CAROLINA CROSSROADS
I-20/26/126 Corridor Project

F&ME CONSULTANTS

GEOTECHNICAL SUBSURFACE DATA REPORT

Carolina Crossroads Phase 3D
Richland/Lexington County, South Carolina



PREPARED FOR
HDR
317 Zimalcrest Drive
Columbia, South Carolina 29210

PREPARED BY
F&ME
211 Business Park Blvd.
Columbia, South Carolina 29201

SCDOT Project ID: P043326
F&ME Project No: G5662.03

SEPTEMBER 2, 2026

September 2, 2026

Ms. Sandhya Ravindran, PE
HDR, Inc.
1201 Main Street, Suite 800
Columbia, South Carolina 29201

Re: Geotechnical Subsurface Data Report
Carolina Crossroads – Phase 3D
Lexington County, South Carolina
SCDOT Project ID: P043326
F&ME Project No.: G5662.03

Ms. Ravindran:

Submitted herein is F&ME Consultants, Inc's (FME) Geotechnical Subsurface Data Report (GSDR) for the Phase 3D portion of the Carolina Crossroads project. Provided herein are the boring location plan, soil testing logs, laboratory test results, and photos of the recovered soil and rock samples from the subsurface investigations performed.

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

Sincerely,

F&ME CONSULTANTS





Digitally signed by John Hamilton
Date: 2026.09.02 14:43:16-04'00'

John F. Hamilton, PE
Geotechnical Design Manager

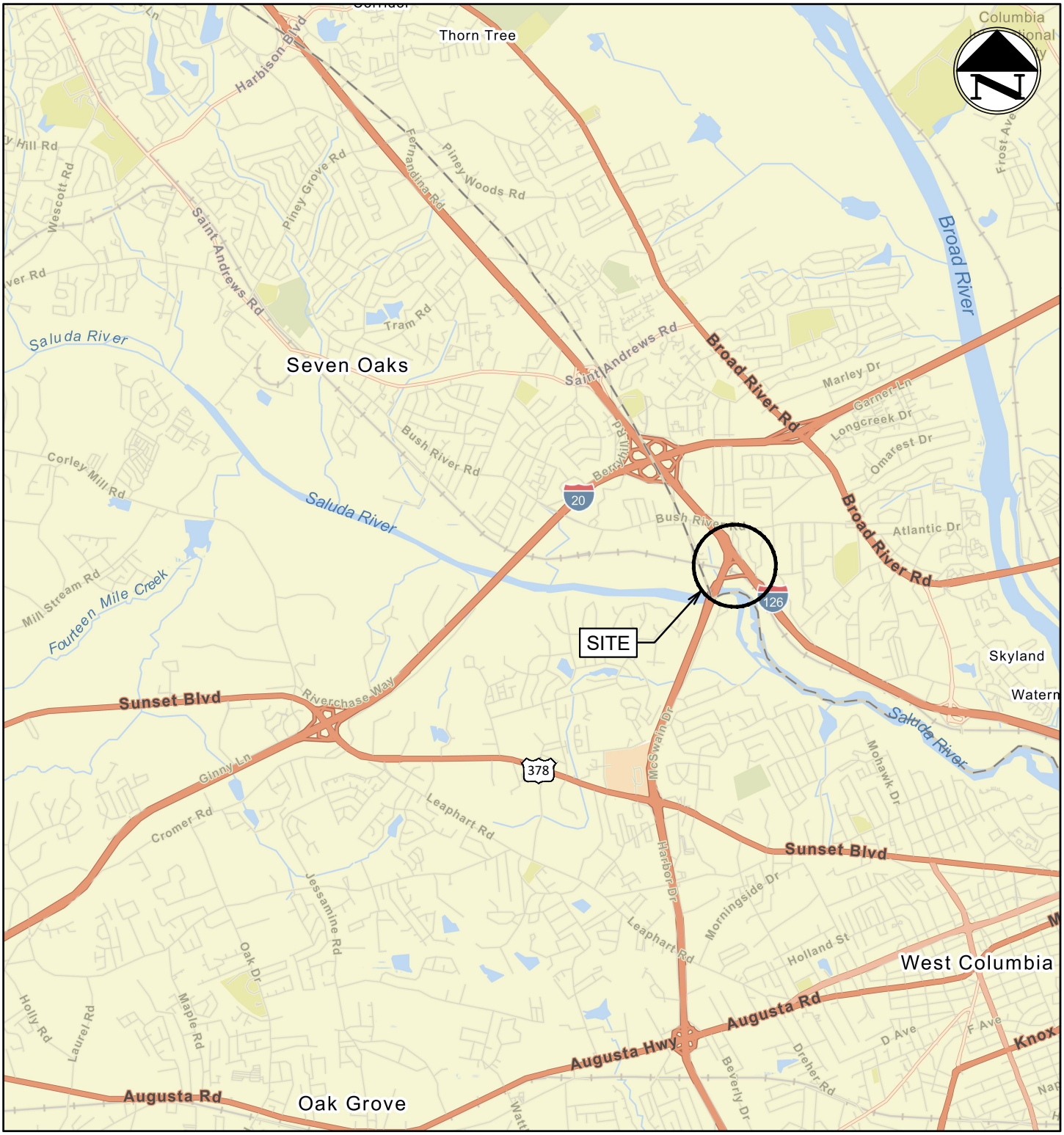
Attachments

APPENDIX

SECTION 1 SITE LOCATION PLAN
SECTION 2 BORING LOCATION PLAN
SECTION 3 GEOTECHNICAL EXPLORATION LOGS
SECTION 3A SOIL BORING LOGS
SECTION 3B AUGER BORING LOGS
SECTION 4 LABORATORY TEST RESULTS
SECTION 4A SPLIT-SPOON SAMPLES
SECTION 4B ROCK SAMPLES
SECTION 4C UD SAMPLES
SECTION 4D BULK SAMPLES
SECTION 5 ROCK CORE PHOTOS
SECTION 6 GEOPHYSICAL TEST RESULTS
SECTION 7 SPT HAMMER ENERGY REPORTS

APPENDIX

SECTION 1 SITE LOCATION PLAN



1:72,000

0 0.5 1 2 mi

0 0.75 1.5 3 km

F&ME CONSULTANTS, INC.
COLUMBIA, SC

REV.	BY	DATE	DESCRIPTION OF REVISION
4			
3			
2			
1			

TOPO. _____ DATE _____
DWG. CTC DATE 2.14.25 GROUP ____ – _____
R/W _____ DATE _____

CAROLINA CROSSROADS PHASE 3D
RICHLAND COUNTY, SOUTH CAROLINA

SITE LOCATION PLAN

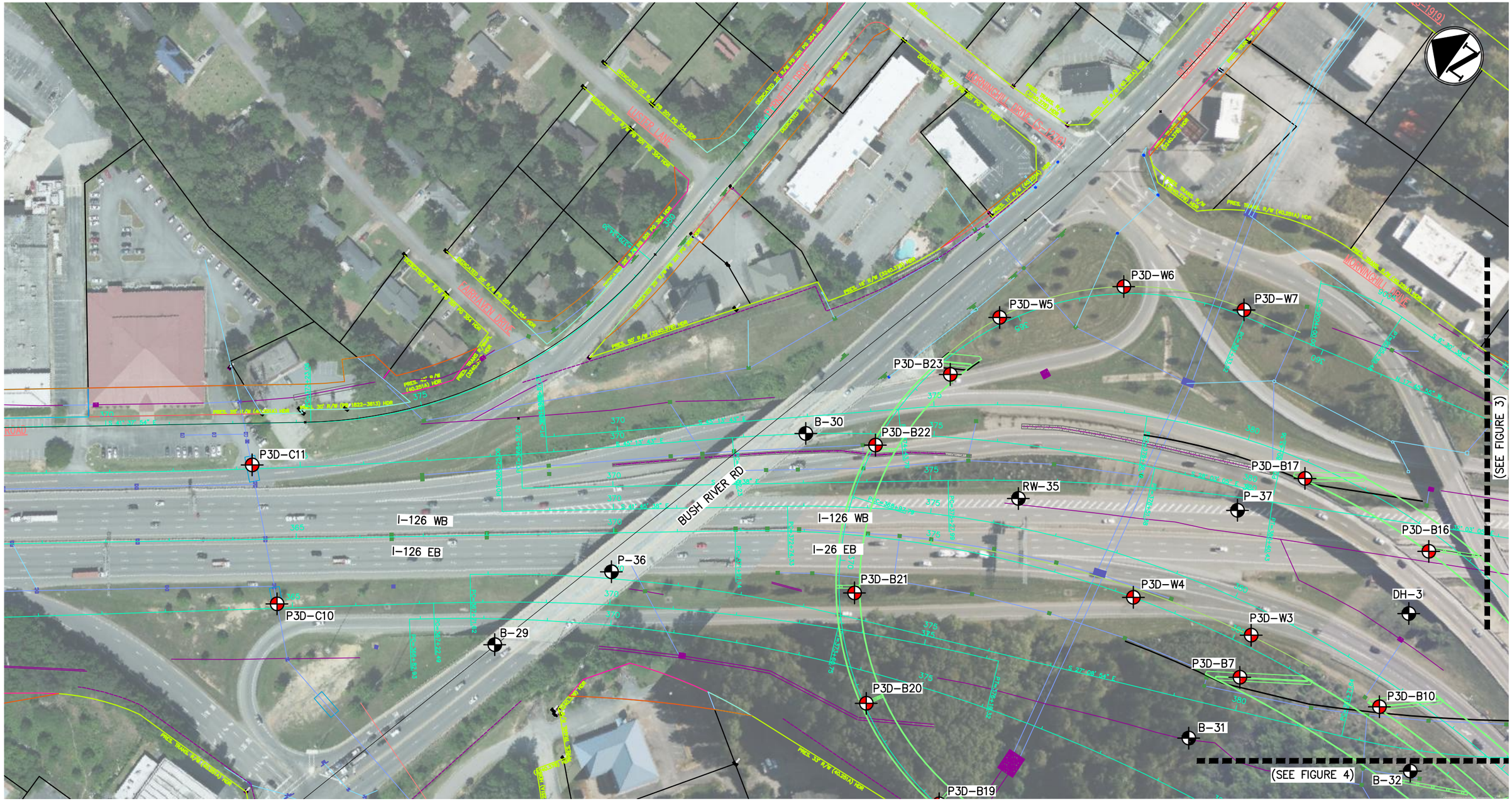
FME JOB NO. G5662.030

SCALE: AS NOTED

FIGURE 1

APPENDIX

SECTION 2 BORING LOCATION PLAN



LEGEND:

- SOIL TEST BORING LOCATION PHASE 3D
- SOIL TEST BORING LOCATION (PREVIOUSLY PERFORMED BY F&ME & S&ME)

REV.	BY	DATE	DESCRIPTION OF REVISION
4			
3			
2			
1			

TOPO. _____ DATE _____
DWG. CTC DATE 10.27.25 GROUP ____ – _____
R/W _____ DATE _____

F&ME CONSULTANTS, INC.
COLUMBIA, SC

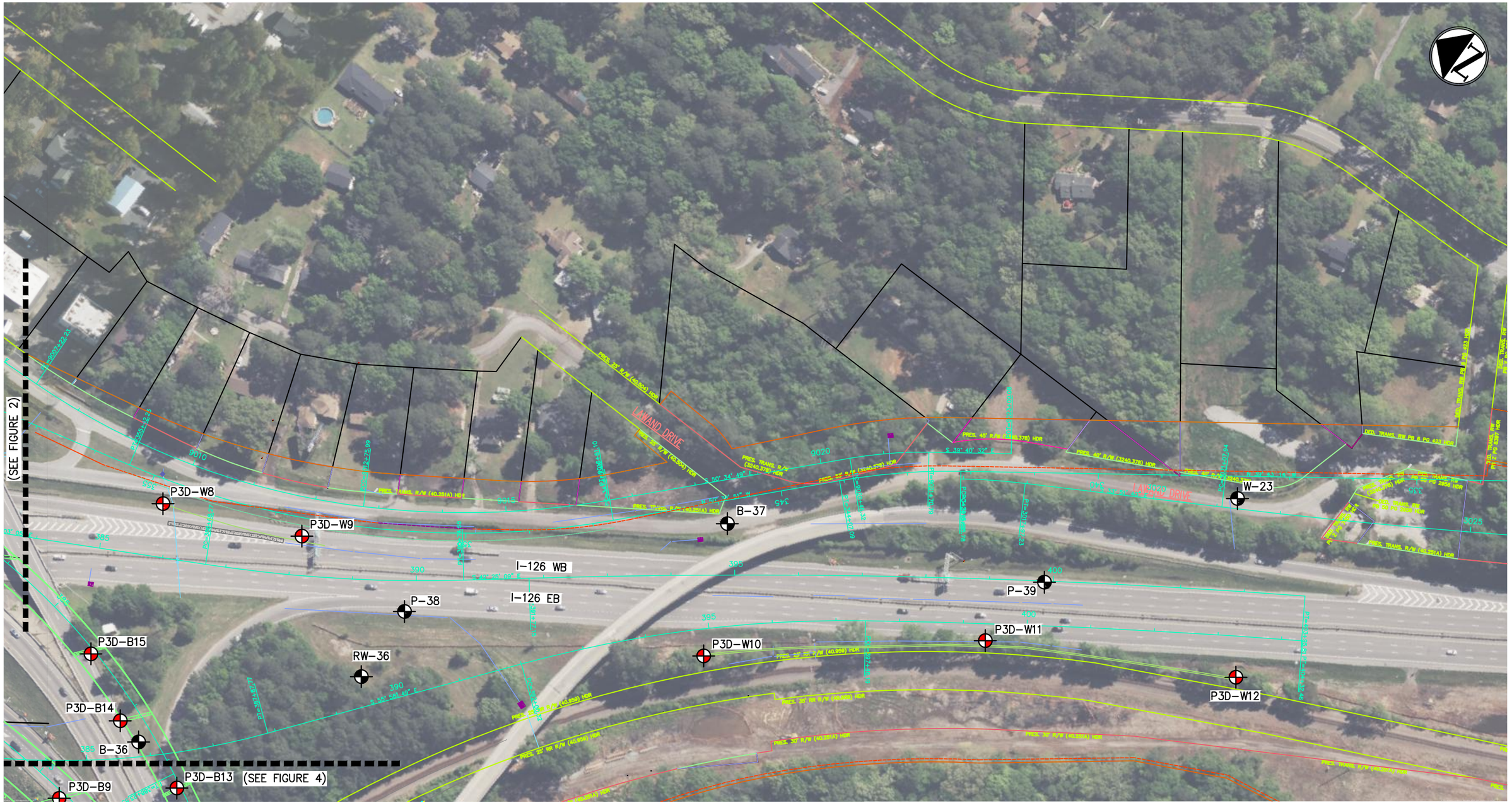
CAROLINA CROSSROADS PHASE 3D
RICHLAND COUNTY, SOUTH CAROLINA

PROPOSED SOIL BORING LOCATION PLAN

SCALE: 1"=150'

FME JOB NO. G5662.030

FIGURE 2



LEGEND:

- SOIL TEST BORING LOCATION PHASE 3D
- SOIL TEST BORING LOCATION (PREVIOUSLY PERFORMED BY F&ME & S&ME)

REV.	BY	DATE	DESCRIPTION OF REVISION
4			
3			
2			
1			

TOPO. _____ DATE _____
DWG. CTC DATE 10.27.25 GROUP ____ – ____
R/W _____ DATE _____

F&ME CONSULTANTS, INC.
COLUMBIA, SC

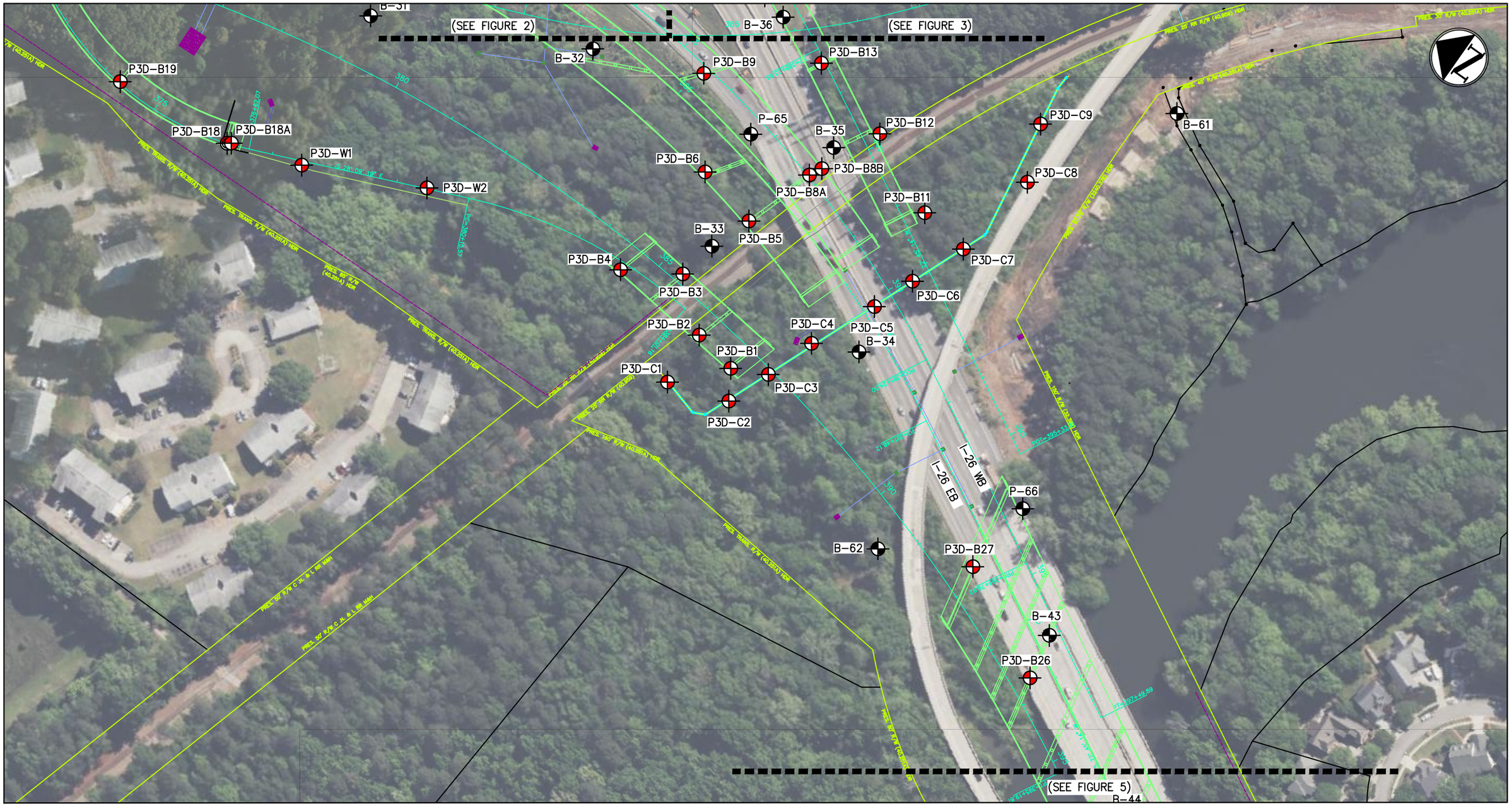
CAROLINA CROSSROADS PHASE 3D
RICHLAND COUNTY, SOUTH CAROLINA

PROPOSED SOIL BORING LOCATION PLAN

FME JOB NO. G5662.030

SCALE: 1"=150'

FIGURE 3



LEGEND:

- SOIL TEST BORING LOCATION PHASE 3D
- SOIL TEST BORING LOCATION (PREVIOUSLY PERFORMED BY F&ME & S&ME)

REV.	BY	DATE	DESCRIPTION OF REVISION
4			
3			
2			
1			

TOPO. ____ DATE ____
DWG. CTC DATE 10.27.25 GROUP ____ – ____
R/W ____ DATE ____

F&ME CONSULTANTS, INC.
COLUMBIA, SC

CAROLINA CROSSROADS PHASE 3D
RICHLAND COUNTY, SOUTH CAROLINA

PROPOSED SOIL BORING LOCATION PLAN

FME JOB NO. G5662.030

SCALE: 1"=150'

FIGURE 4

(SEE FIGURE 4)

B-44

P3D-B25

B-45

P3D-B24

I-26 WB

I-26 EB

B-46

RW-38

P-67

W-22

LEGEND:

SOIL TEST BORING LOCATION PHASE 3D

SOIL TEST BORING LOCATION
(PREVIOUSLY PERFORMED BY F&ME & S&ME)

REV.	BY	DATE	DESCRIPTION OF REVISION
4			
3			
2			
1			

TOPO. _____ DATE _____
DWG. CTC DATE 10.27.25 GROUP ____ – _____
R/W _____ DATE _____

F&ME CONSULTANTS, INC.
COLUMBIA, SC

CAROLINA CROSSROADS PHASE 3D
RICHLAND COUNTY, SOUTH CAROLINA

PROPOSED SOIL BORING LOCATION PLAN

FME JOB NO. G5662.030

SCALE: 1"=150'

FIGURE 5

APPENDIX

SECTION 3 GEOTECHNICAL EXPLORATION LOGS

APPENDIX

SECTION 3 GEOTECHNICAL EXPLORATION LOGS

SECTION 3A SOIL BORING LOGS

FME 2025 INVESTIGATION

SCDOT Soil Test Log

Project ID:	P043326			**County:**	Richland/Lexington	**Boring No.:**	P3D-B1
Site Description:	Carolina Crossroads Phase 3D					**Route:**	I-26 EB_RA
Eng./Geo.:	B. Vogel	**Boring Location:**	386+93	**Offset:**	43-R	**Alignment:**	I-26 EB_RA
Elev.:	174.2 ft	**Latitude:**	34.02611281	**Longitude:**	-81.10321593	**Date Started:**	6/5/2025
Total Depth:	31.7 ft	**Soil Depth:**	16.7 ft	**Core Depth:**	15 ft	**Date Completed:**	6/5/2025
Bore Hole Diameter (in):	6.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	96.7%
Core Size:	NQ	**Driller:**	L. Guempel	**Groundwater:**	**TOB** 13 ft	**24HR**	1 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0		0.0	SS-1	WOH	WOH	WOH	1	0
	0.3	**TOPSOIL** (4.0-in)	2.0	SS-2	1	1	2	3	3
		ALLUVIUM (HOLOCENE)	4.0	SS-3	2	2	4	6	6
169.2		Very Loose to Loose, Moist, Reddish Brown, Low Plasticity, Clayey Fine to Coarse SAND (SC/A-4) with Trace Organics, 2.5YR5/4	6.0	SS-4	5	9	9	11	18
		@SS-1: LL=26, PL=16, PI=10, NMC=19.8%, %200=41.4	8.0	SS-5	12	14	20	50/4"	34
	6.0	@SS-2: Gray/Strong Brown, Reduced Organics, 5/N & 7.5YR5/6							
		LL=24, PL=14, PI=10, NMC=18.1%, %200=41.4							
	8.0	@SS-3: High Plasticity, (SC/A-2-6)							
		LL=32, PL=10, PI=22, NMC=12.8%, %200=35.1							
164.2		**PIEDMONT RESIDUUM**							
		Very Stiff, Moist, Brown, Low Plasticity to Medium Plasticity, Sandy Lean CLAY (CL/A-6), 7.5YR5/3							
		@SS-4: LL=38, PL=20, PI=18, NMC=27.1%, %200=59.8							
	13.5		13.5	SS-6	50/3"				100+
159.2		Hard, Moist, Light Greenish Gray, Medium Plasticity, Fine to Coarse Sandy SILT (ML/A-4), 10Y7/1							
		@SS-5: LL=27, PL=23, PI=4, NMC=9.4%, %200=56.5							
	16.7		16.7	SS-7	50/0"				100+
		Hard, Moist, Dark Greenish Gray, Low Plasticity to Medium Plasticity, Weakly to Strongly Cemented, SILT (ML/A-4), 10Y4/1	16.7	NQ-1					
		AMPHIBOLITE							
154.2		Igneous, Green/White, Very Coarse to Fine Grained, Feldspar/Quartz/Horblade, Moderately Weathered to Slightly Weathered, Ultra #8 Bit							
		@NQ-1: Numerous Joints Dip From 10° to 65°, J, M/N, Su/Sp, Fe, Pl/Ir, VC, SR, %REC=36.6, %RQD=7.1, GSI=25-35, 2.4 min/ft	21.7	NQ-2					
149.2		@NQ-2: Green/Gray, Chlorite, Numerous Joints Dip From 0° to 90°, M, SR/R, %REC=28.3, %RQD=0, GSI=15-25, 4.0 min/ft	26.7						

SPT N VALUE ● PL × MC ○ LL ×
▲ FINES CONTENT (%)
✿ RQD (%) ■ REC (%)
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	

SC_DOT G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT_DATATEMPLATE.GDT 11/10/25

SCDOT Soil Test Log

Project ID:	P043326			**County:**	Richland/Lexington	**Boring No.:**	P3D-B1
Site Description:	Carolina Crossroads Phase 3D					**Route:**	I-26 EB_RA
Eng./Geo.:	B. Vogel	**Boring Location:**	386+93	**Offset:**	43-R	**Alignment:**	I-26 EB_RA
Elev.:	174.2 ft	**Latitude:**	34.02611281	**Longitude:**	-81.10321593	**Date Started:**	6/5/2025
Total Depth:	31.7 ft	**Soil Depth:**	16.7 ft	**Core Depth:**	15 ft	**Date Completed:**	6/5/2025
Bore Hole Diameter (in):	6.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	96.7%
Core Size:	NQ	**Driller:**	L. Guempel	**Groundwater:**	**TOB** 13 ft	**24HR**	1 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value
144.2		@NQ-3: Completely Weathered to Highly Weathered, Numerous Joints Dip From 0° to 90°, Ir, SR, %REC=4.2, %RQD=0, GSI=10-15, 4.2 min/ft			NQ-3		
	31.7	Boring Terminated at 31.7-ft. in Bedrock.					
139.2							
134.2							
129.2							
124.2							

SPT N VALUE
PL MC LL
FINES CONTENT (%)
RQD (%) REC (%)
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 G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT_DATATEMPLATE.GDT 11/10/25

SCDOT Soil Test Log

Project ID:	P043326	**County:**	Richland/Lexington	**Boring No.:**	P3D-B2		
Site Description:	Carolina Crossroads Phase 3D			**Route:**	I-26 EB_RA		
Eng./Geo.:	B. Vogel	**Boring Location:**	386+20	**Offset:**	39-R	**Alignment:**	I-26 EB_RA
Elev.:	170.1 ft	**Latitude:**	34.02630961	**Longitude:**	-81.10319193	**Date Started:**	6/3/2025
Total Depth:	55.9 ft	**Soil Depth:**	33.6 ft	**Core Depth:**	20 ft	**Date Completed:**	6/4/2025
Bore Hole Diameter (in):	6.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	96.7%
Core Size:	NQ	**Driller:**	L. Guempel	**Groundwater:**	**TOB** 2.5 ft	**24HR**	NM

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0		0.0	SS-1	WOH	WOH	2	2	2
	0.2	**TOPSOIL** (2.0-in)	2.0	SS-2	1	2	5	4	7
		ALLUVIUM (HOLOCENE)	4.0	SS-3	1	2	2	4	4
	2.0	Very Soft, Moist, Dark Brown/Reddish Brown, Low Plasticity, Fine to Coarse Sandy SILT (ML/A-4) with Trace Organics, Micaceous, 10YR3/3 & 5YR4/3	6.0	SS-4	3	4	5	8	9
165.1		@SS-1: LL=31, PL=23, PI=8, NMC=18.7%, %200=54.6	8.0	SS-5	6	8	15	13	23
	6.0	Loose to Very Loose, Moist, Dark Brown/Reddish Brown, Low Plasticity, Clayey Fine to Coarse SAND (SC/A-4), Micaceous, 10YR3/3 & 5YR4/3							
		@SS-2: LL=28, PL=20, PI=8, NMC=18%, %200=36.2							
		@SS-3: Yellowish Red/Reddish Brown, Medium Plasticity, (SC/A-2-6), 5YR4/6 & 5YR4/4							
160.1		LL=27, PL=16, PI=11, NMC=17.7%, %200=31.4							
		PIEDMONT RESIDUUM	13.5	SS-6	18	26	50/5"		76
		Stiff to Very Stiff, Moist to Wet, Light Gray/Reddish Yellow, Non-Plastic, Weakly to Strongly Cemented SILT (ML/A-4) with Sand, 7N/Light Gray & 7.5YR6/6							
155.1		@SS-4: LL=NP, PL=NP, PI=NP, NMC=30.1%, %200=72.0							
		@SS-5: Greenish Gray/Reddish Brown, 10Y6/1 & 5YR4/3							
		@SS-6: Hard, Pale Olive, Micaceous, 5Y6/3	18.5	SS-7	15	20	41		61
		@SS-7: Reduced Mica, with Trace Gravel							
150.1									
			23.5	SS-8	17	46	50/4.5"		96
		@SS-8: Gray/Light Gray, 5N/Gray & 5Y7/2							
145.1									

SPT N VALUE ● PL × MC ○ LL ×
▲ FINES CONTENT (%)
✿ RQD (%) ■ REC (%)
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:	P043326			**County:**	Richland/Lexington	**Boring No.:**	P3D-B2
Site Description:	Carolina Crossroads Phase 3D					**Route:**	I-26 EB_RA
Eng./Geo.:	B. Vogel	**Boring Location:**	386+20	**Offset:**	39-R	**Alignment:**	I-26 EB_RA
Elev.:	170.1 ft	**Latitude:**	34.02630961	**Longitude:**	-81.10319193	**Date Started:**	6/3/2025
Total Depth:	55.9 ft	**Soil Depth:**	33.6 ft	**Core Depth:**	20 ft	**Date Completed:**	6/4/2025
Bore Hole Diameter (in):	6.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	96.7%
Core Size:	NQ	**Driller:**	L. Guempel	**Groundwater:**	**TOB** 2.5 ft	**24HR**	NM

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-9: Gray/Yellowish Brown, Micaceous, 5N/Gray & 10YR5/4		28.5	SS-9	50/5.5"	100+
140.1							
		@SS-10: Gray/Pale Brown, 4N/Gray & 2.5YR7/3		33.5	SS-10	50/1.5"	100+
135.1							
	35.9	**AMPHIBOLITE**		35.9	SS-11	50/1"	100+
		Metamorphic, Black, Fine to Very Fine Grained, Laminated to Thinly Laminated, Biotite/ Amphibole/ Feldspar/ Quartz, Slightly Weathered, Ultra #8 Bit		35.9	NQ-1		
		@NQ-1: Numerous Joints Dip From 10° to 80°, J, M, Sp/No, Fe/No, Pl/Ir, VC, SR, %REC=13.3, %RQD=0, GSI=15-20, 2.8 min/ft					
130.1				40.9			
		@NQ-2: Dark Gray, Highly Weathered to Slightly Weathered, Numerous Joints Dip From 10° to 80°, %REC=16.7, %RQD=0, GSI=15-25, 3.4 min/ft			NQ-2		
125.1				45.9			
		@NQ-3: Moderately Weathered to Slightly Weathered, Numerous Joints Dip From 10° to 80°, M/VN, Su/Sp, Fe, %REC=42.5, %RQD=0, GSI=30-40, 4.6 min/ft			NQ-3		
120.1				50.9			
		@NQ-4: Dark Gray/Dark Brown, Very Coarse to Fine, Extremely Strong Rock, Numerous Joints Dip From 0° to 85°, Su/Sp/Fi, Fe/H, Pl/St/Ir, %REC=93.3, %RQD=47.1, q_u= 35110 psi, RMR=39, Class IV, GSI=35-45, 3.8 min/ft			NQ-4		

SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) ✿ RQD (%) ■ REC (%)
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:	P043326			**County:**	Richland/Lexington	**Boring No.:**	P3D-B2
Site Description:	Carolina Crossroads Phase 3D					**Route:**	I-26 EB_RA
Eng./Geo.:	B. Vogel	**Boring Location:**	386+20	**Offset:**	39-R	**Alignment:**	I-26 EB_RA
Elev.:	170.1 ft	**Latitude:**	34.02630961	**Longitude:**	-81.10319193	**Date Started:**	6/3/2025
Total Depth:	55.9 ft	**Soil Depth:**	33.6 ft	**Core Depth:**	20 ft	**Date Completed:**	6/4/2025
Bore Hole Diameter (in):	6.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	96.7%
Core Size:	NQ	**Driller:**	L. Guempel	**Groundwater:**	**TOB** 2.5 ft	**24HR**	NM

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value
115.1	55.9	Boring Terminated at 55.9-ft. in Bedrock.					

SPT N VALUE ● PL × MC ○ LL × ▲ FINES CONTENT (%) ✿ RQD (%) ■ REC (%)

0 10 20 30 40 50 60 70 80 90

110.1 105.1 100.1 95.1 90.1

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 G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT_DATATEMPLATE.GDT 11/3/25

SCDOT Soil Test Log

Project ID:	P043326			**County:**	Richland/Lexington	**Boring No.:**	P3D-B3
Site Description:	Carolina Crossroads Phase 3D					**Route:**	I-26 EB_RA
Eng./Geo.:	B. Vogel	**Boring Location:**	385+36	**Offset:**	15-L	**Alignment:**	I-26 EB_RA
Elev.:	173.9 ft	**Latitude:**	34.02653546	**Longitude:**	-81.10300812	**Date Started:**	7/28/2025
Total Depth:	64.8 ft	**Soil Depth:**	44.8 ft	**Core Depth:**	20 ft	**Date Completed:**	7/30/2025
Bore Hole Diameter (in):	6.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	85.7%
Core Size:	NQ	**Driller:**	A. Alvarez	**Groundwater:**	**TOB** 14 ft	**24HR**	8 ft

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	**TOPSOIL** (5.0-in)	0.0	SS-1	5	8	14	11	22
		ALLUVIUM (HOLOCENE)							
	2.0	Medium Dense, Moist, Dark Greenish Brown/Yellowish Red, Low Plasticity, Clayey Fine to Coarse SAND (SC/A-6) with Trace Gravel & Organics, 10Y4/2 & 5YR5/6	2.0	SS-2	13	12	7	9	19
		@SS-1: NMC=15.5%, %200=47.6	4.0	SS-3	3	4	5	8	9
168.9		**PIEDMONT RESIDUUM**							
		Very Stiff to Stiff, Moist, Yellowish Red/Gray, High Plasticity, Fat CLAY (CH/A-7-6) with Trace Gravel & Organics, 5YR5/8 & 2.5Y6/1	6.0	SS-4	6	9	14	21	23
	8.0	@SS-2: LL=56, PL=27, PI=29, NMC=36.0%, %200=98.2	8.0	SS-5	11	19	13	14	32
		@SS-3: Strong Brown/Gray, Reduced Organics & Trace Gravel, 7.5R5/6 & 2.5Y6/1							
163.9		NMC=33.3%, %200=86.0							
		Hard, Moist, Greenish Gray/Yellowish Brown, Low Plasticity, SILT (ML/A-4) with Sand & Trace Gravel, 10GY5/1 & 10YR5/4							
	13.5	@SS-5: LL=26, PL=23, PI=3, NMC=11.8%, %200=71.4	13.5	SS-6	26	50/4"			100+
158.9		Hard, Moist, Pale Olive, Low Plasticity to Medium Plasticity, SILT (ML/A-4) with Trace Gravel, 5Y6/3							
	18.5	Very Dense, Moist, Pale Olive, Non-Plastic to Low Plasticity, Silty GRAVEL (GM/A-1), 5Y6/3	18.5	SS-7	31	50/3"			100+
153.9									
	23.5	Hard, Moist, Dark Gray/Pale Brown, Low Plasticity to Medium Plasticity, Strongly Cemented, Fine to Coarse Sandy SILT (ML/A-4), 2.5Y4/1 & 2.5Y7/3	23.5	SS-8		50/3"			100+
148.9									

SPT N VALUE ● PL × MC ○ LL ×
▲ FINES CONTENT (%)
✿ RQD (%) ■ REC (%)
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:	P043326			**County:**	Richland/Lexington	**Boring No.:**	P3D-B3
Site Description:	Carolina Crossroads Phase 3D					**Route:**	I-26 EB_RA
Eng./Geo.:	B. Vogel	**Boring Location:**	385+36	**Offset:**	15-L	**Alignment:**	I-26 EB_RA
Elev.:	173.9 ft	**Latitude:**	34.02653546	**Longitude:**	-81.10300812	**Date Started:**	7/28/2025
Total Depth:	64.8 ft	**Soil Depth:**	44.8 ft	**Core Depth:**	20 ft	**Date Completed:**	7/30/2025
Bore Hole Diameter (in):	6.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	85.7%
Core Size:	NQ	**Driller:**	A. Alvarez	**Groundwater:**	**TOB** 14 ft	**24HR**	8 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value
		@SS-9: Gray/Dark Grayish Brown, with Trace Gravel, N5/Gray & 2.5Y4/2		28.5	SS-9	50/5"	100+
143.9							
		@SS-10: Light Olive Gray, 5Y6/2		33.5	SS-10	50/5"	100+
138.9							
		@SS-11: Grayish Brown, 2.5Y5/2		38.5	SS-11	50/4.5"	100+
133.9							
		@SS-12: Gray/Olive, 5Y5/1 & 5Y5/3		43.5	SS-12	43 23 50/2"	73+
	44.8			44.8	SS-13	50/0"	100+
128.9		**PHYLLITE & AMPHIBOLITE**		44.8	NQ-1		
		Metamorphic, Gray/Black/Green, Fine to Very Fine Grained, Laminated to Thinly Laminated, Quartz/Feldspar/Micas/Chlorite/Epidote, Slightly Weathered to Moderately Weathered, Extremely Strong Rock, Ultra #8 Bit		45.8			
		NQ-1: Few Joints Dip From 0° to 30°, J, W, Pa, Ch, Pl, VC, SR, q_u=36950 psi, RMR=70, Class II, %REC=100, %RQD=84, GSI=55-65, 1.8 min/ft			NQ-2		
123.9				50.8			
		NQ-2: Epidote Intrusions, Very Strong Rock, Few Joints Dip From 0° to 30°, J/V, Fi, Fe/Qz, q_u=18600 psi, RMR=77, Class II, %REC=100, %RQD=89.6, GSI=55-75, 2.4 min/ft			NQ-3		

SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) ✿ RQD (%) ■ REC (%)
0 10 20 30 40 50 60 70 80 90

Continued Next Page

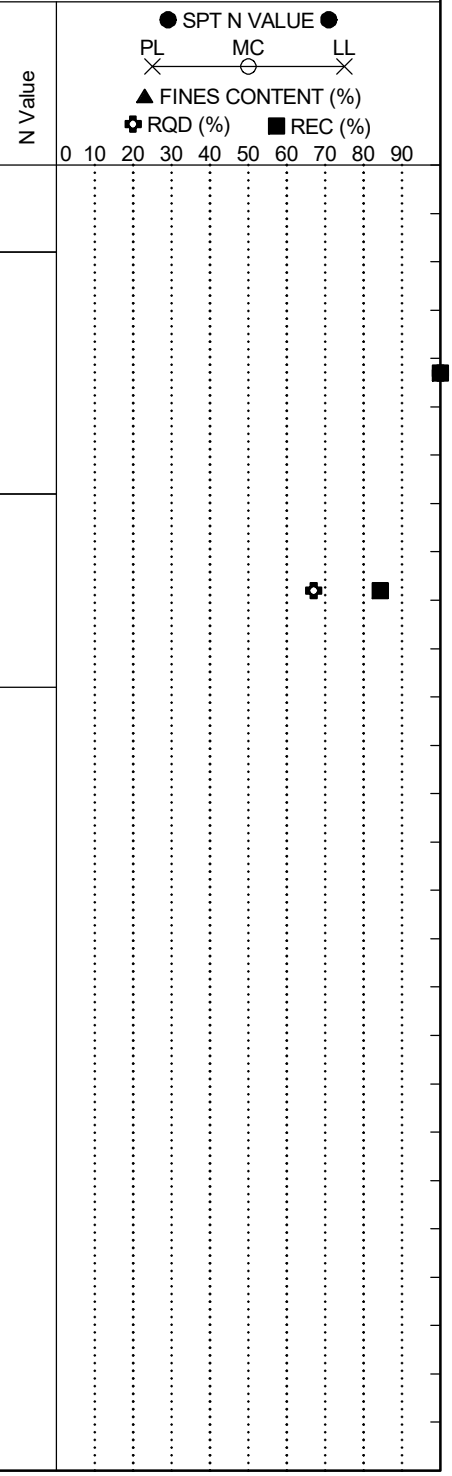
LEGEND

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:	P043326			**County:**	Richland/Lexington	**Boring No.:**	P3D-B3
Site Description:	Carolina Crossroads Phase 3D					**Route:**	I-26 EB_RA
Eng./Geo.:	B. Vogel	**Boring Location:**	385+36	**Offset:**	15-L	**Alignment:**	I-26 EB_RA
Elev.:	173.9 ft	**Latitude:**	34.02653546	**Longitude:**	-81.10300812	**Date Started:**	7/28/2025
Total Depth:	64.8 ft	**Soil Depth:**	44.8 ft	**Core Depth:**	20 ft	**Date Completed:**	7/30/2025
Bore Hole Diameter (in):	6.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	85.7%
Core Size:	NQ	**Driller:**	A. Alvarez	**Groundwater:**	**TOB** 14 ft	**24HR**	8 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value
118.9		NQ-3: Few Joints Dip From 0° to 30°, J, M/VN, Pl, %REC=99, %RQD=97, GSI=55-75, 6.2 min/ft		55.8			
		NQ-4: Back/Gray/Brown, Few Joints Dip From 0° to 60°, Fo, W/VN, Sp/Pa, Ch/Fe, Pl/Ir, S/SR, %REC=100, %RQD=100, GSI=45-55, 6.4 min/ft			NQ-4		
113.9				60.8			
		NQ-5: Few Joints Dip From 0° to 70°, M/N/VN, Su, %REC=84.4, %RQD=67, GSI=30-40, 4.8 min/ft			NQ-5		
	64.9						
108.9		Boring Terminated at 64.8-ft. in Bedrock.					
103.9							
98.9							
93.9							



LEGEND

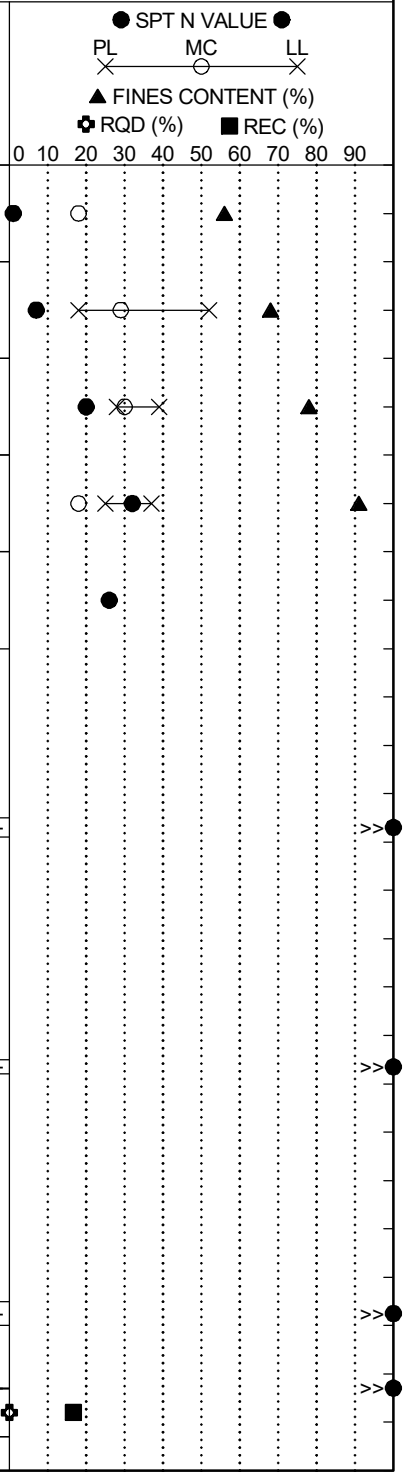
SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P043326	**County:**	Richland/Lexington	**Boring No.:**	P3D-B4		
Site Description:	Carolina Crossroads Phase 3D			**Route:**	I-126 WB_I-26 EB		
Eng./Geo.:	B. Vogel	**Boring Location:**	382+82	**Offset:**	12-R	**Alignment:**	I-126 WB_I-26 EB
Elev.:	172.7 ft	**Latitude:**	34.02675045	**Longitude:**	-81.10320219	**Date Started:**	7/30/2025
Total Depth:	61.3 ft	**Soil Depth:**	24 ft	**Core Depth:**	30 ft	**Date Completed:**	7/31/2025
Bore Hole Diameter (in):	6.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	85.7%
Core Size:	NQ	**Driller:**	A. Alvarez	**Groundwater:**	**TOB** 22 ft	**24HR**	3.5 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION
	0.0	
	0.2	**TOPSOIL** (2.0-in)
		ALLUVIUM (HOLOCENE)
		Very Soft, Moist, Light Reddish Gray/Yellowish Red, High Plasticity, Fine to Coarse Sandy Fat CLAY (CH/A-7-6) with Trace Gravel & Organics, 5YR5/2 & 5YR4/6
	4.0	@SS-1: NMC=17.6%, %200=56.3
167.7		@SS-2: Firm, Light Greenish Gray, Yellowish Brown, 5G7/1 & 10YR5/6
	6.0	LL=52, PL=18, PI=34, NMC=28.7%, %200=68.0
		PIEDMONT RESIDUUM
		Very Stiff, Moist, Strong Brown/Light Greenish Gray, Medium Plasticity, SILT (ML/A-4) with Sand & Trace Gravel & Organics, 7.5YR5/6 & 5GY7/1
162.7		@SS-3: LL=39, PL=28, PI=11, NMC=29.6%, %200=78.0
		Hard to Very Stiff, Moist, Greenish Gray/Reddish Yellow, Medium Plasticity, SILT (ML/A-6), 5G6/1 & 7.5YR6/6
	13.5	@SS-4: LL=37, PL=25, PI=12, NMC=17.9%, %200=90.8
157.7		@SS-5: Yellowish Red/Pale Yellow, 5YR5/6 & 5Y8/2
		Hard, Moist, Light Gray/Reddish Yellow, Non-Plastic to Low Plasticity, Fine to Coarse Sandy SILT (ML/A-4) with Trace Gravel, 7N/Gray & 7.5YR6/6
	18.5	
		Hard, Moist, Pale Brown/Reddish Yellow, Non-Plastic to Low Plasticity, SILT (ML/A-4) with Sand & Trace Gravel, 2.5Y7/3 & 7.5YR7/6
152.7		
		@SS-8: Light Gray, 2.5Y7/1
147.7	25.3	
		AMPHIBOLITE
		Metamorphic, Black/Green, Fine to Very Fine

Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
0.0	SS-1	WOH	WOH	1	2	1
2.0	SS-2	4	4	3	3	7
4.0	SS-3	3	12	8	8	20
6.0	SS-4	7	14	18	17	32
8.0	SS-5	5	10	16	20	26
13.5	SS-6	50/5"				100+
18.5	SS-7	50/3"				100+
23.5	SS-8	50/6"				100+
25.3	SS-9	50/0"				100+
25.3	NQ-1					
26.3						



LEGEND

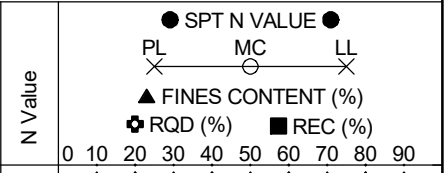
Continued Next Page

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:	P043326	**County:**	Richland/Lexington	**Boring No.:**	P3D-B4		
Site Description:	Carolina Crossroads Phase 3D			**Route:**	I-126 WB_I-26 EB		
Eng./Geo.:	B. Vogel	**Boring Location:**	382+82	**Offset:**	12-R	**Alignment:**	I-126 WB_I-26 EB
Elev.:	172.7 ft	**Latitude:**	34.02675045	**Longitude:**	-81.10320219	**Date Started:**	7/30/2025
Total Depth:	61.3 ft	**Soil Depth:**	24 ft	**Core Depth:**	30 ft	**Date Completed:**	7/31/2025
Bore Hole Diameter (in):	6.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	85.7%
Core Size:	NQ	**Driller:**	A. Alvarez	**Groundwater:**	**TOB** 22 ft	**24HR**	3.5 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value
		Grained, Massive, Hornblande/Feldspar/Quartz/Epodite, Slightly Weathered, Ultra #8 Bit					
		@NQ-1: %REC=16.6, %RQD=0, GSI=0-5, 7.0 min/ft			NQ-2		
142.7		@NQ-2: Very Strong Rock, Numerous Joints Dip From 5° to 30°, J, W/M, Sp, Fe, Pl/Ir, VC, S/SR, q_u= 15870 psi, RMR=18, Class V, %REC=33.3, %RQD=19.6, GSI=15-20, 4.0 min/ft		31.3			
		@NQ-3: Numerous Joints Dip From 5° to 90°, M, Su, S, %REC=9.2, %RQD=0, GSI=5-10, 4.8 min/ft			NQ-3		
137.7				36.3			
		@NQ-4: Numerous Joints Dip From 0° to 15°, Sp, Ir, SR/R, %REC=4, %RQD=0, GSI=30-15, 3.2 min/ft			NQ-4		
132.7				41.3			
		@NQ-5: No Recovery, %REC=0, %RQD=0, GSI=0 , 6.2 min/ft			NQ-5		
127.7				46.3			
		@NQ-6: Numerous Joints Dip From 0° to 90°, J, W/M, Sp/No, Fe/No, Pl/Ir, VC, S/SR, %REC=93.3, %RQD=0, GSI=15-20, 4.0 min/ft			NQ-6		
122.7				51.3			
		@NQ-7: Fresh, Occasional Joints Dip From 0° to 45°, J/V, W/M/N, Fi/No, Fe/Qz/H/No/Py, VC, S/SR/R, %REC=97.9, %RQD=83.3, GSI=75-85, 2.6 min/ft			NQ-7		



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:	P043326			**County:**	Richland/Lexington	**Boring No.:**	P3D-B4
Site Description:	Carolina Crossroads Phase 3D					**Route:**	I-126 WB_I-26 EB
Eng./Geo.:	B. Vogel	**Boring Location:**	382+82	**Offset:**	12-R	**Alignment:**	I-126 WB_I-26 EB
Elev.:	172.7 ft	**Latitude:**	34.02675045	**Longitude:**	-81.10320219	**Date Started:**	7/30/2025
Total Depth:	61.3 ft	**Soil Depth:**	24 ft	**Core Depth:**	30 ft	**Date Completed:**	7/31/2025
Bore Hole Diameter (in):	6.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	85.7%
Core Size:	NQ	**Driller:**	A. Alvarez	**Groundwater:**	**TOB** 22 ft	**24HR**	3.5 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value
117.7							
		@NQ-8: Numerous Joints Dip From 5° to 60°, J, Sp/Fi/No, Fe/H/No/Qz, S/SR, %REC=79.2, %RQD=52.9, GSI=40-50, 3.2 min/ft		56.3	NQ-8		
112.7							
	61.3	Boring Terminated at 61.3-ft. in Bedrock.					
107.7							
102.7							
97.7							
92.7							

● SPT N VALUE ●
PL MC LL
▲ FINES CONTENT (%)
✿ RQD (%) ■ REC (%)
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:	P043326			**County:**	Richland/Lexington	**Boring No.:**	P3D-B5
Site Description:	Carolina Crossroads Phase 3D					**Route:**	I-26 EB
Eng./Geo.:	B. Vogel	**Boring Location:**	387+25	**Offset:**	60-R	**Alignment:**	I-26 EB
Elev.:	180.2 ft	**Latitude:**	34.02646834	**Longitude:**	-81.10257634	**Date Started:**	8/4/2025
Total Depth:	66.1 ft	**Soil Depth:**	16.1 ft	**Core Depth:**	50 ft	**Date Completed:**	8/6/2025
Bore Hole Diameter (in):	6.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	85.7%
Core Size:	NQ	**Driller:**	J. Phillips	**Groundwater:**	**TOB** Dry	**24HR**	3.5 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0		0.0						
	0.4	**TOPSOIL** (4.5-in)							
		ALLUVIUM (HOLOCENE) Firm to Stiff, Moist, Red/Brownish Yellow, High Plasticity, Fat CLAY (CH/A-7-6) with Sand & Organics & Trace Gravel, 10R5/6 & 10YR6/8 ▼		SS-1	2	2	4	4	6
		@SS-1: NMC=29.9%, %200=70.7	2.0						
		@SS-2: Red, 10R5/6		SS-2	5	7	8	10	15
175.2		LL=54, PL=28, PI=26, NMC=26.1%,	4.0						
	6.0	%200=83.4		SS-3	9	11	11	12	22
		@SS-3: Very Stiff, Brownish Yellow, Reduced Organics, 10YR6/6	6.0						
	8.5	**PIEDMONT RESIDUUM**		SS-4	4	6	9	18	15
		Medium Dense, Moist, Gray/Red, High Plasticity, Clayey Fine to Medium SAND (SC/A-6), N7/Gray & 7.5R5/6	8.0						
170.2		@SS-4: LL=40, PL=14, PI=26, NMC=14.3%, %200=44.8		SS-5	6	9	11	23	20
		@SS-5: Red/Light Yellowish Brown, Fine to Coarse Sand, 10R5/6 & 10YR6/4							
	13.5	NMC=8.6%, %200=46.1	13.5	SS-6	50/2"				100+ >>
		Very Stiff, Moist, Very Pale Brown/Brownish Yellow, High Plasticity, Fine to Coarse Sandy Lean CLAY (CL/A-7-6) with Trace Gravel, 10YR8/2 & 10YR6/6							
165.2	16.1	@8.5: LL=43, PL=15, PI=28, NMC=23.0%, %200=66.3	16.1	SS-7	50/0"				100+ >>
		Very Dense, Dry to Moist, White, Non-Plastic to Low Plasticity, Silty GRAVEL (GM/A-1) with Sand, 10YR8/1	16.1						
				NQ-1					
160.2		**AMPHIBOLITE** Metamorphic, Green/White/Blue, Fine to Very Fine Grained, Massive, Epidote/Quartz/Biotite/Feldspar, Moderately Weathered to Slightly Weathered, Very Strong Rock, Ultra #8 Bit	21.1						
		@NQ-1: Numerous Joints Dip From 0° to 90°, J/V, N/VN, Su, Fe/H/QZ, Pl/Ir, VC, S/SR, q_u=14740 psi, RMR=42, Class III, %REC=95.8, %RQD=52.1, GSI=30-45, 5.8 min/ft		NQ-2					
155.2			26.1						
		@NQ-2: Gray/White/Green, Numerous							

SPT N VALUE ● PL × MC ○ LL × ▲ FINES CONTENT (%) ✿ RQD (%) ■ REC (%)

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	

SC_DOT G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT_DATATEMPLATE.GDT 11/3/25

SCDOT Soil Test Log

Project ID:	P043326			**County:**	Richland/Lexington	**Boring No.:**	P3D-B5
Site Description:	Carolina Crossroads Phase 3D					**Route:**	I-26 EB
Eng./Geo.:	B. Vogel	**Boring Location:**	387+25	**Offset:**	60-R	**Alignment:**	I-26 EB
Elev.:	180.2 ft	**Latitude:**	34.02646834	**Longitude:**	-81.10257634	**Date Started:**	8/4/2025
Total Depth:	66.1 ft	**Soil Depth:**	16.1 ft	**Core Depth:**	50 ft	**Date Completed:**	8/6/2025
Bore Hole Diameter (in):	6.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	85.7%
Core Size:	NQ	**Driller:**	J. Phillips	**Groundwater:**	**TOB** Dry	**24HR**	3.5 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value
		Joints Dip From 5° to 50°, Fe/Qz, Su/Sp, St/Ir, SR/R, %REC= 64.2, %RQD=0, GSI=15-20, 6.0 min/ft					
		@NQ-3: Laminated to Thinly Laminated, Highly Weathered to Moderately Weathered, Numerous Joints Dip From 0° to 25°, J/Fo, M/N/VN, Sp, Fe, Pl/Ir, %REC=28.3, %RQD=0, GSI=15-20, 8.4 min/ft			NQ-3		
150.2				31.1			
		@NQ-4: Numerous Joints Dip From 0° to 20°, M/VN, Fe/Qz, Ir, S/SR, %REC=15, %RQD=0, GSI=15-20, 5.2 min/ft			NQ-4		
145.2				36.1			
		@NQ-5: Highly Weathered to Slightly Weathered, Numerous Joints Dip From 0° to 25°, SR/R, %REC=26.6, %RQD=0, GSI=10-15, 4.2 min/ft			NQ-5		
140.2				41.1			
		@NQ-6: Epidote/Quartz/Biotite/Feldspar/Hornblende, Black/Gray/Green/White, Massive, Numerous Joints Dip From 0° to 70°, J/V, M/N, Su/Fi, Fe/Qz, %REC=55.8, %RQD=8.3, GSI=15-20, 6.4 min/ft			NQ-6		
135.2				46.1			
		@NQ-7: Green/Gray/Black, Epidote/Quartz/Biotite/Feldspar, Numerous Joints Dip From 0° to 70°, M/VN, Fe/Qz, Ir/Pl, %REC=33.3, %RQD=6.6, GSI=15-20, 7.8 min/ft			NQ-7		
130.2				51.1			
		@NQ-8: Green/Gray/White, Numerous Joints Dip From 10° to 25°, J/Fo, M/N, Su, Pl/Ir, S/SR, %REC=52.5, %RQD=14.6, GSI=15-20, 4.6 min/ft			NQ-8		

SPT N VALUE ● PL × MC ○ LL × ▲ FINES CONTENT (%) ✿ RQD (%) ■ REC (%)

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:	P043326			**County:**	Richland/Lexington	**Boring No.:**	P3D-B5
Site Description:	Carolina Crossroads Phase 3D					**Route:**	I-26 EB
Eng./Geo.:	B. Vogel	**Boring Location:**	387+25	**Offset:**	60-R	**Alignment:**	I-26 EB
Elev.:	180.2 ft	**Latitude:**	34.02646834	**Longitude:**	-81.10257634	**Date Started:**	8/4/2025
Total Depth:	66.1 ft	**Soil Depth:**	16.1 ft	**Core Depth:**	50 ft	**Date Completed:**	8/6/2025
Bore Hole Diameter (in):	6.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	85.7%
Core Size:	NQ	**Driller:**	J. Phillips	**Groundwater:**	**TOB** Dry	**24HR**	3.5 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value
125.2				56.1			
		@NQ-9: Black/Green, Amphibole/Quartz/Epidote, Not Enough Recovery for Discontinuity, %REC=4.2, %RQD=0, 6.6 min/ft			NQ-9		
120.2				61.1			
		@NQ-10: Green, Epidote/Quartz/Biotite/Feldspar, Numerous Joints Dip From 0° to 30°, J, M/VN, Su/Fi, Fe/Qz, Pl/Ir, %REC=30.0, %RQD=15.0, GSI=15-20, 6.0 min/ft			NQ-10		
115.2							
	66.1	Boring Terminated at 66.1-ft. in Bedrock.					
110.2							
105.2							
100.2							

SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) ✿ RQD (%) ■ REC (%)

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:	P043326			**County:**	Richland/Lexington	**Boring No.:**	P3D-B6
Site Description:	Carolina Crossroads Phase 3D					**Route:**	I-26 EB
Eng./Geo.:	B. Vogel	**Boring Location:**	386+18	**Offset:**	59-R	**Alignment:**	I-26 EB
Elev.:	183.6 ft	**Latitude:**	34.02674971	**Longitude:**	-81.10253194	**Date Started:**	8/6/2025
Total Depth:	52.2 ft	**Soil Depth:**	29.4 ft	**Core Depth:**	21 ft	**Date Completed:**	8/7/2025
Bore Hole Diameter (in):	6.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	85.7%
Core Size:	NQ	**Driller:**	J. Phillips	**Groundwater:**	**TOB** 25 ft	**24HR**	7 ft

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	**TOPSOIL** (3.5-in)	0.0	SS-1	WOH	1	2	1	3
		ALLUVIUM (HOLOCENE) Soft, Moist, Red/Light Yellowish Brown, High Plasticity, Fine to Coarse Sandy Fat CLAY (CH/A-7-6) with Organics and Trace Gravel, 7.5R5/6 & 10YR6/4	2.0	SS-2	3	4	6	9	10
		@SS-1: NMC=28.7%, %200=64.2	4.0						
178.6		@SS-2: Stiff, Red, 10R5/6		SS-3	10	14	16	16	30
	6.0	LL=53, PL=24, PI=29, NMC=23.4%, %200=67.8	6.0						
	7.5	@SS-3: Very Stiff		SS-4	19	11	9	7	20
	8.0	Very Stiff, Moist, Red/Reddish Yellow, High Plasticity, Fat CLAY (CH/A-7-6) with Sand & Trace Gravel , 10R5/6 & 7.5YR6/6	8.0	SS-5	4	5	7	8	12
173.6		@SS-4: LL=54, PL=22, PI=32, NMC=23.4%, %200=71.9							
		PIEDMONT RESIDUUM Medium Dense, Moist, Red/Very Pale Brown, Non-Plastic, Silty Fine to Coarse SAND (SM/A-2-4) with Trace Gravel, 10R5/6 & 10YR8/2							
	13.5	@7.5: NMC=9.5%, %200=27.7	13.5	SS-6	33	23	26		49
168.6		Stiff, Moist, Red, Non-Plastic to Low Plasticity, Fine to Medium Sandy SILT (ML/A-2-4) with Trace Organics, 10R5/6							
		Hard, Moist, White/Strong Brown, Non-Plastic, SILT (ML/A-4) with Sand, 10YR8/1 & 7.5YR5/6							
		@SS-6: LL=NP, PL=NP, PI=NP, NMC=10.0%, %200=74.3	18.5	SS-7	41	50/5"			100+
163.6		@SS-7: Gray/Light Yellowish Brown, 7N/Gray & 10YR6/4							
	23.5		23.5	SS-8	36	50/2"			100+
		Hard, Moist, Pale Brown/Brown, Low Plasticity to Medium Plasticity, SILT (ML/A-4), 2.5Y8/2 & 10YR5/3							
158.6		▽							

SPT N VALUE ● PL × MC ○ LL × ▲ FINES CONTENT (%) ✿ RQD (%) ■ REC (%)

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	

SC_DOT G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT_DATATEMPLATE.GDT 11/3/25

SCDOT Soil Test Log

Project ID:	P043326			**County:**	Richland/Lexington	**Boring No.:**	P3D-B6
Site Description:	Carolina Crossroads Phase 3D					**Route:**	I-26 EB
Eng./Geo.:	B. Vogel	**Boring Location:**	386+18	**Offset:**	59-R	**Alignment:**	I-26 EB
Elev.:	183.6 ft	**Latitude:**	34.02674971	**Longitude:**	-81.10253194	**Date Started:**	8/6/2025
Total Depth:	52.2 ft	**Soil Depth:**	29.4 ft	**Core Depth:**	21 ft	**Date Completed:**	8/7/2025
Bore Hole Diameter (in):	6.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	85.7%
Core Size:	NQ	**Driller:**	J. Phillips	**Groundwater:**	**TOB** 25 ft	**24HR**	7 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value
			28.5	SS-9	35 50/5"	100+
153.6	31.2	**AMPHIBOLITE** Metamorphic, Gray/Green, Fine to Very Fine Grained, Massive, Hornblade/Quartz/Feldspar/Epidote, Highly Weathered to Moderately Weathered, Ultra #8 Bit	31.2	SS-10	50/0"	100+
			31.2	NQ-1		
			32.2			
148.6		@NQ-1: No Joint Data, %REC=37.5, %RQD=0, GSI=0-10, 6.0 min/ft @NQ-2: Gray/White, Fine Grained, Biotite/Quartz/Feldspar/Epidote, Highly Weathered, No Joint Data, %REC=12.5, %RQD=0, GSI=0-10, 4.2 min/ft		NQ-2		
			37.2			
143.6		@NQ-3: Black/White/Green, Fine to Very Fine Grained, Amplibole/Biotite/Quartz/Epodite, Completely Weathered to Highly Weathered, No Joint Data, %REC=10.0, %RQD=0, GSI=0-10, 5.4 min/ft		NQ-3		
			42.2			
138.6		@NQ-4: Black/White, Highly Weathered to Moderately Weathered, No Joint Data, %REC=13.3, %RQD=0, GSI=0-10, 3.2 min/ft		NQ-4		
			47.2			
133.6		@NQ-5: Completely Weathered to Highly Weathered, No Joint Data, %REC=5.8, %RQD=0, GSI=0-10, 4.8 min/ft		NQ-5		
	52.2	Boring Terminated at 52.2-ft. in Bedrock.				

SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) ✿ RQD (%) ■ REC (%)
0 10 20 30 40 50 60 70 80 90

SC_DOT G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT_DATATEMPLATE.GDT 11/3/25

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:	P043326	**County:**	Richland/Lexington	**Boring No.:**	P3D-B7		
Site Description:	Carolina Crossroads Phase 3D			**Route:**	I-26 EB		
Eng./Geo.:	B. Vogel	**Boring Location:**	380+37	**Offset:**	49-R	**Alignment:**	I-26 EB
Elev.:	207.3 ft	**Latitude:**	34.0282864	**Longitude:**	-81.10263938	**Date Started:**	8/12/2025
Total Depth:	68.5 ft	**Soil Depth:**	68.5 ft	**Core Depth:**	0 ft	**Date Completed:**	8/12/2025
Bore Hole Diameter (in):	6.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	85.7%
Core Size:	N/A	**Driller:**	A. Alvarez	**Groundwater:**	**TOB** 21 ft	**24HR**	Dry

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0		0.0	SS-1	5	6	5	5	11
	0.3	**TOPSOIL** (3.5-in)	2.0	SS-2	4	6	8	8	14
		PIEDMONT RESIDUUM	4.0	SS-3	6	9	11	13	20
		Stiff, Moist, Light Gray/Greenish Gray, Medium Plasticity, SILT (ML/A-7-5) with Sand & Trace Gravel & Organics, 5Y7/2 & 10GY6/1	6.0	SS-4	5	7	7	8	14
	4.0	@SS-2: Greenish Gray/Pale Yellow, 5G6/1 & 5Y7/3	8.0	SS-5	4	6	6	7	12
202.3		LL=46, PL=31, PI=15, NMC=38.8%, %200=77.9							
	6.0	Very Stiff, Moist, Greenish Gray/Pale Yellow, Medium Plasticity, Elastic SILT (MH/A-7-5) with Sand, 5G6/1 & 5Y7/3							
		@SS-3: LL=50, PL=34, PI=16, NMC=34.0%, %200=82.9							
197.3		Stiff to Very Stiff, Moist, Greenish Gray/Pale Yellow, Low Plasticity, SILT (ML/A-5) with Sand & Trace Gravel, 5G6/1 & 5Y7/3	13.5	SS-6	9	11	7		18
		@SS-5: Reduced Trace Gravel							
		LL=42, PL=32, PI=10, NMC=37.1%, %200=81.7							
		@SS-6: (ML/A-4), 10GY6/1 & 5Y8/4							
192.3		LL=38, PL=29, PI=9, NMC=35.5%, %200=82.6							
	18.5	Very Dense, Dry to Moist, Greenish Gray, Non-Plastic, Poorly Graded GRAVEL (GP-GM/A-1) with Silt & Sand, 10GY6/1	18.5	SS-7	50/5"				100+
187.3		▽							
	23.5	Hard, Moist, Greenish Gray/Pale Yellow, Low Plasticity, Fine to Coarse Sandy SILT (ML/A-4), with Trace Gravel, 10GY6/1 & 5Y8/4	23.5	SS-8	8	29	36		65
182.3		@SS-8: LL=34, PL=24, PI=10, NMC=25.3%, %200=53.1							

SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) ✿ RQD (%) ■ REC (%)

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	

SC_DOT G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT_DATATEMPLATE.GDT 11/3/25

SCDOT Soil Test Log

Project ID:	P043326	**County:**	Richland/Lexington	**Boring No.:**	P3D-B7		
Site Description:	Carolina Crossroads Phase 3D			**Route:**	I-26 EB		
Eng./Geo.:	B. Vogel	**Boring Location:**	380+37	**Offset:**	49-R	**Alignment:**	I-26 EB
Elev.:	207.3 ft	**Latitude:**	34.0282864	**Longitude:**	-81.10263938	**Date Started:**	8/12/2025
Total Depth:	68.5 ft	**Soil Depth:**	68.5 ft	**Core Depth:**	0 ft	**Date Completed:**	8/12/2025
Bore Hole Diameter (in):	6.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	85.7%
Core Size:	N/A	**Driller:**	A. Alvarez	**Groundwater:**	**TOB** 21 ft	**24HR**	Dry

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	28.5			28.5						
177.3		Very Stiff, Moist, Greenish Gray/Pale Yellow, Low Plasticity to Medium Plasticity, SILT (ML/A-4) with Trace Gravel, 10GY6/1 & 5Y8/3			SS-9	11	19	18		37
	33.5			33.5						
172.3		Very Stiff, Moist, Greenish Gray/Pale Yellow, Medium Plasticity, Fine to Coarse Sandy Elastic SILT (MH/A-7-5) with Trace Gravel, 10GY6/1 & 5Y8/3 @SS-10: LL=51, PL=31, PI=20, NMC=27.1%, %200=64.6			SS-10	8	7	14		23
	38.5			38.5						
167.3		Hard, Moist, Greenish Gray/Light Gray, Medium Plasticity, SILT (ML/A-7-6) with Sand, 10GY6/1 & 5Y7/2 @SS-11: LL=44, PL=28, PI=16, NMC=45.4%, %200=71.8			SS-11	11	16	19		35
				43.5	SS-12	50/4"				100+
162.3		@SS-12: Dark Greenish Gray, with Trace Gravel, 5G4/1								
	48.5			48.5						
157.3		Hard, Moist, Greenish Gray/Pale Yellow, Low Plasticity to Medium Plasticity, Fine to Coarse Sandy SILT (ML/A-7-6) with Trace Gravel, 10GY6/1 & 5Y8/3 @SS-13: NMC=37.3%, %200=63.2			SS-13	18	23	22		45
	53.5			53.5						
		No Recovery								

SPT N VALUE ● PL × MC ○ LL × ▲ FINES CONTENT (%) ✿ RQD (%) ■ REC (%)

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:	P043326	**County:**	Richland/Lexington	**Boring No.:**	P3D-B7		
Site Description:	Carolina Crossroads Phase 3D			**Route:**	I-26 EB		
Eng./Geo.:	B. Vogel	**Boring Location:**	380+37	**Offset:**	49-R	**Alignment:**	I-26 EB
Elev.:	207.3 ft	**Latitude:**	34.0282864	**Longitude:**	-81.10263938	**Date Started:**	8/12/2025
Total Depth:	68.5 ft	**Soil Depth:**	68.5 ft	**Core Depth:**	0 ft	**Date Completed:**	8/12/2025
Bore Hole Diameter (in):	6.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	85.7%
Core Size:	N/A	**Driller:**	A. Alvarez	**Groundwater:**	**TOB** 21 ft	**24HR**	Dry

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
152.3					SS-14	18	21	15		36
	58.5			58.5						
		Hard, Moist, Greenish Gray/Pale Yellow, High Plasticity, Lean CLAY (CL/A-7-6) with Sand, 10GY6/1 & 5Y8/3			SS-15	24	25	21		46
147.3		@SS-15: LL=48, PL=26, PI=22, NMC=35.8%, %200=75.4								
	63.5			63.5						
		Hard, Moist, Pale Yellow/Greenish Gray, Low Plasticity to Medium Plasticity, Fine to Coarse Sandy Elastic SILT (ML/A-7-5) with Trace Gravel, 5Y8/4 & 5G5/1			SS-16	40	50/3"			100+
142.3										
	68.5			68.5	~~SS-17~~	~~50/0.5"~~				~~100+~~
		Boring Terminated at 68.5-ft. on Top of Bedrock.								
137.3										
132.3										
127.3										

SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) ✿ RQD (%) ■ REC (%)

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 G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT_DATATEMPLATE.GDT 11/3/25

SCDOT Soil Test Log

Project ID:	P043326			**County:**	Richland/Lexington	**Boring No.:**	P3D-B8A
Site Description:	Carolina Crossroads Phase 3D					**Route:**	I-26 WB_TRANS
Eng./Geo.:	B. Vogel	**Boring Location:**	387+83	**Offset:**	2-L	**Alignment:**	I-26 WB_TRANS
Elev.:	207.6 ft	**Latitude:**	34.02640018	**Longitude:**	-81.10219124	**Date Started:**	10/7/2025
Total Depth:	34.9 ft	**Soil Depth:**	10 ft	**Core Depth:**	0 ft	**Date Completed:**	10/8/2025
Bore Hole Diameter (in):	4.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	85.7%
Core Size:	N/A	**Driller:**	J. Phillips	**Groundwater:**	**TOB** NM	**24HR**	NM

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 (%) / RQD (%) / REC (%) (0 10 20 30 40 50 60 70 80 90)
	0.0										
	0.7	BRIDGE DECK (8.0-in.)									
		AIR GAP (24.2-ft.)									
202.6											
197.6											
192.6											
187.6											
182.6	24.9	**ALLUVIUM (HOLOCENE)**		24.9							
		Loose to Very Loose, Moist, Brown, Non-Plastic to Low Plasticity, Silty Fine to			SS-1	1	4	1	2	5	● ○
				26.9							

LEGEND

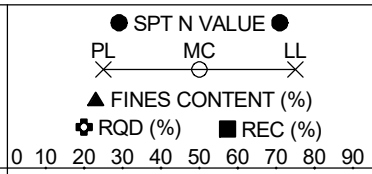
Continued Next Page

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:	P043326			**County:**	Richland/Lexington	**Boring No.:**	P3D-B8A
Site Description:	Carolina Crossroads Phase 3D					**Route:**	I-26 WB_TRANS
Eng./Geo.:	B. Vogel	**Boring Location:**	387+83	**Offset:**	2-L	**Alignment:**	I-26 WB_TRANS
Elev.:	207.6 ft	**Latitude:**	34.02640018	**Longitude:**	-81.10219124	**Date Started:**	10/7/2025
Total Depth:	34.9 ft	**Soil Depth:**	10 ft	**Core Depth:**	0 ft	**Date Completed:**	10/8/2025
Bore Hole Diameter (in):	4.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	85.7%
Core Size:	N/A	**Driller:**	J. Phillips	**Groundwater:**	**TOB** NM	**24HR**	NM

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
		Coarse SAND (SM/A-4) with Trace Gravel, 7.5YR5/4							
	28.9	@SS-1: NMC=11.1%, %200=39.3	28.9	SS-2	2	1	2	2	3
177.6		@SS-2: Reddish Yellow, 5YR6/6							
		Soft to Very Soft, Moist, Light Red/Light Brownish Gray, High Plasticity, Sandy Lean CLAY (CL/A-7-6) with Organics & Trace Gravel, 2.5YR6/8 & 10YR6/2	30.9	SS-3	WOH	2	2	2	4
		@SS-3: LL=46, PL=16, PI=30, NMC=31.5%, %200=67.6		SS-4	2	1	2	1	3
		@SS-5: Light Brownish Gray, 2.5Y6/2	32.9	SS-5	WOH	WOH	1	1	1
172.6	34.9	LL=40, PL=16, PI=24, NMC=34.7%, %200=67.6							
		Boring Terminated at 34.9-ft. on Top of Existing Bridge Foundation. Boring Was Offset to Avoid Existing Bridge (See P3D-B8B Boring Log).							
167.6									
162.6									
157.6									



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:	P043326	**County:**	Richland/Lexington	**Boring No.:**	P3D-B8B		
Site Description:	Carolina Crossroads Phase 3D			**Route:**	I-26 WB_TRANS		
Eng./Geo.:	B. Vogel	**Boring Location:**	387+87	**Offset:**	23-L	**Alignment:**	I-26 WB_TRANS
Elev.:	207.6 ft	**Latitude:**	34.02637806	**Longitude:**	-81.10212409	**Date Started:**	10/7/2025
Total Depth:	78.5 ft	**Soil Depth:**	33.5 ft	**Core Depth:**	30 ft	**Date Completed:**	10/8/2025
Bore Hole Diameter (in):	4.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	85.7%
Core Size:	NQ	**Driller:**	J. Phillips	**Groundwater:**	**TOB** NM	**24HR**	22.5 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	SPT N VALUE / PL MC LL / FINES CONTENT (%) / RQD (%) / REC (%)
	0.0							0 10 20 30 40 50 60 70 80 90
	0.7	BRIDGE DECK (8.0-in.)						
		AIR GAP (14.2-ft.)						
202.6								
197.6								
192.6	15.0	Soil Gap due to Offeset of P3D-B8A. Augered Down to 13.5-ft Below the Existing Ground Surface.						
187.6								
182.6								

Continued Next Page

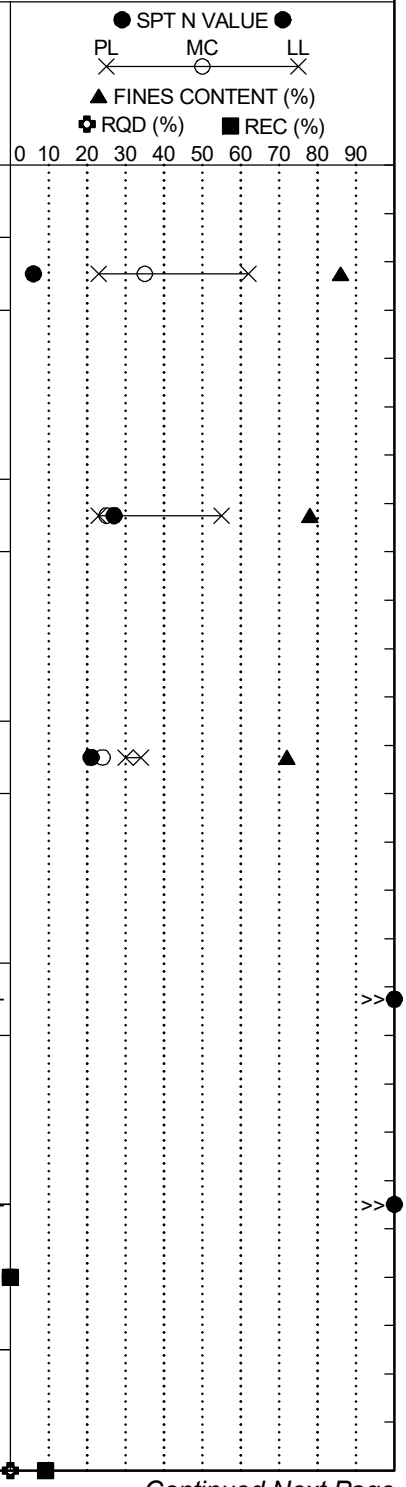
LEGEND

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:	P043326	**County:**	Richland/Lexington	**Boring No.:**	P3D-B8B		
Site Description:	Carolina Crossroads Phase 3D			**Route:**	I-26 WB_TRANS		
Eng./Geo.:	B. Vogel	**Boring Location:**	387+87	**Offset:**	23-L	**Alignment:**	I-26 WB_TRANS
Elev.:	207.6 ft	**Latitude:**	34.02637806	**Longitude:**	-81.10212409	**Date Started:**	10/7/2025
Total Depth:	78.5 ft	**Soil Depth:**	33.5 ft	**Core Depth:**	30 ft	**Date Completed:**	10/8/2025
Bore Hole Diameter (in):	4.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	85.7%
Core Size:	NQ	**Driller:**	J. Phillips	**Groundwater:**	**TOB** NM	**24HR**	22.5 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	28.5	**ALLUVIUM (HOLOCENE)**		28.5						
177.6		Firm, Moist, Weak Red, High Plasticity, Fat CLAY (CH/A-7-6), 10R4/3			SS-1	2	2	4		6
		@SS-1: LL=62, PL=23, PI=39, NMC=34.7%, %200=85.6								
	33.5	**PIEDMONT RESIDUAL**		33.5						
172.6		Very Stiff, Moist, Light Gray/Yellowish Red, High Plasticity, Fat CLAY (CH/A-7-6) with Sand & Trace Gravel, 7N/Light Gray & 5YR5/8			SS-2	7	10	17		27
		@SS-2: LL=55, PL=23, PI=32, NMC=25.0%, %200=78.2								
	38.5	Very Stiff to Hard, Moist, Light Gray/Yellowish Red, Low Plasticity, SILT (ML/A-4) with Sand & Trace Gravel, 7N/Light Gray & 5YR5/8		38.5						
167.6		@SS-3: LL=34, PL=30, PI=4, NMC=24.4%, %200=71.8			SS-3	12	7	14		21
				43.5						
		@SS-4: Light Greenish Gray/Very Pale Brown, 5GY5/1 & 10YR7/4			SS-4	50/4"				100+
162.6										
	48.5			48.5	SS-5	50/0.5"				100+
		AMPHIBOLITE		48.5						
157.6		Metamorphic, Black/Green, Fine to Very Fine Grained, Massive, Feldspar/Hornblade/Epidote/Quartz, Highly Weathered, Ultra #8 Bit			NQ-1					
		@NQ-1: %REC=0, %RQD=0, GSI=0, 5.0 min/ft		51.5						
		@NQ-2: %REC=9.2, %RQD=0, GSI=0-5, 3.8 min/ft								



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:	P043326			**County:**	Richland/Lexington	**Boring No.:**	P3D-B8B
Site Description:	Carolina Crossroads Phase 3D					**Route:**	I-26 WB_TRANS
Eng./Geo.:	B. Vogel	**Boring Location:**	387+87	**Offset:**	23-L	**Alignment:**	I-26 WB_TRANS
Elev.:	207.6 ft	**Latitude:**	34.02637806	**Longitude:**	-81.10212409	**Date Started:**	10/7/2025
Total Depth:	78.5 ft	**Soil Depth:**	33.5 ft	**Core Depth:**	30 ft	**Date Completed:**	10/8/2025
Bore Hole Diameter (in):	4.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	85.7%
Core Size:	NQ	**Driller:**	J. Phillips	**Groundwater:**	**TOB** NM	**24HR**	22.5 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value
152.6			56.5	NQ-2		
		@NQ-3: Highly Weathered to Moderately Weathered, Numerous Joints Dip From 80° to 85°, J, M, Sp, Fe, Pl/Ir, VC, R, %REC=12.5, %RQD=6.6, GSI=0-5, 3.4 min/ft		NQ-3		
147.6			61.5			
		@NQ-4: Highly Weathered, Not Enough Recovery for Discontinuity, %REC=5.8, %RQD=0, GSI=0-5, 2.8 min/ft		NQ-4		
142.6			66.5			
		@NQ-5: Numerous Joints Dip From 0° to 90°, J, M, Sp, Fe, Pl/Ir, VC, SR/R, %REC=20.0, %RQD=0, GSI=0-5, 3.2 min/ft		NQ-5		
137.6			71.5			
		@NQ-6: %REC=10.0, %RQD=0, GSI=0-5, 3.6 min/ft		NQ-6		
132.6			76.5			
		@NQ-7: Highly Weathered to Moderately Weathered, Numerous Joints Dip From 0° to 15°, SR, %REC=15.6, %RQD=0, GSI=0-5, 4.5 min/ft		NQ-7		
	78.5	Boring Terminated at 78.5-ft. in Bedrock.				
127.6						

SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) ✿ RQD (%) ■ REC (%)

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 G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT_DATATEMPLATE.GDT 11/3/25

SCDOT Soil Test Log

Project ID:	P043326	**County:**	Richland/Lexington	**Boring No.:**	P3D-B9		
Site Description:	Carolina Crossroads Phase 3D			**Route:**	I-26 WB_TRANS		
Eng./Geo.:	B. Vogel	**Boring Location:**	385+52	**Offset:**	12-R	**Alignment:**	I-26 WB_TRANS
Elev.:	209.9 ft	**Latitude:**	34.02703189	**Longitude:**	-81.10215007	**Date Started:**	9/30/2025
Total Depth:	93.5 ft	**Soil Depth:**	73.5 ft	**Core Depth:**	20 ft	**Date Completed:**	10/1/2025
Bore Hole Diameter (in):	6.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	85.7%
Core Size:	NQ	**Driller:**	J. Phillips	**Groundwater:**	**TOB** 40 ft	**24HR**	Dry

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0								
	0.9	ASPHALT ROADWAY (11.0-in.)	0.9						
		EXISTING FILL							
	2.0	Loose, Moist, Greenish Gray, Non-Plastic, Fine to Coarse Poorly Graded SAND (SP/A-3) with Trace Gravel, 10Y5/1	2.0	SS-1	X	X	6	6	6
				SS-2	6	5	3	4	8
		Firm to Stiff, Moist, Light Gray/Greenish Gray, Medium Plasticity, SILT (ML/A-7-6) with Sand, 5Y7/2 & 5G6/1	4.0						
204.9				SS-3	4	5	6	9	11
		@SS-2: LL=43, PL=28, PI=15, NMC=30.8%, %200=71.5	6.0						
		@SS-3: Bluish Gray/Grayish Olive, with Trace Gravel, 5B5/1 & 10Y6/2		SS-4	10	6	5	6	11
		@SS-4: Greenish Gray, 5G5/1 & 10Y6/1 LL=42, PL=27, PI=15, NMC=28.2%, %200=72.7	8.0						
				SS-5	2	3	8	4	11
199.9		@SS-5: Greenish Gray, 5G5/1 LL=41, PL=26, PI=15, NMC=36.8%, %200=82.7							
			13.5						
		@SS-6: Pale Olive, with Trace Gravel, 5Y6/3 NMC=31.0%, %200=73.0		SS-6	2	6	9		15
194.9									
	18.5	No Recovery	18.5	SS-7	4	5	10		15
189.9									
	23.5		23.5						
		Very Stiff, Moist, Red/Strong Brown, Non-Plastic to Low Plasticity, SILT (ML/A-4), 2.5YR5/6 & 7.5YR5/6		SS-8	6	8	11		19
184.9		@SS-8: NMC=39.5%, %200=97.2							

SPT N VALUE ● PL × MC ○ LL ×
▲ FINES CONTENT (%)
✿ RQD (%) ■ REC (%)
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	

SC_DOT G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT_DATATEMPLATE.GDT 11/3/25

SCDOT Soil Test Log

Project ID:	P043326	**County:**	Richland/Lexington	**Boring No.:**	P3D-B9		
Site Description:	Carolina Crossroads Phase 3D			**Route:**	I-26 WB_TRANS		
Eng./Geo.:	B. Vogel	**Boring Location:**	385+52	**Offset:**	12-R	**Alignment:**	I-26 WB_TRANS
Elev.:	209.9 ft	**Latitude:**	34.02703189	**Longitude:**	-81.10215007	**Date Started:**	9/30/2025
Total Depth:	93.5 ft	**Soil Depth:**	73.5 ft	**Core Depth:**	20 ft	**Date Completed:**	10/1/2025
Bore Hole Diameter (in):	6.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	85.7%
Core Size:	NQ	**Driller:**	J. Phillips	**Groundwater:**	**TOB** 40 ft	**24HR**	Dry

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	28.5	**PIEDMONT RESIDUUM**		28.5						
179.9		Stiff, Moist, Red/Reddish Yellow, High Plasticity, Fat CLAY (CH/A-7-6), 10R5/6 & 7.5YR6/6			SS-9	5	5	5		10
		@SS-9: LL=55, PL=29, PI=26, NMC=40.5%, %200=93.5								
	33.5			33.5						
174.9		Stiff to Very Stiff, Moist, Light Brownish Gray/Reddish Yellow, Medium Plasticity, SILT (ML/A-7-5), 2.5Y6/2 & 5YR6/6			SS-10	2	6	8		14
		@SS-10: LL=48, PL=36, PI=12, NMC=39.4%, %200=86.7								
		@SS-11: Reddish Yellow/Greenish Gray, 5YR6/6 & 5GY6/1		38.5	SS-11	6	6	7		13
169.9		▽								
		@SS-12: Greenish Gray/Light Yellowish Brown, 5G5/1 & 10YR6/4		43.5	SS-12	7	10	17		27
164.9										
	48.5			48.5	SS-13	28	50/4"			100+
		Hard, Moist, Light Greenish Gray, Non-Plastic to Low Plasticity, Fine to Coarse Sandy SILT (ML/A-4) with Trace Gravel, 5G6/1								
159.9										
	53.5			53.5						
		Hard, Moist, Very Dark Brown, Non-Plastic to			SS-14	50/5"				100+

SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) ✿ RQD (%) ■ REC (%)

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	

SC_DOT G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT_DATATEMPLATE.GDT 11/3/25

SCDOT Soil Test Log

Project ID:	P043326	**County:**	Richland/Lexington	**Boring No.:**	P3D-B9		
Site Description:	Carolina Crossroads Phase 3D			**Route:**	I-26 WB_TRANS		
Eng./Geo.:	B. Vogel	**Boring Location:**	385+52	**Offset:**	12-R	**Alignment:**	I-26 WB_TRANS
Elev.:	209.9 ft	**Latitude:**	34.02703189	**Longitude:**	-81.10215007	**Date Started:**	9/30/2025
Total Depth:	93.5 ft	**Soil Depth:**	73.5 ft	**Core Depth:**	20 ft	**Date Completed:**	10/1/2025
Bore Hole Diameter (in):	6.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	85.7%
Core Size:	NQ	**Driller:**	J. Phillips	**Groundwater:**	**TOB** 40 ft	**24HR**	Dry

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
154.9		Low Plasticity, SILT (ML/A-4), 10YR2/2								
				58.5	SS-15	25	50/4"			100+
149.9		@SS-15: Light Gray/Pale Yellow, 10YR5/1 & 5Y7/3								
	63.5			63.5	SS-16	50/2"				100+
144.9		Very Dense, Moist, Light Grayish Olive, Non-Plastic to Low Plasticity, Silty Fine to Coarse SAND (SM/A-2-4), 10Y6/2								
	68.5			68.5	SS-17	50/1.5"				100+
139.9		Hard, Moist, Gray, Non-Plastic to Low Plasticity, SILT (ML/A-4), 5Y5/1								
	73.5			73.5	SS-18	50/0.5"				100+
		AMPHIBOLITE		73.5						
134.9		Metamorphic, Black, Fine to Very Fine Grained, Massive, Feldspar/Hornblade/Epidote/Quartz, Highly Weathered, Ultra #8 Bit			NQ-1					
		@NQ-1: %REC=11.1, %RQD=0, GSI=0-5, 3.7 min/ft		76.5						
		@NQ-2: Black/Brown, Not Enough Recovery for Discontinuity, %REC=8.6, %RQD=0, GSI=0-5, 6.2 min/ft			NQ-2					
129.9										

SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) ✿ RQD (%) ■ REC (%)

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:	P043326			**County:**	Richland/Lexington	**Boring No.:**	P3D-B9
Site Description:	Carolina Crossroads Phase 3D					**Route:**	I-26 WB_TRANS
Eng./Geo.:	B. Vogel	**Boring Location:**	385+52	**Offset:**	12-R	**Alignment:**	I-26 WB_TRANS
Elev.:	209.9 ft	**Latitude:**	34.02703189	**Longitude:**	-81.10215007	**Date Started:**	9/30/2025
Total Depth:	93.5 ft	**Soil Depth:**	73.5 ft	**Core Depth:**	20 ft	**Date Completed:**	10/1/2025
Bore Hole Diameter (in):	6.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	85.7%
Core Size:	NQ	**Driller:**	J. Phillips	**Groundwater:**	**TOB** 40 ft	**24HR**	Dry

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value
		@NQ-3: Black/Green, Highly Weathered to Moderately Weathered, Numerous Joints Dip From 0° to 90°, J, M, Su/Sp, Fe, Pl/Ir, VC, SR/R, %REC=16.6, %RQD=0, GSI=0-5, 5.0 min/ft		81.5	NQ-3		
124.9				86.5			
		@NQ-4: Black, Highly Weathered, Numerous Joints Dip From 0° to 70°, %REC=12.5, %RQD=0, GSI=0-5, 4.0 min/ft			NQ-4		
119.9				91.5			
		@NQ-5: Black/Green, Highly Weathered to Moderately Weathered, Numerous Joints Dip From 0° to 45°, Sp, %REC=22.9, %RQD=0, GSI=0-5, 5.0 min/ft			NQ-5		
	93.5	Boring Terminated at 93.5-ft. in Bedrock.					
114.9							
109.9							
104.9							

SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) ✿ RQD (%) ■ REC (%)

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 G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT_DATATEMPLATE.GDT 11/3/25

SCDOT Soil Test Log

Project ID:	P043326			**County:**	Richland/Lexington	**Boring No.:**	P3D-B10
Site Description:	Carolina Crossroads Phase 3D					**Route:**	I-26 EB
Eng./Geo.:	B. Vogel & A. Pennington	**Boring Location:**	382+52	**Offset:**	23-R	**Alignment:**	I-26 EB
Elev.:	203.6 ft	**Latitude:**	34.02774566	**Longitude:**	-81.10228094	**Date Started:**	7/16/2025
Total Depth:	43.1 ft	**Soil Depth:**	38.1 ft	**Core Depth:**	5 ft	**Date Completed:**	7/16/2025
Bore Hole Diameter (in):	6.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	85.7%
Core Size:	NQ	**Driller:**	J. Phillips	**Groundwater:**	**TOB** Dry	**24HR**	Dry

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0								
	0.2	**TOPSOIL** (2.5-in)	0.0						
		PIEDMONT RESIDUUM		SS-1	3	23	13	6	36
	2.0	Hard, Moist, Light Greenish Gray/Gray, Low Plasticity to Medium Plasticity, Fine to Coarse Sandy SILT (ML/A-4) with Trace Gravel, 5G7/1 & 5Y7/2	2.0	SS-2	7	10	13	14	23
	4.0		4.0						
198.6		Very Stiff, Moist, Greenish Gray, Low Plasticity, SILT (ML/A-4) with Sand & Trace Gravel, 10GY6/1		SS-3	15	25	26	38	51
		@SS-2: LL=33, PL=28, PI=5, NMC=24.1%, %200=78.7	6.0						
				SS-4	9	34	50/2"		84+
	8.0	Hard, Moist, Greenish Gray/Very Pale Brown, Low Plasticity, Fine to Coarse Sandy SILT (ML/A-4) with Trace Gravel, 5G6/1 & 10YR7/3	8.0	SS-5		50/3"			100+
		@SS-3: LL=31, PL=27, PI=4, NMC=16.5%, %200=58.9	10.0	SS-6		50/0"			100+
193.6	10.1	@SS-4: Greenish Gray/Yellow, 5G6/1 & 10YR7/6	10.1						
		NMC=31.9%, %200=60.7		NQ-1					
		Very Dense, Moist, Greenish Gray, Non-Plastic, Poorly Graded SAND (SP-SM/A-3) with Silt, 5G6/1							
188.6	15.1	**PHYLLITE**	15.1						
		Metamorphic, Dark Gray, Fine to Very Fine Grained, Laminated, Quartz/Feldspar/Mica, Slightly Weathered to Fresh, Ultra #8 Bit		NQ-2					
		@NQ-1: Numerous Joints Dip From 10° to 90°, J/Fo, M/N, Sp/Fi/No, Fe/No/Qz, Pl/Ir, VC, SR/R, %REC=73.3, %RQD=43.75, GSI=35-45, 5.2 min/ft							
183.6	20.1	@NQ-2: Sampled as Residual Soil, Moist, Pale Yellow, Medium Plasticity, Elastic SILT (MH/A-7-5), 5Y8/4	20.1						
		LL=57, PL=39, PI=18, NMC=43.6%, %200=88.1		NQ-3					
		@NQ-3: Sampled as Residual Soil, Moist, Pale Olive/Strong Brown, High Plasticity, Fine to Coarse Sandy Fat CLAY (CH/A-7-6), 5Y6/3 & 7.5YR5/6							
178.6		LL=51, PL=26, PI=25, NMC=29.4%, %200=65.7							

SPT N VALUE (PL, MC, LL) ▲ FINES CONTENT (%) ✿ RQD (%) ■ REC (%)

0 10 20 30 40 50 60 70 80 90

Continued Next Page

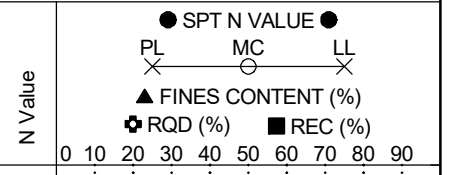
LEGEND

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:	P043326			**County:**	Richland/Lexington	**Boring No.:**	P3D-B10
Site Description:	Carolina Crossroads Phase 3D					**Route:**	I-26 EB
Eng./Geo.:	B. Vogel & A. Pennington	**Boring Location:**	382+52	**Offset:**	23-R	**Alignment:**	I-26 EB
Elev.:	203.6 ft	**Latitude:**	34.02774566	**Longitude:**	-81.10228094	**Date Started:**	7/16/2025
Total Depth:	43.1 ft	**Soil Depth:**	38.1 ft	**Core Depth:**	5 ft	**Date Completed:**	7/16/2025
Bore Hole Diameter (in):	6.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	85.7%
Core Size:	NQ	**Driller:**	J. Phillips	**Groundwater:**	**TOB** Dry	**24HR**	Dry

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	28.5	No Recovery	28.5	SS-9	50/1"				100+
173.6									
	33.5	Dense, Moist, Very Pale Brown, Medium Plasticity, Silty Fine to Coarse SAND (SM/A-7-6) with Trace Gravel, 10YR7/4 @SS-10: LL=46, PL=29, PI=17, NMC=21.0%, %200=49.4	33.5	SS-10	18	30	13		43
168.6									
	38.5	Very Dense, Moist, Black, Non-Plastic, Poorly Graded GRAVEL (GP/A-1), 2.5N/Black	38.5	SS-11	50/2"				100+
163.6									
	43.1	Boring Terminated at 43.1-ft. on Bedrock.	43.1	SS-12	50/0"				100+
158.6									
153.6									



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:	P043326	**County:**	Richland/Lexington	**Boring No.:**	P3D-B11		
Site Description:	Carolina Crossroads Phase 3D			**Route:**	I-26 WB_RC		
Eng./Geo.:	B. Vogel	**Boring Location:**	391+28	**Offset:**	35-L	**Alignment:**	I-26 WB_RC
Elev.:	177.3 ft	**Latitude:**	34.02591744	**Longitude:**	-81.10194887	**Date Started:**	6/9/2025
Total Depth:	51.5 ft	**Soil Depth:**	41.5 ft	**Core Depth:**	10 ft	**Date Completed:**	6/10/2025
Bore Hole Diameter (in):	4.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	96.7%
Core Size:	NQ	**Driller:**	L. Guempel	**Groundwater:**	**TOB** 8.5 ft	**24HR**	NM

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0		0.0	SS-1	1	5	9	9	14
	0.3	**TOPSOIL** (3.5-in)							
		ALLUVIUM (HOLOCENE)							
		Medium Dense, Dry to Moist, Red, Medium Plasticity, Subrounded to Subangular, Clayey Fine to Coarse SAND (SC/A-6) with Trace Organics, 10R5/6	2.0	SS-2	10	11	12	15	23
	4.0	@SS-1: LL=34, PL=15, PI=19, NMC=3.2%, %200=49.9	4.0	SS-3	14	13	12	12	25
172.3		@SS-2: Red, Reduced Organics, 2.5YR5/8							
		Very Stiff, Moist, Red, High Plasticity, Fine to Coarse Sandy Lean CLAY (CL/A-7-6), with Trace Organics, 10R5/6	6.0	SS-4	4	4	4	4	8
	8.0	@SS-3: LL=44, PL=21, PI=23, NMC=18.6%, %200=56.2	8.0	SS-5	2	2	2	2	4
		@SS-4: Firm, Medium Plasticity, (CL/A-6), Reduced Organics							
167.3		LL=32, PL=16, PI=16, NMC=21.3%, %200=53.2							
		Soft, Moist, Olive Gray/Olive, Medium Plasticity, Lean CLAY (CL/A-6) with Sand & Trace Organics, 5Y5/2 & 5Y5/3							
	13.5	@SS-5: LL=40, PL=20, PI=20, NMC=26.2%, %200=71.2	13.5	SS-6	3	5	5		10
162.3		Loose, Moist, Bluish Gray/Yellowish Brown, Medium Plasticity, Subangular to Angular, Clayey Fine SAND (SC/A-6), Micaceous, 10B6/8 & 10YR5/6							
		@SS-6: LL=32, PL=20, PI=12, NMC=21.9%, %200=42.7							
	18.5	**PIEDMONT RESIDUUM**	18.5	SS-7	20	40	42		82
157.3		Hard, Moist, Pale Olive/Yellowish Brown, Low Plasticity to Medium Plasticity, Weakly Cemented SILT (ML/A-4), 5Y6/3 & 10YR5/6							
	23.5	Very Dense, Moist, Greenish Gray/Very Pale Brown, Non-Plastic to Medium Plasticity, Silty Fine to Coarse SAND (SM/A-2-4) with Trace Gravel, 10GY5/1 & 10YR7/4	23.5	SS-8	50/5"				100+
152.3									

SPT N VALUE ● PL × MC ○ LL × ▲ FINES CONTENT (%) ✿ RQD (%) ■ REC (%)

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:	P043326	**County:**	Richland/Lexington	**Boring No.:**	P3D-B11		
Site Description:	Carolina Crossroads Phase 3D			**Route:**	I-26 WB_RC		
Eng./Geo.:	B. Vogel	**Boring Location:**	391+28	**Offset:**	35-L	**Alignment:**	I-26 WB_RC
Elev.:	177.3 ft	**Latitude:**	34.02591744	**Longitude:**	-81.10194887	**Date Started:**	6/9/2025
Total Depth:	51.5 ft	**Soil Depth:**	41.5 ft	**Core Depth:**	10 ft	**Date Completed:**	6/10/2025
Bore Hole Diameter (in):	4.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	96.7%
Core Size:	NQ	**Driller:**	L. Guempel	**Groundwater:**	**TOB** 8.5 ft	**24HR**	NM

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value
	28.5			28.5			
		Hard, Moist, Light Olive Gray/Reddish Yellow, Non-Plastic to Medium Plasticity, Weakly Cemented SILT (ML/A-4), Micaceous, 5Y6/2 & 7.5YR6/6			SS-9	50/3"	100+
147.3							
				33.5			
		@SS-10: Olive Gray/Reddish Yellow, Reduced Mica, 5Y5/2 & 7.5YR6/8			SS-10	50/2.75"	100+
142.3							
				38.5	SS-11	50/2"	100+
137.3							
	41.5			41.5	SS-12	50/0"	100+
		AMPHIBOLITE		41.5			
		Metamorphic, Dark Gray, Very Coarse to Fine Grained, Laminated to Thinly Laminated, Biotite/Amphibole/Feldspar/Quartz, Moderately Weathered to Slightly Weathered, Very Strong Rock, Ultra #8 Bit			NQ-1		
132.3		@NQ-1: Numerous Joints Dip From 0° to 90°, J, M/N/VN, Su/Sp/Fi, Fe/H/Qz, Pl/Ir, VC, S/SR, %REC=85.4, %RQD=47.9, q_u=17780psi, RMR=36, Class IV, GSI=35-50, 4.8 min/ft		46.5			
		@NQ-2: Chlorite/Mica, Highly Weatherd to Slightly Weathered, Numerous Joints Dip From 0° to 85°, J/V, Ch/Fe/H/Qz, SR/R, %REC=81.7, %RQD=21.3, GSI=30-50, 4.6 min/ft			NQ-2		
127.3							
	51.5	Boring Terminated at 51.5-ft. in Bedrock.					

SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) ✿ RQD (%) ■ REC (%)
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:	P043326	**County:**	Richland/Lexington	**Boring No.:**	P3D-B12		
Site Description:	Carolina Crossroads Phase 3D			**Route:**	I-26 WB_RC		
Eng./Geo.:	B. Vogel	**Boring Location:**	389+86	**Offset:**	27-L	**Alignment:**	I-26 WB_RC
Elev.:	179.3 ft	**Latitude:**	34.02628629	**Longitude:**	-81.10179113	**Date Started:**	9/2/2025
Total Depth:	62.1 ft	**Soil Depth:**	32.1 ft	**Core Depth:**	30 ft	**Date Completed:**	9/3/2025
Bore Hole Diameter (in):	6.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	85.7%
Core Size:	NQ	**Driller:**	J. Phillips	**Groundwater:**	**TOB** 22 ft	**24HR**	9 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0		0.0	SS-1	6	5	5	7	10
	0.3	**TOPSOIL** (4.0-in)	2.0	SS-2	6	6	6	6	12
		ALLUVIUM (HOLOCENE)	4.0	SS-3	6	8	9	10	17
		Stiff, Moist, Weak Red/Brown, Medium Plasticity, Sandy Lean CLAY (CL/A-6) with Organics & Trace Gravel, 10R5/4 & 10YR5/3	6.0	SS-4	5	11	7	9	18
		@SS-1: LL=32, PL=18, PI=14, NMC=13.6%, %200=53.5	8.0	SS-5	2	5	6	6	11
174.3	4.0	@SS-2: Yellowish Red, 5YR5/6							
		Very Stiff, Moist, Reddish Yellow/Red, High Plasticity, Fat CLAY (CH.A-7-6) with Sand, 7.5YR6/6 & 10R5/8							
		@SS-3: LL=55, PL=25, PI=30, NMC=23.8%, %200=75.9							
	8.0	@SS-4: LL=57, PL=24, PI=33, NMC=30.2%, %200=81.0							
169.3		Stiff, Moist, Light Gray/Yellowish Red, High Plasticity, Fat CLAY (CH/A-7-6) with Trace Gravel, 7N/Light Gray & 5YR5/6							
		@SS-5: LL=53, PL=28, PI=25, NMC=43.9%, %200=98.0							
	13.5	**PIEDMONT RESIDUUM**	13.5	SS-6	12	20	44		64
164.3		Hard, Moist, Greenish Gray/Pale Brown, Non-Plastic, SILT (ML/A-4), 10GY5/1 & 2.5Y7/4							
		@SS-6: LL=NP, PL=NP, PI=NP, NMC=13.3%, %200=91.0							
			18.5	SS-7	14	43	32		75
		@SS-7: Light Gray/Grayish Brown, with Trace Gravel, 7N/Light Gray & 2.5Y5/2							
159.3									
			23.5	SS-8	43	50/3"			100+
		@SS-8: Pale Brown/Gray, 2.5Y7/3 & 6N/Gray							
154.3									

SPT N VALUE ● PL × MC ○ LL ×
▲ FINES CONTENT (%)
✿ RQD (%) ■ REC (%)
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	

SC_DOT G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT_DATATEMPLATE.GDT 11/3/25

SCDOT Soil Test Log

Project ID:	P043326			**County:**	Richland/Lexington	**Boring No.:**	P3D-B12
Site Description:	Carolina Crossroads Phase 3D					**Route:**	I-26 WB_RC
Eng./Geo.:	B. Vogel	**Boring Location:**	389+86	**Offset:**	27-L	**Alignment:**	I-26 WB_RC
Elev.:	179.3 ft	**Latitude:**	34.02628629	**Longitude:**	-81.10179113	**Date Started:**	9/2/2025
Total Depth:	62.1 ft	**Soil Depth:**	32.1 ft	**Core Depth:**	30 ft	**Date Completed:**	9/3/2025
Bore Hole Diameter (in):	6.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	85.7%
Core Size:	NQ	**Driller:**	J. Phillips	**Groundwater:**	**TOB** 22 ft	**24HR**	9 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value
		@SS-9: Light Olive Gray, 5Y6/2		28.5	SS-9	50/3"	100+
149.3							
	32.1	**AMPHIBOLITE/GREENSTONE**		32.1	SS-10	50/0"	100+
		Metamorphic, Black/Green, Fine to Very Fine Grained, Massive, Hornblade/ Feldspar/ Quartz/ Epidoite, Slightly to Highly Weathered, Ultra #8 Bit		32.1			
144.3		@NQ-1: Numerous Joints Dip From 5° to 80°, J, W/M, Su/Sp/Fi/No, Ch/Fe/H/Qz/No, Pl/Ir, VC, SR, %REC=31.6, %RQD=0, GSI=5-15, 4.8 min/ft			NQ-1		
		@NQ-2: Numerous Joints Dip From 15° to 90°, V, Su/Sp, Ch/No, %REC=17.5, %RQD=0, GSI=5-10, 4.8 min/ft		37.1			
139.3					NQ-2		
		@NQ-3: Numerous Joints Dip From 0° to 85°, J/V, W/M/N, Sp, Fe, SR/R, %REC=25.8, %RQD=0, GSI=5-15, 3.6 min/ft		42.1			
134.3					NQ-3		
		@NQ-4: Numerous Joints Dip From 5° to 90°, J, W/M, R, %REC=27.5, %RQD=0, GSI=5-10, 5.4 min/ft		47.1			
129.3					NQ-4		
		@NQ-5: Slightly to Moderately Weathered, Numerous Joints Dip From 15° to 90°, M/N, Sp, Fe, Pl, SR/R, %REC=25.0, %RQD=0,		52.1			

SPT N VALUE ● PL × MC ○ LL × ▲ FINES CONTENT (%) ✿ RQD (%) ■ REC (%)
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:	P043326			**County:**	Richland/Lexington	**Boring No.:**	P3D-B12
Site Description:	Carolina Crossroads Phase 3D					**Route:**	I-26 WB_RC
Eng./Geo.:	B. Vogel	**Boring Location:**	389+86	**Offset:**	27-L	**Alignment:**	I-26 WB_RC
Elev.:	179.3 ft	**Latitude:**	34.02628629	**Longitude:**	-81.10179113	**Date Started:**	9/2/2025
Total Depth:	62.1 ft	**Soil Depth:**	32.1 ft	**Core Depth:**	30 ft	**Date Completed:**	9/3/2025
Bore Hole Diameter (in):	6.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	85.7%
Core Size:	NQ	**Driller:**	J. Phillips	**Groundwater:**	**TOB** 22 ft	**24HR**	9 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value
124.3		GSI=5-10, 4.4 min/ft			NQ-5		
				57.1			
		@NQ-6: Slightly to Highly Weathered, Numerous Joints Dip From 10° to 90°, Pl/Ir, %REC=20.0, %RQD=0, GSI=5-10, 3.8 min/ft			NQ-6		
119.3							
	62.1	Boring Terminated at 62.1-ft. in Bedrock.					
114.3							
109.3							
104.3							
99.3							

SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) ✿ RQD (%) ■ REC (%)

0 10 20 30 40 50 60 70 80 90

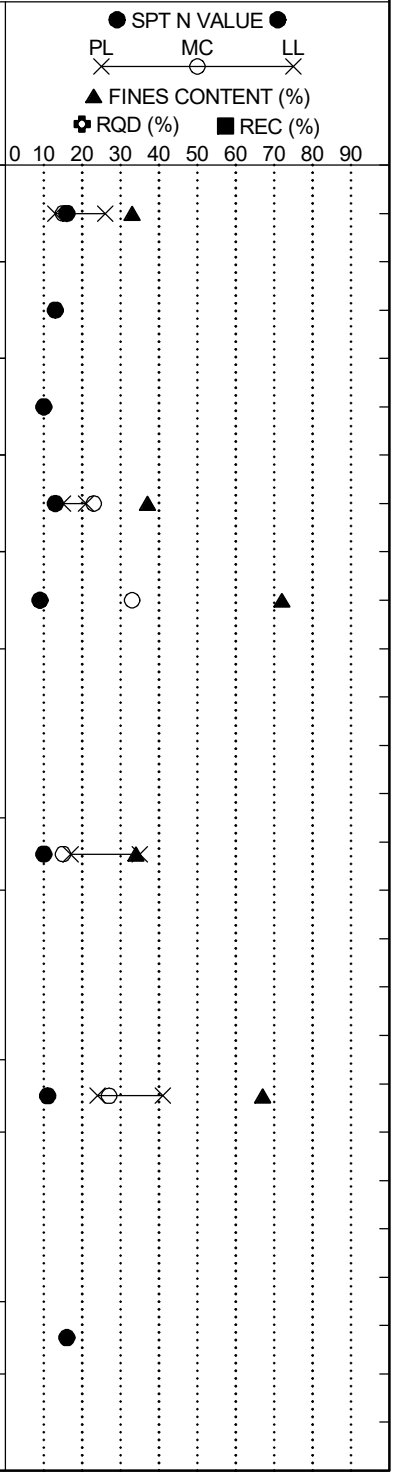
LEGEND

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:	P043326	**County:**	Richland/Lexington	**Boring No.:**	P3D-B13		
Site Description:	Carolina Crossroads Phase 3D			**Route:**	I-26 WB_RC		
Eng./Geo.:	B. Vogel	**Boring Location:**	388+46	**Offset:**	6-R	**Alignment:**	I-26 WB_RC
Elev.:	213.6 ft	**Latitude:**	34.02667651	**Longitude:**	-81.1017121	**Date Started:**	8/28/2025
Total Depth:	75 ft	**Soil Depth:**	75 ft	**Core Depth:**	0 ft	**Date Completed:**	8/29/2025
Bore Hole Diameter (in):	6.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	85.7%
Core Size:	N/A	**Driller:**	J. Phillips	**Groundwater:**	**TOB** 45 ft	**24HR**	42 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0								
	0.6	ASPHALT ROADWAY (7.5-in.)	0.0	SS-1	5	8	8	8	16
		EXISTING FILL							
	2.0	Medium Dense, Moist, Light Red/Light Brown, Medium Plasticity, Clayey Fine to Coarse SAND (SC/A-2-6), 2.5YR6/6 & 7.5YR6/4	2.0	SS-2	6	6	7	7	13
		@SS-1: LL=26, PL=13, PI=13, NMC=15.0%, %200=33.3	4.0	SS-3	6	5	5	7	10
208.6		Medium Dense to Loose, Moist, Red, Brownish Yellow, Low Plasticity, Silty Clayey SAND (SC-SM/A-4) with Trace Gravel & Glass, 10RY/8 & 10YR6/8	6.0	SS-4	5	6	7	7	13
	8.0	@SS-3: Reddish Yellow, reduced Glass, 7.5YR6/6	8.0	SS-5	5	5	4	7	9
		@SS-4: Wet							
203.6		LL=21, PL=15, PI=6, NMC=23.2%, %200=37.2							
		Stiff, Moist, Light Yellow/Greenish Gray, Low Plasticity to Medium Plasticity, Lean CLAY (CL/A-6) with Sand, 5Y8/4 &10GY6/1							
		@SS-5: NMC=32.5%, %200=72.3							
	13.5		13.5	SS-6	4	5	5		10
198.6		Loose, Moist, Reddish Yellow/Greenish Gray, Medium Plasticity, Clayey Fine to Coarse SAND (SC/A-2-6) with Trace Gravel, 5YR6/8 & 10GY6/1							
		@SS-6: LL=35, PL=17, PI=18, NMC=14.6%, %200=33.8							
	18.5		18.5	SS-7	4	5	6		11
193.6		Stiff to Very Stiff, Moist, Reddish Yellow/Greenish Gray, Medium Plasticity, Fine to Coarse Sandy Lean CLAY (CL/A-7-6), with Organics							
		@SS-7: LL=41, PL=24, PI=17, NMC=26.6%, %200=66.8							
			23.5	SS-8	5	7	9		16
		@SS-8: Pale Olive/Light Red, Reduced Organics, 5Y6/3 & 2.5YR6/8							
188.6									



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:	P043326	**County:**	Richland/Lexington	**Boring No.:**	P3D-B13		
Site Description:	Carolina Crossroads Phase 3D			**Route:**	I-26 WB_RC		
Eng./Geo.:	B. Vogel	**Boring Location:**	388+46	**Offset:**	6-R	**Alignment:**	I-26 WB_RC
Elev.:	213.6 ft	**Latitude:**	34.02667651	**Longitude:**	-81.1017121	**Date Started:**	8/28/2025
Total Depth:	75 ft	**Soil Depth:**	75 ft	**Core Depth:**	0 ft	**Date Completed:**	8/29/2025
Bore Hole Diameter (in):	6.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	85.7%
Core Size:	N/A	**Driller:**	J. Phillips	**Groundwater:**	**TOB** 45 ft	**24HR**	42 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	28.5	**PIEDMONT RESIDUUM**	28.5	SS-9	5	11	30		41
183.6		Hard, Moist, Olive Gray/Greenish Gray/Yellowish Red/White, Medium Plasticity, Lean CLAY (CL/A-7-6) with Sand, 5Y4/2 & 5G5/1 & 5YR5/8 & 9.5N/White							
		@SS-9: LL=37, PL=19, PI=18, NMC=26.8%, %200=79.2							
	33.5		33.5	SS-10	9	19	20		39
178.6		Hard, Moist, Greenish Gray & Reddish Yellow, Weakly Cememnted, Low Plasticity, SILT (ML/A-4) with Sand, 5GY6/1 & 7.5YR6/8							
		@SS-10: LL=37, PL=29, PI=8, NMC=12.0%, %200=70.0							
			38.5	SS-11	26	35	37		72
		@SS-11: Light Yellowish Brown/White, 10YR6/4 & 9N/White							
173.6									
		▽							
	43.5		43.5	SS-12	25	18	15		33
		Hard, Moist, Reddish Yellow/Light Gray, Medium Plasticity, Fine to Coarse Sandy ▽SILT (ML/A-4) with Trace Gravel, 7.5YR7/6 & 5Y7/2							
168.6		@SS-12: LL=45, PL=29, PI=16, NMC=24.3%, %200=68.7							
	48.5		48.5	SS-13	17	29	42		71
		Hard, Moist, Reddish Yellow/Light Olive Gray, Weakly Cememnted, Low Plasticity to Medium Plasticity, SILT (ML/A-4), 7.5YR7/6 & 5Y6/2							
163.6									
			53.5						

SPT N VALUE ● PL × MC ○ LL × ▲ FINES CONTENT (%) ✿ RQD (%) ■ REC (%)

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	

SC_DOT G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT_DATATEMPLATE.GDT 11/3/25

SCDOT Soil Test Log

Project ID:	P043326	**County:**	Richland/Lexington	**Boring No.:**	P3D-B13		
Site Description:	Carolina Crossroads Phase 3D			**Route:**	I-26 WB_RC		
Eng./Geo.:	B. Vogel	**Boring Location:**	388+46	**Offset:**	6-R	**Alignment:**	I-26 WB_RC
Elev.:	213.6 ft	**Latitude:**	34.02667651	**Longitude:**	-81.1017121	**Date Started:**	8/28/2025
Total Depth:	75 ft	**Soil Depth:**	75 ft	**Core Depth:**	0 ft	**Date Completed:**	8/29/2025
Bore Hole Diameter (in):	6.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	85.7%
Core Size:	N/A	**Driller:**	J. Phillips	**Groundwater:**	**TOB** 45 ft	**24HR**	42 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
158.6					SS-14	29	31	28		59
				58.5						
		@SS-15: Light Bluish Gray, Yellowish Brown, 5B7/1 & 10YR5/4			SS-15	23	50/6"			100+
153.6										
				63.5						
		@SS-16: Light Brown/Gray, 7.5YR6/4 & 5N/Gray, with Trace Gravel			SS-16	29	50/6"			100+
148.6										
	68.5			68.5	SS-17	50/5"				100+
		Hard, Moist, Greenish Gray, Low Plasticity to Medium Plasticity, Fine to Coarse Sandy SILT (ML/A-4) with Trace Gravel, 5G6/1								
143.6										
	73.5			73.5	SS-18	50/2.5"				100+
	73.8	Hard, Moist, Greenish Gray/Grayish Brown, Weakly Cememnted, Low Plasticity to Medium Plasticity, SILT (ML/A-4), 10Y5/1 & 2.5Y5/2								
138.6		Boring Terminated at 73.8-ft. on Hard, Residual Soils.								
133.6										

SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) ✿ RQD (%) ■ REC (%)

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 G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT_DATATEMPLATE.GDT 11/3/25

SCDOT Soil Test Log

Project ID:	P043326	**County:**	Richland/Lexington	**Boring No.:**	P3D-B14		
Site Description:	Carolina Crossroads Phase 3D			**Route:**	I-26 WB_RC		
Eng./Geo.:	B. Vogel	**Boring Location:**	387+08	**Offset:**	32-R	**Alignment:**	I-26 WB_RC
Elev.:	207.3 ft	**Latitude:**	34.0282864	**Longitude:**	-81.10263938	**Date Started:**	8/25/2025
Total Depth:	89.3 ft	**Soil Depth:**	69.1 ft	**Core Depth:**	20.2 ft	**Date Completed:**	8/27/2025
Bore Hole Diameter (in):	6.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	85.7%
Core Size:	NQ	**Driller:**	J. Phillips	**Groundwater:**	**TOB** 49 ft	**24HR**	43 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	**ASPHALT ROADWAY** (25.0-in.)		0.0		X	X	X	X	
	2.1	**EXISTING FILL**		2.1						
		Dense, Moist, Red/Yellow, Non-Plastic to Low Plasticity, Silty Fine to Medium SAND (SM/A-2-4), 2.5YR5/8 & 5YR7/6			SS-1	16	24	18	18	42
	4.0	@SS-1: LL=NP, PL=NP, PI=NP, NMC=10.3%, %200=18.9		4.0						
202.3					SS-2	8	9	8	10	17
		Medium Dense to Loose, Moist, Light Red/Light Yellowish Brown, High Plasticity, Clayey SAND (SC/A-6) with Organics, 2.5YR6/8 & 2.5Y6/4		6.0						
					SS-3	7	7	9	11	16
		@SS-3: Red/Light Olive Brown, Reduced Organics, 2.5YR5/6 & 2.5Y5/3		8.0						
					SS-4	3	3	4	4	7
197.3		NMC=16.5%, %200=38.4								
		@SS-4: Yellow/Red, 10YR7/6 & 10R5/6								
		LL=36, PL=13, PI=23, NMC=17.3%, %200=41.1								
	13.5			13.5						
		Stiff, Moist, Red/Light Yellowish Brown, Medium Plasticity, SILT (ML/A-7-6) with Sand & Organics, 10R5/6 & 2.5Y6/4,			SS-5	2	4	6		10
192.3		@SS-5: LL=41, PL=29, PI=12, NMC=23.7%, %200=74.8								
				18.5						
		@SS-6: Pale Olive/Greenish Gray, 5Y6/3 & 10GY6/1			SS-6	3	5	6		11
187.3		LL=44, PL=27, PI=17, NMC=32.3%, %200=76.0								
	23.5			23.5						
		Firm, Moist, Greenish Gray, Low Plasticity to Medium Plasticity, Sandy SILT (ML/A-4), 5G6/1			SS-7	2	2	3		5
182.3		@SS-7: NMC=40.6%, %200=83.1								

SPT N VALUE ● PL × MC ○ LL ×
▲ FINES CONTENT (%)
✿ RQD (%) ■ REC (%)
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:	P043326	**County:**	Richland/Lexington	**Boring No.:**	P3D-B14		
Site Description:	Carolina Crossroads Phase 3D			**Route:**	I-26 WB_RC		
Eng./Geo.:	B. Vogel	**Boring Location:**	387+08	**Offset:**	32-R	**Alignment:**	I-26 WB_RC
Elev.:	207.3 ft	**Latitude:**	34.0282864	**Longitude:**	-81.10263938	**Date Started:**	8/25/2025
Total Depth:	89.3 ft	**Soil Depth:**	69.1 ft	**Core Depth:**	20.2 ft	**Date Completed:**	8/27/2025
Bore Hole Diameter (in):	6.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	85.7%
Core Size:	NQ	**Driller:**	J. Phillips	**Groundwater:**	**TOB** 49 ft	**24HR**	43 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	28.5			28.5						
		Firm, Moist, Red/Light Gray, Medium Plasticity, Elastic SILT (MH/A-7-5) with Organics, 10R5/6 & 7N/Light Gray			SS-8	3	3	4		7
177.3										
				33.5						
		@SS-9: Red/Gray, Reduced Organics, 10R5/6 & 6N/Gray			SS-9	2	2	4		6
172.3		LL=52, PL=37, PI=15, NMC=49.5%, %200=95.7								
	38.5			38.5						
		PIEDMONT RESIDUUM								
		Very Stiff, Moist, Reddish Yellow/Light Grayish Green, Non-Plastic to Low Plasticity, SILT (ML/A-4) with Sand, 7.5YR6/8 & 10Y7/1			SS-10	3	6	14		20
167.3										
				43.5						
		@SS-11: Grayish Green/Pale Brown, 5GY6/1 & 2.5Y7/4			SS-11	4	7	14		21
162.3		NMC=32.6%, %200=73.6								
				48.5						
		@SS-12: Greenish Gray/Light Yellowish Brown, Weakly to Moderately Cemented, 10Y6/1 & 2.5Y6/4			SS-12	13	31	50/3"		81+
157.3										
				53.5						
		@SS-13: Greenish Gray, 10Y6/1			SS-13	50/2"				100+

SPT N VALUE ● PL × MC ○ LL × ▲ FINES CONTENT (%) ✿ RQD (%) ■ REC (%)

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	

SC_DOT G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT_DATATEMPLATE.GDT 11/3/25

SCDOT Soil Test Log

Project ID:	P043326	**County:**	Richland/Lexington	**Boring No.:**	P3D-B14		
Site Description:	Carolina Crossroads Phase 3D			**Route:**	I-26 WB_RC		
Eng./Geo.:	B. Vogel	**Boring Location:**	387+08	**Offset:**	32-R	**Alignment:**	I-26 WB_RC
Elev.:	207.3 ft	**Latitude:**	34.0282864	**Longitude:**	-81.10263938	**Date Started:**	8/25/2025
Total Depth:	89.3 ft	**Soil Depth:**	69.1 ft	**Core Depth:**	20.2 ft	**Date Completed:**	8/27/2025
Bore Hole Diameter (in):	6.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	85.7%
Core Size:	NQ	**Driller:**	J. Phillips	**Groundwater:**	**TOB** 49 ft	**24HR**	43 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value
152.3							
		@SS-14: Non-Plastic, with Trace Gravel		58.5	SS-14	50/4"	100+
147.3							
		@SS-15: Greenish Gray/Light Yellowish Brown, Low Plasticity to Medium Plasticity, 10Y6/1 & 2.5Y6/3		63.5	SS-15	50/2"	100+
142.3							
	69.1			68.5	SS-16	50/2"	100+
		AMPHIBOLITE		69.1			
137.3		Metamorphic, Black/Green, Fine to Very Fine Grained, Massive, Hornblende/ Epidote/ Quartz, Slightly to Highly Weathered, Ultra #8 Bit			NQ-1		
		@NQ-1: Numerous Joints Dip From 0° to 85°, J, M, Sp, Fe, Pl/Ir, VC, R, %REC=55.8, %RQD=0, GSI=5-10, 3.2 min/ft		71.3			
		@NQ-2: Highly Weathered, No Joints, %REC=5.0, %RQD=0, GSI=0-5, 8.4 min/ft			NQ-2		
132.3				76.3			
		@NQ-3: Slightly to Highly Weathered, Numerous Joints Dip From 0° to 90°, J/V, W/M, Sp/Fi, Ch/Fe/Qz, Pl/Ir, VC, SR/R, %REC=55.8, %RQD=0, GSI=5-10, 6.4 min/ft			NQ-3		
127.3							

SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) ✿ RQD (%) ■ REC (%)
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:	P043326	**County:**	Richland/Lexington	**Boring No.:**	P3D-B14		
Site Description:	Carolina Crossroads Phase 3D			**Route:**	I-26 WB_RC		
Eng./Geo.:	B. Vogel	**Boring Location:**	387+08	**Offset:**	32-R	**Alignment:**	I-26 WB_RC
Elev.:	207.3 ft	**Latitude:**	34.0282864	**Longitude:**	-81.10263938	**Date Started:**	8/25/2025
Total Depth:	89.3 ft	**Soil Depth:**	69.1 ft	**Core Depth:**	20.2 ft	**Date Completed:**	8/27/2025
Bore Hole Diameter (in):	6.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	85.7%
Core Size:	NQ	**Driller:**	J. Phillips	**Groundwater:**	**TOB** 49 ft	**24HR**	43 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value
		@NQ-4: Moderately to Highly Weathered, No Joints, %REC=17.5, %RQD=0, GSI=0-5, 9.4 min/ft		81.3	NQ-4		
122.3		@NQ-5: Slightly Weathered, Few Joints Dip From 0° to 20°, J, W, Sp, Fe, Ir, VC, SR, %REC=13.2, %RQD=0, GSI=0-5, 4.0 min/ft		86.3	NQ-5		
	89.3	Boring Terminated at 89.3-ft. in Bedrock.					
117.3							
112.3							
107.3							
102.3							

SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) ✿ RQD (%) ■ REC (%)
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 G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT_DATATEMPLATE.GDT 11/3/25

SCDOT Soil Test Log

Project ID:	P043326	**County:**	Richland/Lexington	**Boring No.:**	P3D-B15		
Site Description:	Carolina Crossroads Phase 3D			**Route:**	I-26 WB_RC		
Eng./Geo.:	B. Vogel	**Boring Location:**	385+94	**Offset:**	7-R	**Alignment:**	I-26 WB_RC
Elev.:	225.6 ft	**Latitude:**	34.02733514	**Longitude:**	-81.10147639	**Date Started:**	8/25/2025
Total Depth:	75 ft	**Soil Depth:**	75 ft	**Core Depth:**	0 ft	**Date Completed:**	8/25/2025
Bore Hole Diameter (in):	6.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	85.7%
Core Size:	N/A	**Driller:**	J. Phillips	**Groundwater:**	**TOB** 44 ft	**24HR**	Dry

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	ASPHALT ROADWAY (24.0-in.)	0.0		X	X	X	X	
	2.0	**EXISTING FILL** Medium Dense to Loose, Moist, Reddish Yellow, Medium Plasticity, Clayey Fine to Medium SAND (SC/A-2-6), 5YR6/8	2.0	SS-1	21	14	8	10	22
220.6		@SS-1: LL=28, PL=13, PI=15, NMC=10.5%, %200=26.3	4.0	SS-2	12	9	7	6	16
		@SS-2: Reddish Yellow, with Trace Gravel, 5YR6/8	6.0	SS-3	4	4	6	7	10
	8.0	@SS-3: Reddish Yellow/Red, High Plasticity, (SC/A-7-6), 5YR6/8 & 10R5/8 LL=44, PL=17, PI=27, NMC=17.7%, %200=43.4	8.0	SS-4	3	5	6	6	11
215.6		Stiff, Moist, Red/Light Yellowish Brown, Low Plasticity to Medium Plasticity, Sandy Lean CLAY (CL/A-6), 2.5YR5/8 & 2.5Y6/3 @SS-4: NMC=21.5%, %200=67.4							
	13.5	Firm, Moist, Red/Brownish Yellow, High Plasticity, Elastic SILT (MH/A-7-5) with Sand, Micaceous, 2.5YR5/8 & 10YR6/6	13.5	SS-5	3	3	3		6
210.6		@SS-5: LL=59, PL=32, PI=27, NMC=25.9%, %200=74.5							
		@SS-6: Weak Red/Light Yellowish Brown, 5R5/4 & 2.5Y6/3	18.5	SS-6	2	2	3		5
205.6		NMC=25.9%, %200=75.3							
	23.5	**PIEDMONT RESIDUUM**	23.5	SS-7	10	10	7		17
200.6		Very Stiff, Red/Greenish Gray/Dark Grayish Brown, Low Plasticity to Medium Plasticity, Sandy Elastic SILT (MH/A-7-5), 10R5/8 & 5G6/1 & 10YR4/2							

SPT N VALUE ● PL × MC ○ LL ×
▲ FINES CONTENT (%)
✿ RQD (%) ■ REC (%)
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:	P043326	**County:**	Richland/Lexington	**Boring No.:**	P3D-B15		
Site Description:	Carolina Crossroads Phase 3D			**Route:**	I-26 WB_RC		
Eng./Geo.:	B. Vogel	**Boring Location:**	385+94	**Offset:**	7-R	**Alignment:**	I-26 WB_RC
Elev.:	225.6 ft	**Latitude:**	34.02733514	**Longitude:**	-81.10147639	**Date Started:**	8/25/2025
Total Depth:	75 ft	**Soil Depth:**	75 ft	**Core Depth:**	0 ft	**Date Completed:**	8/25/2025
Bore Hole Diameter (in):	6.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	85.7%
Core Size:	N/A	**Driller:**	J. Phillips	**Groundwater:**	**TOB** 44 ft	**24HR**	Dry

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-7: NMC=23.5%, %200=61.1								
	28.5			28.5						
195.6		Very Stiff, Moist, Brownish Yellow/Yellow, Medium Plasticity, SILT (ML/A-6), 10YR6/8 & 2.5Y7/6			SS-8	5	8	9		17
		@SS-8: LL=40, PL=27, PI=13, NMC=37.6%, %200=92.5								
	33.5			33.5						
190.6		Hard, Moist, Very Pale Brown/Greenish Gray, Medium Plasticity, SILT (ML/A-6) with Sand & Trace Gravel, Micaceous, 10YR7/4 & 5GY7/1			SS-9	10	13	25		38
		@SS-9: LL=36, PL=25, PI=11, NMC=21.7%, %200=79.3								
	38.5			38.5						
185.6		Hard, Moist, Yellow/Red, Weakly Cemented, Low Plasticity to Medium Plasticity, SILT (ML/A-4), Micaceous, 10YR7/6 & 7.5R5/6			SS-10	14	22	38		60
				43.5						
		▽ @SS-11: Reddish Yellow/Light Gray, 7.5YR6/8 & 7N/Light Gray			SS-11	18	28	50/6"		78
180.6										
	48.5			48.5						
175.6		Hard, Moist, Yellow/Greenish Gray, Weakly Cemented, Low Plasticity to Medium Plasticity, SILT (ML/A-4) with Sand, 10YR7/6 & 5GY7/1			SS-12	28	50/6"			100+
				53.5						
		@SS-13: Gray/Pale Brown, Micaceous,								

SPT N VALUE ● PL × MC ○ LL × ▲ FINES CONTENT (%) ✿ RQD (%) ■ REC (%)

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:	P043326	**County:**	Richland/Lexington	**Boring No.:**	P3D-B15		
Site Description:	Carolina Crossroads Phase 3D			**Route:**	I-26 WB_RC		
Eng./Geo.:	B. Vogel	**Boring Location:**	385+94	**Offset:**	7-R	**Alignment:**	I-26 WB_RC
Elev.:	225.6 ft	**Latitude:**	34.02733514	**Longitude:**	-81.10147639	**Date Started:**	8/25/2025
Total Depth:	75 ft	**Soil Depth:**	75 ft	**Core Depth:**	0 ft	**Date Completed:**	8/25/2025
Bore Hole Diameter (in):	6.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	85.7%
Core Size:	N/A	**Driller:**	J. Phillips	**Groundwater:**	**TOB** 44 ft	**24HR**	Dry

