wood beam with steel plates attached to the ends. Compression waves were generated by striking an aluminum plate on the ground surface with the sledgehammer. Seismic data was recorded starting at the bottom of the borehole and continued at 2.5-foot intervals from 112.5 ft.

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

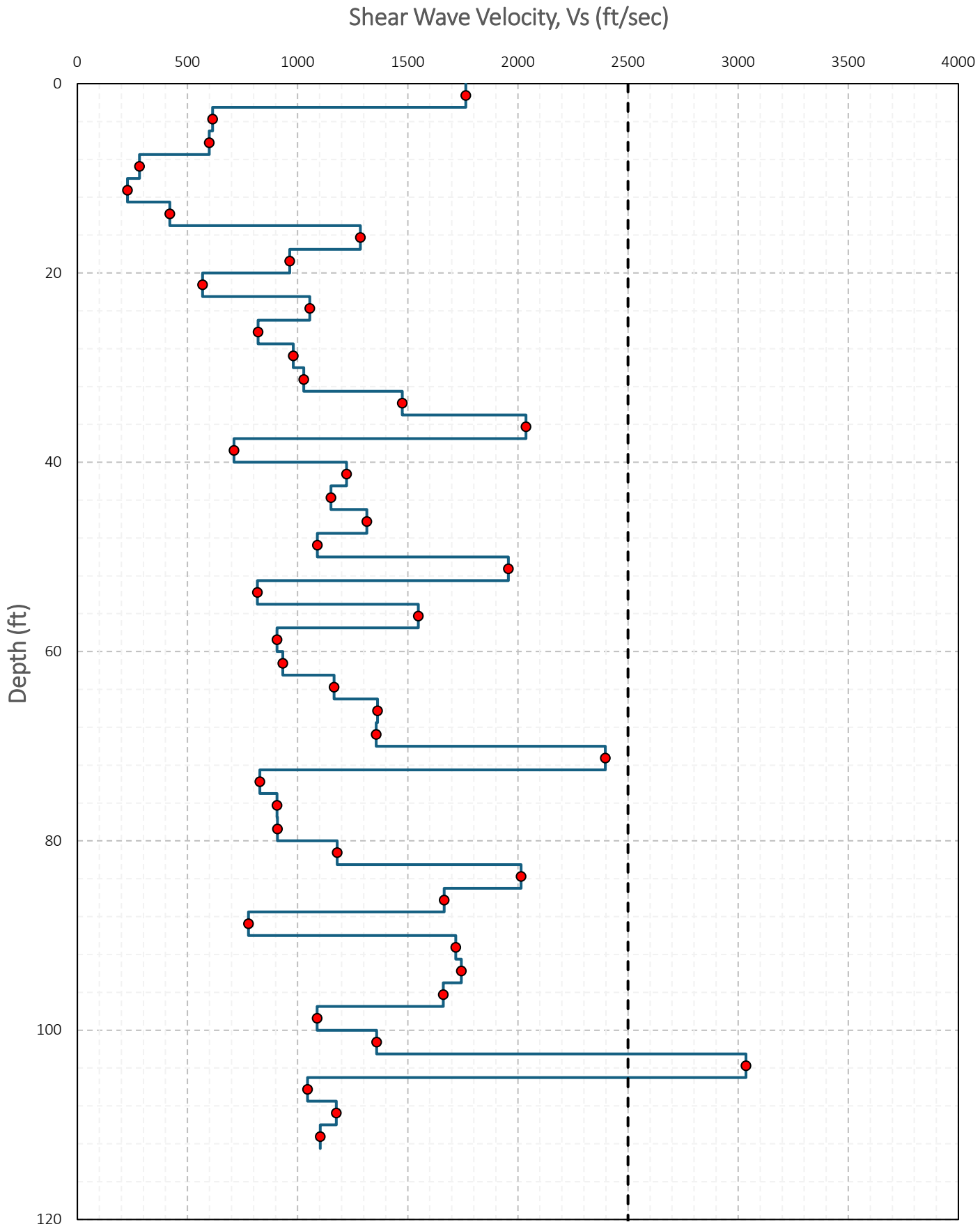
The results from the downhole seismic test are a V_s112.5 value of 835 ft/sec and a V_p112.5 value of 3,187 ft/sec. This downhole seismic test was conducted at one location at the test site, the attached seismic velocity models may not be representative of subsurface conditions across the entire project area.

Regards,

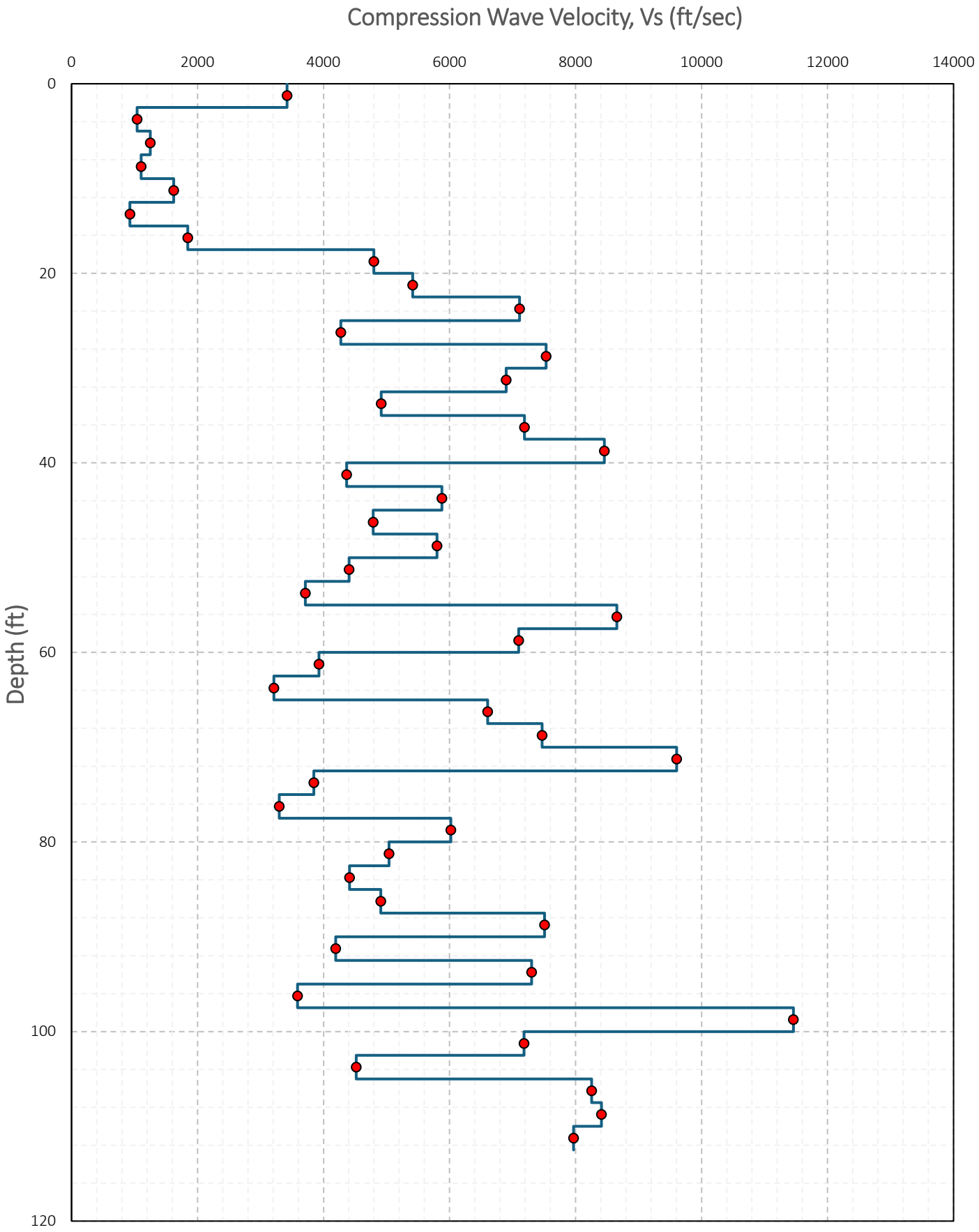
Craig Piercy, P.G.
Senior Geologist

US 278 Grays Highway Emergency Repairs B-1/DHT			
Compression (P) Wave Velocity		**Shear (S) Wave Velocity**	
Depth(ft)	**Interval velocity(ft/sec)**	**Depth(ft)**	**Interval velocity(ft/sec)**
0.0	--	0.0	--
2.5	3,421	2.5	1,763
5.0	1,042	5.0	614
7.5	1,251	7.5	598
10.0	1,104	10.0	283
12.5	1,621	12.5	228
15.0	926	15.0	420
17.5	1,844	17.5	1,285
20.0	4,798	20.0	964
22.5	5,416	22.5	569
25.0	7,111	25.0	1,055
27.5	4,273	27.5	821
30.0	7,533	30.0	980
32.5	6,898	32.5	1,028
35.0	4,916	35.0	1,476
37.5	7,189	37.5	2,037
40.0	8,459	40.0	711
42.5	4,367	42.5	1,222
45.0	5,880	45.0	1,151
47.5	4,787	47.5	1,314
50.0	5,802	50.0	1,089
52.5	4,406	52.5	1,957
55.0	3,710	55.0	817
57.5	8,654	57.5	1,548
60.0	7,098	60.0	907
62.5	3,928	62.5	933
65.0	3,211	65.0	1,166
67.5	6,605	67.5	1,362
70.0	7,468	70.0	1,357
72.5	9,603	72.5	2,397
75.0	3,847	75.0	829
77.5	3,296	77.5	907
80.0	6,022	80.0	909
82.5	5,039	82.5	1,179
85.0	4,412	85.0	2,014
87.5	4,909	87.5	1,665
90.0	7,509	90.0	777
92.5	4,192	92.5	1,718
95.0	7,303	95.0	1,743
97.5	3,586	97.5	1,662
100.0	11,459	100.0	1,088
102.5	7,183	102.5	1,359
105.0	4,520	105.0	3,036
107.5	8,254	107.5	1,045
110.0	8,412	110.0	1,176
112.5	7,968	112.5	1,102
V_p112.5 =3,187 ft/sec		V_s112.5=835 ft/sec	

Project: US 278 Grays Highway Emergency Repairs
Date: October 23, 2024
Analysis: Downhole Geophysical Test Results in Soil Boring B-1



Project: US 278 Grays Highway Emergency Repairs
Date: October 23, 2024
Analysis: Downhole Geophysical Test Results in Soil Boring B-1



APPENDIX

SECTION 5 LABORATORY TEST RESULTS

APPENDIX

SECTION 5 LABORATORY TEST RESULTS

SECTION 5A SPLIT SPOON SAMPLES (SS)

SUMMARY OF LABORATORY RESULTS

PROJECT ID P043789 **PROJECT NAME** US 278 Grays Highway Emergency Repairs

PROJECT COUNTY Jasper

Borehole	Depth	Liquid Limit	Plastic Limit	Plasticity Index	Maximum Size (mm)	%<#200 Sieve	Class-ification	Water Content (%)	Dry Density (pcf)	Satur-ation (%)	Void Ratio
B-1/DHT-1	8.0	NP	NP	NP	9.51	12	SM	11.8			
B-1/DHT-1	10.0	NP	NP	NP	4.76	10	SP-SM	22.1			
B-1/DHT-1	20.0	NP	NP	NP	4.76	6	SP-SM	24.4			
B-1/DHT-1	30.0	36	23	13	4.76	16	SC	36.0			
B-1/DHT-1	45.0	54	23	31	4.76	42	SC	42.8			
B-1/DHT-1	80.0	43	25	18	4.76	41	SC	44.8			
B-1/DHT-1	105.0	NP	NP	NP	19	13	SM	26.3			
B-2	8.0	NP	NP	NP	19	10	SP-SM	20.7			
B-2	10.0	NP	NP	NP	4.76	11	SP-SM	19.6			
B-2	12.0	NP	NP	NP	4.76	17	SM	22.4			
B-2	20.0	NP	NP	NP	9.51	5	SP-SM	19.9			
B-2	22.0	36	21	15	9.51	32	SC	30.3			
B-2	40.0	107	43	64	2	86	CH	74.4			
B-2	55.0	65	26	39	4.76	28	SC	46.1			
B-2	80.0	41	15	26	4.76	38	SC	43.6			
B-2	100.0	NP	NP	NP	19	14	SM	27.9			
R-1	8.0	NP	NP	NP	19	10	SP-SM	24.7			
R-1	15.0	NP	NP	NP	9.51	33	SM	50.9			
R-1	20.0	36	21	15	9.51	19	SC	47.1			
R-1	45.0	129	49	80	4.76	81	CH	67.5			
R-2	10.0	NP	NP	NP	9.51	23	SM	25.4			
R-2	20.0	52	20	32	4.76	18	SC	36.7			
R-2	30.0	47	23	24	4.76	29	SC	34.0			
R-2	55.0	60	23	37	9.51	30	SC	49.2			

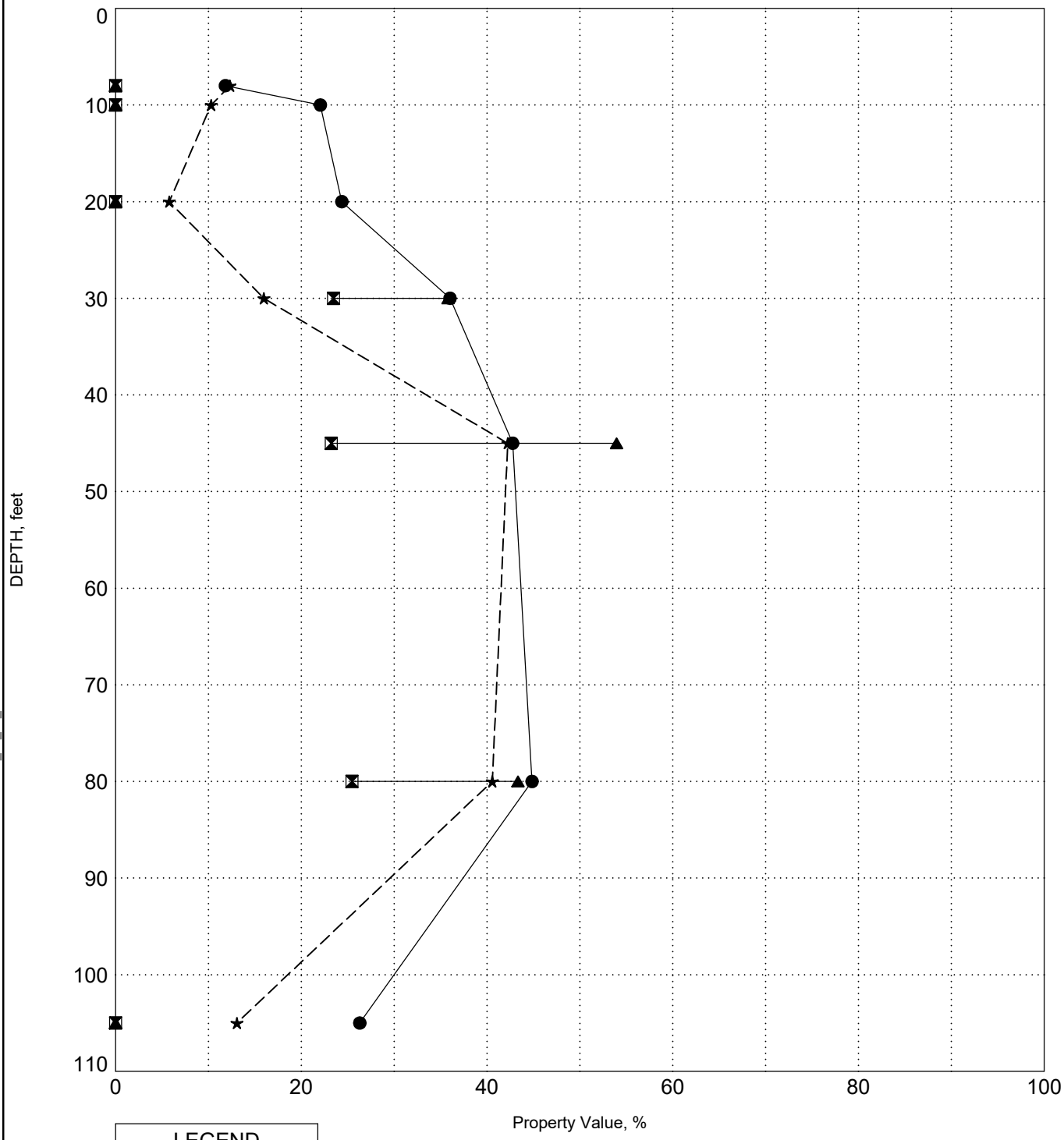
INDEX PROPERTIES VERSUS DEPTH

PROJECT ID P043789 **PROJECT NAME** US 278 Grays Highway Emergency Repairs

PROJECT COUNTY Jasper

BORING B-1/DHT-1

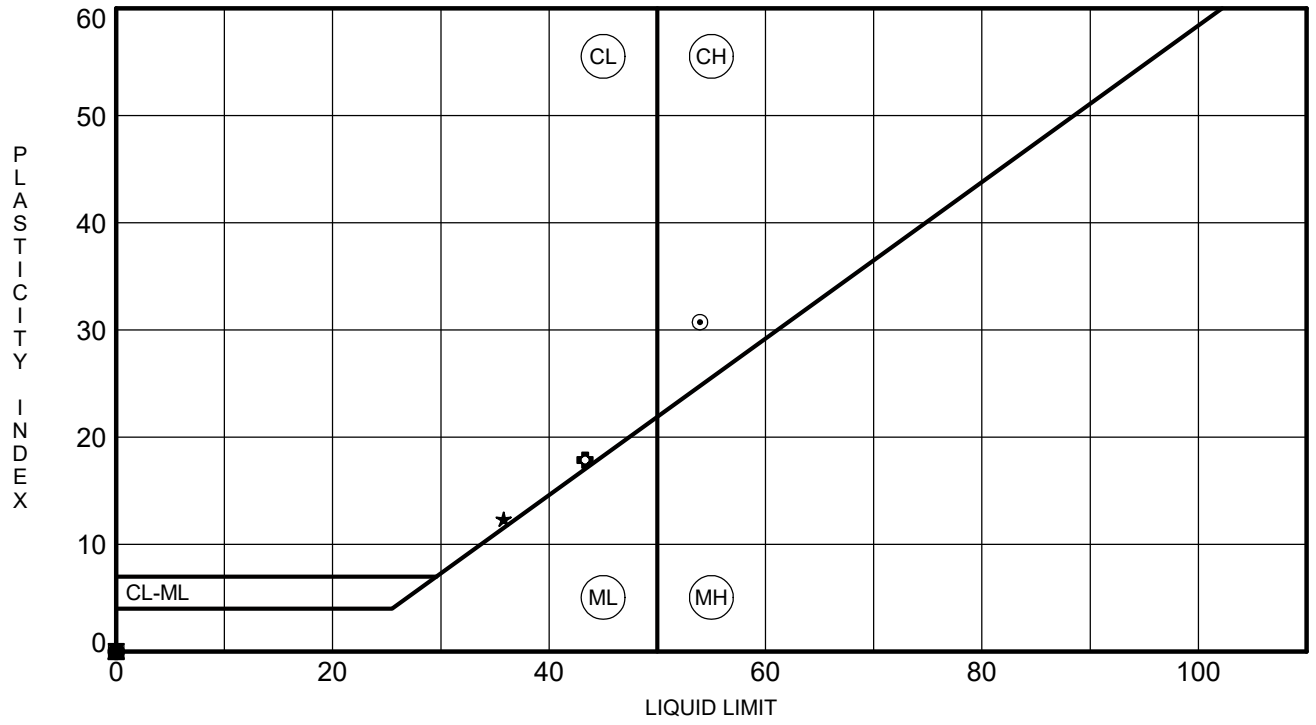
SURFACE ELEVATION: 52.2



ATTERBERG LIMITS' RESULTS

PROJECT ID P043789 **PROJECT NAME** US 278 Grays Highway Emergency Repairs

PROJECT COUNTY Jasper

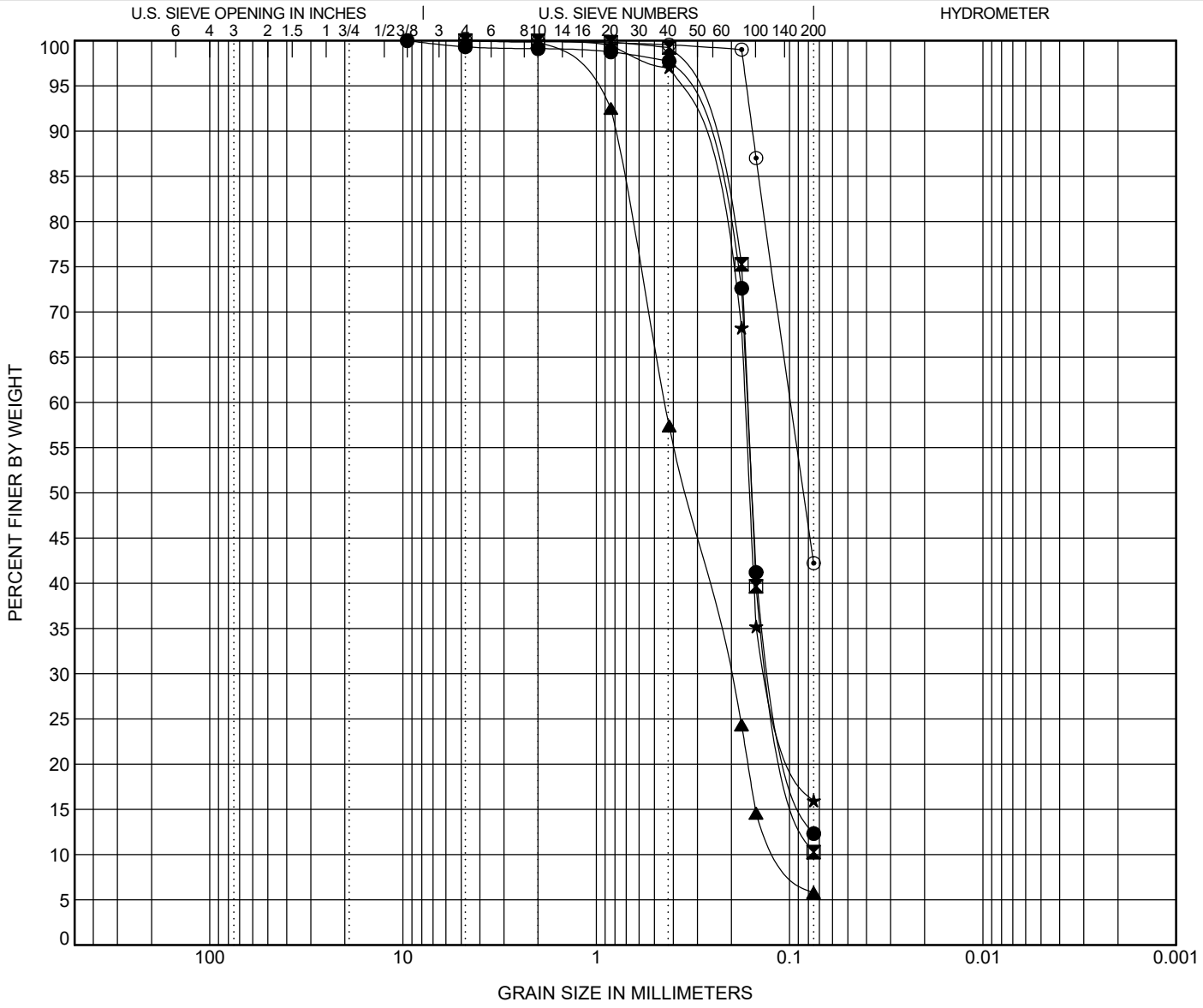


	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	B-1/DHT-1	8.0	NP	NP	NP	12	SILTY SAND (SM/A-2-4)
⊠	B-1/DHT-1	10.0	NP	NP	NP	10	POORLY GRADED SAND with SILT (SP-SM/A-3)
▲	B-1/DHT-1	20.0	NP	NP	NP	6	POORLY GRADED SAND with SILT (SP-SM/A-3)
★	B-1/DHT-1	30.0	36	23	13	16	CLAYEY SAND (SC/A-2-6)
⊙	B-1/DHT-1	45.0	54	23	31	42	CLAYEY SAND (SC/A-7-6)
✿	B-1/DHT-1	80.0	43	25	18	41	CLAYEY SAND (SC/A-7-6)
○	B-1/DHT-1	105.0	NP	NP	NP	13	SILTY SAND with GRAVEL (SM/A-1-b)

GRAIN SIZE DISTRIBUTION

PROJECT ID P043789 **PROJECT NAME** US 278 Grays Highway Emergency Repairs

PROJECT COUNTY Jasper



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

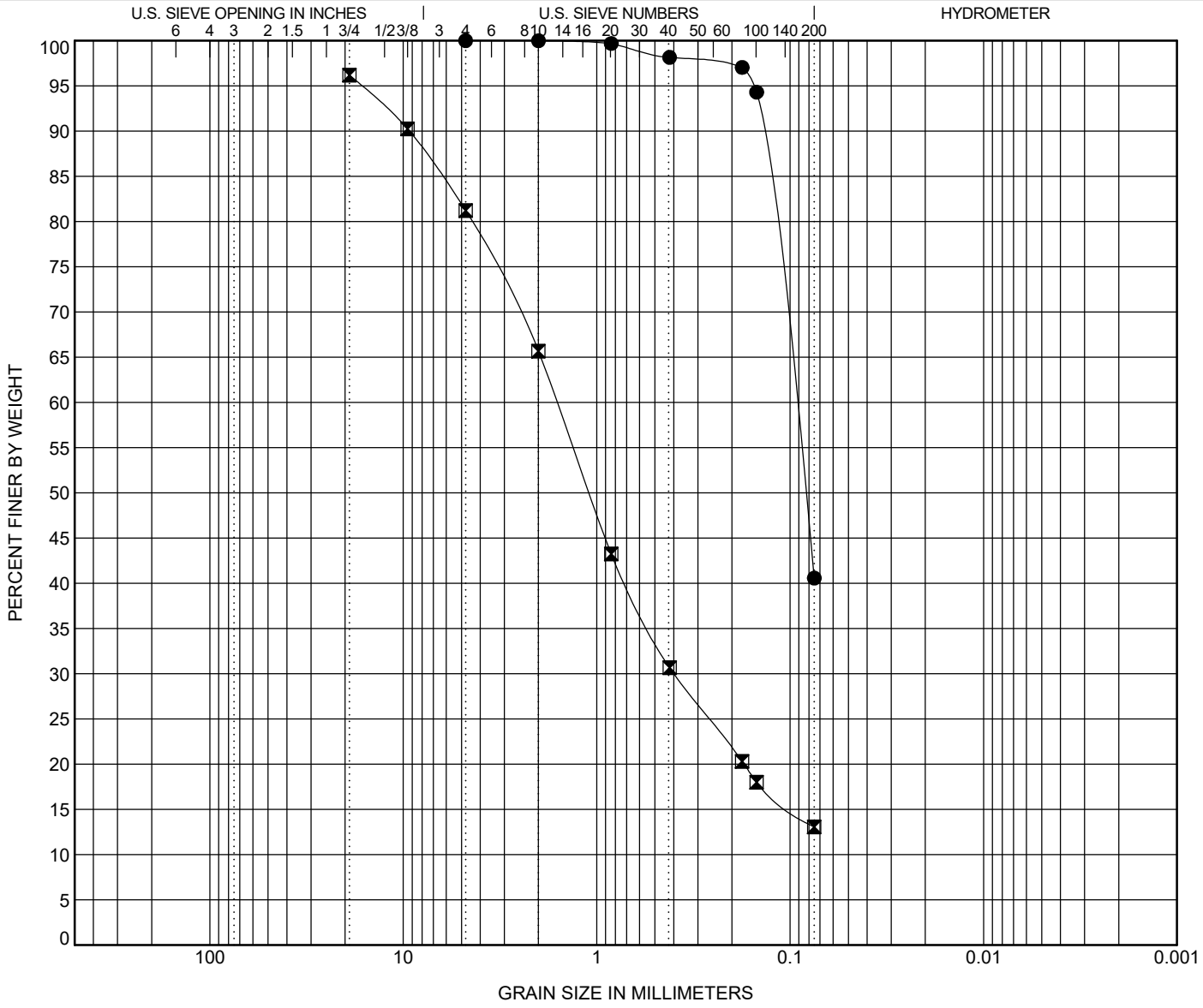
	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	B-1/DHT-1	8.0	SILTY SAND (SM/A-2-4)	NP	NP	NP	1.11	2.33
⊠	B-1/DHT-1	10.0	POORLY GRADED SAND with SILT (SP-SM/A-3)	NP	NP	NP	1.15	2.21
▲	B-1/DHT-1	20.0	POORLY GRADED SAND with SILT (SP-SM/A-3)	NP	NP	NP	0.91	4.24
★	B-1/DHT-1	30.0	CLAYEY SAND (SC/A-2-6)	36	23	13		
⊙	B-1/DHT-1	45.0	CLAYEY SAND (SC/A-7-6)	54	23	31		

	BOREHOLE	DEPTH	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	B-1/DHT-1	8.0	9.51	0.165	0.114		0.7	87.0	12.3	
⊠	B-1/DHT-1	10.0	4.76	0.164	0.119		0.0	89.7	10.3	
▲	B-1/DHT-1	20.0	4.76	0.442	0.205	0.104	0.0	94.2	5.8	
★	B-1/DHT-1	30.0	4.76	0.17	0.124		0.0	84.0	16.0	
⊙	B-1/DHT-1	45.0	4.76	0.098			0.0	57.8	42.2	

GRAIN SIZE DISTRIBUTION

PROJECT ID P043789 **PROJECT NAME** US 278 Grays Highway Emergency Repairs

PROJECT COUNTY Jasper



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**B-1/DHT-1**	**80.0**	**CLAYEY SAND (SC/A-7-6)**	**43**	**25**	**18**		
⊠	**B-1/DHT-1**	**105.0**	**SILTY SAND with GRAVEL (SM/A-1-b)**	**NP**	**NP**	**NP**		

	BOREHOLE	DEPTH	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**B-1/DHT-1**	**80.0**	**4.76**	**0.096**			**0.0**	**59.4**	**40.6**	
⊠	**B-1/DHT-1**	**105.0**	**19**	**1.607**	**0.397**		**15.0**	**68.1**	**13.1**	

REV 04/2024

F&ME CONSULTANTS, INC.

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	US 278 Grays Highway Emergency Repairs	**SCDOT PROJECT No.:**	P043789
SAMPLE NUMBER:	24-3758	**DATE SAMPLE RECEIVED:**	10/16/2024
DESCRIPTION OF SOIL:	VARIOUS		
TESTED BY:	LiAnn Johnson & Tyler Ennis	**DATE SETUP:**	10/22/2024
WEIGHED BY:	Ashley Burgess	**DATE OF WEIGHING:**	10/23/2024

BORING NO.	B-1/DHT-1	B-1/DHT-1	B-1/DHT-1	B-1/DHT-1	B-1/DHT-1
SAMPLE NO.	SS-4	SS-5	SS-7	SS-9	SS-12
SAMPLE DEPTH (FT.)	6.0 - 8.0	8.0 - 10.0	18.5 - 20.0	28.5 - 30.0	43.5 - 45.0
WATER CONTENT, W%	11.8	22.1	24.4	36.0	42.8

BORING NO.	B-1/DHT-1	B-1/DHT-1			
SAMPLE NO.	SS-19	SS-24			
SAMPLE DEPTH (FT.)	78.5 - 80.0	103.5 - 105.0			
WATER CONTENT, W%	44.9	26.3			

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH (FT.)					
WATER CONTENT, W%					

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH (FT.)					
WATER CONTENT, W%					