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
170.6		6N/Gray & 2.5Y7/4 NMC=25.4%, %200=76.4			SS-13	13	22	21		43
				58.5						
		@SS-14: Light Gray/Pale Brown, 7N/Light Gray & 2.5Y7/4			SS-14	38	50/2"			100+
165.6										
				63.5						
		@SS-15: Moderately Cemented			SS-15	50/2.5"				100+
160.6										
				68.5						
		@SS-16: Reddish Yellow/Light Olive Gray, 5YR6/8 & 5Y6/2			SS-16	50/4"				100+
155.6										
	73.5			73.5						
		Hard, Moist, Greenish Gray/Brownish Yellow, Weakly Cemented, Non-Plastic, SILT (ML/A-4) with Gravel, 10Y5/1 & 10YR6/6			SS-17	50/6"				100+
150.6	75.0	SS-17								
		Boring Terminated at 75.0-ft. on Hard, Residual Soils.								
145.6										

SPT N VALUE ● PL × MC ○ LL ×
▲ FINES CONTENT (%)
✿ RQD (%) ■ REC (%)
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:	P043326	**County:**	Richland/Lexington	**Boring No.:**	P3D-B16		
Site Description:	Carolina Crossroads Phase 3D			**Route:**	I-26 WB_RC		
Eng./Geo.:	B. Vogel	**Boring Location:**	383+39	**Offset:**	27-R	**Alignment:**	I-26 WB_RC
Elev.:	207.5 ft	**Latitude:**	34.02802316	**Longitude:**	-81.10150232	**Date Started:**	10/13/2025
Total Depth:	56.5 ft	**Soil Depth:**	32 ft	**Core Depth:**	24.5 ft	**Date Completed:**	10/14/2025
Bore Hole Diameter (in):	6.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	85.7%
Core Size:	NQ	**Driller:**	J. Phillips	**Groundwater:**	**TOB** 16 ft	**24HR**	NM

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	ASPHALT ROADWAY (21.0-in.)							
	1.7		1.7	SS-1	X	X	X	5	
	2.0	**EXISTING FILL**	2.0						
		Firm, Moist, Red, Non-Plastic to Low Plasticity, Silty Fine to Medium SAND (SM/A-2-4) with Trace Gravel, 2.5YR5/6		SS-2	5	6	7	9	13
	4.0		4.0						
202.5		**PIEDMONT RESIDUUM**		SS-3	7	8	10	12	18
		Stiff, Moist, Light Grayish Olive/Pale Brown, Medium Plasticity, Sandy Elastic SILT (MH/A-7-5), 10Y6/2 & 2.5Y8/7	6.0						
		@SS-2: LL=54, PL=38, PI=16, NMC=35.0%, %200=63.5		SS-4	8	12	16	17	28
			8.0						
		Very Stiff to Stiff, Moist, Pale Yellow/Greenish Gray, Low Plasticity, SILT (ML/A-5), 5Y8/3 & 5G6/1		SS-5	5	5	9	9	14
197.5		@SS-3: NMC=39.6%, %200=76.8							
		@SS-4: Greenish Gray, 5G6/1							
		@SS-5: Pale Yellow/Greenish Gray, 5Y8/3 & 5G6/1							
		LL=44, PL=34, PI=10, NMC=34.4%, %200=77.3	13.5						
				SS-6	7	14	50/5"		64+
192.5		@SS-6: Hard, Greenish Gray, with Trace Gravel, 5G6/1							
		▽							
	18.5		18.5						
		Very Dense, Moist, Greenish Gray, Non-Plastic to Low Plasticity, Silty GRAVEL (GM/A-1), 5GY5/1		SS-7	50/3"				100+
187.5									
	23.5		23.5						
		Very Stiff to Hard, Moist, Pale Yellow, Medium Plasticity, Elastic SILT (MH/A-7-5), 5Y8/3		SS-8	5	7	14		21
182.5		@SS-8: LL=51, PL=34, PI=17, NMC=44.0%, %200=80.7							

SPT N VALUE ● PL × MC ○ LL ×
▲ FINES CONTENT (%)
✿ RQD (%) ■ REC (%)
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	

SC_DOT G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT_DATATEMPLATE.GDT 11/3/25

SCDOT Soil Test Log

Project ID:	P043326	**County:**	Richland/Lexington	**Boring No.:**	P3D-B16		
Site Description:	Carolina Crossroads Phase 3D			**Route:**	I-26 WB_RC		
Eng./Geo.:	B. Vogel	**Boring Location:**	383+39	**Offset:**	27-R	**Alignment:**	I-26 WB_RC
Elev.:	207.5 ft	**Latitude:**	34.02802316	**Longitude:**	-81.10150232	**Date Started:**	10/13/2025
Total Depth:	56.5 ft	**Soil Depth:**	32 ft	**Core Depth:**	24.5 ft	**Date Completed:**	10/14/2025
Bore Hole Diameter (in):	6.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	85.7%
Core Size:	NQ	**Driller:**	J. Phillips	**Groundwater:**	**TOB** 16 ft	**24HR**	NM

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
		@SS-9: Pale Yellow/Greenish Gray, with Trace Gravel, 5Y8/2 & 5G6/1	28.5						
177.5		NMC=35.3%, %200=74.1		SS-9	9	21	11		32
	32.0	**AMPHIBOLITE**	32.0	SS-10	50/0.5"				100+
		Metamorphic, Dark Bluish Gray/Light Bluish Gray, Fine to Very Fine Grained, Thinly Laminated, Hornblade/Plagioclase Feldspar, Moderately Weathered to Slightly Weathered, Very Strong Rock, Ultra #8 Bit	32.0						
172.5		@NQ-1: Numerous Joints Dip From 0° to 90°, J, M/N, Su/Sp, Fe, Pl/Ir, VC, S/SR/R, %REC=42.6, %RQD=7.9, GSI=35-45, 2.9 min/ft		NQ-1					
		@NQ-2: Numerous Joints Dip From 20° to 85°, SR/R, %REC=38.3, %RQD=33.3, q_u=31670psi, RMR=39, Class IV, GSI=45-55, 4.2 min/ft	36.5						
167.5				NQ-2					
		@NQ-3: Numerous Joints Dip From 0° to 90°, M, Ir, %REC=11.6, %RQD=0, GSI=25-35, 2.8 min/ft	41.5						
162.5				NQ-3					
		@NQ-4: Numerous Joints Dip From 0° to 85°, M/N/VN, Pl/Ir, S/SR, %REC=30.0, %RQD=8.3, GSI=30-40, 3.6 min/ft	46.5						
157.5				NQ-4					
		@NQ-5: Dark Blue/Green, Numerous Joints Dip From 0° to 85°, %REC=15.0, %RQD=0, GSI=25-35, 3.8 min/ft	51.5						

SPT N VALUE ● PL × MC ○ LL × ▲ FINES CONTENT (%) ✿ RQD (%) ■ REC (%)

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:	P043326			**County:**	Richland/Lexington	**Boring No.:**	P3D-B16
Site Description:	Carolina Crossroads Phase 3D					**Route:**	I-26 WB_RC
Eng./Geo.:	B. Vogel	**Boring Location:**	383+39	**Offset:**	27-R	**Alignment:**	I-26 WB_RC
Elev.:	207.5 ft	**Latitude:**	34.02802316	**Longitude:**	-81.10150232	**Date Started:**	10/13/2025
Total Depth:	56.5 ft	**Soil Depth:**	32 ft	**Core Depth:**	24.5 ft	**Date Completed:**	10/14/2025
Bore Hole Diameter (in):	6.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	85.7%
Core Size:	NQ	**Driller:**	J. Phillips	**Groundwater:**	**TOB** 16 ft	**24HR**	NM

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value
152.5					NQ-5		
	56.5	Boring Terminated at 56.5.0-ft. in Bedrock.					
147.5							
142.5							
137.5							
132.5							
127.5							

SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) ✿ RQD (%) ■ REC (%)
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 G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT_DATATEMPLATE.GDT 11/3/25

SCDOT Soil Test Log

Project ID:	P043326	**County:**	Richland/Lexington	**Boring No.:**	P3D-B17		
Site Description:	Carolina Crossroads Phase 3D			**Route:**	I-26 WB_RC		
Eng./Geo.:	B. Vogel	**Boring Location:**	381+07	**Offset:**	25-R	**Alignment:**	I-26 WB_RC
Elev.:	208.9 ft	**Latitude:**	34.02863491	**Longitude:**	-81.10163535	**Date Started:**	9/10/2025
Total Depth:	41 ft	**Soil Depth:**	31 ft	**Core Depth:**	10 ft	**Date Completed:**	9/10/2025
Bore Hole Diameter (in):	6.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	85.7%
Core Size:	NQ	**Driller:**	J. Phillips	**Groundwater:**	**TOB** 15 ft	**24HR**	12 ft

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	**TOPSOIL** (4.0-in)	0.0	SS-1	4	5	7	6	12
		EXISTING FILL							
	2.0	Stiff, Moist, Grayish Brown/Red, Non-Plastic to Low Plasticity, Fine to Coarse Sandy Lean CLAY (CL/A-6) with Organics & Trace Gravel, 10YR5/2 & 10Y4/6	2.0	SS-2	6	7	10	13	17
		@SS-1: LL=33, PL=13, PI=20, NMC=12.8%, %200=50.6	4.0	SS-3	8	9	10	10	19
203.9		**PIEDMONT RESIDUUM**							
		Very Stiff to Stiff, Moist, Light Grayish Green/Yellow, High Plasticity, Elastic SILT (MH/A-7-5), 5GY6/2 & 10YR7/6	6.0	SS-4	3	4	5	8	9
		@SS-2: LL=53, PL=30, PI=23, NMC=34.0%, %200=97.0	8.0	SS-5	3	2	2	4	4
		@SS-4: Medium Plasticity							
198.9		LL=54, PL=37, PI=17, NMC=48.1%, %200=96.0							
		@SS-5: Soft							
		LL=52, PL=33, PI=19, NMC=44.7%, %200=92.9							
	13.5		13.5	SS-6	12	10	11		21
		Very Stiff & Stiff, Moist, Bluish Gray/Pale Yellow, Medium Plasticity, SILT (ML/A-7-5) with Sand, 5B5/1 & 5Y8/4							
193.9		@SS-6: LL=47, PL=30, PI=17, NMC=36.2%, %200=80.0							
			18.5	SS-7	4	5	10		15
		@SS-7: Brownish Yellow/Greenish Gray, Low Plasticity, (ML/A-5), with Trace Gravel, 10Y56/6 & 5G5/1							
188.9		LL=44, PL=37, PI=7, NMC=30.0%, %200=71.3							
	23.5		23.5	SS-8	11	16	50/3"		66
		Hard, Moist, Greenish Gray/Brown, Non-Plastic to Low Plasticity, Weakly Cemented, SILT (ML/A-4), 5G5/1 & 2.5Y8/3							
183.9									

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

Continued Next Page

LEGEND

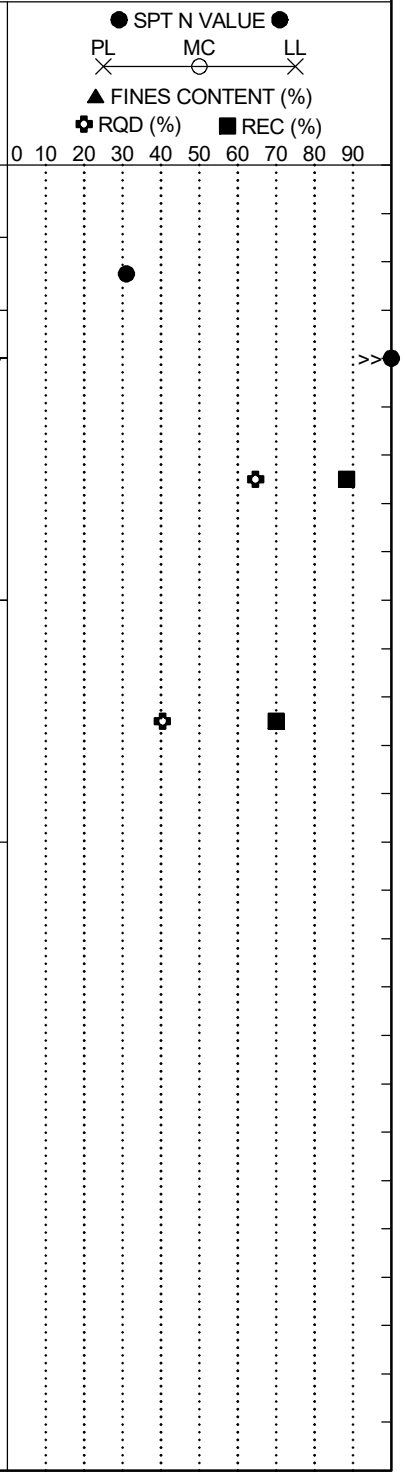
SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT_DATATEMPLATE.GDT 11/3/25

SCDOT Soil Test Log

Project ID:	P043326			**County:**	Richland/Lexington	**Boring No.:**	P3D-B17
Site Description:	Carolina Crossroads Phase 3D					**Route:**	I-26 WB_RC
Eng./Geo.:	B. Vogel	**Boring Location:**	381+07	**Offset:**	25-R	**Alignment:**	I-26 WB_RC
Elev.:	208.9 ft	**Latitude:**	34.02863491	**Longitude:**	-81.10163535	**Date Started:**	9/10/2025
Total Depth:	41 ft	**Soil Depth:**	31 ft	**Core Depth:**	10 ft	**Date Completed:**	9/10/2025
Bore Hole Diameter (in):	6.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	85.7%
Core Size:	NQ	**Driller:**	J. Phillips	**Groundwater:**	**TOB** 15 ft	**24HR**	12 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
		@SS-9: Greenish Gray/Light Greenish Gray, 5G5/1 & 10Y7/1		28.5						
					SS-9	12	13	18		31
178.9	31.0			31.0	SS-10	50/0"				100+
		AMPHIBOLITE		31.0						
		Metamorphic, Dark Gray/Light Gray, Fine to Very Fine Grained, Thinly Laminated, Plasioclase Feldspar/Hornblade/Mica/Quartz, Moderately Weathered to Fresh, Extremely Strong Rock, Ultra #8 Bit			NQ-1					
173.9		@NQ-1: Numerous Joints Dip From 0° to 60°, J/V, M/N/VN, Su/Sp/Fi, Fe/Qz, Pl/Ir, VC, SR/R, %REC=88.3, %RQD=64.6, q_u=52480psi, RMR=44, Class III, GSI=40-50, 3.4 min/ft		36.0						
		@NQ-2: Very Strong Rock, Numerous Joints Dip From 5° to 75°, J, Su/Sp/Pa/Fi, Fe/H, %REC=70.0, %RQD=40.4, q_u=8870psi, RMR=31, Class IV, GSI=35-45, 3.8 min/ft			NQ-2					
168.9	41.0									
		Boring Terminated at 41.0-ft. in Bedrock.								
163.9										
158.9										



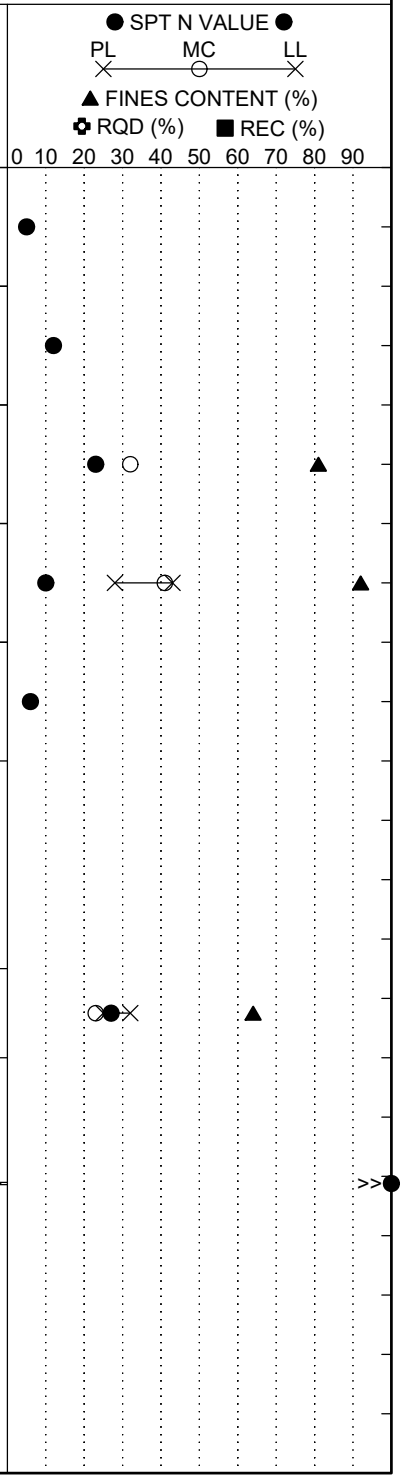
LEGEND

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:	P043326	**County:**	Richland/Lexington	**Boring No.:**	P3D-B18		
Site Description:	Carolina Crossroads Phase 3D			**Route:**	I-126 WB_I-26 EB		
Eng./Geo.:	G. Cantel & B. Vogel	**Boring Location:**	376+33	**Offset:**	CL	**Alignment:**	I-126 WB_I-26 EB
Elev.:	190.1 ft	**Latitude:**	34.02839136	**Longitude:**	-81.10403733	**Date Started:**	8/8/2025
Total Depth:	17.1 ft	**Soil Depth:**	17.1 ft	**Core Depth:**	0 ft	**Date Completed:**	8/12/2025
Bore Hole Diameter (in):	6.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	85.7%
Core Size:	N/A	**Driller:**	A. Alvarez	**Groundwater:**	**TOB** 11.5 ft	**24HR**	12 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0									
	0.3	**TOPSOIL** (3.0-in)		0.0						
		ALLUVIUM (HOLOCENE)			SS-1	2	3	2	3	5
	2.0	Firm, Moist, Olive Brown, Non-Plastic to Low Plasticity, Fine to Coarse Sandy SILT (ML/A-4) with Trace Gravel & Organics, 2.5Y4/3		2.0	SS-2	4	5	7	9	12
	4.0	Stiff, Moist, Light Yellowish Brown, Low Plasticity to Medium Plasticity, Fine to Medium Sandy Elastic SILT (MH/A-7-5) with Trace Gravel, 2.5Y6/3		4.0	SS-3	9	12	11	12	23
185.1										
	6.0	Very Stiff, Moist, Olive, Non-Plastic to Low Plasticity, SILT (ML/A-4) with Sand, 5Y5/4 @SS-3: NMC=32.4%, %200=81.0		6.0	SS-4	2	4	6	6	10
	8.0	Stiff, Moist, Very Dark Grayish Green, Medium Plasticity, SILT (ML/A-4), 5G3/2 @SS-4: LL=43, PL=28, PI=15, NMC=40.9%, %200=92.0		8.0	SS-5	2	3	3	3	6
		PIEDMONT RESIDUUM								
180.1		Firm, Moist, Light Olive Brown, Low Plasticity, Sandy SILT (ML/A-4), 2.5Y5/3								
		▽								
		▼								
				13.5						
		@SS-6: Very Stiff, Very Dark Grayish Green, 5G3/2 LL=32, PL=25, PI=7, NMC=22.8%, %200=63.7			SS-6	7	12	15		27
175.1										
	17.1			17.1	SS-7	50/0.5"				100+
		Boring Terminated at 17.1-ft on Top of Bedrock. Boring Offset for Rock Coring due to Casing Issue.								
170.1										



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:	P043326			**County:**	Richland/Lexington	**Boring No.:**	P3D-B18A
Site Description:	Carolina Crossroads Phase 3D					**Route:**	I-126 WB_I-26 EB
Eng./Geo.:	B. Vogel	**Boring Location:**	376+40	**Offset:**	1-R	**Alignment:**	I-126 WB_I-26 EB
Elev.:	190.1 ft	**Latitude:**	34.02835626	**Longitude:**	-81.10402291	**Date Started:**	8/8/2025
Total Depth:	25.3 ft	**Soil Depth:**	14.1 ft	**Core Depth:**	11.2 ft	**Date Completed:**	8/12/2025
Bore Hole Diameter (in):		**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**		**Hammer Type:**	Automatic	**Energy Ratio:**	85.7%
Core Size:	NQ	**Driller:**	A. Alvarez	**Groundwater:**	**TOB** NM	**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
	0.0	Soil Gap due to Offeset of P3D-B18. Augered Down to 14.1-ft Below the Existing Ground Surface.		0.0			
185.1							
180.1							
	14.1	**AMPHIBOLITE** Metamorphic, Black/Gray, Fine to Very Fine Grained, Massive, Amphibole/Quartz/Feldspar/Epidote, Slightly Weathered, Ultra #8 Bit @NQ-1: Numerous Joints Dip From 5° to 80°, J, N/VN, Su, Fe, Pl, VC, S/SR, %REC=57.1, %RQD=0, GSI=30-35, 5 min/ft @NQ-2: Extremely Strong Rock, Occasional Joints Dip From 5° to 35°, J/V, M/N, Su/Fi, Fe/H/Qz, Pl/Ir, SR, q_u=36900 psi, RMR=59, Class III, %REC=97.5, %RQD=77.1, GSI=45-60, 6.6 min/ft @NQ-3: Very Strong Rock, Occasional Joints Dip From 5° to 70°, J, M/N/VN, Su, Fe, S/SR, q_u=20720 psi, RMR=33, Class IV, %REC=71.6, %RQD=51.6, GSI=45-55, 5.4 min/ft		14.1	NQ-1		
175.1				15.3	NQ-2		
170.1				20.3	NQ-3		
165.1	25.3	Boring Terminated at 25.3-ft. Below the Existing Ground Surface.					

SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) ✿ RQD (%) ■ REC (%)
0 10 20 30 40 50 60 70 80 90

LEGEND

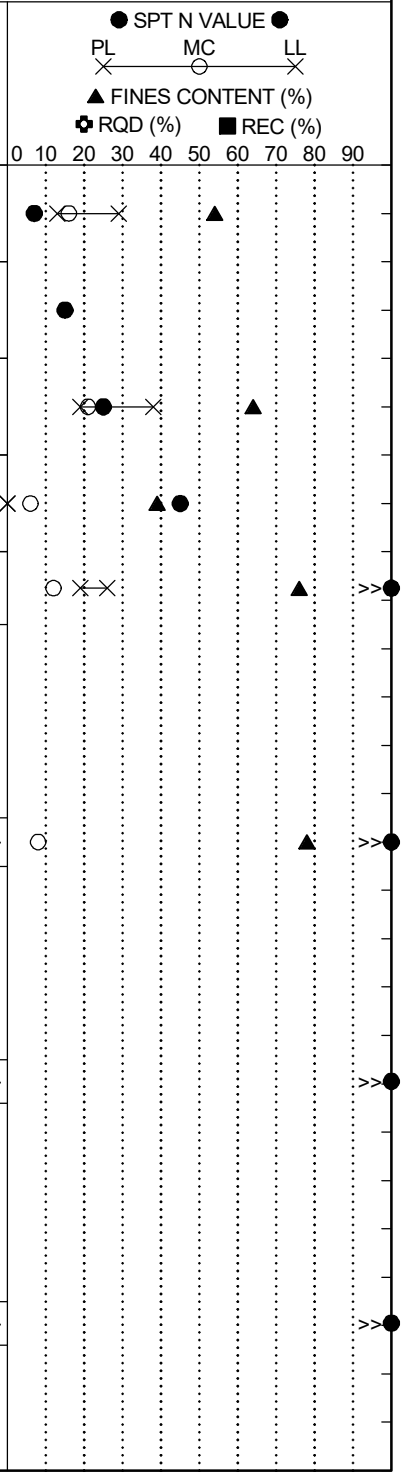
SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT_DATATEMPLATE.GDT 11/4/25

SCDOT Soil Test Log

Project ID:	P043326			**County:**	Richland/Lexington	**Boring No.:**	P3D-B19
Site Description:	Carolina Crossroads Phase 3D					**Route:**	I-126 WB_I-26 EB
Eng./Geo.:	B. Vogel & A. Folz	**Boring Location:**	374+31	**Offset:**	3-L	**Alignment:**	I-126 WB_I-26 EB
Elev.:	192.2 ft	**Latitude:**	34.0289142	**Longitude:**	-81.10415738	**Date Started:**	8/13/2025
Total Depth:	59.8 ft	**Soil Depth:**	38.7 ft	**Core Depth:**	21.1 ft	**Date Completed:**	8/14/2025
Bore Hole Diameter (in):	6.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	85.7%
Core Size:	NQ	**Driller:**	A. Alvarez	**Groundwater:**	**TOB** 10.3 ft	**24HR**	5 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0								
	0.7	**TOPSOIL** (8.0-in)	0.0	SS-1	2	4	3	8	7
		ALLUVIUM (HOLOCENE)							
		Firm to Stiff, Moist, Gray/Brownish Yellow, Medium Plasticity, Fine to Coarse Sandy Lean CLAY (CL/A-6) with Organics & Trace Gravel, N6/Gray & 10YR6/6	2.0	SS-2	7	7	8	10	15
		@SS-1: LL=29, PL=13, PI=16, NMC=15.9%, %200=53.6	4.0	SS-3	10	10	15	30	25
187.2	6.0	@SS-2: Gray/Reddish Yellow, Fine to Medium, Reduced Trace Gravel, 6N/Gray & 7.5YR6/8	6.0	SS-4	16	21	24	44	45
		@SS-3: Very Stiff, Bluish Gray/Strong Brown, with Trace Gravel, 5B6/1 & 7.5YR5/6	8.0	SS-5	4	22	50/6"		72+
	8.0	LL=38, PL=19, PI=19, NMC=21.3%, %200=64.0							
182.2		**PIEDMONT RESIDUUM**							
		Dense, Moist, Bluish Gray/Strong Brown, Non-Plastic, Silty SAND (SM/A-4), 5B6/1 & 7.5YR5/6							
		@SS-4: LL=NP, PL=NP, PI=NP, NMC=6.3%, %200=38.6							
	13.5		13.5	SS-6	39	50/5.5"			100+
177.2		Hard, Moist, Pale Brown, Low Plasticity, Weakly Cemented, Silty CLAY (CL-ML/A-4) with Sand, 2.5Y8/3							
		@SS-5: LL=26, PL=19, PI=7, NMC=12.2%, %200=76.4							
		Hard, Moist, Light Gray, Low Plasticity, Weakly Cemented, SILT (ML/A-4) with Sand, 2.5Y7/2	18.5	SS-7	19	50/4"			100+
		@SS-6: NMC=7.5%, %200=77.5							
172.2		@SS-7: Light Gray/Pale Brown, 2.5Y7/2 & 2.5Y7/4							
	23.5		23.5	SS-8	40	50/4"			100+
		Hard, Moist, Light Gray, Non-Plastic, Fine to Coarse Sandy SILT (ML/A-4), 2.5Y7/2							
167.2									



Continued Next Page

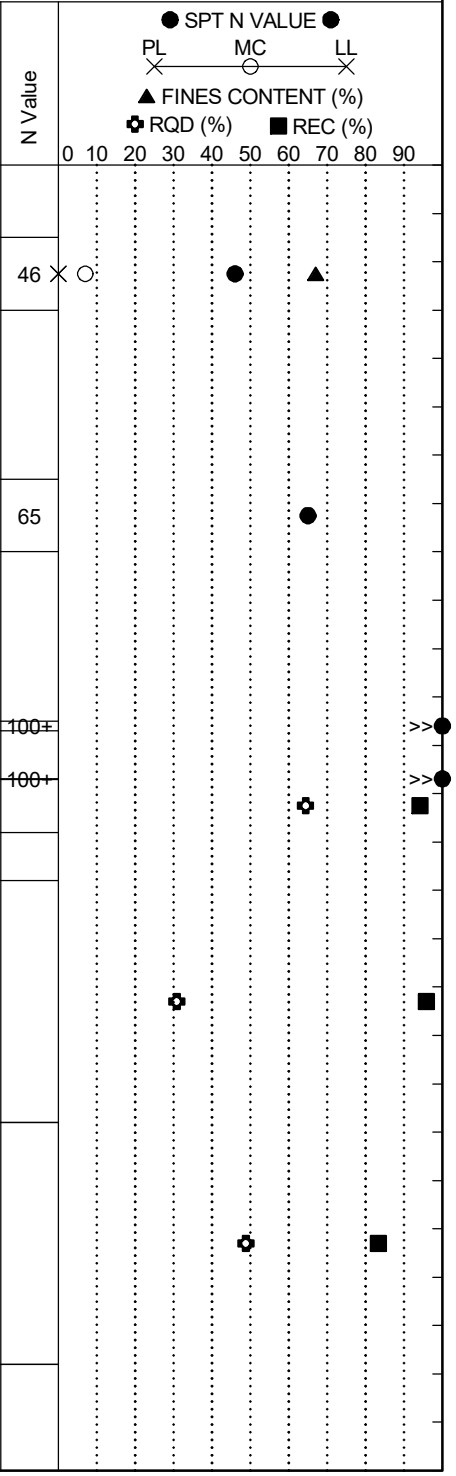
LEGEND

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:	P043326	**County:**	Richland/Lexington	**Boring No.:**	P3D-B19		
Site Description:	Carolina Crossroads Phase 3D			**Route:**	I-126 WB_I-26 EB		
Eng./Geo.:	B. Vogel & A. Folz	**Boring Location:**	374+31	**Offset:**	3-L	**Alignment:**	I-126 WB_I-26 EB
Elev.:	192.2 ft	**Latitude:**	34.0289142	**Longitude:**	-81.10415738	**Date Started:**	8/13/2025
Total Depth:	59.8 ft	**Soil Depth:**	38.7 ft	**Core Depth:**	21.1 ft	**Date Completed:**	8/14/2025
Bore Hole Diameter (in):	6.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	85.7%
Core Size:	NQ	**Driller:**	A. Alvarez	**Groundwater:**	**TOB** 10.3 ft	**24HR**	5 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
		@SS-9: Light Gray, with Trace Gravel, 5Y7/2		28.5	SS-9	34	28	18		46
162.2		LL=NP, PL=NP, PI=NP, NMC=6.7%, %200=67.3								
		@SS-10: Light Gray/Yellow, 7N/Light Gray & 10YR7/6		33.5	SS-10	20	38	27		65
157.2										
		@SS-11: Light Brownish Gray/Light Yellowish Brown, 2.5Y6/2 & 2.5Y6/3		38.5	SS-11	50/2"				100+
	39.7			39.7	SS-12	50/0"				100+
152.2		**AMPHIBOLITE** Metamorphic, Black, Coarse to Fine Grained, Massive, Hornblende/Quartz/Feldspar, Moderately Weathered to Slightly Weathered, Strong Rock, Ultra #8 Bit		39.7	NQ-1					
		@NQ-1: Numerous Joints Dip From 2° to 70°, J, N, Su/Sp, Fe, Pl, VC, S/SR, q_u= 12460 psi, RMR=28, Class IV, %REC=94.2, %RQD=64.4, GSI=35-45, 10.0 min/ft		41.8	NQ-2					
147.2		@NQ-2: Gray, Numerous Joints Dip From 5° to 80°, q_u= 14400 psi, RMR=18, Class V, %REC=95.8, %RQD=30.8, GSI=15-20, 3.4 min/ft		46.8	NQ-3					
		@NQ-3: Laminated, Numerous Joints Dip From 5° to 35°, J/Fe/V, M/N, Su/Sp/Fi, Fe/H/Qz, Pl/Ir, %REC=83.3, %RQD=48.8, GSI=20-30, 3.0 min/ft								
142.2				51.8						
		@NQ-4: Numerous Joints Dip From 5° to 85°, J, N, Su, Fe, Pl, %REC=95.4, %RQD=69.2, GSI=20-30, 3.6 min/ft								



Continued Next Page

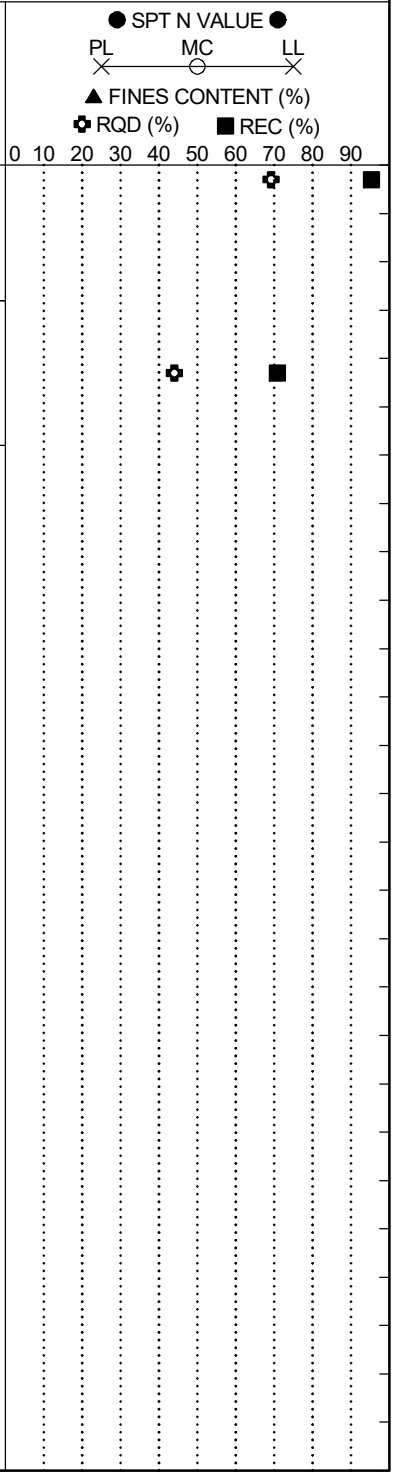
LEGEND

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:	P043326	**County:**	Richland/Lexington	**Boring No.:**	P3D-B19		
Site Description:	Carolina Crossroads Phase 3D			**Route:**	I-126 WB_I-26 EB		
Eng./Geo.:	B. Vogel & A. Folz	**Boring Location:**	374+31	**Offset:**	3-L	**Alignment:**	I-126 WB_I-26 EB
Elev.:	192.2 ft	**Latitude:**	34.0289142	**Longitude:**	-81.10415738	**Date Started:**	8/13/2025
Total Depth:	59.8 ft	**Soil Depth:**	38.7 ft	**Core Depth:**	21.1 ft	**Date Completed:**	8/14/2025
Bore Hole Diameter (in):	6.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	85.7%
Core Size:	NQ	**Driller:**	A. Alvarez	**Groundwater:**	**TOB** 10.3 ft	**24HR**	5 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value
137.2				56.8	NQ-4		
		@NQ-5: Slightly Weathered, Occasional Joints Dip From 0° to 25°, M/N, Pl/Ir, %REC=70.8, %RQD=44.0, GSI=30-40, 4.7 min/ft			NQ-5		
	59.8						
132.2		Boring Terminated at 59.8-ft. in Bedrock.					
127.2							
122.2							
117.2							
112.2							



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:	P043326	**County:**	Richland/Lexington	**Boring No.:**	P3D-B20		
Site Description:	Carolina Crossroads Phase 3D			**Route:**	I-126 WB_I-26 EB		
Eng./Geo.:	B. Vogel	**Boring Location:**	372+33	**Offset:**	4-L	**Alignment:**	I-126 WB_I-26 EB
Elev.:	206.3 ft	**Latitude:**	34.02943703	**Longitude:**	-81.10401029	**Date Started:**	8/15/2025
Total Depth:	68.7 ft	**Soil Depth:**	48.7 ft	**Core Depth:**	20 ft	**Date Completed:**	8/18/2025
Bore Hole Diameter (in):	6.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	85.7%
Core Size:	NQ	**Driller:**	J. Phillips & A. Alvarez	**Groundwater:**	**TOB** 16 ft	**24HR**	12 ft

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	**TOPSOIL** (3.0-in)	0.0	SS-1	1	1	2	1	3
		EXISTING FILL							
		Soft to Firm, Moist, Yellowish Brown/Red, Medium Plasticity, Clayey Fine to Coarse SAND (SC/A-2-6) with Organics & Trace Gravel, 10YR5/4 & 2.5YR5/6	2.0	SS-2	4	3	3	4	6
		@SS-1: NMC=10.1%, %200=24.7	4.0	SS-3	3	4	3	7	7
201.3		@SS-2: Red/Reddish Yellow, Reduced Organics, 2.5YR5/6 & 5YR6/6							
		LL=25, PL=14, PI=11, NMC=9.1%, %200=22.0	6.0	SS-4	6	9	10	10	19
		@SS-3: Red/Reddish Yellow, 2.5YR5/6 & 5YR6/6	8.0	SS-5	7	10	17	39	27
		LL=30, PL=14, PI=16, NMC=9.7%, %200=22.6							
196.3		@SS-4: Very Stiff, Yellowish Red/White, 5YR5/6 & 7.5YR9.5/1							
		@SS-5: White/Strong Brown, with Organics, 7.5YR9.5/1 & 7.5YR5/6							
		LL=33, PL=14, PI=19, NMC=13.3%, %200=32.7							
	13.5	**ALLUVIUM (HOLOCENE)**	13.5	SS-6	2	2	3		5
191.3		Firm, Moist, Strong Brown/Light Olive Gray, Low Plasticity to Medium Plasticity, SILT (ML/A-4) with Sand, 7.5YR5/6 & 5Y6/2							
		@SS-6: LL=40, PL=27, PI=13, NMC=35.8%, %200=79.3							
	18.5	**PIEDMONT RESIDUUM**	18.5	SS-7	WOH	1	2		3
186.3		Soft, Moist, Light Gray/Dark Yellowish Brown, Weakly Cemented, Medium Plasticity, SILT (ML/A-4), 5Y7/2 & 10YR4/4							
		@SS-7: NMC=36.5%, %200=90.9	23.5	SS-8	12	17	16		33
		@SS-8: Hard, Pale Brown/Dark Yellowish Brown, 2.5Y7/4 & 10YR4/4							
181.3									

SPT N VALUE ● PL × MC ○ LL ×
▲ FINES CONTENT (%)
✿ RQD (%) ■ REC (%)
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:	P043326			**County:**	Richland/Lexington	**Boring No.:**	P3D-B20
Site Description:	Carolina Crossroads Phase 3D					**Route:**	I-126 WB_I-26 EB
Eng./Geo.:	B. Vogel	**Boring Location:**	372+33	**Offset:**	4-L	**Alignment:**	I-126 WB_I-26 EB
Elev.:	206.3 ft	**Latitude:**	34.02943703	**Longitude:**	-81.10401029	**Date Started:**	8/15/2025
Total Depth:	68.7 ft	**Soil Depth:**	48.7 ft	**Core Depth:**	20 ft	**Date Completed:**	8/18/2025
Bore Hole Diameter (in):	6.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	85.7%
Core Size:	NQ	**Driller:**	J. Phillips & A. Alvarez	**Groundwater:**	**TOB** 16 ft	**24HR**	12 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
		@SS-9: Light Yellowish Brown/Light Gray, with Trace Gravel, 2.5Y6/4 & 7N/Light Gray	28.5	SS-9	17	21	31		52
176.3		LL=41, PL=28, PI=13, NMC=24.5%, %200=92.3							
		@SS-10: Light Yellowish Brown/Greenish Gray, 2.5Y6/4 & 5GY6/1	33.5	SS-10	28	38	32		70
171.3									
	38.5	Hard, Moist, Bluish Gray/Pale Brown, Low Plasticity to Medium Plasticity, Weakly to Moderately Cemented, SILT (ML/A-4) with Sand, 5B6/1 & 2.5Y8/3	38.5	SS-11	20	33	50/4"		83+
166.3									
	43.5	Very Dense, Moist, Reddish Yellow/Pale Yellowish Pink, Non-Plastic to Low Plasticity, Silty Fine to Coarse SAND (SM/A-2-4) with Trace Gravel, 7.5YR6/8 & 7.5YR9.5/2	43.5	SS-12	50/2"				100+
161.3									
	48.5		48.5	SS-13	50/2"				100+
	48.8	Hard, Moist, Dark Greenish Gray/Light Yellowish Brown, Low Plasticity to Medium Plasticity, Weakly to Moderately Cemented, SILT (ML/A-4), 10Y4/1 & 10YR6/4	48.8	SS-14	50/0"				100+
156.3		**PHYLLITE** Metamorphic, Dark Gray, Fine to Very Fine Grained, Laminated, Quartz/Feldspar/Epodite/Chlorite, Fresh, Strong Rock, Ultra #8 Bit	48.8	NQ-1					
			51.6						

SPT N VALUE ● PL × MC ○ LL × ▲ FINES CONTENT (%) ✿ RQD (%) ■ REC (%)

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:	P043326			**County:**	Richland/Lexington	**Boring No.:**	P3D-B20
Site Description:	Carolina Crossroads Phase 3D					**Route:**	I-126 WB_I-26 EB
Eng./Geo.:	B. Vogel	**Boring Location:**	372+33	**Offset:**	4-L	**Alignment:**	I-126 WB_I-26 EB
Elev.:	206.3 ft	**Latitude:**	34.02943703	**Longitude:**	-81.10401029	**Date Started:**	8/15/2025
Total Depth:	68.7 ft	**Soil Depth:**	48.7 ft	**Core Depth:**	20 ft	**Date Completed:**	8/18/2025
Bore Hole Diameter (in):	6.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	85.7%
Core Size:	NQ	**Driller:**	J. Phillips & A. Alvarez	**Groundwater:**	**TOB** 16 ft	**24HR**	12 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value
151.3		@NQ-1: Ocasional Joints Dip From 5° to 60°, Fo/V, N/VN, Fi/No, No/Py/Qz, Pl, VC, SR, q_u= 10680 psi, RMR=56, Class III, %REC=89.7, %RQD=85.3, GSI=65-75, 11.2 min/ft			NQ-2		
		@NQ-2: Ocasional Joints Dip From 5° to 90°, J/V, No/Qz, Pl/Ir, q_u= 11700 psi, RMR=59, Class III, %REC=97.5, %RQD=95.8, GSI=70-80, 3.6 min/ft		56.6			
146.3		@NQ-3: Ocasional Joints Dip From 5° to 90°, J/Fo/V, M/N/VN, Ch/No/Qz, Pl, %REC=100, %RQD=94.6, GSI=70-80, 3.4 min/ft			NQ-3		
		@NQ-4: Few Joints Dip From 0° to 60°, J/Fo, N, No, Ch/H/No/Qz, %REC=100, %RQD=100, GSI=80-90, 3.0 min/ft		61.6			
141.3					NQ-4		
		@NQ-5: Few Joints Dip From 0° to 60°, Fo, VN, Pa/Fi, Ch/H/No, %REC=100, %RQD=100, GSI=85-95, 4.5 min/ft		66.6	NQ-5		
	68.8	Boring Terminated at 68.8-ft. in Bedrock.					
136.3							
131.3							
126.3							

SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) ✿ RQD (%) ■ REC (%)

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 G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT_DATATEMPLATE.GDT 11/3/25

SCDOT Soil Test Log

Project ID:	P043326			**County:**	Richland/Lexington	**Boring No.:**	P3D-B21
Site Description:	Carolina Crossroads Phase 3D					**Route:**	I-126 WB_I-26 EB
Eng./Geo.:	B. Vogel	**Boring Location:**	370+52	**Offset:**	24-L	**Alignment:**	I-126 WB_I-26 EB
Elev.:	208.8 ft	**Latitude:**	34.02978768	**Longitude:**	-81.10361573	**Date Started:**	8/19/2025
Total Depth:	75.4 ft	**Soil Depth:**	55.1 ft	**Core Depth:**	20.3 ft	**Date Completed:**	8/19/2025
Bore Hole Diameter (in):	6.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	85.7%
Core Size:	NQ	**Driller:**	J. Phillips	**Groundwater:**	**TOB** 17 ft	**24HR**	16 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0		0.0	SS-1	3	5	4	4	9
	0.6	**TOPSOIL** (7.0-in)	2.0	SS-2	3	3	8	13	11
		EXISTING FILL	4.0	SS-3	9	9	11	9	20
		Stiff, Moist, Reddish Yellow/Light Gray, Low Plasticity to Medium Plasticity, Fine to Coarse Sandy Lean CLAY (CL/A-6) with Organics & Trace Gravel, 7.5YR6/6 & 7N/Light Gray	6.0	SS-4	4	5	3	3	8
	4.0	@SS-1: LL=40, PL=14, PI=26, NMC=20.2%, %200=65.3	8.0	SS-5	3	3	6	8	9
203.8		Medium Dense to Loose, Moist, Brown/Reddish Yellow, Low Plasticity, Silty Clayey Fine to Medium SAND (SC-SM/A-2-4) with Trace Gravel, 7.5YR5/3 & 7.5YR6/8							
	8.0	@SS-4: Brownish Yellow, Fine to Coarse, 10YR6/6							
198.8		LL=21, PL=14, PI=7, NMC=11.9%, %200=23.2							
		ALLUVIUM (HOLOCENE)	13.5	SS-6	4	7	10		17
		Loose, Moist, Light Gray/Reddish Yellow, Non-Plastic to Low Plasticity, Clayey Fine to Coarse SAND (SC/A-2-4), 7N/Light Gray & 7.5YR6/6							
	13.5	@SS-5: LL=23, PL=13, PI=10, NMC=14.0%, %200=31.1							
193.8		**PIEDMONT RESIDUUM**							
		Very Stiff, Moist, Light Gray/Reddish Yellow, Low Plasticity, SILT (ML/A-4), 5Y7/2 & 7.5YR6/8	18.5	SS-7	11	15	16		31
	18.5	@SS-6: LL=38, PL=28, PI=10, NMC=29.4%, %200=95.7							
188.8		Hard, Moist, Light Gray/Brownish Yellow, Low Plasticity, SILT (ML/A-4), with Sand & Trace Gravel, 7N/Light Gray & 10YR6/6							
		@SS-8: Light Gray/Reddish Yellow, 5Y7/2& 7.5YR6/8	23.5	SS-8	12	16	25		41
183.8		LL=37, PL=29, PI=8, NMC=15.7%, %200=75.8							

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

LEGEND

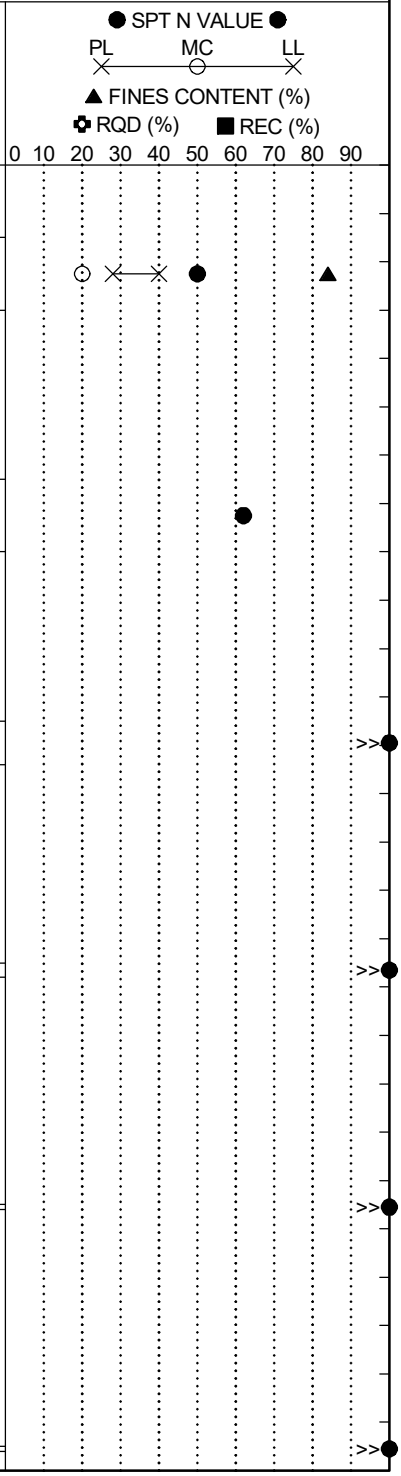
Continued Next Page

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:	P043326	**County:**	Richland/Lexington	**Boring No.:**	P3D-B21		
Site Description:	Carolina Crossroads Phase 3D			**Route:**	I-126 WB_I-26 EB		
Eng./Geo.:	B. Vogel	**Boring Location:**	370+52	**Offset:**	24-L	**Alignment:**	I-126 WB_I-26 EB
Elev.:	208.8 ft	**Latitude:**	34.02978768	**Longitude:**	-81.10361573	**Date Started:**	8/19/2025
Total Depth:	75.4 ft	**Soil Depth:**	55.1 ft	**Core Depth:**	20.3 ft	**Date Completed:**	8/19/2025
Bore Hole Diameter (in):	6.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	85.7%
Core Size:	NQ	**Driller:**	J. Phillips	**Groundwater:**	**TOB** 17 ft	**24HR**	16 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
		@SS-9: (ML/A-6), Reduced Trace Gravel LL=40, PL=28, PI=12, NMC=20.0%, %200=84.3		28.5	SS-9	14	20	30		50
178.8										
		@SS-10: Olive/Light Gray, 5Y4/3 & 5Y7/2		33.5	SS-10	11	22	40		62
173.8										
		@SS-11: Light Gray/Reddish Yellow, 7N/Light Gray & 7.5YR6/6		38.5	SS-11	28	50/3"			100+
168.8										
		@SS-12: Pale Olive, 5Y6/3		43.5	SS-12		50/3"			100+
163.8										
		@SS-13: Light Olive Brown, 2.5Y5/4		48.5	SS-13		50/1.25"			100+
158.8										
		@SS-14: Greenish Gray, 10Y5/1		53.5	SS-14		50/1.25"			100+



LEGEND

Continued Next Page

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

SCDOT Soil Test Log

Project ID:	P043326			**County:**	Richland/Lexington	**Boring No.:**	P3D-B21
Site Description:	Carolina Crossroads Phase 3D					**Route:**	I-126 WB_I-26 EB
Eng./Geo.:	B. Vogel	**Boring Location:**	370+52	**Offset:**	24-L	**Alignment:**	I-126 WB_I-26 EB
Elev.:	208.8 ft	**Latitude:**	34.02978768	**Longitude:**	-81.10361573	**Date Started:**	8/19/2025
Total Depth:	75.4 ft	**Soil Depth:**	55.1 ft	**Core Depth:**	20.3 ft	**Date Completed:**	8/19/2025
Bore Hole Diameter (in):	6.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	85.7%
Core Size:	NQ	**Driller:**	J. Phillips	**Groundwater:**	**TOB** 17 ft	**24HR**	16 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value
153.8	55.1	**PHYLLITE** Metamorphic, Tan/Light Green, Fine to Very Fine Grained, Laminated to Thinly Laminated, Quartz/Feldspar/Epodite/Chlorite, Moderately to Highly Weathered, Ultra #8 Bit @NQ-1: Numerous Joints Dip From 35° to 90°, J, M/N, Su/Sp, Fe, Pl/St, VC, S/SR, %REC=100, %RQD=0, GSI=15-20, 6.1 min/ft	55.1 55.1 55.4	SS-15 NQ-1	50/0"	100+
148.8		@NQ-2: Tan/Light Gray, Numerous Joints Dip From 0° to 80°, M/N/VN, Pl, %REC=55, %RQD=22.5, GSI=15-20, 4.6 min/ft	60.4	NQ-2		
143.8		@NQ-3: Strong Rock, Dark Gray/Light Gray, Quartz/Feldspar/Mica, Fresh to Highly Weathered, Occasional Joints Dip From 0° to 90°, M/N, Su/Sp/Fi, Fe/H/Qz, q_u=14420 psi, RMR=37, Class IV, %REC=34.2, %RQD=27.5, GSI=35-55, 5.2 min/ft	65.4	NQ-3		
138.8		@NQ-4: Fresh, Few Joints Dip From 0° to 25°, Sp/Fi, Ca/H/Qz, %REC=100, %RQD=100, GSI=60-70, 3.6 min/ft	70.4	NQ-4		
133.8	75.4	@NQ-5: Few Joints Dip From 0° to 15°, M/N/VN, %REC=98.8, %RQD=98.8, GSI=70-80, 2.4 min/ft Boring Terminated at 75.4-ft. in Bedrock.		NQ-5		
128.8						

SPT N VALUE ● PL × MC ○ LL × ▲ FINES CONTENT (%) ✿ RQD (%) ■ REC (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

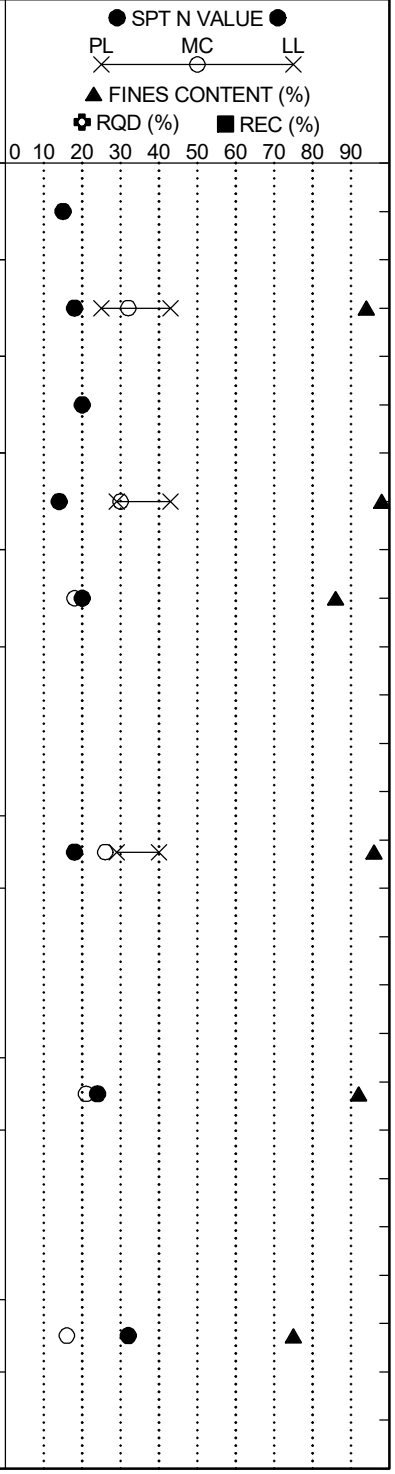
SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT_DATATEMPLATE.GDT 11/3/25

SCDOT Soil Test Log

Project ID:	P043326	**County:**	Richland/Lexington	**Boring No.:**	P3D-B22		
Site Description:	Carolina Crossroads Phase 3D			**Route:**	I-126 WB_I-26 EB		
Eng./Geo.:	B. Vogel	**Boring Location:**	368+09	**Offset:**	1-L	**Alignment:**	I-126 WB_I-26 EB
Elev.:	212.3 ft	**Latitude:**	34.03013662	**Longitude:**	-81.10296301	**Date Started:**	9/11/2025
Total Depth:	98.6 ft	**Soil Depth:**	78.6 ft	**Core Depth:**	20 ft	**Date Completed:**	9/12/2025
Bore Hole Diameter (in):	6.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	85.7%
Core Size:	NQ	**Driller:**	J. Phillips	**Groundwater:**	**TOB** 13.5 ft	**24HR**	8 ft

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	**TOPSOIL** (5.0-in)	0.0						
		EXISTING FILL		SS-1	3	6	9	9	15
		Stiff to Very Stiff, Moist, Reddish Yellow/Light Gray, Medium Plasticity, Lean CLAY (CL/A-7-6) with Organics, 5YR6/8 & 2.5Y7/1	2.0						
		SS-2: Yellowish Red/Light Gray, Reduced Organics 5YR5/8 & 2.5Y7/1		SS-2	6	8	10	11	18
207.3		LL=43, PL=25, PI=18, NMC=32.0%, %200=94.2	4.0						
				SS-3	9	10	10	12	20
	6.0	@SS-3: Yellowish Red/Light Gray, 5YR5/8 & 2.5Y7/1	6.0						
				SS-4	5	7	7	10	14
		PIEDMONT RESIDUUM	8.0						
		Stiff to Very Stiff, Moist, Reddish Yellow/Greenish Gray, Medium Plasticity, SILT (ML/A-7-6), 7.5YR6/8 & 10Y6/1		SS-5	4	9	11	13	20
202.3		@SS-4: LL=43, PL=29, PI=14, NMC=30.3%, %200=98.0							
		@SS-5: Reddish Yellow, 7.5YR6/6 NMC=17.8%, %200=86.3							
			13.5						
		@SS-6: Reddish Yellow/Light Gray, (ML/A-6), 7.5YR6/8 & 10YR7/2		SS-6	5	6	12		18
197.3		LL=40, PL=29, PI=11, NMC=25.7%, %200=96.0							
			18.5						
		@SS-7: Brownish Yellow/Light Greenish Gray, 10YR6/8 & 10YR7/1		SS-7	7	9	15		24
192.3		NMC=20.8%, %200=92.0							
	23.5		23.5						
		Hard, Moist, Reddish Yellow/Light Greenish Gray, Non-Plastic to Low Plasticity, SILT (ML/A-4) with Sand, 5YR6/8 & 10YR7/1		SS-8	3	13	19		32
187.3		@SS-8: NMC=15.7%, %200=74.8							



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	

SC_DOT G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT_DATATEMPLATE.GDT 11/3/25

SCDOT Soil Test Log

Project ID:	P043326	**County:**	Richland/Lexington	**Boring No.:**	P3D-B22		
Site Description:	Carolina Crossroads Phase 3D			**Route:**	I-126 WB_I-26 EB		
Eng./Geo.:	B. Vogel	**Boring Location:**	368+09	**Offset:**	1-L	**Alignment:**	I-126 WB_I-26 EB
Elev.:	212.3 ft	**Latitude:**	34.03013662	**Longitude:**	-81.10296301	**Date Started:**	9/11/2025
Total Depth:	98.6 ft	**Soil Depth:**	78.6 ft	**Core Depth:**	20 ft	**Date Completed:**	9/12/2025
Bore Hole Diameter (in):	6.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	85.7%
Core Size:	NQ	**Driller:**	J. Phillips	**Groundwater:**	**TOB** 13.5 ft	**24HR**	8 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
				28.5						
					SS-9	11	16	24		40
182.3										
	33.5			33.5						
		Hard, Moist, Yellow/Light Greenish Gray, Non-Plastic to Low Plasticity, Sandy SILT (ML/A-4), 10YR7/6 & 10YR7/1			SS-10	19	23	33		56
177.3		@SS-10: NMC=18.7%, %200=68.6								
				38.5						
		@SS-11: Reddish Yellow/Light Gray, 5YR7/6 & 5Y6/1			SS-11	28	39	50/5"		89+
172.3										
				43.5						
		@SS-12: Light Gray/Reddish Yellow, 5Y7/2 & 5YR6/8			SS-12	22	50/6"			100+
167.3										
				48.5						
		@SS-13: Brownish Yellow, 10YR6/6			SS-13	45	50/4"			100+
162.3										
				53.5						
					SS-14		50/4"			100+

SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) ✿ RQD (%) ■ REC (%)

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	

SC_DOT G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT_DATATEMPLATE.GDT 11/3/25

SCDOT Soil Test Log

Project ID:	P043326	**County:**	Richland/Lexington	**Boring No.:**	P3D-B22		
Site Description:	Carolina Crossroads Phase 3D			**Route:**	I-126 WB_I-26 EB		
Eng./Geo.:	B. Vogel	**Boring Location:**	368+09	**Offset:**	1-L	**Alignment:**	I-126 WB_I-26 EB
Elev.:	212.3 ft	**Latitude:**	34.03013662	**Longitude:**	-81.10296301	**Date Started:**	9/11/2025
Total Depth:	98.6 ft	**Soil Depth:**	78.6 ft	**Core Depth:**	20 ft	**Date Completed:**	9/12/2025
Bore Hole Diameter (in):	6.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	85.7%
Core Size:	NQ	**Driller:**	J. Phillips	**Groundwater:**	**TOB** 13.5 ft	**24HR**	8 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
157.3										
				58.5	SS-15	50/2"				100+
152.3										
		@SS-16: Reddish Yellow, 7.5YR6/6		63.5	SS-16	50/2"				100+
147.3										
		@SS-17: Greenish Gray, 5GY5/1		68.5	SS-17	50/2"				100+
142.3										
		@SS-18: Pale Brown/Yellowish Red, 2.5Y7/4 & 5YR5/6		73.5	SS-18	50/2"				100+
137.3										
	78.6	@SS-19: Pale Brown/Gray, 2.5Y7/3 & 5YR5/6		78.5	SS-19	50/0.75"				100+
132.3		**AMPHIBOLITE** Metamorphic, Dark Brown/Green, Medium to		78.6	NQ-1					

SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) ✿ RQD (%) ■ REC (%)

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:	P043326	**County:**	Richland/Lexington	**Boring No.:**	P3D-B22		
Site Description:	Carolina Crossroads Phase 3D			**Route:**	I-126 WB_I-26 EB		
Eng./Geo.:	B. Vogel	**Boring Location:**	368+09	**Offset:**	1-L	**Alignment:**	I-126 WB_I-26 EB
Elev.:	212.3 ft	**Latitude:**	34.03013662	**Longitude:**	-81.10296301	**Date Started:**	9/11/2025
Total Depth:	98.6 ft	**Soil Depth:**	78.6 ft	**Core Depth:**	20 ft	**Date Completed:**	9/12/2025
Bore Hole Diameter (in):	6.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	85.7%
Core Size:	NQ	**Driller:**	J. Phillips	**Groundwater:**	**TOB** 13.5 ft	**24HR**	8 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value
		Fine Grained, Laminated to Thinly Laminated, Epidote/Plagioclase Feldspar/Hornblade/Mica/Quartz, Completely Weathered to Slightly Weathered		81.6			
		@NQ-1: Numerous Joints Dip From 0° to 80°, J, M/N/VN, Su/Sp, Fe, Ir, VC, S/SR/R, %REC=6.9, %RQD=0, GSI=15-25, 8.0 min/ft			NQ-2		
127.3		@NQ-2: Dark Gray/Green, Numerous Joints Dip From 0° to 90°, M, Su/Sp/Fi, Fe/H/Qz, St/Ir, %REC=12.5, %RQD=0, GSI=15-25, 5.8 min/ft		86.6			
		@NQ-3: Numerous Joints Dip From 0° to 85°, J/V, Su/Sp/Pa/Fi, Fe/H/Py/Qz, Pl/Ir, %REC=59.2, %RQD=15, GSI=25-35, 6.2 min/ft			NQ-3		
122.3				91.6			
		@NQ-4: Coarse to Fine Grained, Highly Weathered to Slightly Weathered, Numerous Joints Dip From 10° to 90°, J, M/N/VN, SR/R, %REC=71.9, %RQD=0, GSI=20-30, 4.0 min/ft			NQ-4		
117.3				95.6			
		@NQ-5: Highly Weathered to Slightly Weathered, Numerous Joints Dip From 0° to 65°, J, M/N/VN, Su/Sp/Fi, Fe/H/Py, Pl/St/Ir, VC, SR/R, %REC=75.0, %RQD=0, GSI=20-30, 3.7 min/ft			NQ-5		
	98.6	Boring Terminated at 98.6-ft. in Bedrock.					
112.3							
107.3							

SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) ✿ RQD (%) ■ REC (%)
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:	P043326	**County:**	Richland/Lexington	**Boring No.:**	P3D-B23		
Site Description:	Carolina Crossroads Phase 3D			**Route:**	I-126 WB_I-26 EB		
Eng./Geo.:	G. Cantel	**Boring Location:**	366+43	**Offset:**	22-L	**Alignment:**	I-126 WB_I-26 EB
Elev.:	210.6 ft	**Latitude:**	34.03009101	**Longitude:**	-81.1024307	**Date Started:**	7/8/2025
Total Depth:	69.7 ft	**Soil Depth:**	58.9 ft	**Core Depth:**	10 ft	**Date Completed:**	7/9/2025
Bore Hole Diameter (in):	6.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	85.7%
Core Size:	NQ	**Driller:**	J. Phillips	**Groundwater:**	**TOB** 27.5 ft	**24HR**	NM

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	ASPHALT ROADWAY (16.0-in.)							
	1.3	**PAVEMENT BASE**	1.3						
	2.0	Very Loose, Dry to Moist, Dark Reddish Brown, Non-Plastic, Poorly Graded GRAVEL (GP/A-1) , 5YR3/6	2.0	SS-1	X	X	X	2	
				SS-2	1	1	2	6	3
	4.0	**PIEDMONT RESIDUUM**	4.0						
205.6		Soft, Moist, Brownish Yellow/Light Gray/Dark Red, Low Plasticity, SILT (ML/A-5) with Sand, 10YR6/8 & 5Y7/1 & 2.5YR3/6		SS-3	11	11	14	23	25
		@SS-2: LL=42, PL=32, PI=10, NMC=31.6%, %200=78.8	6.0						
				SS-4	5	8	9	12	17
	8.0		8.0						
		Very Stiff, Moist, Brownish Yellow/Light Gray, Low Plasticity, SILT (ML/A-4), 10YR6/8 & 5Y7/1		SS-5	2	4	5	8	9
200.6		@SS-4: Dark Gray, 4N/Dark Gray LL=35, PL=28, PI=7, NMC=24.0%, %200=92.7							
		Stiff, Moist, Pale Olive, Non-Plastic, SILT (ML/A-4) with Sand, 5Y6/4							
	13.5	@SS-5: LL=NP, PL=NP, PI=NP, NMC=24.9%, %200=83.8	13.5						
				SS-6	11	13	21		34
195.6		Hard, Dry to Moist, Dark Gray, Low Plasticity, Silty CLAY (CL-ML/A-4) with Sand & Trace Gravel, 4N/Dark Gray							
		@SS-6: LL=29, PL=22, PI=7, NMC=23.7%, %200=76.5							
	18.5		18.5						
		Hard to Very Stiff, Dry to Moist, Olive Yellow/Dark Gray, Low Plasticity, SILT (ML/A-4), 2.5Y6/6 & 4N/Dark Gray		SS-7	10	19	26		45
190.6									
			23.5						
		@SS-8: Strong Brown, with Trace Gravel, 7.5YR4/6		SS-8	10	8	13		21
185.6		LL=33, PL=25, PI=8, NMC=23.8%, %200=92.0							

SPT N VALUE ● PL × MC ○ LL × ▲ FINES CONTENT (%) ✿ RQD (%) ■ REC (%)

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:	P043326	**County:**	Richland/Lexington	**Boring No.:**	P3D-B23		
Site Description:	Carolina Crossroads Phase 3D			**Route:**	I-126 WB_I-26 EB		
Eng./Geo.:	G. Cantel	**Boring Location:**	366+43	**Offset:**	22-L	**Alignment:**	I-126 WB_I-26 EB
Elev.:	210.6 ft	**Latitude:**	34.03009101	**Longitude:**	-81.1024307	**Date Started:**	7/8/2025
Total Depth:	69.7 ft	**Soil Depth:**	58.9 ft	**Core Depth:**	10 ft	**Date Completed:**	7/9/2025
Bore Hole Diameter (in):	6.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	85.7%
Core Size:	NQ	**Driller:**	J. Phillips	**Groundwater:**	**TOB** 27.5 ft	**24HR**	NM

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
		▽		28.5						
		@SS-9: Light Yellowish Brown, 2.5Y6/3			SS-9	5	8	13		21
180.6										
				33.5						
		@SS-10: Light Gray, 7N/Light Gray			SS-10	13	21	22		43
175.6										
				38.5						
		@SS-11: Light Olive Gray, 5Y6/2			SS-11	33		50/2"		100+
170.6										
				43.5						
		@SS-12: Pale Olive, Reduced Gravel, 3Y6/3			SS-12	50/2"				100+
165.6										
				48.5						
					SS-13	45		50/4"		100+
160.6										
				53.5						
		@SS-14: Olive Gray, 5Y4/2			SS-14	50/2"				100+

SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) ✿ RQD (%) ■ REC (%)
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	

SC_DOT G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT_DATATEMPLATE.GDT 11/3/25

SCDOT Soil Test Log

Project ID:	P043326	**County:**	Richland/Lexington	**Boring No.:**	P3D-B23		
Site Description:	Carolina Crossroads Phase 3D			**Route:**	I-126 WB_I-26 EB		
Eng./Geo.:	G. Cantel	**Boring Location:**	366+43	**Offset:**	22-L	**Alignment:**	I-126 WB_I-26 EB
Elev.:	210.6 ft	**Latitude:**	34.03009101	**Longitude:**	-81.1024307	**Date Started:**	7/8/2025
Total Depth:	69.7 ft	**Soil Depth:**	58.9 ft	**Core Depth:**	10 ft	**Date Completed:**	7/9/2025
Bore Hole Diameter (in):	6.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	85.7%
Core Size:	NQ	**Driller:**	J. Phillips	**Groundwater:**	**TOB** 27.5 ft	**24HR**	NM

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value
155.6				58.5	SS-15	50/5"	100+
	59.7	@SS-15: Very Dark Gray, 3N/Very Dark Gray		59.7	SS-16	50/0"	100+
150.6		**AMPHIBOLITE** Metamorphic, Black/Gray, Medium to Very Fine Grained, Massive, Plagioclase Feldspar/Hornblade/Mica/Epidote/Quartz, Moderately to Slightly Weathered, Ultra #8 Bit		59.7	NQ-1		
		@NQ-1: Few Joints Dip From 0° to 65°, J, M/N, Su/Sp/Fi, Fe/H/Qz, Pl/Ir, VC, S/SR/R, %REC=63, %RQD=19, GSI=25-30, 9.0 min/ft		61.7	NQ-2		
145.6		@NQ-2: Fine to Very Fine Grained, Thinly Laminated, Slightly Weathered to Fresh, Very Strong Rock, Few Joints Dip From 0° to 60°, J/V, M/N/VN, Ca/Fe/H/Qz, %REC=100, %RQD=100, q_u=29950psi, RMR=42, Class III, GSI=50-65, 4.2 min/ft		66.7	NQ-3		
	69.7	@NQ-3: Few Joints Dip From 25° to 30°, J, VN, Fi, Ca/H, Pl, C, S, %REC=99, %RQD=96, q_u=35640psi, RMR=75, Class II, GSI=65-80, 6.0 min/ft					
140.6		Boring Terminated at 69.7-ft. in Bedrock.					
135.6							
130.6							

SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) ✿ RQD (%) ■ REC (%)

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 G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT_DATATEMPLATE.GDT 11/3/25

SCDOT Soil Test Log

Project ID:	P043326	**County:**	Richland/Lexington	**Boring No.:**	P3D-B24		
Site Description:	Carolina Crossroads Phase 3D			**Route:**	I-26 EB		
Eng./Geo.:	B. Vogel	**Boring Location:**	401+71	**Offset:**	78-R	**Alignment:**	I-26 EB
Elev.:	179.2 ft	**Latitude:**	34.02281545	**Longitude:**	-81.10430063	**Date Started:**	9/16/2025
Total Depth:	34.1 ft	**Soil Depth:**	24.1 ft	**Core Depth:**	10 ft	**Date Completed:**	9/16/2025
Bore Hole Diameter (in):	6.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	85.7%
Core Size:	NQ	**Driller:**	J. Phillips	**Groundwater:**	**TOB** 20 ft	**24HR**	9 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0									
	0.7	**TOPSOIL** (8.0-in)		0.0						
		EXISTING FILL			SS-1	4	7	5	4	12
		Stiff to Firm, Moist, Light Brownish Gray/Brownish Yellow, Medium Plasticity, Sandy Lean CLAY (CL/A-6) with Trace Gravel & Organics, 10YR6/2 & 10YR6/6		2.0	SS-2	4	4	4	5	8
	4.0	@SS-1: LL=33, PL=19, PI=14, NMC=14.0%, %200=57.8		4.0	SS-3	3	4	3	5	7
174.2		@SS-2: Brownish Gray/Reddish Yellow, Reduced Organics, 10YR6/2 & 7.5YR6/8 NMC=15.2%, %200=51.4		6.0	SS-4	8	3	4	3	7
	8.0	Loose, Moist, Light Brown, Medium Plasticity, Clayey SAND (SC/A-6) with Trace Gravel, 7.5YR6/4		8.0	SS-5	3	2	1	2	3
169.2		@SS-4: Light Gray/Reddish Yellow, Reduced Gravel, Micaceous, 7.5YR7/1 & 5YR6/8 LL=34, PL=23, PI=11, NMC=17.9%, %200=45.0								
	13.5	Soft, Moist, Light Gray, Low Plasticity, SILT (ML/A-4) with Sand & Trace Gravel, 2.5Y7/2		13.5						
		ALLUVIUM (HOLOCENE)			SS-6	2	4	4		8
164.2		Firm, Moist, Gray, Low Plasticity, Sandy Silty CLAY (CL-ML/A-4), 7.5YR5/1 @SS-6: LL=23, PL=18, PI=5, NMC=19.3, %200=63.7								
	18.5	Soft, Moist, Reddish Yellow/Pinkish Gray, High Plasticity, Lean CLAY (CL/A-7-6) with Organics, 7.5YR6/6 & 7.5YR7/2		18.5	SS-7	2	2	2		4
159.2		@SS-7: LL=44, PL=21, PI=23, NMC=29.1%, %200=96.0								
	23.5			23.5	~~SS-8~~	~~50/0.25"~~				~~100+~~
	24.1	@SS-8: No Recovery		24.1						
154.2		**COLUMBIA METAGRANITE** Metamorphic, Pink/Black, Very Coarse to Fine Grained, Massive, Feldspar/Mica/Quartz, Slightly Weathered to		25.6	NQ-1					

SPT N VALUE ● PL × MC ○ LL × ▲ FINES CONTENT (%) ✿ RQD (%) ■ REC (%)
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:	P043326			**County:**	Richland/Lexington	**Boring No.:**	P3D-B24
Site Description:	Carolina Crossroads Phase 3D					**Route:**	I-26 EB
Eng./Geo.:	B. Vogel	**Boring Location:**	401+71	**Offset:**	78-R	**Alignment:**	I-26 EB
Elev.:	179.2 ft	**Latitude:**	34.02281545	**Longitude:**	-81.10430063	**Date Started:**	9/16/2025
Total Depth:	34.1 ft	**Soil Depth:**	24.1 ft	**Core Depth:**	10 ft	**Date Completed:**	9/16/2025
Bore Hole Diameter (in):	6.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	85.7%
Core Size:	NQ	**Driller:**	J. Phillips	**Groundwater:**	**TOB** 20 ft	**24HR**	9 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value
		Fresh, Strong Rock, Ultra #8 Bit					
		@NQ-1: Occasional Joints Dip From 0° to 80°, J, M/VN, Su/Sp, Fe, Pl/Ir, VC, SR/R, %REC=100, %RQD=80.6, q_u=10010psi, RMR=43, Class III, GSI=40-50, 4.0 min/ft			NQ-2		
149.2		@NQ-2: Numerous Joints Dip From 5° to 85°, Pl/St/Ir, %REC=83.3, %RQD=60.8, q_u=36100psi, RMR=31, Class IV, GSI=50-60, 5.2 min/ft		30.6			
		@NQ-3: Occasional Joints Dip From 10° to 65°, M/VN, Su/Sp/Fi, Fe/H/Qz, Pl/Ir, %REC=100, %RQD=74.4, GSI=55-65, 4.6 min/ft			NQ-3		
	34.1						
144.2		Boring Terminated at 34.1-ft. in Bedrock.					
139.2							
134.2							
129.2							

SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) ✿ RQD (%) ■ REC (%)

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 G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT_DATATEMPLATE.GDT 11/3/25

SCDOT Soil Test Log

Project ID:	P043326	**County:**	Richland/Lexington	**Boring No.:**	P3D-B25		
Site Description:	Carolina Crossroads Phase 3D			**Route:**	I-26 EB		
Eng./Geo.:	B. Vogel	**Boring Location:**	398+90	**Offset:**	33-R	**Alignment:**	I-26 EB
Elev.:	180.7 ft	**Latitude:**	34.02347987	**Longitude:**	-81.103806	**Date Started:**	10/6/2025
Total Depth:	45.7 ft	**Soil Depth:**	2.1 ft	**Core Depth:**	20 ft	**Date Completed:**	10/7/2025
Bore Hole Diameter (in):	6.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	85.7%
Core Size:	NQ	**Driller:**	J. Phillips	**Groundwater:**	**TOB** 21 ft	**24HR**	NM

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									
	0.7	BRIDGE DECK (8.0-in.)								
		AIR GAP (20.3-ft.)								
175.7										
170.7										
165.7										
160.7										
	21.0	WATER (2.6-ft.)								
	23.6	**PIEDMONT RESIDUUM**		23.6	SS-1	25	50/2"			100+
155.7		Very Dense, Moist, Red, Non-Plastic to Low Plasticity, Silty GRAVEL (GM/A-1) with Sand & Organics, 2.5YR5/6		25.6	SS-2	50/1"				100+
	25.7	@25.6-ft: Moist, Greenish Gray,		25.7						

SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) ✿ RQD (%) ■ REC (%)

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:	P043326			**County:**	Richland/Lexington	**Boring No.:**	P3D-B25
Site Description:	Carolina Crossroads Phase 3D					**Route:**	I-26 EB
Eng./Geo.:	B. Vogel	**Boring Location:**	398+90	**Offset:**	33-R	**Alignment:**	I-26 EB
Elev.:	180.7 ft	**Latitude:**	34.02347987	**Longitude:**	-81.103806	**Date Started:**	10/6/2025
Total Depth:	45.7 ft	**Soil Depth:**	2.1 ft	**Core Depth:**	20 ft	**Date Completed:**	10/7/2025
Bore Hole Diameter (in):	6.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	85.7%
Core Size:	NQ	**Driller:**	J. Phillips	**Groundwater:**	**TOB** 21 ft	**24HR**	NM

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value
		Non-Plastic to Low Plasticity, Silty Fine to Coarse SAND (SM/A-2-4) with Trace Gravel, 10Y5/1					
		COLUMBIA METAGRANITE					
150.7		Igneous, Pink, Coarse to Medium Grained, Massive, Feldspar/Biotite/Hornblade/Quartz, Slightly Weathered to Fresh, Very Strong Rock, Ultra #8 Bit		30.7	NQ-1		
		@NQ-1: Few Joints Dip From 40° to 45°, J, M, Sp/No, Fe/No, Pl, C, R, %REC=86.6, %RQD=86.6, q_u=18974psi, RMR=81, Class I, GSI=90-95, 3.2 min/ft			NQ-2		
145.7		@NQ-2: Few Joints Dip From 0° to 90°, M/N, C/VC, R/VR, %REC=86.6, %RQD=73.8, q_u=22107psi, RMR=70, Class II, GSI=70-85, 3.8 min/ft		35.7			
		@NQ-3: Few Joints Dip From 5° to 85°, M, C, R, %REC=100, %RQD=100, GSI=90-95, 9.5 min/ft			NQ-3		
140.7				40.7			
		@NQ-4: Few Joints Dip From 5° to 70°, Sp/No, Pl/St/Ir, R/VR, %REC=68.3, %RQD=65.8, GSI=85-90, 10.0 min/ft			NQ-4		
135.7	45.7						
		Boring Terminated at 45.7-ft. in Bedrock.					
130.7							

SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) ✿ RQD (%) ■ REC (%)

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 G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT_DATATEMPLATE.GDT 11/3/25

SCDOT Soil Test Log

Project ID:	P043326	**County:**	Richland/Lexington	**Boring No.:**	P3D-B26		
Site Description:	Carolina Crossroads Phase 3D			**Route:**	I-26 EB		
Eng./Geo.:	B. Vogel	**Boring Location:**	395+82	**Offset:**	35-R	**Alignment:**	I-26 EB
Elev.:	181.1 ft	**Latitude:**	34.02426322	**Longitude:**	-81.10341688	**Date Started:**	10/2/2025
Total Depth:	81.7 ft	**Soil Depth:**	38.5 ft	**Core Depth:**	28 ft	**Date Completed:**	10/3/2025
Bore Hole Diameter (in):	4.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	85.7%
Core Size:	NQ	**Driller:**	J. Phillips	**Groundwater:**	**TOB** 19.2 ft	**24HR**	6 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0									
	0.8	BRIDGE DECK (10.0-in.)								
		AIR GAP (14.4-ft.)								
176.1										
171.1										
166.1	15.2	**ALLUVIUM (HOLOCENE)**		15.2						
		Firm, Moist, Grayish Bronw/Gray, Medium Plasticity, Sandy Lean CLAY (CL/A-6), 10YR5/2 & 2.5Y5/1			SS-1	3	2	4	4	6
	17.2	@SS-1: LL=37, PL=18, PI=19, NMC=21.6%, %200=60.6		17.2	SS-2	1	1/12'		1	1
	19.2	Very Soft, Moist, Gray/Light Brownish Gray, Medium Plasticity, Lean CLAY (CL/A-6) with Sand, 2.5Y5/1 & 2/5Y6/2		19.2						
161.1					SS-3	WOH	WOH	3	6	3
	21.2	@SS-2: LL=34, PL=18, PI=16, NMC=32.2%, %200=75.5		21.2	SS-4	1	WOH	WOH	1	0
	23.2	Soft, Moist, Gray, High Plasticity, Lean CLAY (CL/A-7-6) with Organics, 6N/Gray		23.2	SS-5	WOH	WOH	WOH	WOH	0
		@SS-3: LL=47, PL=22, PI=25, NMC=48.3%, %200=98.2								
156.1		No Recovery								
		Very Soft, Moist, Gray, Medium Plasticity, Sandy Lean CLAY (CL/A-6) with Organics,								

SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) ✿ RQD (%) ■ REC (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

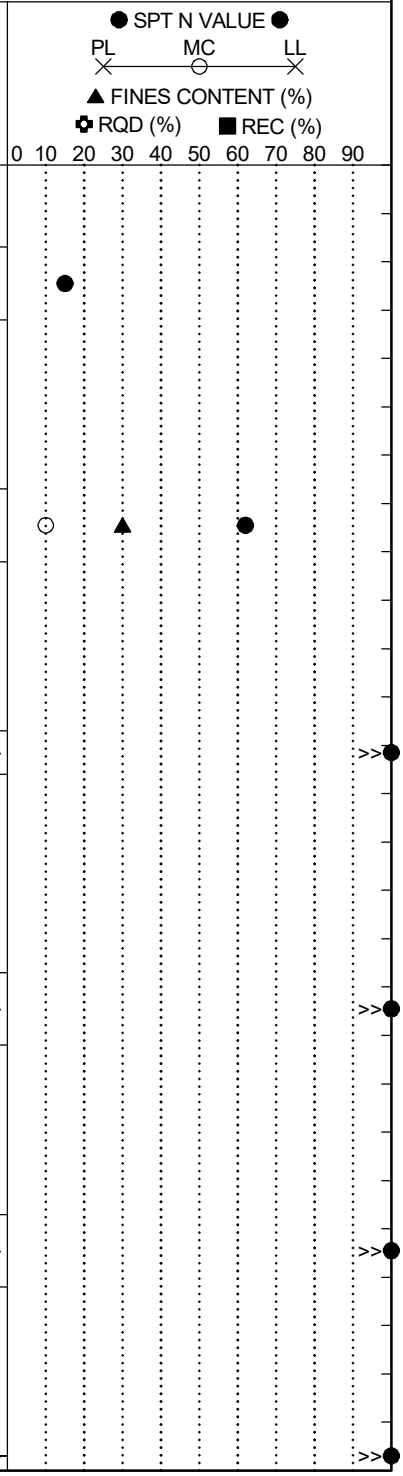
Continued Next Page

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:	P043326			**County:**	Richland/Lexington	**Boring No.:**	P3D-B26
Site Description:	Carolina Crossroads Phase 3D					**Route:**	I-26 EB
Eng./Geo.:	B. Vogel	**Boring Location:**	395+82	**Offset:**	35-R	**Alignment:**	I-26 EB
Elev.:	181.1 ft	**Latitude:**	34.02426322	**Longitude:**	-81.10341688	**Date Started:**	10/2/2025
Total Depth:	81.7 ft	**Soil Depth:**	38.5 ft	**Core Depth:**	28 ft	**Date Completed:**	10/3/2025
Bore Hole Diameter (in):	4.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	85.7%
Core Size:	NQ	**Driller:**	J. Phillips	**Groundwater:**	**TOB** 19.2 ft	**24HR**	6 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
		10YR6/1							
	28.7	@SS-5: LL=33, PL=18, PI=15, NMC=49.2%, %200=65.6	28.7						
151.1		Medium Dense, Moist, Grayish Olive/Greenish Gray, Non-Plastic, Silty GRAVEL (GM/A-2-4) with Sand, 10Y5/2 & 5G5/1		SS-6	5	8	7		15
	33.7	**PIEDMONT RESIDUUM**	33.7						
146.1		Very Dense, Moist, Greenish Gray, Low Plasticity to Medium Plasticity, Clayey Fine to Coarse SAND (SC/A-2-6) with Trace Gravel, 5G5/1		SS-7	26	29	33		62
		@SS-7: NMC=10.3%, %200=29.5	38.7						
				SS-8	41	50/5"			100+
141.1									
	43.7	Hard, Moist, Dark Greenish Gray, Non-Plastic to Low Plasticity, SILT (ML/A-4), 5G4/1	43.7	SS-9	50/4"				100+
136.1									
	48.7	Very Dense, Moist, Dark Greenish Gray, Non-Plastic to Low Plasticity, Silty Fine to Coarse SAND (SM/A-2-4), 5G4/1	48.7	SS-10	50/3"				100+
131.1									
	53.7		53.7	SS-11	50/0"				100+



Continued Next Page

LEGEND

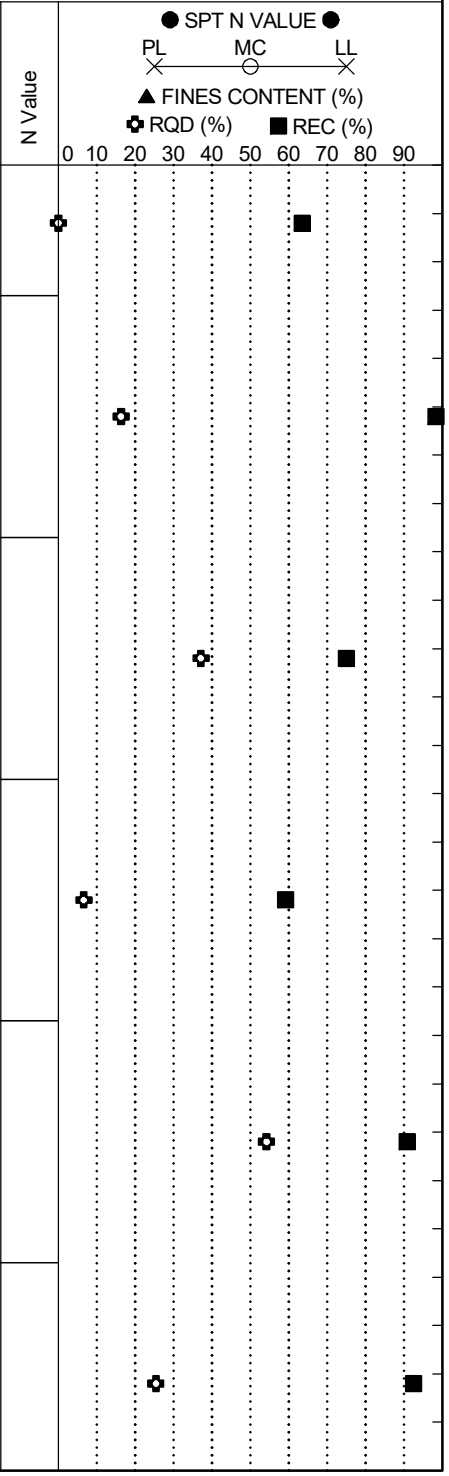
SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT_DATATEMPLATE.GDT 11/3/25

SCDOT Soil Test Log

Project ID:	P043326			**County:**	Richland/Lexington	**Boring No.:**	P3D-B26
Site Description:	Carolina Crossroads Phase 3D					**Route:**	I-26 EB
Eng./Geo.:	B. Vogel	**Boring Location:**	395+82	**Offset:**	35-R	**Alignment:**	I-26 EB
Elev.:	181.1 ft	**Latitude:**	34.02426322	**Longitude:**	-81.10341688	**Date Started:**	10/2/2025
Total Depth:	81.7 ft	**Soil Depth:**	38.5 ft	**Core Depth:**	28 ft	**Date Completed:**	10/3/2025
Bore Hole Diameter (in):	4.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	85.7%
Core Size:	NQ	**Driller:**	J. Phillips	**Groundwater:**	**TOB** 19.2 ft	**24HR**	6 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value
126.1		**AMPHIBOLITE** Metamorphic, Black/Green, Fine to Very Fine Grained, Massive, Feldspar/Hornblade/Epidote/Quartz, Moderately to Slightly Weathered, Ultra #8 Bit		53.7	NQ-1		
		@NQ-1: Numerous Joints Dip From 0° to 85°, J, M/N, Su/Sp, Cl/Ch/Fe/Qz, Pl, VC, S/SR, %REC=63.8, %RQD=0, GSI=15-20, 6.7 min/ft		56.7	NQ-2		
121.1		@NQ-2: Numerous Joints Dip From 0° to 90°, Fe/Qz, Pl/Ir, %REC=98.3, %RQD=16.3, GSI=15-20, 4.4 min/ft		61.7	NQ-3		
		@NQ-3: Moderately to Slightly Weathered, Numerous Joints Dip From 0° to 90°, J/V, M/N, Su/Sp/Fi, Fe, Pl/Ir, VC, SR/R, %REC=75.0, %RQD=37.1, GSI=20-30, 3.6 min/ft					
116.1				66.7	NQ-4		
		@NQ-4: Moderately to Slightly Weathered, Numerous Joints Dip From 0° to 90°, J/V, M/N, Su/Sp, Fe/Qz, Pl, VC, S/SR, %REC=59.2, %RQD=6.6, q_u=8043psi, RMR=13, Class V, GSI=15-20, 3.8 min/ft					
111.1				71.7	NQ-5		
		@NQ-5: Slightly Weathered to Fresh, Numerous Joints Dip From 5° to 90°, J/V, M/N, Sp/No, Fe/No, Pl/Ir, VC, S/SR/R, %REC=90.8, %RQD=54.2, GSI=20-30, 5.2 min/ft					
106.1				76.7	NQ-6		
		@NQ-6: Slightly Weathered to Fresh, Numerous Joints Dip From 5° to 80°, J/V, M/N, Su/Sp/Fi, Fe/Qz, Pl/Ir, VC, SR/R, %REC=92.5, %RQD=25.4, GSI=15-25, 4.2 min/ft					
101.1							



LEGEND

Continued Next Page

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

SCDOT Soil Test Log

Project ID:	P043326			**County:**	Richland/Lexington	**Boring No.:**	P3D-B26
Site Description:	Carolina Crossroads Phase 3D					**Route:**	I-26 EB
Eng./Geo.:	B. Vogel	**Boring Location:**	395+82	**Offset:**	35-R	**Alignment:**	I-26 EB
Elev.:	181.1 ft	**Latitude:**	34.02426322	**Longitude:**	-81.10341688	**Date Started:**	10/2/2025
Total Depth:	81.7 ft	**Soil Depth:**	38.5 ft	**Core Depth:**	28 ft	**Date Completed:**	10/3/2025
Bore Hole Diameter (in):	4.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	85.7%
Core Size:	NQ	**Driller:**	J. Phillips	**Groundwater:**	**TOB** 19.2 ft	**24HR**	6 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value
	81.7	Boring Terminated at 81.7-ft. in Bedrock.					
96.1							
91.1							
86.1							
81.1							
76.1							

● SPT N VALUE ●
PL MC LL
▲ FINES CONTENT (%)
✿ RQD (%) ■ REC (%)
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 G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT_DATATEMPLATE.GDT 11/3/25

SCDOT Soil Test Log

Project ID:	P043326	**County:**	Richland/Lexington	**Boring No.:**	P3D-B27		
Site Description:	Carolina Crossroads Phase 3D			**Route:**	I-26 EB		
Eng./Geo.:	B. Vogel	**Boring Location:**	393+86	**Offset:**	37-R	**Alignment:**	I-26 EB
Elev.:	183.8 ft	**Latitude:**	34.02476326	**Longitude:**	-81.10317429	**Date Started:**	10/1/2025
Total Depth:	52.3 ft	**Soil Depth:**	42.9 ft	**Core Depth:**	9.4 ft	**Date Completed:**	10/2/2025
Bore Hole Diameter (in):	6.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	85.7%
Core Size:	NQ	**Driller:**	J. Phillips	**Groundwater:**	**TOB** 26 ft	**24HR**	NM

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	CONCRETE (12.5-in.)							
	1.0	**EXISTING FILL**	1.0						
		Very Loose to Loose, Moist, Gray/Greenish Gray, High Plasticity, Clayey Fine to Coarse SAND (SC/A-7-6) with Trace gravel, 10YR5/1 & 5G5/1		SS-1	X	X	4	6	4
		@SS-2: Gray/Red, 2.5Y5/1 & 2.5YR5/6	2.0	SS-2	3	4	3	5	7
178.8		LL=47, PL=22, PI=25, NMC=18.3%, %200=48.1	4.0	SS-3	4	5	5	6	10
	6.0	@SS-3: Stiff, Light Yellowish Brown/White, 9.5N/White	6.0	SS-4	5	5	6	7	11
		Stiff, Moist, Gray/Pale Brown, High Plasticity, Fine to Coarse Sandy Lean CLAY (CL/A-6), 10YR6/1 & 2.5Y8/2	8.0	SS-5	3	7	8	12	15
173.8		@SS-4: LL=39, PL=17, PI=22, NMC=20.9%, %200=60.2							
		@SS-5: Light Grayish Olive/Very Pale Brown, 10Y6/2 & 10YR8/3							
	13.5	Stiff, Moist, Grayish Green, Medium Plasticity, SILT (ML/A-7-6) with Sand & Trace Gravel, 5G5/2	13.5	SS-6	5	5	5		10
168.8		@SS-6: LL=45, PL=28, PI=17, NMC=30.2%, %200=76.5							
	18.5	No Recovery	18.5	SS-7	6	6	5		11
163.8									
	23.5	**ALLUVIUM (HOLOCENE)**	23.5	SS-8	3	2	5		7
158.8		Firm, Moist, Gray/Brown, Medium Plasticity, Sandy Lean CLAY (CL/A-6), 6N/Gray & 10YR4/3							
		@SS-8: LL=30, PL=17, PI=13,							

SPT N VALUE ● PL × MC ○ LL ×
▲ FINES CONTENT (%)
✿ RQD (%) ■ REC (%)
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	

SC_DOT G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT_DATATEMPLATE.GDT 11/3/25

SCDOT Soil Test Log

Project ID:	P043326	**County:**	Richland/Lexington	**Boring No.:**	P3D-B27		
Site Description:	Carolina Crossroads Phase 3D			**Route:**	I-26 EB		
Eng./Geo.:	B. Vogel	**Boring Location:**	393+86	**Offset:**	37-R	**Alignment:**	I-26 EB
Elev.:	183.8 ft	**Latitude:**	34.02476326	**Longitude:**	-81.10317429	**Date Started:**	10/1/2025
Total Depth:	52.3 ft	**Soil Depth:**	42.9 ft	**Core Depth:**	9.4 ft	**Date Completed:**	10/2/2025
Bore Hole Diameter (in):	6.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	85.7%
Core Size:	NQ	**Driller:**	J. Phillips	**Groundwater:**	**TOB** 26 ft	**24HR**	NM

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
		NMC=23.5%, %200=60.6							
	28.5	**PIEDMONT RESIDUUM**	28.5						
153.8		Hard, Moist, Light Gray/Bluish Gray, Non-Plastic to Low Plasticity, Fine to Medium Sandy SILT (ML/A-4), 7N/Light Gray & 10B6/1		SS-9	1	10	40		50
	33.5		33.5						
		Hard, Moist, Bluish Gray, Non-Plastic to Low Plasticity, SILT (ML/A-4), 10B6/1		SS-10	50/2"				100+
148.8									
	38.5		38.5						
		Hard, Moist, Light Grayish Olive, Non-Plastic to Low Plasticity, Fine to Medium Sandy SILT (ML/A-4), 10Y6/2		SS-11	50/2"				100+
143.8									
	42.9		42.9	SS-12	50/0"				100+
		AMPHIBOLITE	42.9						
138.8		Metamorphic, Black/Green, Fine to Very Fine Grained, Massive, Feldspar/Hornblade/Mica/Epidote/Quartz, Highly Weathered, Ultra #8 Bit		NQ-1					
		@NQ-1: %REC=8.7, %RQD=0, GSI=0-5, 5.7 min/ft	47.3						
		@NQ-2: Highly Weathered to Slightly Weathered, Numerous Joints Dip From 0° to 90°, J, M/N/VN, Sp, Fe/Qz, Pl/Ir, VC, S/SR/R, %REC=64.3, %RQD=8.3, GSI=10-15, 4.4 min/ft		NQ-2					
133.8									
	52.3	Boring Terminated at 52.3-ft. in Bedrock.							

SPT N VALUE ● PL × MC ○ LL × ▲ FINES CONTENT (%) ✿ RQD (%) ■ REC (%)

0 10 20 30 40 50 60 70 80 90

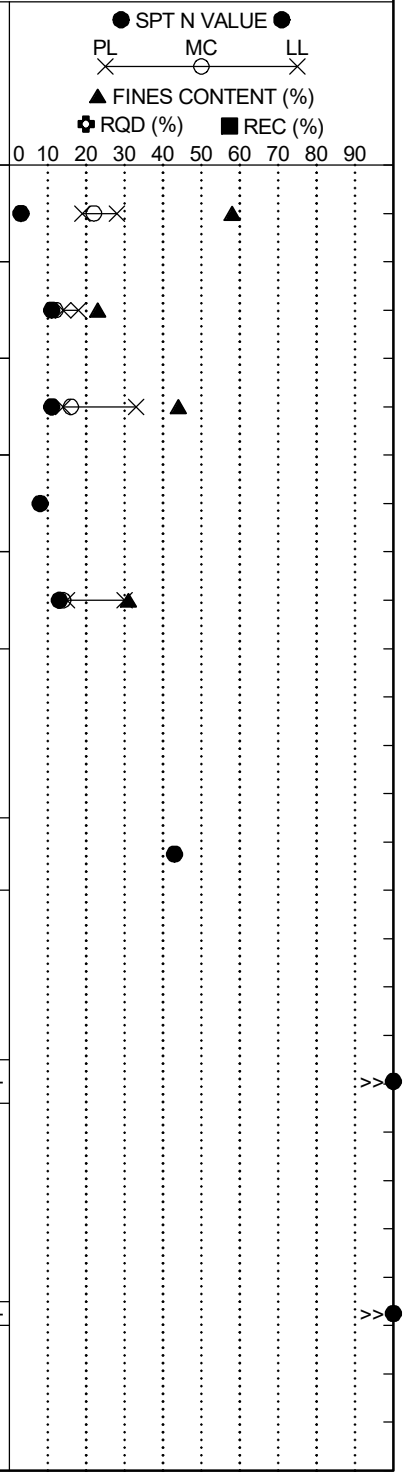
LEGEND

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:	P043326			**County:**	Richland/Lexington	**Boring No.:**	P3D-C1
Site Description:	Carolina Crossroads Phase 3D					**Route:**	I-26 EB_RA
Eng./Geo.:	B. Vogel	**Boring Location:**	386+34	**Offset:**	127-R	**Alignment:**	I-26 EB_RA
Elev.:	171.4 ft	**Latitude:**	34.02628047	**Longitude:**	-81.10348325	**Date Started:**	6/2/2025
Total Depth:	38.6 ft	**Soil Depth:**	38.6 ft	**Core Depth:**	0 ft	**Date Completed:**	6/3/2025
Bore Hole Diameter (in):	6.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	96.7%
Core Size:	N/A	**Driller:**	L. Guempel	**Groundwater:**	**TOB** 11 ft	**24HR**	4.5 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0		0.0						
	0.3	**TOPSOIL** (3.0-in.)							
		ALLUVIUM (HOLOCENE)							
	2.0	Soft, Moist, Brown/Strong Brown, Low Plasticity, Sandy Lean CLAY (CL/A-4) with Trace Organics, Micaceous, 7.5YR5/3 & 7.5YR5/6	2.0	SS-1	1	1	2	3	3
	4.0	@SS-1: LL=28, PL=19, PI=9, NMC=22.0%, %200=57.6	4.0	SS-2	3	4	7	11	11
166.4		Medium Dense, Light Yellowish Brown/Reddish Yellow, Low Plasticity, Silty Clayey Fine to Coarse SAND (SC-SM/A-2-4), 10YR6/4 & 7.5YR6/6		SS-3	2	6	5	4	11
		@SS-2: LL=18, PL=14, PI=4, NMC=11.5%, %200=23.1	6.0	SS-4	2	4	4	6	8
			8.0	SS-5	5	8	5	5	13
161.4		Loose to Medium Dense, Moist, Gray/Reddish Yellow, Medium Plasticity, Clayey Fine to Coarse SAND (SC/A-6) with Trace Organics, 6N/Gray & 7.5YR6/6							
		@SS-3: LL=33, PL=14, PI=19, NMC=16.3%, %200=44.0							
		@SS-4: Gray/Yellowish Red, 6N/Gray & 5YR5/8							
	13.5	@SS-5: Brownish Yellow/Reddish Brown, Low Plasticity, (SC/A-2-6), Reduced Organics, 10YR6/6 & 5YR5/4	13.5	SS-6	7	17	26		43
156.4		LL=30, PL=15, PI=15, NMC=13.9%, %200=31.3							
		PIEDMONT RESIDUUM							
	18.5	Hard, Moist, Gray/Yellowish Brown, Low Plasticity to Medium Plasticity, Weakly to Strongly Cemented SILT (ML/A-4), Micaceous, 6N/Gray & 10YR5/4	18.5	SS-7	23	50/5.5"			101+
151.4		Hard, Moist, Light Olive Gray/Dark Gray, Non-Plastic to Low Plasticity, Weakly to Strongly Cemented SILT (ML/A-4) with Sand & Trace Gravel, Micaceous 5Y6/2 & N4/Dark Gray							
			23.5	SS-8	50/5.75"				101+
146.4									



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:	P043326			**County:**	Richland/Lexington	**Boring No.:**	P3D-C1
Site Description:	Carolina Crossroads Phase 3D					**Route:**	I-26 EB_RA
Eng./Geo.:	B. Vogel	**Boring Location:**	386+34	**Offset:**	127-R	**Alignment:**	I-26 EB_RA
Elev.:	171.4 ft	**Latitude:**	34.02628047	**Longitude:**	-81.10348325	**Date Started:**	6/2/2025
Total Depth:	38.6 ft	**Soil Depth:**	38.6 ft	**Core Depth:**	0 ft	**Date Completed:**	6/3/2025
Bore Hole Diameter (in):	6.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	96.7%
Core Size:	N/A	**Driller:**	L. Guempel	**Groundwater:**	**TOB** 11 ft	**24HR**	4.5 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	28.5			28.5						
		Hard, Wet, Light Olive Brown, Non-Plastic to Low Plasticity, Fine to Coarse Sandy SILT (ML/A-4) with Trace Gravel, 2.5Y5/3			SS-9	41	50/3.5"			101+
141.4										
	33.5			33.5						
		Hard, Moist, Pale Olive, Low Plasticity to Medium Plasticity, Weakly to Strongly Cemented SILT (ML/A-4), 5Y6/3			SS-10	50/4"				101+
136.4										
	38.6			38.5						
		@SS-11: Pale Yellow/Light Gray, 5Y7/3 & 5Y7/1			SS-11	50/0.75"				101+
131.4		Boring Terminated at 38.6-ft. on Top of Rock.								
126.4										
121.4										

SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) ✿ RQD (%) ■ REC (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

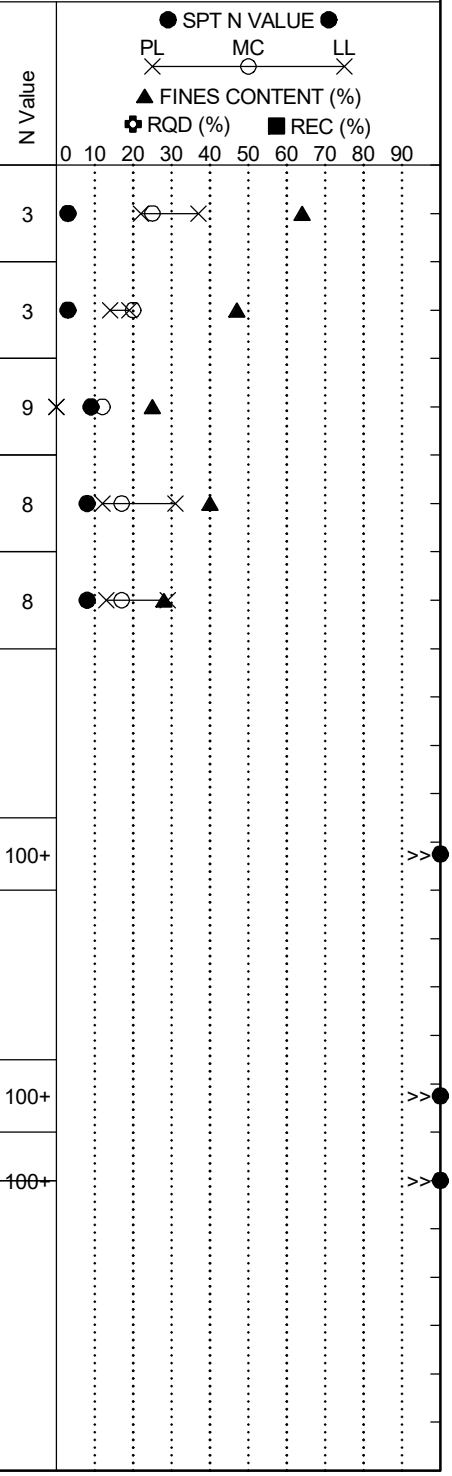
SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT_DATATEMPLATE.GDT 11/3/25

SCDOT Soil Test Log

Project ID:	P043326			**County:**	Richland/Lexington	**Boring No.:**	P3D-C2
Site Description:	Carolina Crossroads Phase 3D					**Route:**	I-26 EB_RA
Eng./Geo.:	B. Vogel	**Boring Location:**	387+28	**Offset:**	82-R	**Alignment:**	I-26 EB_RA
Elev.:	169.9 ft	**Latitude:**	34.02602657	**Longitude:**	-81.10335072	**Date Started:**	6/3/2025
Total Depth:	21 ft	**Soil Depth:**	21 ft	**Core Depth:**	0 ft	**Date Completed:**	6/3/2025
Bore Hole Diameter (in):	6.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	96.7%
Core Size:	N/A	**Driller:**	L. Guempel	**Groundwater:**	**TOB** 10 ft	**24HR**	5 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0								
	0.5	**TOPSOIL** (6.0-in.)	0.0	SS-1	WOH	1	2	1	3
		ALLUVIUM (HOLOCENE)							
	2.0	Soft, Moist, Yellowish Red/Yellowish Brown, Medium Plasticity, Fine to Coarse Sandy Lean CLAY (CL/A-6) with Trace Organics, 5YR5/6 & 10YR6/4	2.0	SS-2	1	1	2	2	3
	4.0	@SS-1: LL=37, PL=22, PI=15, NMC=24.5%, %200=64.2	4.0	SS-3	WOH	3	6	9	9
164.9									
	6.0	Very Loose, Moist to Wet, Red/Light Gray, Low Plasticity, Silty Clayey Fine to Coarse SAND (SC-SM/A-4), 2.5YR5/6 & 5Y7/2	6.0	SS-4	5	5	3	3	8
		@SS-2: LL=19, PL=14, PI=5, NMC=19.9%, %200=46.8	8.0	SS-5	4	5	3	2	8
159.9		Loose, Moist to Wet, Light Gray/Yellowish Brown, Non-Plastic, Silty Fine to Coarse SAND (SM/A-2-4), 5Y7/2 & 2.5YR6/4							
		@SS-3: LL=NP, PL=NP, PI=NP, NMC=11.7%, %200=25.1							
		Loose, Moist, Light Gray/Reddish Yellow, Medium Plasticity, Clayey Fine to Coarse SAND (SC/A-6), 5Y7/1 & 7.5YR6/6							
	13.5	@SS-4: LL=31, PL=12, PI=19, NMC=17.1%, %200=40.2	13.5	SS-6	50/3.4"				100+
154.9		@SS-5: Gray/Yellowish Brown, (SC/A-2-6), Micaceous, N6/Gray & 10YR5/6							
		LL=29, PL=13, PI=16, NMC=16.9%, %200=27.5							
		PIEDMONT RESIDUUM							
	18.5	Very Dense, Moist, White/Pale Brown, Non-Plastic to Low Plasticity, Moderately to Strongly Cemented, Silty Fine to Coarse SAND (SM/A-2-4) with Trace Gravel, N9/White & 2.5Y7/4	18.5	SS-7	46	50/1"			100+
149.9									
	21.0	Very Dense, Moist, White/Gray, Low Plasticity to Medium Plasticity, Weakly to Strong Cemented SILT (ML/A-4), Micaceous, N9/White & N5/Gray	21.0	SS-8	50/0"				100+
		Boring Terminated at 21.0-ft. on Top of Rock.							
144.9									



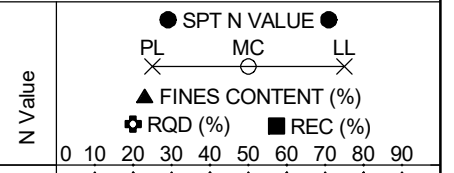
LEGEND

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:	P043326			**County:**	Richland/Lexington	**Boring No.:**	P3D-C3
Site Description:	Carolina Crossroads Phase 3D					**Route:**	I-26 EB_RA
Eng./Geo.:	B. Vogel	**Boring Location:**	387+42	**Offset:**	8-R	**Alignment:**	I-26 EB_RA
Elev.:	168.1 ft	**Latitude:**	34.02597274	**Longitude:**	-81.10311288	**Date Started:**	6/2/2025
Total Depth:	11.8 ft	**Soil Depth:**	11.8 ft	**Core Depth:**	0 ft	**Date Completed:**	6/2/2025
Bore Hole Diameter (in):	6.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	96.7%
Core Size:	N/A	**Driller:**	L. Guempel	**Groundwater:**	**TOB** 4 ft	**24HR**	NM

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0		0.0						
	0.3	**TOPSOIL** (3.0-in)							
		ALLUVIUM (HOLOCENE)							
	2.0	Very Soft, Moist, Brown, Medium Plasticity, Lean CLAY (CL/A-7-6) with Sand & Trace Organics, Micaceous, 10YR5/3	2.0						
		@SS-1: LL=41, PL=21, PI=20, NMC=35.7%, %200=73.3		SS-1	WOH	WOH	WOH	1	0
	4.0		4.0	SS-2	WOH	WOH	WOH	2	0
163.1		Very Soft, Moist, Brown/Gray, Low Plasticity, Sandy Silty CLAY (CL-ML/A-4), 10YR5/3 & N5/Gray		SS-3	WOH	WOH	WOH	2	0
	6.0	@SS-2: LL=21, PL=15, PI=6, NMC=25.0%, %200=55.3	6.0	SS-4	1	2	3	5	5
	8.0	Very Loose, Moist, Gray/Brown, Low Plasticity, Silty SAND (SM/A-4), N6/Gray & 7.5YR5/4	8.0	SS-5	4	4	7	49	11
158.1		@SS-3: LL=19, PL=16, PI=3, NMC=19.8%, %200=42.3							
	11.8	Firm, Moist, Greenish Gray/Yellow Brown, High Plasticity, Fine to Medium Sandy Lean CLAY (CL/A-6) with Organics, Micaceous, 10BG6/1 & 10YR5/4	11.8	SS-6	50/0"				100+
		@SS-4: LL=37, PL=16, PI=21, NMC=26.2%, %200=58.4							
153.1		**PIEDMONT RESIDUUM**							
		Stiff, Moist, Gray/Brown, Non-Plastic, Fine to Medium Sandy SILT (ML/A-4) with Trace Gravel, Micaceous, N6/Gray & 7.5YR5/4							
		@SS-5: LL=NP, PL=NP, PI=NP, NMC=18.2%, %200=53.5							
		Boring Terminated at 11.8-ft. on Top of Rock.							
148.1									
143.1									



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:	P043326	**County:**	Richland/Lexington	**Boring No.:**	P3D-C4		
Site Description:	Carolina Crossroads Phase 3D			**Route:**	I-26 EB_RA		
Eng./Geo.:	B. Vogel	**Boring Location:**	387+54	**Offset:**	74-L	**Alignment:**	I-26 EB_RA
Elev.:	168.7 ft	**Latitude:**	34.02591909	**Longitude:**	-81.10284475	**Date Started:**	6/2/2025
Total Depth:	36.3 ft	**Soil Depth:**	36.3 ft	**Core Depth:**	0 ft	**Date Completed:**	6/2/2025
Bore Hole Diameter (in):	6.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	96.7%
Core Size:	N/A	**Driller:**	L. Guempel	**Groundwater:**	**TOB** 2 ft	**24HR**	NM

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	**ALLUVIUM (HOLOCENE)**	0.0	SS-1	WOH	WOH	WOH	WOH	0
	2.0	Very Soft, Moist, Light Brown/Gray, Low Plasticity to High Plasticity, Subangular, Fine to Medium Sandy Elastic SILT (MH/A-7-5) with Trace Organics, 7.5YR6/3 & N6/Gray	2.0	SS-2	WOH	WOH	WOH	WOH	0
163.7		Very Soft, Moist, Dark Brown/Gray, Low Plasticity, Subangular, Fine to Coarse Sandy CLAY (CL/A-4) with Trace Organics, 7.5YR3/2 & 6/1	4.0	SS-3	WOH	WOH	WOH	2	0
	6.0	@SS-2: LL=23, PL=15, PI=8, NMC=23.3%, %200=54.6	6.0	SS-4	6	6	4	6	10
	8.0	@SS-3: Gray/Brown, Medium Plasticity, (CL/A-6), N6/Gray & 7.5YR5/4 LL=27, PL=15, PI=12, NMC=25.0%, %200=54.1	8.0	SS-5	8	4	4	5	8
158.7		Loose, Moist to Wet, Very Pale Brown/Reddish Yellow, Medium Plasticity, Clayey Fine to Coarse SAND (SC/A-6), 10YR7/3 & 7.5YR6/6 @SS-4: LL=29, PL=14, PI=15, NMC=19.6%, %200=40.4							
	13.5	@SS-5: No Recovery	13.5	SS-6	16	16	21		37
153.7		**PIEDMONT RESIDUUM** Dense, Wet, Light Yellow Brown, Non-Plastic to Low Plasticity, Silty Fine to Medium SAND (SM/A-2-4) with Trace Organics, 2.5Y6/4							
	18.5		18.5						
	19.0	Hard, Moist, Light Olive Gray, Medium Plasticity to High Plasticity, Fine to Coarse Sandy Fat CLAY (CH/A-7-6) with Trace Gravel, 5Y6/2		SS-7	10	38	48		86
148.7		Hard, Moist, Light Gray/Yellowish Brown, Low Plasticity to Medium Plasticity, Weakly Cemented, SILT (ML/A-4), 5Y7/2 & 10YR5/6							
	23.5	@SS-8: No Recovery	23.5	SS-8	50/4.5"				100+
143.7									

SPT N VALUE ● PL × MC ○ LL × ▲ FINES CONTENT (%) ✿ RQD (%) ■ REC (%)

0 10 20 30 40 50 60 70 80 90

SC_DOT G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT_DATATEMPLATE.GDT 11/3/25

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:	P043326			**County:**	Richland/Lexington	**Boring No.:**	P3D-C4
Site Description:	Carolina Crossroads Phase 3D					**Route:**	I-26 EB_RA
Eng./Geo.:	B. Vogel	**Boring Location:**	387+54	**Offset:**	74-L	**Alignment:**	I-26 EB_RA
Elev.:	168.7 ft	**Latitude:**	34.02591909	**Longitude:**	-81.10284475	**Date Started:**	6/2/2025
Total Depth:	36.3 ft	**Soil Depth:**	36.3 ft	**Core Depth:**	0 ft	**Date Completed:**	6/2/2025
Bore Hole Diameter (in):	6.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	96.7%
Core Size:	N/A	**Driller:**	L. Guempel	**Groundwater:**	**TOB** 2 ft	**24HR**	NM

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" 2nd 6" 3rd 6" 4th 6"	N Value
	28.5			28.5			
		Hard, Moist, White/Gray, Low Plasticity to High Plasticity, Strongly Cemented, SILT (ML/A-4) with Trace Gravel, Micaceous, 10YR8/1 & 10YR5/1			SS-9	50/5"	100+
138.7							
				33.5			
		@SS-10: White/Gray, Reduced Gravel Content, N9/White & 10YR5/1			SS-10	21 16 37	53
133.7							
	36.3			36.3	SS-11	50/0"	100+
		Boring Terminated at 36.3-ft. on Top of Rock.					
128.7							
123.7							
118.7							

SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) ✿ RQD (%) ■ REC (%)

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 G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT_DATATEMPLATE.GDT 11/3/25

SCDOT Soil Test Log

Project ID:	P043326	**County:**	Richland/Lexington	**Boring No.:**	P3D-C5		
Site Description:	Carolina Crossroads Phase 3D			**Route:**	I-26 EB		
Eng./Geo.:	B. Vogel	**Boring Location:**	389+53	**Offset:**	18-L	**Alignment:**	I-26 EB
Elev.:	198.3 ft	**Latitude:**	34.02581774	**Longitude:**	-81.10248757	**Date Started:**	10/8/2025
Total Depth:	53.6 ft	**Soil Depth:**	53.6 ft	**Core Depth:**	0 ft	**Date Completed:**	10/8/2025
Bore Hole Diameter (in):	6.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	85.7%
Core Size:	N/A	**Driller:**	J. Phillips	**Groundwater:**	**TOB** Dry	**24HR**	Dry

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	ASPHALT ROADWAY (17.0-in.)							
	1.4	**EXISTING FILL**	1.4						
		Loose to Medium Dense, Moist, Red, High Plasticity, Clayey Fine to Medium SAND (SC/A-7-6), 10R5/6	2.0	SS-1	X	X	X	10	
		@SS-1: NMC=12.8%, %200=20.5		SS-2	8	7	8	8	15
193.3		@SS-2: Red/Gray, Fine to Coarse Sand, Micaceous, 10R5/6 & 2.5Y6/1	4.0	SS-3	4	3	5	6	8
		LL=42, PL=21, PI=21, NMC=20.9%, %200=48.6	6.0	SS-4	3	2	4	5	6
		@SS-3: Red, 10R5/8							
	8.0	@SS-4: with Trace Gravel	8.0	SS-5	2	4	6	5	10
		Loose to Medium Dense, Moist, Red/Very Pale Brown, High Plasticity, Sandy Lean CLAY (CL/A-7-6), 10R5/8 & 10YR7/3							
188.3		@SS-5: LL=48, PL=22, PI=26, NMC=25.0%, %200=55.0							
			13.5	SS-6	3	4	6		10
		@SS-6: Light Red, 10R6/8							
183.3									
			18.5	SS-7	3	4	5		9
		@SS-7: Red/Gray, with Trace Gravel, 10R5/6 & N5/Gray							
178.3		LL=48, PL=24, PI=24, NMC=23.8%, %200=51.9							
			23.5	SS-8	5	6	7		13
		@SS-8: Red/Weak Red, 10R5/6 & 10R4/2							
173.3									

SPT N VALUE ● PL × MC ○ LL ×
▲ FINES CONTENT (%)
✿ RQD (%) ■ REC (%)
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:	P043326	**County:**	Richland/Lexington	**Boring No.:**	P3D-C5		
Site Description:	Carolina Crossroads Phase 3D			**Route:**	I-26 EB		
Eng./Geo.:	B. Vogel	**Boring Location:**	389+53	**Offset:**	18-L	**Alignment:**	I-26 EB
Elev.:	198.3 ft	**Latitude:**	34.02581774	**Longitude:**	-81.10248757	**Date Started:**	10/8/2025
Total Depth:	53.6 ft	**Soil Depth:**	53.6 ft	**Core Depth:**	0 ft	**Date Completed:**	10/8/2025
Bore Hole Diameter (in):	6.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	85.7%
Core Size:	N/A	**Driller:**	J. Phillips	**Groundwater:**	**TOB** Dry	**24HR**	Dry

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	28.5	Loose, Moist, Weak Red/Gray Non-Plastic to Low Plasticity, Clayey Fine to Medium SAND (SC/A-7-6), 10R5/4 & 5Y5/1		28.5	SS-9	4	4	6		10
168.3		@SS-9: LL47, PL=23, PI=24, NMC=19.2%, %200=46.1								
	33.5	**ALLUVIUM (HOLOCENE)**		33.5	SS-10	4	5	7		12
163.3		Medium Dense, Moist, Bluish Gray/Yellowish Brown, Non-Plastic to Low Plasticity, SILT (ML/A-4), 5B6/1 & 10YR5/4								
	38.5	Stiff, Moist, Brown/Yellowish Brown, Non-Plastic to Low Plasticity, Lean CLAY (CL/A-7-6) with Sand, 7.5YR4/2 & 10YR5/6		38.5	SS-11	6	4	5		9
158.3		@SS-11: LL=49, PL=21, PI=28, NMC=22.6%, %200=71.2								
	43.5	**PIEDMONT RESIDUUM**		43.5	SS-12	50/5.5"				100+
153.3		Hard, Moist, Greenish Gray, Non-Plastic to Low Plasticity, Weakly Cemented, SILT (ML/A-4) with Sand & Trace Gravel, 10BG6/1								
	48.5	Hard, Moist, Pale Brown/Light Bluish Gray, Non-Plastic to Low Plasticity, Weakly Cemented, SILT (ML/A-4), 2.5Y8/3 & 5B7/1		48.5	SS-13	50/4"				100+
148.3										
	53.5			53.5	SS-14	50/0.5"				100+
	53.6	No Recovery								

SPT N VALUE ● PL × MC ○ LL × ▲ FINES CONTENT (%) ✿ RQD (%) ■ REC (%)

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	

SC_DOT G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT_DATATEMPLATE.GDT 11/3/25

SCDOT Soil Test Log

Project ID:	P043326			**County:**	Richland/Lexington	**Boring No.:**	P3D-C5
Site Description:	Carolina Crossroads Phase 3D					**Route:**	I-26 EB
Eng./Geo.:	B. Vogel	**Boring Location:**	389+53	**Offset:**	18-L	**Alignment:**	I-26 EB
Elev.:	198.3 ft	**Latitude:**	34.02581774	**Longitude:**	-81.10248757	**Date Started:**	10/8/2025
Total Depth:	53.6 ft	**Soil Depth:**	53.6 ft	**Core Depth:**	0 ft	**Date Completed:**	10/8/2025
Bore Hole Diameter (in):	6.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	85.7%
Core Size:	N/A	**Driller:**	J. Phillips	**Groundwater:**	**TOB** Dry	**24HR**	Dry

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 (%) / RQD (%) / REC (%) 0 10 20 30 40 50 60 70 80 90
143.3		Boring Terminated at 53.6-ft. on Top of Rock.						
138.3								
133.3								
128.3								
123.3								
118.3								

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 G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT_DATATEMPLATE.GDT 11/3/25

SCDOT Soil Test Log

Project ID:	P043326	**County:**	Richland/Lexington	**Boring No.:**	P3D-C6		
Site Description:	Carolina Crossroads Phase 3D			**Route:**	I-26 WB_RC		
Eng./Geo.:	B. Vogel	**Boring Location:**	392+16	**Offset:**	30-R	**Alignment:**	I-26 WB_RC
Elev.:	198.7 ft	**Latitude:**	34.02576428	**Longitude:**	-81.10225882	**Date Started:**	8/28/2025
Total Depth:	63.6 ft	**Soil Depth:**	63.6 ft	**Core Depth:**	0 ft	**Date Completed:**	8/28/2025
Bore Hole Diameter (in):	6.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	85.7%
Core Size:	N/A	**Driller:**	J. Phillips	**Groundwater:**	**TOB** 39.5 ft	**24HR**	29.3 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0									
	0.3	ASPHALT ROADWAY (3.5-in.)		0.3						
		EXISTING FILL Medium Dense, Moist, Red/Light Yellowish Brown, Medium Plasticity, Clayey Fine to Coarse SAND (SC/A-6), 2.5YR5/8 & 10YR6/4 @SS-1: NMC=9.9%, %200=19.8		2.0	SS-1	15	10	10	6	20
					SS-2	4	6	7	9	13
193.7		@SS-2: Light Red/Red, with Trace Gravel & Organics, 2.5YR7/6 & 3.5YR5/6 LL=39, PL=21, PI=18, NMC=19.9%, %200=46.6		4.0	SS-3	6	6	8	12	14
				6.0	SS-4	6	6	8	11	14
	8.0	@SS-3: Light Red/Light Yellowish Brown, Reduced Organics, 2.5YR7/6 & 10YR6/4 @SS-4: Light Red/Gray, with Organics, 2.5YR7/6 & 10YR5/1		8.0	SS-5	8	7	6	7	13
188.7		Stiff, Moist, Light Red/Red, Medium Plasticity, Fine to Coarse Sandy SILT (ML/A-7-6) with Trace Gravel, 2.5YR6/8 & 10R4/8 @SS-5: LL=42, PL=28, PI=14, NMC=21.5%, %200=55.8		13.5	SS-6	3	5	8		13
183.7		@SS-6: Light Red, Reduced Trace Gravel 2.5YR6/8								
	18.5			18.5						
178.7		Stiff, Moist, Red/Brown, High Plasticity, Fine to Coarse Sandy Lean CLAY (CL/A-7-6) with Trace Gravel, 2.5YR5/8 & 10YR5/3 @SS-7: LL=49, PL=24, PI=25, NMC=21.7%, %200=58.4			SS-7	5	6	6		12
				23.5						
173.7		@SS-8: Red/Reddish Brown, 2.5YR5/8 & 5YR5/4			SS-8	4	6	7		13

SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) ✿ RQD (%) ■ REC (%)

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:	P043326	**County:**	Richland/Lexington	**Boring No.:**	P3D-C6		
Site Description:	Carolina Crossroads Phase 3D			**Route:**	I-26 WB_RC		
Eng./Geo.:	B. Vogel	**Boring Location:**	392+16	**Offset:**	30-R	**Alignment:**	I-26 WB_RC
Elev.:	198.7 ft	**Latitude:**	34.02576428	**Longitude:**	-81.10225882	**Date Started:**	8/28/2025
Total Depth:	63.6 ft	**Soil Depth:**	63.6 ft	**Core Depth:**	0 ft	**Date Completed:**	8/28/2025
Bore Hole Diameter (in):	6.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	85.7%
Core Size:	N/A	**Driller:**	J. Phillips	**Groundwater:**	**TOB** 39.5 ft	**24HR**	29.3 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
		@SS-9: Red/Gray, 2.5YR5/8 & 5YR5/1	28.5	SS-9	3	5	7		12
168.7									
		@SS-10: Greenish Gray/Yellowish Brown, Fine to Medium, (CL/A-6), 5GY6/1 & 10YR5/4 LL=38, PL=19, PI=19, NMC=18.9%, %200=62.0	33.5	SS-10	3	5	6		11
163.7									
	38.5	**ALLUVIUM (HOLOCENE)**	38.5	SS-11	6	12	15		27
158.7		Medium Dense, Moist, Red/Olive/Gray, High Plasticity, Elastic SILT (MH/A-7-5), 2.5YR4/6 & 5Y5/3 & 7N/Gray @SS-11: LL=39, PL=13, PI=26, NMC=18.5%, %200=41.8							
	43.5	**PIEDMONT RESIDUUM**	43.5	SS-12	16	50/5"			100+
153.7		Hard, Moist, Greenish Gray, Weakly Cemented, Low Plasticity to Medium Plasticity, SILT (ML/A-4), 5GY6/1							
		@SS-13: Light Gray, 5Y7/2	48.5	SS-13	50/6"				100+
148.7									
			53.5						

SPT N VALUE ● PL × MC ○ LL × ▲ FINES CONTENT (%) ✿ RQD (%) ■ REC (%)

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:	P043326			**County:**	Richland/Lexington	**Boring No.:**	P3D-C6
Site Description:	Carolina Crossroads Phase 3D					**Route:**	I-26 WB_RC
Eng./Geo.:	B. Vogel	**Boring Location:**	392+16	**Offset:**	30-R	**Alignment:**	I-26 WB_RC
Elev.:	198.7 ft	**Latitude:**	34.02576428	**Longitude:**	-81.10225882	**Date Started:**	8/28/2025
Total Depth:	63.6 ft	**Soil Depth:**	63.6 ft	**Core Depth:**	0 ft	**Date Completed:**	8/28/2025
Bore Hole Diameter (in):	6.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	85.7%
Core Size:	N/A	**Driller:**	J. Phillips	**Groundwater:**	**TOB** 39.5 ft	**24HR**	29.3 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" 2nd 6" 3rd 6" 4th 6"	N Value
143.7					SS-14	39 50/6"	100+
				58.5	SS-15	50/3"	100+
		@SS-15: Light Olive, Brownish Yellow, 5Y6/3 & 10YR6/6					
138.7							
	63.7			63.5	SS-16	50/1"	100+
		@SS-16: Light Gray/Brownish Yellow, 10YR6/1 & 10YR6/6					
133.7		Boring Terminated at 63.6-ft. on Top of Rock.					
128.7							
123.7							
118.7							

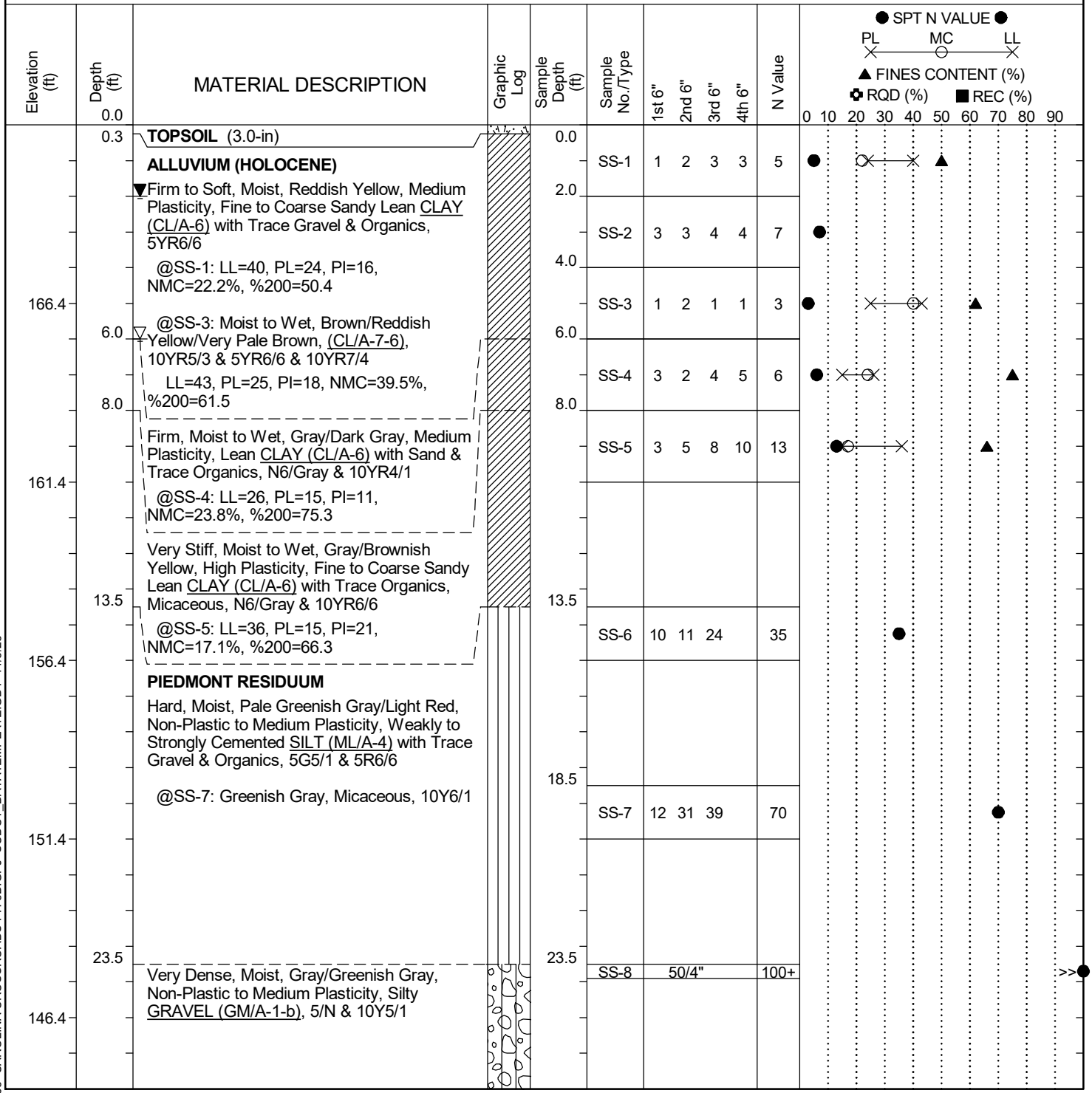
SPT N VALUE ● PL × MC ○ LL ×
▲ FINES CONTENT (%)
✿ RQD (%) ■ REC (%)
0 10 20 30 40 50 60 70 80 90 >>

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:	P043326			**County:**	Richland/Lexington	**Boring No.:**	P3D-C7
Site Description:	Carolina Crossroads Phase 3D					**Route:**	I-26 WB_RC
Eng./Geo.:	B. Vogel	**Boring Location:**	392+06	**Offset:**	63-L	**Alignment:**	I-26 WB_RC
Elev.:	171.4 ft	**Latitude:**	34.02568907	**Longitude:**	-81.10196101	**Date Started:**	6/6/2025
Total Depth:	37.9 ft	**Soil Depth:**	37.9 ft	**Core Depth:**	0 ft	**Date Completed:**	6/6/2025
Bore Hole Diameter (in):	6.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	96.7%
Core Size:	N/A	**Driller:**	L. Guempel	**Groundwater:**	**TOB** 6 ft	**24HR**	2 ft



LEGEND

Continued Next Page

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

SCDOT Soil Test Log

Project ID:	P043326			**County:**	Richland/Lexington	**Boring No.:**	P3D-C7
Site Description:	Carolina Crossroads Phase 3D					**Route:**	I-26 WB_RC
Eng./Geo.:	B. Vogel	**Boring Location:**	392+06	**Offset:**	63-L	**Alignment:**	I-26 WB_RC
Elev.:	171.4 ft	**Latitude:**	34.02568907	**Longitude:**	-81.10196101	**Date Started:**	6/6/2025
Total Depth:	37.9 ft	**Soil Depth:**	37.9 ft	**Core Depth:**	0 ft	**Date Completed:**	6/6/2025
Bore Hole Diameter (in):	6.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	96.7%
Core Size:	N/A	**Driller:**	L. Guempel	**Groundwater:**	**TOB** 6 ft	**24HR**	2 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value
	28.5			28.5	SS-9	50/3"	100+
141.4		Hard, Moist, Greenish Gray/Yellow, Non-Plastic to Low Plasticity, Weakly to Strongly Cemented SILT (ML/A-4) with Trace Gravel, Micaceous, 5GY5/1 & 10YR7/6					
	33.5			33.5	SS-10	50/3.5"	100+
136.4		Hard, Moist, Gray, Non-Plastic to Low Plasticity, Subangular to Angular, Sandy Fine to Coarse SILT (ML/A-4) with Gravel, N4/Gray					
	37.9			37.9	SS-1	50/0.25"	100+
131.4		Boring Terminated at 37.9-ft. on Top of Rock.					
126.4							
121.4							

SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) ✿ RQD (%) ■ REC (%)

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 G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT_DATATEMPLATE.GDT 11/3/25

SCDOT Soil Test Log

Project ID:	P043326	**County:**	Richland/Lexington	**Boring No.:**	P3D-C8		
Site Description:	Carolina Crossroads Phase 3D			**Route:**	I-26 WB_RC		
Eng./Geo.:	A. Folz	**Boring Location:**	391+57	**Offset:**	200-L	**Alignment:**	I-26 WB_RC
Elev.:	170.6 ft	**Latitude:**	34.02566863	**Longitude:**	-81.10148203	**Date Started:**	5/30/2025
Total Depth:	23.6 ft	**Soil Depth:**	23.6 ft	**Core Depth:**	0 ft	**Date Completed:**	5/30/2025
Bore Hole Diameter (in):	6.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	96.7%
Core Size:	N/A	**Driller:**	L. Guempel	**Groundwater:**	**TOB** 14 ft	**24HR**	NM

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	**ALLUVIUM (HOLOCENE)**		0.0						
		Firm to Soft, Dry to Moist, Reddish Brown, Medium Plasticity, Fine to Coarse Sandy Lean CLAY (CL/A-6) with Organics & Trace Gravel, 5YR4/4			SS-1	2	3	4	5	7
		@SS-1: LL=34, PL=18, PI=16, NMC=17.7%, %200=59.9		2.0						
					SS-2	3	3	4	4	7
				4.0						
165.6		@SS-2: Brown, Reduced Organics, 7.5YR4/3			SS-3	2	2	1	2	3
	6.0	@SS-3: Dark Gray, 7.5YR4/1		6.0						
		LL=31, PL=15, PI=16, NMC=18.7%, %200=61.6			SS-4	2	3	3	5	6
	8.0	@SS-4: No Recovery		8.0						
		PIEDMONT RESIDUUM			SS-5	2	3	5	5	8
160.6		Firm, Dry to Moist, Dark Gray, High Plasticity, Lean CLAY (CL/A-7-6) with Sand, 7.5YR4/1								
		@SS-5: LL=44, PL=14, PI=30, NMC=21.0%, %200=84.4								
				13.5						
		@SS-6: Hard, Moist to Wet, with Organics			SS-6	37	50/5.5"			100+ >>
155.6										
				18.5						
		@SS-7: Dark Grayish Brown, Low Plasticity, (CL/A-4), Reduced Organics, 10YR4/2			SS-7	23	50/5.5"			100+ >>
150.6		LL=28, PL=20, PI=8, NMC=14.5%, %200=73.6								
	23.5			23.5						
	23.6	Very Dense, Moist to Wet, Dark Grayish Brown, Non-Plastic, Poorly Graded GRAVEL (GP-GM/A-1) with Silt, 10YR4/2			SS-8		50/1"			100+ >>
145.6		Boring Terminated at 23.6-ft. on Top of Rock.								