211 Business Park Blvd., SC 29203

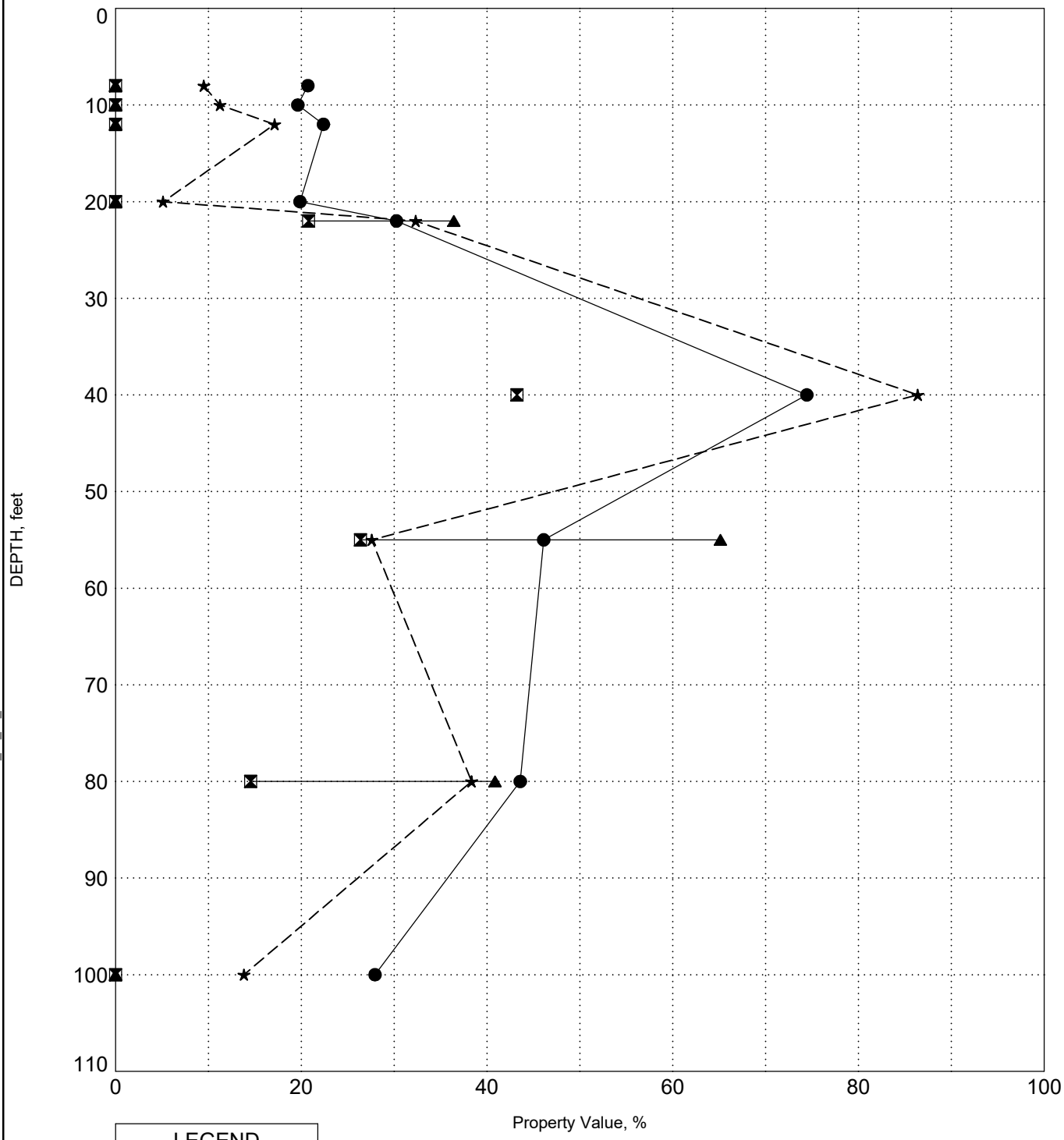
INDEX PROPERTIES VERSUS DEPTH

PROJECT ID P043789 **PROJECT NAME** US 278 Grays Highway Emergency Repairs

PROJECT COUNTY Jasper

BORING B-2

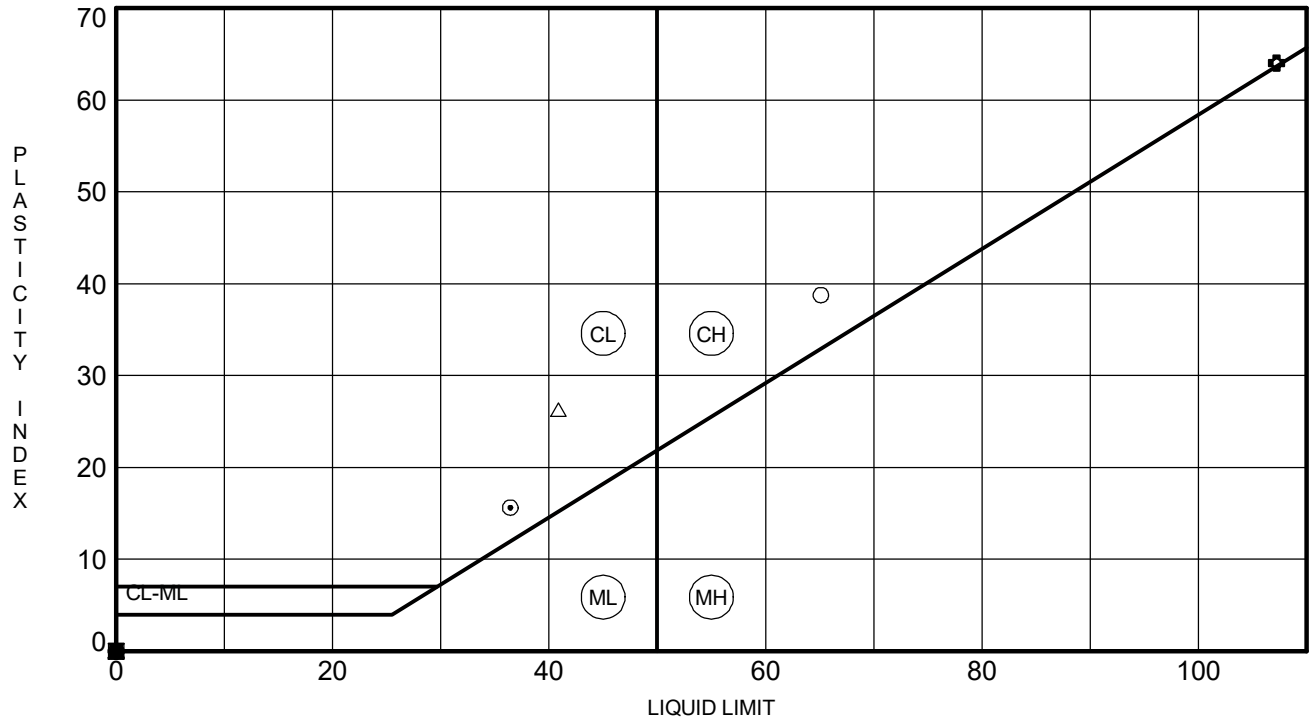
SURFACE ELEVATION: 49.5



ATTERBERG LIMITS' RESULTS

PROJECT ID P043789 **PROJECT NAME** US 278 Grays Highway Emergency Repairs

PROJECT COUNTY Jasper

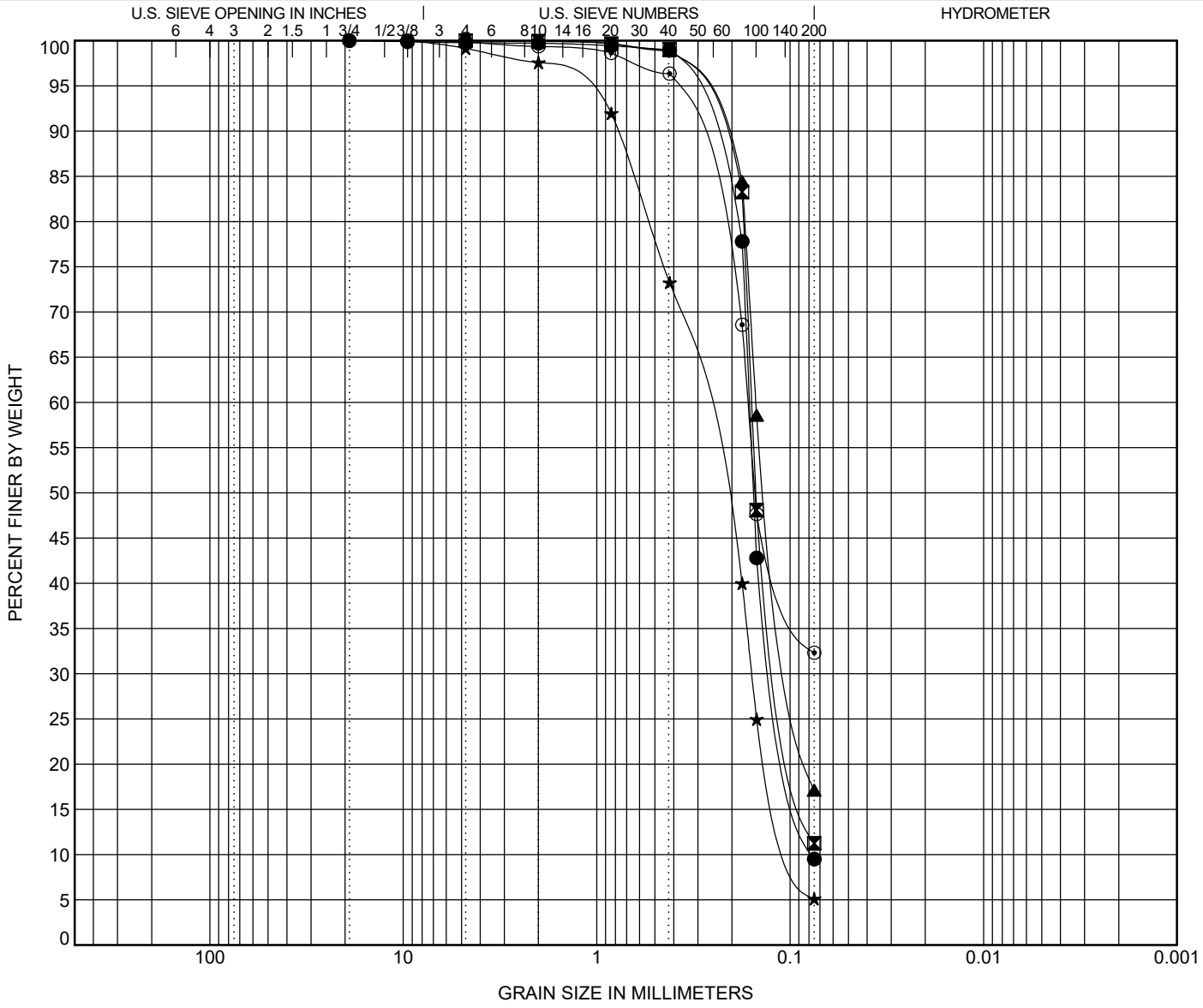


	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	B-2	8.0	NP	NP	NP	10	POORLY GRADED SAND with SILT (SP-SM/A-3)
⊠	B-2	10.0	NP	NP	NP	11	POORLY GRADED SAND with SILT (SP-SM/A-2-4)
▲	B-2	12.0	NP	NP	NP	17	SILTY SAND (SM/A-2-4)
★	B-2	20.0	NP	NP	NP	5	POORLY GRADED SAND with SILT (SP-SM/A-3)
⊙	B-2	22.0	36	21	15	32	CLAYEY SAND (SC/A-2-6)
✿	B-2	40.0	107	43	64	86	FAT CLAY (CH/A-7-5)
○	B-2	55.0	65	26	39	28	CLAYEY SAND (SC/A-2-7)
△	B-2	80.0	41	15	26	38	CLAYEY SAND (SC/A-7-6)
⊗	B-2	100.0	NP	NP	NP	14	SILTY SAND with GRAVEL (SM/A-1-b)

GRAIN SIZE DISTRIBUTION

PROJECT ID P043789 **PROJECT NAME** US 278 Grays Highway Emergency Repairs

PROJECT COUNTY Jasper



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	B-2	8.0	POORLY GRADED SAND with SILT (SP-SM/A-3)	NP	NP	NP	1.07	2.14
⊠	B-2	10.0	POORLY GRADED SAND with SILT (SP-SM/A-2-4)	NP	NP	NP	0.98	2.16
▲	B-2	12.0	SILTY SAND (SM/A-2-4)	NP	NP	NP		
★	B-2	20.0	POORLY GRADED SAND with SILT (SP-SM/A-3)	NP	NP	NP	0.94	3.35
⊙	B-2	22.0	CLAYEY SAND (SC/A-2-6)	36	21	15		

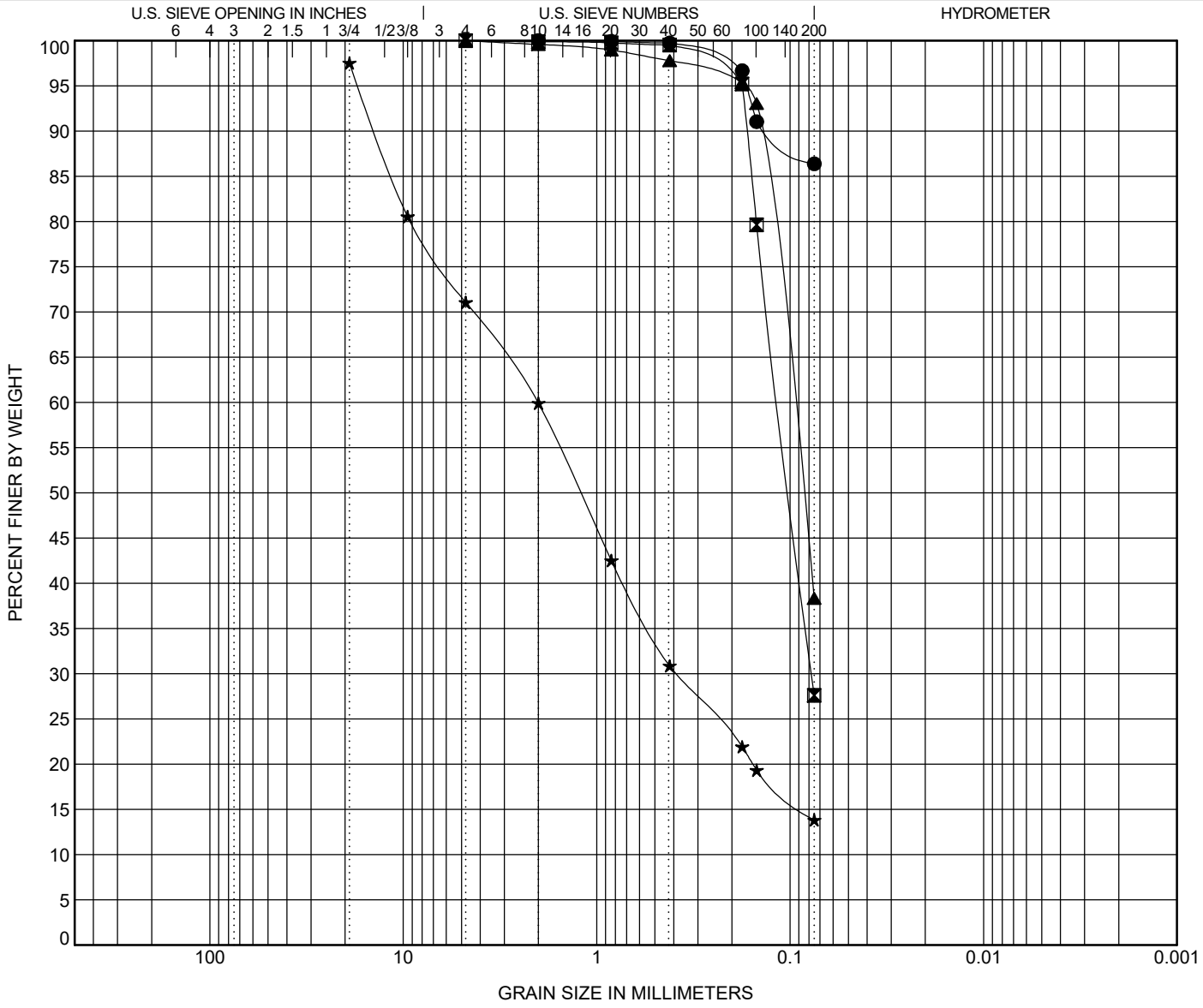
	BOREHOLE	DEPTH	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	B-2	8.0	19	0.162	0.114	0.076	0.2	90.3	9.5	
⊠	B-2	10.0	4.76	0.158	0.106		0.0	88.8	11.2	
▲	B-2	12.0	4.76	0.15	0.093		0.0	82.9	17.1	
★	B-2	20.0	9.51	0.298	0.158	0.089	0.9	94.0	5.1	
⊙	B-2	22.0	9.51	0.165			0.1	67.5	32.3	

GRAIN SIZE G7100.006 - US 278 BEAVERDAM BRANCH.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/30/24

GRAIN SIZE DISTRIBUTION

PROJECT ID P043789 **PROJECT NAME** US 278 Grays Highway Emergency Repairs

PROJECT COUNTY Jasper



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**B-2**	**40.0**	**FAT CLAY (CH/A-7-5)**	**107**	**43**	**64**		
⊠	**B-2**	**55.0**	**CLAYEY SAND (SC/A-2-7)**	**65**	**26**	**39**		
▲	**B-2**	**80.0**	**CLAYEY SAND (SC/A-7-6)**	**41**	**15**	**26**		
★	**B-2**	**100.0**	**SILTY SAND with GRAVEL (SM/A-1-b)**	**NP**	**NP**	**NP**		

	BOREHOLE	DEPTH	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**B-2**	**40.0**	**2**				**0.0**	**13.6**	**86.4**	
⊠	**B-2**	**55.0**	**4.76**	**0.115**	**0.077**		**0.0**	**72.4**	**27.6**	
▲	**B-2**	**80.0**	**4.76**	**0.098**			**0.0**	**61.7**	**38.3**	
★	**B-2**	**100.0**	**19**	**2.014**	**0.386**		**26.5**	**57.2**	**13.8**	

REV 04/2024

F&ME CONSULTANTS, INC.

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	US 278 Grays Highway Emergency Repairs	**SCDOT PROJECT No.:**	P043789
SAMPLE NUMBER:	24-3759	**DATE SAMPLE RECEIVED:**	10/16/2024
DESCRIPTION OF SOIL:	VARIOUS		
TESTED BY:	LiAnn Johnson & Tyler Ennis	**DATE SETUP:**	10/22/2024
WEIGHED BY:	Ashley Burgess	**DATE OF WEIGHING:**	10/23/2024

BORING NO.	B-2	B-2	B-2	B-2	B-2
SAMPLE NO.	SS-4	SS-5	SS-6	SS-10	SS-11
SAMPLE DEPTH (FT.)	6.0 - 8.0	8.0 - 10.0	10.0 - 12.0	18.0 - 20.0	20.0 - 22.0
WATER CONTENT, W%	20.7	19.6	22.4	19.9	30.3

BORING NO.	B-2	B-2	B-2	B-2	
SAMPLE NO.	SS-20	SS-23	SS-28	SS-32	
SAMPLE DEPTH (FT.)	38.5 - 40.0	53.5 - 55.0	78.5 - 80.0	98.5 - 100.0	
WATER CONTENT, W%	74.4	46.1	43.6	27.9	

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH (FT.)					
WATER CONTENT, W%					

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH (FT.)					
WATER CONTENT, W%					

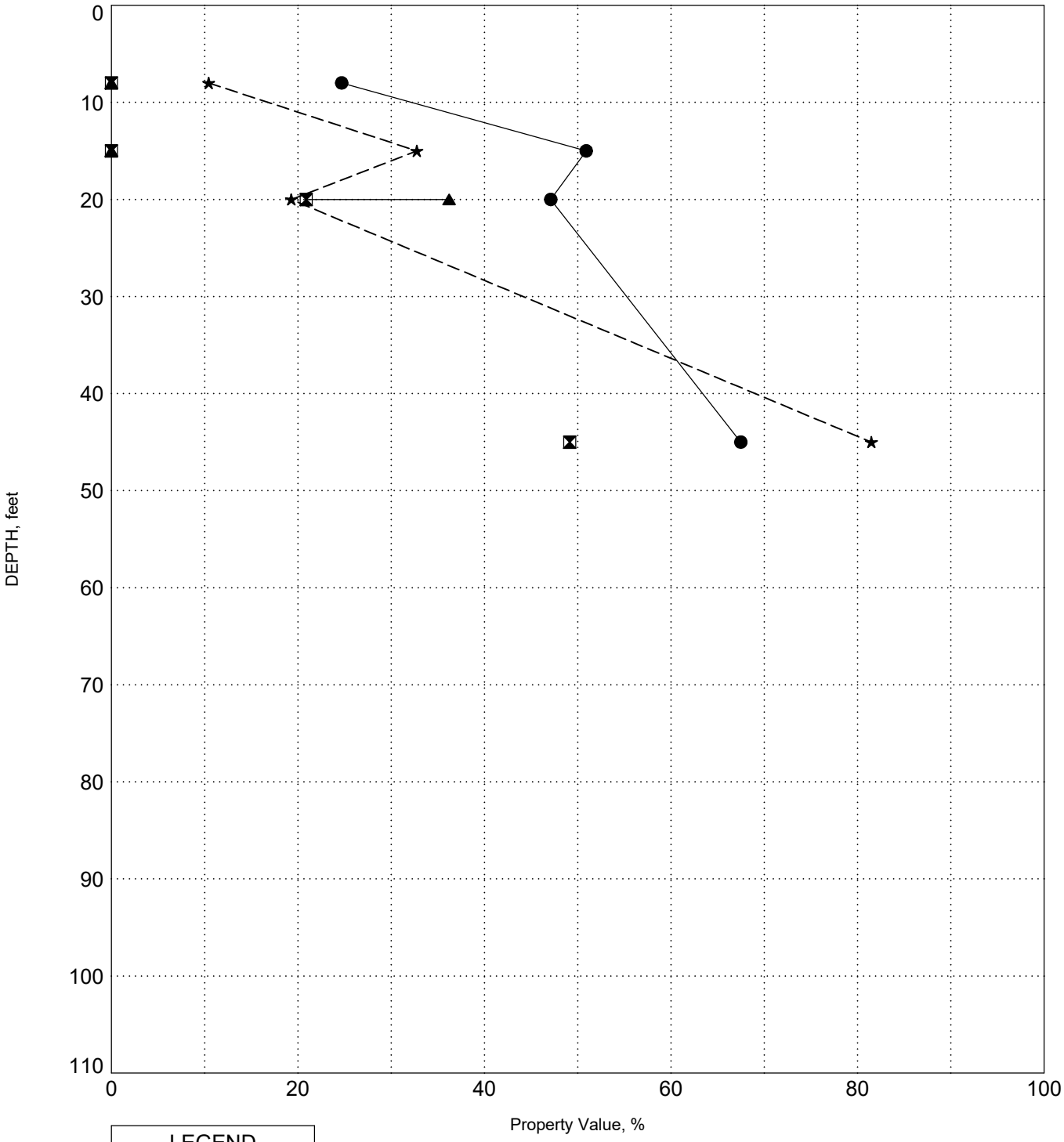
INDEX PROPERTIES VERSUS DEPTH

PROJECT ID P043789 **PROJECT NAME** US 278 Grays Highway Emergency Repairs

PROJECT COUNTY Jasper

BORING R-1

SURFACE ELEVATION: 54.9



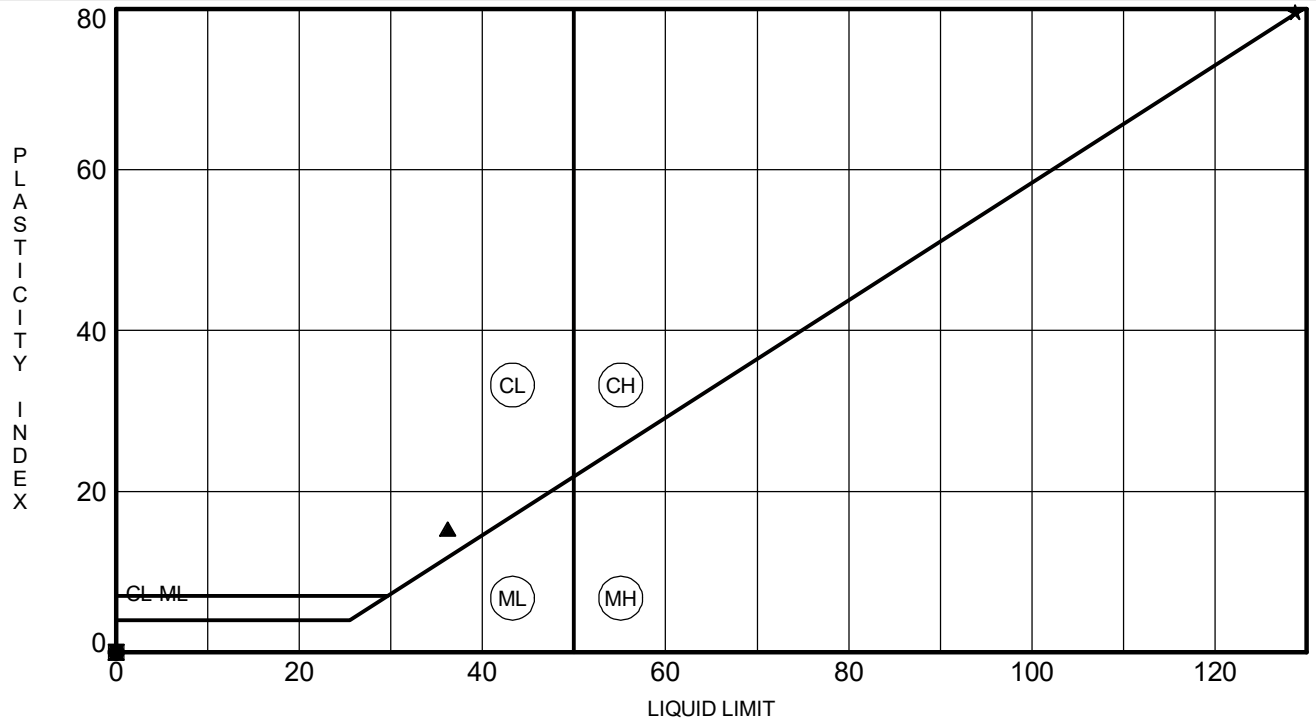
LEGEND
● Water Content
⊠ Plastic Limit
▲ Liquid Limit
★ Fines

INDEX PROPS G7100.006 - US 278 BEAVERDAM BRANCH.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/29/24

ATTERBERG LIMITS' RESULTS

PROJECT ID P043789 **PROJECT NAME** US 278 Grays Highway Emergency Repairs

PROJECT COUNTY Jasper



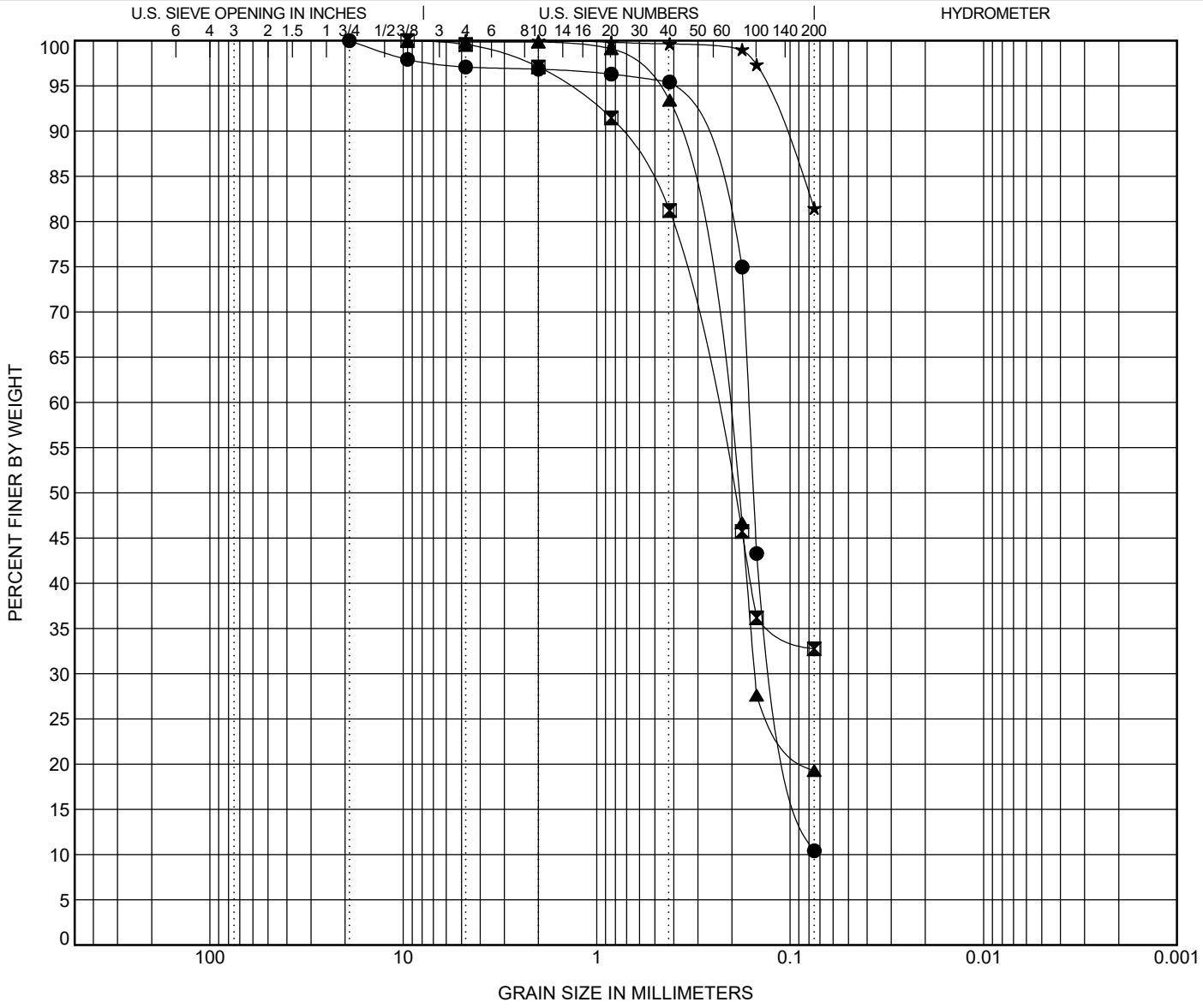
	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**R-1**	**8.0**	**NP**	**NP**	**NP**	**10**	**POORLY GRADED SAND with SILT (SP-SM/A-3)**
⊠	**R-1**	**15.0**	**NP**	**NP**	**NP**	**33**	**SILTY SAND (SM/A-2-4)**
▲	**R-1**	**20.0**	**36**	**21**	**15**	**19**	**CLAYEY SAND (SC/A-2-6)**
★	**R-1**	**45.0**	**129**	**49**	**80**	**81**	**FAT CLAY with SAND (CH/A-7-5)**

ATTERBERG LIMITS G7100.006 - US 278 BEAVERDAM BRANCH.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/30/24

GRAIN SIZE DISTRIBUTION

PROJECT ID P043789 **PROJECT NAME** US 278 Grays Highway Emergency Repairs

PROJECT COUNTY Jasper



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	R-1	8.0	POORLY GRADED SAND with SILT (SP-SM/A-3)	NP	NP	NP	1.05	2.19
⊠	R-1	15.0	SILTY SAND (SM/A-2-4)	NP	NP	NP		
▲	R-1	20.0	CLAYEY SAND (SC/A-2-6)	36	21	15		
★	R-1	45.0	FAT CLAY with SAND (CH/A-7-5)	129	49	80		

	BOREHOLE	DEPTH	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	R-1	8.0	19	0.163	0.113		2.9	86.7	10.4	
⊠	R-1	15.0	9.51	0.251			0.4	66.8	32.7	
▲	R-1	20.0	9.51	0.226	0.152		0.1	80.6	19.3	
★	R-1	45.0	4.76				0.0	18.5	81.5	

GRAIN SIZE G7100.006 - US 278 BEAVERDAM BRANCH.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/26/24

REV 04/2024

F&ME CONSULTANTS, INC.

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	US 278 Grays Highway Emergency Repairs	**SCDOT PROJECT No.:**	P043789
SAMPLE NUMBER:	24-3759	**DATE SAMPLE RECEIVED:**	10/16/2024
DESCRIPTION OF SOIL:	VARIOUS		
TESTED BY:	LiAnn Johnson & Tyler Ennis	**DATE SETUP:**	10/22/2024
WEIGHED BY:	Ashley Burgess	**DATE OF WEIGHING:**	10/23/2024

BORING NO.	R-1	R-1	R-1	R-1	
SAMPLE NO.	SS-4	SS-6	SS-7	SS-12	
SAMPLE DEPTH (FT.)	6.0 - 8.0	13.5 - 15.0	18.5 - 20.0	43.5 - 45.0	
WATER CONTENT, W%	24.7	50.9	47.1	67.5	

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH (FT.)					
WATER CONTENT, W%					

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH (FT.)					
WATER CONTENT, W%					

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH (FT.)					
WATER CONTENT, W%					

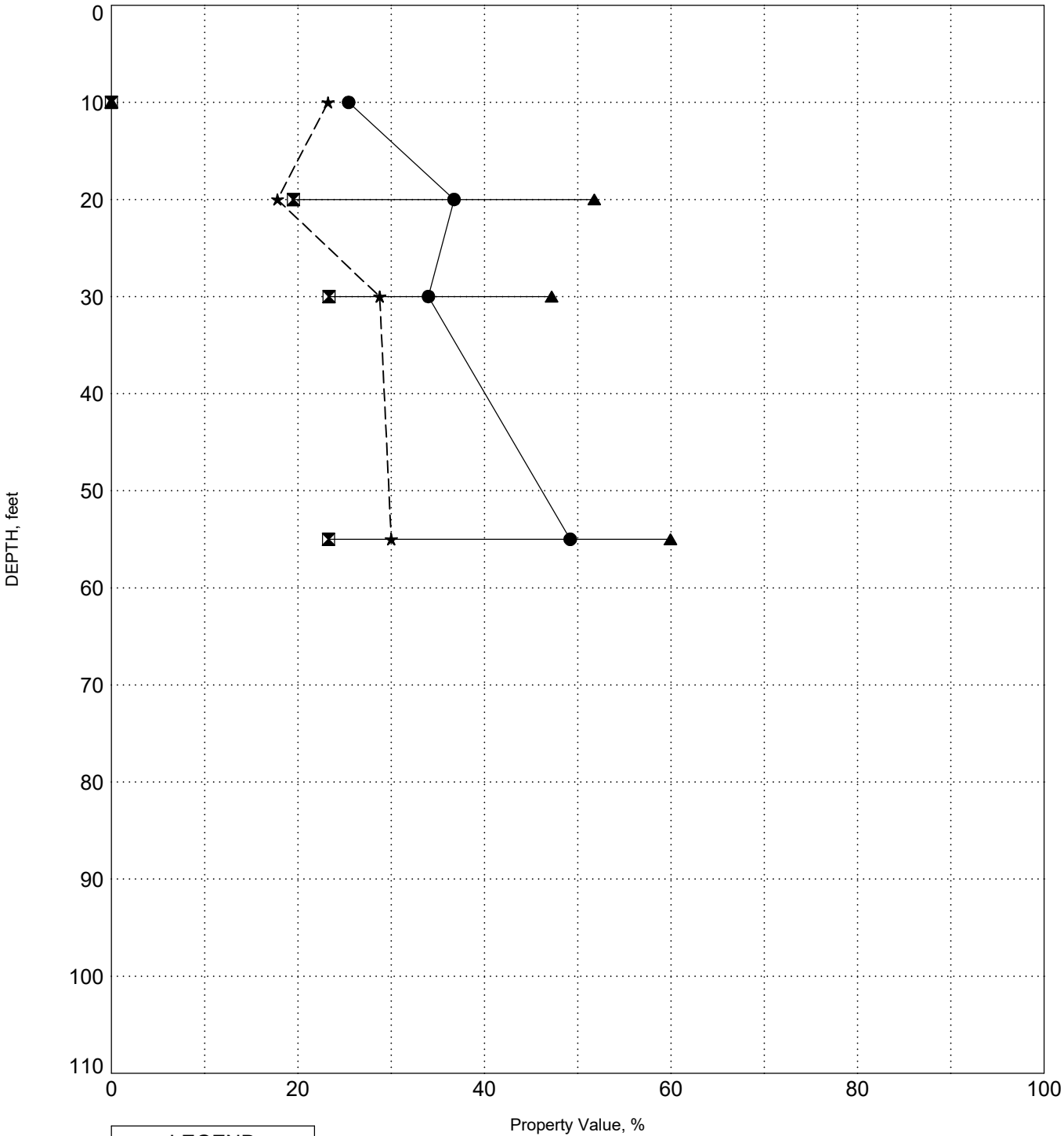
INDEX PROPERTIES VERSUS DEPTH

PROJECT ID P043789 **PROJECT NAME** US 278 Grays Highway Emergency Repairs

PROJECT COUNTY Jasper

BORING R-2

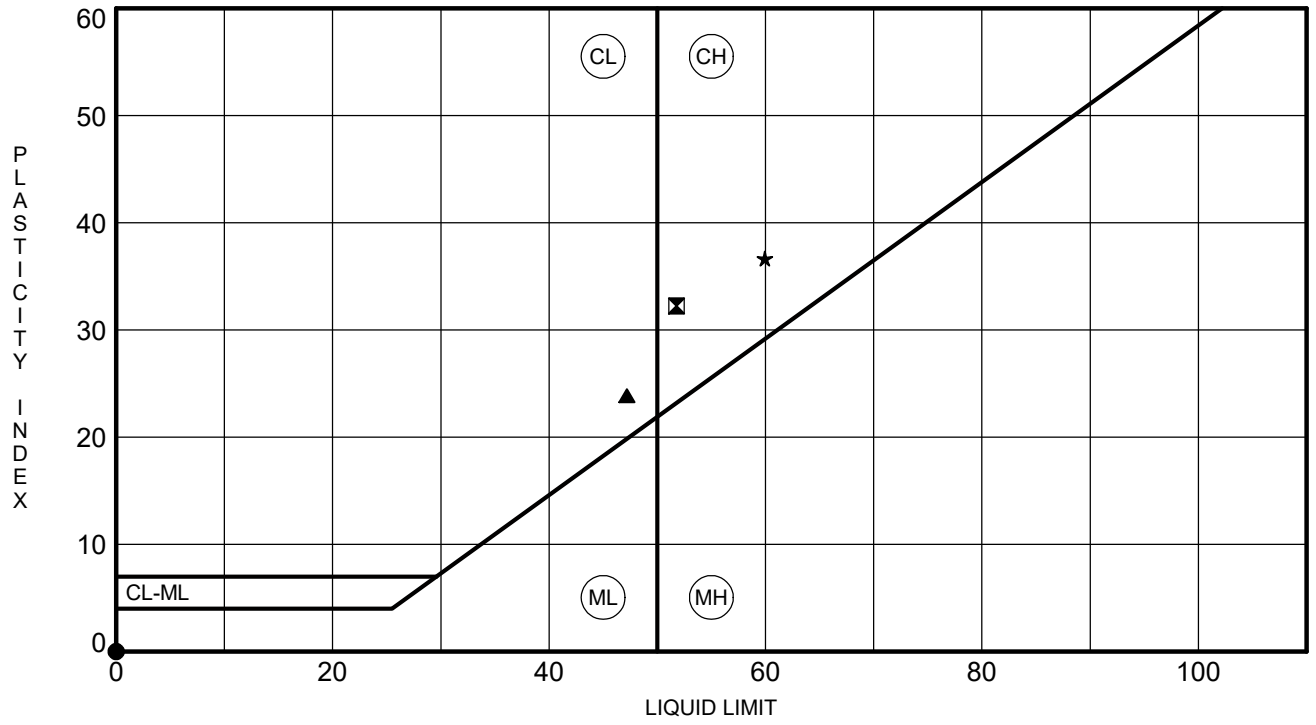
SURFACE ELEVATION: 49.4



ATTERBERG LIMITS' RESULTS

PROJECT ID P043789 **PROJECT NAME** US 278 Grays Highway Emergency Repairs

PROJECT COUNTY Jasper

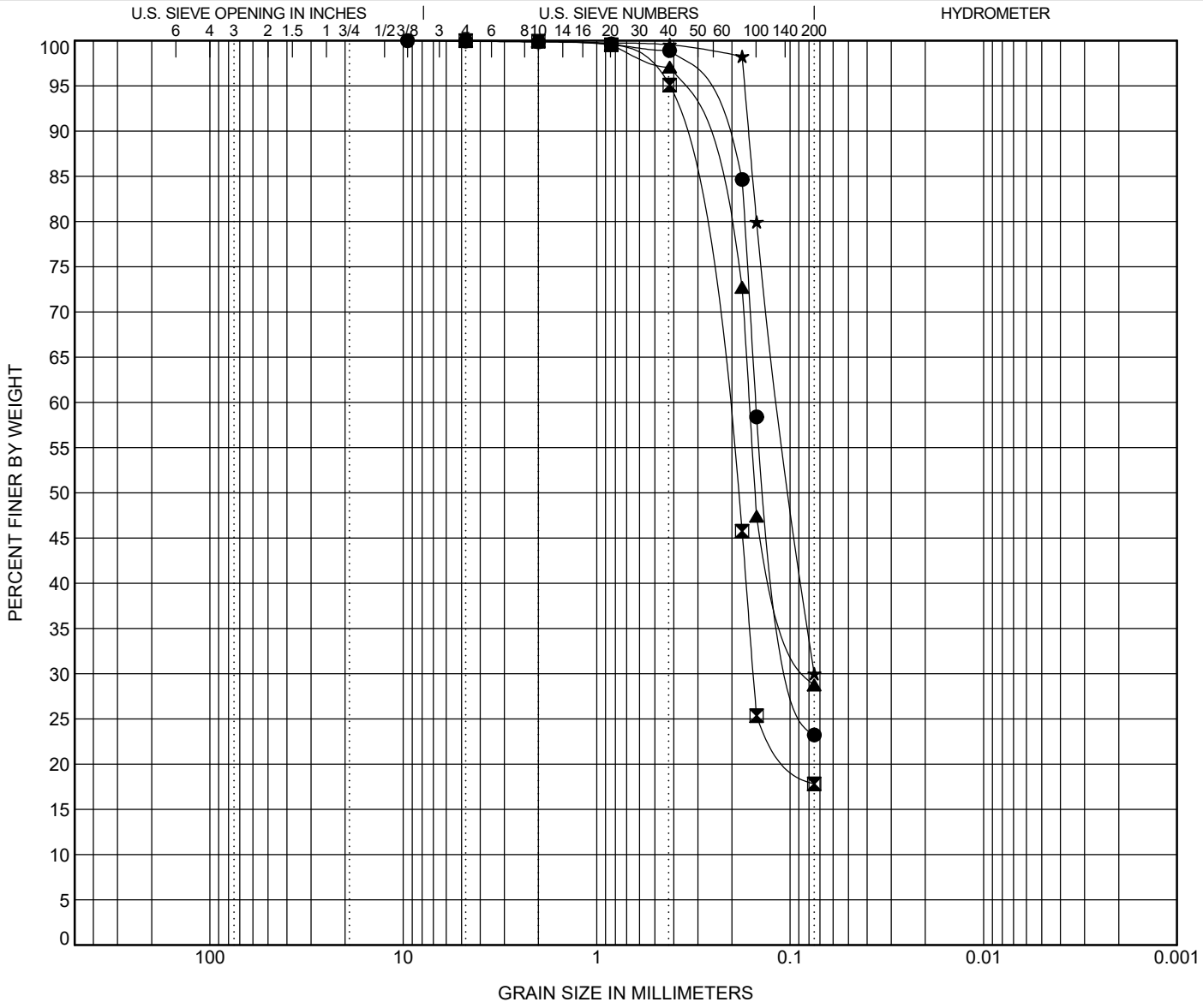


	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**R-2**	**10.0**	**NP**	**NP**	**NP**	**23**	**SILTY SAND (SM/A-2-4)**
⊠	**R-2**	**20.0**	**52**	**20**	**32**	**18**	**CLAYEY SAND (SC/A-2-7)**
▲	**R-2**	**30.0**	**47**	**23**	**24**	**29**	**CLAYEY SAND (SC/A-2-7)**
★	**R-2**	**55.0**	**60**	**23**	**37**	**30**	**CLAYEY SAND (SC/A-2-7)**

GRAIN SIZE DISTRIBUTION

PROJECT ID P043789 **PROJECT NAME** US 278 Grays Highway Emergency Repairs

PROJECT COUNTY Jasper



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
● R-2	10.0	SILTY SAND (SM/A-2-4)	NP	NP	NP		
⊠ R-2	20.0	CLAYEY SAND (SC/A-2-7)	52	20	32		
▲ R-2	30.0	CLAYEY SAND (SC/A-2-7)	47	23	24		
★ R-2	55.0	CLAYEY SAND (SC/A-2-7)	60	23	37		

BOREHOLE	DEPTH	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● R-2	10.0	9.51	0.151	0.086		0.1	76.7	23.2	
⊠ R-2	20.0	4.76	0.227	0.155		0.0	82.2	17.8	
▲ R-2	30.0	4.76	0.162	0.079		0.0	71.2	28.8	
★ R-2	55.0	9.51	0.113			0.1	69.9	30.0	

GRAIN SIZE G7100.006 - US 278 BEAVERDAM BRANCH.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/26/24

REV 04/2024

F&ME CONSULTANTS, INC.