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

LEGEND

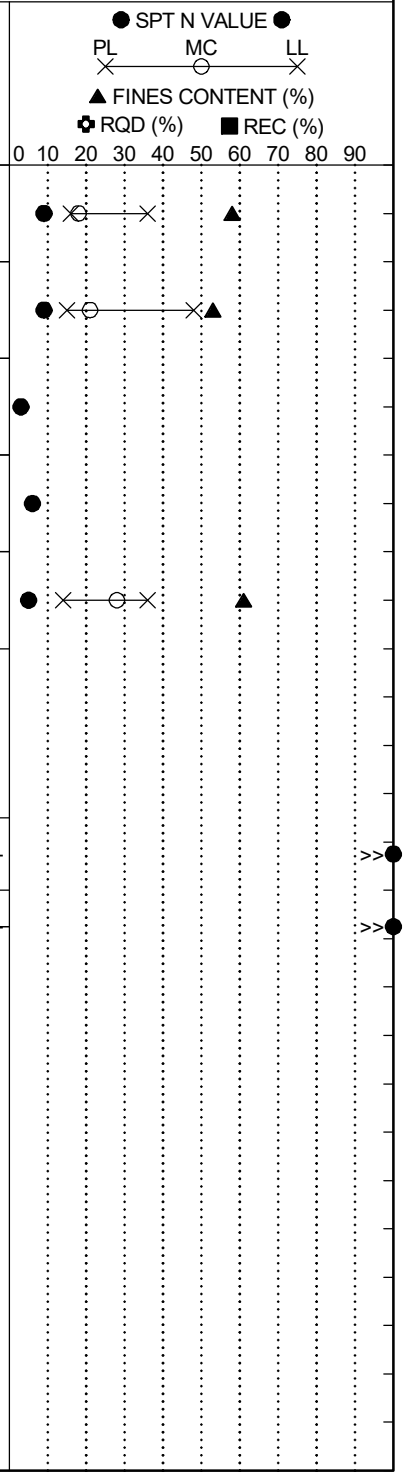
SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT_DATATEMPLATE.GDT 11/3/25

SCDOT Soil Test Log

Project ID:	P043326			**County:**	Richland/Lexington	**Boring No.:**	P3D-C9
Site Description:	Carolina Crossroads Phase 3D					**Route:**	I-26 WB_RC
Eng./Geo.:	A. Folz	**Boring Location:**	390+85	**Offset:**	259-L	**Alignment:**	I-26 WB_RC
Elev.:	172.0 ft	**Latitude:**	34.02578925	**Longitude:**	-81.10120929	**Date Started:**	5/30/2025
Total Depth:	15.75 ft	**Soil Depth:**	15.75 ft	**Core Depth:**	0 ft	**Date Completed:**	5/30/2025
Bore Hole Diameter (in):	4.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	96.7%
Core Size:	N/A	**Driller:**	L. Guempel	**Groundwater:**	**TOB** 2 ft	**24HR**	NM

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	**ALLUVIUM (HOLOCENE)**		0.0						
		Stiff, Dry to Moist, Red, Medium Plasticity, Fine to Medium Sandy Lean CLAY (CL/A-6), with Trace Organics, 2.5YR4/6			SS-1	2	4	5	6	9
		@SS-1: LL=36, PL=16, PI=20, NMC=18.0%, %200=57.7		2.0	SS-2	5	4	5	6	9
167.0		@SS-2: Dark Reddish Brown, High Plasticity, (CL/A-7-6), Reduced Organics, 2.5YR3/4		4.0	SS-3	2	2	1	3	3
		LL=48, PL=15, PI=33, NMC=20.9%, %200=53.3		6.0	SS-4	2	2	4	4	6
		@SS-3: Soft, Very Dark Gray, with Trace Organics, 5YR3/1		8.0	SS-5	2	2	3	3	5
		@SS-4: Firm, Moist to Wet								
		@SS-5: Dark Gray, (CL/A-6), 7.5YR4/1								
162.0		LL=36, PL=14, PI=22, NMC=28.0%, %200=61.0								
	12.0	**PIEDMONT RESIDUUM**								
		Hard, Moist, Dark Gray, High Plasticity, Fine to Medium Sandy Lean CLAY (CL/A-6), 7.5YR4/1		13.5	SS-6	23	50/2"			100+
157.0	15.9			15.8	~~SS-7~~	~~50/0"~~				~~100+~~
		Boring Terminated at 15.9-ft. on Top of Rock.								
152.0										
147.0										



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:	P043326	**County:**	Richland/Lexington	**Boring No.:**	P3D-C10		
Site Description:	Carolina Crossroads Phase 3D			**Route:**	I-26 EB_STAN		
Eng./Geo.:	B. Vogel	**Boring Location:**	364+76	**Offset:**	7-L	**Alignment:**	I-26 EB_STAN
Elev.:	220.7 ft	**Latitude:**	34.03164878	**Longitude:**	-81.1056198	**Date Started:**	7/15/2025
Total Depth:	55.3 ft	**Soil Depth:**	55.3 ft	**Core Depth:**	0 ft	**Date Completed:**	7/15/2025
Bore Hole Diameter (in):	6.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	85.7%
Core Size:	N/A	**Driller:**	J. Phillips	**Groundwater:**	**TOB** 6 ft	**24HR**	3 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	**PIEDMONT RESIDUUM**		0.0						
		Very Stiff, Moist, Brownish Yellow/Red, High Plasticity, Fine to Medium Sandy Fat Clay (CH/A-7-6), 10YR6/6 & 10R5/6			SS-1	10	12	12	12	24
		@SS-1: LL=57, PL=26, PI=31, NMC=16.9%, %200=56.5		2.0						
	4.0				SS-2	15	16	14	14	30
215.7		Very Stiff to Stiff, Moist, Red/White, High Plasticity, Fine to Coarse Sandy Lean CLAY (CL/A-6), 2.5Y5/8 & N8/White		4.0	SS-3	10	11	10	9	21
		@SS-4: Reddish Yellow/Very Pale Brown, 7.5YR6/6 & 10YR8/4		6.0	SS-4	3	4	5	9	9
		LL=39, PL=18, PI=21, NMC=28.1%, %200=69.8		8.0						
		@SS-5: Reddish Yellow/Light Red, (CL/A-7-6), 7.5YR6/6 & 2.5YR6/6			SS-5	3	4	6	2	10
210.7		LL=47, PL=21, PI=26, NMC=24.4%, %200=62.9								
	13.5			13.5						
		Stiff, Moist, Reddish Yellow, Very Plastic, Fat CLAY (CH/A-7-6) with Sand, 7.5YR6/6			SS-6	4	5	4		9
205.7		@SS-6: LL=62, PL=20, PI=42, NMC=27.2%, %200=70.4								
	18.5			18.5						
		Very Stiff, Moist, Light Red, Medium Plasticity to High Plasticity, Elastic SILT (MH/A-7-5) with Gravel, 10R6/6			SS-7	9	11	15		26
200.7										
	23.5			23.5						
		Hard to Very Stiff, Moist, White/Reddish Yellow, Non-Plastic, SILT (ML/A-4), 2.5Y8/1 & 7.5YR6/8			SS-8	6	11	21		32
195.7										

SPT N VALUE ● PL × MC ○ LL × ▲ FINES CONTENT (%) ✿ RQD (%) ■ REC (%)

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	

SC_DOT G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT_DATATEMPLATE.GDT 11/3/25

SCDOT Soil Test Log

Project ID:	P043326	**County:**	Richland/Lexington	**Boring No.:**	P3D-C10		
Site Description:	Carolina Crossroads Phase 3D			**Route:**	I-26 EB_STAN		
Eng./Geo.:	B. Vogel	**Boring Location:**	364+76	**Offset:**	7-L	**Alignment:**	I-26 EB_STAN
Elev.:	220.7 ft	**Latitude:**	34.03164878	**Longitude:**	-81.1056198	**Date Started:**	7/15/2025
Total Depth:	55.3 ft	**Soil Depth:**	55.3 ft	**Core Depth:**	0 ft	**Date Completed:**	7/15/2025
Bore Hole Diameter (in):	6.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	85.7%
Core Size:	N/A	**Driller:**	J. Phillips	**Groundwater:**	**TOB** 6 ft	**24HR**	3 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
				28.5						
		@SS-9: Very Pale Brown/Reddish Yellow, 10YR8/2 & 7.5YR6/8			SS-9	15	17	12		29
190.7		LL=NP, PL=NP, PI=NP, NMC=12.9%, %200=88.4								
				33.5						
		@SS-10: White/Reddish Yellow, 5Y8/1 & 5YR6/8			SS-10	33	30	33		63
185.7										
				38.5						
					SS-11	50/5"				100+
180.7										
				43.5						
		@SS-12: Very Pale Brown/Reddish Yellow, 10YR8/2 & 5YR6/8			SS-12	33	50/4"			100+
175.7										
				48.5						
		@SS-13: Very Pale Brown/Strong Brown, 10YR8/2 & 7.5YR5/6			SS-13	50/5"				100+
170.7										
				53.5						
		@SS-14: Light Greenish Gray & Strong								

SPT N VALUE ● PL × MC ○ LL × ▲ FINES CONTENT (%) ✿ RQD (%) ■ REC (%)

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:	P043326			**County:**	Richland/Lexington	**Boring No.:**	P3D-C10
Site Description:	Carolina Crossroads Phase 3D					**Route:**	I-26 EB_STAN
Eng./Geo.:	B. Vogel	**Boring Location:**	364+76	**Offset:**	7-L	**Alignment:**	I-26 EB_STAN
Elev.:	220.7 ft	**Latitude:**	34.03164878	**Longitude:**	-81.1056198	**Date Started:**	7/15/2025
Total Depth:	55.3 ft	**Soil Depth:**	55.3 ft	**Core Depth:**	0 ft	**Date Completed:**	7/15/2025
Bore Hole Diameter (in):	6.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	85.7%
Core Size:	N/A	**Driller:**	J. Phillips	**Groundwater:**	**TOB** 6 ft	**24HR**	3 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
165.7	55.3	Brown, 10Y7/1 & 7.5YR5/6		55.3	SS-14	12	21	50/6"		71
		Boring Terminated at 55.3-ft. on Top of Rock.			SS-15	50/0"				100+

SPT N VALUE ● PL × MC ○ LL × ▲ FINES CONTENT (%) ✿ RQD (%) ■ REC (%)

0 10 20 30 40 50 60 70 80 90

160.7 155.7 150.7 145.7 140.7

LEGEND

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

SC_DOT G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT_DATATEMPLATE.GDT 11/3/25

SCDOT Soil Test Log

Project ID:	P043326	**County:**	Richland/Lexington	**Boring No.:**	P3D-C11		
Site Description:	Carolina Crossroads Phase 3D			**Route:**	I-126 WB_I-20 WB		
Eng./Geo.:	A. Penninger	**Boring Location:**	364+25	**Offset:**	6-L	**Alignment:**	I-126 WB_I-20 WB
Elev.:	225.9 ft	**Latitude:**	34.03212287	**Longitude:**	-81.10515708	**Date Started:**	8/28/2025
Total Depth:	75 ft	**Soil Depth:**	75 ft	**Core Depth:**	0 ft	**Date Completed:**	8/28/2025
Bore Hole Diameter (in):	4.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	85.7%
Core Size:	N/A	**Driller:**	C. Taylor	**Groundwater:**	**TOB** 1.7 ft	**24HR**	5.1 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0		0.0	SS-1	6	9	7	8	16
	0.3	**TOPSOIL** (4.0-in)	2.0	SS-2	4	5	6	5	11
		PIEDMONT RESIDUUM	4.0	SS-3	3	3	4	5	7
		Medium Dense, Moist, Brown, Non-Plastic, Fine to Coarse Poorly Graded SAND (SP-SM/A-3) with Silt, 7.5YR5/4	6.0	SS-4	5	6	7	7	13
	4.0	@SS-2: with Trace Gravel	8.0	SS-5	6	7	7	7	14
220.9		Loose to Medium Dense, Moist, Light Yellowish Brown/Gray, Medium Plasticity, Clayey Fine to Coarse SAND (SC/A-6), 10YR6/4 & 10YR6/1	13.5	SS-6	3	4	6		10
		@SS-3: LL=27, PL=12, PI=15, NMC=13.3%, %200=35.9	18.5	SS-7	3	3	5		8
	8.0	@SS-4: Gray/Olive, Fine to Medium, 10YR5/1 & 5Y5/4	23.5	SS-8	3	5	8		13
		NMC=16.2%, %200=49.2							
215.9		Stiff to Firm, Moist, Gray/Olive, Low Plasticity, SILT (ML/A-4), 10YR5/1 & 5Y5/4							
		@SS-6: Light Olive Brown, 2.5Y5/3 LL=39, PL=34, PI=5, NMC=40.7%, %200=87.7							
210.9									
		@SS-7: Medium Plasticity, (ML/A-7-5) LL=45, PL=34, PI=11, NMC=42.2%, %200=88.9							
205.9									
200.9									

SPT N VALUE ● PL × MC ○ LL ×
▲ FINES CONTENT (%)
✿ RQD (%) ■ REC (%)
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	

SC_DOT G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT_DATATEMPLATE.GDT 11/3/25

SCDOT Soil Test Log

Project ID:	P043326	**County:**	Richland/Lexington	**Boring No.:**	P3D-C11		
Site Description:	Carolina Crossroads Phase 3D			**Route:**	I-126 WB_I-20 WB		
Eng./Geo.:	A. Penninger	**Boring Location:**	364+25	**Offset:**	6-L	**Alignment:**	I-126 WB_I-20 WB
Elev.:	225.9 ft	**Latitude:**	34.03212287	**Longitude:**	-81.10515708	**Date Started:**	8/28/2025
Total Depth:	75 ft	**Soil Depth:**	75 ft	**Core Depth:**	0 ft	**Date Completed:**	8/28/2025
Bore Hole Diameter (in):	4.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	85.7%
Core Size:	N/A	**Driller:**	C. Taylor	**Groundwater:**	**TOB** 1.7 ft	**24HR**	5.1 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
				28.5						
					SS-9	4	6	9		15
195.9										
	33.5			33.5						
		Very Stiff to Hard, Moist, Light Olive Brown, Medium Plasticity, SILT (ML/A-7-5) with Sand, 2.5Y5/3			SS-10	6	8	13		21
190.9										
				38.5						
		@SS-11: LL=49, PL=37, PI=12, NMC=37.5%, %200=82.7			SS-11	4	6	10		16
185.9										
				43.5						
		@SS-12: Light Yellowish Brown, (ML/A-6), 10YR6/4 LL=38, PL=26, PI=12, NMC=25.7%, %200=77.2			SS-12	9	11	20		31
180.9										
	48.5			48.5						
		Hard, Moist, Light Yellowish Brown, Low Plasticity to Medium Plasticity, SILT (ML/A-4), 10YR6/4			SS-13	31	50/6"			100+
175.9										
				53.5						

SPT N VALUE ● PL × MC ○ LL ×
▲ FINES CONTENT (%)
✿ RQD (%) ■ REC (%)
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	

SC_DOT G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT_DATATEMPLATE.GDT 11/3/25

SCDOT Soil Test Log

Project ID:	P043326			**County:**	Richland/Lexington	**Boring No.:**	P3D-C11
Site Description:	Carolina Crossroads Phase 3D					**Route:**	I-126 WB_I-20 WB
Eng./Geo.:	A. Penninger	**Boring Location:**	364+25	**Offset:**	6-L	**Alignment:**	I-126 WB_I-20 WB
Elev.:	225.9 ft	**Latitude:**	34.03212287	**Longitude:**	-81.10515708	**Date Started:**	8/28/2025
Total Depth:	75 ft	**Soil Depth:**	75 ft	**Core Depth:**	0 ft	**Date Completed:**	8/28/2025
Bore Hole Diameter (in):	4.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	85.7%
Core Size:	N/A	**Driller:**	C. Taylor	**Groundwater:**	**TOB** 1.7 ft	**24HR**	5.1 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" 2nd 6" 3rd 6" 4th 6"	N Value
170.9					SS-14	37 50/5"	100+
				58.5			
					SS-15	27 30 40	70
165.9							
				63.5			
					SS-16	28 50/5"	100+
160.9							
				68.5			
					SS-17	44 50/3"	100+
155.9							
				73.5			
					SS-18	50/3"	100+
150.9	75.0	Boring Terminated at 75.0-ft. on Hard Residual Soils.					
145.9							

SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) ✿ RQD (%) ■ REC (%)

0 10 20 30 40 50 60 70 80 90

>> >> >>

LEGEND

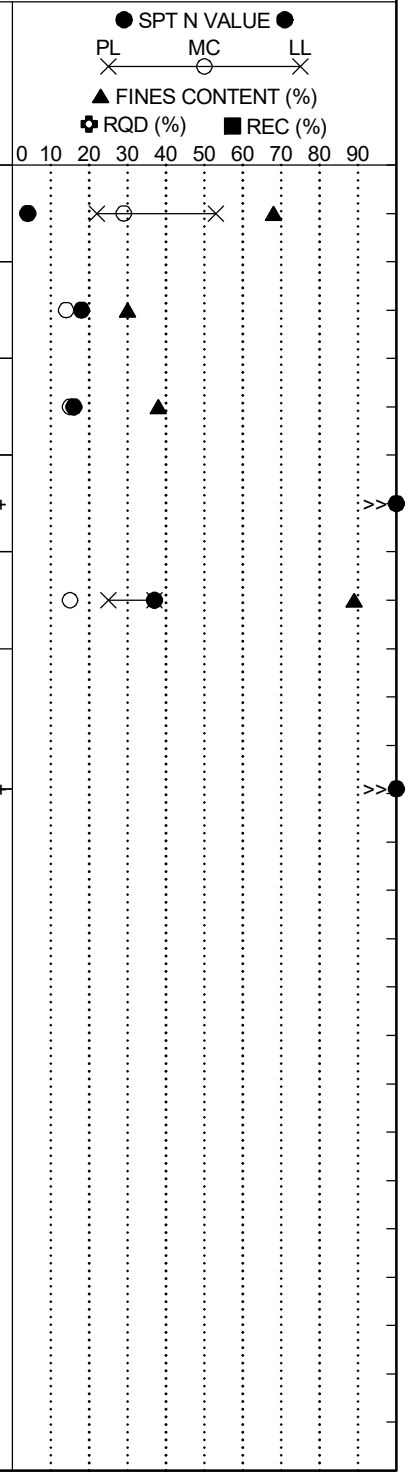
SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT_DATATEMPLATE.GDT 11/3/25

SCDOT Soil Test Log

Project ID:	P043326			**County:**	Richland/Lexington	**Boring No.:**	P3D-W1
Site Description:	Carolina Crossroads Phase 3D					**Route:**	I-126 WB_I-26 EB
Eng./Geo.:	B. Vogel	**Boring Location:**	377+48	**Offset:**	7-R	**Alignment:**	I-126 WB_I-26 EB
Elev.:	192.6 ft	**Latitude:**	34.02808627	**Longitude:**	-81.10387088	**Date Started:**	8/7/2025
Total Depth:	12.9 ft	**Soil Depth:**	12.9 ft	**Core Depth:**	0 ft	**Date Completed:**	8/7/2025
Bore Hole Diameter (in):	6.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	85.7%
Core Size:	N/A	**Driller:**	A. Alvarez	**Groundwater:**	**TOB** Dry	**24HR**	Dry

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	**TOPSOIL** (4.0-in)	0.0	SS-1	1	2	2	3	4
		ALLUVIUM (HOLOCENE)							
	2.0	Soft, Moist, Brown/Grayish Green, High Plasticity, Fine to Coarse Sandy Fat CLAY (CH/A-7-6) with Organics and Trace Gravel, 10YR5/3 & 10GY5/1	2.0	SS-2	9	11	7	6	18
		@SS-1: LL=53, PL=22, PI=31, NMC=28.5%, %200=68.3	4.0	SS-3	9	9	7	9	16
187.6		**PIEDMONT RESIDUUM**							
		Medium Dense, Moist, Dark Greenish Brown/Greenish Gray, Non-Plastic to Medium Plasticity, Silty Fine to Coarse SAND (SM/A-2-4), 10YR4/2 & 10GY5/1	6.0	SS-4	40	50/4"			100+
	8.0	@SS-2: NMC=13.6%, %200=29.8	8.0	SS-5	16	24	13	15	37
		@SS-3: Pale Olive/Dark Gray, (SM/A-4), 5Y6/3 & 10YR4/1							
182.6		NMC=15.1%, %200=37.5							
		@SS-4: Very Dense, Light Grayish Green/Yellow, 5G7/1 & 2.5Y7/6							
	12.9	Hard, Moist, Light Grayish Olive/Reddish Yellow, Medium Plasticity, SILT (ML/A-4) with Trace Gravel, 10Y6/2 & 7.5YR6/8	12.9	SS-6	50/0"				100+
177.6		@SS-5: LL=37, PL=25, PI=12, NMC=14.7%, %200=89.0							
		Boring Terminated at 12.9-ft. on Top of Rock.							
172.6									
167.6									



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:	P043326	**County:**	Richland/Lexington	**Boring No.:**	P3D-W2		
Site Description:	Carolina Crossroads Phase 3D			**Route:**	I-126 WB_I-26 EB		
Eng./Geo.:	B. Vogel	**Boring Location:**	379+48	**Offset:**	1-L	**Alignment:**	I-126 WB_I-26 EB
Elev.:	184.0 ft	**Latitude:**	34.02761296	**Longitude:**	-81.10353602	**Date Started:**	8/8/2025
Total Depth:	37.2 ft	**Soil Depth:**	37.2 ft	**Core Depth:**	0 ft	**Date Completed:**	8/8/2025
Bore Hole Diameter (in):	6.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	85.7%
Core Size:	N/A	**Driller:**	A. Alvarez	**Groundwater:**	**TOB** 30 ft	**24HR**	7.5 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0		0.0						
	0.3	**TOPSOIL** (3.0-in)							
		ALLUVIUM (HOLOCENE)							
	2.0	Firm, Moist, Dark Greenish Brown/Brownish Yellow, Low Plasticity to Medium Plasticity, Fine to Coarse Sandy CLAY (CL/A-6) with Organics & Trace Gravel, 10YR4/2 & 10YR6/6	2.0	SS-1	2	3	3	3	6
	4.0	@SS-1: NMC=23.4%, %200=51.8	4.0	SS-2	4	5	4	7	9
179.0				SS-3	3	4	4	4	8
	6.0	Loose, Moist, Brownish Yellow/Brown, High Plasticity, Clayey Fine to Coarse SAND (SC/A-7-6), 10YR6/6 & 10YR5/3	6.0	SS-4	3	5	7	10	12
	8.0	@SS-2: LL=53, PL=17, PI=36, NMC=20.0%, %200=48.1	8.0	SS-5	4	6	9	14	15
174.0		Firm, Moist, Brownish Yellow/Light Gray, Very Plastic, Fat CLAY (CH/A-7-6) with Sand & Trace Gravel, 10YR6/6 & 5Y7/2							
		@SS-3: LL=77, PL=22, PI=55, NMC=31.9%, %200=82.6							
		PIEDMONT RESIDUUM							
		Stiff, Moist, Reddish Yellow/Greenish Gray, High Plasticity, Lean CLAY (CL/A-7-6), 5YR6/8 & 5G5/1	13.5	SS-6	5	13	23		36
169.0		@SS-4: LL=48, PL=24, PI=24, NMC=35.9%, %200=96.3							
		Stiff, Moist, Reddish Yellow/Light Gray, Medium Plasticity, SILT (ML/A-6), 7.5YR6/8 & 5Y7/1							
		@SS-5: LL=40, PL=29, PI=11, NMC=28.6%, %200=88.9	18.5	SS-7	6	21	36		57
		@SS-6: Hard, Low Plasticity, (ML/A-4)							
164.0		LL=37, PL=27, PI=10, NMC=18.3%, %200=91.7							
		@SS-7: Pale Brown, 2.5Y7/4							
			23.5	SS-8	4	6	10		16
		@SS-8: Pale Brown/Dark Gray, 2.5Y7/4 & 2.5Y4/1							
159.0		LL=38, PL=28, PI=10, NMC=20.4%, %200=85.9							

SPT N VALUE ● PL × MC ○ LL ×
▲ FINES CONTENT (%)
✿ RQD (%) ■ REC (%)
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:	P043326			**County:**	Richland/Lexington	**Boring No.:**	P3D-W2
Site Description:	Carolina Crossroads Phase 3D					**Route:**	I-126 WB_I-26 EB
Eng./Geo.:	B. Vogel	**Boring Location:**	379+48	**Offset:**	1-L	**Alignment:**	I-126 WB_I-26 EB
Elev.:	184.0 ft	**Latitude:**	34.02761296	**Longitude:**	-81.10353602	**Date Started:**	8/8/2025
Total Depth:	37.2 ft	**Soil Depth:**	37.2 ft	**Core Depth:**	0 ft	**Date Completed:**	8/8/2025
Bore Hole Diameter (in):	6.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	85.7%
Core Size:	N/A	**Driller:**	A. Alvarez	**Groundwater:**	**TOB** 30 ft	**24HR**	7.5 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	28.5	No Recovery		28.5	SS-9	50/2"				100+
154.0		▽								
	33.5	Hard, Moist, Pale Brown, Non-Plastic to Low Plasticity, Fine to Coarse Sandy SILT (ML/A-4) with Trace Gravel, 2.5Y7/4		33.5	SS-10	50/5"				100+
149.0										
	37.2	Boring Terminated at 37.2-ft. on Top of Rock.		37.2	SS-11	50/0"				100+
144.0										
139.0										
134.0										

SPT N VALUE ● PL MC LL
▲ FINES CONTENT (%)
✿ RQD (%) ■ REC (%)
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 G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT_DATATEMPLATE.GDT 11/3/25

SCDOT Soil Test Log

Project ID:	P043326	**County:**	Richland/Lexington	**Boring No.:**	P3D-W3		
Site Description:	Carolina Crossroads Phase 3D			**Route:**	I-26 EB		
Eng./Geo.:	B. Vogel	**Boring Location:**	380+23	**Offset:**	18-L	**Alignment:**	I-26 EB
Elev.:	203.7 ft	**Latitude:**	34.02836809	**Longitude:**	-81.10243546	**Date Started:**	8/20/2025
Total Depth:	46.1 ft	**Soil Depth:**	46.1 ft	**Core Depth:**	0 ft	**Date Completed:**	8/20/2025
Bore Hole Diameter (in):	6.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	85.7%
Core Size:	N/A	**Driller:**	J. Phillips	**Groundwater:**	**TOB** 16 ft	**24HR**	13 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0		0.0	SS-1	2	4	7	9	11
	0.3	**TOPSOIL** (4.0-in)							
		PIEDMONT RESIDUUM							
	2.0	Stiff, Moist, Greenish Gray/Pale Brown, Medium Plasticity, Coarse Sandy SILT (ML/A-7-5) with Organics, 5G6/1 & 2.5Y8/4	2.0	SS-2	6	14	15	15	29
		@SS-1: LL=46, PL=31, PI=15, NMC=26.0%, %200=64.8	4.0	SS-3	12	15	19	17	34
198.7	6.0	Very Stiff to Hard, Moist, Greenish Gray/Reddish Yellow, SILT (ML/A-7-5) with Sand, 5G6/1 & 7.5YR6/8	6.0	SS-4	8	16	21	22	37
		@SS-2: LL=44, PL=31, PI=13, NMC=22.3%, %200=80.3	8.0	SS-5	8	32	25	24	57
		Hard to Very Stiff, Moist, Greenish Gray/Red, Low Plasticity, Fine to Coarse Sandy SILT (ML/A-4) with Trace Gravel, 5G6/1 & 10R5/6							
193.7		@SS-4: LL=33, PL=24, PI=9, NMC=14.4%, %200=50.3							
		@SS-5: Greenish Gray/Pale Yellow, 5G5/1 & 5Y8/3							
		@SS-6: Greenish Gray/Pale Yellow, 5G6/1 & 5Y7/4	13.5	SS-6	9	8	10		18
188.7		NMC=26.1%, %200=67.1							
	18.5	Stiff to Very Stiff, Moist, Greenish Gray/Pale Yellow, Medium Plasticity, SILT (ML/A-7-5), 5G6/1 & 5Y7/4	18.5	SS-7	6	6	9		15
183.7		@SS-7: LL=46, PL=32, PI=14, NMC=35.7%, %200=86.8							
		@SS-8: Yellow/Greenish Gray, with Trace Gravel, 10YR7/6 & 5G6/1	23.5	SS-8	12	14	15		29
178.7									

SPT N VALUE ● PL × MC ○ LL × ▲ FINES CONTENT (%) ✿ RQD (%) ■ REC (%)

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:	P043326	**County:**	Richland/Lexington	**Boring No.:**	P3D-W3		
Site Description:	Carolina Crossroads Phase 3D			**Route:**	I-26 EB		
Eng./Geo.:	B. Vogel	**Boring Location:**	380+23	**Offset:**	18-L	**Alignment:**	I-26 EB
Elev.:	203.7 ft	**Latitude:**	34.02836809	**Longitude:**	-81.10243546	**Date Started:**	8/20/2025
Total Depth:	46.1 ft	**Soil Depth:**	46.1 ft	**Core Depth:**	0 ft	**Date Completed:**	8/20/2025
Bore Hole Diameter (in):	6.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	85.7%
Core Size:	N/A	**Driller:**	J. Phillips	**Groundwater:**	**TOB** 16 ft	**24HR**	13 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
		SS-9: Greenish Gray/Pale Yellow, 5G6/1 & 5Y7/3		28.5						
					SS-9	4	5	9		14
173.7										
	33.5			33.5						
		Very Stiff, Moist, Reddish Yellow/Greenish Gray, Medium Plasticity, Fine to Coarse Sandy SILT (ML/A-6) with Trace Gravel, 7.5YR6/6 & 5G6/1			SS-10	15	13	12		25
168.7		@SS-10: LL=37, PL=26, PI=11, NMC=24.3%, %200=53.9								
	38.5			38.5						
		Hard, Moist, Greenish Gray/Yellow, Weakly Cemented, Medium Plasticity, SILT (ML/A-6) with Sand, 5G6/1 & 10YR7/6			SS-11	27	23	27		50
163.7		@SS-11: LL=40, PL=26, PI=14, NMC=28.1%, %200=80.3								
				43.5						
		@SS-12: Greenish Gray/Pale Yellow, 5G6/1 & 5Y8/2			SS-12	21	30	50/6"		80
158.7										
	46.1			46.1	SS-13	50/0"				100+
		Boring Terminated at 46.1-ft. on Top of Rock.								
153.7										

SPT N VALUE ● PL × MC ○ LL × ▲ FINES CONTENT (%) ✿ RQD (%) ■ REC (%)

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 G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT_DATATEMPLATE.GDT 11/3/25

SCDOT Soil Test Log

Project ID:	P043326			**County:**	Richland/Lexington	**Boring No.:**	P3D-W4
Site Description:	Carolina Crossroads Phase 3D					**Route:**	I-26 EB
Eng./Geo.:	B. Vogel	**Boring Location:**	378+30	**Offset:**	CL	**Alignment:**	I-26 EB
Elev.:	205.9 ft	**Latitude:**	34.02886118	**Longitude:**	-81.10268619	**Date Started:**	7/15/2025
Total Depth:	20.3 ft	**Soil Depth:**	20.3 ft	**Core Depth:**	0 ft	**Date Completed:**	7/15/2025
Bore Hole Diameter (in):	4.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	85.7%
Core Size:	N/A	**Driller:**	J. Phillips	**Groundwater:**	**TOB** 13 ft	**24HR**	14 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0									
	0.3	**TOPSOIL** (3.5-in)		0.0	SS-1	7	8	7	7	15
		EXISTING FILL Medium Dense, Moist, Brown/Red, Medium Plasticity, Clayey Fine to Coarse SAND (SC/A-2-6) with Organics & Trace Gravel, 7.5YR5/2 & 2.5YR5/6		2.0	SS-2	14	17	7	50/6"	24
	4.0	@SS-1: LL=26, PL=15, PI=11, NMC=9.8%, %200=35.0		4.0	SS-3	9	8	8	10	16
200.9		@SS-2: Reddish Yellow/Grayish Green, (SC/A-6), Micaceous, 7.5YR6/6 & 5GY6/2 LL=31, PL=12, PI=19, NMC=14.8%, %200=35.6		6.0	SS-4	3	3	4	6	7
		PIEDMONT RESIDUUM Stiff to Firm, Moist, Light Grayish Green/Yellow, Medium Plasticity, Elastic SILT (MH/A-7-5), 5GY6/2 & 2.5Y8/6		8.0	SS-5	2	3	3	5	6
195.9		@SS-3: LL=60, PL=43, PI=17, NMC=48.4%, %200=97.5								
		@SS-5: Greenish Gray/Pale Yellow, 10G6/1 & 5Y7/4 LL=55, PL=35, PI=20, NMC=50.6%, %200=97.5		13.5	SS-6	3	5	5		10
190.9		@SS-6: Greenish Gray/Very Pale Brown, 5G6/1 & 10YR8/3								
				18.5	SS-7	15	50/4"			100+
185.9	20.3	@SS-7: Greenish Gray/Red, 5G6/1 & 2.5YR5/8		20.3	~~SS-8~~	~~50/0.75"~~				~~100+~~
		Boring Terminated at 20.3-ft. on Top of Rock.								
180.9										

SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) ✿ RQD (%) ■ REC (%)

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:	P043326	**County:**	Richland/Lexington	**Boring No.:**	P3D-W5		
Site Description:	Carolina Crossroads Phase 3D			**Route:**	I-126 WB_I-26 EB		
Eng./Geo.:	B. Vogel	**Boring Location:**	365+27	**Offset:**	10-R	**Alignment:**	I-126 WB_I-26 EB
Elev.:	219.5 ft	**Latitude:**	34.03009039	**Longitude:**	-81.10203898	**Date Started:**	7/14/2025
Total Depth:	53.6 ft	**Soil Depth:**	53.6 ft	**Core Depth:**	0 ft	**Date Completed:**	7/14/2025
Bore Hole Diameter (in):	6.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	85.7%
Core Size:	N/A	**Driller:**	J. Phillips	**Groundwater:**	**TOB** 17 ft	**24HR**	14 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0									
	0.3	**TOPSOIL** (3.0-in)		0.0	SS-1	3	4	4	6	8
		EXISTING FILL Firm, Moist, Reddish Brown, Medium Plasticity, Fine to Coarse Sandy Lean CLAY (CL/A-6) with Organics, 5YR5/4		2.0	SS-2	6	7	13	15	20
		@SS-2: Very Stiff, Red/Light Yellowish Brown, with Trace Gravel, 2.5YR5/6 & 2.5Y6/4		4.0	SS-3	6	7	9	6	16
214.5		@SS-3: Red/ Brown, Reduced Organics, 2.5YR5/6 & 10Y5/3		6.0	SS-4	3	4	4	5	8
		@SS-4: Firm, Light Reddish Gray/Reddish Yellow, 2.5YR7/1 & 7.5YR6/6		8.0	SS-5	3	4	4	5	8
	8.0	LL=35, PL=16, PI=19, NMC=18.4%, %200=69.9								
		PIEDMONT RESIDUUM Firm, Moist, Light Reddish Gray/Reddish Yellow, High Plasticity, Fat Clay (CH/A-7-6) with Trace Gravel, 2.5YR7/1 & 7.5YR6/6								
209.5		@SS-5: LL=59, PL=23, PI=36, NMC=26.5%, %200=81.8								
	13.5	Very Stiff, Moist, Reddish Yellow/Greenish Gray, Medium Plasticity, Lean CLAY (CL/A-7-6), 7.5YR6/8 & 5GYR6/1		13.5	SS-6	4	7	9		16
204.5		@SS-6: LL=44, PL=26, PI=18, NMC=28.1%, %200=94.0								
	18.5	Very Stiff, Moist, Light Gray/Strong Brown, Low Plasticity, SILT (ML/A-4), Micaceous, N7/Light Gray & 7.5YR5/6		18.5	SS-7	6	9	15		24
199.5				23.5	SS-8	4	10	7		17
		@SS-8: Greenish Gray/Strong Brown, 10Y6/1 & 7.5YR5/6								
194.5		LL=38, PL=28, PI=10, NMC=31.3%, %200=96.2								

SPT N VALUE ● PL × MC ○ LL ×
▲ FINES CONTENT (%)
✿ RQD (%) ■ REC (%)
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:	P043326			**County:**	Richland/Lexington	**Boring No.:**	P3D-W5
Site Description:	Carolina Crossroads Phase 3D					**Route:**	I-126 WB_I-26 EB
Eng./Geo.:	B. Vogel	**Boring Location:**	365+27	**Offset:**	10-R	**Alignment:**	I-126 WB_I-26 EB
Elev.:	219.5 ft	**Latitude:**	34.03009039	**Longitude:**	-81.10203898	**Date Started:**	7/14/2025
Total Depth:	53.6 ft	**Soil Depth:**	53.6 ft	**Core Depth:**	0 ft	**Date Completed:**	7/14/2025
Bore Hole Diameter (in):	6.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	85.7%
Core Size:	N/A	**Driller:**	J. Phillips	**Groundwater:**	**TOB** 17 ft	**24HR**	14 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
				28.5						
					SS-9	4	9	15		24
189.5										
				33.5						
		@SS-9: Hard, Light Greenish Gray/ Brown, 2.5Y6/3 & 7.5YR5/6			SS-10	10	14	24		38
184.5										
	38.5			38.5						
		Hard to Very Stiff, Moist, Yellowish Brown/Strong Brown, Low Plasticity, SILT (ML/A-4) with Fine to Coarse Sand, 5Y7/2 & 7.5YR5/6			SS-11	10	14	24		38
179.5										
		@SS-11: Light Gray/Strong Brown, 5Y7/2 & 7.5YR5/6		43.5	SS-12	10	15	22		37
174.5										
		@SS-13: LL=40, PL=30, PI=10, NMC=35.8%, %200=84.7		48.5	SS-13	6	12	16		28
169.5										
	53.6			53.5	SS-14	50/0.5"				100+

SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) ✿ RQD (%) ■ REC (%)
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	

SC_DOT G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT_DATATEMPLATE.GDT 11/3/25

SCDOT Soil Test Log

Project ID:	P043326			**County:**	Richland/Lexington	**Boring No.:**	P3D-W5
Site Description:	Carolina Crossroads Phase 3D					**Route:**	I-126 WB_I-26 EB
Eng./Geo.:	B. Vogel	**Boring Location:**	365+27	**Offset:**	10-R	**Alignment:**	I-126 WB_I-26 EB
Elev.:	219.5 ft	**Latitude:**	34.03009039	**Longitude:**	-81.10203898	**Date Started:**	7/14/2025
Total Depth:	53.6 ft	**Soil Depth:**	53.6 ft	**Core Depth:**	0 ft	**Date Completed:**	7/14/2025
Bore Hole Diameter (in):	6.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	85.7%
Core Size:	N/A	**Driller:**	J. Phillips	**Groundwater:**	**TOB** 17 ft	**24HR**	14 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value
164.5		Boring Terminated at 53.6-ft. on Top of Rock.					
159.5							
154.5							
149.5							
144.5							
139.5							

● SPT N VALUE ●
PL MC LL
▲ FINES CONTENT (%)
✿ RQD (%) ■ REC (%)
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 G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT_DATATEMPLATE.GDT 11/3/25

SCDOT Soil Test Log

Project ID:	P043326	**County:**	Richland/Lexington	**Boring No.:**	P3D-W6		
Site Description:	Carolina Crossroads Phase 3D			**Route:**	I-126 WB_I-26 EB		
Eng./Geo.:	A. Chandler	**Boring Location:**	363+29	**Offset:**	11-R	**Alignment:**	I-126 WB_I-26 EB
Elev.:	212.7 ft	**Latitude:**	34.02977111	**Longitude:**	-81.10149603	**Date Started:**	7/10/2025
Total Depth:	49.8 ft	**Soil Depth:**	49.8 ft	**Core Depth:**	0 ft	**Date Completed:**	7/10/2025
Bore Hole Diameter (in):	4.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	85.7%
Core Size:	N/A	**Driller:**	J. Phillips	**Groundwater:**	**TOB** 15.5 ft	**24HR**	NM

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0		0.0	SS-1	2	3	6	8	9
	0.2	**TOPSOIL** (2.0-in)	2.0	SS-2	6	6	9	13	15
		PIEDMONT RESIDUUM	4.0	SS-3	8	10	11	12	21
		Stiff, Dry, Reddish Brown, Medium Plasticity, Lean CLAY (CL/A-6) with Sand, 5YR5/3	6.0	SS-4	12	12	9	9	21
		@SS-1: LL=40, PL=20, PI=20, NMC=17.0%, %200=71.8	8.0	SS-5	2	2	3	WOH	5
	4.0	@SS-2: Moist							
207.7		Very Stiff, Moist, Grayish Green, Medium Plasticity, Elastic SILT (MH/A-7-5), 5GY5/2							
		@SS-3: LL=52, PL=35, PI=17, NMC=34.1%, %200=98.6							
		@SS-4: Yellowish Brown, 10YR5/6							
		@SS-5: Firm							
		NMC=43.2%, %200=98.0							
202.7									
	13.5		13.5	SS-6	11	11	12		23
		Very Stiff to Stiff, Moist, Light Gray, Non-Plastic, SILT (ML/A-4), 2.5Y7/2							
197.7		@SS-6: LL=NP, PL=NP, PI=NP, NMC=17.2%, %200=96.1							
			18.5	SS-7	6	7	9		16
		@SS-7: Yellowish Brown, 10YR5/6							
192.7		LL=NP, PL=NP, PI=NP, NMC=32.6%, %200=96.9							
			23.5	SS-8	5	6	8		14
187.7									

SPT N VALUE ● PL × MC ○ LL ×
▲ FINES CONTENT (%)
✿ RQD (%) ■ REC (%)
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	

SC_DOT G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT_DATATEMPLATE.GDT 11/3/25

SCDOT Soil Test Log

Project ID:	P043326	**County:**	Richland/Lexington	**Boring No.:**	P3D-W6		
Site Description:	Carolina Crossroads Phase 3D			**Route:**	I-126 WB_I-26 EB		
Eng./Geo.:	A. Chandler	**Boring Location:**	363+29	**Offset:**	11-R	**Alignment:**	I-126 WB_I-26 EB
Elev.:	212.7 ft	**Latitude:**	34.02977111	**Longitude:**	-81.10149603	**Date Started:**	7/10/2025
Total Depth:	49.8 ft	**Soil Depth:**	49.8 ft	**Core Depth:**	0 ft	**Date Completed:**	7/10/2025
Bore Hole Diameter (in):	4.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	85.7%
Core Size:	N/A	**Driller:**	J. Phillips	**Groundwater:**	**TOB** 15.5 ft	**24HR**	NM

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
				28.5						
					SS-9	6	10	14		24
182.7										
				33.5						
		@SS-10: Hard, Reddish Brown, 5YR5/3			SS-10	12	18	37		55
177.7										
				38.5						
					SS-11	20	43	50/5.5"		83+
172.7										
				43.5						
					SS-12	12	13	35		48
167.7										
				48.5						
					SS-13	50/4.0"				100+
	49.8			49.8						
162.7		Boring Terminated at 49.8-ft. on Top of Rock.			SS-14	50/0"				100+

SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) ✿ RQD (%) ■ REC (%)

0 10 20 30 40 50 60 70 80 90

SS-11: >>● SS-13: >>● SS-14: >>●

LEGEND

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

SC_DOT G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT_DATATEMPLATE.GDT 11/3/25

SCDOT Soil Test Log

Project ID:	P043326			**County:**	Richland/Lexington	**Boring No.:**	P3D-W7
Site Description:	Carolina Crossroads Phase 3D					**Route:**	I-126 WB_I-26 EB
Eng./Geo.:	B. Vogel	**Boring Location:**	361+39	**Offset:**	9-R	**Alignment:**	I-126 WB_I-26 EB
Elev.:	214.7 ft	**Latitude:**	34.02931104	**Longitude:**	-81.10117964	**Date Started:**	7/14/2025
Total Depth:	37.7 ft	**Soil Depth:**	37.7 ft	**Core Depth:**	0 ft	**Date Completed:**	7/14/2025
Bore Hole Diameter (in):	6.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	85.7%
Core Size:	N/A	**Driller:**	J. Phillips	**Groundwater:**	**TOB** 15 ft	**24HR**	10 ft

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	**TOPSOIL** (1.5-in)	0.0	SS-1	4	6	6	6	12
		PIEDMONT RESIDUUM							
		Stiff, Moist, Light Yellowish Brown, High Plasticity, Fine to Coarse Sandy Fat CLAY (CH/A-7-6) with Organics & Trace Gravel, 2.5Y6/3	2.0	SS-2	4	6	9	13	15
	4.0	@SS-1: LL=53, PL=22, PI=31, NMC=17.7%, %200=67.3	4.0	SS-3	6	5	5	6	10
209.7									
	6.0	@SS-2: Greenish Gray/Light Reddish Brown, 5GY6/1 & 2.5Y6/4	6.0	SS-4	5	9	9	5	18
		Loose, Moist, Brown, Non-Plastic to Medium Plasticity, Silty Fine to Coarse SAND (SM/A-2-4) with Trace Gravel, Micaceous, 7.5YR5/4							
	8.0		8.0	SS-5	9	8	6	5	14
		Medium Dense, Moist, Olive/Bluish Gray, Medium Plasticity, Clayey Fine to Coarse SAND (SC/A-6) with Trace Gravel, Micaceous, 5Y4/4 & 10B6/1							
204.7									
		@SS-4: LL=32, PL=17, PI=15, NMC=13.6%, %200=47.9							
	13.5	Stiff, Moist, Grayish Green/Brownish Yellow, High Plasticity, Sandy Fat CLAY (CH/A-7-6) with Trace Gravel, 5G5/2 & 10YR6/6	13.5	SS-6	3	4	6		10
199.7		@SS-5: LL=58, PL=23, PI=35, NMC=22.1%, %200=59.4							
		Stiff, Moist, Yellowish Brown, Low Plasticity to Medium Plasticity, Fine to Coarse Sandy SILT (ML/A-4) with Trace Gravel, 10YR5/4							
	18.5	Firm, Moist, Reddish Yellow/Grayish Olive, High Plasticity, Elastic SILT (MH/A-7-6), Micaceous, 7.5Y6/8 & 10Y6/2	18.5	SS-7	2	4	4		8
194.7		@SS-7: LL=51, PL=29, PI=22, NMC=44.7%, %200=94.4							
	23.5	Very Stiff, Moist, Yellow/Greenish Gray, Medium Plasticity, SILT (ML/A-7-5), 2.5Y7/6 & 5G6/1	23.5	SS-8	5	8	9		17
189.7		@SS-8: LL=47, PL=31, PI=16, NMC=43.5%, %200=97.3							

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

Continued Next Page

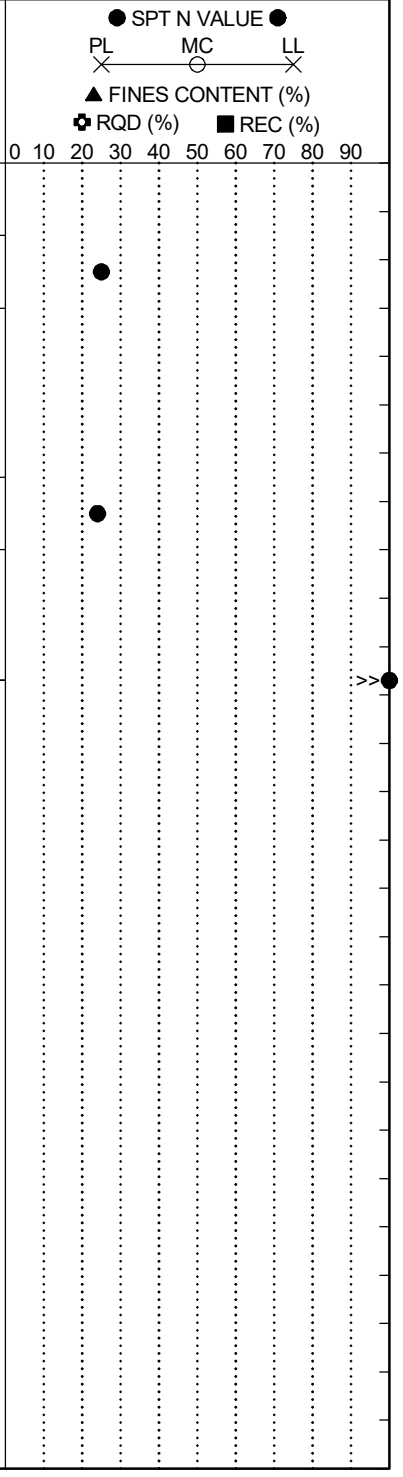
LEGEND

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:	P043326			**County:**	Richland/Lexington	**Boring No.:**	P3D-W7
Site Description:	Carolina Crossroads Phase 3D					**Route:**	I-126 WB_I-26 EB
Eng./Geo.:	B. Vogel	**Boring Location:**	361+39	**Offset:**	9-R	**Alignment:**	I-126 WB_I-26 EB
Elev.:	214.7 ft	**Latitude:**	34.02931104	**Longitude:**	-81.10117964	**Date Started:**	7/14/2025
Total Depth:	37.7 ft	**Soil Depth:**	37.7 ft	**Core Depth:**	0 ft	**Date Completed:**	7/14/2025
Bore Hole Diameter (in):	6.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	85.7%
Core Size:	N/A	**Driller:**	J. Phillips	**Groundwater:**	**TOB** 15 ft	**24HR**	10 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
				28.5						
		@SS-9: Light Greenish Gray/Light Yellowish Brown, 5G6/2 & 10YR6/4			SS-9	7	11	14		25
184.7										
				33.5						
		@SS-10: Dark Greenish Gray/Reddish Yellow, 5GY4/2 & 7.5YR6/6			SS-10	6	11	13		24
179.7										
	37.7			37.7	SS-11	50/0"				100+
		Boring Terminated at 37.7-ft. on Top of Rock.								
174.7										
169.7										
164.7										



LEGEND

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

SCDOT Soil Test Log

Project ID:	P043326	**County:**	Richland/Lexington	**Boring No.:**	P3D-W8		
Site Description:	Carolina Crossroads Phase 3D			**Route:**	I-126 WB_I-26 EB		
Eng./Geo.:	A. Folz	**Boring Location:**	354+72	**Offset:**	37-L	**Alignment:**	I-126 WB_I-26 EB
Elev.:	203.6 ft	**Latitude:**	34.02752271	**Longitude:**	-81.10064366	**Date Started:**	9/15/2025
Total Depth:	43.6 ft	**Soil Depth:**	43.6 ft	**Core Depth:**	0 ft	**Date Completed:**	9/15/2025
Bore Hole Diameter (in):	6.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	85.7%
Core Size:	N/A	**Driller:**	J. Phillips	**Groundwater:**	**TOB** 9.5 ft	**24HR**	9 ft

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	**TOPSOIL** (3.5-in.)	0.0	SS-1	3	5	5	5	10
		PIEDMONT RESIDUUM							
	2.0	Loose, Moist, Light Olive Brown, Non-Plastic to Low Plasticity, Silty Fine to Coarse SAND (SM/A-2-4) with Organics, 2.5Y5/3	2.0	SS-2	15	35	41	37	76
		@SS-1: NMC=13.6%, %200=41.8	4.0	SS-3	13	18	18	33	36
198.6		Hard to Very Stiff, Moist, Light Olive Gray, Low Plasticity, SILT (ML/A-4), 5Y6/2							
		@SS-2: LL=28, PL=27, PI=1, NMC=11.1%, %200=94.9	6.0	SS-4	15	14	12	21	26
		@SS-4: Non-Plastic LL=NP, PL=NP, PI=NP, NMC=12.2%, %200=91.5	8.0	SS-5	9	15	14	12	29
		@SS-5: NMC=14.3%, %200=93.7							
193.6									
			13.5	SS-6	11	20	25		45
		@SS-6: Gray, Low Plasticity, 5Y6/1 LL=30, PL=25, PI=5, NMC=11.4%, %200=93.9							
188.6									
			18.5	SS-7	7	13	33		46
		@SS-7: Olive, 5Y5/3 NMC=18.7%, %200=85.8							
183.6									
			23.5	SS-8	5	13	35		48
178.6									

SPT N VALUE ● PL × MC ○ LL × ▲ FINES CONTENT (%) ✿ RQD (%) ■ REC (%)

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	

SC_DOT G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT_DATATEMPLATE.GDT 11/3/25

SCDOT Soil Test Log

Project ID:	P043326	**County:**	Richland/Lexington	**Boring No.:**	P3D-W8		
Site Description:	Carolina Crossroads Phase 3D			**Route:**	I-126 WB_I-26 EB		
Eng./Geo.:	A. Folz	**Boring Location:**	354+72	**Offset:**	37-L	**Alignment:**	I-126 WB_I-26 EB
Elev.:	203.6 ft	**Latitude:**	34.02752271	**Longitude:**	-81.10064366	**Date Started:**	9/15/2025
Total Depth:	43.6 ft	**Soil Depth:**	43.6 ft	**Core Depth:**	0 ft	**Date Completed:**	9/15/2025
Bore Hole Diameter (in):	6.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	85.7%
Core Size:	N/A	**Driller:**	J. Phillips	**Groundwater:**	**TOB** 9.5 ft	**24HR**	9 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
		@SS-9: Light Olive, 5Y7/1 NMC=17.5%, %200=90.4		28.5	SS-9	15	23	35		58
173.6										
		@SS-10: Olive, 5Y4/3		33.5	SS-10	50/5"				100+
168.6										
		@SS-11: Dark Olive, 5Y4/1		38.5	SS-11	50/5.5"				100+
163.6										
	43.6	@SS-12: No Recovery		43.5	SS-12	50/1"				100+
		Boring Terminated at 43.6-ft. on Top of Rock.								
158.6										
153.6										

SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) ✿ RQD (%) ■ REC (%)

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 G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT_DATATEMPLATE.GDT 11/3/25

SCDOT Soil Test Log

Project ID:	P043326	**County:**	Richland/Lexington	**Boring No.:**	P3D-W9		
Site Description:	Carolina Crossroads Phase 3D			**Route:**	I-126 WB_I-26 EB		
Eng./Geo.:	A. Folz	**Boring Location:**	352+53	**Offset:**	29-L	**Alignment:**	I-126 WB_I-26 EB
Elev.:	201.7 ft	**Latitude:**	34.02697784	**Longitude:**	-81.10030085	**Date Started:**	9/15/2025
Total Depth:	40.4 ft	**Soil Depth:**	40.4 ft	**Core Depth:**	0 ft	**Date Completed:**	9/15/2025
Bore Hole Diameter (in):	6.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	85.7%
Core Size:	N/A	**Driller:**	J. Phillips	**Groundwater:**	**TOB** 10.5 ft	**24HR**	11 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0		0.0						
	0.3	**TOPSOIL** (3.0-in.)							
		PIEDMONT RESIDUUM							
		Medium Dense, Moist, Brown, Non-Plastic to Low Plasticity, Silty Fine to Medium SAND (SM/A-4) with Trace Gravel & Organics, 10YR4/3		SS-1	4	11	13	11	24
	2.0		2.0						
				SS-2	11	10	12	10	22
	4.0	@SS-2: Light Gray, 2.5Y7/2	4.0						
		NMC=12.3%, %200=41.4		SS-3	18	17	18	20	35
196.7		Very Stiff, Moist, Dark Gray, Medium Plasticity, Sandy SILT (ML/A-7-6) with Trace Gravel, 10YR4/1	6.0						
		@SS-3: NMC=7.6%, %200=21.6		SS-4	8	13	12	10	25
	8.0	@SS-4: LL=42, PL=29, PI=13, NMC=18.9%, %200=56.2	8.0						
				SS-5	7	7	11	15	18
191.7		Very Stiff, Moist, Light Yellowish Brown, Low Plasticity, SILT (ML/A-5), 10YR6/4							
		@SS-5: LL=41, PL=31, PI=10, NMC=23.6%, %200=94.6							
	13.5		13.5						
		Very Stiff, Moist, Gray, Non-Plastic to Low Plasticity, Fine to Medium Sandy SILT (ML/A-4), 2.5Y5/1		SS-6	8	11	11		22
186.7		@SS-6: NMC=14.3%, %200=53.1							
	18.5		18.5						
		Very Dense, Moist, Dark Grayish Brown, Low Plasticity, Silty Clayey SAND (SC-SM/A-2-4), 2.5Y4/2		SS-7	20	28	33		61
181.7		@SS-7: LL=27, PL=20, PI=7, NMC=16.0%, %200=34.7							
	23.5		23.5						
		Hard, Moist, Light Olive Brown, Low Plasticity, SILT (ML/A-4), 2.5Y5/3		SS-8	14	25	50		75
176.7		@SS-8: LL=37, PL=28, PI=9, NMC=21.8%, %200=90.6							

SPT N VALUE ● PL × MC ○ LL ×
▲ FINES CONTENT (%)
✿ RQD (%) ■ REC (%)
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	

SC_DOT G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT_DATATEMPLATE.GDT 11/3/25

SCDOT Soil Test Log

Project ID:	P043326			**County:**	Richland/Lexington	**Boring No.:**	P3D-W9
Site Description:	Carolina Crossroads Phase 3D					**Route:**	I-126 WB_I-26 EB
Eng./Geo.:	A. Folz	**Boring Location:**	352+53	**Offset:**	29-L	**Alignment:**	I-126 WB_I-26 EB
Elev.:	201.7 ft	**Latitude:**	34.02697784	**Longitude:**	-81.10030085	**Date Started:**	9/15/2025
Total Depth:	40.4 ft	**Soil Depth:**	40.4 ft	**Core Depth:**	0 ft	**Date Completed:**	9/15/2025
Bore Hole Diameter (in):	6.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	85.7%
Core Size:	N/A	**Driller:**	J. Phillips	**Groundwater:**	**TOB** 10.5 ft	**24HR**	11 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	28.5			28.5						
		Hard, Moist, Pale Brown, Non-Plastic to Low Plasticity, SILT (ML/A-4) with Sand, 2.5Y8/4			SS-9	17	26	50/4"		76+
171.7										
				33.5						
		@SS-10: Light Olive Brown, 2.5Y5/3			SS-10	28	50/5.5"			100+
166.7										
				38.5						
		@SS-11: Olive Yellow, 2.5Y6/6 NMC=20.2%, %200=87.5			SS-11	14	33	40		73
161.7	40.3			40.3	SS-12		50/1"			100+
	40.4	No Recovery								
		Boring Terminated at 40.4-ft. on Top of Rock.								
156.7										
151.7										

SPT N VALUE: PL, MC, LL; ▲ FINES CONTENT (%); ✿ RQD (%); ■ REC (%); 0 10 20 30 40 50 60 70 80 90

LEGEND

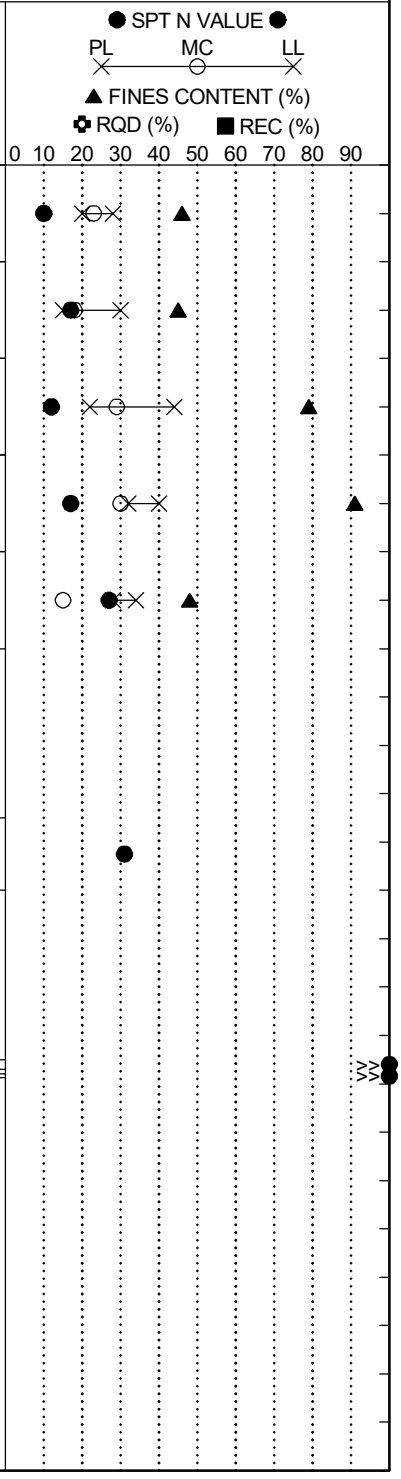
SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT_DATATEMPLATE.GDT 11/3/25

SCDOT Soil Test Log

Project ID:	P043326			**County:**	Richland/Lexington	**Boring No.:**	P3D-W10
Site Description:	Carolina Crossroads Phase 3D					**Route:**	I-26 EB_I-126 EB
Eng./Geo.:	B. Vogel	**Boring Location:**	394+87	**Offset:**	42-R	**Alignment:**	I-26 EB_I-126 EB
Elev.:	176.2 ft	**Latitude:**	34.02532848	**Longitude:**	-81.09941121	**Date Started:**	9/9/2025
Total Depth:	18.8 ft	**Soil Depth:**	18.8 ft	**Core Depth:**	0 ft	**Date Completed:**	9/9/2025
Bore Hole Diameter (in):	6.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	85.7%
Core Size:	N/A	**Driller:**	J. Phillips	**Groundwater:**	**TOB** 15.5 ft	**24HR**	4 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	**PIEDMONT RESIDUUM**	0.0						
		Loose to Medium Dense, Moist, Dark Gray/Reddish Yellow, Low Plasticity, Clayey Fine to Medium SAND (SC/A-4) with Organics & Trace Gravel, 10YR4/1 & 5YR6/6		SS-1	2	5	5	3	10
		@SS-1: LL=28, PL=20, PI=8, NMC=22.5%, %200=46.0	2.0						
	4.0			SS-2	2	5	12	6	17
171.2		@SS-2: Reddish Yellow/Light Brownish Gray, Medium Plasticity, (SC/A-6), 5YR6/8 & 2.5Y6/2	4.0	SS-3	6	5	7	8	12
	6.0	LL=30, PL=15, PI=15, NMC=17.5%, %200=44.9	6.0	SS-4	5	6	11	12	17
	8.0	Stiff, Moist, Red/Brownish Yellow, High Plasticity, Lean CLAY (ML/A-4) with Sand, Organics, & Trace Gravel, 2.5YR5/6 & 10YR6/8	8.0	SS-5	3	8	19	21	27
166.2		@SS-3: LL=44 PL=22, PI=22, NMC=29.0%, %200=79.3							
		Very Stiff, Moist, Reddish Yellow/Greenish Gray, Low Plasticity, SILT (ML/A-4), 7.5YR6/8 & 5GY6/1							
	13.5	@SS-4: LL=40, PL=32, PI=8, NMC=29.9%, %200=91.1	13.5	SS-6	13	15	16		31
161.2		Medium Dense, Moist, Reddish Yellow/Greenish Gray, Low Plasticity, Silty SAND (SM/A-2-4) with Organics, 7.5YR6/8 & 5GY6/1							
		@SS-5: LL=34, PL=28, PI=6, NMC=14.7%, %200=48.2							
	18.5	Hard, Moist, Pale Brown, Non-Plastic to Low Plasticity, SILT (ML/A-4), Micaceous, 2.5Y7/3	18.5	SS-7	50/2"				100+
	18.8		18.8	SS-8	50/1"				100+
156.2		Very Dense, Moist, Light Gray, Non-Plastic, Poorly Graded Gravel (GP-GM/A-1) with Silt, 2.5Y7/2							
		Boring Terminated at 18.8-ft. on Top of Rock.							
151.2									



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:	P043326	**County:**	Richland/Lexington	**Boring No.:**	P3D-W11		
Site Description:	Carolina Crossroads Phase 3D			**Route:**	I-26 EB_I-126 EB		
Eng./Geo.:	B. Vogel	**Boring Location:**	399+35	**Offset:**	27-R	**Alignment:**	I-26 EB_I-126 EB
Elev.:	184.2 ft	**Latitude:**	34.02445167	**Longitude:**	-81.09839862	**Date Started:**	9/9/2025
Total Depth:	34.5 ft	**Soil Depth:**	34.5 ft	**Core Depth:**	0 ft	**Date Completed:**	9/9/2025
Bore Hole Diameter (in):	6.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	85.7%
Core Size:	N/A	**Driller:**	J. Phillips	**Groundwater:**	**TOB** Dry	**24HR**	10.5 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	ASPHALT ROADWAY (15.5-in.)							
	1.3	**PIEDMONT RESIDUUM**	1.3						
	2.0	Loose, Moist, Light Gray/Light Brown, Non-Plastic, Silty Fine to Coarse SAND (SM/A-2-4) with Trace Gravel, 10YR7/1 & 10YR6/2	2.0	SS-1	X	X	8	10	8
		@SS-1: LL=NP, PL=NP, PI=NP, NMC=8.1%, %200=15.0		SS-2	8	2	3	3	5
179.2			4.0						
	6.0	Firm to Stiff, Moist, Yellowish Red/Pale Yellow, Medium Plasticity, SILT (ML/A-7-5) with Sand & Trace Gravel, 5YR5/6 & 5Y8/3		SS-3	4	4	5	6	9
		@SS-3: Greenish Gray/Brownish Yellow, 5G5/1 & 10YR6/8	6.0						
	8.0	LL=45, PL=30, PI=15, NMC=33.3%, %200=77.3		SS-4	6	6	5	5	11
174.2			8.0						
		Stiff, Moist, Light Greenish Gray/Bluish Gray, High Plasticity, Elastic SILT (MH/A-7-5), 5GY6/2 & 5B5/1		SS-5	2	3	3	4	6
		@SS-4: LL=54, PL=30, PI=24, NMC=36.0%, %200=81.1							
	13.5	Firm, Moist, Olive Gray/Greenish Gray, Medium Plasticity, Sandy Lean CLAY (CL/A-7-6) with Trace Gravel & Organics, 5Y6/2 & 10Y5/1	13.5	SS-6	6	7	6		13
169.2		@SS-5: LL=26, PL=15, PI=11, NMC=20.7%, %200=50.1							
		Stiff, Moist, Pale Brown/Greenish Gray, High Plasticity, Lean CLAY (CL/A-7-6) with Sand & Organics, 2.5Y7/4 & 10GY6/1							
	18.5	@SS-6: LL=48, PL=26, PI=22, NMC=33.2%, %200=77.8	18.5	SS-7	6	6	7		13
164.2									
		Stiff, Moist, Yellowish Brown/Gray, Non-Plastic, SILT (ML/A-4) with Sand & Trace Gravel, 10YR5/6 & 6N/Gray							
		@SS-7: LL=NP, PL=NP, PI=NP, NMC=34.9%, %200=81.4	23.5						
		@SS-8: Hard, Yellowish Brown/Pale Brown, Reduced Trace Gravel, Micaceous, 10YR5/4 & 2.5Y7/3		SS-8	18	26	39		65
159.2									

SPT N VALUE ● PL × MC ○ LL ×
▲ FINES CONTENT (%)
✿ RQD (%) ■ REC (%)
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	

SC_DOT G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT_DATATEMPLATE.GDT 11/3/25

SCDOT Soil Test Log

Project ID:	P043326			**County:**	Richland/Lexington	**Boring No.:**	P3D-W11
Site Description:	Carolina Crossroads Phase 3D					**Route:**	I-26 EB_I-126 EB
Eng./Geo.:	B. Vogel	**Boring Location:**	399+35	**Offset:**	27-R	**Alignment:**	I-26 EB_I-126 EB
Elev.:	184.2 ft	**Latitude:**	34.02445167	**Longitude:**	-81.09839862	**Date Started:**	9/9/2025
Total Depth:	34.5 ft	**Soil Depth:**	34.5 ft	**Core Depth:**	0 ft	**Date Completed:**	9/9/2025
Bore Hole Diameter (in):	6.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	85.7%
Core Size:	N/A	**Driller:**	J. Phillips	**Groundwater:**	**TOB** Dry	**24HR**	10.5 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value
				28.5			
		@SS-9: Light Brownish Gray, 2.5Y6/2			SS-9	50/6"	100+
154.2							
	33.5			33.5	SS-10	50/2"	100+
	34.5	Very Dense, Moist, Gray, Non-Plastic, Poorly Graded Gravel (GP-GM/A-1) with Silt, 6N/Gray		34.5	SS-11	50/0"	100+
149.2		Boring Terminated at 34.5-ft. on Top of Rock.					
144.2							
139.2							
134.2							

SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) ✿ RQD (%) ■ REC (%)
0 10 20 30 40 50 60 70 80 90

LEGEND

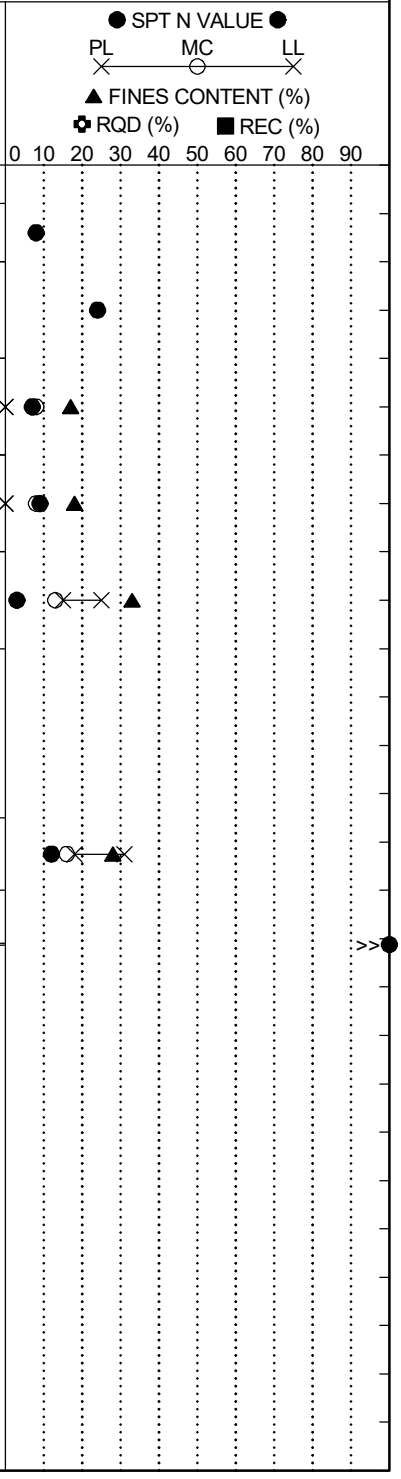
SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT_DATATEMPLATE.GDT 11/3/25

SCDOT Soil Test Log

Project ID:	P043326			**County:**	Richland/Lexington	**Boring No.:**	P3D-W12
Site Description:	Carolina Crossroads Phase 3D					**Route:**	I-26 EB_I-126 EB
Eng./Geo.:	B. Vogel	**Boring Location:**	403+32	**Offset:**	65-R	**Alignment:**	I-26 EB_I-126 EB
Elev.:	183.3 ft	**Latitude:**	34.0235301	**Longitude:**	-81.09769421	**Date Started:**	9/9/2025
Total Depth:	16.1 ft	**Soil Depth:**	16.1 ft	**Core Depth:**	0 ft	**Date Completed:**	9/9/2025
Bore Hole Diameter (in):	6.0	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	85.7%
Core Size:	N/A	**Driller:**	J. Phillips	**Groundwater:**	**TOB** Dry	**24HR**	Dry

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0								
	0.8	ASPHALT ROADWAY (9.75-in.)							
		PIEDMONT RESIDUUM	0.8						
		Loose to Medium Dense, Moist, Gray, Non-Plastic, Silty Fine to Coarse SAND (SM/A-2-4) with Trace Gravel, 7.5YR6/1		SS-1	X	X	8	11	8
		@SS-2: with Organics, Reduced Gravel	2.0	SS-2	9	11	13	9	24
		@SS-3: with Trace Gravel	4.0						
178.3		LL=NP, PL=NP, PI=NP, NMC=8.0%, %200=17.1		SS-3	5	3	4	4	7
		@SS-4: Reduced Gravel	6.0						
		LL=NP, PL=NP, PI=NP, NMC=8.2%, %200=17.5		SS-4	4	5	4	4	9
			8.0						
	9.0			SS-5	2	2	1	4	3
		Very Loose, Moist, Brown, Low PLasticity, Clayey Fine to Medium SAND (SC/A-2-4), 7.5YR5/3							
173.3		@SS-5: LL=25, PL=15, PI=10, NMC=12.7%, %200=33.0							
			13.5						
		@SS-6: Medium Dense, Gray/Strong Brown, 5N/Gray & 7.5YR5/6		SS-6	4	4	8		12
168.3		LL=31, PL=18, PI=13, NMC=16.3%, %200=27.6							
	16.1		16.1	SS-7	50/0.5"				100+
		@SS-7: Very Dense							
		Boring Terminated at 16.1-ft. on Top of Rock.							
163.3									
158.3									



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	

FME & SME 2017 INVESTIGATION

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	DH-3
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I26RCA
Eng./Geo.:	R. Wessinger	**Boring Location:**	5383+63	**Offset:**	119 R	**Alignment:**	Mainline
Elev.:	209.3 ft	**Latitude:**	34.027965	**Longitude:**	-81.101848	**Date Started:**	1/11/2018
Total Depth:	8.2 ft	**Soil Depth:**	8.2 ft	**Core Depth:**	0 ft	**Date Completed:**	1/11/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	90%
Core Size:	N/A	**Driller:**	L. Guempel	**Groundwater:**	**TOB** Drilling Fluid	**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	Grassed Shoulder								
		Firm, Moist, Greenish Gray, Medium Plasticity, SILT (ML/A-7-5(12)) with Fine to Medium Sand, Munsell=10GY 6/1		0.0						
		@SS-1: LL=45, PL=31, PI=14, NMC=27.8%, %#200=75.5			SS-1	2	3	3	2	6
		@2-ft: Very Stiff		2.0						
					SS-2	13	9	12	12	21
	4.0			4.0						
		Dense, Moist, Greenish Gray, Non-Plastic to Low Plasticity, Silty Fine to Coarse SAND (SM/A-2), Munsell=GLEY1 4/10GY								
204.3					SS-3	14	18	19	28	37
	6.0			6.0						
		Hard, Moist, Dark Greenish Gray, Low Plasticity, Sandy SILT (ML/A-4(3)), Munsell=GLEY1 4/10GY								
		@SS-4: LL=32, PL=26, PI=6, NMC=26.4%, %#200=63.9			SS-4	14	18	50/6"		68+
	8.0			8.0						
	8.2	Very Dense, Moist, Non-Plastic, GRAVEL (GP-GM/A-1) with Silt and Sand, Munsell=GLEY1 4/10GY			SS-5	50/2"				100+
		Boring Terminated at 8.2 feet Due to Drilling Refusal in Boulder; SEE BORING DH-3A								
199.3										

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 G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 7/24/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	DH-3A
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I26RCA
Eng./Geo.:	R. Wessinger	**Boring Location:**	5383+53	**Offset:**	113 R	**Alignment:**	Mainline
Elev.:	208.7 ft	**Latitude:**	34.027991	**Longitude:**	-81.101829	**Date Started:**	1/11/2018
Total Depth:	120.7 ft	**Soil Depth:**	64.5 ft	**Core Depth:**	56.2 ft	**Date Completed:**	1/22/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW/RC	**Hammer Type:**	Automatic	**Energy Ratio:**	90%
Core Size:	NQ	**Driller:**	L. Guempel	**Groundwater:**	**TOB** 12.0 ft	**24HR**	38.5 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
	0.0	Grassed Shoulder									
		Boulders Encountered in Upper Twenty-Five feet									
	1.7	Drill to 1.7 feet		1.7							
		HORNFELS with Quartz Vein Metamorphic, Gray/Dark Gray, Fine Grained, No Foliation, Hornblende/Olivine, Slightly Weathered to Fresh, Joints Dip from 25° to 85°, Numerous Joints, Wide to Tight, Surface Stained (Iron Oxide), Planar/Irregular, Very Close, Slightly Rough to Rough			NQ-1						@2.9-ft.: UC Strength=69,510 psi %REC=53, %RQD=38, RMR=28, GSI=53-58
203.7	5.5			5.5	SS-1	2	5	7	9	12	
				8.0							
		Medium Dense, Moist, Clayey Fine to Coarse SAND (SC), with Gravel, Munsell=GLEY1 4/10GY			SS-2	11	11	12	11	23	
198.7		▽									
	13.9	@13.5-ft: Very Dense		13.5	SS-3	50/3"				100+	
				13.9	SS-4	10/0"				100+	
193.7		**HORNFELS** Metamorphic, Dark Gray, Fine Grained, No Folation, Hornblende/Olivine, Fresh to Slightly Weathered, Joints Dip from 10° to 15°, Few Joints, Narrow to Tight, No Infilling, Irregular/Planar, Very Close, Slightly Rough		13.9	NQ-2						%REC=61, %RQD=43, RMR=N/A, GSI=62-67
		@NQ-3: Highly to Slightly Weathered, Joints Dip from 5° to 80°, Numerous Joints, Moderately Wide to Very Narrow, Surface Stained/Partially Infilled (Calcite/Chlorite), Planar/Irregular, Very Close, Slightly Rough to Rough		15.8	NQ-3						%REC=18, %RQD=0, RMR=N/A, GSI=30-35
188.7		@NQ-4: Joints Dip from 20° to 70°, Numerous Joints, Wide to Narrow, Surface Stained/Filled (Clay/Chlorite/Iron Oxide), Irregular, Very Close, Slightly Rough to Rough		20.8	NQ-4						@21.1-ft.: UC Strength=36,670 psi %REC=50, %RQD=23, RMR=20, GSI=30-35 @23.0-25.8-ft: Mud Seam
183.7	25.8			25.8	NQ-5						%REC=5, %RQD=0, RMR=N/A, GSI=N/A
		RESIDUUM SAMPLED AS: Moist, Pale Olive/Very Dark Grayish Green, Low Plasticity, Clay (CL/A-6) with Gravel, Munsell=5Y 6/4 & 5GY 3/2		30.8	NQ-6						%REC=2, %RQD=0, RMR=N/A, GSI-N/A
178.7											

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:	P027662			**County:**	Richland/Lexington	**Boring No.:**	DH-3A
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I26RCA
Eng./Geo.:	R. Wessinger	**Boring Location:**	5383+53	**Offset:**	113 R	**Alignment:**	Mainline
Elev.:	208.7 ft	**Latitude:**	34.027991	**Longitude:**	-81.101829	**Date Started:**	1/11/2018
Total Depth:	120.7 ft	**Soil Depth:**	64.5 ft	**Core Depth:**	56.2 ft	**Date Completed:**	1/22/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW/RC	**Hammer Type:**	Automatic	**Energy Ratio:**	90%
Core Size:	NQ	**Driller:**	L. Guempel	**Groundwater:**	**TOB** 12.0 ft	**24HR**	38.5 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
173.7	35.8	Dense, Moist, Pale Olive/Very Dark Grayish Green, Non-Plastic to Low Plasticity, Silty Fine to Coarse SAND (SM/A-2) with Gravel, Munsell=5Y 6/4 & 5GY 3/2	38.5	SS-5	36	21	22		43
168.7	43.5	Hard to Very Stiff, Moist, Pale Olive/Very Dark Grayish Green, Medium Plasticity, Sandy SILT (ML/A-7-5(8)), Munsell=5Y 6/4 & 5GY 3/2	43.5	SS-6	11	20	25		45
163.7		@SS-6: LL=42, PL=31, PI=11, NMC=28.2%, %#200=68.5							
		@48.5-ft: Moist to Wet	48.5	SS-7	18	12	6		18
158.7	53.5	Very Stiff, Moist to Wet, Pale Olive, Medium Plasticity, Elastic SILT (MH/A-7-5(17)) with Fine to Medium Sand, Munsell=5Y 6/4	53.5	SS-8	7	8	15		23
153.7		@SS-8: LL=53, PL=36, PI=17, NMC=47.2%, %#200=82.3							
	58.5	Very Stiff, Moist to Wet, Pale Olive/Reddish Yellow, Non-Plastic to Low Plasticity, SILT (ML/A-4), Munsell=5Y 6/4	58.5	SS-9	5	12	12		24
148.7	63.5	**PARTIALLY WEATHERED ROCK (PWR)**	63.5	SS-10	49	50/4"			100+
143.7	64.5	SAMPLED AS: Very Dense, Moist, Dark Greenish Gray, Non-Plastic to Low Plasticity, Sandy SILT (ML/A-4), Munsell=5GY 4/2	64.5	SS-11	10/0"				100+
			66.3	NQ-7					

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

%REC=68, %RQD=23, RMR=N/A, GSI=30-35

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:	P027662			**County:**	Richland/Lexington	**Boring No.:**	DH-3A
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I26RCA
Eng./Geo.:	R. Wessinger	**Boring Location:**	5383+53	**Offset:**	113 R	**Alignment:**	Mainline
Elev.:	208.7 ft	**Latitude:**	34.027991	**Longitude:**	-81.101829	**Date Started:**	1/11/2018
Total Depth:	120.7 ft	**Soil Depth:**	64.5 ft	**Core Depth:**	56.2 ft	**Date Completed:**	1/22/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW/RC	**Hammer Type:**	Automatic	**Energy Ratio:**	90%
Core Size:	NQ	**Driller:**	L. Guempel	**Groundwater:**	**TOB** 12.0 ft	**24HR**	38.5 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
138.7		**HORNFELS** @NQ-7: Metamorphic, Dark Gray, Fine Grained, No Foliation, Hornblende/Olivine, Moderately Weathered to Fresh, Joints Dip from 10° to 50°, Occasional Joints, Wide to Very Narrow, Surface Stained (Chlorite), Planar/Irregular, Very Close, Smooth to Rough		71.3	NQ-8			%REC=32, %RQD=7, RMR=N/A, GSI=30-35
133.7		@NQ-8: Highly to Slightly Weathered, Joints Dip from 3° to 85°, Numerous Joints, Moderately Wide to Very Narrow, Surface Stained (Chlorite/Iron Oxide), Planar/Irregular, Very Close, Smooth to Rough		76.3	NQ-9			@72.3-ft.: UC Strength=22,610 psi %REC=87, %RQD=62, RMR=26, GSI=30-35
128.7		@NQ-9: Joints Dip from 5° to 80°, Numerous Joints/Faults, Moderately Wide to Very Narrow, Surface Stained (Iron Oxide), Planar, Very Close, Smooth to Rough @NQ-10: Slightly Weathered to Fresh, Joints Dip from 20° to 70°, Occasional Joints, Narrow to Very Narrow, Surface Stained (Chlorite/Iron Oxide)/Spotty (Calcite)/Filled (Healed), Planar/Irregular, Very Close, Smooth to Rough		81.3	NQ-10			@76.5-ft.: UC Strength=13,710 psi %REC=99, %RQD=95, RMR=41, GSI=30-40
123.7		@NQ-11: Joints Dip from 20° to 60°, Few Joints, Surface Stained/Partially Filled/Filled (Calcite/Chlorite/Iron Oxide), Planar/Irregular, Very Close, Slightly Rough to Rough		86.3	NQ-11			@80.6-ft.: UC Strength=16,760 psi %REC=93, %RQD=85, RMR=43, GSI=30-40 @84.6-ft.: UC Strength=28,600 psi
118.7		@NQ-12: Fresh, Joints Dip from 20° to 55°, Few Joints, Narrow to Tight, Surface Stained/Filled (Calcite/Chlorite/Iron Oxide/Healed), Planar/Irregular, Very Close, Slightly Rough to Rough		91.3	NQ-12			%REC=98, %RQD=98, RMR=43, GSI=30-40 @89.6-ft.: UC Strength=37,260 psi
113.7		@NQ-13: Joints Dip from 15° to 70°, Few Joints, Narrow to Tight, Surface Stained/Spotty (Calcite/Chlorite/Healed), Planar, Very Close, Smooth/Rough		96.3	NQ-13			%REC=99, %RQD=99, RMR=N/A, GSI=30-40
108.7		@NQ-14: Joints Dip from 10° to 85°, Few Joints, Narrow to Tight, Surface Stained/Filled (Calcite/Chlorite/Healed), Planar/Irregular, Very Close, Slightly Rough to Rough			NQ-14			%REC=98, %RQD=95, RMR=N/A, GSI=30-40

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:	P027662			**County:**	Richland/Lexington	**Boring No.:**	DH-3A
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I26RCA
Eng./Geo.:	R. Wessinger	**Boring Location:**	5383+53	**Offset:**	113 R	**Alignment:**	Mainline
Elev.:	208.7 ft	**Latitude:**	34.027991	**Longitude:**	-81.101829	**Date Started:**	1/11/2018
Total Depth:	120.7 ft	**Soil Depth:**	64.5 ft	**Core Depth:**	56.2 ft	**Date Completed:**	1/22/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW/RC	**Hammer Type:**	Automatic	**Energy Ratio:**	90%
Core Size:	NQ	**Driller:**	L. Guempel	**Groundwater:**	**TOB** 12.0 ft	**24HR**	38.5 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" 2nd 6" 3rd 6" 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
		@NQ-15: Joints Dip from 55° to 80°, Few Joints, Very Narrow, Filled (Calcite/Healed), Planar, Very Close, Slightly Rough		101.3	NQ-15			@103.3-ft.: UC Strength=29,080 psi %REC=98, %RQD=98, RMR=47, GSI=40-45
103.7		@NQ-16: Joints Dip from 65° to 75°, Few Joints, Narrow to Very Narrow, Filled (Calcite/Healed), Planar, Very Close, Slightly Rough		106.3	NQ-16			%REC=98, %RQD=98, RMR=N/A, GSI=40-45
98.7		@NQ-17: Joints Dip from 5° to 85°, Few Joints, Very Narrow to Tight, Filled (Calcite/Healed), Planar/Irregular, Rough		111.3	NQ-17			%REC=95, %RQD=98, RMR=N/A, GSI=40-50
93.7		@NQ-18: No Joints		116.3	NQ-18			%REC=100, %RQD=100, RMR=N/A, GSI=80-90
88.7	120.7	Coring Terminated at 120.7 feet						
83.7								
78.7								

LEGEND

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

SC_DOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 7/25/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-30
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 26
Eng./Geo.:	AKS	**Boring Location:**	87+38.05	**Offset:**	L:42.04'	**Alignment:**	Proposed
Elev.:	234.2 ft	**Latitude:**	34.030514	**Longitude:**	-81.102766	**Date Started:**	2/15/2018
Total Depth:	98.6 ft	**Soil Depth:**	98.6 ft	**Core Depth:**	0 ft	**Date Completed:**	2/15/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	N/A	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 38.7 ft	**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									
	0.2	**SURFACE MATERIALS** - 2 inches of TOPSOIL.		0.0	SS-1	3	2	4	4	6
		FILL - CLAYEY SAND (SC) - loose, moist, weak red (10R 4/4), subangular, mostly fine to medium sands, some low plasticity fines.		2.0	SS-2	6	5	7	8	12
		@ 2 feet - medium dense.								
229.2		@ 4 feet - [LL=37, PL=16, PI=21, NMC=15.9%, %#200=45.3], AASHTO = A-6 (5).		4.0	SS-3	5	5	9	10	14
				6.0	SS-4	9	10	11	14	21
		@ 8 feet - loose, brown (7.5YR 5/4).		8.0	SS-5	2	3	3	3	6
224.2										
		@ 13.5 feet - very loose.		13.5	SS-6	3	2	2		4
219.2										
	18.5	**PIEDMONT RESIDUUM - FAT CLAY (CH)** - very stiff, moist, reddish-yellow (7.5YR 6/6), mostly high plasticity fines, few fine sands.		18.5	SS-7	9	14	14		28

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	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-30
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 26
Eng./Geo.:	AKS	**Boring Location:**	87+38.05	**Offset:**	L:42.04'	**Alignment:**	Proposed
Elev.:	234.2 ft	**Latitude:**	34.030514	**Longitude:**	-81.102766	**Date Started:**	2/15/2018
Total Depth:	98.6 ft	**Soil Depth:**	98.6 ft	**Core Depth:**	0 ft	**Date Completed:**	2/15/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	N/A	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 38.7 ft	**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
		@ 23.5 feet - stiff, [LL=50, PL=26, PI=24, NMC=39.3%, %#200=91.4], AASHTO = A-7-6 (25).		23.5	SS-8	9	5	8		13
209.2										
	28.5	**SILTY SAND (SM)** - medium dense, moist, reddish-yellow (7.5YR 6/6), subangular, mostly fine sands, some low plasticity fines.		28.5	SS-9	5	6	8		14
204.2										
				33.5	SS-10	5	8	10		18
199.2										
		▽ @ 38.5 feet - dense.		38.5	SS-11	5	14	18		32

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	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-30
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 26
Eng./Geo.:	AKS	**Boring Location:**	87+38.05	**Offset:**	L:42.04'	**Alignment:**	Proposed
Elev.:	234.2 ft	**Latitude:**	34.030514	**Longitude:**	-81.102766	**Date Started:**	2/15/2018
Total Depth:	98.6 ft	**Soil Depth:**	98.6 ft	**Core Depth:**	0 ft	**Date Completed:**	2/15/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	N/A	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 38.7 ft	**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	SPT N VALUE / PL MC LL / FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
				43.5				
		@ 43.5 feet - medium dense.			SS-12	9 11 12	23	●
189.2								
				48.5				
					SS-13	10 12 16	28	●
184.2								
	53.5			53.5				
		PARTIALLY WEATHRED ROCK (PWR) - SILTY SAND (SM) - very dense, moist, reddish-yellow (7.5YR 6/6), subangular, mostly fine sands, some low plasticity fines.			SS-14	16 29 50/5"	100	●
179.2								
	58.5			58.5				
		PIEDMONT RESIDUUM - SILT WITH SAND (ML) - hard, moist, reddish-yellow (7.5YR 6/6), mostly low plasticity fines, little fine sands.			SS-15	12 18 25	43	●

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:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-30
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 26
Eng./Geo.:	AKS	**Boring Location:**	87+38.05	**Offset:**	L:42.04'	**Alignment:**	Proposed
Elev.:	234.2 ft	**Latitude:**	34.030514	**Longitude:**	-81.102766	**Date Started:**	2/15/2018
Total Depth:	98.6 ft	**Soil Depth:**	98.6 ft	**Core Depth:**	0 ft	**Date Completed:**	2/15/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	N/A	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 38.7 ft	**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	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
				63.5				
		@ 63.5 feet - very hard, [LL=39, PL=28, PI=11, NMC=20.3%, %#200=77.9], AASHTO = A-6 (9)			SS-16	13 32 40	72	
169.2								
				68.5				
					SS-17	17 28 35	63	
164.2								
	73.5			73.5				
		PARTIALLY WEATHRED ROCK (PWR) - SILTY SAND (SM) - very dense, moist, reddish-yellow (7.5YR 6/6), subangular, mostly fine sands, some low plasticity fines.			SS-18	32 38 50/4"	100	
159.2								
	78.5			78.5				
		PIEDMONT RESIDUUM - SILT WITH SAND (SM) - very hard, moist, reddish-yellow (7.5YR 6/6), mostly low plasticity fines, some fine sands, [LL=36,			SS-19	20 30 35	65	

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	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-30
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 26
Eng./Geo.:	AKS	**Boring Location:**	87+38.05	**Offset:**	L:42.04'	**Alignment:**	Proposed
Elev.:	234.2 ft	**Latitude:**	34.030514	**Longitude:**	-81.102766	**Date Started:**	2/15/2018
Total Depth:	98.6 ft	**Soil Depth:**	98.6 ft	**Core Depth:**	0 ft	**Date Completed:**	2/15/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	N/A	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 38.7 ft	**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
		PL=25, PI=11, NMC=18.3%, %#200=74.1], AASHTO = A-6 (8).					
	83.5			83.5			
149.2		**PARTIALLY WEATHRED ROCK (PWR) - SILTY SAND (SM)** - very dense, moist, reddish-yellow (7.5YR 6/6), subangular, mostly fine sands, some low plasticity fines.			SS-20	50/5"- -	100
				88.5	SS-21	45 50/5"	100
144.2							
				93.5	SS-22	50/3"- -	100
139.2							
	98.6			98.5	SS-23	50/1"- -	100
		Boring Terminated at 98.6 feet.					

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 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-31
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 27
Eng./Geo.:	AKS	**Boring Location:**	8379+65.67	**Offset:**	L:42.91'	**Alignment:**	Proposed
Elev.:	205.7 ft	**Latitude:**	34.028294	**Longitude:**	-81.102982	**Date Started:**	3/5/2018
Total Depth:	55.5 ft	**Soil Depth:**	25.9 ft	**Core Depth:**	29.6 ft	**Date Completed:**	3/5/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	NQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 11.2 ft	**24HR**	23.3 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0								
	0.2	**SURFACE MATERIALS** - 2 inches of TOPSOIL.	0.0	SS-1	3	3	5	7	8
		PIEDMONT RESIDUUM - SILT WITH SAND (ML) - firm, moist, light brownish-gray (10YR 6/2), mostly low plasticity fines, little fine to medium sands, relict rock structure, [LL=45, PL=28, PI=17, NMC=25.3%, %#200=72.6], AASHTO = A-7-6 (13).	2.0	SS-2	12	18	20	26	38
		@ 2 feet - hard, bluish-gray (6/5 B).							
		@ 4 feet - very stiff.	4.0	SS-3	6	10	12	12	22
200.7									
		@ 6 feet - hard.	6.0	SS-4	12	14	17	19	31
			8.0	SS-5	12	13	14	19	27
		@ 8 feet - very stiff, brownish-yellow (10YR 6/6), little fine sands, [LL=45, PL=32, PI=13, NMC=27.8%, %#200=82.5], AASHTO = A-7-5 (13).							
195.7									
		▽							
			13.5	SS-6	7	10	16		26
		@ 13.5 feet - bluish-gray (GLEY 2 6/5B).							
190.7									
			18.5	SS-7	5	7	9		16

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	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-31
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 27
Eng./Geo.:	AKS	**Boring Location:**	8379+65.67	**Offset:**	L:42.91'	**Alignment:**	Proposed
Elev.:	205.7 ft	**Latitude:**	34.028294	**Longitude:**	-81.102982	**Date Started:**	3/5/2018
Total Depth:	55.5 ft	**Soil Depth:**	25.9 ft	**Core Depth:**	29.6 ft	**Date Completed:**	3/5/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	NQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 11.2 ft	**24HR**	23.3 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value	SPT N VALUE / PL MC LL / FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
		@ 23.5 feet - hard.		23.5	SS-8	5	9	32		41	
180.7	25.9	Tri-cone bit refusal at 25.9 feet. Install NW casing to 25.9 for NQ wireline coring.		25.9							
		For discontinuity descriptors, see discontinuity worksheet.									
		METAMORPHIC BEDROCK - SCHIST - gray (GLEY 1 4/), fine grained, foliated, slightly weathered, strong rock.			RC-1						
175.7		RC-1: Rec= 93.5%, RQD= 52.3%, GSI= 45-55, RMR = 47.		30.5							
		@ 30.7 feet - greenish-gray (GLEY 1 6/), residual soil.									
		@ 31 feet - dark greenish-gray (GLEY 1 4/), moderately weathered, medium strong rock.			RC-2						
		RC-2: Rec= 48.0%, RQD= 0.0%, GSI= 30-40.									
170.7		@ 35.4 feet - greenish-gray (GLEY 1 6/), residual soil.		35.5							
		@ 35.9 feet - dark greenish-gray (GLEY 1 4/), moderately weathered, medium rock.									
		@ 37 feet - greenish-gray (GLEY 1 6/), residual soil.			RC-3						
		RC-3: Rec= 46.0%, RQD= 0.0%, GSI= 30-40.									

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	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-31
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 27
Eng./Geo.:	AKS	**Boring Location:**	8379+65.67	**Offset:**	L:42.91'	**Alignment:**	Proposed
Elev.:	205.7 ft	**Latitude:**	34.028294	**Longitude:**	-81.102982	**Date Started:**	3/5/2018
Total Depth:	55.5 ft	**Soil Depth:**	25.9 ft	**Core Depth:**	29.6 ft	**Date Completed:**	3/5/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	NQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 11.2 ft	**24HR**	23.3 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value
		@ 40.5 feet - dark greenish-gray (GLEY 1 4/), moderately weathered, medium strong rock.		40.5			
		@ 42 feet - greenish-gray (GLEY 1 6/), residual soil.			RC-4		
		@ 42.2 feet - dark greenish-gray (GLEY 1 4/), moderately weathered, weak rock.					
		42.7 feet - fresh, strong rock.					
		RC-4: Rec= 80.0%, RQD= 43.3%, GSI= 30-40, RMR = 42.					
160.7				45.5			
		@ 46.7 feet - residual soil, greenish-gray (GLEY 1 6/).			RC-5		
		RC-5: Rec= 44.0%, RQD= 13.3%, GSI= 30-40.					
155.7				50.5			
		RC-6: Rec= 66.0%, RQD= 0.0%, GSI= 10-20.			RC-6		
150.7							
	55.5	@ 55.1 feet - dark greenish-gray (GLEY 1 4/), moderately weathered, medium strong rock.					
		Boring Terminated at 55.5 feet.					

● 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:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-32
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 27
Eng./Geo.:	AKS	**Boring Location:**	8382+97.01	**Offset:**	R:19.22'	**Alignment:**	Proposed
Elev.:	194.7 ft	**Latitude:**	34.027484	**Longitude:**	-81.102468	**Date Started:**	3/13/2018
Total Depth:	85.7 ft	**Soil Depth:**	55.7 ft	**Core Depth:**	30 ft	**Date Completed:**	3/14/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	NQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** N/A	**24HR**	19.7 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0									
	0.1	**SURFACE MATERIALS** - 1 inch of TOPSOIL.		0.0	SS-1	2	2	3	3	5
	2.0	**ALLUVIUM - CLAYEY SAND WITH GRAVEL (SC)** - loose, moist, strong brown (7.5YR 4/6), mostly fine to coarse sands, some low plasticity fines, few fine gravel, [LL=45, PL=21, PI=24, NMC=26.3%, %#200=48.0], AASHTO = A-7-6 (8).		2.0	SS-2	7	14	12	10	26
				4.0	SS-3	8	7	10	10	17
189.7	6.0	**CLAYEY GRAVEL WITH SAND (GC)** - medium dense, reddish-yellow (5YR 6/6) and dark greenish-gray (GLEY 1 4/1), mostly fine quartz gravel, some fine to coarse sands, little low plasticity fines, [LL=32, PL=17, PI=15, NMC=10.9%, %#200=17.4], AASHTO = A-2-6 (0).		6.0	SS-4	5	8	11	9	19
				8.0	SS-5	7	8	12	27	20
184.7		**PIEDMONT RESIDUUM - SILT WITH SAND (ML)** - very stiff, moist, grayish-green (GLEY 1 4/2), mostly low plasticity fines, little fine to coarse sands, trace weathered rock fragments, [LL=43, PL=32, PI=11, NMC=34.6%, %#200=70.3], AASHTO = A-7-5 (8). @ 8 feet - grayish-green (GLEY 1 4/2) and brownish-yellow (10YR 6/8).								
		@ 13.5 feet - hard.		13.5	SS-6	15	17	15		32
179.7										
	18.5	**PARTIALLY WEATHERED ROCK (PWR) - SILTY SAND (SM)** - very dense, moist to wet, very dark greenish-gray (GLEY 1 3/1), mostly fine to coarse sands, little low		18.5	SS-7	27	37	50/4"		100

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	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-32
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 27
Eng./Geo.:	AKS	**Boring Location:**	8382+97.01	**Offset:**	R:19.22'	**Alignment:**	Proposed
Elev.:	194.7 ft	**Latitude:**	34.027484	**Longitude:**	-81.102468	**Date Started:**	3/13/2018
Total Depth:	85.7 ft	**Soil Depth:**	55.7 ft	**Core Depth:**	30 ft	**Date Completed:**	3/14/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	NQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** N/A	**24HR**	19.7 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	SPT N VALUE / PL MC LL / FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
		plasticity fines, weathered rock fragments.						
				23.5	SS-8	50/5"- -	100	
169.7								
	28.5			28.5				
		SANDY SILT (ML) - very hard, moist, dark yellowish-brown (10YR 4/6) and dark greenish-gray (GLEY 1 3/1), mostly low plasticity fines, some fine to coarse sands, weathered rock fragments.			SS-9	43 45 50/5"	100	
164.7								
				33.5	SS-10	50/4"- -	100	
159.7								
				38.5	SS-11	50/5"- -	100	

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	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-32
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 27
Eng./Geo.:	AKS	**Boring Location:**	8382+97.01	**Offset:**	R:19.22'	**Alignment:**	Proposed
Elev.:	194.7 ft	**Latitude:**	34.027484	**Longitude:**	-81.102468	**Date Started:**	3/13/2018
Total Depth:	85.7 ft	**Soil Depth:**	55.7 ft	**Core Depth:**	30 ft	**Date Completed:**	3/14/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	NQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** N/A	**24HR**	19.7 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	SPT N VALUE / PL MC LL / FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
	43.5			43.5	SS-12	50/3"- -	100	
149.7		**SILTY SAND (SM)** - very dense, moist to wet, very dark greenish-gray (GLEY 1 3/2), mostly fine to coarse sands, little low plasticity fines, weathered rock fragments.						
				48.5	SS-13	50/5"- -	100	
144.7								
		@ 53.5 feet - no recovery.		53.5	SS-14	50/1"- -	100	
139.7								
	55.7	Tri-Cone Bit Refusal at 55.7 feet. Install NW Casing to 55.7 feet for NQ wireline coring.		55.7				
		For discontinuity descriptors, see discontinuity worksheet.						
		<u>METAMORPHIC BEDROCK</u> - SCHIST - gray (GLEY 1 4/), fine grained, foliated, moderately weathered, medium strong rock.			RC-1			
		@ 55.7 feet - 3-inch quartz epidote vein.						

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:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-32
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 27
Eng./Geo.:	AKS	**Boring Location:**	8382+97.01	**Offset:**	R:19.22'	**Alignment:**	Proposed
Elev.:	194.7 ft	**Latitude:**	34.027484	**Longitude:**	-81.102468	**Date Started:**	3/13/2018
Total Depth:	85.7 ft	**Soil Depth:**	55.7 ft	**Core Depth:**	30 ft	**Date Completed:**	3/14/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	NQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** N/A	**24HR**	19.7 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	SPT N VALUE / PL MC LL / FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
		RC-1: Rec= 18.0%, RQD= 0.0%, GSI=10-20.		60.7				
		@ 60.8 feet - highly weathered.			RC-2			
		RC-2: Rec= 30.0%, RQD= 0.0%, GSI=10-20.						
129.7				65.7				
		@ 65.8 feet - brownish-yellow (10YR 6/8), residual soil.			RC-3			
		@ 66.4 feet - gray (GLEY 1 4/), highly weathered, weak rock.						
		RC-3: Rec= 60.0%, RQD= 20.0%, GSI=10-20, RMR = 24.						
124.7				70.7				
		@ 70.7 feet - moderately weathered, medium strong rock.			RC-4			
		RC-4: Rec= 32.0%, RQD= 0.0%, GSI= 10-20.						
119.7				75.7				
		RC-5: Rec= 24.0%, RQD= 0.0%, GSI= 10-20.			RC-5			

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	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-32
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 27
Eng./Geo.:	AKS	**Boring Location:**	8382+97.01	**Offset:**	R:19.22'	**Alignment:**	Proposed
Elev.:	194.7 ft	**Latitude:**	34.027484	**Longitude:**	-81.102468	**Date Started:**	3/13/2018
Total Depth:	85.7 ft	**Soil Depth:**	55.7 ft	**Core Depth:**	30 ft	**Date Completed:**	3/14/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	NQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** N/A	**24HR**	19.7 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
		@ 80.7 feet - highly weathered, weak rock.		80.7				
		@ 81.3 feet - moderately weathered, medium strong rock.			RC-6			
		RC-6: Rec= 16.0%, RQD= 0.0%, GSI= 10-20.						
109.7	85.7	Boring Terminated at 85.7 feet.						
104.7								
99.7								

LEGEND

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

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

Rock Core Discontinuity Worksheet

Project Name: Carolina Crossroads I-20/I-26/I-126 Improvement Project
Project Number: 1461-16-047
Driller (Company/Name): S&ME/Millwood
Logged By: Austin Syms
Date: 3/14/2018

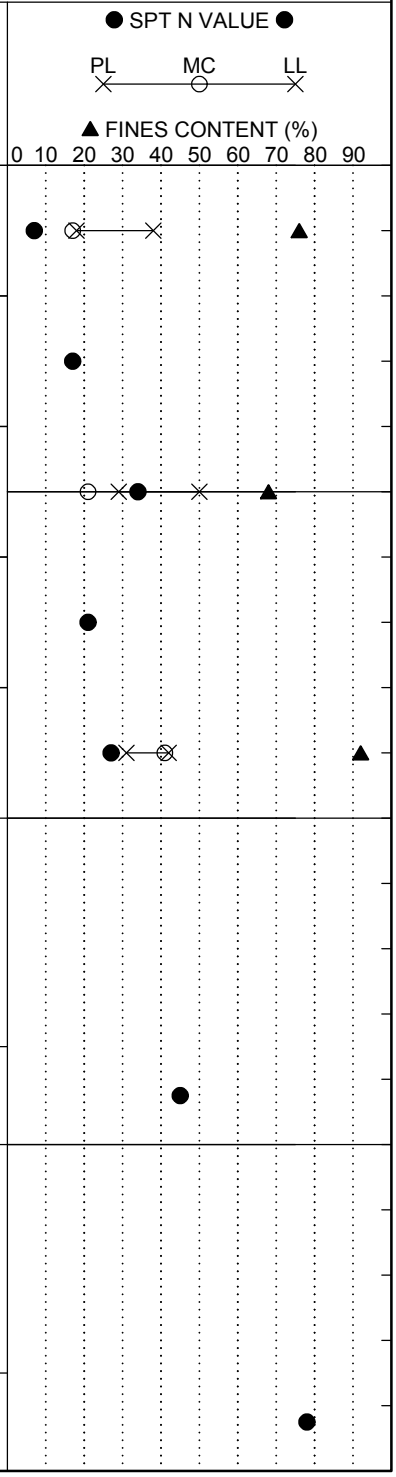
Boring Number: B-32
Core Barrel Type: NQ
Core Barrel Length: 5 ft
Coring Technique: Wireline
Number of Core Boxes: 1

Depth (ft)	Disc. No.	Disc. Type	Dip Angle (deg)	Disc. Width (mm)	Infill Amount	Infill Type	Surface Shape	Surface Roughness	Notes
55.7	1	J	N/A	N/A	Pa	Fe	Ir	SR	Fractured zone 55.7' - 56.1'
56.1	2	J	59	W	Pa	Fe	Pl	SR	
56.3	3	J	N/A	N/A	No	N/A	Ir	SR	Fractured zone 56.3' - 67.1'
67.1	4	J	38	W	No	N/A	Pl	SR	
68.1	5	J	N/A	N/A	No	N/A	Ir	SR	Fractured zone 68.1' - 76.5'
76.5	6	J	21	VN	Pa	Fe	Pl	SR	
76.9	7	J	N/A	N/A	No	N/A	Ir	SR	Fractured zone 76.9' - 95.7'

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-33
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 30
Eng./Geo.:	AKS	**Boring Location:**	385+33.31	**Offset:**	L:2.608'	**Alignment:**	Proposed
Elev.:	183.3 ft	**Latitude:**	34.026832	**Longitude:**	-81.102580	**Date Started:**	3/8/2018
Total Depth:	74.6 ft	**Soil Depth:**	45.9 ft	**Core Depth:**	28.7 ft	**Date Completed:**	3/9/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	NQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 9.9 ft	**24HR**	8.2 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0		0.0						
	0.1	**SURFACE MATERIALS** - 1 inch of TOPSOIL.							
		ALLUVIUM - LEAN CLAY WITH SAND (CL) - firm, moist, red (10R 4/6), mostly low plasticity fines, little fine to medium sands, [LL=38, PL=18, PI=20, NMC=17.0%, %#200=75.9], AASHTO = A-6 (14).		SS-1	2	4	3	5	7
		@ 2 feet - very stiff.	2.0						
				SS-2	5	7	10	12	17
	4.0		4.0						
178.3		**SANDY ELASTIC SILT (MH)** - hard, moist, red (10R 4/6), mostly high plasticity fines, some fine to medium sands, [LL=50, PL=29, PI=21, NMC=20.8%, %#200=68.1], AASHTO = A-7-6 (14).		SS-3	7	12	22	26	34
		@ 6 feet - very stiff, brownish-yellow (10YR 6/8).	6.0						
				SS-4	7	10	11	15	21
	8.0		8.0						
		PIEDMONT RESIDUUM - SILT (ML) - hard, moist, brownish-yellow (10YR 6/8) and greenish-gray (GLEY 1 5/1), mostly low plasticity fines, few fine sands, [LL=42, PL=31, PI=11, NMC=40.9%, %#200=92.4], AASHTO = A-7-5 (13).		SS-5	7	12	15	17	27
173.3									
			13.5						
				SS-6	20	22	23		45
168.3									
			18.5						
		@ 18.5 feet - very hard.		SS-7	20	32	46		78



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	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-33
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 30
Eng./Geo.:	AKS	**Boring Location:**	385+33.31	**Offset:**	L:2.608'	**Alignment:**	Proposed
Elev.:	183.3 ft	**Latitude:**	34.026832	**Longitude:**	-81.102580	**Date Started:**	3/8/2018
Total Depth:	74.6 ft	**Soil Depth:**	45.9 ft	**Core Depth:**	28.7 ft	**Date Completed:**	3/9/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	NQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 9.9 ft	**24HR**	8.2 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value
	23.5	**PARTIALLY WEATHERED ROCK (PWR) - SANDY SILT (ML)** - very hard, moist, brownish-yellow (10YR 6/8) and greenish-gray (GLEY 1 5/1), mostly low plasticity fines, some fine to medium sands, relict rock structure.		23.5	SS-8	50/5"- -	100
158.3				28.5	SS-9	50/4"- -	100
153.3				33.5	SS-10	50/4"- -	100
148.3				38.5	SS-11	50/0"- -	100

● 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	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-33
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 30
Eng./Geo.:	AKS	**Boring Location:**	385+33.31	**Offset:**	L:2.608'	**Alignment:**	Proposed
Elev.:	183.3 ft	**Latitude:**	34.026832	**Longitude:**	-81.102580	**Date Started:**	3/8/2018
Total Depth:	74.6 ft	**Soil Depth:**	45.9 ft	**Core Depth:**	28.7 ft	**Date Completed:**	3/9/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	NQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 9.9 ft	**24HR**	8.2 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	SPT N VALUE / PL MC LL / FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
				43.5	SS-12	50/0"- -	100	
138.3	45.9	Tri-Cone Bit Refusal at 45.9 feet. Install NW Casing to 45.9 feet for NQ wireline coring.		45.9				
		For discontinuity descriptors, see discontinuity worksheet.						
		METAMORPHIC BEDROCK - SCHIST - gray (GLEY 1 4/), fine grained, foliated, moderately weathered, medium strong rock, coarse grained quartz veins.			RC-1			
133.3		@ 46.1 feet - light yellowish-brown (10YR 6/4), residual soil.		50.6				
		RC-1: Rec= 21.3%, RQD= 0.0%, GSI= 10-20.						
		@ 46.7 feet - gray (GLEY 1 4/), moderately weathered, medium strong rock.			RC-2			
		RC-2: Rec= 12.0%, RQD= 0.0%, GSI= 10-20.						
128.3				55.6				
					RC-3			
		RC-3: Rec= 20.0%, RQD= 0.0%, GSI= 10-20.						

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	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-33
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 30
Eng./Geo.:	AKS	**Boring Location:**	385+33.31	**Offset:**	L:2.608'	**Alignment:**	Proposed
Elev.:	183.3 ft	**Latitude:**	34.026832	**Longitude:**	-81.102580	**Date Started:**	3/8/2018
Total Depth:	74.6 ft	**Soil Depth:**	45.9 ft	**Core Depth:**	28.7 ft	**Date Completed:**	3/9/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	NQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 9.9 ft	**24HR**	8.2 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
				60.6				
		RC-4: Rec= 30.0%, RQD= 0.0%, GSI= 10-20.			RC-4			
118.3				65.6				
		@ 65.9 feet - dark yellowish-brown (10YR 4/6), residual soil.						
		@ 67.4 feet - gray (GLEY 1 4/), highly weathered, weak rock.			RC-5			
		68.3 feet - medium strong rock.						
		RC-5: Rec= 80.0%, RQD= 0.0%, GSI= 10-20.						
113.3		@ 69 feet - moderately weathered, medium strong rock.		70.6				
		@ 72.2 feet - quartz vein.			RC-6			
		RC-6: Rec= 100%, RQD= 18.8%, GSI= 30-40, RMR = 37.						
	74.6							
108.3		Boring Terminated at 74.6 feet.						

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

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	

Rock Core Discontinuity Worksheet

Project Name: Carolina Crossroads I-20/I-26/I-126 Improvement Project
Project Number: 1461-16-047
Driller (Company/Name): S&ME/Millwood
Logged By: Austin Syms
Date: 3/9/2018

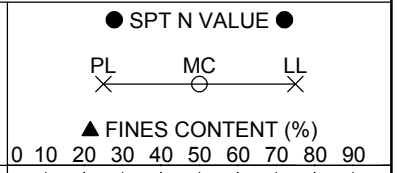
Boring Number: B-33
Core Barrel Type: NQ
Core Barrel Length: 5 ft
Coring Technique: Wireline
Number of Core Boxes: 1

Depth (ft)	Disc. No.	Disc. Type	Dip Angle (deg)	Disc. Width (mm)	Infill Amount	Infill Type	Surface Shape	Surface Roughness	Notes
45.9	1	J	N/A	N/A	No	N/A	Pl	SR	Fractured zone 45.9' - 69'
69	2	J	55	N	No	N/A	Pl	SR	
69.4	3	J	55	VN	No	N/A	Pl	SR	
71	4	J	53	N	No	N/A	Pl	SR	
71.3	5	J	69	VN	No	N/A	Pl	SR	
71.5	6	J	72	VN	No	N/A	Pl	SR	
71.6	7	J	N/A	N/A	Pa	Fe	Ir	SR	Fractured zone 71.6' - 771.8'
72	8	J	88	VN	Pa	Fe	Pl	SR	
72.2	9	J	31	N	Pa	Fe	Pl	SR	
72.3	10	J	N/A	N/A	Pa	Fe	Ir	SR	Fractured zone 72.3' - 72.7'
73	11	J	19	T	Pa	Fe	Pl	SR	
73.2	12	J	79	T	Pa	Fe	Ir	SR	
73.4	13	J	31	T	Pa	Fe	Pl	SR	
73.6	14	J	90	T	No	N/A	Pl	SR	
73.7	15	J	90	T	No	N/A	Pl	SR	
74.2	16	J	82	VN	No	N/A	Pl	SR	
75.2	17	J	25	N	No	N/A	Pl	SR	
75.4	18	J	5	N/A	No	N/A	Ir	SR	Fractured zone 75.4' - 75.6'

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-34
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 33
Eng./Geo.:	ELF	**Boring Location:**	389+21.02	**Offset:**	L:14.330'	**Alignment:**	Proposed
Elev.:	196.8 ft	**Latitude:**	34.025765	**Longitude:**	-81.102667	**Date Started:**	2/5/18
Total Depth:	74.6 ft	**Soil Depth:**	41.3 ft	**Core Depth:**	33.3 ft	**Date Completed:**	2/6/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	NQ	**Driller:**	T. Miller	**Groundwater:**	**TOB** N/A	**24HR**	25 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	**SURFACE MATERIALS** - 12 inches of ASPHALT.								
	1.0	**FILL - SANDY SILT (ML)** - soft, wet, yellowish red (5YR 5/6), mostly low plasticity fines, some fine to medium sands.		1.0	SS-1	3	3	1	1	4
		@ 3 feet - stiff, [LL=43, PL=27, PI=16, NMC=29.0%, %#200=62.2], AASHTO = A-7-6 (9).		3.0	SS-2	2	5	4	5	9
191.8	5.0	**CLAYEY SAND (SC)** - loose, moist, gray (5YR 6/1), mostly fine to medium sand, some low plasticity fines.		5.0	SS-3	3	4	4	5	8
				7.0	SS-4	2	3	4	4	7
		@ 9 feet - grayish-green (GLEY 1 5G 5/2), trace roots, [LL=39, PL=18, PI=21, NMC=18.5%, %#200=41.6], AASHTO = A-6 (4).		9.0	SS-5	3	2	4	4	6
186.8										
				13.5	SS-6	3	4	4		8
181.8										
		@ 18.5 feet - medium dense, dark gray (5YR 4/1), mostly fine to coarse sands.		18.5	SS-7	2	5	6		11



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	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-34
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 33
Eng./Geo.:	ELF	**Boring Location:**	389+21.02	**Offset:**	L:14.330'	**Alignment:**	Proposed
Elev.:	196.8 ft	**Latitude:**	34.025765	**Longitude:**	-81.102667	**Date Started:**	2/5/18
Total Depth:	74.6 ft	**Soil Depth:**	41.3 ft	**Core Depth:**	33.3 ft	**Date Completed:**	2/6/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	NQ	**Driller:**	T. Miller	**Groundwater:**	**TOB** N/A	**24HR**	25 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value	SPT N VALUE / PL MC LL / FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
				23.5	SS-8	4	4	4		8	
171.8		@ 23.5 feet - loose, gray to yellowish red (5YR 5/11 to 5/6), mostly fine to medium sands.									
				28.5	SS-9	3	4	4		8	
166.8		@ 28.5 feet - dark gray to yellowish red (5YR 4/1 to 4/6).									
	32.0	**ALLUVIUM - SANDY SILTY CLAY (CL-ML)** - very soft, moist, dark gray (5YR 4/1), mostly low plasticity fines, some fine to medium sands, [LL=23, PL=16, PI=7, NMC=24.5%, %#200=69.0], AASHTO = A-4 (2).		33.5	SS-10	1	1	1		2	
161.8											
	36.0	**CLAYEY SAND (SC)** - very loose, moist, dark gray (5YR 4/1), mostly fine to medium sands, little low plasticity fines.									
	38.5	**SANDY LEAN CLAY (CL)** - soft, wet, dark gray (5YR 4/1), mostly low plasticity fines, some fine to medium sands, trace mica, [LL=37, PL=23, PI=14, NMC=30.9%,		38.5	SS-11	4	2	2		4	

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	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-34
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 33
Eng./Geo.:	ELF	**Boring Location:**	389+21.02	**Offset:**	L:14.330'	**Alignment:**	Proposed
Elev.:	196.8 ft	**Latitude:**	34.025765	**Longitude:**	-81.102667	**Date Started:**	2/5/18
Total Depth:	74.6 ft	**Soil Depth:**	41.3 ft	**Core Depth:**	33.3 ft	**Date Completed:**	2/6/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	NQ	**Driller:**	T. Miller	**Groundwater:**	**TOB** N/A	**24HR**	25 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
		%#200=69.3], AASHTO = A-6 (8).						
	41.3	Tri-Cone Bit Refusal at 41.3 feet. Install NW Casing to 41.3 feet for NQ wireline coring.		41.3				
		For discontinuity descriptors, see discontinuity worksheet.			RC-1			
		METAMORPHIC BEDROCK - SCHIST - dark greenish-gray (10GY 4/1), fine grained to very fine grained, subrounded, moderately weathered, medium strong rock, low core recovery 41.3 to 55 feet likely due to residual soil seams washed away by drilling process.		44.6				
151.8		RC-1 : Rec= 9.1%, RQD= 0.0%, GSI= 10-20.			RC-2			
		RC-2 : Rec= 16.0%, RQD= 0.0%, GSI= 10-20.		49.6				
146.8		@ 49.6 feet - highly weathered zone, extremely weak rock.			RC-3			
		RC-3 : Rec= 20.0%, RQD= 0.0%, GSI= 10-20.						
	54.6			55.0				
141.8		**PARTIALLY WEATHERED ROCK (PWR) - SILTY SAND (SM)** - very dense, wet, gray (5YR 5/1), mostly fine to coarse sands, few non-plastic fines, gravel-sized rock fragments.			SS-12	50/5" - -	100	
	56.0	Tri-Cone Bit Refusal at 56 feet. Advance NW Casing to 56 feet to continue NQ wireline coring.		56.0				
		METAMORPHIC BEDROCK - SCHIST - pinkish-gray (5YR 6/2), coarse grained to fine grained, foliated, moderately to highly weathered, medium strong to weak rock, quartz epidote.			RC-4			
				59.6				

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	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-34
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 33
Eng./Geo.:	ELF	**Boring Location:**	389+21.02	**Offset:**	L:14.330'	**Alignment:**	Proposed
Elev.:	196.8 ft	**Latitude:**	34.025765	**Longitude:**	-81.102667	**Date Started:**	2/5/18
Total Depth:	74.6 ft	**Soil Depth:**	41.3 ft	**Core Depth:**	33.3 ft	**Date Completed:**	2/6/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	NQ	**Driller:**	T. Miller	**Groundwater:**	**TOB** N/A	**24HR**	25 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
		@ 56.7 feet - dark greenish-gray (10GY 4/1), fine grained to very fine grained, moderately weathered, medium strong rock, low to moderate core recovery likely due to residual soil seams washed away by drilling process.			RC-5			
		@ 57.6 feet - moderately weathered, weak rock.						
		RC-4 : Rec= 63.8%, RQD= 0.0%, GSI= 10-20.						
		@ 61.5 feet - highly weathered, extremely weak rock.		64.6				
131.8		RC-5 : Rec= 80.0%, RQD= 0.0%, GSI= 10-20.						
					RC-6			
		RC-6 : Rec= 24.0%, RQD= 0.0%, GSI= 10-20.						
				69.6				
126.8		@ 70.1 feet - completely weathered.						
					RC-7			
		@ 72 feet - moderately weathered, weak rock.						
	74.6	RC-7 : Rec= 54.0%, RQD= 0.0%, GSI= 10-20.						
121.8		Boring Terminated at 74.6 feet.						

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	

Rock Core Discontinuity Worksheet

Project Name: Carolina Crossroads I-20/I-26/I-126 Improvement Project
Project Number: 1461-16-047
Driller (Company/Name): S&ME/Miller
Logged By: Lehe Fender
Date: 2/5/2018

Boring Number: B-34
Core Barrel Type: NQ
Core Barrel Length: 5 ft
Coring Technique: Wireline
Number of Core Boxes: 1

Depth (ft)	Disc. No.	Disc. Type	Dip Angle (deg)	Disc. Width (mm)	Infill Amount	Infill Type	Surface Shape	Surface Roughness	Notes
56.2	1	J	31	W	No	N/A	Pl	SR	
56.4	2	J	26	N	No	N/A	Pl	SR	
56.7	3	J	N/A	W	Su	Fe	Ir	SR	Fractured zone 56.7' to 57.3'
57.6	4	J	N/A	W	Su	Cl	Ir	SR	Fractured zone 57.6' to 58.3'
59.6	5	J	N/A	W	Su	Fe	Ir	SR	Fractured zone 59.6' to 60.1'
60.3	6	J	N/A	W	Su	Fe	Pl	SR	
60.5	7	J	N/A	W	Su	Fe	Pl	SR	
60.8	8	J	N/A	W	Su	Sd/Cl	Ir	SR	Fractured zone 60.8' to 61.0'
61.2	9	J	31	W	Su	Sd/Cl	Pl	SR	
61.4	10	J	20	MW	Su	Sd/Cl	Pl	SR	
61.6	11	J	N/A	W	Su	Sd/Cl	Ir	SR	Fractured zone 61.6' to 64.6'
64.6	12	J	N/A	W	Su	Fe	Ir	SR	Fractured zone 64.6' to 69.6'
69.6	13	J	N/A	W	Su	Fe	Ir	SR	Fractured zone 69.6' to 70'
70.3	14	J	N/A	W	Su	Fe	Ir	SR	Fractured zone 70.3' to 74.6'

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-35
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 31
Eng./Geo.:	AKS	**Boring Location:**	7388+25.51	**Offset:**	L:145.51'	**Alignment:**	Proposed
Elev.:	185.2 ft	**Latitude:**	34.026450	**Longitude:**	-81.101378	**Date Started:**	3/2/2018
Total Depth:	55 ft	**Soil Depth:**	33.0 ft	**Core Depth:**	22 ft	**Date Completed:**	3/2/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	NQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 12.0 ft	**24HR**	13.9 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0									
	0.1	**SURFACE MATERIALS** - 1 inch TOPSOIL.		0.0						
		ALLUVIUM - SILT WITH SAND (ML) - stiff, moist, red (10R 5/8), mostly low plasticity fines, little fine to medium sands, [LL=47, PL=29, PI=18, NMC=22.6%, %#200=75.8], AASHTO = A-7-6 (15).			SS-1	5	5	6	8	11
		@ 2 feet - hard.		2.0	SS-2	8	14	17	18	31
		@ 4 feet - very stiff.		4.0	SS-3	7	9	9	10	18
180.2		@ 6 feet - very hard.		6.0	SS-4	7	37	29	32	66
	8.0	**PIEDMONT RESIDUUM - LEAN CLAY WITH SAND (CL)** - very hard, dry to moist, greenish gray (GLEY 1 6/5GY), mostly low plasticity fines, little fine to coarse sands, relict rock structure, [LL=29, PL=20, PI=9, NMC=17.3%, %#200=73.1], AASHTO = A-4 (5).		8.0	SS-5	14	44	22	39	66
175.2		▽								
	13.5	**PARTIALLY WEATHERED ROCK (PWR) - SILTY SAND (SM)** - very dense, dry to moist, greenish gray (6/5GY), subangular, mostly fine to medium sands, some low plasticity fines, relict rock structure.		13.5	SS-6	50/5"-		-		100
170.2										
				18.5	SS-7	28	50/5"	-		100

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	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-35
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 31
Eng./Geo.:	AKS	**Boring Location:**	7388+25.51	**Offset:**	L:145.51'	**Alignment:**	Proposed
Elev.:	185.2 ft	**Latitude:**	34.026450	**Longitude:**	-81.101378	**Date Started:**	3/2/2018
Total Depth:	55 ft	**Soil Depth:**	33.0 ft	**Core Depth:**	22 ft	**Date Completed:**	3/2/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	NQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 12.0 ft	**24HR**	13.9 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	SPT N VALUE / PL MC LL / FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
				23.5				
					SS-8	12 50/5" -	100	
160.2								
				28.5				
					SS-9	50/4"- -	100	
155.2								
		Tri-Cone Bit Refusal at 33 feet. Install NW Casing to 33 feet for NQ wireline coring.						
	33.0	For discontinuity descriptors, see discontinuity worksheet.		33.0				
		METAMORPHIC - SCHIST - gray (GLEY 1 4/), fine grained, foliated, moderately weathered, strong rock, low to moderate recovery likely due to seams of completely weathered rock or residual soil washed away by drilling process.			RC-1			
150.2		RC-1: Rec= 34.8%, RQD= 0.0%, GSI= 10-20, RMR =		35.3				
		@ 35.7 feet - residual soil, weak.			RC-2			
		RC-2: Rec= 44.0%, RQD= 0.0%, GSI= 10-20.						

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	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-35
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 31
Eng./Geo.:	AKS	**Boring Location:**	7388+25.51	**Offset:**	L:145.51'	**Alignment:**	Proposed
Elev.:	185.2 ft	**Latitude:**	34.026450	**Longitude:**	-81.101378	**Date Started:**	3/2/2018
Total Depth:	55 ft	**Soil Depth:**	33.0 ft	**Core Depth:**	22 ft	**Date Completed:**	3/2/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	NQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 12.0 ft	**24HR**	13.9 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Sample Depth (ft)	Sample No./Type	N Value
			40.3		
				RC-3	
		RC-3: Rec= 32.0%, RQD= 0.0%, GSI= 10-20.			
140.2			45.3		
		@ 45.5 feet - moderately weathered, strong rock.			
		@ 46.1 feet - epidote vein.		RC-4	
		RC-4: Rec= 40.0%, RQD= 0.0%, GSI= 10-20.			
135.2			50.3		
				RC-5	
		RC-5: Rec= 40.7%, RQD= 0.0%, GSI= 10-20.			
		@ 52.5 feet - some quartz.	53.0		
				RC-6	
		RC-6: Rec= 60.0%, RQD= 0.0%, GSI= 10-20.			
130.2	55.0	Boring Terminated at 55 feet.			

● 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 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

Rock Core Discontinuity Worksheet

Project Name: Carolina Crossroads I-20/I-26/I-126 Improvement Project
Project Number: 1461-16-047
Driller (Company/Name): S&ME/Millwood
Logged By: Austin Syms
Date: 3/2/2018

Boring Number: B-35
Core Barrel Type: NQ
Core Barrel Length: 5 ft
Coring Technique: Wireline
Number of Core Boxes: 2

Depth (ft)	Disc. No.	Disc. Type	Dip Angle (deg)	Disc. Width (mm)	Infill Amount	Infill Type	Surface Shape	Surface Roughness	Notes
33.1	1	J	0	N	No	No	Ir	SR	
33.3	2	J	90	N/A	No	No	N/A	SR	Fractured zone 33.3' - 45.8'
45.8	3	J	0	N	Pa	Fe	Pl	SR	
46.4	4	J	0	N	Pa	Fe	Pl	SR	
50.3	5	J	50	N	Pa	Fe	Pl	SR	
50.9	6	J	73	N	No	No	St	SR	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-36
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 29
Eng./Geo.:	ELF	**Boring Location:**	7387+13.79	**Offset:**	L:11.09'	**Alignment:**	Proposed
Elev.:	216.5 ft	**Latitude:**	34.026863	**Longitude:**	-81.101700	**Date Started:**	2/12/2018
Total Depth:	77.2 ft	**Soil Depth:**	66.0 ft	**Core Depth:**	11.2 ft	**Date Completed:**	2/13/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	NQ	**Driller:**	T. Miller	**Groundwater:**	**TOB** N/A	**24HR**	44 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0									
	0.3	**SURFACE MATERIALS** - 3 inches of TOPSOIL.		0.0	SS-1	3	4	9	13	13
		FILL - CLAYEY SAND (SC) - medium dense, moist, red (2.5YR 4/6), mostly fine sands, little low plasticity fines, [LL=21, PL=12, PI=9, NMC=10.2%, %#200=24.3], AASHTO = A-2-4.		2.0	SS-2	10	10	8	8	18
		@ 2 feet - reddish-gray (2.5YR 6/1), mostly fine to medium sands, some low plasticity fines, [LL=37, PL=15, PI=22, NMC=13.2%, %#200=30.4], AASHTO = A-2-6.		4.0	SS-3	4	4	5	6	9
211.5	4.0	**ALLUVIUM - CLAYEY SAND (SC)** - loose, moist, red (2.5YR 5/8), mostly fine to coarse sands, little low plasticity fines, trace quartz gravel.		6.0	SS-4	2	4	6	10	10
		@ 8 feet - medium dense, some high plasticity fines, [LL=52, PL=23, PI=29, NMC=18.8%, %#200=44.5], AASHTO = A-7-6 (8).		8.0	SS-5	9	9	10	11	19
206.5										
		@ 13.5 feet - loose.		13.5	SS-6	3	3	4		7
201.5										
	18.5	**FAT CLAY WITH SAND (CH)** - stiff, moist, pale green (5G 6/2), mostly high plasticity fines, little fine sands, trace quartz gravel.		18.5	SS-7	4	5	5		10

● 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	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-36
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 29
Eng./Geo.:	ELF	**Boring Location:**	7387+13.79	**Offset:**	L:11.09'	**Alignment:**	Proposed
Elev.:	216.5 ft	**Latitude:**	34.026863	**Longitude:**	-81.101700	**Date Started:**	2/12/2018
Total Depth:	77.2 ft	**Soil Depth:**	66.0 ft	**Core Depth:**	11.2 ft	**Date Completed:**	2/13/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	NQ	**Driller:**	T. Miller	**Groundwater:**	**TOB** N/A	**24HR**	44 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
			23.5	SS-8	3	4	5		9
191.5		@ 23.5 feet - very dark gray (5YR 3/1), [LL=87, PL=30, PI=57, NMC=38.06%, %#200=82.8], AASHTO = A-7-5 (53).							
	28.5	**PIEDMONT RESIDUUM - SILT WITH SAND (ML)** - stiff, moist, very dark gray (5YR 3/1), mostly non-plastic fines, little fine sands.	28.5	SS-9	4	4	6		10
186.5									
			33.5	SS-10	7	10	12		22
181.5		@ 33.5 feet - very stiff, olive (5Y 4/3), [LL=NP, PL=NP, PI=NP, NMC=21.0%, %#200=83.6], AASHTO = A-4 (0).							
			38.5	SS-11	8	14	7		21
		@ 38.5 feet - olive (5Y 4/3) and yellowish-red (5YR 5/6), few gravel sized rock fragments.							