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	US 278 Grays Highway Emergency Repairs	**SCDOT PROJECT No.:**	P043789
SAMPLE NUMBER:	24-3629	**DATE SAMPLE RECEIVED:**	10/16/2024
DESCRIPTION OF SOIL:	VARIOUS		
TESTED BY:	LiAnn Johnson & Tyler Ennis	**DATE SETUP:**	10/22/2024
WEIGHED BY:	Ashley Burgess	**DATE OF WEIGHING:**	10/23/2024

BORING NO.	R-2	R-2	R-2	R-2	
SAMPLE NO.	SS-5	SS-7	SS-9	SS-14	
SAMPLE DEPTH (FT.)	8.0 - 10.0	18.5 - 20.0	28.5 - 30.0	53.5 - 55.0	
WATER CONTENT, W%	25.4	36.7	34.0	49.2	

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH (FT.)					
WATER CONTENT, W%					

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH (FT.)					
WATER CONTENT, W%					

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH (FT.)					
WATER CONTENT, W%					

211 Business Park Blvd., SC 29203

APPENDIX

SECTION 5 LABORATORY TEST RESULTS

SECTION 5B DISTURBED SAMPLES (DS)

SUMMARY OF LABORATORY RESULTS

PROJECT ID P043789 **PROJECT NAME** US 278 Grays Highway Emergency Repairs

PROJECT COUNTY Jasper

Borehole	Depth	Liquid Limit	Plastic Limit	Plasticity Index	Maximum Size (mm)	%<#200 Sieve	Class-ification	Water Content (%)	Dry Density (pcf)	Satur-ation (%)	Void Ratio
MAB-1	1.5	NP	NP	NP	4.76	2	SP	22.6			

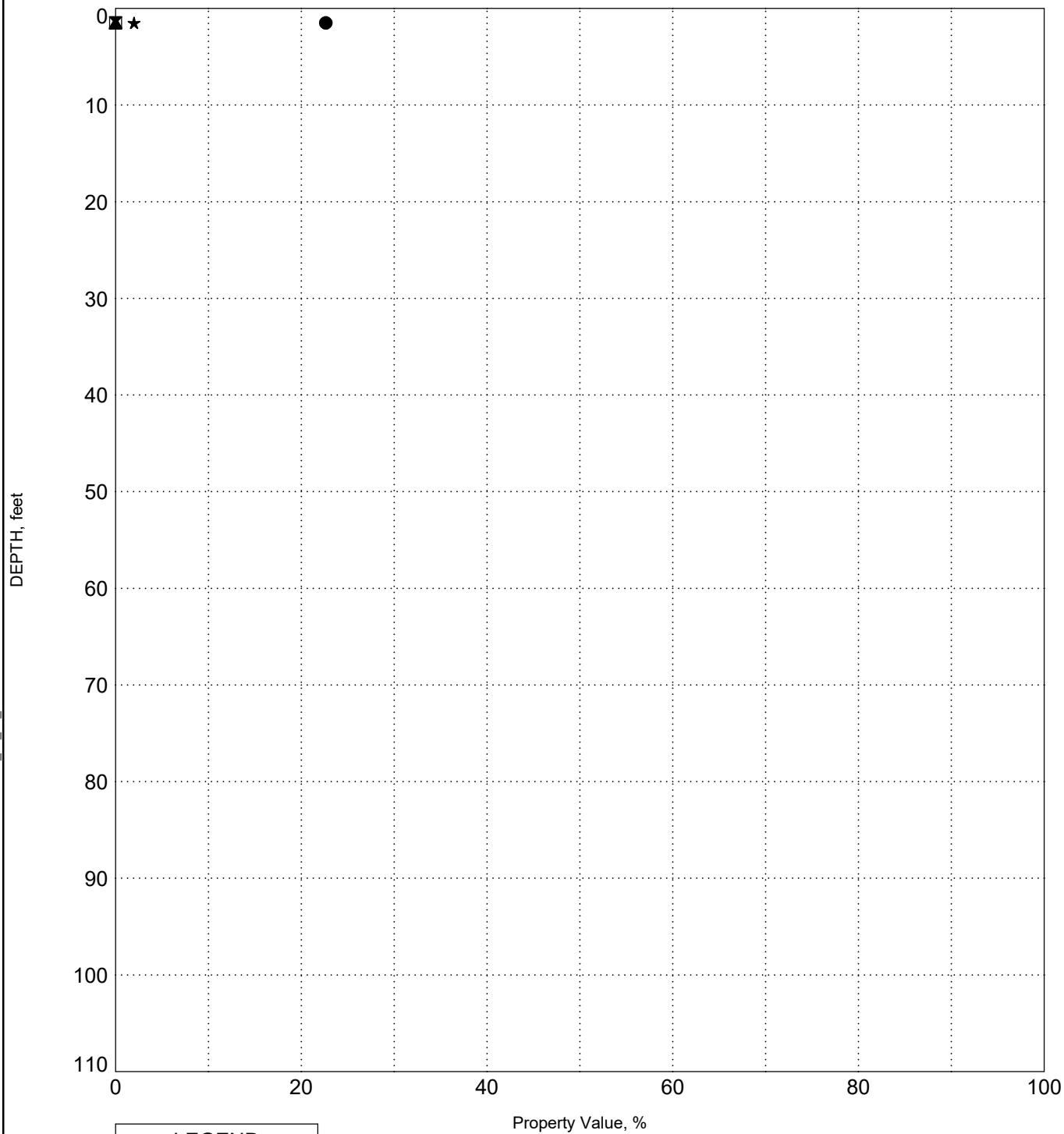
INDEX PROPERTIES VERSUS DEPTH

PROJECT ID P043789 **PROJECT NAME** US 278 Grays Highway Emergency Repairs

PROJECT COUNTY Jasper

BORING MAB-1

SURFACE ELEVATION: 43.2

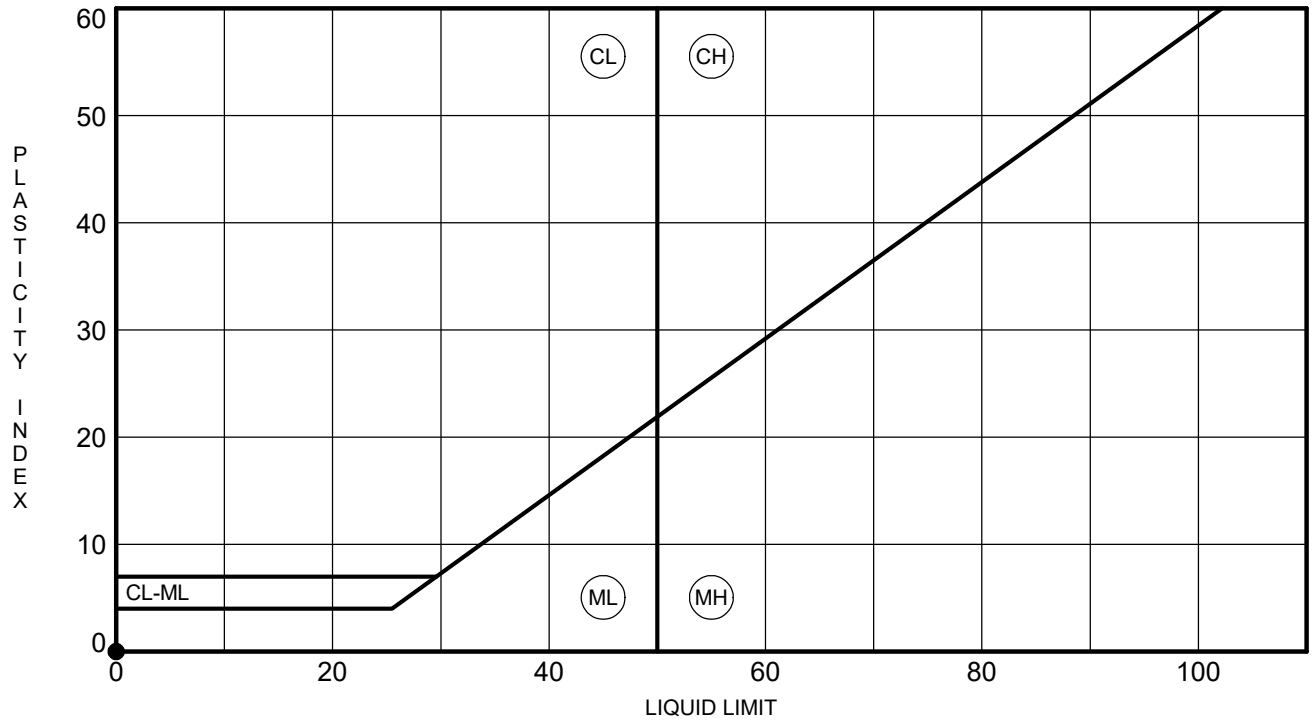


LEGEND
● Water Content
⊠ Plastic Limit
▲ Liquid Limit
★ Fines

ATTERBERG LIMITS' RESULTS

PROJECT ID P043789 **PROJECT NAME** US 278 Grays Highway Emergency Repairs

PROJECT COUNTY Jasper

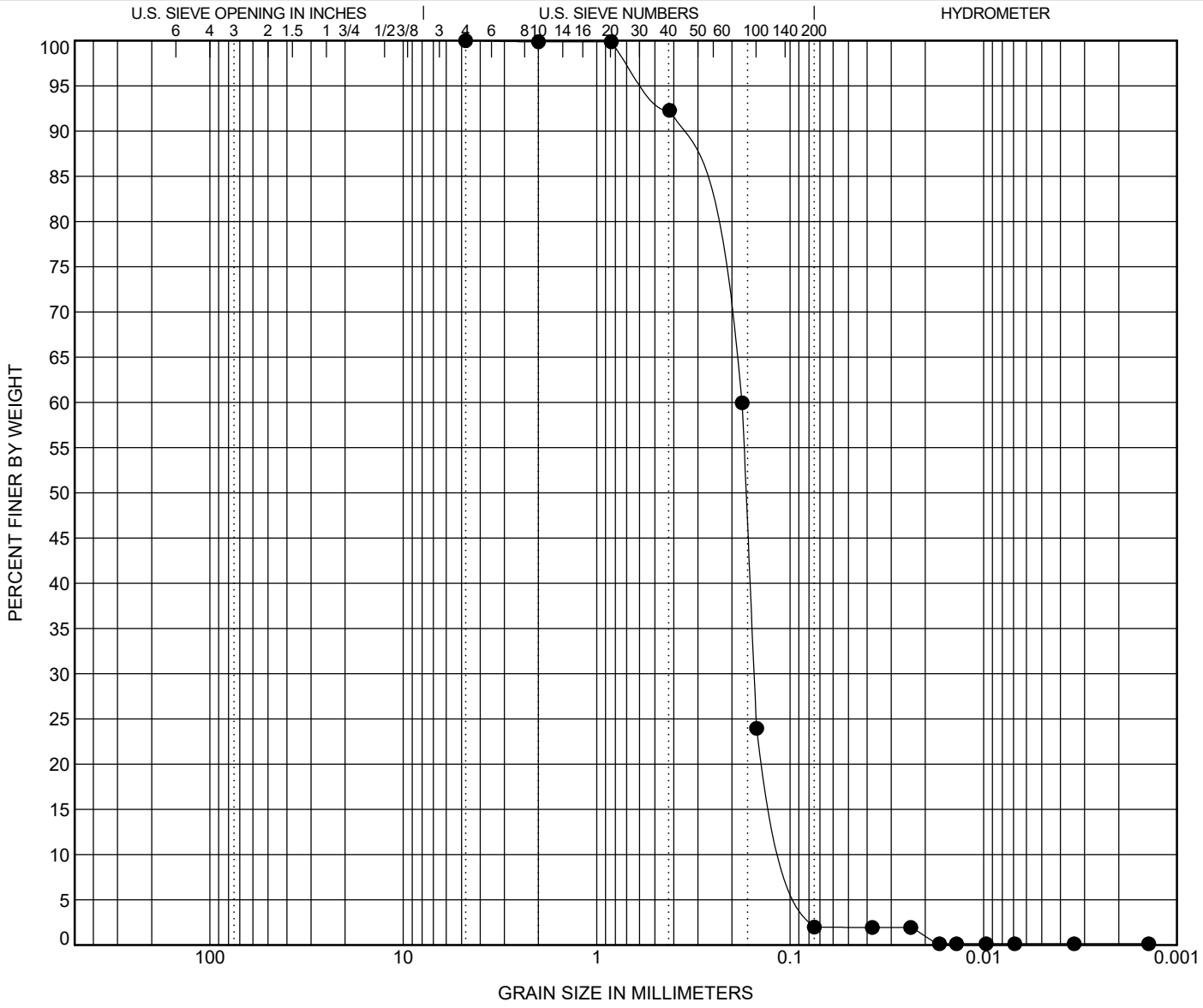


	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**MAB-1**	**1.5**	**NP**	**NP**	**NP**	**2**	**POORLY GRADED SAND (SP/A-3)**

GRAIN SIZE DISTRIBUTION

PROJECT ID P043789 **PROJECT NAME** US 278 Grays Highway Emergency Repairs

PROJECT COUNTY Jasper



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**MAB-1**	**1.5**	**POORLY GRADED SAND(SP)**	**NP**	**NP**	**NP**	**1.38**	**1.84**

	BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**MAB-1**	**1.5**	**4.76**	**0.538**	**0.169**	**0.096**	**0.0**	**98.0**	**1.8**	**0.1**

REV 04/2024

F&ME CONSULTANTS, INC.

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT: US 278 Grays Highway Emergency Repairs **SCDOT PROJECT No.:** P043789

SAMPLE NUMBER: 24-3763 **DATE SAMPLE RECEIVED:** 10/16/2024

DESCRIPTION OF SOIL: Poorly Graded SAND (SP/A-3)

TESTED BY: LiAnn Johnson & Tyler Ennis **DATE SETUP:** 10/22/2024

WEIGHED BY: Ashley Burgess **DATE OF WEIGHING:** 10/23/2024

BORING NO.	MAB-1				
SAMPLE NO.	DS-2				
SAMPLE DEPTH (FT.)	1.0 - 1.5				
WATER CONTENT, W%	22.6				

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH (FT.)					
WATER CONTENT, W%					

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH (FT.)					
WATER CONTENT, W%					

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH (FT.)					
WATER CONTENT, W%					

APPENDIX

SECTION 5 LABORATORY TEST RESULTS

SECTION 5C BULK SOIL SAMPLES (BS)

BULK SOIL SAMPLES SUMMARY

PROJECT ID P038263 **PROJECT NAME** US 278 Grays Highway Emergency Repairs

PROJECT COUNTY Jasper

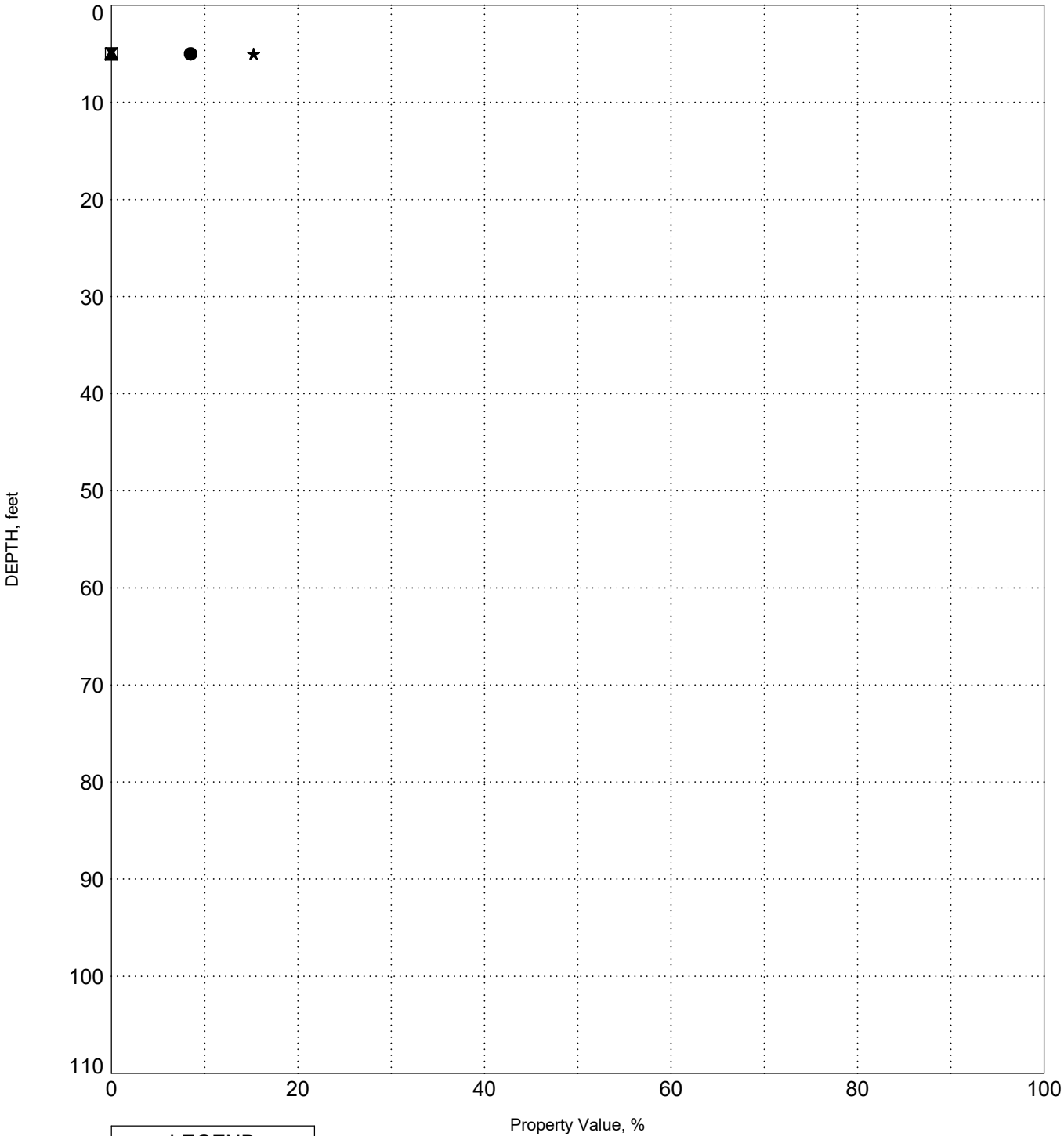
Boring No.	Sample Depth (ft.)	Liquid Limit	Plastic Limit	Plasticity Index	%<#200 Sieve	Soil Classifi-cation	Moisture Content (%)	Max Dry Density (PCF)	Optimum Moisture Content (%)	C (psi)	ϕ (Degrees)	C' (psi)	ϕ' (Degrees)
BS-1	0.0 – 5.0	NP	NP	NP	15.2	SM	8.5	108.4	13.6	--	'--	36.0	1.87
BS-2	0.0 – 5.0	NP	NP	NP	17.5	SM	12.1	108.2	13.8	--	--	35.6	2.05
BS-3	0.0 – 5.0	NP	NP	NP	16.7	SM	18.4	112.8	12.4	--	--	--	--
BS-4	0.0 – 5.0	NP	NP	NP	11.0	SP-SM	14.5	107.2	13.7	--	--	--	--

INDEX PROPERTIES VERSUS DEPTH

PROJECT ID P043789 **PROJECT NAME** US 278 Grays Highway Emergency Repairs

PROJECT COUNTY Jasper

BORING BS-1

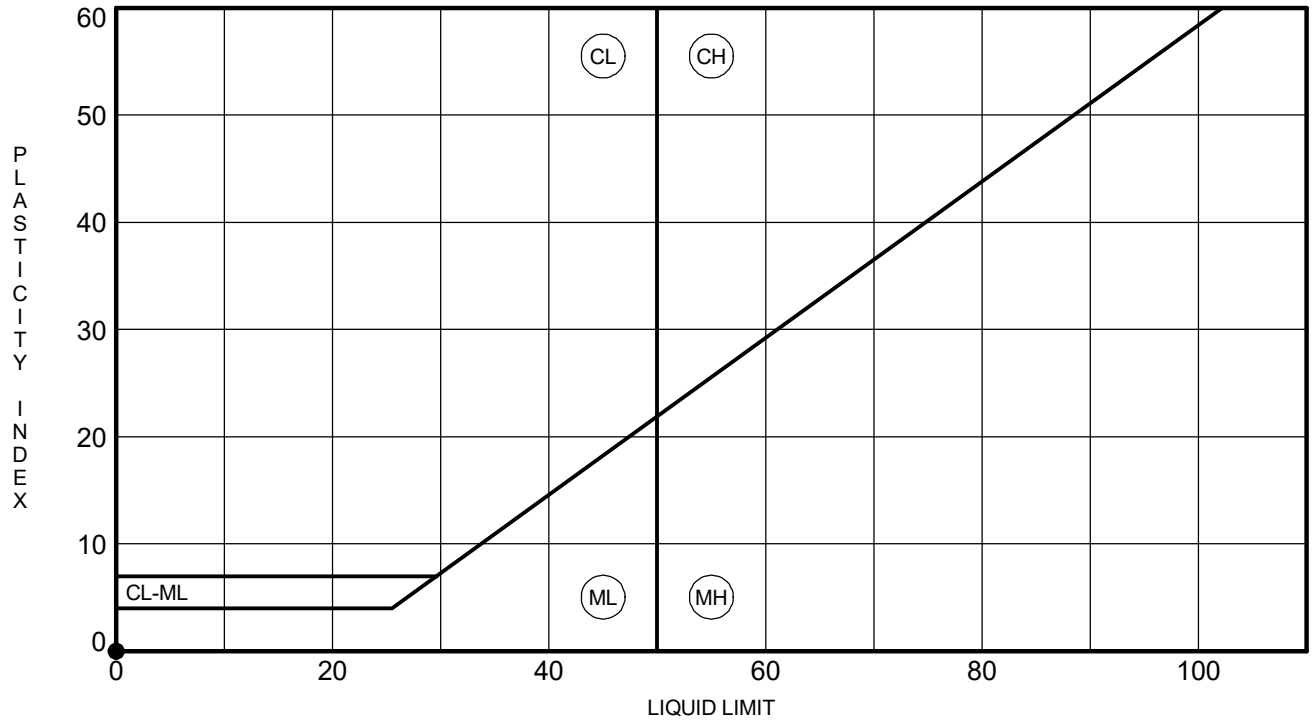


LEGEND
● Water Content
⊠ Plastic Limit
▲ Liquid Limit
★ Fines

ATTERBERG LIMITS' RESULTS

PROJECT ID P043789 **PROJECT NAME** US 278 Grays Highway Emergency Repairs

PROJECT COUNTY Jasper



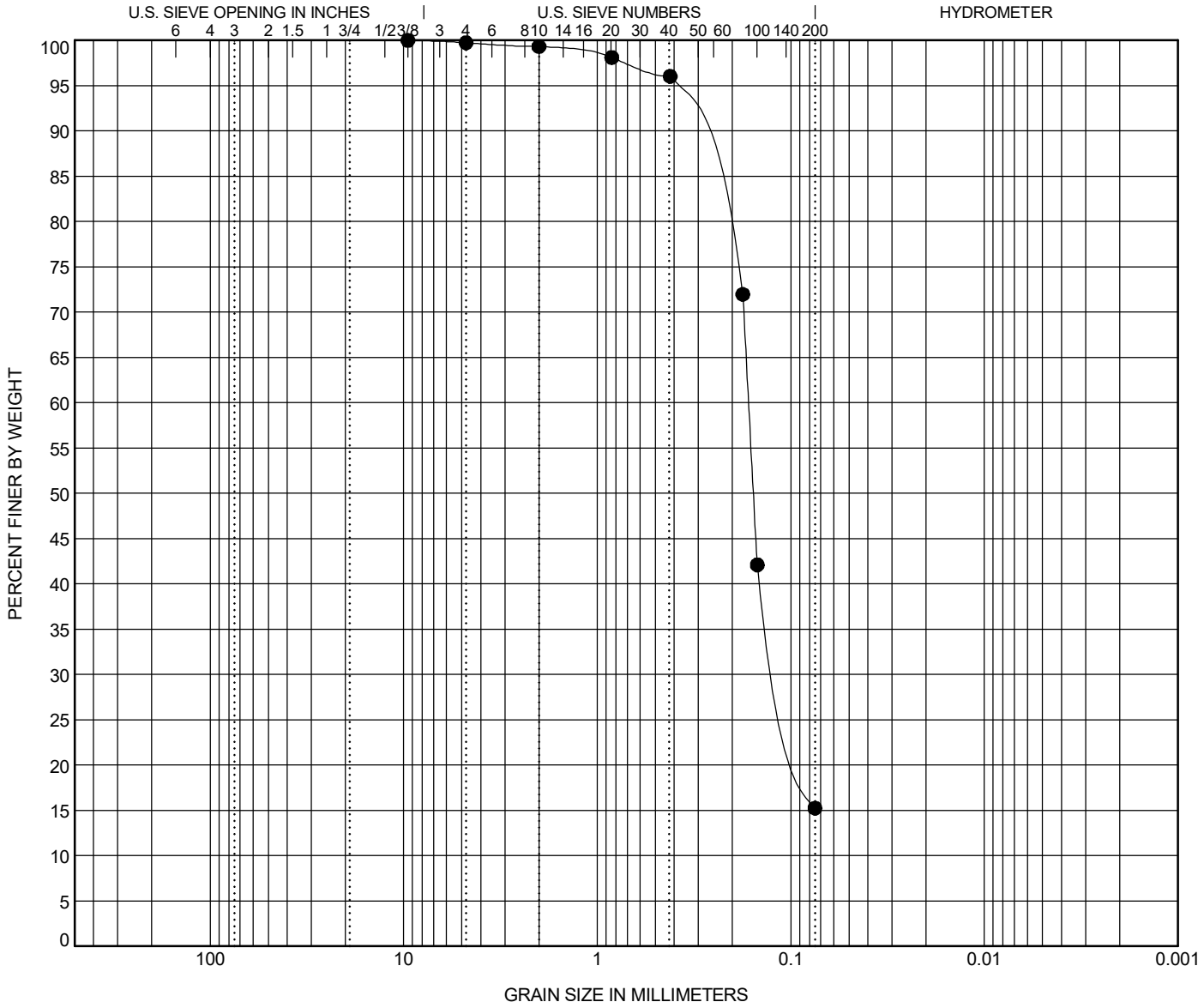
	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**BS-1**	**5.0**	**NP**	**NP**	**NP**	**15**	**SILTY SAND (SM/A-2-4)**

ATTERBERG LIMITS G7100.006 - US 278 BEAVERDAM BRANCH.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/25/24

GRAIN SIZE DISTRIBUTION

PROJECT ID P043789 **PROJECT NAME** US 278 Grays Highway Emergency Repairs

PROJECT COUNTY Jasper



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**BS-1**	**5.0**	**SILTY SAND (SM/A-2-4)**	**NP**	**NP**	**NP**		

	BOREHOLE	DEPTH	D90	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**BS-1**	**5.0**	**0.338**	**0.165**	**0.109**		**0.3**	**84.5**	**15.2**	

REV 04/2024

F&ME CONSULTANTS, INC.