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	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-36
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 29
Eng./Geo.:	ELF	**Boring Location:**	7387+13.79	**Offset:**	L:11.09'	**Alignment:**	Proposed
Elev.:	216.5 ft	**Latitude:**	34.026863	**Longitude:**	-81.101700	**Date Started:**	2/12/2018
Total Depth:	77.2 ft	**Soil Depth:**	66.0 ft	**Core Depth:**	11.2 ft	**Date Completed:**	2/13/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	NQ	**Driller:**	T. Miller	**Groundwater:**	**TOB** N/A	**24HR**	44 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
				43.5						
		@ 43.5 feet - stiff, no recovery.			SS-12	3	5	6		11
171.5										
				48.5						
		@ 48.5 feet - very stiff, dark reddish-gray (5YR 4/2), trace mica.			SS-13	28	10	6		16
166.5										
	53.5			53.5						
		PARTIALLY WEATHERED ROCK (PWR) - SILTY SAND (SM) - very dense, grayish-brown (2.5Y 5/2), mostly fine sands, little low plasticity fines, trace gravel sized rock fragments, trace mica.			SS-14	12	32	50/3"		100
161.5										
				58.5						
					SS-15	50/3"-		-		100

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	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-36
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 29
Eng./Geo.:	ELF	**Boring Location:**	7387+13.79	**Offset:**	L:11.09'	**Alignment:**	Proposed
Elev.:	216.5 ft	**Latitude:**	34.026863	**Longitude:**	-81.101700	**Date Started:**	2/12/2018
Total Depth:	77.2 ft	**Soil Depth:**	66.0 ft	**Core Depth:**	11.2 ft	**Date Completed:**	2/13/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	NQ	**Driller:**	T. Miller	**Groundwater:**	**TOB** N/A	**24HR**	44 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
				63.5	SS-16	34 50/1" -	100	
151.5		@ 63.5 feet - dark yellowish-brown (10YR 3/4).						
	66.0	Tri-Cone Bit Refusal at 66 feet. Install NW Casing to 66 feet for NQ wireline coring.		66.0	RC-1			
		For discontinuity descriptors, see discontinuity worksheet.						
		METAMORPHIC BEDROCK - SCHIST - greenish-gray (5GY 5/1), fine grained to very fine grained, foliated, moderately weathered, strong rock.		68.0	RC-2			
		RC-1: Rec= 75.0%, RQD= 0.0%, GSI= 10-20.		68.4	RC-3			
146.5		RC-2: Rec= 100.0%, RQD= 0.0%, GSI= 10-20.						
		@ 70.7 feet - dark grayish-brown (10YR 4/2), highly weathered, extremely weak rock.		71.2	RC-4			
		@ 70.9 feet - residual soil.						
		RC-3: Rec= 100.0%, RQD= 34.2%, GSI= 10-20, RMR = 25.		73.4	RC-5			
		@ 71.2 feet - very dark gray (10YR 3/1), moderately weathered, strong rock.						
141.5		RC-4: Rec= 72.7%, RQD= 17.0%, GSI= 10-20.						
		RC-5: Rec= 46.9%, RQD= 0.0%, GSI= 10-20.		76.6	RC-6			
	77.2	RC-6: Rec= 100.0%, RQD= 0.0%, GSI= 10-20.						
		Boring Terminated at 77.2 feet.						

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 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

Rock Core Discontinuity Worksheet

Project Name: Carolina Crossroads I-20/I-26/I-126 Improvement Project
Project Number: 1461-16-047
Driller (Company/Name): S&ME/Miller
Logged By: Lehe Fender
Date: 2/13/2018

Boring Number: B-36
Core Barrel Type: NQ
Core Barrel Length: 5 ft
Coring Technique: Wireline
Number of Core Boxes: 1

Depth (ft)	Disc. No.	Disc. Type	Dip Angle (deg)	Disc. Width (mm)	Infill Amount	Infill Type	Surface Shape	Surface Roughness	Notes
68.9	1	J	20	W	Su	Sd/Cl	Ir	N/A	
69.3	2	J	42	MW	Su	Fe	Pl	S	
70	3	J	90	N	Su	Fe	Pl	S	Fractured zone 70' to 70.4'
71.2	4	J	20	W	Su	Fe	Ir	SR	Fractured zone 71.2' to 71.9'
72.3	5	J	10	W	Su	Fe	Ir	R	
73.5	6	J	N/A	W	Pa	Sd/Cl	Ir	R	Fractured zone 73.5' to 74.5'
74.8	7	J	20	W	Pa/Su	Sd/Cl/Fe	Ir	R	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-36A
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 29
Eng./Geo.:	ELF	**Boring Location:**	7387+06.35	**Offset:**	L:9.39'	**Alignment:**	Proposed
Elev.:	217.2 ft	**Latitude:**	34.026884	**Longitude:**	-81.101700	**Date Started:**	2/14/2018
Total Depth:	78.6 ft	**Soil Depth:**	52.8 ft	**Core Depth:**	25.8 ft	**Date Completed:**	2/14/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	NQ	**Driller:**	T. Miller	**Groundwater:**	**TOB** N/A	**24HR**	44 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
	0.0							
212.2		Drilled without sampling to 42.4 feet. Tri-Cone Bit Refusal at 42.4 feet. Install NW Casing to 42.4 feet for NQ wireline coring.						
207.2								
202.2								

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	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-36A
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 29
Eng./Geo.:	ELF	**Boring Location:**	7387+06.35	**Offset:**	L:9.39'	**Alignment:**	Proposed
Elev.:	217.2 ft	**Latitude:**	34.026884	**Longitude:**	-81.101700	**Date Started:**	2/14/2018
Total Depth:	78.6 ft	**Soil Depth:**	52.8 ft	**Core Depth:**	25.8 ft	**Date Completed:**	2/14/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	NQ	**Driller:**	T. Miller	**Groundwater:**	**TOB** N/A	**24HR**	44 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
192.2		Drilled without sampling to 42.4 feet. Tri-Cone Bit Refusal at 42.4 feet. Install NW Casing to 42.4 feet for NQ wireline coring.						
187.2								
182.2								

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	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-36A
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 29
Eng./Geo.:	ELF	**Boring Location:**	7387+06.35	**Offset:**	L:9.39'	**Alignment:**	Proposed
Elev.:	217.2 ft	**Latitude:**	34.026884	**Longitude:**	-81.101700	**Date Started:**	2/14/2018
Total Depth:	78.6 ft	**Soil Depth:**	52.8 ft	**Core Depth:**	25.8 ft	**Date Completed:**	2/14/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	NQ	**Driller:**	T. Miller	**Groundwater:**	**TOB** N/A	**24HR**	44 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
	42.4	For discontinuity descriptors, see attached worksheet.		42.4				
		▼ **METAMORPHIC BEDROCK - SCHIST** - pinkish-white (5YR 8/2), very coarse grained, quartz epidote, massive, highly weathered, mostly extremely weak rock not recovered by coring process, recovered rock fragments were strong rock.			RC-1			
172.2	45.0	RC-1: Rec= 3.8%, RQD= 0.0%, GSI= 10-20.						
		Drilled without sampling to 55.4 feet. Tri-Cone Bit Refusal at 55.4 feet. Install NW Casing to 55.4 feet for NQ wireline coring.						
167.2								
162.2	55.4	For discontinuity descriptors, see discontinuity worksheet.		55.4				
		METAMORPHIC BEDROCK - SCHIST - grayish-green (5GY 5/2), fine grained to very fine grained, foliated, highly weathered, strong rock.			RC-2			

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:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-36A
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 29
Eng./Geo.:	ELF	**Boring Location:**	7387+06.35	**Offset:**	L:9.39'	**Alignment:**	Proposed
Elev.:	217.2 ft	**Latitude:**	34.026884	**Longitude:**	-81.101700	**Date Started:**	2/14/2018
Total Depth:	78.6 ft	**Soil Depth:**	52.8 ft	**Core Depth:**	25.8 ft	**Date Completed:**	2/14/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	NQ	**Driller:**	T. Miller	**Groundwater:**	**TOB** N/A	**24HR**	44 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value
		RC-2: Rec= 8.0%, RQD= 0.0%, GSI= 10-20.	60.4			
				RC-3		
152.2		RC-3: Rec= 12.0%, RQD= 0.0%, GSI= 10-20.	65.4			
		@ 65.6 feet - completely weathered, extremely weak rock.		RC-4		
147.2		RC-4: Rec= 24.0%, RQD= 0.0%, GSI= 10-20.	70.4			
		@ 70.4 feet - moderately weathered, strong rock.		RC-5		
		@ 70.8 feet - completely weathered, extremely weak rock.	73.4			
		@ 71.6 feet - moderately weathered, strong rock.		RC-6		
		@ 72.5 feet - completely weathered.				
		RC-5: Rec= 63.3%, RQD= 0.0%, GSI= 10-20.				
142.2		@ 73.2 feet - moderately weathered.	75.4			
		RC-6: Rec= 40.0%, RQD= 0.0%, GSI= 10-20.		RC-7		
	78.6	RC-7: Rec= 31.3%, RQD= 0.0%, GSI= 10-20.				
		Boring Terminated at 78.6 feet.				

● 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	

Rock Core Discontinuity Worksheet

Project Name: Carolina Crossroads I-20/I-26/I-126 Improvement Project
Project Number: 1461-16-047
Driller (Company/Name): S&ME/Miller
Logged By: Lehe Fender
Date: 2/14/2018

Boring Number: B-36A
Core Barrel Type: NQ
Core Barrel Length: 5 ft
Coring Technique: Wireline
Number of Core Boxes: 1

Depth (ft)	Disc. No.	Disc. Type	Dip Angle (deg)	Disc. Width (mm)	Infill Amount	Infill Type	Surface Shape	Surface Roughness	Notes
73.7	1	J	5	W	Pa	Sd/Cl	Ir	R	Fractured zone 73.7' to 74'

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-37
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 32
Eng./Geo.:	NGS	**Boring Location:**	6013+18.37	**Offset:**	L:9.63'	**Alignment:**	Proposed
Elev.:	185.2 ft	**Latitude:**	34.025625	**Longitude:**	-81.098778	**Date Started:**	3/7/2018
Total Depth:	64.3 ft	**Soil Depth:**	39.7 ft	**Core Depth:**	24.6 ft	**Date Completed:**	3/7/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	NQ	**Driller:**	T. Miller	**Groundwater:**	**TOB** 6 ft	**24HR**	10 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0									
	0.4	**SURFACE MATERIALS** - 5 inches of ASPHALT.		0.4						
		ALLUVIUM - SANDY LEAN CLAY (CL) - firm, moist, brown (7.5YR 4/4), mostly low plasticity fines, some fine to medium sands, [LL=49, PL=22, PI=27, NMC=18.9%, %#200=51.4], AASHTO = A-7-6 (10).			SS-1	3	3	4	3	7
				2.4	SS-2	3	2	3	1	5
	4.4			4.4						
180.2		**FAT CLAY WITH SAND (CH)** - stiff, moist, dark gray (7.5YR 4/1), mostly high plasticity fines, little fine to medium sands, trace fine gravel, [LL=77, PL=23, PI=54, NMC=32.9%, %#200=85.8], AASHTO = A-7-6 (51).			SS-3	2	3	8	11	11
	6.4			6.4	SS-4	50/4"-		-	-	100
		PARTIALLY WEATHERED ROCK (PWR) - SILTY SAND (SM) - very dense, moist, pink (2.5YR 8/4) and pinkish-gray (5YR 7/2), mostly fine to meduim sands, little non-plastic fines.		7.5	SS-5	50/2"-		-	-	100
	7.7	Tri-cone bit refusal at 7.7 feet. Install NW Casing to 7.7 feet for NQ wireline coring.		7.7	RC-1					
	9.5			9.5						
175.2		**POSSIBLE BOULDER - GRANITE** - pinkish-white (7.5YR 8/2), coarse grained, moderately weathered, medium strong rock.			SS-6	7	11	14	15	25
		RC-1 : Rec= 50.0%, RQD= 0.0%, GSI= 10-20.								
		PIEDMONT RESIDUUM - SILT (ML) - very stiff, moist, yellowish-red (5YR 4/6) and very dark gray (5YR 3/1), mostly low plasticity fines, few fine sands, [NMC=28.0%, %#200=88.1].		13.5	SS-7	7	8	14		22
170.2										
	17.1									
		SILTY CLAYEY SAND WITH GRAVEL (SC-SM) - dense, moist, yellowish-red (5YR 4/6) and very dark gray (5YR 3/1), mostly fine to coarse sands, some low plasticity fines, little fine gravel-sized rock fragments, [LL=26, PL=19, PI=7, NMC=15.8%, %#200=36.1], AASHTO = A-4		18.5	SS-8	11	15	18		33

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	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-37
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 32
Eng./Geo.:	NGS	**Boring Location:**	6013+18.37	**Offset:**	L:9.63'	**Alignment:**	Proposed
Elev.:	185.2 ft	**Latitude:**	34.025625	**Longitude:**	-81.098778	**Date Started:**	3/7/2018
Total Depth:	64.3 ft	**Soil Depth:**	39.7 ft	**Core Depth:**	24.6 ft	**Date Completed:**	3/7/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	NQ	**Driller:**	T. Miller	**Groundwater:**	**TOB** 6 ft	**24HR**	10 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	SPT N VALUE / PL MC LL / FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
		(0).						
	21.8	**PARTIALLY WEATHERED ROCK (PWR) - SILTY GRAVEL WITH SAND (GM)** - very dense, moist, yellowish-red (5YR 4/6) and very dark gray (5YR 3/1), mostly fine weathered rock fragments, little non-plastic fines, little medium to coarse sands.		22.2	SS-9	26 44 50/5"	100	
160.2								
	27.0	**PIEDMONT RESIDUUM - SILT WITH GRAVEL (ML)** - very hard, moist, brown (10YR 5/3), mostly non-plastic to low plasticity fines, little weathered rock fragments, few fine sands.		28.5	SS-10	17 34 44	78	
155.2								
	32.0	**PARTIALLY WEATHERED ROCK (PWR) - SILT WITH SAND (ML)** - very hard, moist, light brown (7.5YR 6/3) and gray (GLEY 1 5/), mostly low plasticity fines, little fine sands, trace weathered rock fragments.		33.5	SS-11	18 50/5" -	100	
150.2								
				38.5	SS-12	50/4"- -	100	
	39.7	Tri-cone bit refusal at 39.7 feet. Advance		39.7				

LEGEND

Continued Next Page

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

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-37
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 32
Eng./Geo.:	NGS	**Boring Location:**	6013+18.37	**Offset:**	L:9.63'	**Alignment:**	Proposed
Elev.:	185.2 ft	**Latitude:**	34.025625	**Longitude:**	-81.098778	**Date Started:**	3/7/2018
Total Depth:	64.3 ft	**Soil Depth:**	39.7 ft	**Core Depth:**	24.6 ft	**Date Completed:**	3/7/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	NQ	**Driller:**	T. Miller	**Groundwater:**	**TOB** 6 ft	**24HR**	10 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	SPT N VALUE / PL MC LL / FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
		NW casing to 39.7 for NQ wireline coring.						
		For discontinuity descriptors, see discontinuity worksheet.			RC-2			
		<u>METAMORPHIC BEDROCK</u> - SCHIST - gray (GLEY 1 5/) and dark gray (GLEY 1 4/), fine grained, foliated, moderately weathered, medium strong rock, chlorite epidote, low to moderate recovery 39.7 to 49.3 likely due to seams of completed weathered rock or residual soil washed away by drilling process.		44.3				
140.2		RC-2 : Rec= 37.0%, RQD= 0.0%, GSI= 10-20.			RC-3			
		RC-3 : Rec= 70.0%, RQD= 13.3%, GSI= 15-25.						
		@ 47.5 feet - slightly weathered, strong rock.		49.3				
135.2					RC-4			
		RC-4 : Rec= 100.0%, RQD= 30.0%, GSI= 20-30, RMR= 26.		54.3				
130.2		@ 55 feet - moderately weathered, medium strong rock.			RC-5			
		@ 55.8 feet - fine grained to very fine grained, slightly weathered, very strong rock.						
		RC-5 : Rec= 96.0%, RQD= 31.7%, GSI= 20-30, RMR= 26.		59.3				

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	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-37
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 32
Eng./Geo.:	NGS	**Boring Location:**	6013+18.37	**Offset:**	L:9.63'	**Alignment:**	Proposed
Elev.:	185.2 ft	**Latitude:**	34.025625	**Longitude:**	-81.098778	**Date Started:**	3/7/2018
Total Depth:	64.3 ft	**Soil Depth:**	39.7 ft	**Core Depth:**	24.6 ft	**Date Completed:**	3/7/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	NQ	**Driller:**	T. Miller	**Groundwater:**	**TOB** 6 ft	**24HR**	10 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
		RC-6 : Rec= 100.0%, RQD= 80.0%, GSI= 50-60, RMR= 58.			RC-6			
120.2	64.3	Boring Terminated at 64.3 feet.						
115.2								
110.2								

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 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

Rock Core Discontinuity Worksheet

Project Name: Carolina Crossroads I-20/I-26/I-126 Improvement Project
Project Number: 1461-16-047
Driller (Company/Name): S&ME/Miller
Logged By: Nathaniel Shuff
Date: 3/7/2018

Boring Number: B-37
Core Barrel Type: NQ
Core Barrel Length: 5 ft
Coring Technique: Wireline
Number of Core Boxes: 2

Depth (ft)	Disc. No.	Disc. Type	Dip Angle (deg)	Disc. Width (mm)	Infill Amount	Infill Type	Surface Shape	Surface Roughness	Notes
39.4	1	N/A	N/A	W	Pa	Sd/Cl	Ir	R	Fractured zone 39.4' - 40.3'
40.6	2	J	50	VN	Pa	Sd	Pl	SR	
40.8	3	N/A	N/A	N/A	Sp	Fe	Pl	SR	Fractured zone 40.8' - 46.3'
46.8	4	J	50	VN	Sp	Fe	Pl	SR	
47	5	J	50	VN	Sp	Fe	Pl	SR	
47.2	6	J	50	VN	Sp	Fe	Ir	SR	
48.4	7	J	50	VN	Sp	Fe/Sd	Ir	SR	
48.6	8	J	50	N/A	Sp	Fe/Sd	Ir	SR	
49.5	9	J	0	N	Sp	Fe	Ir	SR	
50.2	10	J	0	N	Su	Fe	Ir	R	
50.4	11	J	20	N	Pa	Sd	Ir	R	
50.9	12	J	90	T	Fi	Fe	Pl	SR	
51.9	13	J	10	VN	Pa	Qz/Fe	Pl	SR	
52.3	14	J	60	VN	No	N/A	Pl	SR	
52.6	15	J	10	VN	Su	Fe	Pl	SR	
53.3	16	J	60	VN	Pa	Qz/Fe	Pl	SR	
53.8	17	J	0	VN	Su	Fe	Ir	R	
53.9	18	J	0	VN	Su	Fe	Ir	R	
54.8	19	N/A	N/A	N	Su	Fe	Ir	R	Fractured zone 54.8' - 55.7'
56.2	20	J	60	VN	Pa	Cl/Ca	Pl	SR	
56.7	21	J	60	N	Pa	N/A	Pl	SR	
56.9	22	J	60	VN	Pa	Sd/Cl	Pl	SR	
59.7	23	J	20	N	No	N/A	Pl	R	
59.8	24	J	0	N	Su	Fe	Ir	R	
59.9	25	J	0	N	Su	Fe	Ir	R	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-43
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 33
Eng./Geo.:	AKS	**Boring Location:**	395+13.46	**Offset:**	R:34.908'	**Alignment:**	Proposed
Elev.:	181.0 ft	**Latitude:**	34.024263	**Longitude:**	-81.103418	**Date Started:**	2/26/2018
Total Depth:	73 ft	**Soil Depth:**	53 ft	**Core Depth:**	20 ft	**Date Completed:**	2/26/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	NQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 19.1 ft	**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	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
	0.0										
	0.7	**SURFACE MATERIALS** - 8 inches of CONCRETE BRIDGE DECK.									
176.0		14.8 feet from top of bridge deck to ground surface.									
171.0											
	14.8			14.8							
166.0		**ALLUVIUM - SILTY SAND (SM)** - loose, moist, reddish-brown (5YR 5/4), subangular, mostly fine to medium sands, some non-plastic fines, [LL=NP, PL=NP, PI=NP, NMC=18.6%, %#200=30.7], AASHTO = A-2-4.			SS-1	3	2	3	3	5	
	16.8	**SANDY LEAN CLAY (CL)** - stiff, moist, gray (5YR 5/1), mostly low plasticity fines, some fine to medium sands, [LL=34, PL=19, PI=15, NMC=20.6%, %#200=68.3], AASHTO = A-6 (8).		16.8	SS-2	3	4	5	5	9	
	18.8	**ELASTIC SILT WITH SAND (MH)** - stiff,		18.8	SS-3	6	5	5	5	10	

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	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-43
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 33
Eng./Geo.:	AKS	**Boring Location:**	395+13.46	**Offset:**	R:34.908'	**Alignment:**	Proposed
Elev.:	181.0 ft	**Latitude:**	34.024263	**Longitude:**	-81.103418	**Date Started:**	2/26/2018
Total Depth:	73 ft	**Soil Depth:**	53 ft	**Core Depth:**	20 ft	**Date Completed:**	2/26/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	NQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 19.1 ft	**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
		wet, gray (5YR 5/1), mostly high plasticity fines, little fine to medium sands.		20.8						
					SS-4	5	6	5	5	11
				22.8						
					SS-5	6	6	5	5	11
156.0										
	28.3	**SILTY SAND WITH GRAVEL (SM)** - medium dense, moist, light reddish-brown (5YR 6/3), subangular, mostly fine to medium sands, some non-plastic fines, little fine to medium gravel, [LL=NP, PL=NP, PI=NP, NMC=19.2%, %#200=33.9], AASHTO = A-2-4.		28.3						
151.0					SS-6	8	5	7		12
	33.3	**PARTIALLY WEATHERED ROCK (PWR) - SILTY SAND (SM)** - very dense, moist, bluish-gray (5/5B), mostly fine to medium sands, some low plasticity fines.		33.3						
					SS-7	28	40	50/4"		100
146.0										
				38.3						
					SS-8	50/4"-		-		100

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	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-43
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 33
Eng./Geo.:	AKS	**Boring Location:**	395+13.46	**Offset:**	R:34.908'	**Alignment:**	Proposed
Elev.:	181.0 ft	**Latitude:**	34.024263	**Longitude:**	-81.103418	**Date Started:**	2/26/2018
Total Depth:	73 ft	**Soil Depth:**	53 ft	**Core Depth:**	20 ft	**Date Completed:**	2/26/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	NQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 19.1 ft	**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	SPT N VALUE / PL MC LL / FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
				43.3	SS-9	50/1"- -	100	
136.0								
				48.3	SS-10	50/5"- -	100	
131.0								
	53.0	Tri-Cone Bit Refusal at 53 feet. Install NW Casing to 53 feet for NQ wireline coring.		53.0				
		For discontinuity descriptors, see discontinuity worksheet.			RC-1			
126.0		**METAMORPHIC BEDROCK - SCHIST** - gray (GLEY 1 4/N), fine grained, foliated, highly weathered, weak rock.		55.5				
		RC-1: Rec= 60.0%, RQD= 0.0%, GSI= 25-35.						
		@ 55.5 feet - moderately weathered, medium strong rock.						
		@ 56.2 feet - highly weathered, weak rock.			RC-2			
		@ 56.5 feet - moderatly weathered, medium strong rock.						

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	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-43
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 33
Eng./Geo.:	AKS	**Boring Location:**	395+13.46	**Offset:**	R:34.908'	**Alignment:**	Proposed
Elev.:	181.0 ft	**Latitude:**	34.024263	**Longitude:**	-81.103418	**Date Started:**	2/26/2018
Total Depth:	73 ft	**Soil Depth:**	53 ft	**Core Depth:**	20 ft	**Date Completed:**	2/26/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	NQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 19.1 ft	**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	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
		RC-2: Rec= 100%, RQD= 8.0%, GSI= 35-45.		60.5				
		@ 61.1 feet - completely weathered to residual soil, extremely weak rock.			RC-3			
116.0		@ 64.8 feet - granitic dike, light pink (7.5YR 8/3), coarse grained, slightly weathered, medium strong rock.		65.5				
		RC-3: Rec= 80.0%, RQD= 0.0%, GSI= 30-40.						
		@ 66.5 feet - gray (GLEY 1 4/N), fine grained, foliated.			RC-4			
111.0		RC-4: Rec= 100%, RQD= 31.7%, GSI= 45-55.		70.5				
		@ 71.1 feet - granitic dike, light pink (7.5YR 8/3), coarse grained, fresh, strong rock.			RC-5			
	73.0	@ 72.1 feet - gray (GLEY 1 4/N), fine grained, foliated, slightly weathered, medium strong rock.						
		RC-5: Rec= 100%, RQD= 26.7%, GSI= 45-55.						
		Boring Terminated at 73 feet.						
106.0								

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	

Rock Core Discontinuity Worksheet

Project Name: Carolina Crossroads I-20/I-26/I-126 Improvement Project
Project Number: 1461-16-047
Driller (Company/Name): S&ME/Millwood
Logged By: Austin Syms
Date: 2/26/2018

Boring Number: B-43
Core Barrel Type: NQ
Core Barrel Length: 5 ft
Coring Technique: Wireline
Number of Core Boxes: 2

Depth (ft)	Disc. No.	Disc. Type	Dip Angle (deg)	Disc. Width (mm)	Infill Amount	Infill Type	Surface Shape	Surface Roughness	Notes
53	1	J	N/A	N/A	No	N/A	Ir	SR	Fractured zone 53' - 55.5'
55.9	2	J	15	W	No	N/A	Ir	SR	
56.2	3	J	N/A	N/A	No	N/A	Ir	SR	Fractured zone 56.2' - 56.5'
26.6	4	J	15	MW	No	N/A	Ir	SR	
26.9	5	J	10	W	No	N/A	Pl	SR	
57.3	6	J	10	VN	No	N/A	Ir	SR	
57.5	7	J	N/A	N/A	No	N/A	Pl	SR	Fractured zone 57.5' - 58'
58.1	8	J	0	N/A	No	N/A	Ir	SR	
58.5	9	J	15	N/A	No	N/A	Pl	SR	
59	10	J	25	N/A	No	N/A	Pl	SR	
59.1	11	J	0	N/A	No	N/A	N/A	SR	
59.5	12	J	N/A	N/A	No	N/A	St	SR	Fractured zone 59.5' - 64.8'
65	13	J	20	VN	No	N/A	Pl	SR	
65.2	14	J	45	VN	No	N/A	Ir	SR	
65.7	15	J	40	N	No	N/A	Ir	SR	
66.5	16	J	10	N/A	No	N/A	Ir	SR	Fractured zone 66.5' - 67.5'
67.8	17	J	20	W	No	N/A	Pl	SR	
69	18	J	10	MW	No	N/A	Pl	SR	
69.6	19	J	15	N	No	N/A	Pl	SR	
69.7	20	J	N/A	N/A	No	N/A	Ir	SR	Fractured zone 69.7' - 71'
72	21	J	N/A	N/A	No	N/A	Ir	SR	Fractured zone 72' - 73'

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-44
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 33
Eng./Geo.:	AKS	**Boring Location:**	398+36.32	**Offset:**	L:98.897'	**Alignment:**	Proposed
Elev.:	165.5 ft	**Latitude:**	34.023303	**Longitude:**	-81.103422	**Date Started:**	3/21/2018
Total Depth:	26.2 ft	**Soil Depth:**	6.2 ft	**Core Depth:**	20 ft	**Date Completed:**	3/22/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	NQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 4.8 ft	**24HR**	0.9 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0									
	0.4	**SURFACE MATERIALS** - 5 inches of TOPSOIL.		0.0	SS-1	3	4	6	4	10
		ALLUVIUM - SANDY SILTY CLAY (CL-ML) - stiff, moist, pale brown (10YR 6/3), mostly low plasticity fines, some fine sands, [LL=25, PL=19, PI=6, NMC=16.6%, %#200=59.6], AASHTO = A-4 (1).		2.0	SS-2	4	5	7	7	12
		@ 4 feet - very stiff.		4.0	SS-3	7	8	10	50/1"	18
160.5										
	6.0			6.0	SS-4	50/0"	-	-	-	100
	6.2	**PARTIALLY WEATHERED ROCK (PWR)** - no recovery. Tri-Cone Bit Refusal at 6.2 feet. Install NW Casing to 6.2 feet for NQ wireline coring.		6.2						
		For discontinuity descriptors, see discontinuity worksheet.			RC-1					
155.5		**IGNEOUS BEDROCK - GRANITE** - pale red (7.5YR 6/4), coarse grained, massive slightly weathered, strong rock.								
		RC-1 : Rec= 100%, RQD= 30.0%, GSI= 45-55, RMR = 53.		11.2						
		@ 11.2 feet - fresh, very strong rock.			RC-2					
150.5										
		@ 15.8 feet - slightly weathered, strong rock.		16.2						
		RC-2 : Rec= 100%, RQD= 18.3%, GSI= 45-55, RMR = 53.			RC-3					

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	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-44
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 33
Eng./Geo.:	AKS	**Boring Location:**	398+36.32	**Offset:**	L:98.897'	**Alignment:**	Proposed
Elev.:	165.5 ft	**Latitude:**	34.023303	**Longitude:**	-81.103422	**Date Started:**	3/21/2018
Total Depth:	26.2 ft	**Soil Depth:**	6.2 ft	**Core Depth:**	20 ft	**Date Completed:**	3/22/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	NQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 4.8 ft	**24HR**	0.9 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
		RC-3 : Rec= 100%, RQD= 40.0%, GSI= 45-55, RMR = 37.		21.2				
	22.2	**QUARTZ DIKE** - white (10R 8/1), massive, moderately weathered, massive strong rock.						
	23.0	**GRANITE** - pale red (7.5YR 6/4), coarse grained, slightly weathered, strong rock.			RC-4			
140.5								
	26.2	RC-4 : Rec= 94.0%, RQD= 25.0%, GSI= 45-55.						
		Boring Terminated at 26.2 feet.						
135.5								
130.5								

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 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

Rock Core Discontinuity Worksheet

Project Name: Carolina Crossroads I-20/I-26/I-126 Improvement Project
Project Number: 1461-16-047
Driller (Company/Name): S&ME/Millwood
Logged By: Austin Syms
Date: 3/21/2018

Boring Number: B-44
Core Barrel Type: NQ
Core Barrel Length: 5 ft
Coring Technique: Wireline
Number of Core Boxes: 2

Depth (ft)	Disc. No.	Disc. Type	Dip Angle (deg)	Disc. Width (mm)	Infill Amount	Infill Type	Surface Shape	Surface Roughness	Notes
6.3	1	J	71	N	Pa	Sd	Pl	SR	
6.7	2	J	44	VN	Pa	Sd	Pl	SR	
7	3	J	40	N	Pa	Sd	Pl	SR	
7.4	4	J	86	VN	Pa	Sd	Pl	SR	
7.7	5	J	63	T	Pa	Sd	Pl	SR	
8	6	J	48	W	Pa	Sd	Pl	SR	
8.5	7	J	20	VN	Pa	Sd	Pl	SR	
9.1	8	J	45	T	No	N/A	St	SR	
9.7	9	J	40	VN	Pa	Sd	St	SR	
9.9	10	J	54	T	No	N/A	Pl	SR	
10.1	11	J	53	VN	Pa	Sd	Pl	SR	
10.8	12	J	24	N	Pa	Sd	Pl	SR	
11.2	13	J	84	T	No	N/A	Wa	SR	
11.6	14	J	39	T	Pa	Sd	Pl	SR	
12.3	15	J	45	T	No	N/A	Pl	SR	
12.7	16	J	37	T	No	N/A	Pl	R	
13.4	17	J	88	T	No	N/A	Pl	SR	
13.6	18	J	29	T	Pa	Sd	Pl	SR	
13.8	19	J	26	VN	Pa	Sd	Pl	SR	
15	20	J	9	N	Pa	Sd	Pl	SR	
17	21	J	41	T	No	N/A	Pl	SR	
18	22	J	40	VN	Pa	Sd	Pl	SR	
18.1	23	J	39	T	No	N/A	Pl	R	
18.8	24	J	14	VN	Pa	Sd	Pl	SR	
20	25	J	35	T	Pa	Sd	Pl	SR	
20.2	26	J	22	VN	Pa	Sd	Pl	SR	
20.7	27	J	10	VN	Pa	Sd	Pl	SR	
22.7	28	J	32	T	No	N/A	Pl	SR	
23.1	29	J	17	T	No	N/A	Pl	R	
23.2	30	J	N/A	N/A	No	N/A	Ir	SR	Fractured zone 23.2' - 24.2'
24.9	31	J	50	VN	No	N/A	Pl	SR	
25.2	32	J	36	N	Pa	Sd	Pl	SR	
25.5	33	J	31	N	No	N/A	Pl	SR	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-45
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 33
Eng./Geo.:	ELF	**Boring Location:**	401+11.44	**Offset:**	L:76.366'	**Alignment:**	Proposed
Elev.:	183.3 ft	**Latitude:**	34.022629	**Longitude:**	-81.103841	**Date Started:**	2/8/2018
Total Depth:	47 ft	**Soil Depth:**	27 ft	**Core Depth:**	20 ft	**Date Completed:**	2/8/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	NQ	**Driller:**	T. Miller	**Groundwater:**	**TOB** 12 ft	**24HR**	10.7 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0									
	0.8	**SURFACE MATERIALS** - 10 inches of ASPHALT.		0.8						
		FILL - SILTY CLAYEY SAND (SC-SM) - medium dense, wet, strong brown (7.5YR 5/8), mostly fine to medium sands, little low plasticity fines, trace fine gravel, [LL=20, PL=16, PI=4, NMC=11.0%, %#200=24.0], AASHTO = A-2-4.			SS-1	7	10	10	8	20
	2.8			2.8	SS-2	7	50/5"	-	-	100
		PARTIALLY WEATHERED ROCK (PWR) - SILTY SAND (SM) - very dense, wet, black (7.5YR 2.5/1) and light brown (7.5YR 6/3), mostly fine sands, little low plasticity fines.		4.8	SS-3	50/2"	-	-	-	100
178.3		@ 4.8 feet - yellowish-red (7.5YR 6/6), mostly fine to coarse sands, weathered rock fragments.		6.8	SS-4	50/1"	-	-	-	100
		@ 6.8 feet - no recovery.		8.8	SS-5	50/2"	-	-	-	100
173.3										
				13.5	SS-6	50/1"	-	-	-	100
		@ 13.5 feet - no recovery.								
168.3										
				18.5	SS-7	50/3"	-	-	-	100

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	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-45
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 33
Eng./Geo.:	ELF	**Boring Location:**	401+11.44	**Offset:**	L:76.366'	**Alignment:**	Proposed
Elev.:	183.3 ft	**Latitude:**	34.022629	**Longitude:**	-81.103841	**Date Started:**	2/8/2018
Total Depth:	47 ft	**Soil Depth:**	27 ft	**Core Depth:**	20 ft	**Date Completed:**	2/8/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	NQ	**Driller:**	T. Miller	**Groundwater:**	**TOB** 12 ft	**24HR**	10.7 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	SPT N VALUE / PL MC LL / FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
				23.5	SS-8	25 50/1" -	100	
158.3	27.0	Tri-Cone Bit Refusal at 27.0 feet. Install NW Casing to 27.0 feet for NQ wireline coring.		27.0				
		For discontinuity descriptors, see discontinuity worksheet.			RC-1			
153.3		**IGNEOUS BEDROCK - GRANITE** - reddish-brown (2.5YR 5/4), coarse grained to fine grained, massive, slightly weathered, strong rock.		30.4				
		RC-1: Rec= 67.6%, RQD= 21.4%, GSI= 70-80.			RC-2			
148.3		RC-2: Rec= 100%, RQD= 75.0%, GSI= 70-80, RMR = 42.		35.4				
		@ 35.4 feet - fresh, very strong rock.			RC-3			

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	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-45
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 33
Eng./Geo.:	ELF	**Boring Location:**	401+11.44	**Offset:**	L:76.366'	**Alignment:**	Proposed
Elev.:	183.3 ft	**Latitude:**	34.022629	**Longitude:**	-81.103841	**Date Started:**	2/8/2018
Total Depth:	47 ft	**Soil Depth:**	27 ft	**Core Depth:**	20 ft	**Date Completed:**	2/8/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	NQ	**Driller:**	T. Miller	**Groundwater:**	**TOB** 12 ft	**24HR**	10.7 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
		RC-3: Rec= 100%, RQD= 76.7%, GSI= 70-80, RMR = 45.		40.4				
					RC-4			
		RC-4: Rec= 100%, RQD= 100%, GSI= 70-80.		42.0				
				42.5	RC-5			
		RC-5: Rec= 100%, RQD= 100%, GSI= 70-80.						
					RC-6			
138.3		@ 44.8 feet - slightly weathered, medium strong rock.		45.5				
		RC-6: Rec= 100%, RQD= 90.3%, GSI= 70-80, RMR = 45.			RC-7			
	47.0	@ 46.3 feet - moderately weathered.						
		RC-7: Rec= 100%, RQD= 100%, GSI= 70-80.						
		Boring Terminated at 47 feet.						
133.3								
128.3								

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	

Rock Core Discontinuity Worksheet

Project Name: Carolina Crossroads I-20/I-26/I-126 Improvement Project
Project Number: 1461-16-047
Driller (Company/Name): S&ME/Miller
Logged By: Lehe Fender
Date: 2/8/2018

Boring Number: B-45
Core Barrel Type: NQ
Core Barrel Length: 5 ft
Coring Technique: Wireline
Number of Core Boxes: 2

Depth (ft)	Disc. No.	Disc. Type	Dip Angle (deg)	Disc. Width (mm)	Infill Amount	Infill Type	Surface Shape	Surface Roughness	Notes
27.1	1	J	17	MW	Su	Fe	Pl	SR	
27.3	2	J	15	MW	Su	Fe	Pl	SR	
27.4	3	J	38	MW	No	N/A	Pl	S	
27.9	4	J	90	MW	Su	Fe	Pl	SR	Fractured zone 27.9' to 29.2'
31.9	5	J	61	N	Su	Fe	Pl	S	
32.9	6	J	18	MW	No	N/A	Pl	SR	
33.7	7	J	N/A	W	Su	Fe	Pl	N/A	Fractured zone 33.7' to 34.2'
34.9	8	J	40	W	Su	Fe	Pl	SR	Fractured zone 34.9' to 35.3'
35.3	9	J	5	MW	Su	Fe	Pl	SR	
35.9	10	J	12	N	No	N/A	Ir	SR	
36.2	11	V	67	W	Fi	Qz	Pl	N/A	
37.2	12	J	50	N	No	N/A	Pl	SR	Fractured zone 37.2' to 37.5'
38.6	13	J	5	MW	No	N/A	Pl	SR	
38.7	14	J	83	N	No	N/A	Pl	SR	Fractured zone 38.7' to 39.6'
40	15	J	5	N	No	N/A	Pl	SR	
40.8	16	V	40	W	Fi	Qz	Pl	N/A	
41.9	17	J	5	W	No	N/A	Ir	R	Fractured zone 41.9' to 42'
43.4	18	J	N/A	MW	No	N/A	Pl	SR	
43.7	19	J	64	VN	Su	Fe	Pl	S	
44.4	20	J	11	N	No	N/A	Ir	SR	Fractured zone 44.4' to 44.8'
46.3	21	J	N/A	W	Su	Fe	Ir	R	Fractured zone 46.3' to 46.4'
46.7	22	J	N/A	N	No	N/A	Pl	SR	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-46
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 32
Eng./Geo.:	NGS	**Boring Location:**	5987+47.92	**Offset:**	L:48.77'	**Alignment:**	Proposed
Elev.:	168.9 ft	**Latitude:**	34.022548	**Longitude:**	-81.104982	**Date Started:**	4/2/2018
Total Depth:	48.6 ft	**Soil Depth:**	23.6 ft	**Core Depth:**	25 ft	**Date Completed:**	4/3/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	NQ	**Driller:**	T. Miller	**Groundwater:**	**TOB** 6 ft	**24HR**	8 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0									
	0.2	**SURFACE MATERIALS** - 2 inches of TOPSOIL.		0.0	SS-1	4	3	3	3	6
		PIEDMONT RESIDUUM - LEAN CLAY WITH SAND (CL) - firm, moist, brown (7.5YR 5/5) and strong brown (7.5YR 5/6), mostly low plasticity fines, little fine sands, micaceous, [LL=32, PL=21, PI=11, NMC=28.7%, %#200=80], AASHTO = A-6 (8).		2.0	SS-2	4	6	6	8	12
		@ 2 feet - stiff, brown (7.5YR 5/5), trace organics, [LL=32, PL=19, PI=13, NMC=20.7%, %#200=73], AASHTO = A-6 (8).		4.0	SS-3	8	11	10	9	21
163.9		@ 4 feet - very stiff.		6.0	SS-4	8	10	11	9	21
				8.0	SS-5	9	8	9	8	17
158.9										
	13.0	**PARTIALLY WEATHERED ROCK (PWR) - SILTY SAND (SM)** - very dense, moist, gray (GLEY 1 5/), mostly fine to medium sands, little low plasticity fines, trace weathered rock fragments, relict rock structure.		13.5	SS-6	23	39	50/3"		100
153.9										
	18.5			18.5	SS-7	50/1"				100
	18.6	**POORLY GRADED SAND (SP)** - very dense, moist, light red (2.5YR 6/8), mostly fine to medium sands, trace non-plastic fines.		18.6						

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:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-46
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 32
Eng./Geo.:	NGS	**Boring Location:**	5987+47.92	**Offset:**	L:48.77'	**Alignment:**	Proposed
Elev.:	168.9 ft	**Latitude:**	34.022548	**Longitude:**	-81.104982	**Date Started:**	4/2/2018
Total Depth:	48.6 ft	**Soil Depth:**	23.6 ft	**Core Depth:**	25 ft	**Date Completed:**	4/3/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	NQ	**Driller:**	T. Miller	**Groundwater:**	**TOB** 6 ft	**24HR**	8 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value
		Tri-Cone Bit Refusal at 18.6 feet. Install NW Casing to 18.6 feet for NQ wireline coring.		RC-1		
		For discontinuity descriptors, see discontinuity worksheet.				
		IGNEOUS BEDROCK - GRANITE - light red (10R 7/6), coarse grained, highly weathered, extremely weak rock, possible boulder.	23.6			
143.9		RC-1: Rec= 6.0%, RQD= 0.0%, GSI= 10-20.		RC-2		
	28.6	RC-2: Rec= 6.0%, RQD= 0.0%, GSI= 10-20.	28.6			
		Switched back to Tri-Cone Bit at 28.6 feet. SPT mud rotary drilling to 33.6 feet.		SS-8	26 12 50	62
138.9		**PIEDMONT RESIDUUM - SILTY SAND (SM)** - very dense, moist, light red (2.5YR 6/8), mostly fine to medium sands, little non-plastic fines.				
		Tri-Cone Bit Refusal at 33.6 feet. Install NW Casing to 33.6 feet for NQ wireline coring.	33.5	SS-9	50/0"- -	100
	33.6	**IGNEOUS BEDROCK - GRANITE** - light red (10R 7/6), coarse grained, slightly weathered, medium strong rock.	33.6			
133.9		@ 34.8 feet - strong rock.		RC-3		
		RC-3: Rec= 94.0%, RQD= 35.0%, GSI= 50-60.	38.6			

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	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-46
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 32
Eng./Geo.:	NGS	**Boring Location:**	5987+47.92	**Offset:**	L:48.77'	**Alignment:**	Proposed
Elev.:	168.9 ft	**Latitude:**	34.022548	**Longitude:**	-81.104982	**Date Started:**	4/2/2018
Total Depth:	48.6 ft	**Soil Depth:**	23.6 ft	**Core Depth:**	25 ft	**Date Completed:**	4/3/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	NQ	**Driller:**	T. Miller	**Groundwater:**	**TOB** 6 ft	**24HR**	8 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
		RC-4: Rec= 100%, RQD= 38.3%, GSI= 50-60.		43.6	RC-4			
		@ 43.3 feet - quartzite dike, gray (GLEY 1 5/N), very fine grained, fresh.						
123.9		@ 43.6 feet - light red (10R 7/6), coarse grained, slightly weathered.			RC-5			
		@ 45.1 feet - quartzite dike, gray (GLEY 1 5/N), very fine grained, fresh.		46.6				
		RC-5: Rec= 100%, RQD= 38.9%, GSI= 55-65.						
		@ 46.6 feet - light red (10R 7/6), coarse grained, slightly weathered, medium strong rock.			RC-6			
	48.6	RC-6: Rec= 95.0%, RQD= 0.0%, GSI= 55-65.						
118.9		Boring Terminated at 48.6 feet.						
113.9								

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	

Rock Core Discontinuity Worksheet

Project Name: Carolina Crossroads I-20/I-26/I-126 Improvement Project
Project Number: 1461-16-047
Driller (Company/Name): S&ME/Miller
Logged By: Nat Shuff
Date: 4/3/2018

Boring Number: B-46
Core Barrel Type: NQ
Core Barrel Length: 5 ft
Coring Technique: Wireline
Number of Core Boxes: 2

Depth (ft)	Disc. No.	Disc. Type	Dip Angle (deg)	Disc. Width (mm)	Infill Amount	Infill Type	Surface Shape	Surface Roughness	Notes
18.6	1	N/A	N/A	W	Pa/Fi	Sd	Ir	SR	Fractured zone 18.6' - 28.6'
35.2	2	J	30	VN	No	N/A	Ir	SR	
35.6	3	J	20	T	Su	Cl	Wa	SR	
36.6	4	J	40	MW	Pa	Cl/Sd	Ir	R	
37.9	5	J	0	VN	Pa	Sd	Ir	R	
38.2	6	J	0	VN	Pa	Sd	Ir	R	
38.4	7	J	0	VN	No	N/A	Ir	R	
38.8	8	J	70	VN	Su	Fe	Wa	SR	
40	9	J	55	VN	Su	Fe	Wa	SR	
40.3	10	J	90	VN	Su	Fe	Wa	SR	
40.4	11	J	0	N	No	N/A	Ir	R	
41.4	12	N/A	N/A	W	Pa	Sd	Ir	R	Fractured zone 41.4' - 42'
42.4	13	J	50	VN	Su	Fe/Cl	Wa	SR	
43.6	14	J	0	N	Su	Fe	Wa	SR	
44.1	15	J	20	N	Su	Fe	Wa	SR	
44.6	16	J	40	N	Su	Fe	Wa	SR	
44.9	17	J	0	VN	Su	Fe	Ir	R	
45	18	N/A	N/A	N/A	No	N/A	Ir	R	Fractured zone 45' - 46.5'
46.6	19	J	0	VN	Su	Fe	Ir	R	
47.1	20	J	70	VN	Su	Fe	Ir	R	
47.9	21	J	0	VN	No	N/A	Ir	SR	
48.2	22	J	0	VN	No	N/A	Ir	SR	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-62
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 32
Eng./Geo.:	AKS	**Boring Location:**	5996+61.92	**Offset:**	L:82.84'	**Alignment:**	Proposed
Elev.:	167.2 ft	**Latitude:**	34.024985	**Longitude:**	-81.103943	**Date Started:**	4/10/2018
Total Depth:	45.7 ft	**Soil Depth:**	23.7 ft	**Core Depth:**	22 ft	**Date Completed:**	4/12/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	NQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 5.8 ft	**24HR**	5.8 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0									
	0.1	**SURFACE MATERIALS** - 1 inch of TOPSOIL.		0.0	SS-1	2	2	2	3	4
	2.0	**ALLUVIUM - SANDY LEAN CLAY (CL)** - soft, moist, red (2.5YR 5/6), mostly low plasticity fines, some fine sands, [LL=25, PL=16, PI=9, NMC=19.6%, %#200=56], AASHTO = A-4 (2).		2.0	SS-2	4	5	5	6	10
162.2		**SILTY SAND (SM)** - loose, moist, brownish-yellow (10YR 6/6), mostly fine sands, little non-plastic fines, trace mica, [LL=NP, PL=NP, PI=NP, NMC=11.2%, %#200=17], AASHTO = A-2-4.		4.0	SS-3	6	5	5	6	10
		@ 6 feet - medium dense.		6.0	SS-4	6	8	8	10	16
	8.0	**PIEDMONT RESIDUUM - SILT WITH SAND (ML)** - very stiff, moist, brownish-yellow (10YR 6/6), mostly low plasticity fines, little fine sands, [LL=45, PL=30, PI=15, NMC=27.1%, %#200=81], AASHTO = A-7-5 (14).		8.0	SS-5	7	7	9	8	16
157.2		@ 9 feet - wet, light brownish-gray (10YR 6/2).								
	13.5	**PARTIALLY WEATHERED ROCK (PWR) - SANDY SILT (ML)** - very hard, moist, light brownish-gray (10YR 6/2), mostly low plasticity fines, some fine sands.		13.5	SS-6	36	50/4"	-		100
152.2										
	18.5	**PIEDMONT RESIDUUM - SANDY SILT (ML)** - very stiff, moist, light brownish-gray (10YR 6/2), mostly low plasticity fines, some fine sands.		18.5	SS-7	15	25	43		68

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	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-62
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 32
Eng./Geo.:	AKS	**Boring Location:**	5996+61.92	**Offset:**	L:82.84'	**Alignment:**	Proposed
Elev.:	167.2 ft	**Latitude:**	34.024985	**Longitude:**	-81.103943	**Date Started:**	4/10/2018
Total Depth:	45.7 ft	**Soil Depth:**	23.7 ft	**Core Depth:**	22 ft	**Date Completed:**	4/12/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	NQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 5.8 ft	**24HR**	5.8 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	SPT N VALUE / PL MC LL / FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
	23.5			23.5	SS-8	50/0"- -	100	
	23.7	no recovery		23.7				
		Tri-Cone Bit Refusal at 23.7 feet. Install NW Casing to 23.7 feet for NQ wireline coring.			RC-1			
142.2		For discontinuity descriptors, see discontinuity worksheet.		25.7				
		<u>METAMORPHIC BEDROCK</u> - SCHIST - gray (GLEY 1 4/), fine grained, foliated, moderately weathered, medium strong rock.			RC-2			
		RC-1: Rec= 35.0%, RQD= 0.0%, GSI= 10-20.						
		@ 28 feet - residual soil.						
137.2		@ 29.1 feet - moderately weathered, medium strong rock.		30.7				
		RC-2: Rec= 56.0%, RQD= 0.0%, GSI= 10-20.			RC-3			
132.2		RC-3: Rec= 36.0%, RQD= 0.0%, GSI= 10-20.		35.7				
		@ 35.7 feet - trace manganese coating on fractures, some epidote alteration.			RC-4			

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	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-62
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 32
Eng./Geo.:	AKS	**Boring Location:**	5996+61.92	**Offset:**	L:82.84'	**Alignment:**	Proposed
Elev.:	167.2 ft	**Latitude:**	34.024985	**Longitude:**	-81.103943	**Date Started:**	4/10/2018
Total Depth:	45.7 ft	**Soil Depth:**	23.7 ft	**Core Depth:**	22 ft	**Date Completed:**	4/12/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	NQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 5.8 ft	**24HR**	5.8 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
		RC-4: Rec= 40.0%, RQD= 0.0%, GSI= 10-20.		40.7				
		@ 41 feet - slightly weathered.			RC-5			
		RC-5: Rec= 100%, RQD= 0.0%, GSI= 20-30.		43.7				
		@ 43.7 feet - epidote alteration.			RC-6			
122.2		RC-6: Rec= 100%, RQD= 50.0%, GSI= 30-40.						
	45.7	Boring Terminated at 45.7 feet.						
117.2								
112.2								

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 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

Rock Core Discontinuity Worksheet

Project Name: Carolina Crossroads I-20/I-26/I-126 Improvement Project
Project Number: 1461-16-047
Driller (Company/Name): S&ME/Millwood
Logged By: Austin Syms
Date: 4/10/2018

Boring Number: B-62
Core Barrel Type: NQ
Core Barrel Length: 5 ft
Coring Technique: Wireline
Number of Core Boxes: 1

Depth (ft)	Disc. No.	Disc. Type	Dip Angle (deg)	Disc. Width (mm)	Infill Amount	Infill Type	Surface Shape	Surface Roughness	Notes
23.7	1	N/A	N/A	N/A	Pa	Fe	Ir	SR	Fractured zone 23.7' - 26.3'
26.5	2	J	44	T	Pa	Fe	St	SR	
26.6	3	N/A	N/A	N/A	Pa	Cl/Fe	Ir	SR	Fractured zone 26.6' - 29.3'
29.3	4	J	56	VN	Pa	Fe	Pl	SR	
29.5	5	N/A	N/A	N/A	No	N/A	Ir	SR	Fractured zone 29.5' - 30'
30.6	6	N/A	N/A	N/A	No	N/A	Ir	SR	Fractured zone 30.6' - 31'
31.4	7	N/A	N/A	N/A	Pa	Fe	Ir	SR	Fractured zone 31.4' - 43'
43.1	8	J	18	VN	No	N/A	Ir	SR	
44.1	9	J	62	N	No	N/A	Pl	SR	
44.7	10	J	42	T	No	N/A	Pl	SR	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	W-22
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-26
Eng./Geo.:	ELF	**Boring Location:**	407+18.51	**Offset:**	L:77.239'	**Alignment:**	Proposed
Elev.:	185.9 ft	**Latitude:**	34.021085	**Longitude:**	-81.104590	**Date Started:**	2/7/2018
Total Depth:	79.1 ft	**Soil Depth:**	79.1 ft	**Core Depth:**	0 ft	**Date Completed:**	2/7/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	N/A	**Driller:**	T. Miller	**Groundwater:**	**TOB** 13 ft	**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	SPT N VALUE / PL MC LL / FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
	0.0										
	0.3	**SURFACE MATERIALS** - 2 inches of TOPSOIL.		0.0	SS-1	2	3	3	2	6	
	2.0	**PIEDMONT RESIDUUM - SILTY CLAYEY SAND (SC-SM)** - loose, moist, very pale brown (10YR 7/3), subangular, mostly fine to medium sands, little low plasticity fines, [LL=20, PL=14, PI=6, NMC=14.8%, %#200=23.8], AASHTO = A-2-4.		2.0	SS-2	4	6	6	6	12	
180.9		**CLAYEY SAND (SC)** - medium dense, moist, gray to brown (10YR 5/1 to 5/3), subangular, mostly fine to coarse sands, some plastic fines, trace weathered rock fragments.		4.0	SS-3	4	5	5	5	10	
	6.0	@ 4 feet - loose, brownish yellow (10YR 6/6).		6.0	SS-4	3	3	3	4	6	
		SILTY SAND (SM) - loose, moist, reddish yellow (5YR 6/6), mostly fine to coarse sands, some low plasticity fines, [LL=36, PL=25, PI=11, NMC=20.4%, %#200=44.6], AASHTO = A-6 (2).		8.0	SS-5	3	5	4	4	9	
175.9											
	13.5			13.5	SS-6	14	11	7		18	
170.9	15.0	**SILTY CLAYEY SAND (SC-SM)** - medium dense, wet, reddish yellow (5YR 6/6), subangular, mostly fine to coarse sands, little low plasticity fines, few weathered rock fragments, [LL=30, PL=23, PI=7, NMC=22.7%, %#200=21.2], AASHTO = A-2-4. Tri-Cone Bit Refusal at 15 feet. Install NW Casing to 15 feet for NQ wireline coring.		15.0	RC-1						
				15.5	RC-2						
				16.5	RC-3						
	17.5	For discontinuity descriptors, see discontinuity worksheet.		18.5							
		POSSIBLE BOULDER - GRANITE - reddish-gray (5YR 5/2), coarse grained, massive, moderately weathered, strong			SS-7	7	10	14		24	

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:	P027662			**County:**	Lexington/Richland	**Boring No.:**	W-22
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-26
Eng./Geo.:	ELF	**Boring Location:**	407+18.51	**Offset:**	L:77.239'	**Alignment:**	Proposed
Elev.:	185.9 ft	**Latitude:**	34.021085	**Longitude:**	-81.104590	**Date Started:**	2/7/2018
Total Depth:	79.1 ft	**Soil Depth:**	79.1 ft	**Core Depth:**	0 ft	**Date Completed:**	2/7/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	N/A	**Driller:**	T. Miller	**Groundwater:**	**TOB** 13 ft	**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	SPT N VALUE / PL MC LL / FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
		rock. RC-1: Rec= 80.0%, RQD= 0.0%, GSI= 75-85. @ 15.5 feet - completely weathered. RC-2: Rec= 20.0%, RQD= 0.0%, GSI= 75-85. @ 16.7 feet - slightly weathered, very strong rock. RC-3: Rec= 90.0%, RQD= 67.0%, GSI= 75-85, RMR = 62. Low to moderate recoveries likely due to seams of completely weathered rock or residual soil washed away by drilling process.		23.5	SS-8	13 13 12	25	
160.9		**SILTY SAND (SM)** - medium dense, moist, light gray (10YR 7/1), subangular, mostly fine to coarse sands, little non-plastic fines, few weathered rock fragments. @ 23.5 feet - pale brown (10YR 6/3), absent weathered rock fragments, [LL=NP, PL=NP, PI=NP, NMC=16.5%, %#200=20.6], AASHTO = A-2-4.		28.5	SS-9	14 20 22	42	
155.9		@ 28.5 feet - dense.		33.5	SS-10	33 44 50	94	
150.9		@ 33.5 feet - very dense, trace mica.						
	38.5	**PARTIALLY WEATHERED ROCK (PWR) - SILTY SAND (SM)** - very dense, moist, light yellowish brown (10YR 6/4), few non-plastic fines, moslty fine to coarse		38.5	SS-11	50/5" - -	100	

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:	P027662			**County:**	Lexington/Richland	**Boring No.:**	W-22
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-26
Eng./Geo.:	ELF	**Boring Location:**	407+18.51	**Offset:**	L:77.239'	**Alignment:**	Proposed
Elev.:	185.9 ft	**Latitude:**	34.021085	**Longitude:**	-81.104590	**Date Started:**	2/7/2018
Total Depth:	79.1 ft	**Soil Depth:**	79.1 ft	**Core Depth:**	0 ft	**Date Completed:**	2/7/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	N/A	**Driller:**	T. Miller	**Groundwater:**	**TOB** 13 ft	**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	SPT N VALUE / PL MC LL / FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
		sands.						
		@ 43.5 feet - yellowish brown (10YR 5/4).		43.5	SS-12	4 7 50/2" -	100	
140.9								
		@ 48.5 feet - very pale brown to brown (10YR 7/3 to 5/3).		48.5	SS-13	3 9 50/5" -	100	
135.9								
				53.5	SS-14	50/1" -	100	
130.9								
		@ 58.5 feet - no recovery.		58.5	SS-15	50/1" -	100	

LEGEND

Continued Next Page

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

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	W-22
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-26
Eng./Geo.:	ELF	**Boring Location:**	407+18.51	**Offset:**	L:77.239'	**Alignment:**	Proposed
Elev.:	185.9 ft	**Latitude:**	34.021085	**Longitude:**	-81.104590	**Date Started:**	2/7/2018
Total Depth:	79.1 ft	**Soil Depth:**	79.1 ft	**Core Depth:**	0 ft	**Date Completed:**	2/7/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	N/A	**Driller:**	T. Miller	**Groundwater:**	**TOB** 13 ft	**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
		@ 63.5 feet - no recovery.		63.5	SS-16	50/1"	-	-		100
120.9										
		@ 68.5 feet - no recovery.		68.5	SS-17	50/0"	-	-		100
115.9										
				73.5	SS-18	50/1"	-	-		100
110.9										
				78.5	SS-19	50/0"	-	-		100
	79.1	Boring Terminated at 79.1 feet due to Tri-Cone bit refusal.								