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT: US 278 Grays Highway Emergency Repairs **SCDOT PROJECT No.:** P043789

SAMPLE NUMBER: 24-3631 **DATE SAMPLE RECEIVED:** 10/16/2024

DESCRIPTION OF SOIL: Silty SAND (SM/A-2-4)

TESTED BY: LiAnn Johnson & Tyler Ennis **DATE SETUP:** 10/22/2024

WEIGHED BY: Ashley Burgess **DATE OF WEIGHING:** 10/23/2024

BORING NO.	BS-1				
SAMPLE NO.	--				
SAMPLE DEPTH (FT.)	0.0 - 5.0				
WATER CONTENT, W%	8.5				

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH (FT.)					
WATER CONTENT, W%					

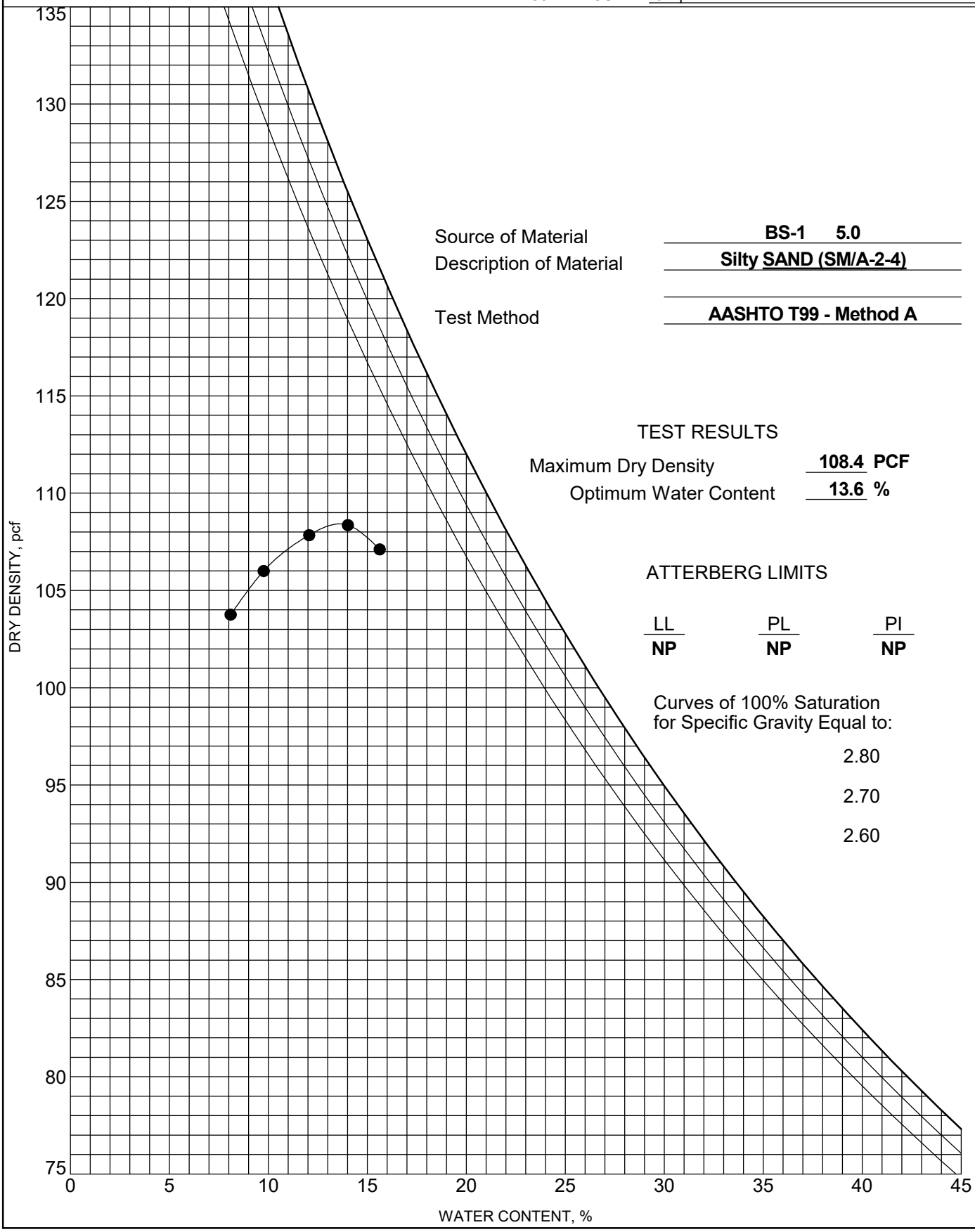
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH (FT.)					
WATER CONTENT, W%					

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH (FT.)					
WATER CONTENT, W%					

MOISTURE-DENSITY RELATIONSHIP

PROJECT ID P043789 **PROJECT NAME** US 278 Grays Highway Emergency Repairs

PROJECT COUNTY Jasper



Source of Material **BS-1 5.0**

Description of Material **Silty SAND (SM/A-2-4)**

Test Method **AASHTO T99 - Method A**

TEST RESULTS

Maximum Dry Density **108.4** **PCF**

Optimum Water Content **13.6** **%**

ATTERBERG LIMITS

LL	PL	PI
NP	**NP**	**NP**

Curves of 100% Saturation for Specific Gravity Equal to:

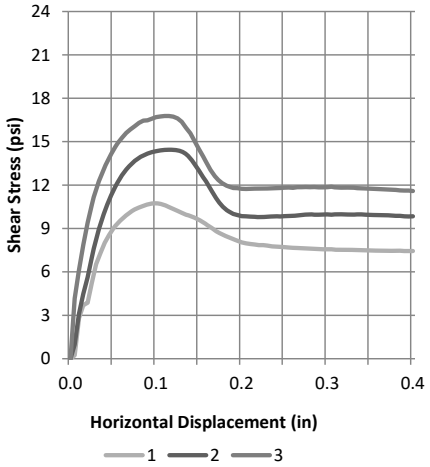
2.80

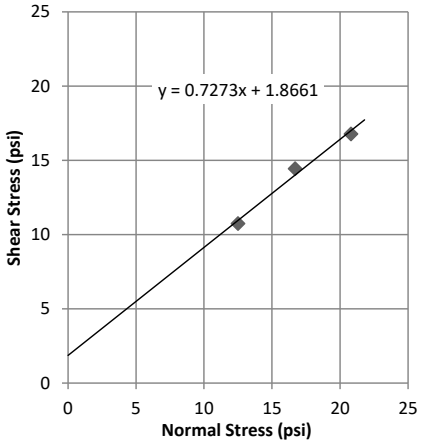
2.70

2.60

COMPACTION - SCDOT G7100.006 - US 278 BEAVERDAM BRANCH.GPJ FME2017.GDT 10/30/24

DIRECT SHEAR TEST REPORT
ASTM - D3080 / AASHTO T236





Sample 1	
Normal Stress (psi)	12.5
Speed (in./min.)	0.01
Sample Width (in.)	4.00
Percent Moisture	12.9%
Wet Density (pcf)	119.4
Dry Density (pcf)	105.8
t50 (min.)	0.2
Saturation (%)	60.5%
Horizontal Displacement (in.)	Shear Stress (psi)
0.000	0.00
0.005	0.24
0.010	2.81
0.015	3.71
0.020	3.88
0.030	6.53
0.040	8.02
0.050	8.99
0.060	9.64
0.070	10.13
0.080	10.44
0.090	10.66
0.100	10.74
0.125	10.22
0.150	9.60
0.175	8.66
0.200	8.04
0.225	7.86
0.250	7.70
0.300	7.56
0.350	7.48
0.400	7.44
Max Shear Stress	**10.74**

Sample 2	
Normal Stress (psi)	16.7
Speed (in./min.)	0.01
Sample Width (in.)	4.00
Percent Moisture	13.0%
Wet Density (pcf)	119.7
Dry Density (pcf)	105.9
t50 (min)	0.2
Saturation (%)	61.2%
Horizontal Displacement (in.)	Shear Stress (psi)
0.000	0.00
0.005	0.99
0.010	3.11
0.015	4.49
0.020	5.63
0.030	8.27
0.040	10.20
0.050	11.63
0.060	12.67
0.070	13.38
0.080	13.88
0.090	14.16
0.100	14.34
0.125	14.40
0.150	13.01
0.175	10.71
0.200	9.85
0.225	9.80
0.250	9.86
0.300	9.97
0.350	9.95
0.400	9.84
Max Shear Stress	**14.44**

Sample 3	
Normal Stress (psi)	20.8
Speed (in./min.)	0.01
Sample Width (in.)	4.00
Percent Moisture	13.1%
Wet Density (pcf)	119.9
Dry Density (pcf)	106.0
t50 (min.)	0.2
Saturation (%)	62.0%
Horizontal Displacement (in.)	Shear Stress (psi)
0.000	0.00
0.005	4.16
0.010	6.14
0.015	7.88
0.020	9.40
0.030	11.71
0.040	13.25
0.050	14.42
0.060	15.26
0.070	15.85
0.080	16.29
0.090	16.48
0.100	16.69
0.125	16.61
0.150	14.49
0.175	12.23
0.200	11.74
0.225	11.78
0.250	11.82
0.300	11.85
0.350	11.75
0.400	11.59
Max Shear Stress	**16.78**

Project Name: US 278 Grays Highway Emergency Repairs

F&ME Project No.: G7100.006 Date: 10/25/24

SCDOT Project No.: P043789

Location/Sample: BS-1 / Sample No. 24-3631

Depth/Elevation: 0' - 5'

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

Sample Type : Remolded 1" Thick, Non-Innundated

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

PI= NP % Fines= 15.2

SG= 2.65 Box Gap= 2.5 mm

ϕ= 36.0° $C_{apparent}$= 1.87 psi

F&ME CONSULTANTS

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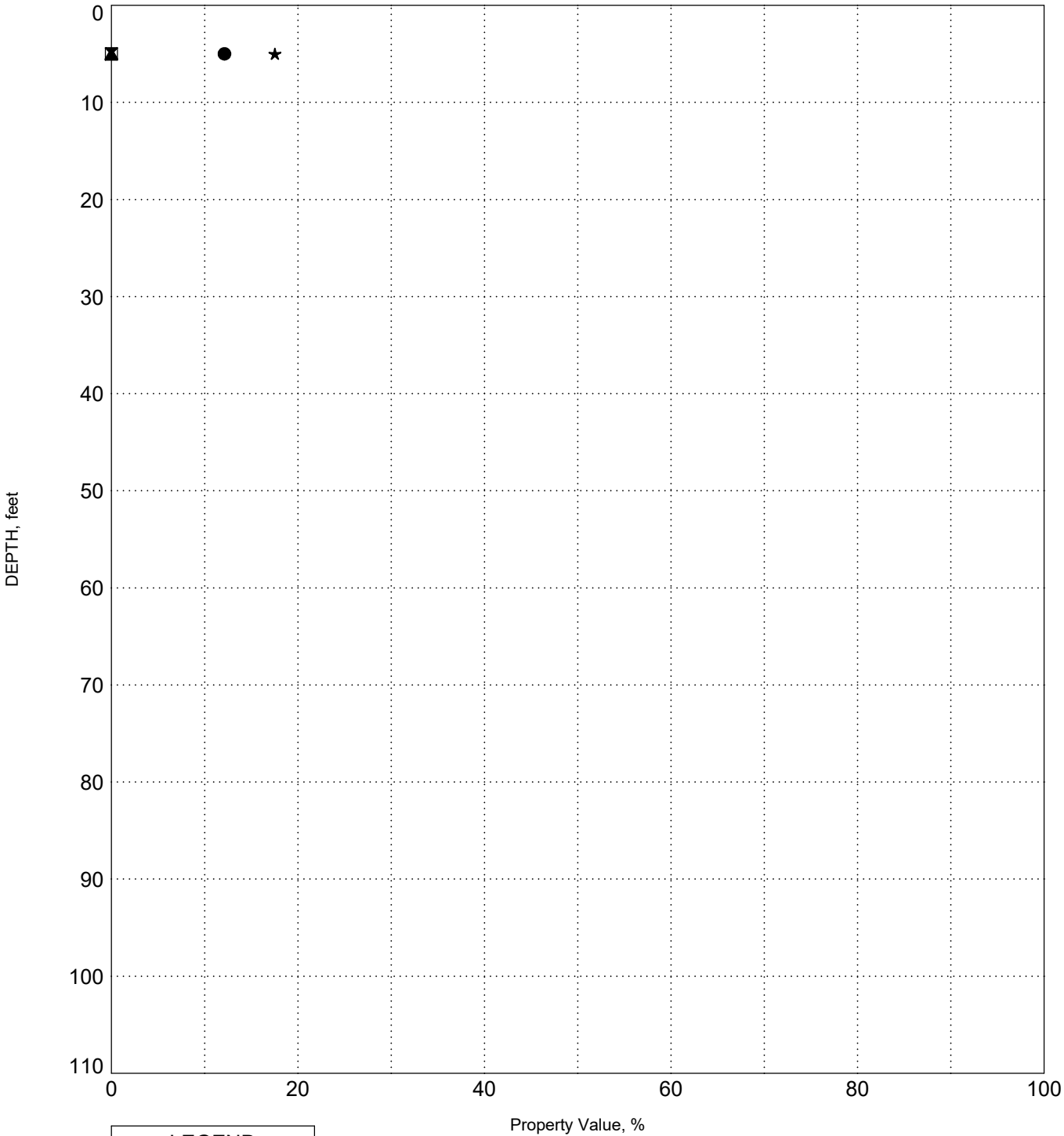
INDEX PROPERTIES VERSUS DEPTH

PROJECT ID P043789 **PROJECT NAME** US 278 Grays Highway Emergency Repairs

PROJECT COUNTY Jasper

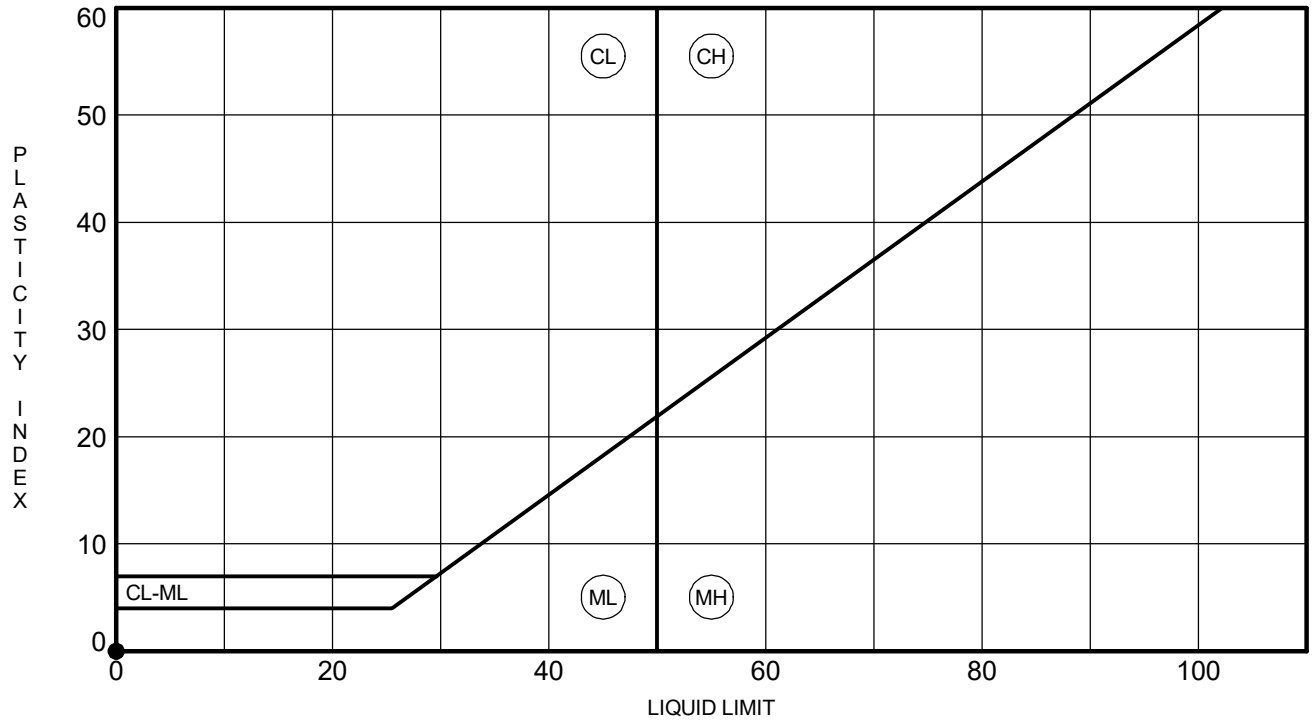
BORING BS-2



ATTERBERG LIMITS' RESULTS

PROJECT ID P043789 **PROJECT NAME** US 278 Grays Highway Emergency Repairs

PROJECT COUNTY Jasper



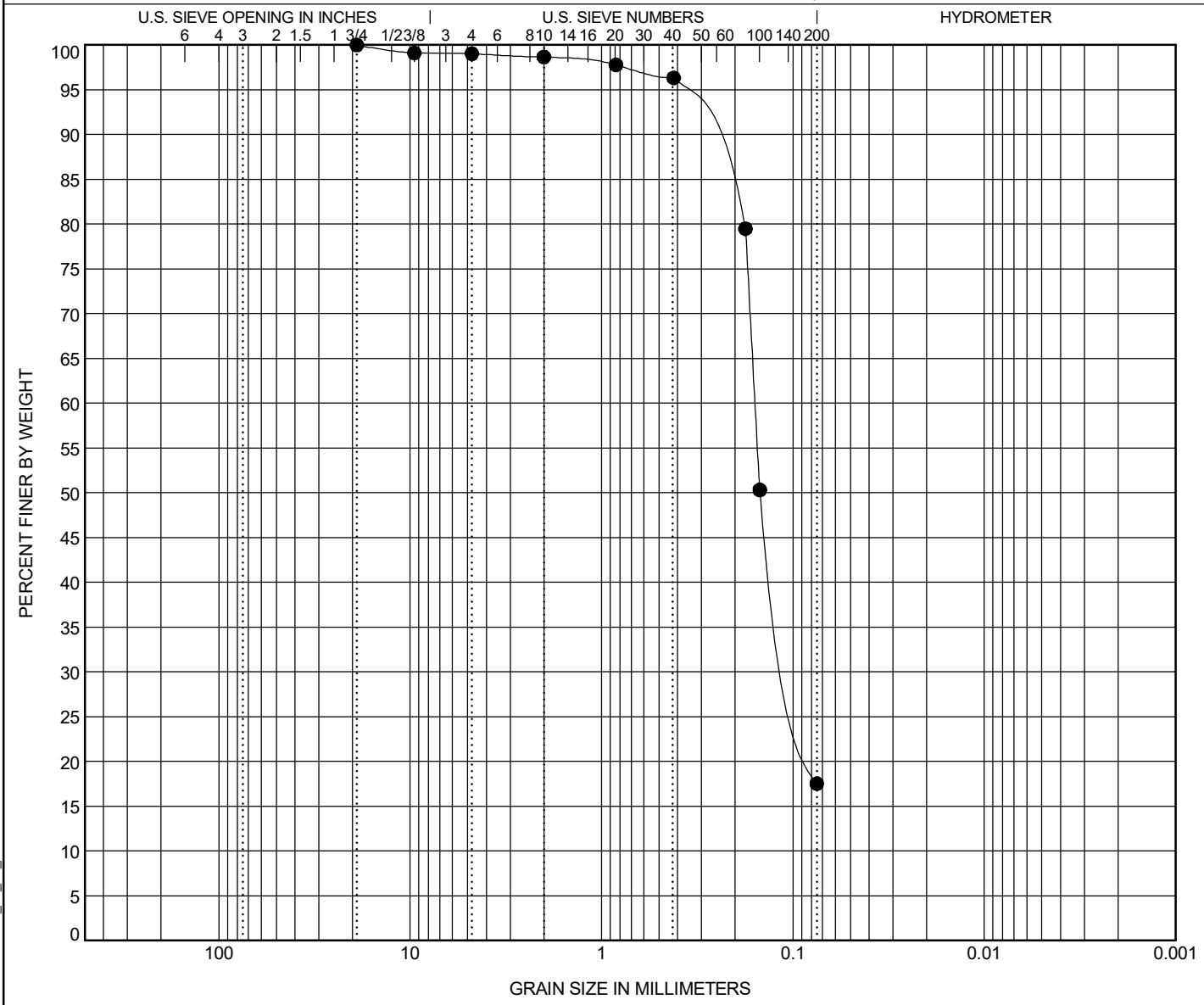
	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**BS-2**	**5.0**	**NP**	**NP**	**NP**	**18**	**SILTY SAND (SM/A-2-4)**

ATTERBERG LIMITS G7100.006 - US 278 BEAVERDAM BRANCH.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/25/24

GRAIN SIZE DISTRIBUTION

PROJECT ID P043789 **PROJECT NAME** US 278 Grays Highway Emergency Repairs

PROJECT COUNTY Jasper



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
● **BS-2**	**5.0**	**SILTY SAND (SM/A-2-4)**	**NP**	**NP**	**NP**		

BOREHOLE	DEPTH	D90	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● **BS-2**	**5.0**	**0.303**	**0.158**	**0.097**		**1.0**	**81.5**	**17.5**	

REV 04/2024

F&ME CONSULTANTS, INC.

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT: US 278 Grays Highway Emergency Repairs **SCDOT PROJECT No.:** P043789

SAMPLE NUMBER: 24-3630 **DATE SAMPLE RECEIVED:** 10/16/2024

DESCRIPTION OF SOIL: Silty SAND (SM/A-2-4)

TESTED BY: LiAnn Johnson & Tyler Ennis **DATE SETUP:** 10/22/2024

WEIGHED BY: Ashley Burgess **DATE OF WEIGHING:** 10/23/2024

BORING NO.	BS-2				
SAMPLE NO.	--				
SAMPLE DEPTH (FT.)	0.0 - 5.0				
WATER CONTENT, W%	12.1				

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH (FT.)					
WATER CONTENT, W%					

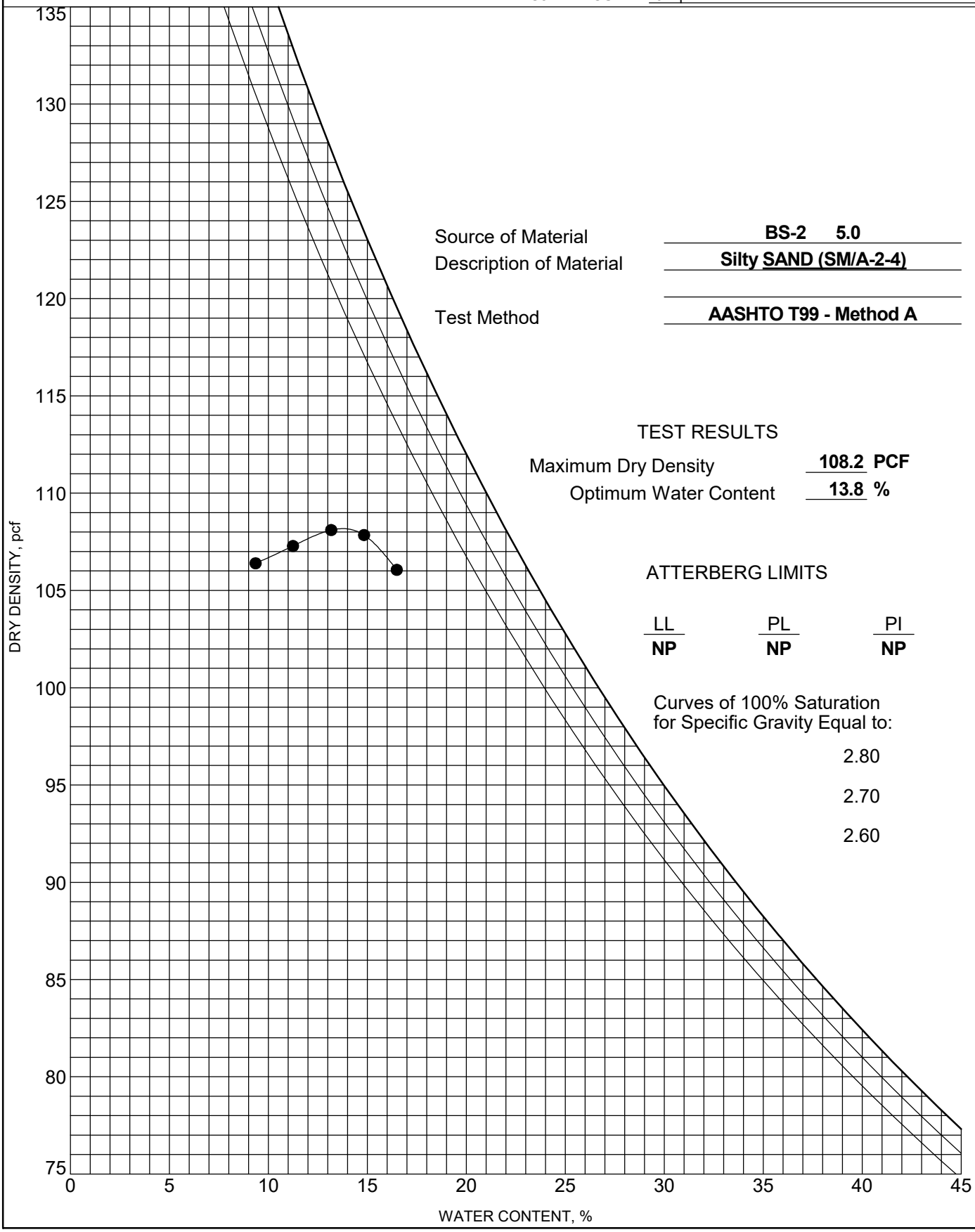
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH (FT.)					
WATER CONTENT, W%					

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH (FT.)					
WATER CONTENT, W%					

MOISTURE-DENSITY RELATIONSHIP

PROJECT ID P043789 **PROJECT NAME** US 278 Grays Highway Emergency Repairs

PROJECT COUNTY Jasper



Source of Material **BS-2 5.0**

Description of Material **Silty SAND (SM/A-2-4)**

Test Method **AASHTO T99 - Method A**

TEST RESULTS

Maximum Dry Density **108.2** **PCF**

Optimum Water Content **13.8** **%**

ATTERBERG LIMITS

LL	PL	PI
NP	**NP**	**NP**

Curves of 100% Saturation for Specific Gravity Equal to:

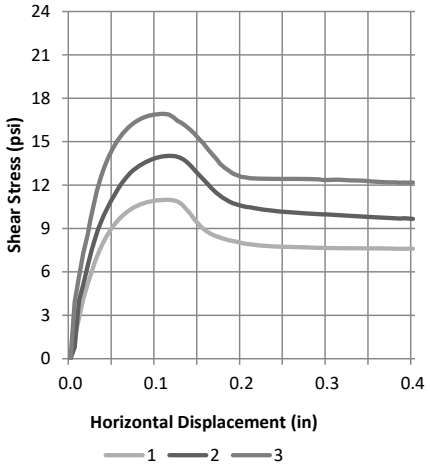
2.80

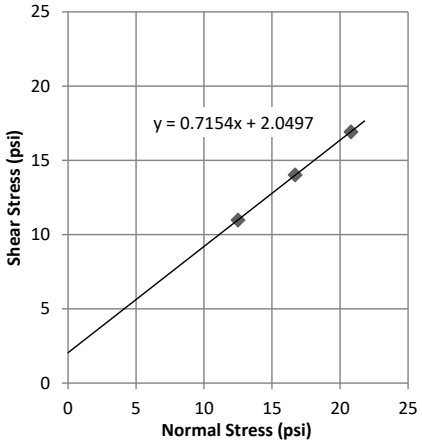
2.70

2.60

COMPACTION - SCDOT G7100.006 - US 278 BEAVERDAM BRANCH.GPJ FME2017.GDT 10/30/24

DIRECT SHEAR TEST REPORT
ASTM - D3080 / AASHTO T236





Sample 1	
Normal Stress (psi)	12.5
Speed (in./min.)	0.01
Sample Width (in.)	4.00
Percent Moisture	13.5%
Wet Density (pcf)	120.1
Dry Density (pcf)	105.8
t50 (min.)	0.2
Saturation (%)	63.7%
Horizontal Displacement (in.)	Shear Stress (psi)
0.000	0.00
0.005	1.51
0.010	2.80
0.015	4.14
0.020	5.18
0.030	6.93
0.040	8.24
0.050	9.18
0.060	9.83
0.070	10.32
0.080	10.63
0.090	10.81
0.100	10.94
0.125	10.86
0.150	9.29
0.175	8.36
0.200	7.99
0.225	7.81
0.250	7.73
0.300	7.66
0.350	7.63
0.400	7.60
Max Shear Stress	**10.98**

Sample 2	
Normal Stress (psi)	16.7
Speed (in./min.)	0.01
Sample Width (in.)	4.00
Percent Moisture	13.3%
Wet Density (pcf)	119.4
Dry Density (pcf)	105.4
t50 (min)	0.2
Saturation (%)	62.1%
Horizontal Displacement (in.)	Shear Stress (psi)
0.000	0.00
0.005	0.79
0.010	4.01
0.015	5.14
0.020	6.41
0.030	8.53
0.040	10.05
0.050	11.21
0.060	12.14
0.070	12.85
0.080	13.33
0.090	13.64
0.100	13.88
0.125	13.96
0.150	12.71
0.175	11.24
0.200	10.56
0.225	10.33
0.250	10.14
0.300	9.98
0.350	9.80
0.400	9.67
Max Shear Stress	**14.02**

Sample 3	
Normal Stress (psi)	20.8
Speed (in./min.)	0.01
Sample Width (in.)	4.00
Percent Moisture	13.5%
Wet Density (pcf)	119.3
Dry Density (pcf)	105.1
t50 (min.)	0.2
Saturation (%)	62.6%
Horizontal Displacement (in.)	Shear Stress (psi)
0.000	0.00
0.005	3.91
0.010	5.66
0.015	7.31
0.020	8.56
0.030	11.43
0.040	13.29
0.050	14.58
0.060	15.49
0.070	16.11
0.080	16.53
0.090	16.75
0.100	16.89
0.125	16.44
0.150	15.21
0.175	13.46
0.200	12.56
0.225	12.44
0.250	12.44
0.300	12.36
0.350	12.27
0.400	12.17
Max Shear Stress	**16.92**

Project Name: US 278 Grays Highway Emergency Repairs

F&ME Project No.: G7100.006 Date: 10/25/24

SCDOT Project No.: P043789

Location/Sample: BS-2 / Sample No. 24-3630

Depth/Elevation: 0' - 5'

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

Sample Type : Remolded 1" Thick, Non-Innundated

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

PI= NP % Fines= 17.5

SG= 2.65 Box Gap= 2.5 mm

ϕ= 35.6° $C_{apparent}$= 2.05 psi

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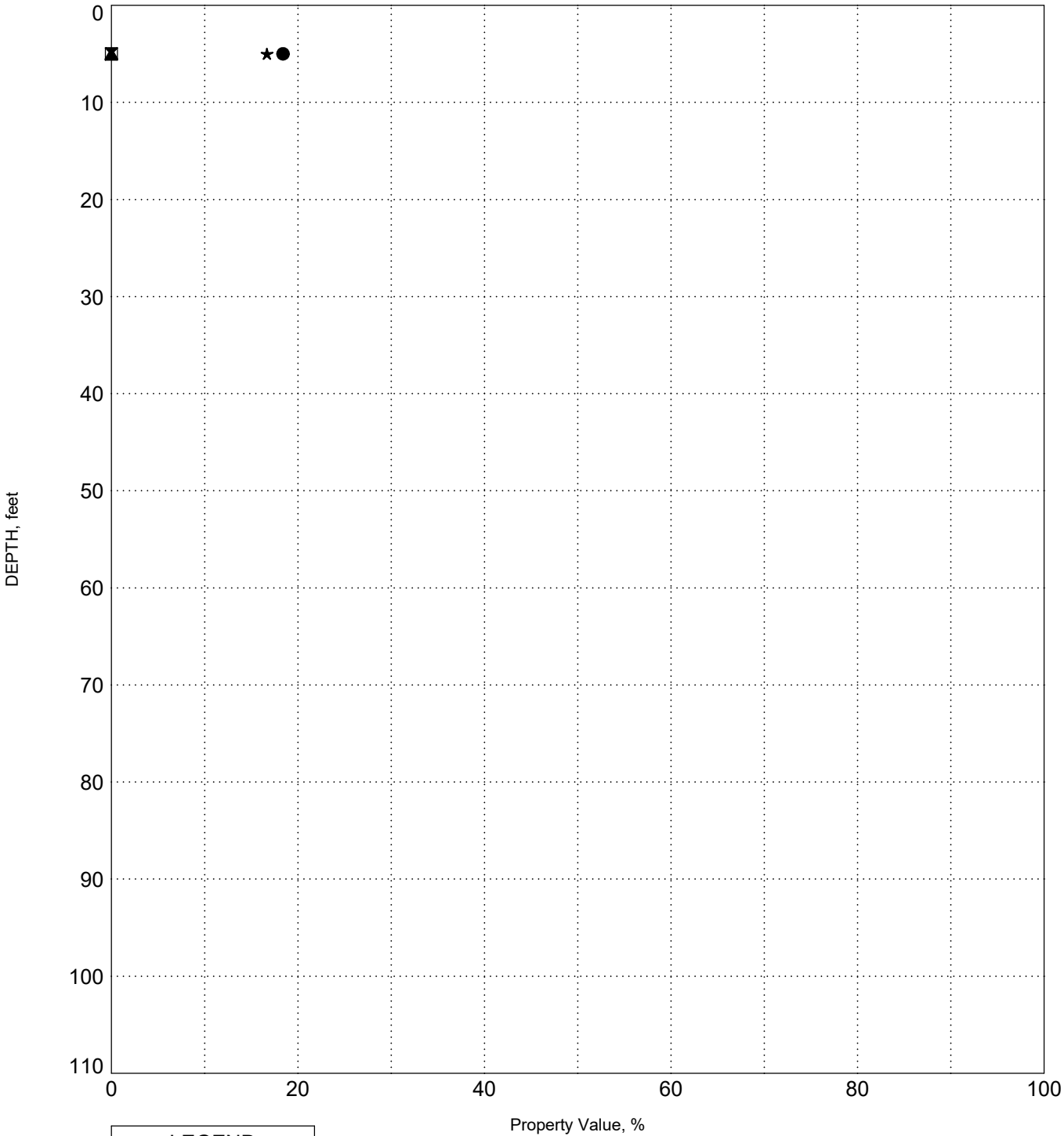
INDEX PROPERTIES VERSUS DEPTH

PROJECT ID P043789 **PROJECT NAME** US 278 Grays Highway Emergency Repairs

PROJECT COUNTY Jasper

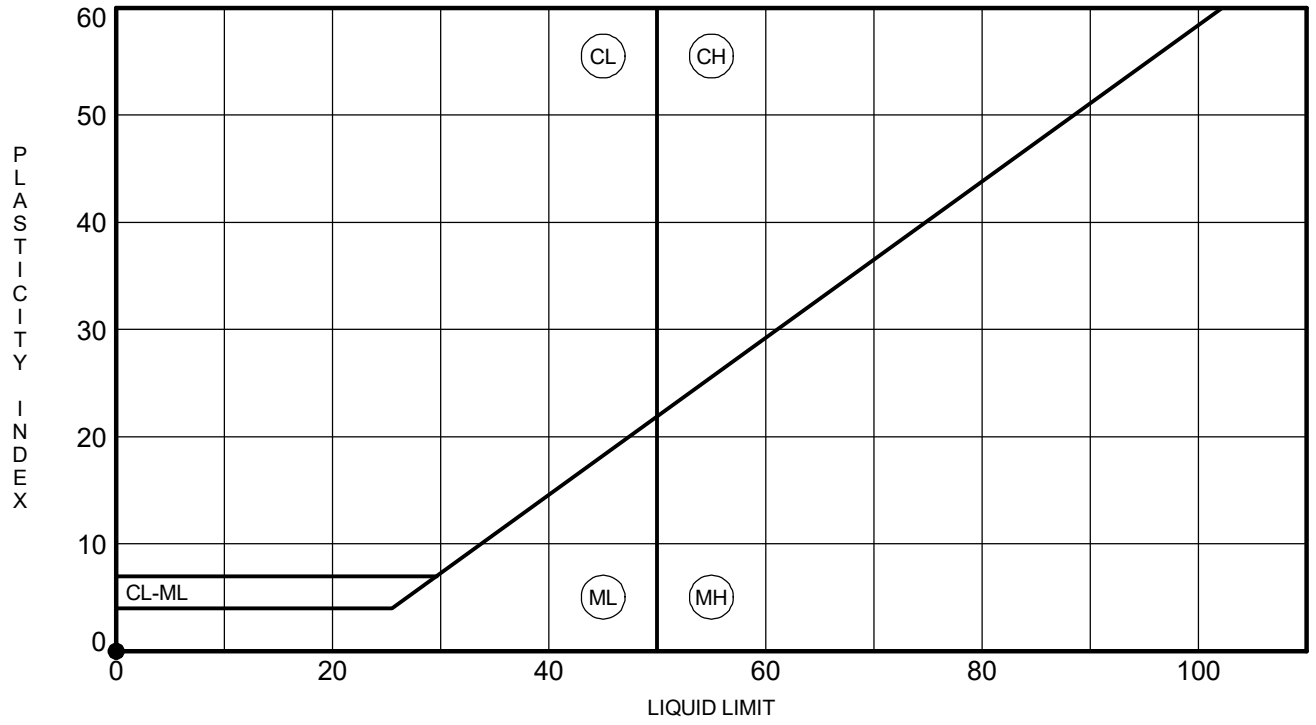
BORING BS-3



ATTERBERG LIMITS' RESULTS

PROJECT ID P043789 **PROJECT NAME** US 278 Grays Highway Emergency Repairs

PROJECT COUNTY Jasper

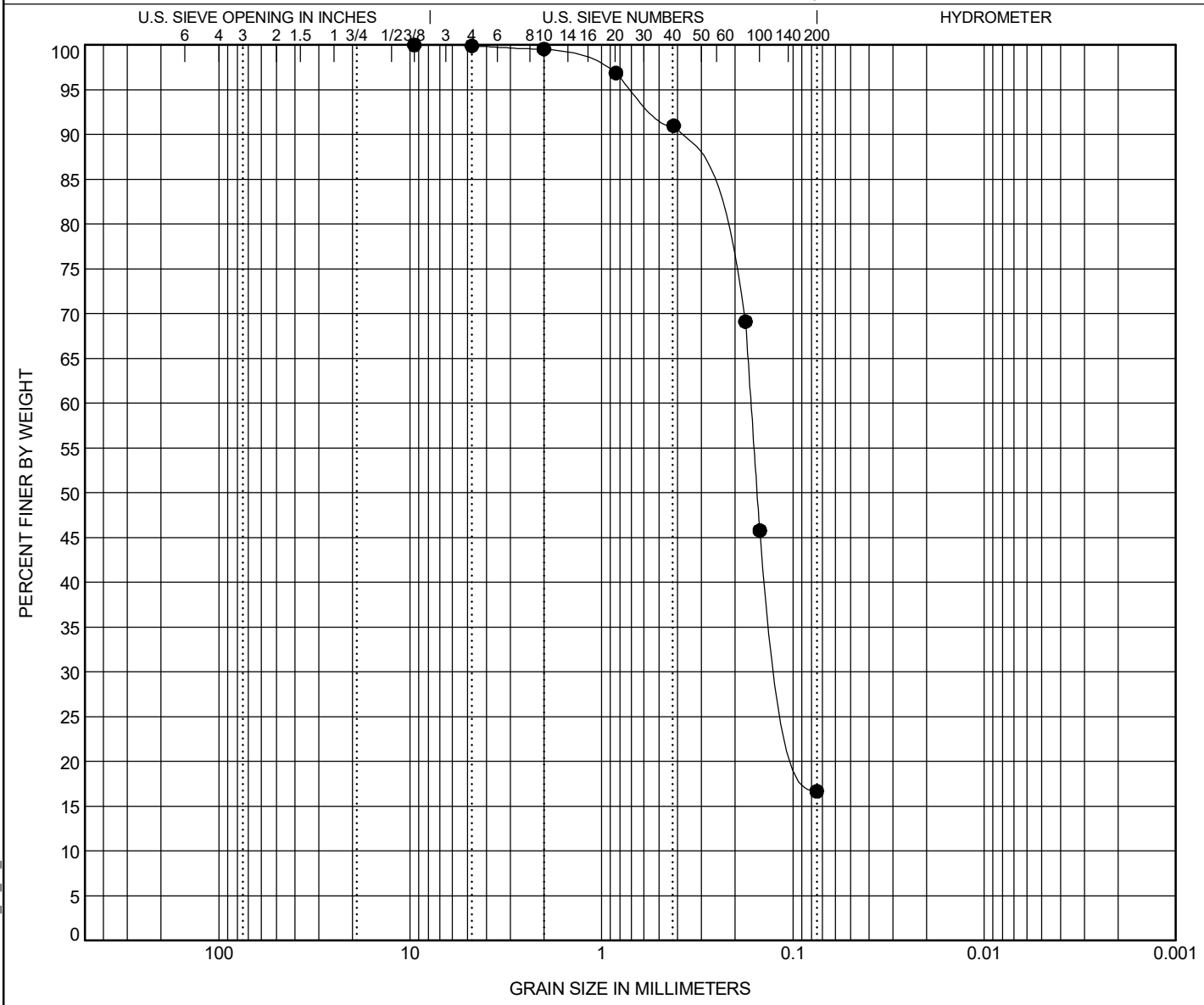


	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**BS-3**	**5.0**	**NP**	**NP**	**NP**	**17**	**SILTY SAND (SM/A-2-4)**

GRAIN SIZE DISTRIBUTION

PROJECT ID P043789 **PROJECT NAME** US 278 Grays Highway Emergency Repairs

PROJECT COUNTY Jasper



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
● **BS-3**	**5.0**	**SILTY SAND (SM/A-2-4)**	**NP**	**NP**	**NP**		

BOREHOLE	DEPTH	D90	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● **BS-3**	**5.0**	**0.404**	**0.165**	**0.103**		**0.1**	**83.2**	**16.7**	

GRAIN SIZE G7100.006 - US 278 BEAVERDAM BRANCH.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/25/24

REV 04/2024

F&ME CONSULTANTS, INC.

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	US 278 Grays Highway Emergency Repairs	**SCDOT PROJECT No.:**	P043789
SAMPLE NUMBER:	24-3760	**DATE SAMPLE RECEIVED:**	10/16/2024
DESCRIPTION OF SOIL:	Silty SAND (SM/A-2-4)		
TESTED BY:	LiAnn Johnson & Tyler Ennis	**DATE SETUP:**	10/21/2024
WEIGHED BY:	Ashley Burgess	**DATE OF WEIGHING:**	10/22/2024

BORING NO.	BS-3				
SAMPLE NO.	--				
SAMPLE DEPTH (FT.)	0.0 - 5.0				
WATER CONTENT, W%	18.4				

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH (FT.)					
WATER CONTENT, W%					

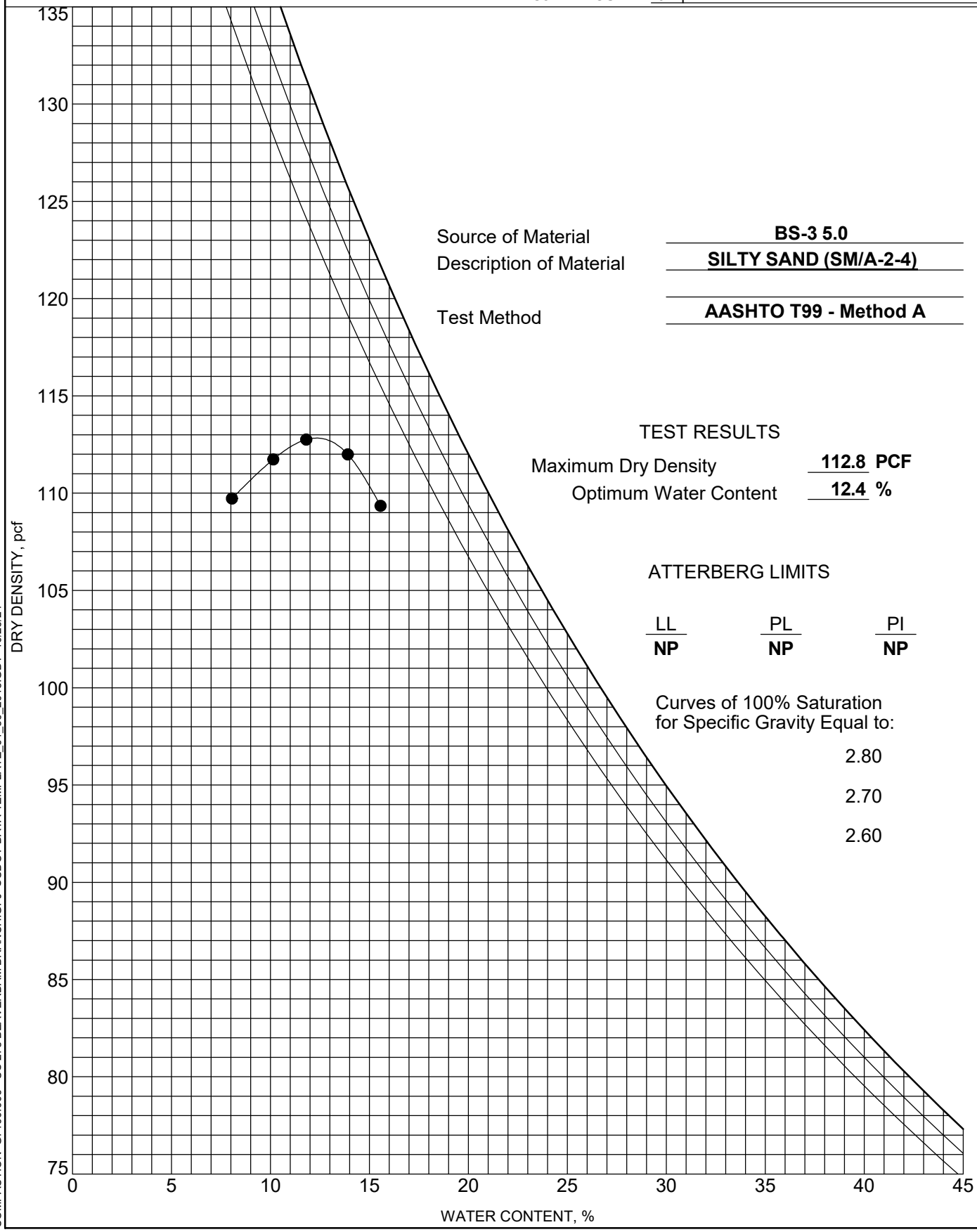
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH (FT.)					
WATER CONTENT, W%					

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH (FT.)					
WATER CONTENT, W%					

MOISTURE-DENSITY RELATIONSHIP

PROJECT ID P043789 **PROJECT NAME** US 278 Grays Highway Emergency Repairs

PROJECT COUNTY Jasper



Source of Material **BS-3 5.0**

Description of Material **SILTY SAND (SM/A-2-4)**

Test Method **AASHTO T99 - Method A**

TEST RESULTS

Maximum Dry Density **112.8** **PCF**

Optimum Water Content **12.4** **%**

ATTERBERG LIMITS

LL	PL	PI
NP	**NP**	**NP**

Curves of 100% Saturation for Specific Gravity Equal to:

2.80

2.70

2.60

COMPACTION G7100.006 - US 278 BEAVERDAM BRANCH.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/26/24

REV 01/2023

CALIFORNIA BEARING RATIO (CBR)
AASHTO T193

SAMPLE INFORMATION

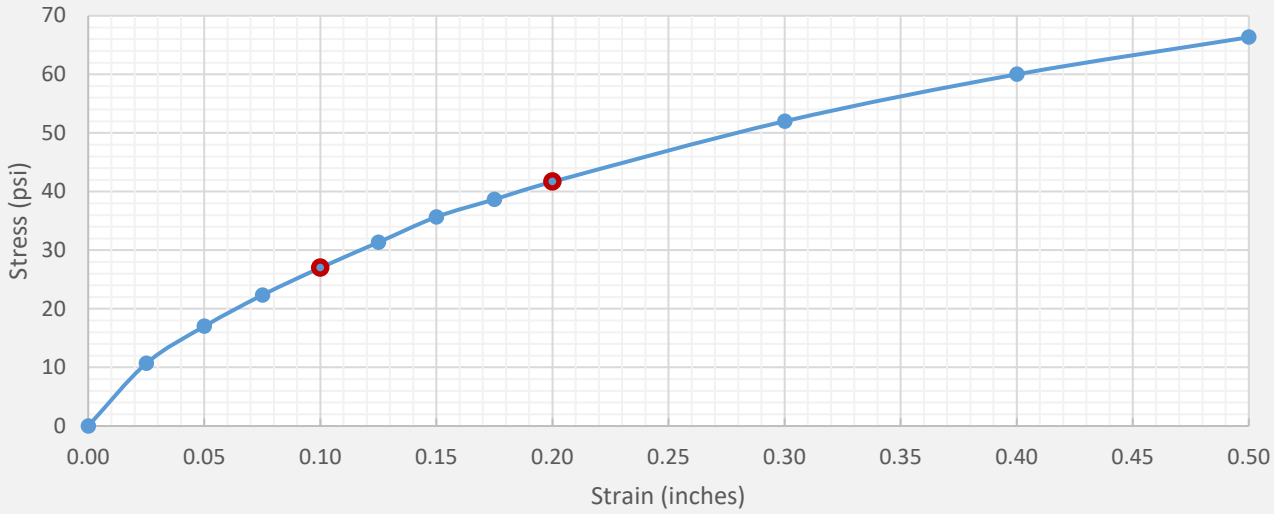
Project Name	US 278 Grays Highway Emergency Repairs			Project No.	G7100.006
Sample Location	BS-3			FME Lab ID	24-3760
Soil Description	Silty SAND (SM/A-2-4)			Depth/Elev.	0.0 - 5.0
Date Sampled	--	Sampled By:	F&ME	Date Received	10/21/2024
Date Test Began	10/25/2024	Date Completed	10/29/24	Tested By	JJ

MOLDING CHARACTERISTICS

Method	AASHTO T99 - Method A	% Retained on 3/4" Sieve	0%
Max Dry Density (lb/ft^3)	112.8	Optimum Moisture Content (%)	12.4
Soak Time (hr)	96	Surcharge Weight (lb)	10.0

TESTING RESULTS

CBR at 0.10-inch penetration	CBR at 0.20-inch penetration
2.7	**2.8**



Before Soaking	
Dry Density (lb/ft^3)	102.3
Moisture Content	12.6%
Percent Compaction	90.7%
Percent Shrink/Swell	--

After Soaking	
Dry Density (lb/ft^3)	105.4
Moisture Content (Top 1")	15.7%
Percent Compaction	93.4%
Percent Shrink/Swell	0.0%

ADDITIONAL COMMENTS

Target %Compaction = 90%

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Alix M Armstrong

Reviewed By

10/30/24

Date

REV 01/2023

CALIFORNIA BEARING RATIO (CBR)
AASHTO T193

SAMPLE INFORMATION

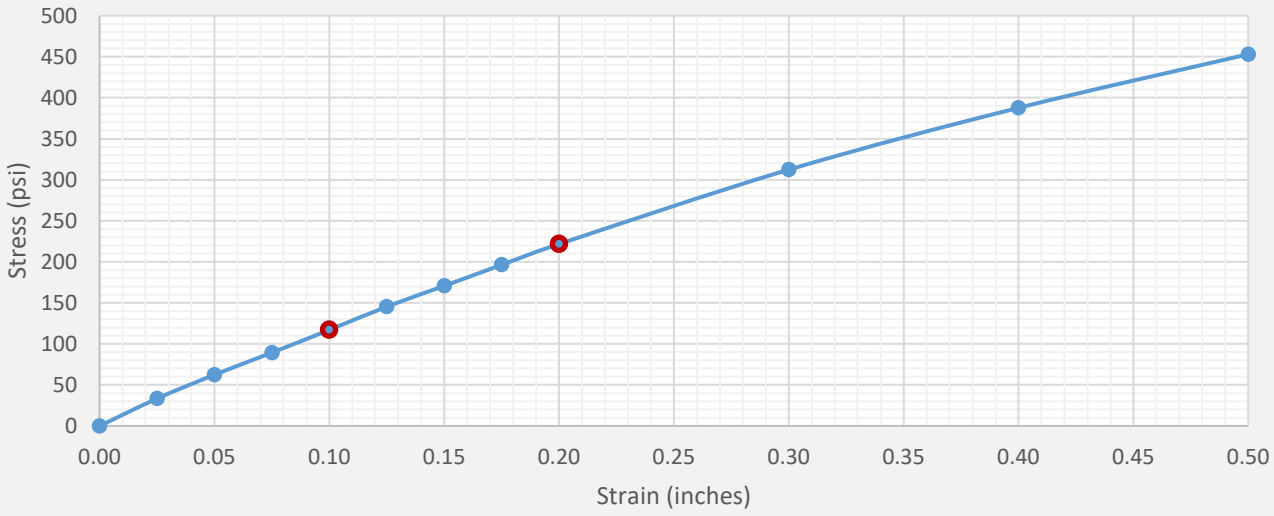
Project Name	US 278 Grays Highway Emergency Repairs			Project No.	G7100.006
Sample Location	BS-3			FME Lab ID	24-3760
Soil Description	Silty SAND (SM/A-2-4)			Depth/Elev.	0.0 - 5.0
Date Sampled	--	Sampled By:	F&ME	Date Received	10/21/2024
Date Test Began	10/25/2024	Date Completed	10/29/24	Tested By	JJ

MOLDING CHARACTERISTICS

Method	AASHTO T99 - Method A	% Retained on 3/4" Sieve	0%
Max Dry Density (lb/ft^3)	112.8	Optimum Moisture Content (%)	12.4
Soak Time (hr)	96	Surcharge Weight (lb)	10.0

TESTING RESULTS

CBR at 0.10-inch penetration	CBR at 0.20-inch penetration
11.7	**14.8**



Before Soaking	
Dry Density (lb/ft^3)	106.8
Moisture Content	12.7%
Percent Compaction	94.7%
Percent Shrink/Swell	--

After Soaking	
Dry Density (lb/ft^3)	107.7
Moisture Content (Top 1")	16.2%
Percent Compaction	95.5%
Percent Shrink/Swell	0.1%

ADDITIONAL COMMENTS

Target %Compaction = 95%

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CALIFORNIA BEARING RATIO (CBR)
AASHTO T193

SAMPLE INFORMATION

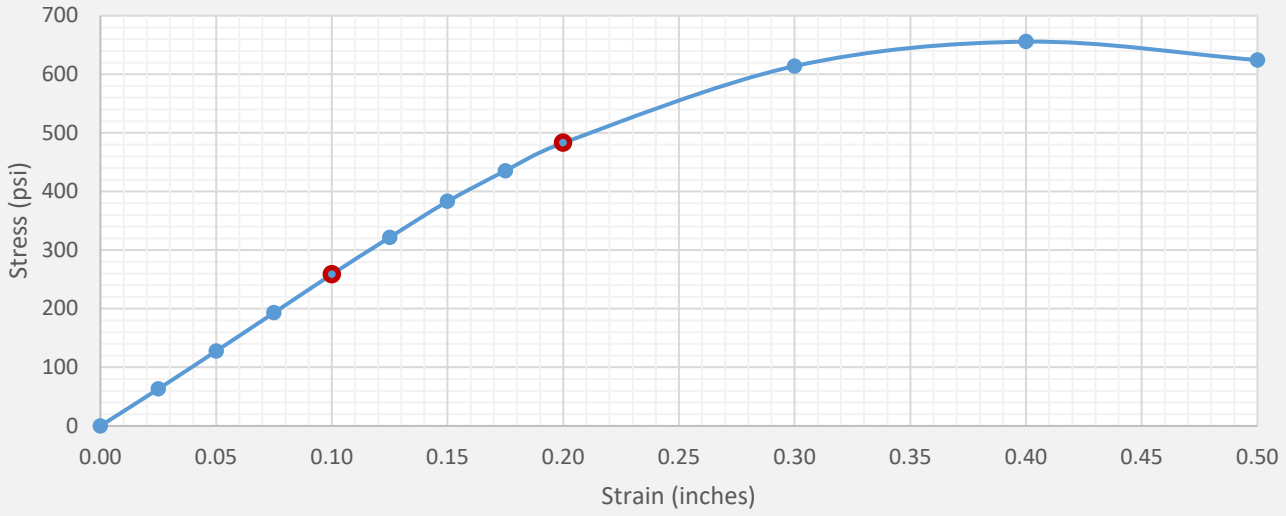
Project Name	US 278 Grays Highway Emergency Repairs			Project No.	G7100.006
Sample Location	BS-3			FME Lab ID	24-3760
Soil Description	Silty SAND (SM/A-2-4)			Depth/Elev.	0.0 - 5.0
Date Sampled	--	Sampled By:	F&ME	Date Received	10/21/2024
Date Test Began	10/25/2024	Date Completed	10/29/2024	Tested By	JJ

MOLDING CHARACTERISTICS

Method	AASHTO T99 - Method A	% Retained on 3/4" Sieve	0%
Max Dry Density (lb/ft^3)	112.8	Optimum Moisture Content (%)	12.4
Soak Time (hr)	96	Surcharge Weight (lb)	10.0

TESTING RESULTS

CBR at 0.10-inch penetration	CBR at 0.20-inch penetration
25.9	**32.2**



Before Soaking	
Dry Density (lb/ft^3)	111.4
Moisture Content	12.3%
Percent Compaction	98.8%
Percent Shrink/Swell	--

After Soaking	
Dry Density (lb/ft^3)	111.1
Moisture Content (Top 1")	15.3%
Percent Compaction	98.5%
Percent Shrink/Swell	0.1%

ADDITIONAL COMMENTS

Target %Compaction = 100%

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10/30/24

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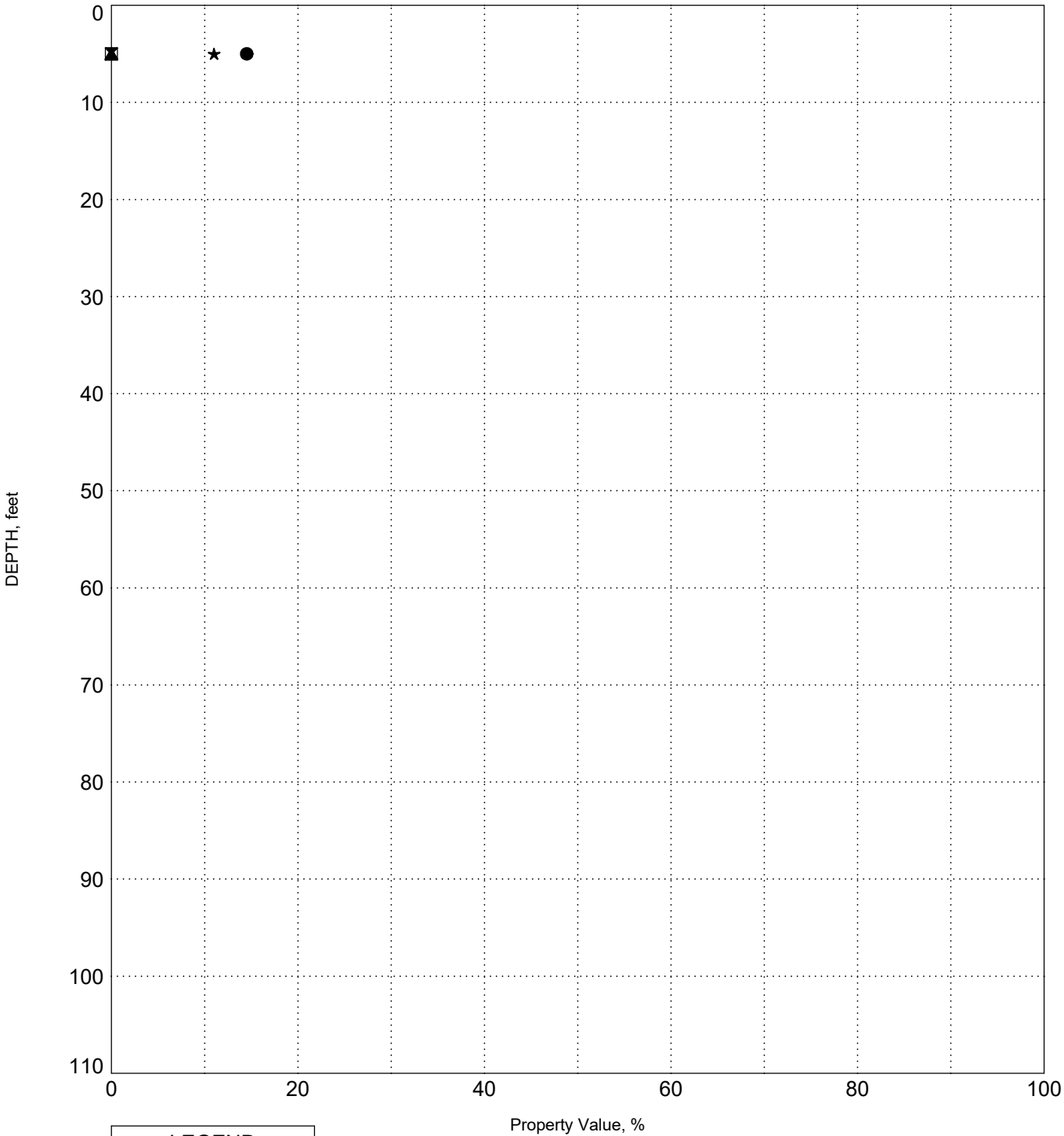
INDEX PROPERTIES VERSUS DEPTH

PROJECT ID P043789 **PROJECT NAME** US 278 Grays Highway Emergency Repairs

PROJECT COUNTY Jasper

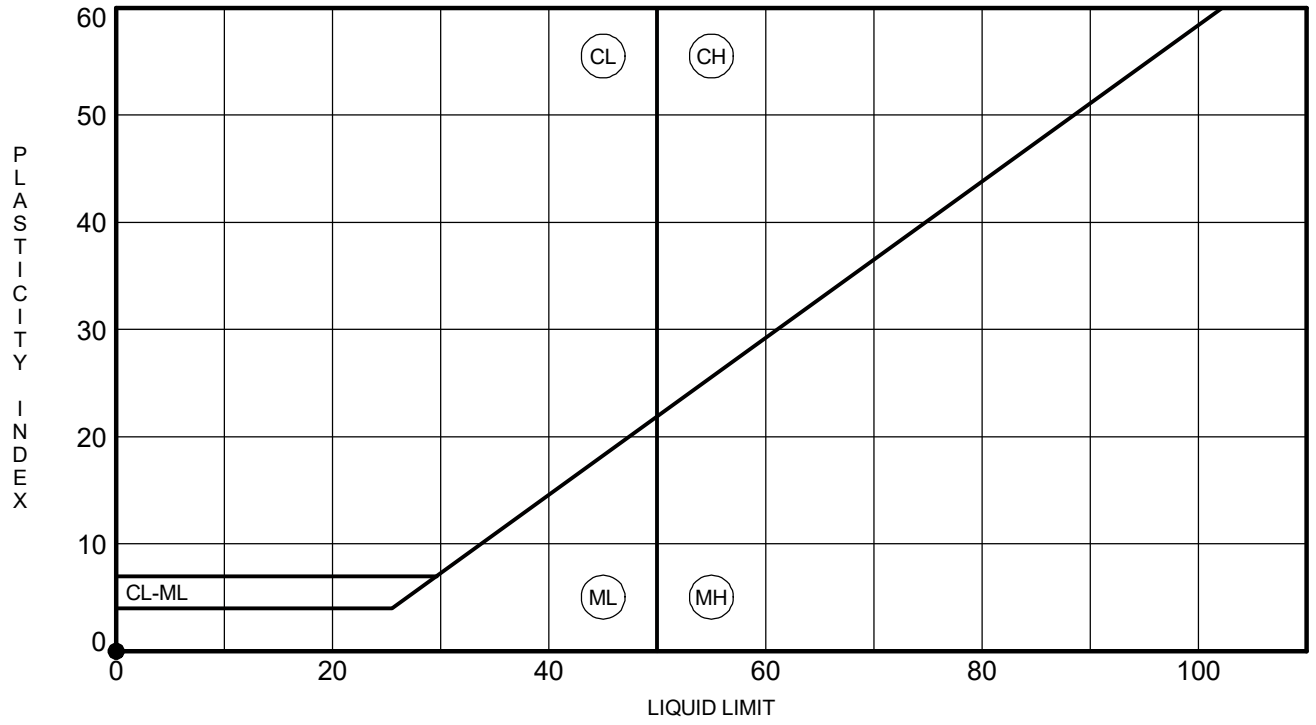
BORING BS-4



ATTERBERG LIMITS' RESULTS

PROJECT ID P043789 **PROJECT NAME** US 278 Grays Highway Emergency Repairs

PROJECT COUNTY Jasper

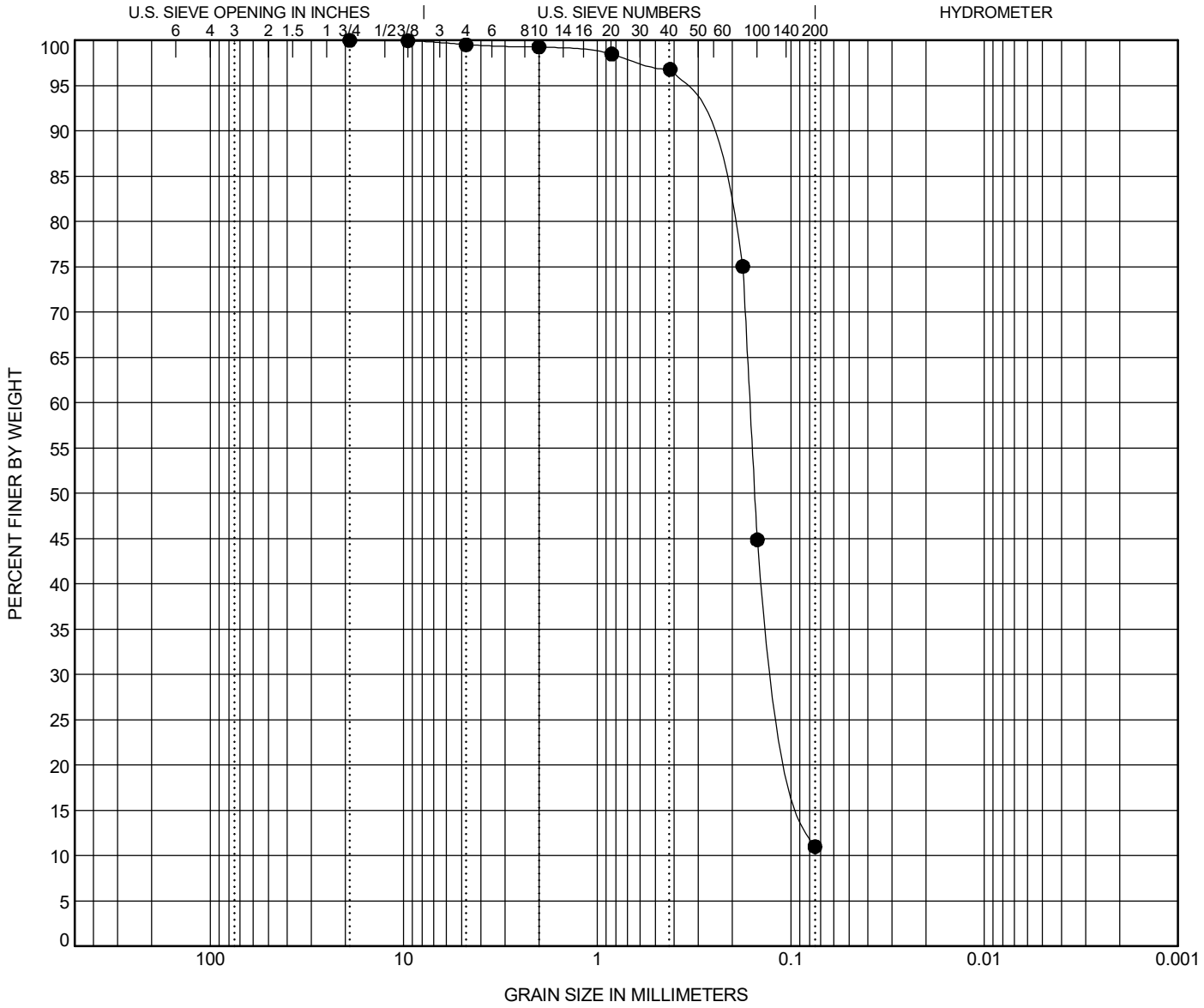


	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**BS-4**	**5.0**	**NP**	**NP**	**NP**	**11**	**POORLY GRADED SAND with SILT (SP-SM/A-2-4)**

GRAIN SIZE DISTRIBUTION

PROJECT ID P043789 **PROJECT NAME** US 278 Grays Highway Emergency Repairs

PROJECT COUNTY Jasper



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**BS-4**	**5.0**	**POORLY GRADED SAND with SILT (SP-SM/A-2-4)**	**NP**	**NP**	**NP**	**1.02**	**2.21**

	BOREHOLE	DEPTH	D90	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**BS-4**	**5.0**	**0.321**	**0.162**	**0.11**		**0.5**	**88.5**	**11.0**	

REV 04/2024

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MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT: US 278 Grays Highway Emergency Repairs **SCDOT PROJECT No.:** P043789

SAMPLE NUMBER: 24-3761 **DATE SAMPLE RECEIVED:** 10/16/2024

DESCRIPTION OF SOIL: Poorly Graded SAND with Silt (SP-SM/A-2-4)

TESTED BY: LiAnn Johnson & Tyler Ennis **DATE SETUP:** 10/21/2024

WEIGHED BY: Ashley Burgess **DATE OF WEIGHING:** 10/22/2024

BORING NO.	BS-4				
SAMPLE NO.	--				
SAMPLE DEPTH (FT.)	0.0 - 5.0				
WATER CONTENT, W%	14.5				

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH (FT.)					
WATER CONTENT, W%					

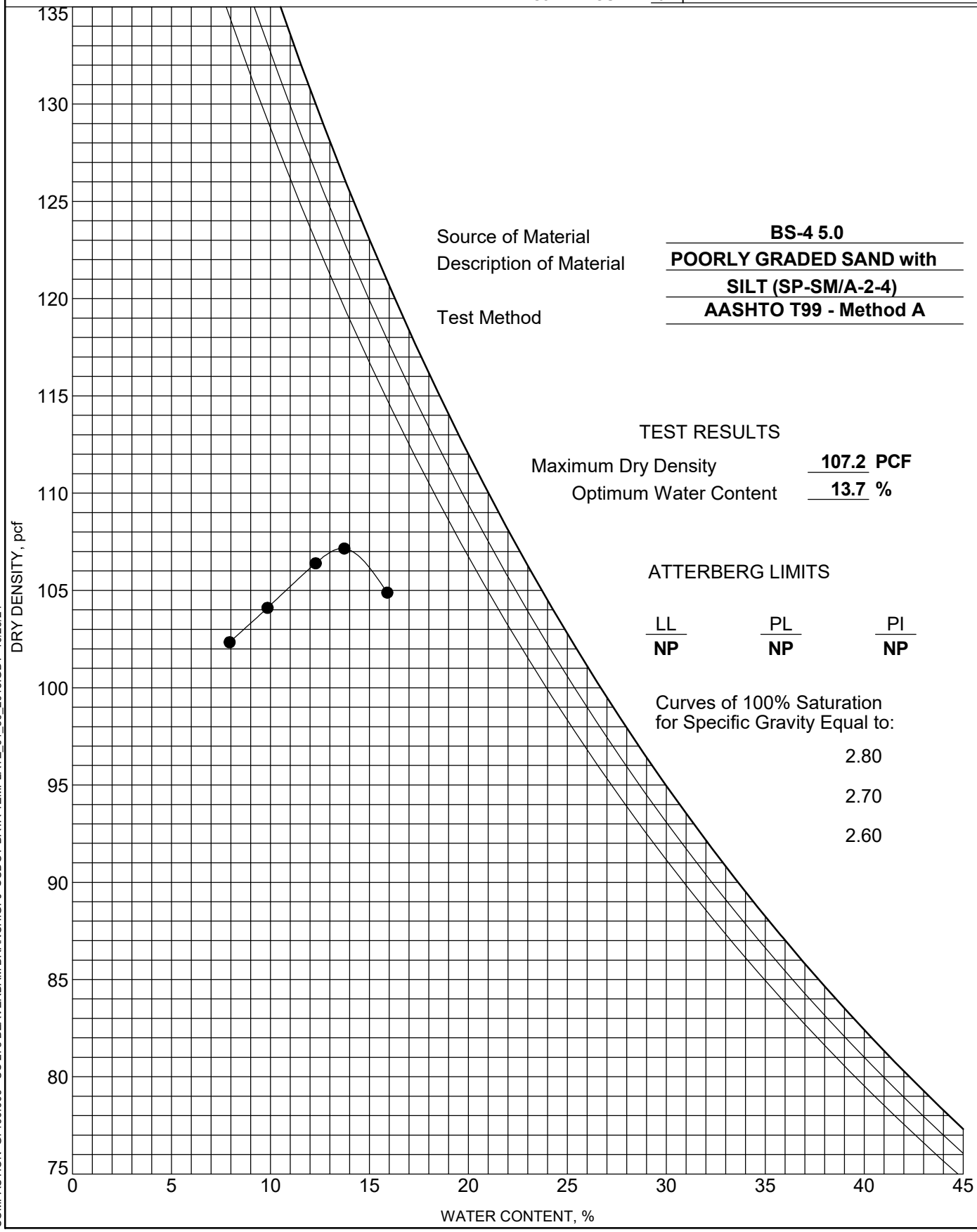
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH (FT.)					
WATER CONTENT, W%					

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH (FT.)					
WATER CONTENT, W%					

MOISTURE-DENSITY RELATIONSHIP

PROJECT ID P043789 **PROJECT NAME** US 278 Grays Highway Emergency Repairs

PROJECT COUNTY Jasper



Source of Material **BS-4 5.0**

Description of Material **POORLY GRADED SAND with SILT (SP-SM/A-2-4)**

Test Method **AASHTO T99 - Method A**

TEST RESULTS

Maximum Dry Density **107.2** **PCF**

Optimum Water Content **13.7** **%**

ATTERBERG LIMITS

LL	PL	PI
NP	**NP**	**NP**

Curves of 100% Saturation for Specific Gravity Equal to:

2.80

2.70

2.60

COMPACTION G7100.006 - US 278 BEAVERDAM BRANCH.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/26/24

REV 01/2023

CALIFORNIA BEARING RATIO (CBR)
AASHTO T193

SAMPLE INFORMATION

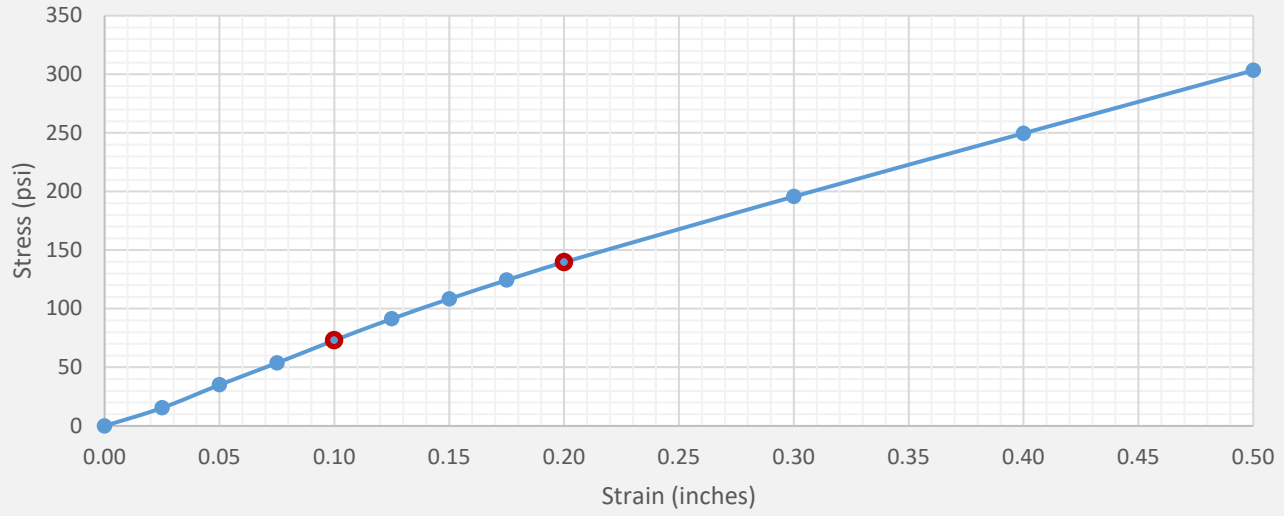
Project Name	US 278 Grays Highway Emergency Repairs			Project No.	G7100.006
Sample Location	BS-4			FME Lab ID	24-3761
Soil Description	Poorly Graded SAND with Silt (SP-SM/A-2-4)			Depth/Elev.	0.0 - 5.0
Date Sampled	--	Sampled By:	F&ME	Date Received	10/21/2024
Date Test Began	10/25/2024	Date Completed	10/29/24	Tested By	JJ

MOLDING CHARACTERISTICS

Method	AASHTO T99 - Method A	% Retained on 3/4" Sieve	0%
Max Dry Density (lb/ft^3)	107.2	Optimum Moisture Content (%)	13.7
Soak Time (hr)	96	Surcharge Weight (lb)	10.0

TESTING RESULTS

CBR at 0.10-inch penetration	CBR at 0.20-inch penetration
7.3	**9.3**



Before Soaking	
Dry Density (lb/ft^3)	97.0
Moisture Content	13.5%
Percent Compaction	90.4%
Percent Shrink/Swell	--

After Soaking	
Dry Density (lb/ft^3)	100.4
Moisture Content (Top 1")	16.4%
Percent Compaction	93.6%
Percent Shrink/Swell	0.0%

ADDITIONAL COMMENTS

Target %Compaction = 90%

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Reviewed By

10/30/24

Date

REV 01/2023

CALIFORNIA BEARING RATIO (CBR)
AASHTO T193

SAMPLE INFORMATION

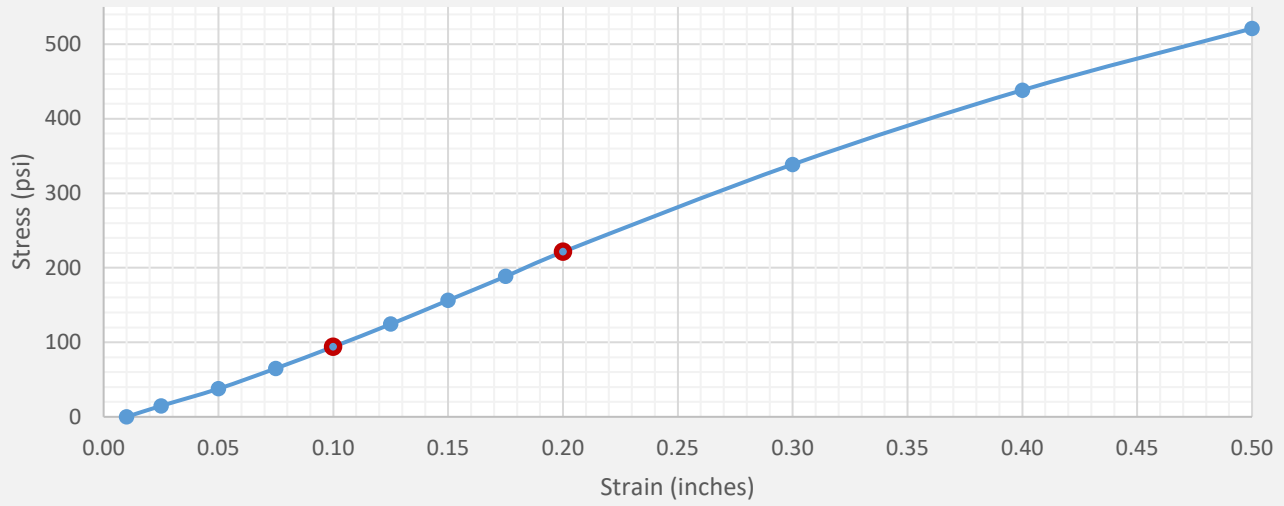
Project Name	US 278 Grays Highway Emergency Repairs			Project No.	G7100.006
Sample Location	BS-4			FME Lab ID	24-3761
Soil Description	Poorly Graded SAND with Silty (SP-SM/A-2-4)			Depth/Elev.	0.0 - 5.0
Date Sampled	--	Sampled By:	F&ME	Date Received	10/21/2024
Date Test Began	10/25/2024	Date Completed	10/29/24	Tested By	JJ

MOLDING CHARACTERISTICS

Method	AASHTO T99 - Method A	% Retained on 3/4" Sieve	0%
Max Dry Density (lb/ft^3)	107.2	Optimum Moisture Content (%)	13.7
Soak Time (hr)	96	Surcharge Weight (lb)	10.0

TESTING RESULTS

Corrected CBR at 0.10-inch penetration	Corrected CBR at 0.20-inch penetration
10.5	**15.6**



Before Soaking	
Dry Density (lb/ft^3)	102.8
Moisture Content	13.4%
Percent Compaction	95.9%
Percent Shrink/Swell	--

After Soaking	
Dry Density (lb/ft^3)	102.0
Moisture Content (Top 1")	17.6%
Percent Compaction	95.2%
Percent Shrink/Swell	0.0%

ADDITIONAL COMMENTS

Target %Compaction = 95%

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10/30/24

Date

REV 01/2023

CALIFORNIA BEARING RATIO (CBR)
AASHTO T193

SAMPLE INFORMATION

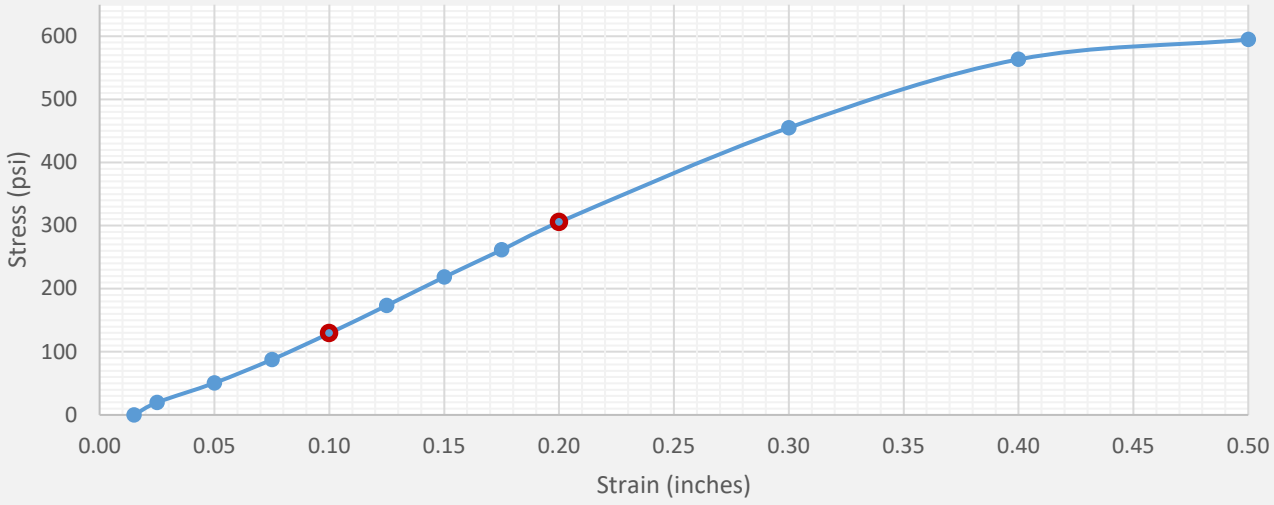
Project Name	US 278 Grays Highway Emergency Repairs			Project No.	G7100.006
Sample Location	BS-4			FME Lab ID	24-3761
Soil Description	Poorly Graded SAND with Silt (SP-SM/A-2-4)			Depth/Elev.	0.0 - 5.0
Date Sampled	--	Sampled By:	F&ME	Date Received	10/21/2024
Date Test Began	10/25/2024	Date Completed	10/29/24	Tested By	JJ

MOLDING CHARACTERISTICS

Method	AASHTO T99 - Method A	% Retained on 3/4" Sieve	0%
Max Dry Density (lb/ft^3)	107.2	Optimum Moisture Content (%)	13.7
Soak Time (hr)	96	Surcharge Weight (lb)	10.0

TESTING RESULTS

Corrected CBR at 0.10-inch penetration	Corrected CBR at 0.20-inch penetration
15.5	**21.9**



Before Soaking	
Dry Density (lb/ft^3)	107.4
Moisture Content	14.0%
Percent Compaction	100.2%
Percent Shrink/Swell	--

After Soaking	
Dry Density (lb/ft^3)	105.8
Moisture Content (Top 1")	17.9%
Percent Compaction	98.7%
Percent Shrink/Swell	0.1%

ADDITIONAL COMMENTS

Target %Compaction = 100%

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F&ME Consultants, Inc.

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Alix M Armstrong

Reviewed By

10/30/24

Date

APPENDIX

SECTION 5 LABORATORY TEST RESULTS

SECTION 5D CORROSION SERIES TESTING

CORROSION SERIES SUMMARY

SCDOT

PROJECT ID P043789 **PROJECT NAME** US 278 Grays Highway Emergency Repairs

PROJECT COUNTY Jasper

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/DHT-1	SS-1/SS-2	2.0 – 6.0	5	27,218	7	46
B-2	SS-7/SS-8	12.0 – 16.0	7	19,964	6	54
BS-1	--	0.0 – 5.0	5	37,200	2	48
BS-2	--	0.0 – 5.0	5	27,900	2	67

pH DTERMINTATION
(AASHTO T289)

Project Name:	US 278 Grays Highway Emergency Repairs	SCDOT Project Number:	P043789
FME Project Number:	G7100.006	Sample Elevation/Depth:	--
Description of Sample:	Various	Date Received	10/21/2024
Tested By:	LJ/JM	Date Tested:	10/23/2024

Boring ID	B-1/DHT-1
Boring Depth	2.0 - 6.0
FME Lab ID No.	24-3758
pH Value	5.47
Temperature (˚C)	21.3

Date Reviewed: 10/23/2024 Reviewed By: A. Abernethy

SOIL RESISTIVITY
(AASHTO T288)

Project Name:	US 278 Grays Highway Emergency Repairs	SCDOT Project ID:	P043789
Location:	B-1	FME Lab ID No.:	24-3758
Sampled By:	Grace Cantele	Date Sampled:	--
Soil Description:	Various	Date Received:	10/21/2024
Tested By:	AGB	Date Tested:	10/24/2024

Sample Number	Sample Depth (ft.)	Minimum Soil Resistivity, Ω-cm
SS-2, SS-3	2.0 - 6.0	27,218

Date Reviewed: 10/31/2024 Reviewed By: A. Abernethy

CHLORIDE ION CONTENT IN SOILS

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

Client:	F&ME Consultants, Inc.	Boring No.:	B-1
Client Reference:	Beaverdam Branch G7100.006	Depth (ft):	2.0-6.0'
Project No.:	2024-786-001	Sample No.:	SS-2/SS-3
Lab ID:	2024-786-001-001	Description:	Brown Soil

(- # 10 Sieve material)

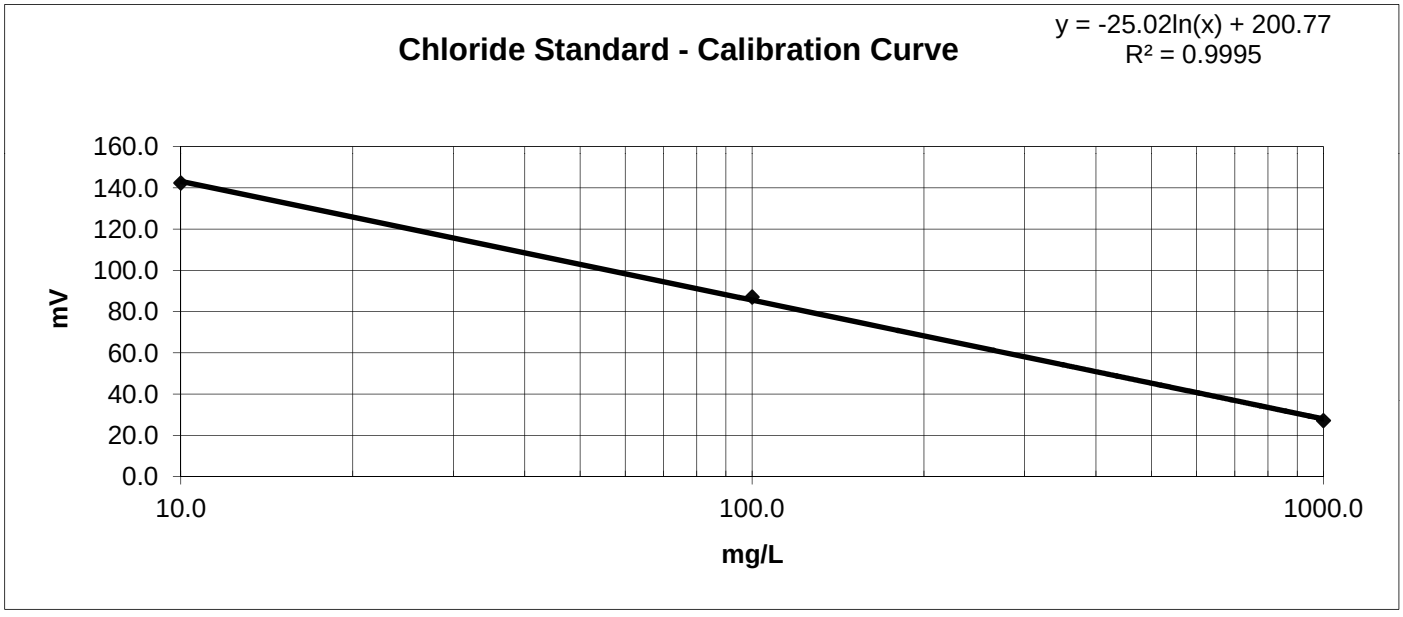
CHLORIDE STANDARD: CALIBRATION CURVE

STANDARD		MILLIVOLTS (mV)
10.0	mg/L	142.4
100.0	mg/L	87.1
1000.0	mg/L	27.2

MEASUREMENT OF CHLORIDES

		CONCENTRATION (mg/L)	CONCENTRATION (mg/kg)
Sample Weight (g):	100.0		
Water added to Sample (ml):	100.0		
Size of Sample Aliquot (ml):	25.0		
Sample Reading (mV):	152.9	6.78	6.78

Notes: 1) Samples and standards were buffered by the addition of an equal volume of the 0.2 M KNO_3 solution (1:1 volume).
2) Samples were dried for a minimum of 12 hours at 110 $^{+}/_{-}$ 5^{o}C.



Notes:

Tested By JAM Date 10/30/24 Checked By KC Date 10/30/24

DCN: CT-S63A DATE: 6/2/14 REVISION: 1

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Water-Soluble Sulfate Ion Content in Soil

AASHTO T 290-95 (2020)

Client:	F&ME Consultants, Inc.	Boring No.:	B-1
Client Reference:	Beaverdam Branch G7100.006	Depth (ft):	2.0-6.0'
Project No.:	2024-786-001	Sample No.:	SS-2/SS-3
Lab ID:	2024-786-001-001	Soil Description:	Brown Soil

Sulfate Standard - Calibration Curve Spectrophotometer Readings

Sulfate Ion Concentrations (mg/L)

0.0	4.0	10.0	20.0	30.0	40.0	60.0	80.0	100.0

Spectrophotometer Readings (FAU)

Underrange	Underrange	7	20	42	63	112	163	243

Measurement of Barium Chloride Turbidity

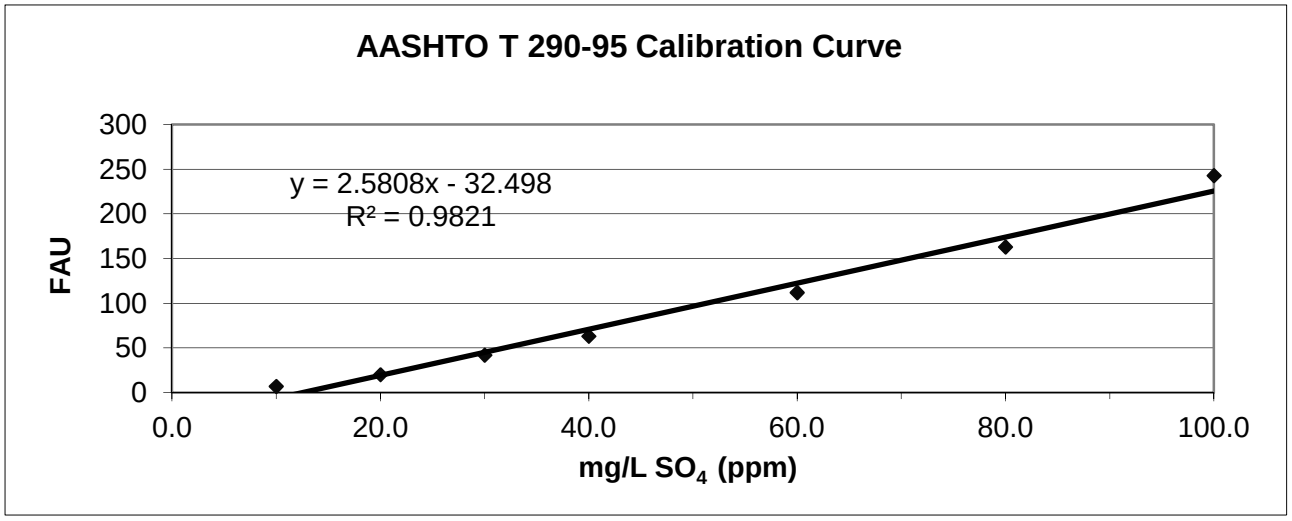
(Sample contains 5.0 mL NaCl solution and 0.3 g $BaCl_2 \cdot 2H_2O$)

Sample Weight (g):	100.0
Water added to Sample (mL):	300.0
Size of Sample Aliquot (mL):	50.0
Sample Reading (FAU):	7
Sample Diluted:	No
Sulfate Solution Added (ml):	0

Sample Moisture Content

Tare Number:	606
Weight of Tare & Wet Sample (g):	210.66
Weight of Tare & Dry Sample (g):	210.45
Weight of Tare (g):	84.83
Weight of Water (g):	0.21
Weight of Dry Sample (g):	125.62
Moisture Content (%):	0.17

Sample Sulfate Ion Concentration:	15.30	**mg/L SO_4 (ppm)**
Sample Sulfate Ion Content:	45.9	**mg/Kg SO_4 (not corrected for moisture)**
Sample Sulfate Ion Content:	46.0	**mg/Kg SO_4 (corrected for moisture)**



Tested by: JAM Date: 10/30/24 Checked by: KC Date: 10/30/24

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pH DTERMINTATION
(AASHTO T289)

Project Name:	US 278 Grays Highway Emergency Repairs	SCDOT Project Number:	P043789
FME Project Number:	G7100.006	Sample Elevation/Depth:	--
Description of Sample:	Various	Date Received	10/21/2024
Tested By:	LJ/JM	Date Tested:	10/23/2024

Boring ID	B-2
Boring Depth	12.0 - 16.0
FME Lab ID No.	24-3759
pH Value	7.00
Temperature (˚C)	21.2

Date Reviewed: 10/23/2024 Reviewed By: A. Abernethy

SOIL RESISTIVITY
(AASHTO T288)

Project Name:	US 278 Grays Highway Emergency Repairs	SCDOT Project ID:	P043789
Location:	B-2	FME Lab ID No.:	24-3759
Sampled By:	Grace Cantele	Date Sampled:	--
Soil Description:	Various	Date Received:	10/21/2024
Tested By:	AGB	Date Tested:	10/24/2024

Sample Number	Sample Depth (ft.)	Minimum Soil Resistivity, Ω-cm
SS-7, SS-8	12.0 - 16.0	19,964

Date Reviewed: 10/31/2024 Reviewed By: A. Abernethy

CHLORIDE ION CONTENT IN SOILS

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

Client:	F&ME Consultants, Inc.	Boring No.:	B-2
Client Reference:	Beaverdam Branch G7100.006	Depth (ft):	12.0-16.0'
Project No.:	2024-786-001	Sample No.:	SS-7/SS-8
Lab ID:	2024-786-001-002	Description:	Dark Brown Soil

(- # 10 Sieve material)

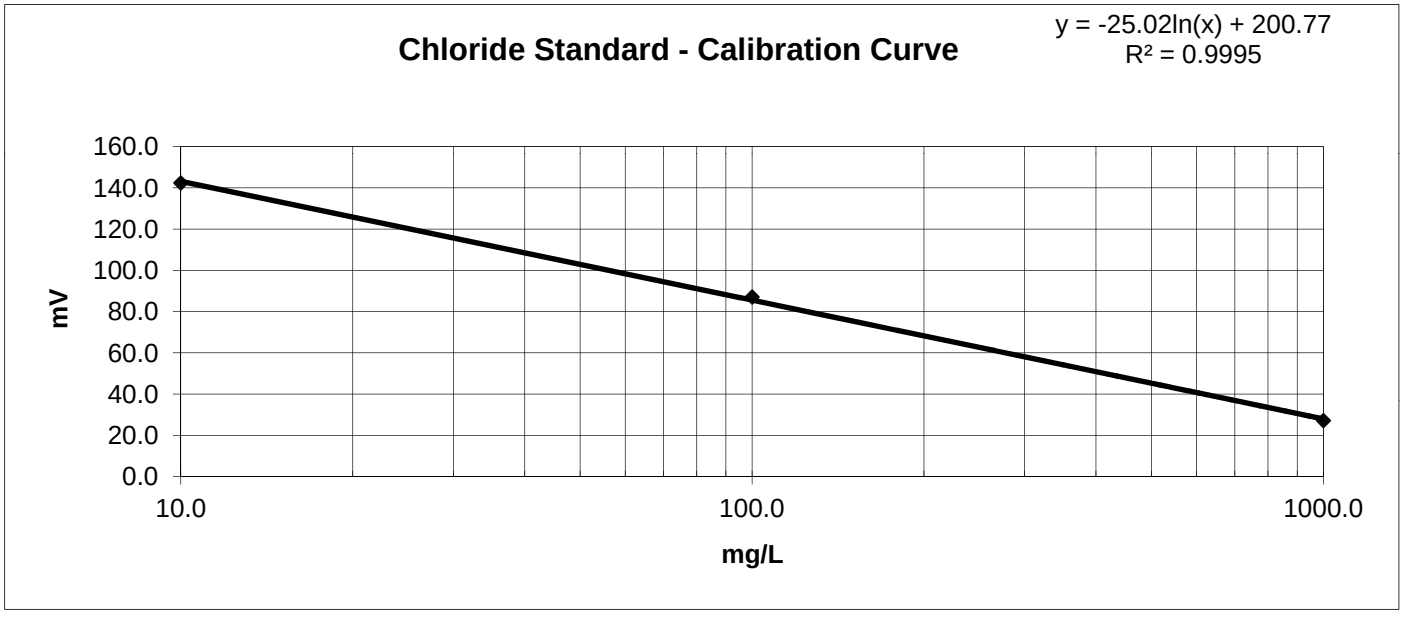
CHLORIDE STANDARD: CALIBRATION CURVE

STANDARD		MILLIVOLTS (mV)
10.0	mg/L	142.4
100.0	mg/L	87.1
1000.0	mg/L	27.2

MEASUREMENT OF CHLORIDES

		CONCENTRATION (mg/L)	CONCENTRATION (mg/kg)
Sample Weight (g):	100.0		
Water added to Sample (ml):	100.0		
Size of Sample Aliquot (ml):	25.0		
Sample Reading (mV):	154.0	6.49	6.49

Notes: 1) Samples and standards were buffered by the addition of an equal volume of the 0.2 M KNO_3 solution (1:1 volume).
2) Samples were dried for a minimum of 12 hours at 110 $^{+}/_{-}$ 5^{o}C.



Notes:

Tested By	JAM	Date	10/30/24	Checked By	KC	Date	10/30/24

DCN: CT-S63A DATE: 6/2/14 REVISION: 1

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Water-Soluble Sulfate Ion Content in Soil

AASHTO T 290-95 (2020)

Client:	F&ME Consultants, Inc.	Boring No.:	B-2
Client Reference:	Beaverdam Branch G7100.006	Depth (ft):	12.0-16.0'
Project No.:	2024-786-001	Sample No.:	SS-7/SS-8
Lab ID:	2024-786-001-002	Soil Description:	Dark Brown Soil

Sulfate Standard - Calibration Curve Spectrophotometer Readings

Sulfate Ion Concentrations (mg/L)

0.0	4.0	10.0	20.0	30.0	40.0	60.0	80.0	100.0

Spectrophotometer Readings (FAU)

Underrange	Underrange	7	20	42	63	112	163	243

Measurement of Barium Chloride Turbidity

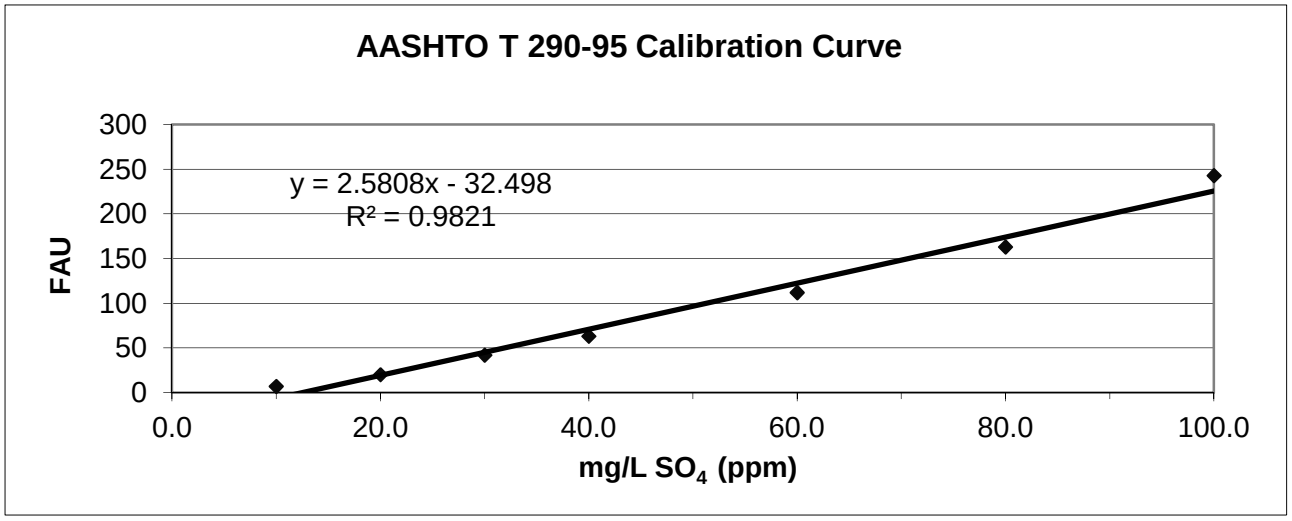
(Sample contains 5.0 mL NaCl solution and 0.3 g $BaCl_2 \cdot 2H_2O$)

Sample Weight (g):	100.0
Water added to Sample (mL):	300.0
Size of Sample Aliquot (mL):	50.0
Sample Reading (FAU):	14
Sample Diluted:	No
Sulfate Solution Added (ml):	0

Sample Moisture Content

Tare Number:	888
Weight of Tare & Wet Sample (g):	239.49
Weight of Tare & Dry Sample (g):	239.36
Weight of Tare (g):	110.05
Weight of Water (g):	0.13
Weight of Dry Sample (g):	129.31
Moisture Content (%):	0.10

Sample Sulfate Ion Concentration:	18.02	**mg/L SO_4 (ppm)**
Sample Sulfate Ion Content:	54.0	**mg/Kg SO_4 (not corrected for moisture)**
Sample Sulfate Ion Content:	54.1	**mg/Kg SO_4 (corrected for moisture)**



Tested by: JAM Date: 10/30/24 Checked by: KC Date: 10/30/24

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pH DTERMINTATION
(AASHTO T289)

Project Name:	US 278 Grays Highway Emergency Repairs	SCDOT Project Number:	P043789
FME Project Number:	G7100.006	Sample Elevation/Depth:	--
Description of Sample:	Silty SAND (SM/A-2-4)	Date Received	10/15/2024
Tested By:	LJ/JM	Date Tested:	10/21/2024

Boring ID	BS-1
Boring Depth	0 - 5
FME Lab ID No.	24-3631
pH Value	5.41
Temperature (˚C)	20.6˚C

Date Reviewed: 10/21/2024 Reviewed By: A. Abernethy

SOIL RESISTIVITY
(AASHTO T288)

Project Name:	US 278 Grays Highway Emergency Repairs	SCDOT Project ID:	P043789
Location:	BS-1	FME Lab ID No.:	24-3631
Sampled By:	Grace Cantele	Date Sampled:	--
Soil Description:	Silty SAND (SM/A-2-4)	Date Received:	10/15/2024
Tested By:	AGB	Date Tested:	10/21/2024

Sample Number	Sample Depth (ft.)	Minimum Soil Resistivity, Ω-cm
BS-1	0.0 - 5.0	37,200

Date Reviewed: 10/26/2024 Reviewed By: A. Abernethy

CHLORIDE ION CONTENT IN SOILS

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

Client:	F&ME Consultants, Inc.	Boring No.:	BS-1
Client Reference:	Beaverdam Branch G7100.006	Depth (ft):	NA
Project No.:	2024-761-001	Sample No.:	BS-1
Lab ID:	2024-761-001-001	Description:	BROWN

(- # 10 Sieve material)

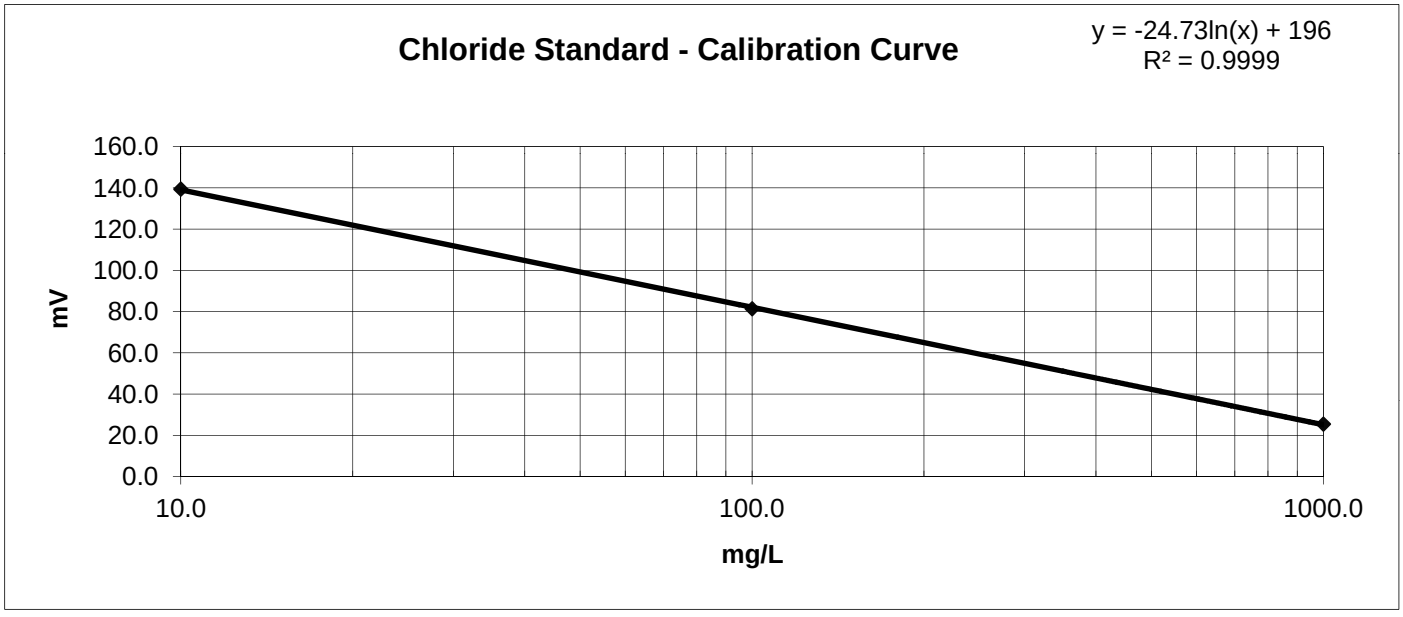
CHLORIDE STANDARD: CALIBRATION CURVE

STANDARD		MILLIVOLTS (mV)
10.0	mg/L	139.4
100.0	mg/L	81.4
1000.0	mg/L	25.5

MEASUREMENT OF CHLORIDES

		CONCENTRATION (mg/L)	CONCENTRATION (mg/kg)
Sample Weight (g):	100.0		
Water added to Sample (ml):	100.0		
Size of Sample Aliquot (ml):	25.0		
Sample Reading (mV):	177.9	2.08	2.08

Notes: 1) Samples and standards were buffered by the addition of an equal volume of the 0.2 M KNO_3 solution (1:1 volume).
2) Samples were dried for a minimum of 12 hours at 110 $^{+}/_{-}$ 5^{o}C.



Notes:

Tested By	JAM	Date	10/22/24	Checked By	GRK	Date	10/22/24

DCN: CT-S63A DATE: 6/2/14 REVISION: 1

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Water-Soluble Sulfate Ion Content in Soil

AASHTO T 290-95 (2020)

Client:	F&ME Consultants, Inc.	Boring No.:	BS-1
Client Reference:	Beaverdam Branch G7100.006	Depth (ft):	NA
Project No.:	2024-761-001	Sample No.:	BS-1
Lab ID:	2024-761-001-001	Soil Description:	Brown

Sulfate Standard - Calibration Curve Spectrophotometer Readings

Sulfate Ion Concentrations (mg/L)

0.0	4.0	10.0	20.0	30.0	40.0	60.0	80.0	100.0

Spectrophotometer Readings (FAU)

Underrange	Underrange	7	20	42	63	112	163	243

Measurement of Barium Chloride Turbidity

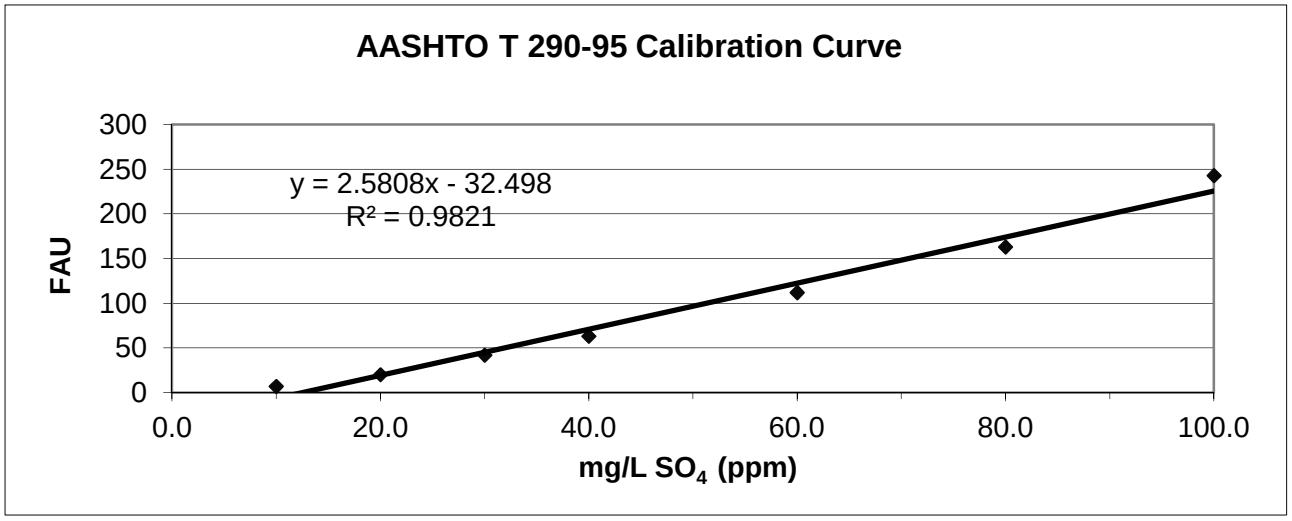
(Sample contains 5.0 mL NaCl solution and 0.3 g $BaCl_2 \cdot 2H_2O$)

Sample Weight (g):	100.0
Water added to Sample (mL):	300.0
Size of Sample Aliquot (mL):	50.0
Sample Reading (FAU):	9
Sample Diluted:	No
Sulfate Solution Added (ml):	0

Sample Moisture Content

Tare Number:	1705
Weight of Tare & Wet Sample (g):	205.92
Weight of Tare & Dry Sample (g):	205.51
Weight of Tare (g):	82.59
Weight of Water (g):	0.41
Weight of Dry Sample (g):	122.92
Moisture Content (%):	0.33

Sample Sulfate Ion Concentration:	16.08	**mg/L SO_4 (ppm)**
Sample Sulfate Ion Content:	48.2	**mg/Kg SO_4 (not corrected for moisture)**
Sample Sulfate Ion Content:	48.4	**mg/Kg SO_4 (corrected for moisture)**



Tested by: JAM Date: 10/22/24 Checked by: GRK Date: 10/22/24

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pH DTERMINTATION
(AASHTO T289)

Project Name:	US 278 Grays Highway Emergency Repairs	SCDOT Project Number:	P043789
FME Project Number:	G7100.006	Sample Elevation/Depth:	--
Description of Sample:	Silty SAND (SM/A-2-4)	Date Received	10/15/2024
Tested By:	LJ/JM	Date Tested:	10/21/2024

Boring ID	BS-2
Boring Depth	0 - 5
FME Lab ID No.	24-3630
pH Value	5.27
Temperature (˚C)	20.7˚C

Date Reviewed: 10/21/2024 Reviewed By: A. Abernethy

SOIL RESISTIVITY
(AASHTO T288)

Project Name:	US 278 Grays Highway Emergency Repairs	SCDOT Project ID:	P043789
Location:	BS-2	FME Lab ID No.:	24-3630
Sampled By:	Grace Cantele	Date Sampled:	--
Soil Description:	Silty SAND (SM/A-2-4)	Date Received:	10/15/2024
Tested By:	AGB	Date Tested:	10/21/2024

Sample Number	Sample Depth (ft.)	Minimum Soil Resistivity, Ω-cm
BS-2	0.0 - 5.0	27,900

Date Reviewed: 10/26/2024 Reviewed By: A. Abernethy

CHLORIDE ION CONTENT IN SOILS

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

Client:	F&ME Consultants, Inc.	Boring No.:	BS-2
Client Reference:	Beaverdam Branch G7100.006	Depth (ft):	NA
Project No.:	2024-761-001	Sample No.:	BS-2
Lab ID:	2024-761-001-002	Description:	BROWN

(- # 10 Sieve material)

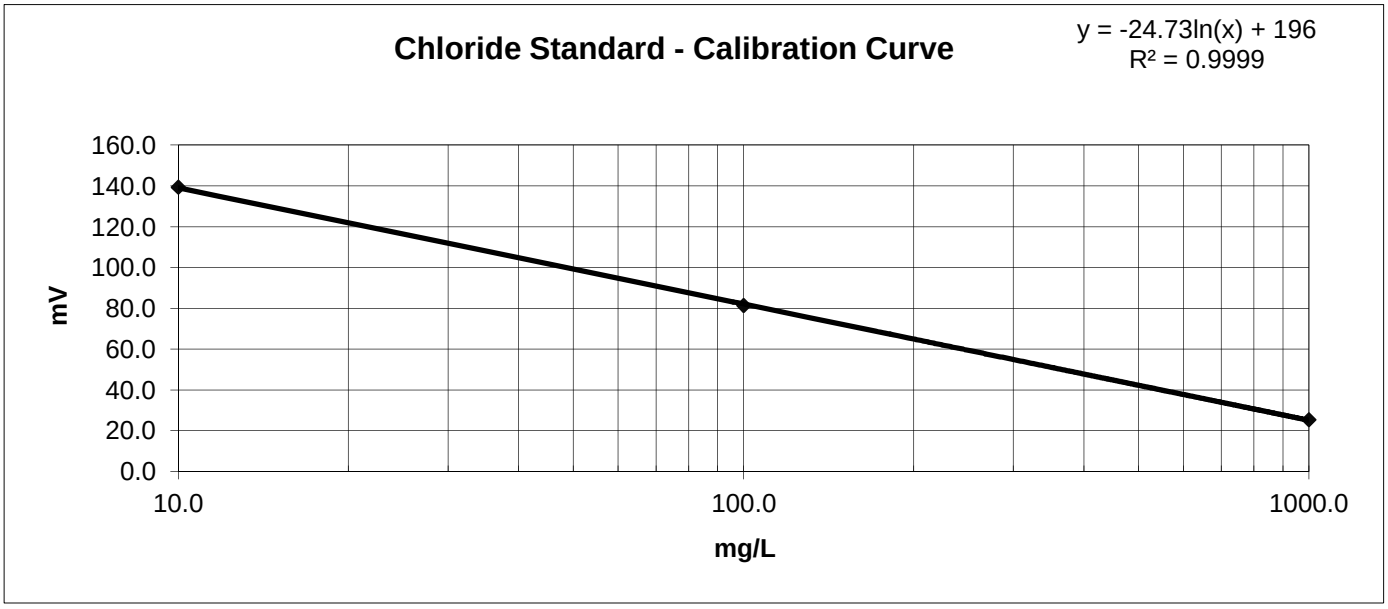
CHLORIDE STANDARD: CALIBRATION CURVE

STANDARD		MILLIVOLTS (mV)
10.0	mg/L	139.4
100.0	mg/L	81.4
1000.0	mg/L	25.5

MEASUREMENT OF CHLORIDES

		CONCENTRATION (mg/L)	CONCENTRATION (mg/kg)
Sample Weight (g):	100.0		
Water added to Sample (ml):	100.0		
Size of Sample Aliquot (ml):	25.0		
Sample Reading (mV):	176.4	2.21	2.21

Notes: 1) Samples and standards were buffered by the addition of an equal volume of the 0.2 M KNO_3 solution (1:1 volume).
2) Samples were dried for a minimum of 12 hours at 110 $^{+}/_{-}$ 5^{o}C.



Notes:

Tested By JAM Date 10/22/24 Checked By GRK Date 10/22/24

DCN: CT-S63A DATE: 6/2/14 REVISION: 1

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Water-Soluble Sulfate Ion Content in Soil

AASHTO T 290-95 (2020)

Client:	F&ME Consultants, Inc.	Boring No.:	BS-2
Client Reference:	Beaverdam Branch G7100.006	Depth (ft):	NA
Project No.:	2024-761-001	Sample No.:	BS-2
Lab ID:	2024-761-001-002	Soil Description:	Brown

Sulfate Standard - Calibration Curve Spectrophotometer Readings

Sulfate Ion Concentrations (mg/L)

0.0	4.0	10.0	20.0	30.0	40.0	60.0	80.0	100.0

Spectrophotometer Readings (FAU)

Underrange	Underrange	7	20	42	63	112	163	243

Measurement of Barium Chloride Turbidity

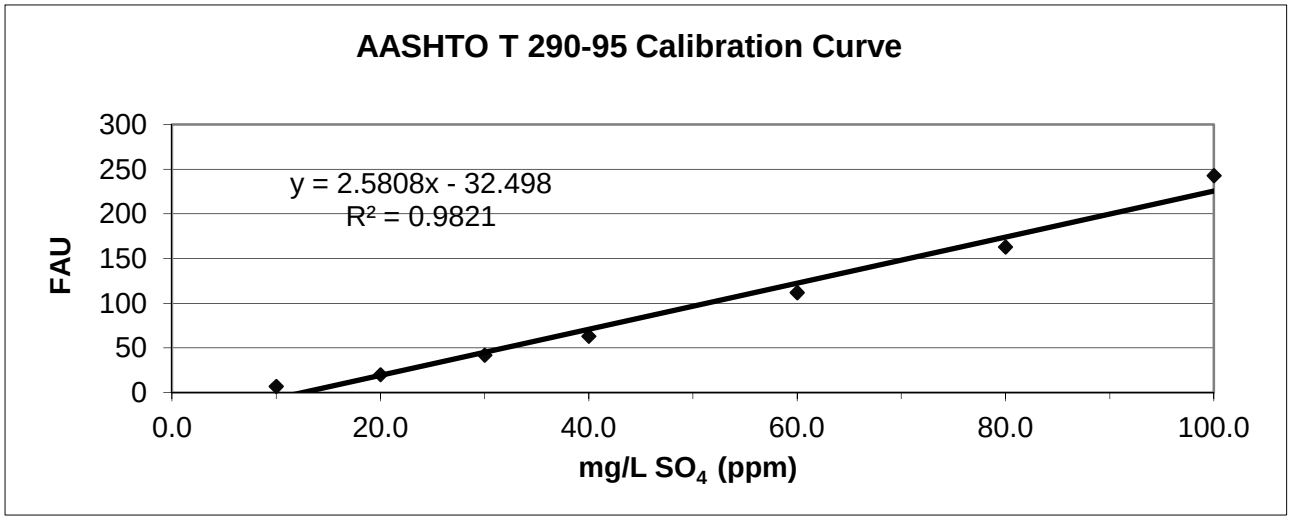
(Sample contains 5.0 mL NaCl solution and 0.3 g $BaCl_2 \cdot 2H_2O$)

Sample Weight (g):	100.0
Water added to Sample (mL):	300.0
Size of Sample Aliquot (mL):	50.0
Sample Reading (FAU):	25
Sample Diluted:	No
Sulfate Solution Added (ml):	0

Sample Moisture Content

Tare Number:	575
Weight of Tare & Wet Sample (g):	213.62
Weight of Tare & Dry Sample (g):	213.18
Weight of Tare (g):	81.84
Weight of Water (g):	0.44
Weight of Dry Sample (g):	131.34
Moisture Content (%):	0.34

Sample Sulfate Ion Concentration:	22.28	**mg/L SO_4 (ppm)**
Sample Sulfate Ion Content:	66.8	**mg/Kg SO_4 (not corrected for moisture)**
Sample Sulfate Ion Content:	67.1	**mg/Kg SO_4 (corrected for moisture)**



Tested by: JAM Date: 10/22/24 Checked by: GRK Date: 10/22/24

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APPENDIX

SECTION 6 ON-SITE DRILL RIG PHOTOS

Drill Rig Photos

B-1

B-2

CPT-1

CPT-2

Drill Rig Photos

CPT-3

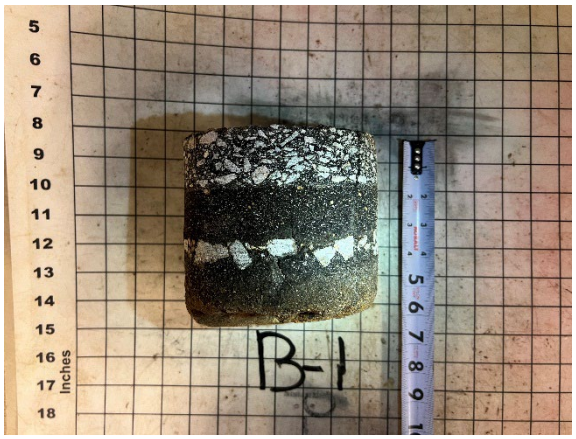
R-1

R-2

APPENDIX

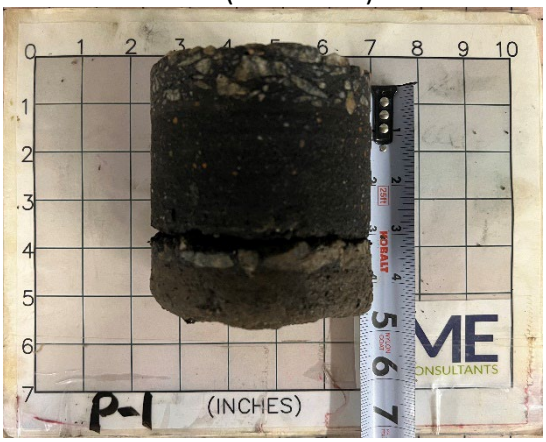
SECTION 7 PAVEMENT CORE PHOTOS

Asphalt Core Photos

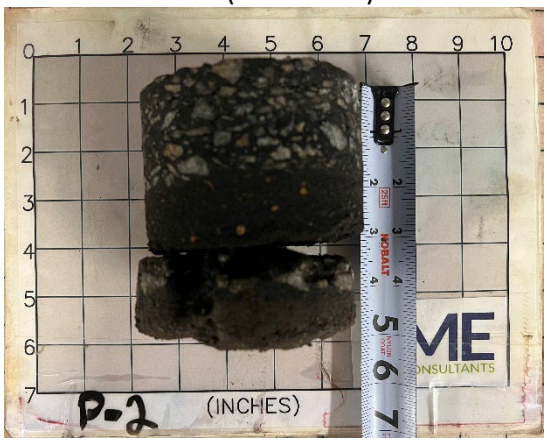


B-1 (5.0 inches)

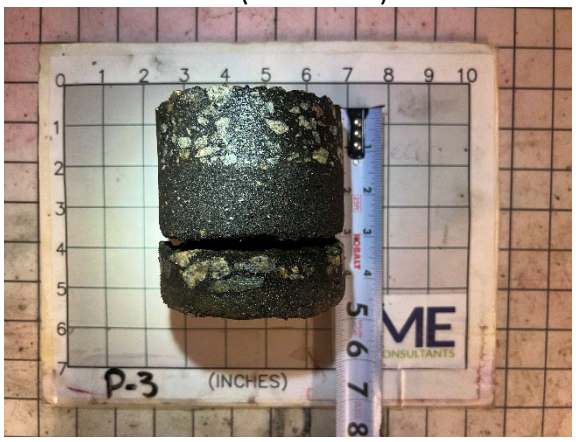
B-2 (4.0 inches)



P-1 (4.5 inches)



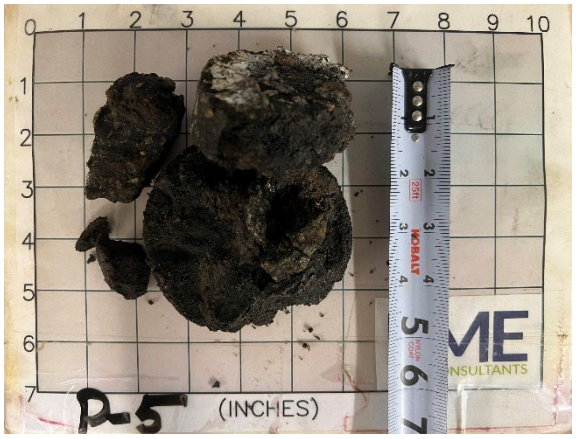
P-2 (4.5 inches)



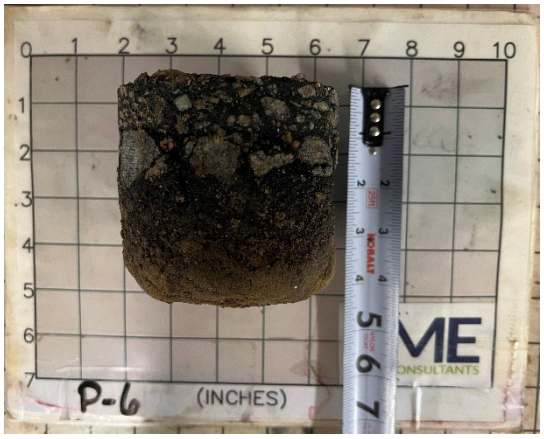
P-3 (3.0 inches)

P-4 (3.0 inches)

Asphalt Core Photos



P-5 (2.0 inches)



P-6 (3.5 inches)

R-1 (5.0 inches)

R-2 (1.5 inches)

APPENDIX

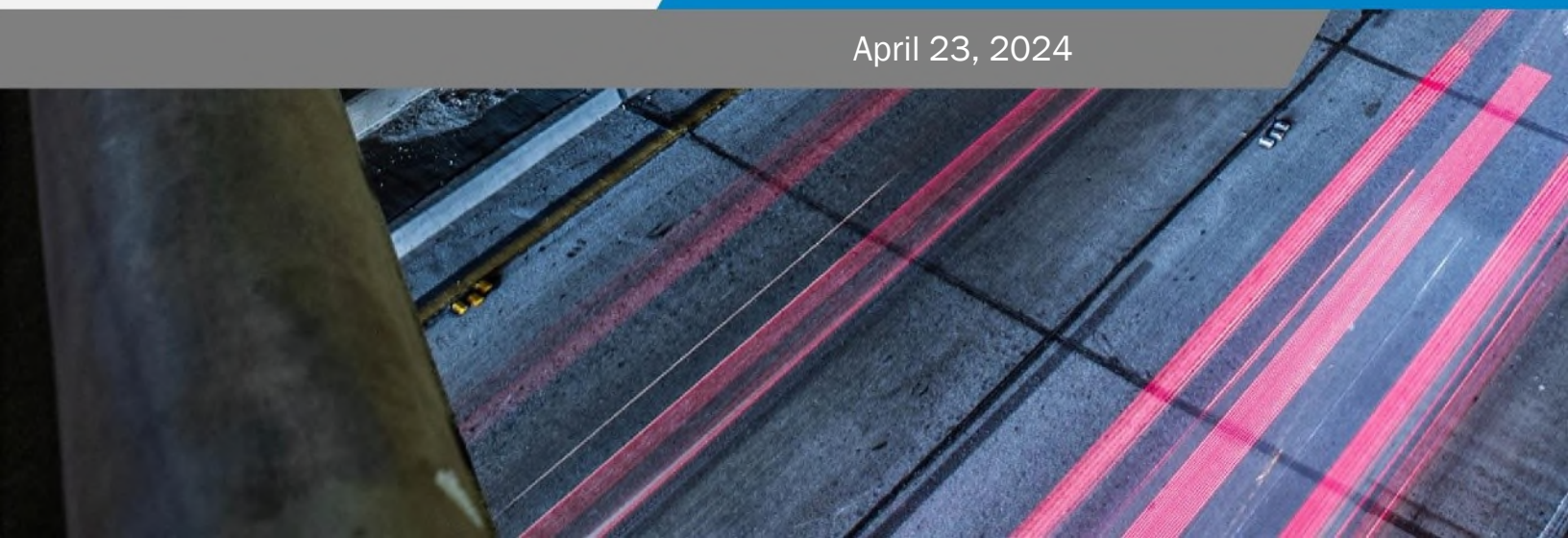
SECTION 8 SPT HAMMER CALIBRATION

CAROLINAS GEOTECHNICAL GROUP

Report of SPT Hammer Energy

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

April 23, 2024



CAROLINAS GEOTECHNICAL GROUP

N.C. Firm License: P-1904

2400 Crownpoint Executive Drive
Suite 800
Charlotte, NC 28227

(980) 339-8684
contact@carolinasgeotech.com
www.carolinasgeotech.com

April 23, 2024

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

SUBJECT: **Report of SPT Hammer Energy**
Breccia Construction, LLC CME 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.

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

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

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

DocuSigned by:
Robert E. Kral
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

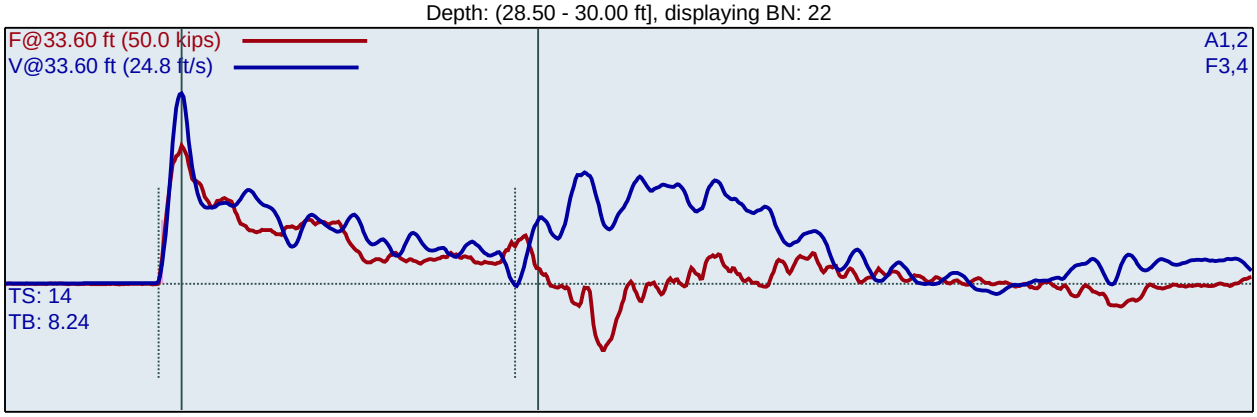
CME 45B (SN 303304)
REK
B-2

B-2
Interval start: 4/12/2024

AR: 1.13 in^2
LE: 33.60 ft
WS: 16807.9 ft/s

SP: 0.492 k/ft3
EM: 30000 ksi

Depth: (28.50 - 30.00 ft], displaying BN: 22



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.

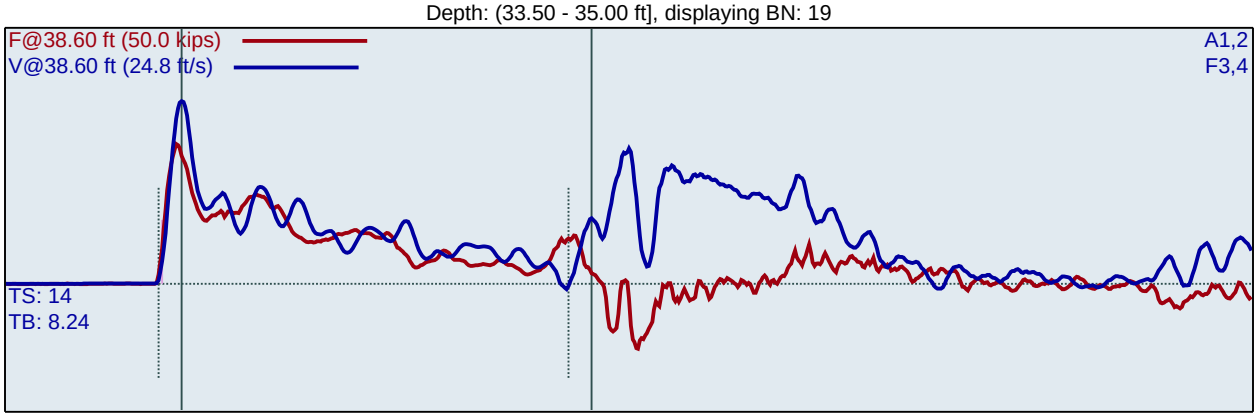
CME 45B (SN 303304)
REK
B-2

B-2
Interval start: 4/12/2024

AR: 1.13 in^2
LE: 38.60 ft
WS: 16807.9 ft/s

SP: 0.492 k/ft3
EM: 30000 ksi

Depth: (33.50 - 35.00 ft], displaying BN: 19



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

Sample Interval Time: 20.53 seconds.

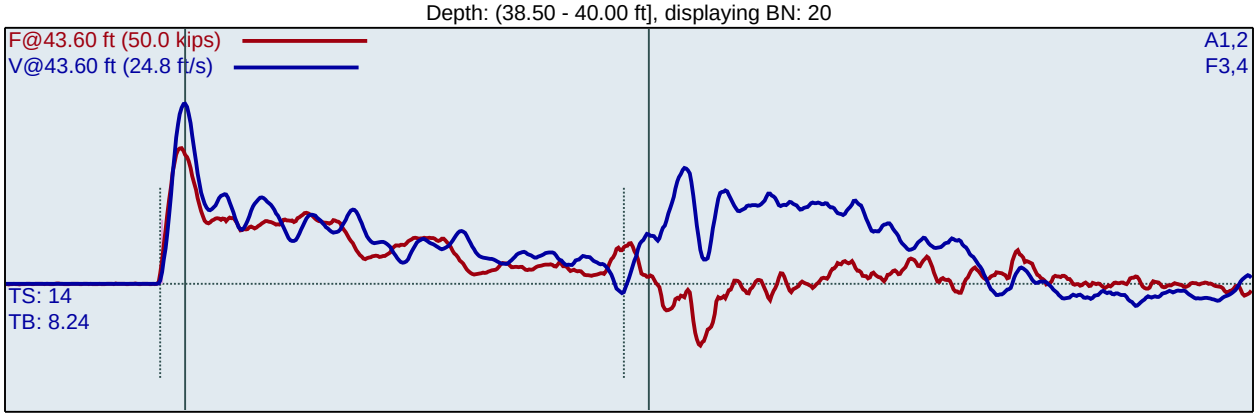
CME 45B (SN 303304)
REK
B-2

B-2
Interval start: 4/12/2024

AR: 1.13 in^2
LE: 43.60 ft
WS: 16807.9 ft/s

SP: 0.492 k/ft3
EM: 30000 ksi

Depth: (38.50 - 40.00 ft], displaying BN: 20



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
FMX: Maximum Force
VMX: Maximum Velocity
DMX: Maximum Displacement
CSX: Compression Stress Maximum
DFN: Final Displacement
EFV: Maximum Energy
ETR: Energy Transfer Ratio - Rated

Instr. 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

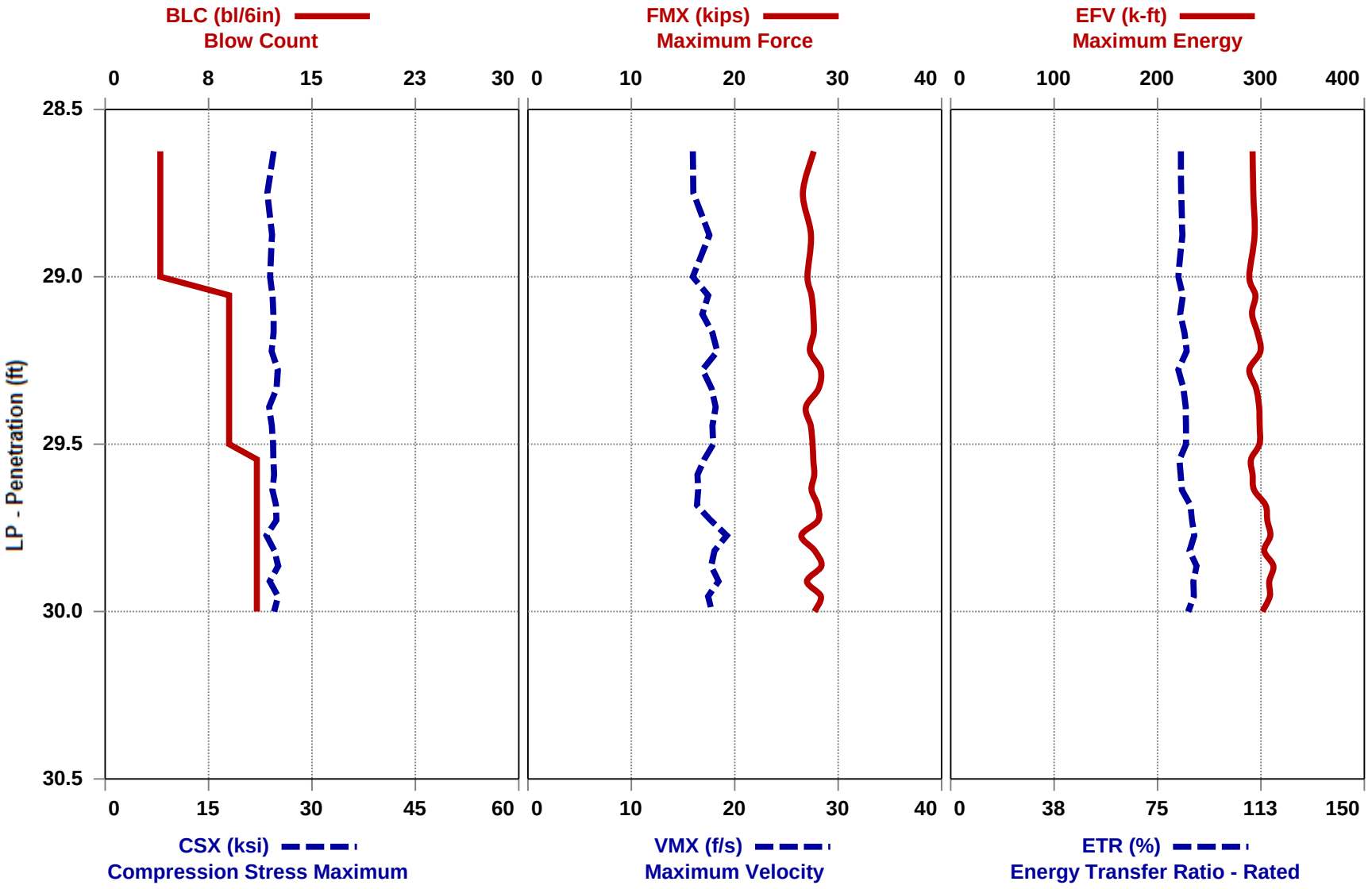
GRL Engineers, Inc. - PDIPLOT2 Ver 2021.1.61.0 - Case Method & iCAP® Results

Printed: 18-April-2024

Test started: 12-April-2024

CME 45B (SN 303304) - 28.5 TO 30.0

B-2



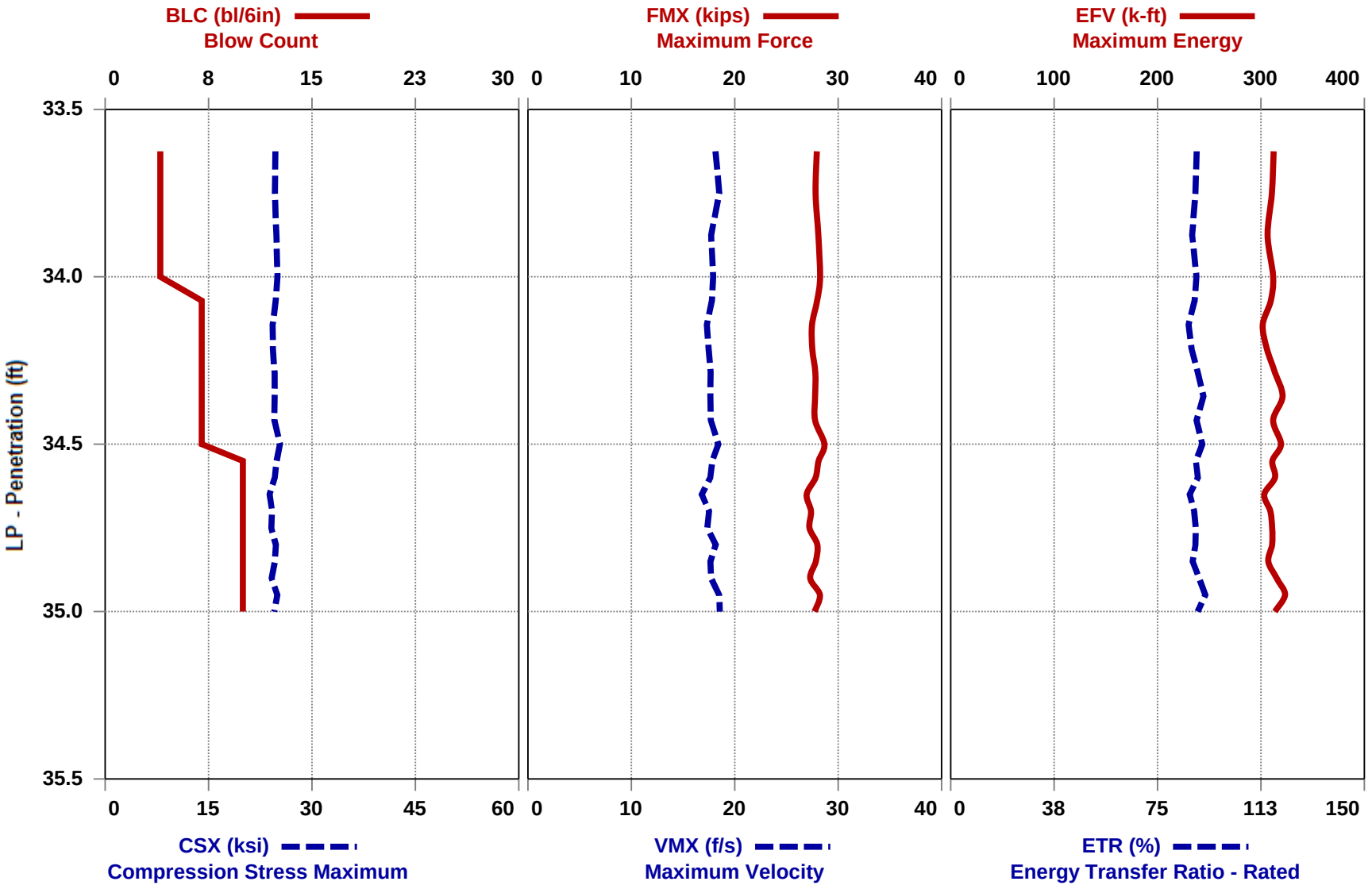
GRL Engineers, Inc. - PDIPLOT2 Ver 2021.1.61.0 - Case Method & iCAP® Results

Printed: 18-April-2024

Test started: 12-April-2024

CME 45B (SN 303304) - 33.5 TO 35.0

B-2



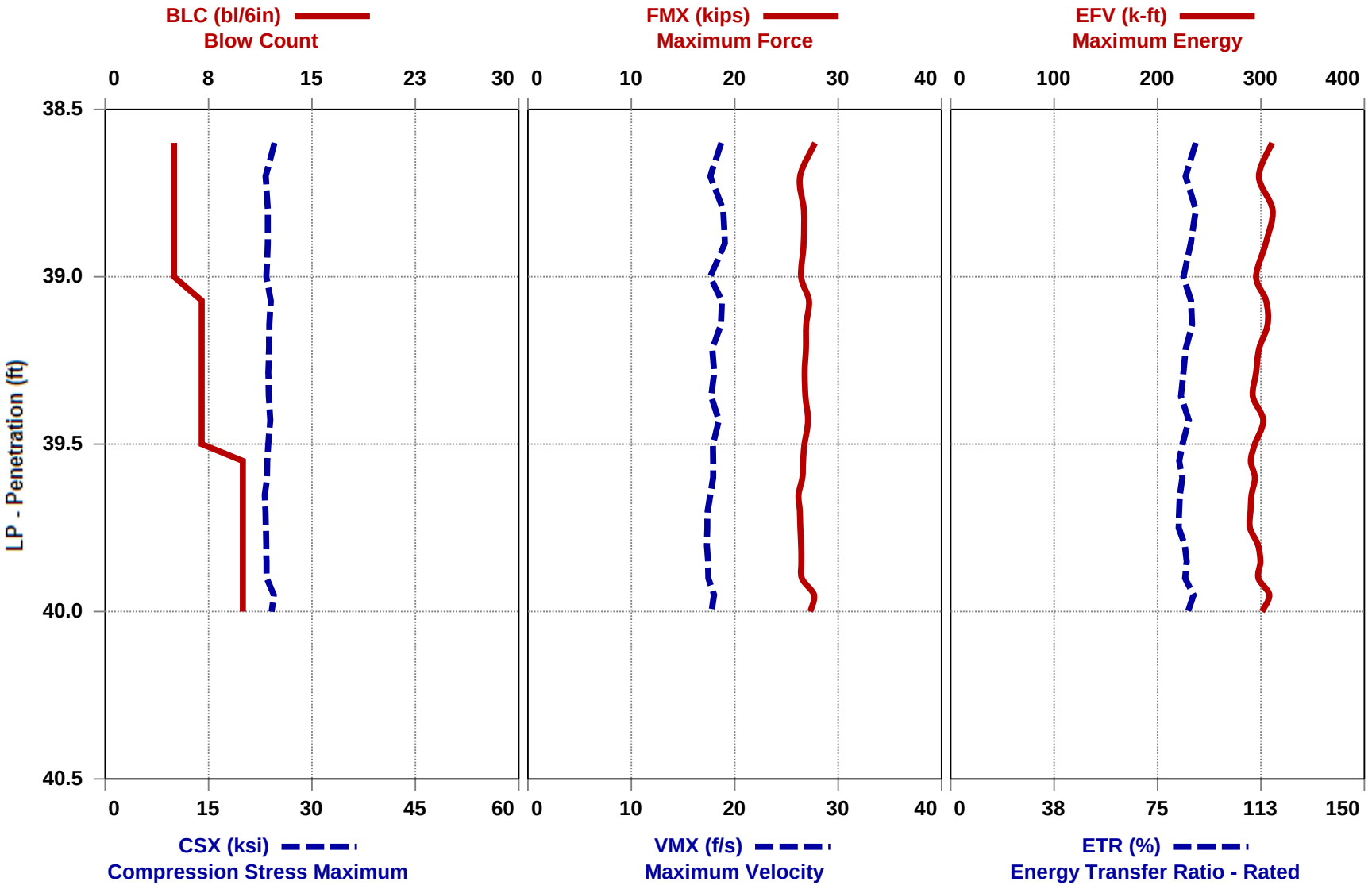
GRL Engineers, Inc. - PDIPLOT2 Ver 2021.1.61.0 - Case Method & iCAP® Results

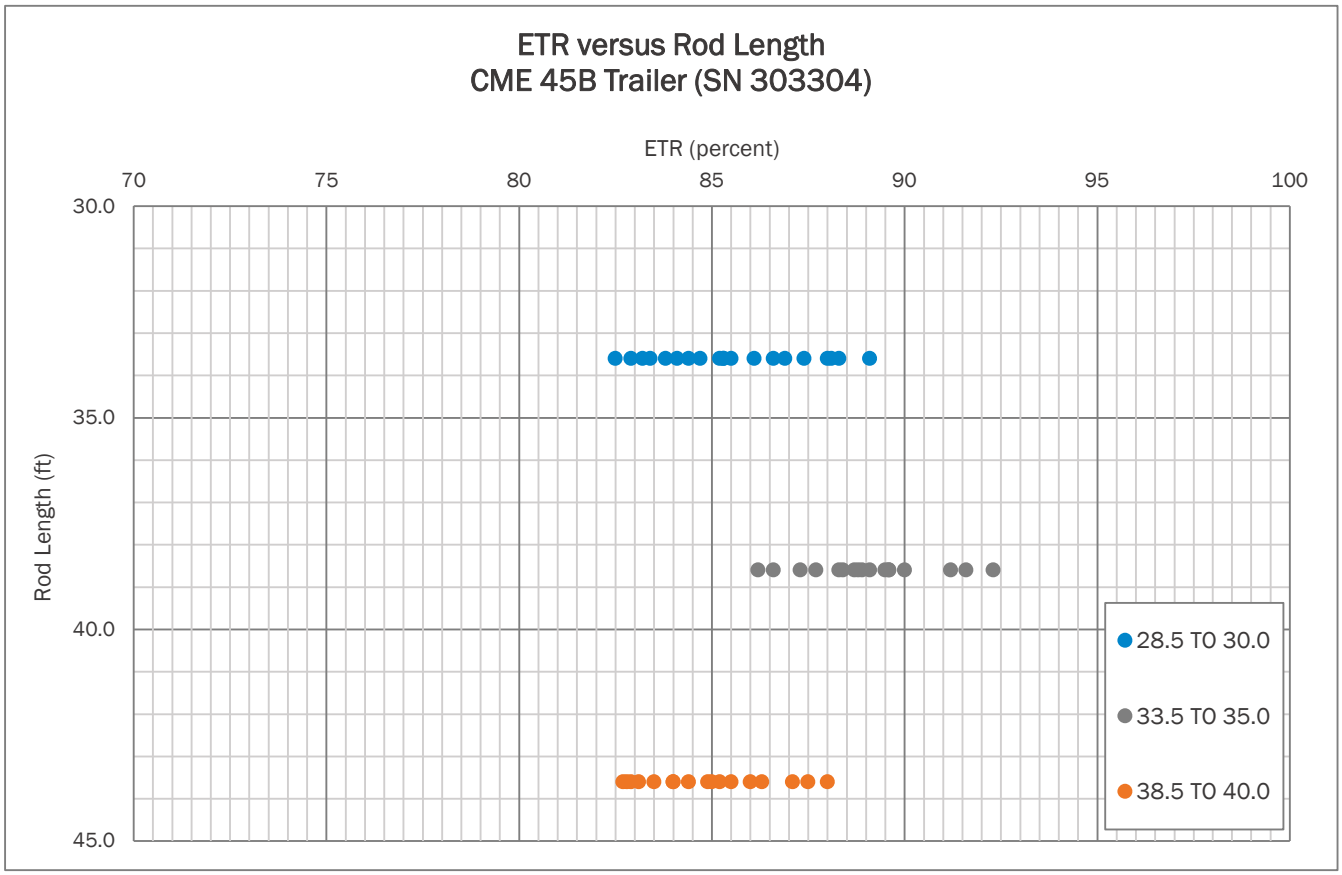
Printed: 18-April-2024

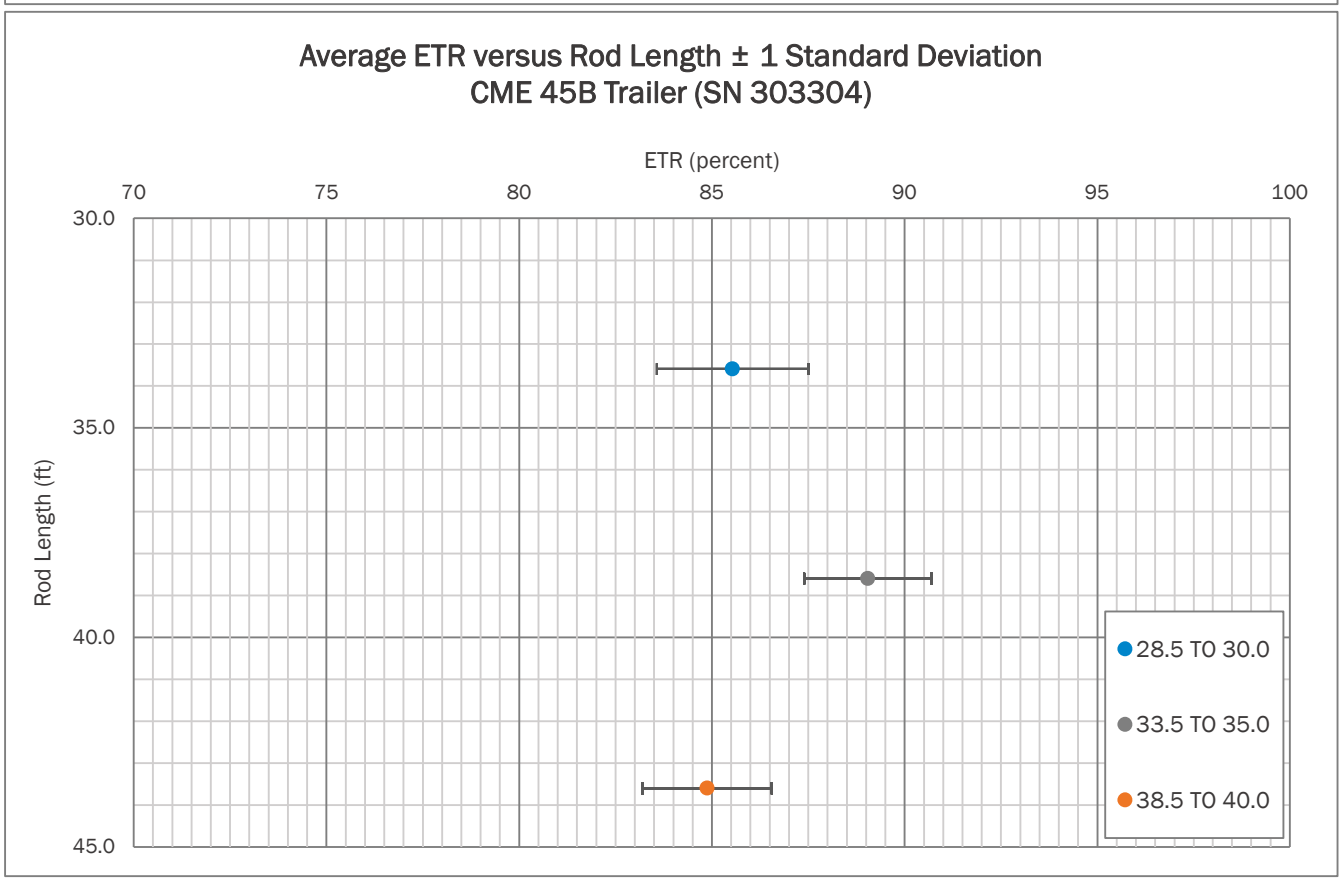
Test started: 12-April-2024

CME 45B (SN 303304) - 38.5 TO 40.0

B-2




ETR versus Rod Length
CME 45B Trailer (SN 303304)
ETR (percent)
70
75
80
85
90
95
100
30.0
35.0
40.0
45.0
Rod Length (ft)
28.5 TO 30.0
33.5 TO 35.0
38.5 TO 40.0


Average ETR versus Rod Length ± 1 Standard Deviation
CME 45B Trailer (SN 303304)
ETR (percent)
70
75
80
85
90
95
100
30.0
35.0
40.0
45.0
Rod Length (ft)
28.5 TO 30.0
33.5 TO 35.0
38.5 TO 40.0

APPENDIX II

SPT Hammer Energy Field Form

Project:	SPT HAMMER ENERGY	**Date:**	4/12/2024
Project No.:	240021095	**Weather:**	50's CLEAR
Boring No.:	B-2	**Drill Rod Type:**	AWJ

On-site Personnel

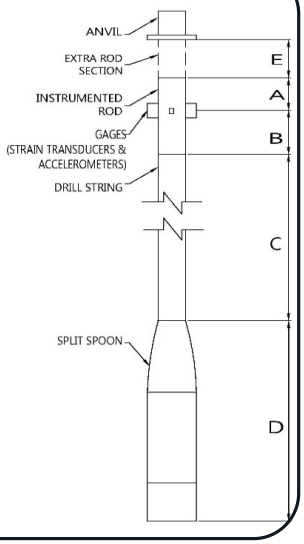
Drilling Company:	BRECCIA CONSTRUCTION, LLC
Rig Operator:	D. HARRIS
Engr/Geologist:	N/A
Client Rep.:	N/A
Analyzer Oper.:	R. KRAL

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	in^2
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 6"	12"	18"	N-Value	Drop Height in Tolerance (y/n)	Soil Class.
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. veritcality, 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.

PILE DYNAMICS, INC. CORPORATE SEAL 1972 OHIO

Tested by

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.

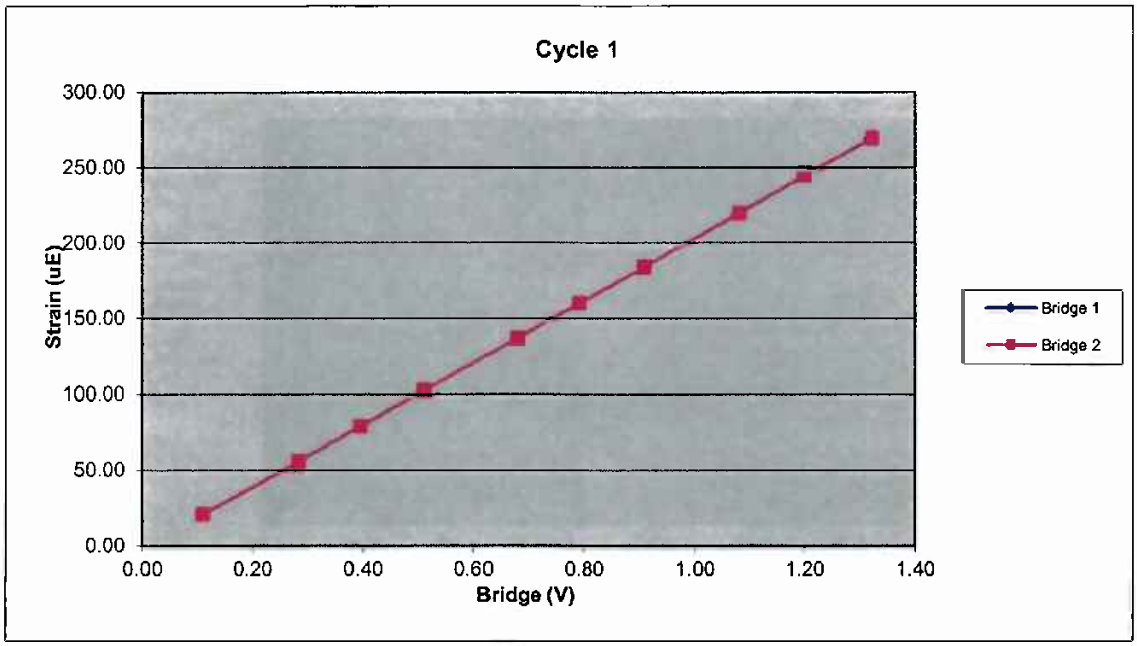
Tested by

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 (µE/V)	**205.90**	**Strain Calibration (µE/V)**	**205.73**
Offset	-1.56	Offset	-1.48
Correlation	0.999995	Correlation	0.999996

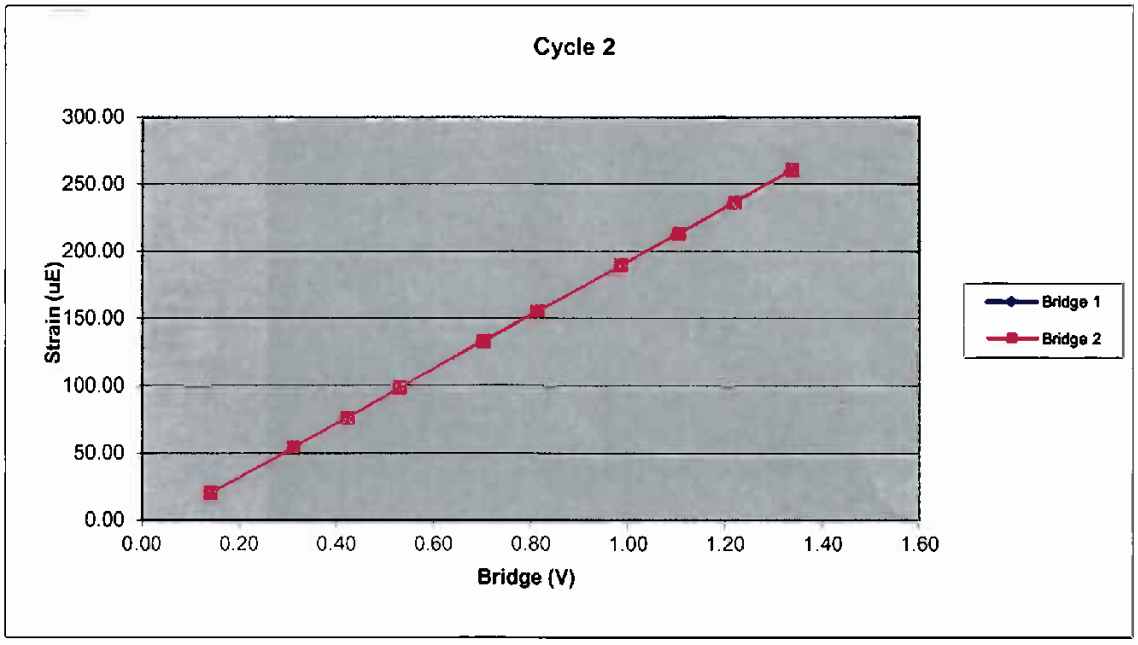
Force Strain Calibration	
EA (Kips)	**35735.87**
Offset	59.29
Correlation	0.999995



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 (μE/V)	**200.83**	**Strain Calibration (μE/V)**	**200.40**
Offset	**-8.59**	Offset	**-8.44**
Correlation	**0.999997**	Correlation	**0.999996**

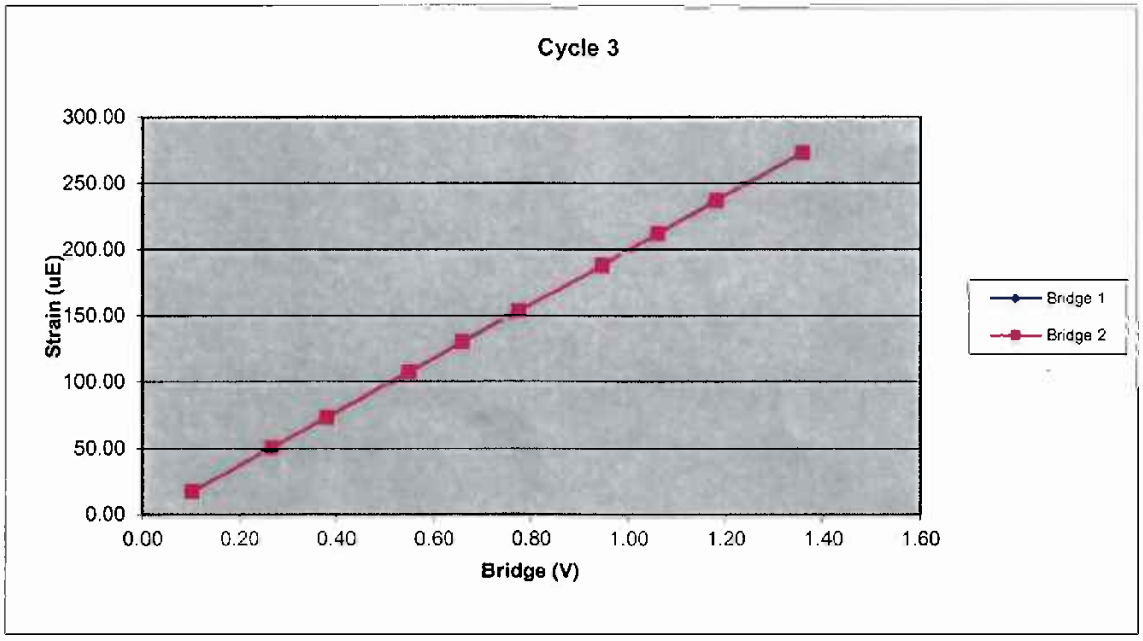
Force Strain Calibration	
EA (Kips)	**36756.34**
Offset	**315.07**
Correlation	**0.999995**



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 (µE/V)	**203.78**	**Strain Calibration (µE/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 Resitor (ohm) 60.4k

Calibration Factors	528AWJ		
Bridge 1 (µE/V)	203.51	Bridge 2 (µE/V)	203.28
EA Factor (Kips)	36213.85	Area (in^2)	1.21

Calibrated by: _____
Calibrated Date: 7/18/2022

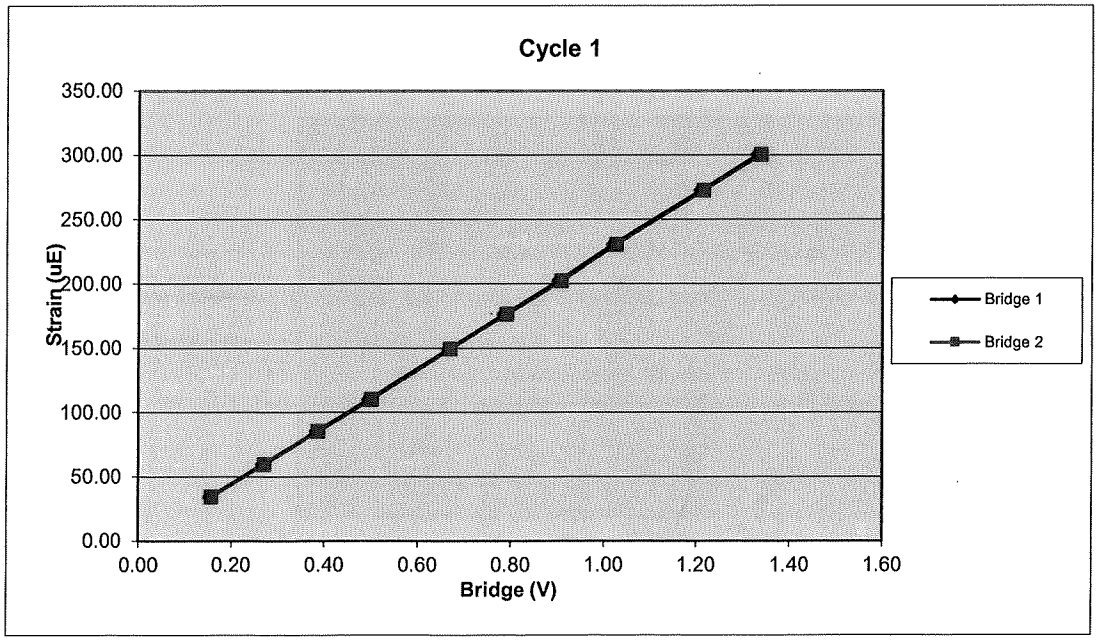
Pile Dynamics Inc
30725 Aurora Rd
Solon, OH 44139

Traceable to N.I.S.T.

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

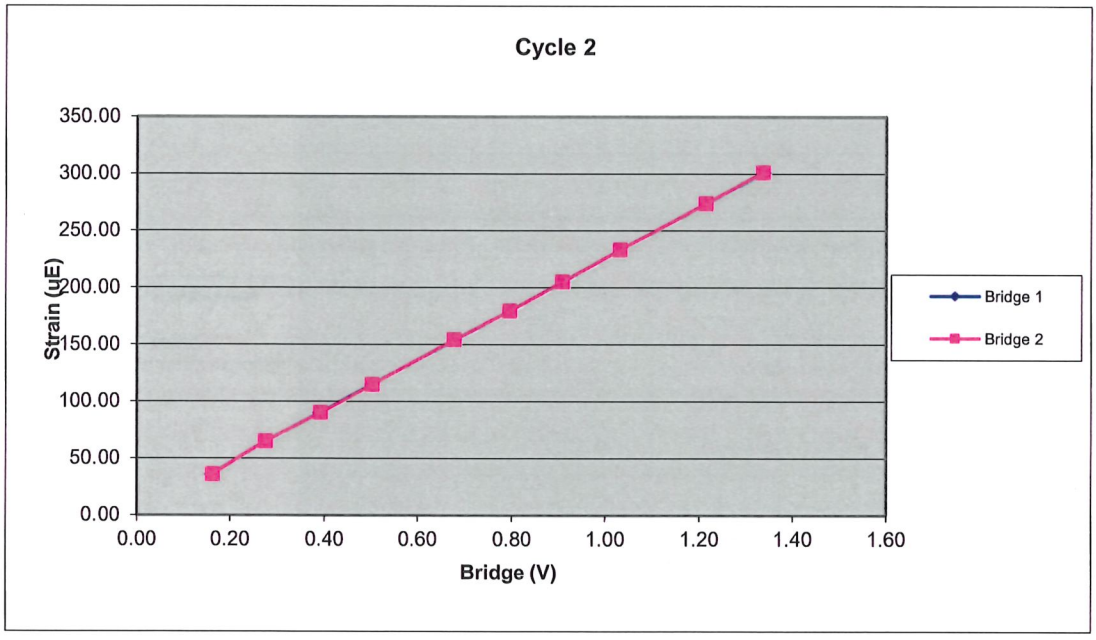
Force Strain Calibration	
EA (Kips)	**33548.47**
Offset	63.54
Correlation	0.999983



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

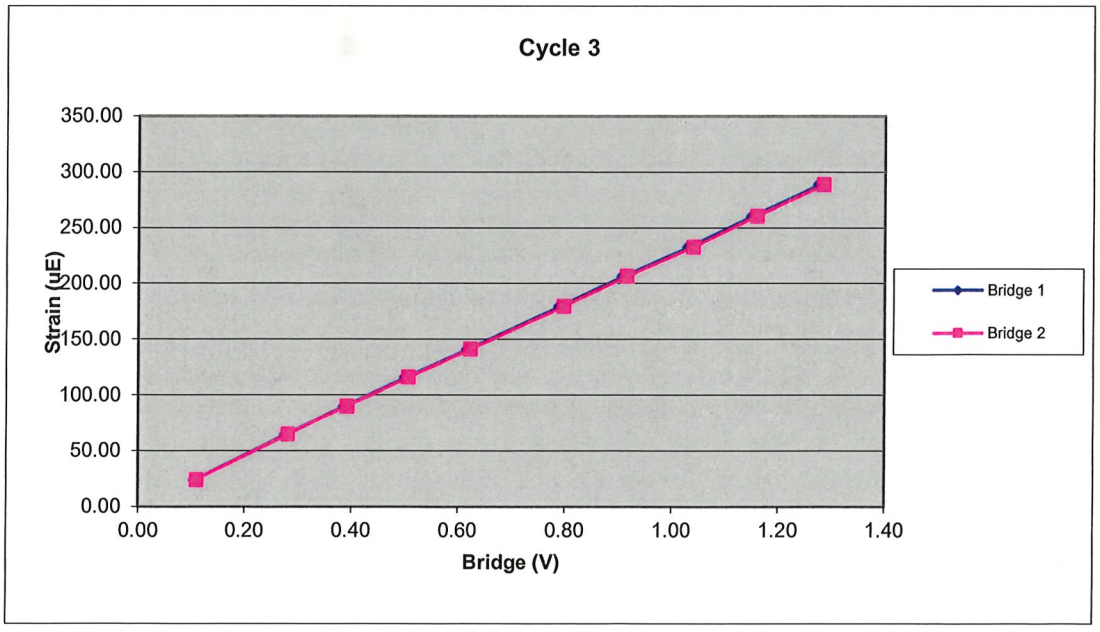
Force Strain Calibration	
EA (Kips)	**33843.24**
Offset	**-37.68**
Correlation	**0.999950**



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 (µE/V)	**224.53**	**Strain Calibration (µE/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 Resitor (ohm) 60.4k

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

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

Pile Dynamics Inc
30725 Aurora Rd
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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		

Ref Acc 1:	72517! 1049 g's/volt	**Cal on:**	24Mar2022
Ref Acc 2:	72505! 1035 g's/volt	**Cal on:**	24Mar2022

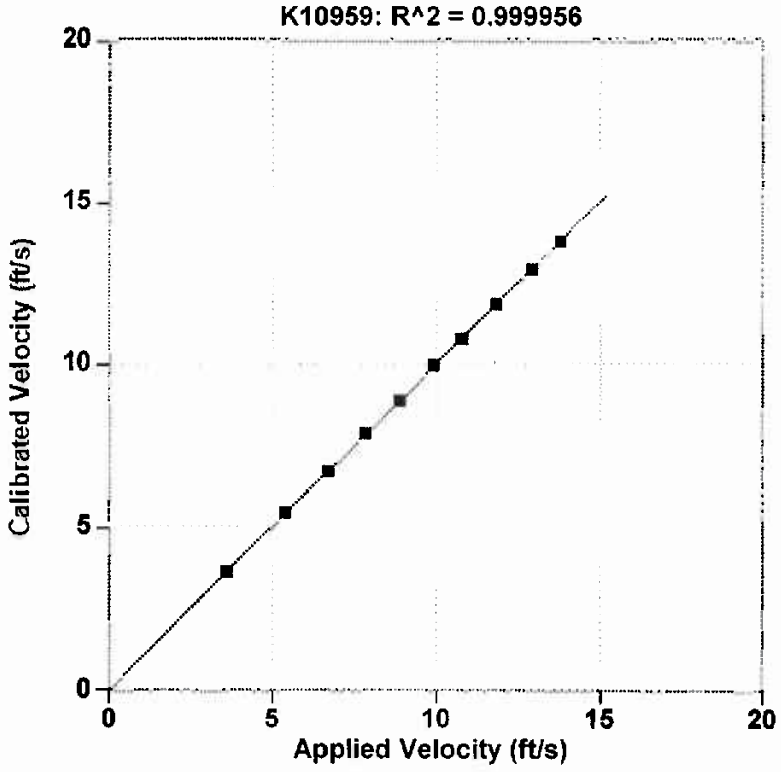
Reference accelerometer calibrations are traceable to the United States National Institute of Standards and Technology (NIST).

PDA CALIBRATION FACTOR

413.8 mv/5000g
(82.8 µv/g)
R^2: 0.999956 [Chip programmed]

Operator: William Johnson

Signed



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		

Ref Acc 1:	72517! 1049 g's/volt	**Cal on:**	24Mar2022
Ref Acc 2:	72505! 1035 g's/volt	**Cal on:**	24Mar2022

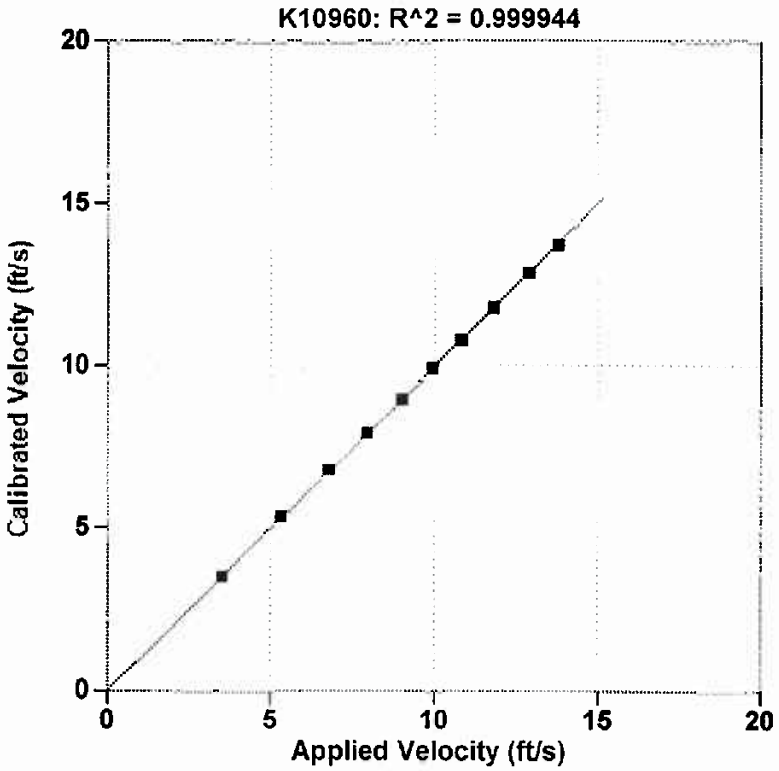
Reference accelerometer calibrations are traceable to the United States National Institute of Standards and Technology (NIST).

PDA CALIBRATION FACTOR

419.9 mv/5000g
(84.0 µv/g)
R^2: 0.999944 [Chip programmed]

Operator: William Johnson

Signed



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		

Ref Acc 1:	72517! 1049 g's/volt	**Cal on:**	24Mar2022
Ref Acc 2:	72505! 1035 g's/volt	**Cal on:**	24Mar2022

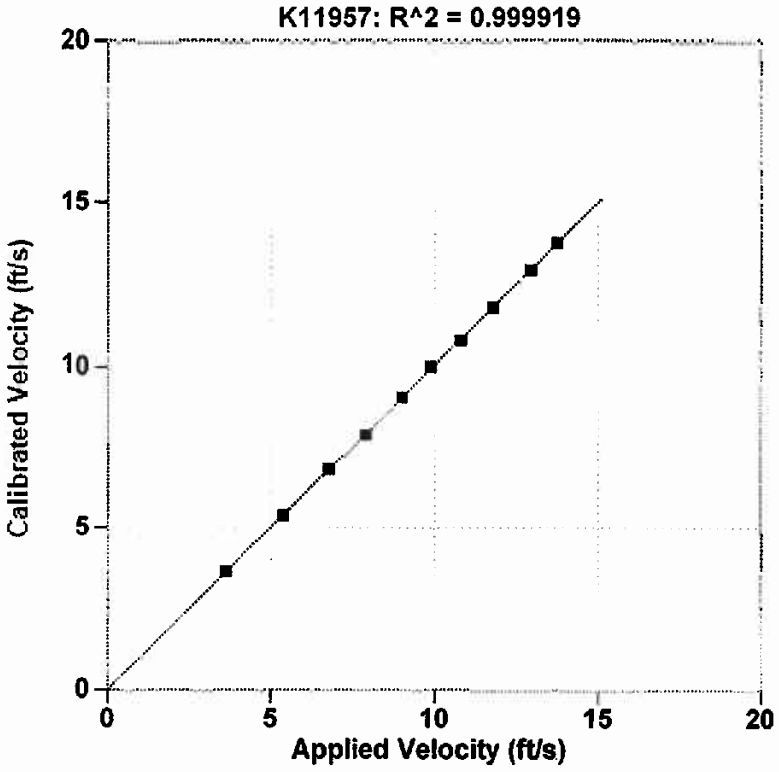
Reference accelerometer calibrations are traceable to the United States National Institute of Standards and Technology (NIST).

PDA CALIBRATION FACTOR

409.6 mv/5000g
(81.9 µv/g)
R^2: 0.999919 [Chip programmed]

Operator: William Johnson

Signed



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

PDCA
PILE DRIVING CONTRACTORS ASSOCIATION

Pile Dynamics, Inc.

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

APPENDIX

SECTION 9 GEOSCOPING FORM

GeoScoping Form

PROJECT INFORMATION	
Project ID: G7100.006	Date of Trip: 10/30/2024
County: Jasper	Location: US 76 BRO Catfish Branch
Rd/Route: US-278	Local Name: Grays Hwy
Attendees: Baylen Carter, Grace Cantele	

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: Not listed	Posted Weight Limit: Not Posted
Crossing: Creek	Skew: 0
Latitude: 33.656590	Longitude: -81.011135
Existing Fill Height: 3	Approximate Existing Slope Angle: N/A

[1]Begin and End Bridge Embankment 100 feet down station or up station from bridge, respectively

EXISTING ROADWAY EMBANKMENT INFORMATION		
Begin Project Sta.:	Begin Bridge Embankment Sta.[1]:	
Accessibility Issues: none		
Ground Cover: Grass / weeds		
Existing Fill Height: 3	Approximate Existing Slope Angle: 1:1	
Local Development (undeveloped, developed residential, developed commercial, developed industrial, etc.): Farm Land		
Topography (level, flat, rolling, steep, hillside, valley, swamp, gully, etc.): Flat		
Traffic Control Necessary (Y/N): yes		
Surface Soil: silty sand	Muck (Y/N): No	
Exposed Rock (Y/N): No	In Stream Bed (Y/N): Yes	In Banks (Y/N): Yes
Wetlands On-Site (Y/N): Yes	Wetlands Adjacent (Y/N): Yes	
Depth FG to Water: 3 ft	Water Depth: 0.1 ft	
Depth to Existing Ground: 3.1 ft		
Scour Condition at EB:	Scour Condition at IB:	
End Bridge Embankment Sta.[1]:	End Project Sta.: East side of Bridge	
Accessibility Issues:		
Ground Cover: Grass / weeds		
Existing Fill Height: 3	Approximate Existing Slope Angle: 1:1	
Local Development (undeveloped, developed residential, developed commercial, developed industrial, etc.): Farm Land		
Topography (level, flat, rolling, steep, hillside, valley, swamp, gully, etc.): Flat		
Traffic Control Necessary (Y/N): yes		
Surface Soil: silty sand	Muck (Y/N): Yes	
Exposed Rock (Y/N): no	In Stream Bed (Y/N): Yes	In Banks (Y/N): Yes
Wetlands On-Site (Y/N): No	Wetlands Adjacent (Y/N): No	
Depth FG to Water: 3 ft	Water Depth: 0.1 ft	
Depth to Existing Ground: 3.1 ft		
Scour Condition at EB: significant	Scour Condition at IB: not visible	

GeoScoping Form

UTILITIES INFORMATION
Attached:
Above Ground/ Overhead: Powerlines running parallel
Underground:

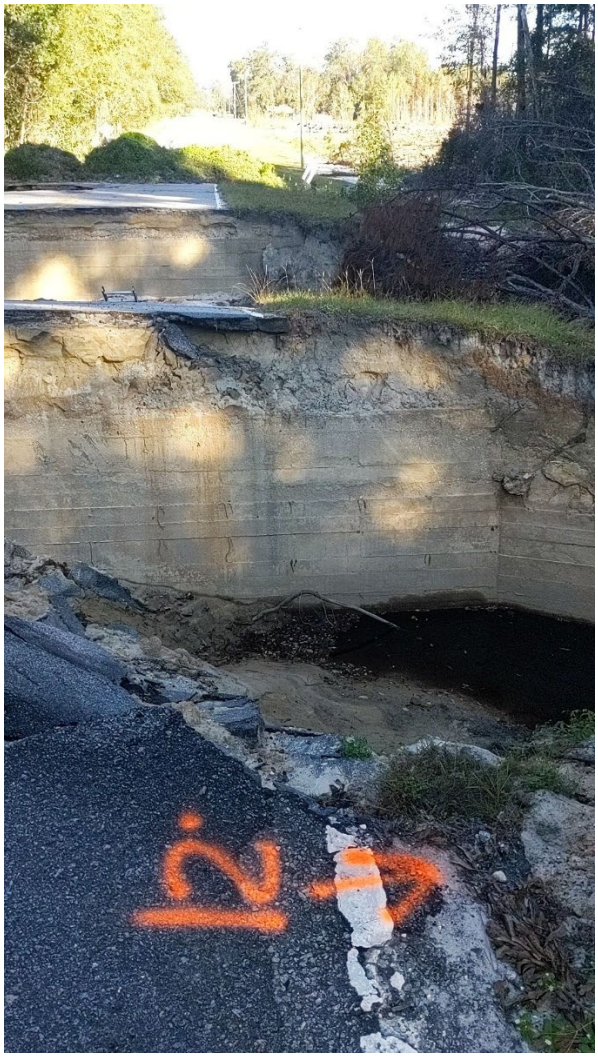
COMMENTS

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.

Geoscope Photos

Bridge Deck Looking SW



Bridge Deck Looking Northwest