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 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

Rock Core Discontinuity Worksheet

Project Name: Carolina Crossroads I-20/I-26/I-126 Improvement Project
Project Number: 1461-16-047
Driller (Company/Name): S&ME/Miller
Logged By: Lehe Fender
Date: 2/7/2018

Boring Number: W-22
Core Barrel Type: NQ
Core Barrel Length: 5 ft
Coring Technique: Wireline
Number of Core Boxes: 1

Depth (ft)	Disc. No.	Disc. Type	Dip Angle (deg)	Disc. Width (mm)	Infill Amount	Infill Type	Surface Shape	Surface Roughness	Notes
14.6	1	J	5	W	No	N/A	Pl	SR	
16.2	2	J	20	W	No	N/A	Ir	SR	Fractured zone 16.2' to 16.3'

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	W-23
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 32
Eng./Geo.:	NGS	**Boring Location:**	6022+73.17	**Offset:**	L:53.37'	**Alignment:**	Proposed
Elev.:	185.6 ft	**Latitude:**	34.023770	**Longitude:**	-81.096544	**Date Started:**	3/5/2018
Total Depth:	28.6 ft	**Soil Depth:**	15.9 ft	**Core Depth:**	10.1 ft	**Date Completed:**	3/5/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	NQ	**Driller:**	T. Miller	**Groundwater:**	**TOB** 10.2 ft	**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									
	0.2	**SURFACE MATERIALS** - 2 inches of ASPHALT.		0.2						
		ALLUVIUM - CLAYEY SAND WITH GRAVEL (SC) - loose, moist, red (2.5YR 5/8), light gray (7.5YR 7/1) and reddish-yellow (7.5YR 6/6), mostly fine to medium sands, some low to medium plasticity fines, little fine gravel, [LL=29, PL=14, PI=15, NMC=17.2%, %#200=35.4], AASHTO = A-2-6 (1).			SS-1	2	2	3	2	5
		@ 2.2 feet - medium dense.		2.2						
					SS-2	7	8	12	15	20
				4.2						
180.6					SS-3	10	12	9	14	21
	6.2			6.2						
		FAT CLAY WITH SAND (CH) - sitff, moist, light green (GLEY 1 7/1) and strong brown (7.5YR 5/8), mostly high plasticity fines, little fine sands, [LL=60, PL=21, PI=39, NMC=26.2%, %#200=80.3], AASHTO = A-7-6 (32).			SS-4	4	6	7	7	13
				8.2						
					SS-5	5	6	9	9	15
175.6		▽								
	12.7			12.7						
		PARTIALLY WEATHERED ROCK (PWR) - no recovery.			SS-6	50/5"-		-		100
		@ 13.5 feet - quartz rock fragments.		13.5	SS-7	50/5"-		-		100
170.6										
	15.9									
		Reamed out borehole from 15.9 feet to 18.5 feet. Recovered 2.6 feet of granitic rock fragments.								
		Tri-Cone Bit Refusal at 18.5 feet. Install NW Casing to 18.5 feet for NQ wireline coring.		18.5	~~SS-8~~	~~50/0"-~~		~~-~~		~~100~~
	18.5			18.5	RC-1					
		For discontinuity descriptors, see discontinuity worksheet.		19.1						

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	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	W-23
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 32
Eng./Geo.:	NGS	**Boring Location:**	6022+73.17	**Offset:**	L:53.37'	**Alignment:**	Proposed
Elev.:	185.6 ft	**Latitude:**	34.023770	**Longitude:**	-81.096544	**Date Started:**	3/5/2018
Total Depth:	28.6 ft	**Soil Depth:**	15.9 ft	**Core Depth:**	10.1 ft	**Date Completed:**	3/5/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	NQ	**Driller:**	T. Miller	**Groundwater:**	**TOB** 10.2 ft	**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	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
		IGNEOUS BEDROCK - GRANITE - pale red (7.5R), pinkish-gray (7.5R 7/1), and dark reddish-gray (7.5R 3/1), medium grained to coarse grained, slightly to moderately weathered, strong rock, trace pyrite.			RC-2			
		RC-1: Rec= 100%, RQD= 0%, GSI= 55-65.						
		@ 19.1 feet - fresh, very strong rock.						
		RC-2: Rec= 96.0%, RQD= 96.7%, GSI= 60-70, RMR = 34.		24.1				
160.6					RC-3			
	28.6	RC-3: Rec= 100%, RQD= 100%, GSI= 70-80.						
		Boring Terminated at 28.6 feet.						
155.6								
150.6								

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 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

Rock Core Discontinuity Worksheet

Project Name: Carolina Crossroads I-20/I-26/I-126 Improvement Project
Project Number: 1461-16-047
Driller (Company/Name): S&ME/Miller
Logged By: Nat Shuff
Date: 3/5/2018

Boring Number: W-23
Core Barrel Type: NQ
Core Barrel Length: 5 ft
Coring Technique: Wireline
Number of Core Boxes: 1

Depth (ft)	Disc. No.	Disc. Type	Dip Angle (deg)	Disc. Width (mm)	Infill Amount	Infill Type	Surface Shape	Surface Roughness	Notes
16.9	1	J	30	N	Sp	Cl/Sd/Fe	Ir	R	
17.4	2	J	0	MW	Sp	Cl/Sd/Fe	Ir	R	
17.6	3	J	85	VN	Sp	Sd/Fe	Wa	SR	
18.7	4	N/A	N/A	MW	Sp	Sd	Ir	R	Fractured zone 17.7' - 19.1'
23.7	5	J	5	VN	Sp	Fe	Ir	R	
24.1	6	J	70	MW	Sp	Ca	Ir	SR	
24.2	7	J	0	VN	Sp	Fe	Pl	R	
24.8	8	J	0	N	Sp	Sd/Fe	Ir	SR	
26.1	9	J	30	N	Sp	Fe/Cl	Ir	SR	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	RW-35
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-26
Eng./Geo.:	AKS	**Boring Location:**	375+94.91	**Offset:**	L:182.418'	**Alignment:**	Proposed
Elev.:	210.8 ft	**Latitude:**	34.029541	**Longitude:**	-81.102643	**Date Started:**	1/24/2018
Total Depth:	49.3 ft	**Soil Depth:**	49.3 ft	**Core Depth:**	0 ft	**Date Completed:**	1/24/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	H.S.A / RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	N/A	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 12.3 ft	**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									
	0.1	**SURFACE MATERIALS** - 1 inch of TOPSOIL.		0.0						
		FILL - CLAYEY SAND (SC) - loose, moist, reddish brown (5YR 5/3), mostly fine to medium sands, some low plasticity fines.			SS-1	3	4	4	5	8
				2.0	SS-2	3	4	5	5	9
	4.0			4.0						
205.8		**SANDY SILT (ML)** - very loose, moist, reddish brown (5YR 5/3), mostly low plasticity fines, some fine to medium sands, trace fine gravel, [LL=49, PL=31, PI=18, NMC=37.7%, %#200=64.2], AASHTO = A-7-5 (11).			SS-3	3	2	2	5	4
	6.0			6.0						
		PIEDMONT RESIDUUM - SILTY SAND (SM) - medium dense, moist, pale brown (2.5YR 8/2), mostly fine to medium sands, some low plasticity fines.			SS-4	5	6	10	13	16
	8.0			8.0						
		LEAN CLAY (CL) - very stiff, moist, pale brown (2.5YR 8/2), mostly low plasticity fines, few fine to medium sands, [LL=30, PL=22, PI=8, NMC=16.7%, %#200=92.8], AASHTO = A-4 (7).			SS-5	6	10	13	16	23
200.8										
		▽								
	13.5			13.5						
		SILT WITH SAND (ML) - hard, dry to moist, pale yellow (5YR 8/2), mostly low plasticity fines, little fine to medium sands.			SS-6	10	14	18		32
195.8										
		@ 18.5 feet - olive gray (5YR 6/2).		18.5						
					SS-7	5	16	24		40

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	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	RW-35
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-26
Eng./Geo.:	AKS	**Boring Location:**	375+94.91	**Offset:**	L:182.418'	**Alignment:**	Proposed
Elev.:	210.8 ft	**Latitude:**	34.029541	**Longitude:**	-81.102643	**Date Started:**	1/24/2018
Total Depth:	49.3 ft	**Soil Depth:**	49.3 ft	**Core Depth:**	0 ft	**Date Completed:**	1/24/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	H.S.A / RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	N/A	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 12.3 ft	**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	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
				23.5				
		@ 23.5 feet - very stiff, [LL=36, PL=26, PI=10, NMC=22.1%, %#200=70.3], AASHTO = A-4 (6).			SS-8	7 10 18	28	
185.8								
				28.5				
		@ 28.5 feet - very hard.			SS-9	15 22 33	55	
180.8								
				33.5				
					SS-10	25 35 50	85	
175.8								
	38.5			38.5				
		PARTIALLY WEATHERED ROCK (PWR) - SILT WITH SAND (ML) - very hard, moist, olive gray (5YR 6/2), mostly low plasticity fines, little fine sands.			SS-11	50/5" - -	100

LEGEND

Continued Next Page

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

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	RW-35
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-26
Eng./Geo.:	AKS	**Boring Location:**	375+94.91	**Offset:**	L:182.418'	**Alignment:**	Proposed
Elev.:	210.8 ft	**Latitude:**	34.029541	**Longitude:**	-81.102643	**Date Started:**	1/24/2018
Total Depth:	49.3 ft	**Soil Depth:**	49.3 ft	**Core Depth:**	0 ft	**Date Completed:**	1/24/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	H.S.A / RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	N/A	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 12.3 ft	**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	SPT N VALUE / PL MC LL / FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
	43.5	**PIEDMONT RESIDUUM - SILT WITH SAND (ML)** - hard, moist, olive gray (5YR 6/2), mostly low plasticity fines, little fine sands.		43.5	SS-12	50 20 30	50	
165.8								
	48.5			48.5				
	49.3	**PARTIALLY WEATHERED ROCK (PWR) - SILT WITH SAND (ML)** - very hard, moist, olive gray (5YR 6/2), mostly low plasticity fines, little fine sands.			SS-13	40 49 50/3"	100	
160.8		Boring Terminated at 49.3 feet.						
		Obtained bulk sample from auger cuttings 0.1 to 10.0 feet.						
155.8								

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:	P027662			**County:**	Lexington/Richland	**Boring No.:**	RW-36
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 29
Eng./Geo.:	AKS	**Boring Location:**	8389+85.83	**Offset:**	R:0.33'	**Alignment:**	Proposed
Elev.:	188.5 ft	**Latitude:**	34.026327	**Longitude:**	-81.100660	**Date Started:**	3/1/2018
Total Depth:	30.1 ft	**Soil Depth:**	30.1 ft	**Core Depth:**	0 ft	**Date Completed:**	3/1/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	H.S.A / RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	N/A	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 4.2 ft	**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									
	0.2	**SURFACE MATERIALS** - 2 inches of TOPSOIL.		0.0	SS-1	3	4	5	5	9
		ALLUVIUM - FAT CLAY WITH SAND (CH) - sitff, moist, olive gray (5Y 5/2), reddish-yellow (5YR 6/8), and yellow (5Y 8/8), mostly high plasticity fines, little fine to medium sands, [LL=55, PL=25, PI=30, NMC=25.2%, %#200=75.6], AASHTO = A-7-6 (23).		2.0	SS-2	3	6	6	5	12
		▽ @ 4 feet - firm, olive gray (5Y 5/2) and reddish-yellow (5YR 6/8).		4.0	SS-3	3	3	4	5	7
183.5	6.0	**PIEDMONT RESIDUUM - LEAN CLAY WITH SAND (CL)** - very stiff, dry to moist, pale yellow (5Y 8/2), mostly low plasticity fines, little fine to coarse sands, trace weathered rock fragments, relict rock structure, [LL=37, PL=23, PI=14, NMC=15.1%, %#200=80.3], AASHTO = A-6 (11).		6.0	SS-4	7	9	19	31	28
	8.0	**PARTIALLY WEATHERED ROCK (PWR) - SILTY SAND (SM)** - very dense, dry to moist, pale yellow (5Y 8/2), subangular, mostly fine to medium sands, some low plasticity fines, relict rock structure.		8.0	SS-5	46	50/3"	-	-	100
178.5										
		@ 13.5 feet - moist, trace weathered rock fragments.		13.5	SS-6	43	50/5"	-		100
173.5										
				18.5	SS-7	35	50/4"	-		100

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	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	RW-36
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 29
Eng./Geo.:	AKS	**Boring Location:**	8389+85.83	**Offset:**	R:0.33'	**Alignment:**	Proposed
Elev.:	188.5 ft	**Latitude:**	34.026327	**Longitude:**	-81.100660	**Date Started:**	3/1/2018
Total Depth:	30.1 ft	**Soil Depth:**	30.1 ft	**Core Depth:**	0 ft	**Date Completed:**	3/1/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	H.S.A / RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	N/A	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 4.2 ft	**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	SPT N VALUE / PL MC LL / FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
				23.5	SS-8	8 50/1" -	100	
163.5								
				28.5	SS-9	50/1" -	100	
		@ 28.5 feet - no recovery.						
158.5	30.1							
		Boring Terminated at 30.1 feet due to Tri-Cone bit refusal.						
		Obtained bulk sample from auger cuttings 0.2 to 10.0 feet.						
153.5								

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 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	RW-38
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 32
Eng./Geo.:	NGS	**Boring Location:**	5985+51.15	**Offset:**	L:73.93'	**Alignment:**	Proposed
Elev.:	169.5 ft	**Latitude:**	34.022027	**Longitude:**	-81.105175	**Date Started:**	4/3/2018
Total Depth:	16.6 ft	**Soil Depth:**	16.6 ft	**Core Depth:**	0 ft	**Date Completed:**	4/3/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	H.S.A / RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	N/A	**Driller:**	T. Miller	**Groundwater:**	**TOB** 6.2 ft	**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									
		PIEDMONT RESIDUUM - SILTY CLAYEY SAND (SC-SM) - loose, moist, light red (2.5YR 7/6), subangular, mostly fine to medium sands, little low plasticity fines, few fine gravel, [LL=17, PL=12, PI=5, NMC=8.1%, %#200=16], AASHTO = A-2-4.		0.0	SS-1	5	4	3	3	7
	1.5			2.0						
		LEAN CLAY WITH SAND (CL) - stiff, moist, strong brown (7.5YR 5/6), mostly low plasticity fines, little fine sands, trace organics, micaceous.			SS-2	4	4	5	5	9
		@ 2 feet - [LL=39, PL=21, PI=18, NMC=23.3%, %#200=76], AASHTO = A-6 (13).		4.0						
164.5					SS-3	5	6	8	10	14
		@ 6 feet - [LL=33, PL=19, PI=14, NMC=25.9%, %#200=85], AASHTO = A-6 (11).		6.0						
					SS-4	2	4	5	7	9
		@ 8 feet - very stiff.		8.0						
					SS-5	8	8	9	8	17
159.5										
	13.5	**PARTIALLY WEATHERED ROCK (PWR) - WELL GRADED SAND (SW)** - very dense, moist, light red (2.5YR 7/6), subangular, mostly fine to coarse sands, trace non-plastic fines.		13.5	SS-6	50/2"	-	-		100
154.5										
	16.6	Tri-Cone Bit Refusal at 16.6 feet. Install NW Casing to 16.6 feet for NQ wireline coring.		16.6	SS-7	50/0"	-	-		100
		Boring Terminated at 16.6 feet.								
		Obtained bulk sample from auger cuttings 0.0 to 10.0 feet.								

● SPT N VALUE ●

PL MC LL

▲ FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

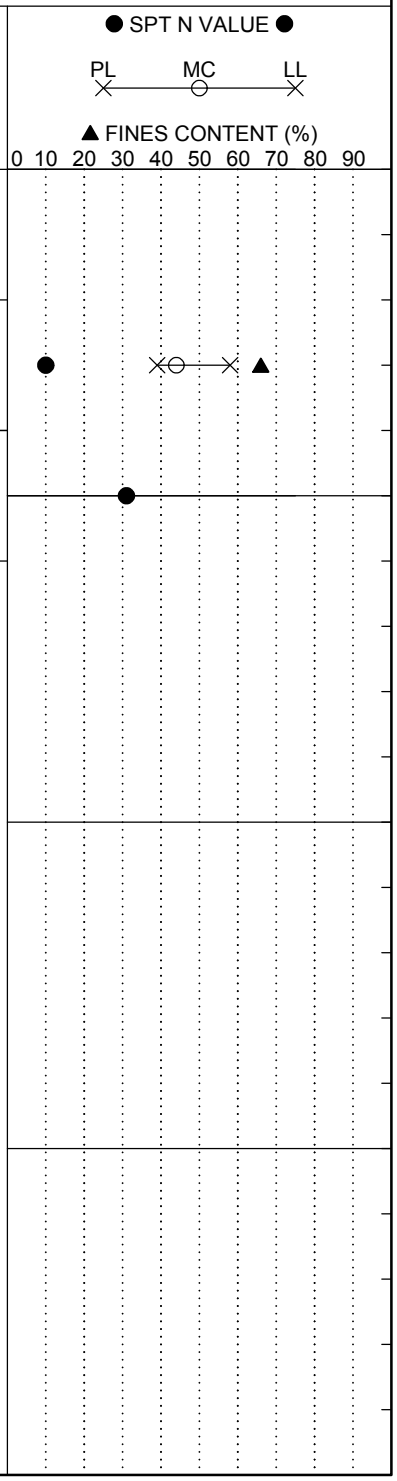
LEGEND

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:	P027662			**County:**	Lexington/Richland	**Boring No.:**	P-37
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-26
Eng./Geo.:	AKS	**Boring Location:**	379+06.59	**Offset:**	L:288.751'	**Alignment:**	Proposed
Elev.:	209.6 ft	**Latitude:**	34.028745	**Longitude:**	-81.101935	**Date Started:**	1/24/2018
Total Depth:	6 ft	**Soil Depth:**	6 ft	**Core Depth:**	0 ft	**Date Completed:**	1/24/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	H.S.A.	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	N/A	**Driller:**	J. Millwood	**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									
	0.2	**SURFACE MATERIALS** - 2 inches of ASPHALT.								
		18 inches of CONCRETE.								
	1.7	**PIEDMONT RESIDUUM - SANDY ELASTIC SILT (MH)** - stiff, dry to moist, gray (GLEY 1 7/10GY), mostly high plasticity fines, some fine to medium sands, relict rock structure, [LL=58, PL=39, PI=19, NMC=44%, %#200=66], AASHTO = A-7-5 (14).		2.0	SS-1	4	5	5	6	10
	4.0			4.0						
204.6		**SILTY SAND WITH GRAVEL (SM)** - medium dense, dry to moist, gray (GLEY 1 6/10GY), mostly fine to medium sands, some low plasticity fines, few weathered rock fragments, relict rock structure.			SS-2	4	6	25	32	31
	6.0	Boring Terminated at 6 feet due to auger refusal.								
199.6										
194.6										



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:	P027662			**County:**	Lexington/Richland	**Boring No.:**	P-38
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-126
Eng./Geo.:	HGM	**Boring Location:**	5+98.81	**Offset:**	R:47.194'	**Alignment:**	Proposed
Elev.:	184.0 ft	**Latitude:**	34.024996	**Longitude:**	-81.098892	**Date Started:**	1/29/2018
Total Depth:	10.8 ft	**Soil Depth:**	10.8 ft	**Core Depth:**	0 ft	**Date Completed:**	1/29/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	H.S.A.	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	N/A	**Driller:**	T. Miller	**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									
	0.8	**SURFACE MATERIALS** - 9.5 inches of ASPHALT.		0.8						
		FILL - CLAYEY SAND (SC) - medium dense, moist, yellowish-red (5YR 5/6), mostly fine to medium sands, little low to medium plasticity fines, [LL=32, PL=14, PI=18, NMC=14%, %#200=27.9], AASHTO = A-2-6.			SS-1	9	10	6	7	16
	2.8			2.8						
		PIEDMONT RESIDUUM - SILT WITH SAND (ML) - stiff, moist, greenish-gray (GLEY1 5/1), mostly low plasticity fines, little fine sands.			SS-2	5	5	4	5	9
	4.8			4.8						
179.0		**ELASTIC SILT WITH SAND (MH)** - firm, moist, very dark greenish-gray (GLEY1 4/1), mostly medium to high plasticity fines, little fine sands.			SS-3	3	3	4	4	7
	6.8			6.8						
		SANDY SILT (ML) - stiff, moist, gray (7.5YR 5/1) and strong brown (7.5YR 4/6), mostly low to medium plasticity fines, some fine sands.			SS-4	2	3	6	6	9
				8.8						
174.0					SS-5	6	6	5	4	11
	10.8									
		Boring Terminated at 10.8 feet.								
169.0										

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:	P027662			**County:**	Lexington/Richland	**Boring No.:**	P-39
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-126
Eng./Geo.:	AKS	**Boring Location:**	9+60.12	**Offset:**	L:50.775'	**Alignment:**	Proposed
Elev.:	184.1 ft	**Latitude:**	34.024369	**Longitude:**	-81.097912	**Date Started:**	1/24/2018
Total Depth:	10.8 ft	**Soil Depth:**	10.8 ft	**Core Depth:**	0 ft	**Date Completed:**	1/24/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	H.S.A.	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	N/A	**Driller:**	J. Millwood	**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									
	0.8	**SURFACE MATERIALS** - 9.5 inches of ASPHALT.		0.8						
		FILL - CLAYEY SAND (SC) - medium dense, dry to moist, yellow (7.5YR 6/8), subangular, mostly fine to medium sands, some low plasticity fines, [LL=32, PL=15, PI=17, NMC=11%, %#200=39], AASHTO = A-6 (2).			SS-1	4	7	6	6	13
	2.8			2.8						
		FILL - POORLY GRADED SAND (SP) - loose, moist, yellow (7.5YR 6/8), subangular, mostly fine to medium sands, trace low plasticity fines.			SS-2	4	4	5	6	9
	4.8			4.8						
179.1		**PIEDMONT RESIDUUM - SANDY LEAN CLAY (CL)** - firm, moist, red (7.5YR 4/6) and gray (7.5YR 7/1), mostly low plasticity fines, little fine sands.			SS-3	3	3	4	4	7
	6.8			6.8						
		SILT (ML) - very stiff, dry to moist, very pale brown (10YR 7/3), low plasticity fines, few fine sands.			SS-4	6	7	13	20	20
				8.8						
174.1					SS-5	7	13	15	19	28
	10.8	Boring Terminated at 10.8 feet.								
169.1										

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:	P027662			**County:**	Lexington/Richland	**Boring No.:**	P-65
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-26
Eng./Geo.:	HGM	**Boring Location:**	377+80.48	**Offset:**	L:89.300'	**Alignment:**	Proposed
Elev.:	207.9 ft	**Latitude:**	34.028944	**Longitude:**	-81.102697	**Date Started:**	1/24/2018
Total Depth:	10.8 ft	**Soil Depth:**	10.8 ft	**Core Depth:**	0 ft	**Date Completed:**	1/24/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	H.S.A.	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	N/A	**Driller:**	T. Miller	**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	**SURFACE MATERIALS** - 10 inches of ASPHALT.								
	0.8	**FILL - SILTY SAND (SM)** - loose, moist to wet due to coring, brown (7.5YR 5/4), mostly fine to medium sands, some non-plastic fines, trace fine to medium gravel, [NMC=28%, %#200=34], AASHTO = A-2-4.		0.8	SS-1	2	3	3	4	6
	2.8	**ALLUVIUM - SANDY ELASTIC SILT (MH)** - soft, moist, brown (7.5YR 5/4), mostly high plasticity fines, some fine to medium sands.		2.8	SS-2	2	2	2	3	4
202.9		4.8 feet - firm, yellowish-brown (10YR 5/4).		4.8	SS-3	1	2	3	5	5
	6.8	**PIEDMONT RESIDUUM - SILT WITH SAND (ML)** - very stiff, moist, very pale brown (10YR 7/4), mostly low plasticity fines, little fine sands.		6.8	SS-4	7	11	12	13	23
				8.8	SS-5	10	8	11	14	19
197.9	10.8	Boring Terminated at 10.8 feet. Obtained bulk sample from auger cuttings 0.8 to 10.8 feet.								
192.9										

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 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	P-66
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-26
Eng./Geo.:	ELF	**Boring Location:**	391+69.40	**Offset:**	L:88.718'	**Alignment:**	Proposed
Elev.:	188.3 ft	**Latitude:**	34.025039	**Longitude:**	-81.102628	**Date Started:**	2/12/2018
Total Depth:	10.8 ft	**Soil Depth:**	10.8 ft	**Core Depth:**	0 ft	**Date Completed:**	2/12/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	H.S.A.	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	N/A	**Driller:**	T. Miller	**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									
	0.3	**SURFACE MATERIALS** - 4 inches of ASPHALT.								
	0.8	6 inches of GRADED AGGREGATE BASE.		0.8						
		FILL - CLAYEY SAND (SC) - medium dense, moist, red (2.5YR 5/6), mostly fine to medium sands, little low plasticity fines, trace fine gravel, [LL=21, PL=12, PI=9, NMC=9.7%, %#200=15.7], AASHTO = A-2-4.			SS-1	14	9	7	5	16
	2.8			2.8						
		CLAYEY SAND WITH GRAVEL (SC) - loose, reddish-brown (2.5YR 5/4), mostly fine to coarse sands, little low plasticity fines, little fine to medium gravel.			SS-2	5	4	4	4	8
	4.8			4.8						
183.3		**ALLUVIUM - CLAYEY SAND (SC)** - medium dense, reddish-brown (2.5YR 5/3), mostly fine to coarse sands, little low plasticity fines, few quartz gravel.			SS-3	5	6	6	6	12
		@ 6.8 feet - loose, trace mica.		6.8	SS-4	3	4	5	11	9
	8.8			8.8						
178.3		**POORLY GRADED SAND WITH CLAY (SP-SC)** - medium dense, moist, red (2.5YR 4/6), mostly fine to coarse sands, few low plasticity fines, trace quartz gravel.			SS-5	12	7	5	6	12
	10.8	Boring Terminated at 10.8 feet.								
173.3										

● 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 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	P-67
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-26
Eng./Geo.:	HGM	**Boring Location:**	404+20.26	**Offset:**	R:38.874'	**Alignment:**	Proposed
Elev.:	184.7 ft	**Latitude:**	34.021965	**Longitude:**	-81.104580	**Date Started:**	1/31/2018
Total Depth:	10.6 ft	**Soil Depth:**	10.6 ft	**Core Depth:**	0 ft	**Date Completed:**	1/31/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	H.S.A.	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	N/A	**Driller:**	T. Miller	**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									
	0.6	**SURFACE MATERIALS** - 7 inches of ASPHALT.		0.6						
		FILL - SANDY FAT CLAY (CH) - firm, moist, red (2.5YR 4/6), mostly high plasticity fines, some fine to medium sands, [LL=52, PL=23, PI=29, NMC=22%, %#200=63.1], AASHTO = A-7-6 (16).			SS-1	3	2	4	5	6
		@ 2.6 feet - stiff, reddish-brown (2.5YR 4/4), 4" seam of poorly graded sand (SP) inbedded between CH in spoon.		2.6	SS-2	4	6	4	6	10
	4.6			4.6						
179.7		**POORLY GRADED SAND WITH SILT (SP-SM)** - medium dense, moist, light yellowish-brown (10YR 6/4), mostly fine to medium sands, few non-plastic fines.			SS-3	6	8	7	7	15
	6.6			6.6						
		PIEDMONT RESIDUUM - SILTY SAND (SM) - medium dense, moist, pink (7.5YR 7/4), mostly fine to coarse sands, some low plasticity fines.			SS-4	4	7	8	10	15
		@ 8.6 feet - pinkish-gray (7.5YR 7/2).		8.6						
					SS-5	9	6	8	9	14
174.7	10.6									
		Boring Terminated at 10.6 feet.								
		Obtained bulk sample from auger cuttings 0.6 to 10.6 feet.								
169.7										

● SPT N VALUE ●

PL MC LL

▲ FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

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	

APPENDIX

SECTION 3 GEOTECHNICAL EXPLORATION LOGS

SECTION 3B AUGER BORING LOGS

FME 2025 INVESTIGATION

SCDOT Soil Test Log

Project ID:	P043326			**County:**	Richland/Lexington	**Boring No.:**	P3D-B1U
Site Description:	Carolina Crossroads Phase 3D					**Route:**	I-26 EB_RA
Eng./Geo.:	B. Vogel	**Boring Location:**	368+89	**Offset:**	40-R	**Alignment:**	I-26 EB_RA
Elev.:	174.2 ft	**Latitude:**	34.02612157	**Longitude:**	-81.10320543	**Date Started:**	6/6/2025
Total Depth:	4 ft	**Soil Depth:**	6 ft	**Core Depth:**	0 ft	**Date Completed:**	6/6/2025
Bore Hole Diameter (in):	6	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	96.7%
Core Size:	N/A	**Driller:**	J. Phillips	**Groundwater:**	**TOB** NR	**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
	0.0	Drill to 2.0-ft.					
	2.0	**ALLUVIUM (HOLOCENE)** Moist, Very Dark Grayish Brown, High Plasticity, Lean CLAY (CL/A-6) with Sand, 2.5YR 3/2		2.0			
	4.0	@ST-1: LL=37, PL=13, PI=24, NMC=15.4%, %200=72.1		4.0	ST-1		
169.2		Moist, Brown, Medium Plasticity, Clayey Fine to Medium SAND (SC/A-6), 10YR 4/3			ST-2		
	6.0	@ST-2: LL=26, PL=8, PI=18, NMC=12.0%, %200=41.9					
		Boring Terminated at Target Depth of 6.0-ft in Alluvial Soils.					
164.2							
159.2							

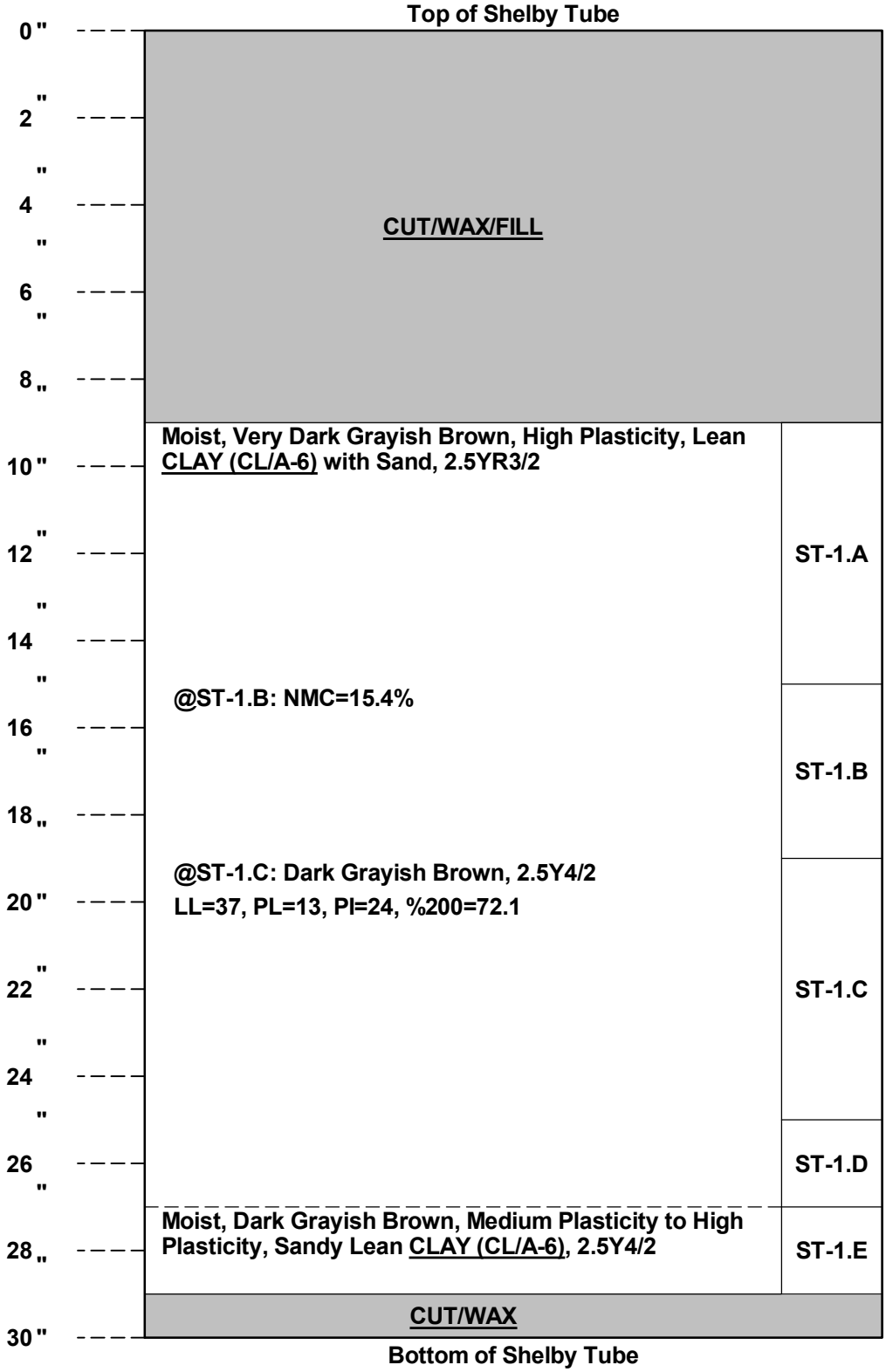
● SPT N VALUE ●
PL MC LL
▲ FINES CONTENT (%)
✿ RQD (%) ■ REC (%)
0 10 20 30 40 50 60 70 80 90

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 Shelby Tube Log

Project ID:	P039721 & P039722	**County:**	Richland/Lexington	**Boring No.:**	P3D-B1U
Project Description:	Carolina Crossroads I-20/26/126 Corridor Improvements			**Route:**	
UD Sample No.:	ST-1	**Depth:**	2' - 4'		
Date Sampled:	6/6/2025	**Date Extracted:**	6/16/2025		
Extracted By:	R. Coldiron	**Eng. Firm:**			



SC_DOT_SHELBY_TUBE_LOG_PICTURES G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT_DATATEMPLATE.GDT 6/27/25

SCDOT Undisturbed Sample Pictures

Project ID:	P039721 & P039722	**County:**	Richland/Lexington	**Boring No.:**	P3D-B1U
Project Description:	Carolina Crossroads I-20/26/126 Corridor Improvements			**Route:**	
UD Sample No.:	ST-1	**Depth:**	2' - 4'		
Date Sampled:	6/6/2025	**Date Extracted:**	6/16/2025		
Extracted By:	R. Coldiron	**Eng. Firm:**			



Specimen No. ST-1.A



Specimen No. ST-1.A

SCDOT Undisturbed Sample Pictures

Project ID:	P039721 & P039722	**County:**	Richland/Lexington	**Boring No.:**	P3D-B1U
Project Description:	Carolina Crossroads I-20/26/126 Corridor Improvements			**Route:**	
UD Sample No.:	ST-1	**Depth:**	2' - 4'		
Date Sampled:	6/6/2025	**Date Extracted:**	6/16/2025		
Extracted By:	R. Coldiron	**Eng. Firm:**			



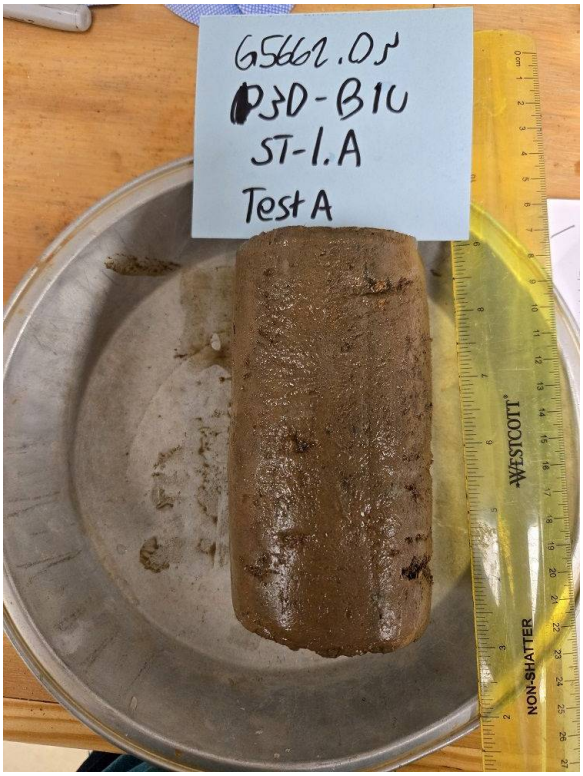
Specimen No. ST-1.A



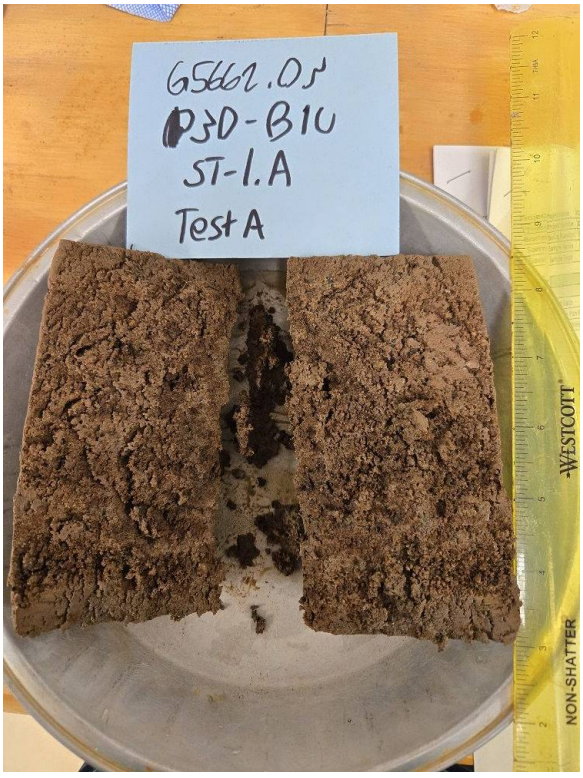
Specimen No. ST-1.A

SCDOT Undisturbed Sample Pictures

Project ID:	P039721 & P039722	**County:**	Richland/Lexington	**Boring No.:**	P3D-B1U
Project Description:	Carolina Crossroads I-20/26/126 Corridor Improvements			**Route:**	
UD Sample No.:	ST-1	**Depth:**	2' - 4'		
Date Sampled:	6/6/2025	**Date Extracted:**	6/16/2025		
Extracted By:	R. Coldiron	**Eng. Firm:**			



Specimen No. ST-1.A



Specimen No. ST-1.A

SCDOT Undisturbed Sample Pictures

Project ID:	P039721 & P039722	**County:**	Richland/Lexington	**Boring No.:**	P3D-B1U
Project Description:	Carolina Crossroads I-20/26/126 Corridor Improvements			**Route:**	
UD Sample No.:	ST-1	**Depth:**	2' - 4'		
Date Sampled:	6/6/2025	**Date Extracted:**	6/16/2025		
Extracted By:	R. Coldiron	**Eng. Firm:**			



Specimen No. ST-1.B



Specimen No. ST-1.B

SC_DOT_SHELBY_TUBE_LOG_PICTURES G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT_DATATEMPLATE.GDT 6/27/25

SCDOT Undisturbed Sample Pictures

Project ID:	P039721 & P039722	**County:**	Richland/Lexington	**Boring No.:**	P3D-B1U
Project Description:	Carolina Crossroads I-20/26/126 Corridor Improvements			**Route:**	
UD Sample No.:	ST-1	**Depth:**	2' - 4'		
Date Sampled:	6/6/2025	**Date Extracted:**	6/16/2025		
Extracted By:	R. Coldiron	**Eng. Firm:**			



Specimen No. ST-1.B



Specimen No. ST-1.B

SC_DOT_SHELBY_TUBE_LOG_PICTURES G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT_DATATEMPLATE.GDT 6/27/25

SCDOT Undisturbed Sample Pictures

Project ID:	P039721 & P039722	**County:**	Richland/Lexington	**Boring No.:**	P3D-B1U
Project Description:	Carolina Crossroads I-20/26/126 Corridor Improvements			**Route:**	
UD Sample No.:	ST-1	**Depth:**	2' - 4'		
Date Sampled:	6/6/2025	**Date Extracted:**	6/16/2025		
Extracted By:	R. Coldiron	**Eng. Firm:**			



Specimen No. ST-1.C



Specimen No. ST-1.C

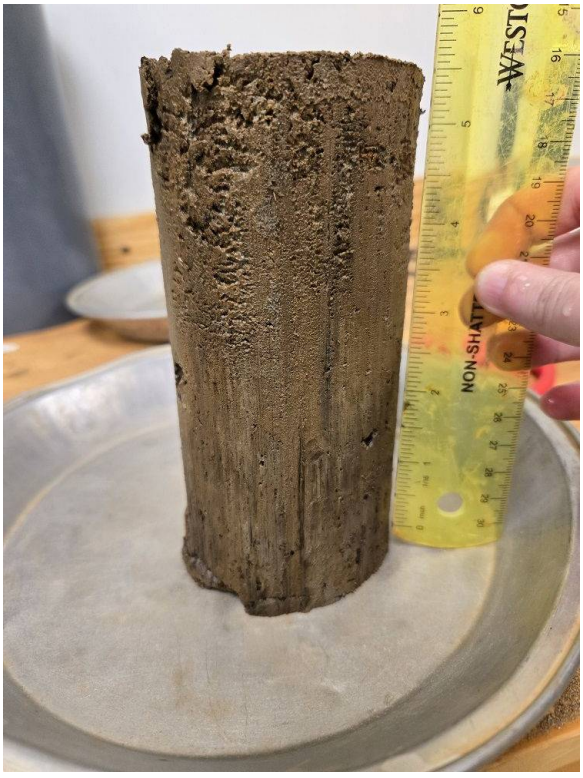
SC_DOT_SHELBY_TUBE_LOG_PICTURES G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT_DATATEMPLATE.GDT 6/27/25

SCDOT Undisturbed Sample Pictures

Project ID:	P039721 & P039722	**County:**	Richland/Lexington	**Boring No.:**	P3D-B1U
Project Description:	Carolina Crossroads I-20/26/126 Corridor Improvements			**Route:**	
UD Sample No.:	ST-1	**Depth:**	2' - 4'		
Date Sampled:	6/6/2025	**Date Extracted:**	6/16/2025		
Extracted By:	R. Coldiron	**Eng. Firm:**			



Specimen No. ST-1.C

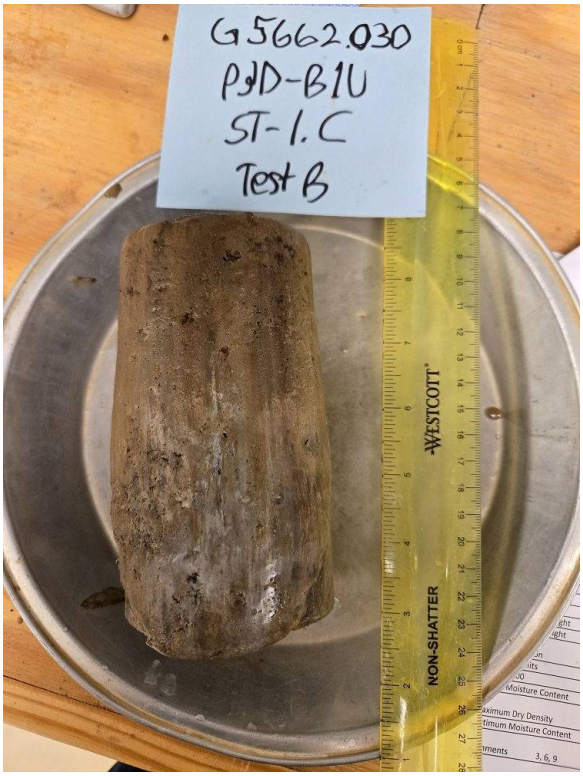


Specimen No. ST-1.C

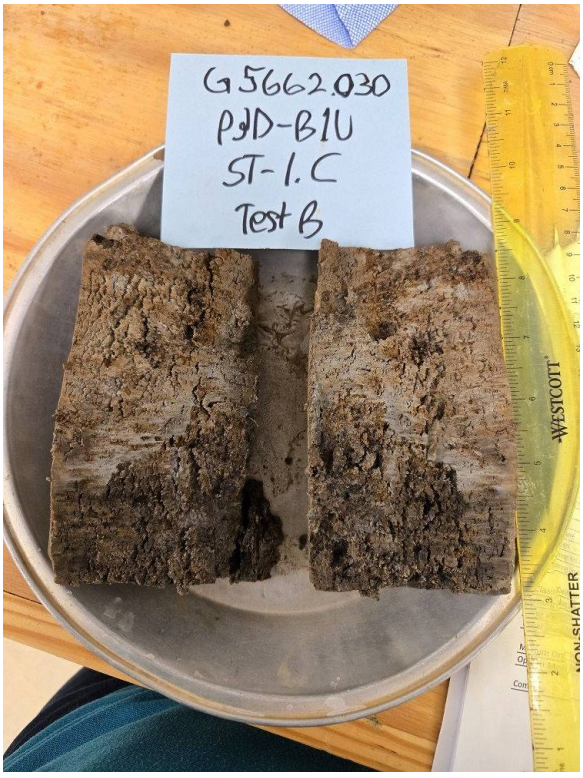
SC_DOT_SHELBY_TUBE_LOG_PICTURES G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT_DATATEMPLATE.GDT 6/27/25

SCDOT Undisturbed Sample Pictures

Project ID:	P039721 & P039722	**County:**	Richland/Lexington	**Boring No.:**	P3D-B1U
Project Description:	Carolina Crossroads I-20/26/126 Corridor Improvements			**Route:**	
UD Sample No.:	ST-1	**Depth:**	2' - 4'		
Date Sampled:	6/6/2025	**Date Extracted:**	6/16/2025		
Extracted By:	R. Coldiron	**Eng. Firm:**			



Specimen No. ST-1.C



Specimen No. ST-1.C

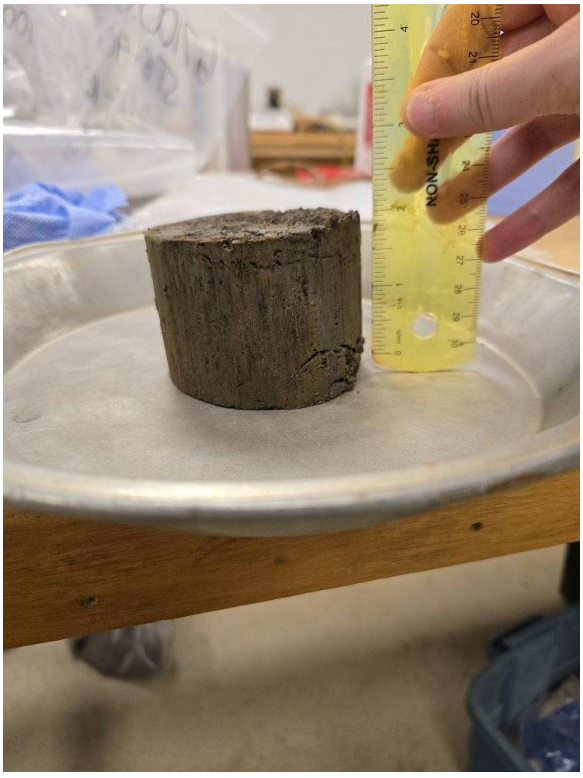
SC_DOT_SHELBY_TUBE_LOG_PICTURES G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT_DATATEMPLATE.GDT 6/27/25

Undisturbed Sample Pictures

Project ID:	P039721 & P039722	**County:**	Richland/Lexington	**Boring No.:**	P3D-B1U
Project Description:	Carolina Crossroads I-20/26/126 Corridor Improvements			**Route:**	
UD Sample No.:	ST-1	**Depth:**	2' - 4'		
Date Sampled:	6/6/2025	**Date Extracted:**	6/16/2025		
Extracted By:	R. Coldiron	**Eng. Firm:**			



Specimen No. ST-1.D



Specimen No. ST-1.D

SC_DOT_SHELBY_TUBE_LOG_PICTURES G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT_DATATEMPLATE.GDT 6/27/25

SCDOT Undisturbed Sample Pictures

Project ID:	P039721 & P039722	**County:**	Richland/Lexington	**Boring No.:**	P3D-B1U
Project Description:	Carolina Crossroads I-20/26/126 Corridor Improvements			**Route:**	
UD Sample No.:	ST-1	**Depth:**	2' - 4'		
Date Sampled:	6/6/2025	**Date Extracted:**	6/16/2025		
Extracted By:	R. Coldiron	**Eng. Firm:**			



Specimen No. ST-1.D



Specimen No. ST-1.D

SC_DOT_SHELBY_TUBE_LOG_PICTURES G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT_DATATEMPLATE.GDT 6/27/25

SCDOT Undisturbed Sample Pictures

Project ID:	P039721 & P039722	**County:**	Richland/Lexington	**Boring No.:**	P3D-B1U
Project Description:	Carolina Crossroads I-20/26/126 Corridor Improvements			**Route:**	
UD Sample No.:	ST-1	**Depth:**	2' - 4'		
Date Sampled:	6/6/2025	**Date Extracted:**	6/16/2025		
Extracted By:	R. Coldiron	**Eng. Firm:**			



Specimen No. ST-1.E

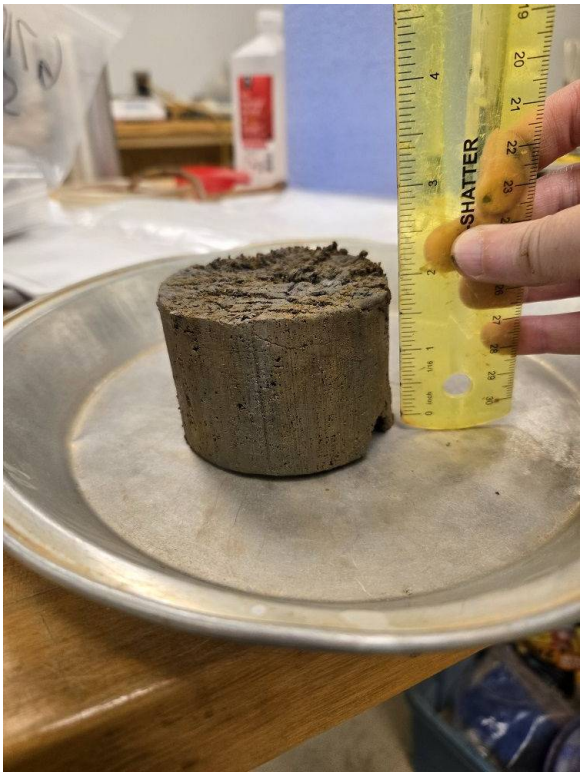


Specimen No. ST-1.E

SC_DOT_SHELBY_TUBE_LOG_PICTURES G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT_DATATEMPLATE.GDT 6/27/25

SCDOT Undisturbed Sample Pictures

Project ID:	P039721 & P039722	**County:**	Richland/Lexington	**Boring No.:**	P3D-B1U
Project Description:	Carolina Crossroads I-20/26/126 Corridor Improvements			**Route:**	
UD Sample No.:	ST-1	**Depth:**	2' - 4'		
Date Sampled:	6/6/2025	**Date Extracted:**	6/16/2025		
Extracted By:	R. Coldiron	**Eng. Firm:**			



Specimen No. ST-1.E

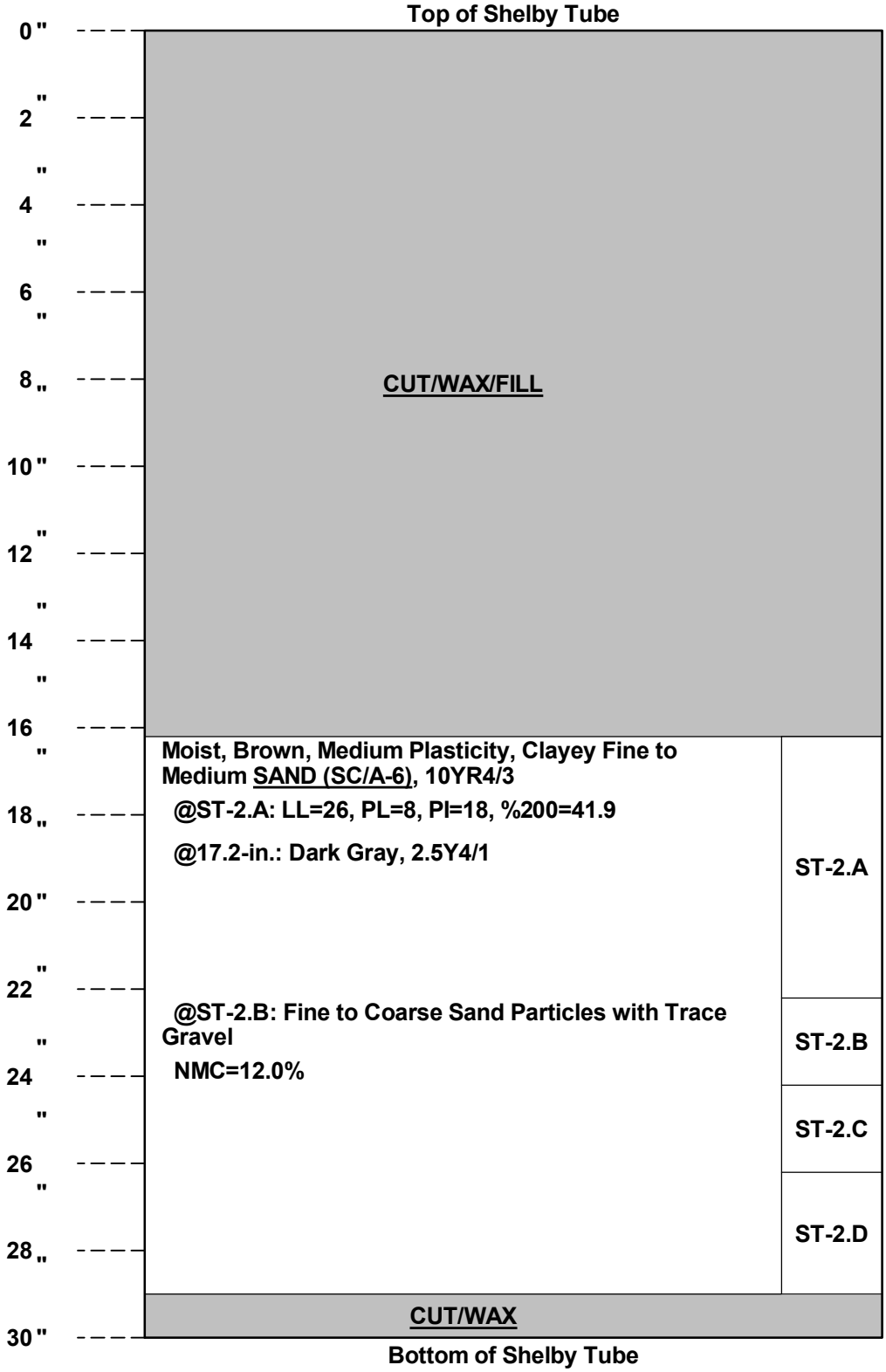


Specimen No. ST-1.E

SC_DOT_SHELBY_TUBE_LOG_PICTURES G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT_DATATEMPLATE.GDT 6/27/25

SCDOT Shelby Tube Log

Project ID:	P039721 & P039722	**County:**	Richland/Lexington	**Boring No.:**	P3D-B1U
Project Description:	Carolina Crossroads I-20/26/126 Corridor Improvements			**Route:**	
UD Sample No.:	ST-2	**Depth:**	4' - 6'		
Date Sampled:	6/6/2025	**Date Extracted:**	6/16/2025		
Extracted By:	R. Coldiron	**Eng. Firm:**			



SC_DOT_SHELBY_TUBE_LOG_PICTURES G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT_DATATEMPLATE.GDT 6/27/25

SCDOT Undisturbed Sample Pictures

Project ID:	P039721 & P039722	**County:**	Richland/Lexington	**Boring No.:**	P3D-B1U
Project Description:	Carolina Crossroads I-20/26/126 Corridor Improvements			**Route:**	
UD Sample No.:	ST-2	**Depth:**	4' - 6'		
Date Sampled:	6/6/2025	**Date Extracted:**	6/16/2025		
Extracted By:	R. Coldiron	**Eng. Firm:**			



Specimen No. ST-2.A



Specimen No. ST-2.A

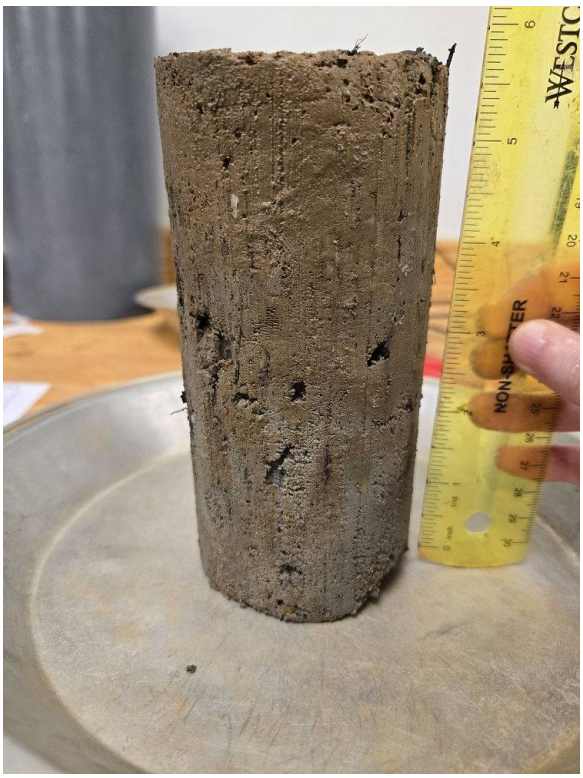
SC_DOT_SHELBY_TUBE_LOG_PICTURES G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT_DATATEMPLATE.GDT 6/27/25

SCDOT Undisturbed Sample Pictures

Project ID:	P039721 & P039722	**County:**	Richland/Lexington	**Boring No.:**	P3D-B1U
Project Description:	Carolina Crossroads I-20/26/126 Corridor Improvements			**Route:**	
UD Sample No.:	ST-2	**Depth:**	4' - 6'		
Date Sampled:	6/6/2025	**Date Extracted:**	6/16/2025		
Extracted By:	R. Coldiron	**Eng. Firm:**			



Specimen No. ST-2.A



Specimen No. ST-2.A

SCDOT Undisturbed Sample Pictures

Project ID:	P039721 & P039722	**County:**	Richland/Lexington	**Boring No.:**	P3D-B1U
Project Description:	Carolina Crossroads I-20/26/126 Corridor Improvements			**Route:**	
UD Sample No.:	ST-2	**Depth:**	4' - 6'		
Date Sampled:	6/6/2025	**Date Extracted:**	6/16/2025		
Extracted By:	R. Coldiron	**Eng. Firm:**			



Specimen No. ST-2.A



Specimen No. ST-2.A

SCDOT Undisturbed Sample Pictures

Project ID:	P039721 & P039722	**County:**	Richland/Lexington	**Boring No.:**	P3D-B1U
Project Description:	Carolina Crossroads I-20/26/126 Corridor Improvements			**Route:**	
UD Sample No.:	ST-2	**Depth:**	4' - 6'		
Date Sampled:	6/6/2025	**Date Extracted:**	6/16/2025		
Extracted By:	R. Coldiron	**Eng. Firm:**			



Specimen No. ST-2.B



Specimen No. ST-2.B

SC_DOT_SHELBY_TUBE_LOG_PICTURES G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT_DATATEMPLATE.GDT 6/27/25

SCDOT Undisturbed Sample Pictures

Project ID:	P039721 & P039722	**County:**	Richland/Lexington	**Boring No.:**	P3D-B1U
Project Description:	Carolina Crossroads I-20/26/126 Corridor Improvements			**Route:**	
UD Sample No.:	ST-2	**Depth:**	4' - 6'		
Date Sampled:	6/6/2025	**Date Extracted:**	6/16/2025		
Extracted By:	R. Coldiron	**Eng. Firm:**			



Specimen No. ST-2.B



Specimen No. ST-2.B

SCDOT Undisturbed Sample Pictures

Project ID:	P039721 & P039722	**County:**	Richland/Lexington	**Boring No.:**	P3D-B1U
Project Description:	Carolina Crossroads I-20/26/126 Corridor Improvements			**Route:**	
UD Sample No.:	ST-2	**Depth:**	4' - 6'		
Date Sampled:	6/6/2025	**Date Extracted:**	6/16/2025		
Extracted By:	R. Coldiron	**Eng. Firm:**			



Specimen No. ST-2.B



Specimen No. ST-2.C

SC_DOT_SHELBY_TUBE_LOG_PICTURES G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT_DATATEMPLATE.GDT 6/27/25

SCDOT Undisturbed Sample Pictures

Project ID:	P039721 & P039722	**County:**	Richland/Lexington	**Boring No.:**	P3D-B1U
Project Description:	Carolina Crossroads I-20/26/126 Corridor Improvements			**Route:**	
UD Sample No.:	ST-2	**Depth:**	4' - 6'		
Date Sampled:	6/6/2025	**Date Extracted:**	6/16/2025		
Extracted By:	R. Coldiron	**Eng. Firm:**			



Specimen No. ST-2.C



Specimen No. ST-2.C

SC_DOT_SHELBY_TUBE_LOG_PICTURES G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT_DATATEMPLATE.GDT 6/27/25

SCDOT Undisturbed Sample Pictures

Project ID:	P039721 & P039722	**County:**	Richland/Lexington	**Boring No.:**	P3D-B1U
Project Description:	Carolina Crossroads I-20/26/126 Corridor Improvements			**Route:**	
UD Sample No.:	ST-2	**Depth:**	4' - 6'		
Date Sampled:	6/6/2025	**Date Extracted:**	6/16/2025		
Extracted By:	R. Coldiron	**Eng. Firm:**			



Specimen No. ST-2.C



Specimen No. ST-2.D

SC_DOT_SHELBY_TUBE_LOG_PICTURES G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT_DATATEMPLATE.GDT 6/27/25

SCDOT Undisturbed Sample Pictures

Project ID:	P039721 & P039722	**County:**	Richland/Lexington	**Boring No.:**	P3D-B1U
Project Description:	Carolina Crossroads I-20/26/126 Corridor Improvements			**Route:**	
UD Sample No.:	ST-2	**Depth:**	4' - 6'		
Date Sampled:	6/6/2025	**Date Extracted:**	6/16/2025		
Extracted By:	R. Coldiron	**Eng. Firm:**			



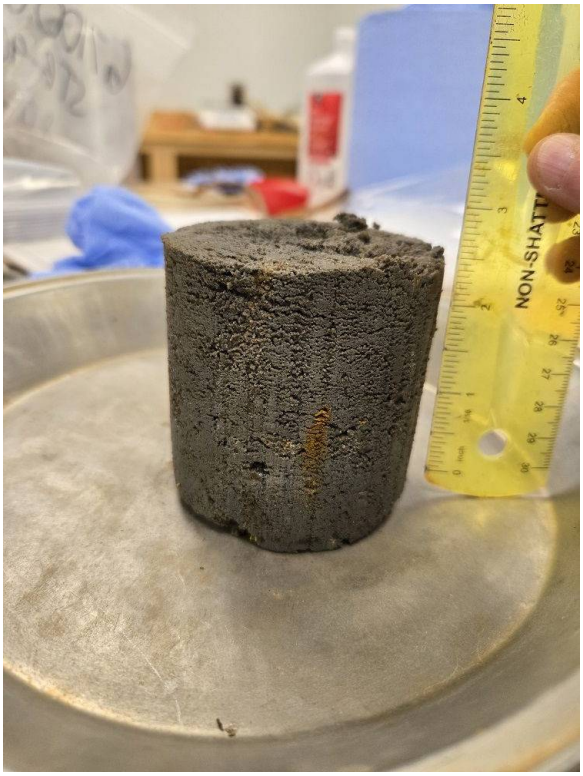
Specimen No. ST-2.D



Specimen No. ST-2.D

SCDOT Undisturbed Sample Pictures

Project ID:	P039721 & P039722	**County:**	Richland/Lexington	**Boring No.:**	P3D-B1U
Project Description:	Carolina Crossroads I-20/26/126 Corridor Improvements			**Route:**	
UD Sample No.:	ST-2	**Depth:**	4' - 6'		
Date Sampled:	6/6/2025	**Date Extracted:**	6/16/2025		
Extracted By:	R. Coldiron	**Eng. Firm:**			



Specimen No. ST-2.D



Specimen No. ST-2.D

FME & SME 2018 INVESTIGATION

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-34UD
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 33
Eng./Geo.:	NGS	**Boring Location:**	389+16.20	**Offset:**	L:15.195'	**Alignment:**	Proposed
Elev.:	196.7 ft	**Latitude:**	34.025778	**Longitude:**	-81.102661	**Date Started:**	3/29/2018
Total Depth:	39.5 ft	**Soil Depth:**	39.5 ft	**Core Depth:**	0 ft	**Date Completed:**	3/29/2018
Bore Hole Diameter (in):	4.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	N/A	**Driller:**	T. Miller	**Groundwater:**	**TOB** 9 ft	**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	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
	0.0	**SURFACE MATERIALS** - 12 inches of ASPHALT.						
	1.0							
191.7								
		▽						
186.7								
181.7		Drilled without sampling to 32 feet.						

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	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-34UD
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 33
Eng./Geo.:	NGS	**Boring Location:**	389+16.20	**Offset:**	L:15.195'	**Alignment:**	Proposed
Elev.:	196.7 ft	**Latitude:**	34.025778	**Longitude:**	-81.102661	**Date Started:**	3/29/2018
Total Depth:	39.5 ft	**Soil Depth:**	39.5 ft	**Core Depth:**	0 ft	**Date Completed:**	3/29/2018
Bore Hole Diameter (in):	4.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	N/A	**Driller:**	T. Miller	**Groundwater:**	**TOB** 9 ft	**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	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
171.7											
166.7											
	32.0	**<u>ALLUVIUM</u> - ELASTIC SILT WITH SAND (MH)** - soft, moist, dark reddish-gray (7.5R 3/1), mostly medium to high plasticity fines, little fine sands.		32.0	SS-1	1	2	2		4	●
	33.5	**SANDY LEAN CLAY (CL)** - moist, dark reddish-gray (7.5R 3/1), mostly low plasticity fines, some fine to medium sands, trace fine gravel, [LL=29, PL=16, PI=13, %#200=51.9]. AASHTO = A-6 (4).		33.5	UD-1						
161.7	35.5	**CLAYEY SAND (SC)** - moist, gray (GLEY 1 6/N) and (7.5YR 5/4), mostly fine to medium sands, little low to medium plasticity fines.		36.0	UD-2						
	38.0	@ 36 feet - gray (GLEY 1 6/N), [LL=31, PL=14, PI=17, %#200=23.9]. AASHTO = A-2-6 (1).		38.0	SS-2	1	3	8		11	●
	39.5	**POORLY GRADED SAND (SP)** - medium dense, moist, light gray (GLEY 1 7/), mostly fine to medium sands, trace									

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	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-34UD
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 33
Eng./Geo.:	NGS	**Boring Location:**	389+16.20	**Offset:**	L:15.195'	**Alignment:**	Proposed
Elev.:	196.7 ft	**Latitude:**	34.025778	**Longitude:**	-81.102661	**Date Started:**	3/29/2018
Total Depth:	39.5 ft	**Soil Depth:**	39.5 ft	**Core Depth:**	0 ft	**Date Completed:**	3/29/2018
Bore Hole Diameter (in):	4.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	N/A	**Driller:**	T. Miller	**Groundwater:**	**TOB** 9 ft	**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	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
		non-plastic fines.						
		Boring Terminated at 39.5 feet.						
151.7								
146.7								
141.7								

LEGEND

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

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	W-23UD
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 32
Eng./Geo.:	AKS	**Boring Location:**	6022+77.81	**Offset:**	L:49.00'	**Alignment:**	Proposed
Elev.:	185.8 ft	**Latitude:**	34.023752	**Longitude:**	-81.096546	**Date Started:**	3/30/2018
Total Depth:	10.5 ft	**Soil Depth:**	10.5 ft	**Core Depth:**	0 ft	**Date Completed:**	3/30/2018
Bore Hole Diameter (in):	4.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	N/A	**Driller:**	T. Millwood	**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	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
	0.0							
	0.3	**SURFACE MATERIALS** - 4 inches of ASPHALT.						
		Drilled without sampling to 6 feet.						
180.8	6.0	**RIVER TERRACE ALLUVIUM - FAT CLAY (CH)** - moist, yellowish-brown (10YR 4/4), mostly high plasticity fines, few fine sands.		6.0	UD-1			
		@ 8.5 feet - light gray (10YR 7/1) and brownish-yellow (10YR 6/6), [LL=59, PL=24, PI=35, %#200=90.8], AASHTO = A-7-6 (35).		8.5	UD-2			
175.8	10.5	Boring Terminated at 10.5 feet.						
170.8								

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 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

APPENDIX

SECTION 4 LABORATORY TEST RESULTS

APPENDIX

SECTION 4 LABORATORY TEST RESULTS

SECTION 4A SPLIT-SPOON SAMPLES

FME 2025 INVESTIGATION

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	CCR Ph. 3D	**PROJECT NO.:**	G5662.030
SAMPLE NUMBER:	25-1800	**DATE REQUESTED:**	6/10/2025
DESCRIPTION OF SOIL:	Various		
TESTED BY:	BW/MW	**DATE OF TESTING:**	6/24/2025
WEIGHED BY:	MW	**DATE OF WEIGHING:**	6/25/2025

BORING NO.	P3D-B1	P3D-B1	P3D-B1	P3D-B1	P3D-B1
SAMPLE NO.	SS-1	SS-2	SS-3	SS-4	SS-5
SAMPLE DEPTH	0.0 - 2.0	2.0 - 4.0	4.0 - 6.0	6.0 - 8.0	8.0 - 10.0
WATER CONTENT, W%	19.8	18.1	12.8	27.1	9.4

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

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

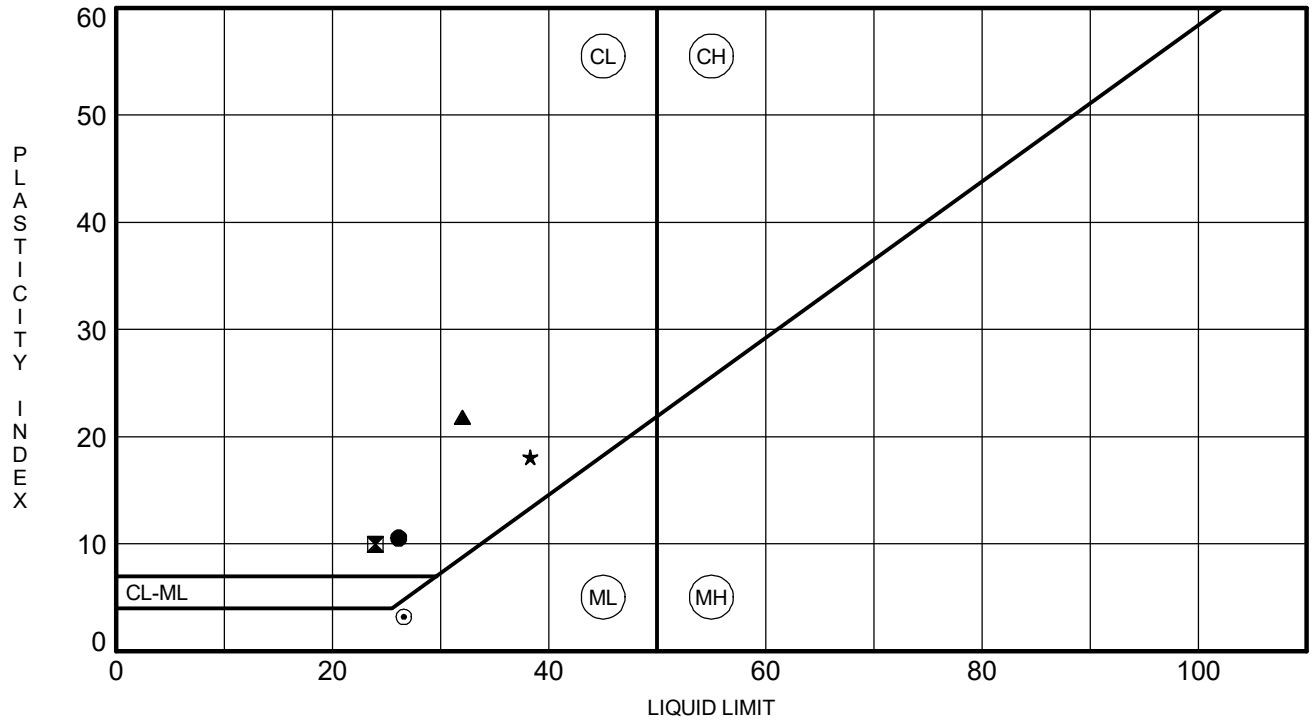
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

This report shall not be reproduced, except in full, without the written approval of F&ME Consultants, Inc.
211 Business Park Boulevard, Columbia SC 29203

ATTERBERG LIMITS' RESULTS

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**P3D-B1**	**2.0**	**26**	**16**	**10**	**41**	**CLAYEY SAND (SC/A-4)**
⊠	**P3D-B1**	**4.0**	**24**	**14**	**10**	**41**	**CLAYEY SAND (SC/A-4)**
▲	**P3D-B1**	**6.0**	**32**	**10**	**22**	**35**	**CLAYEY SAND (SC/A-2-6)**
★	**P3D-B1**	**8.0**	**38**	**20**	**18**	**60**	**SANDY LEAN CLAY (CL/A-6)**
⊙	**P3D-B1**	**10.0**	**27**	**23**	**4**	**56**	**SANDY SILT (ML/A-4)**

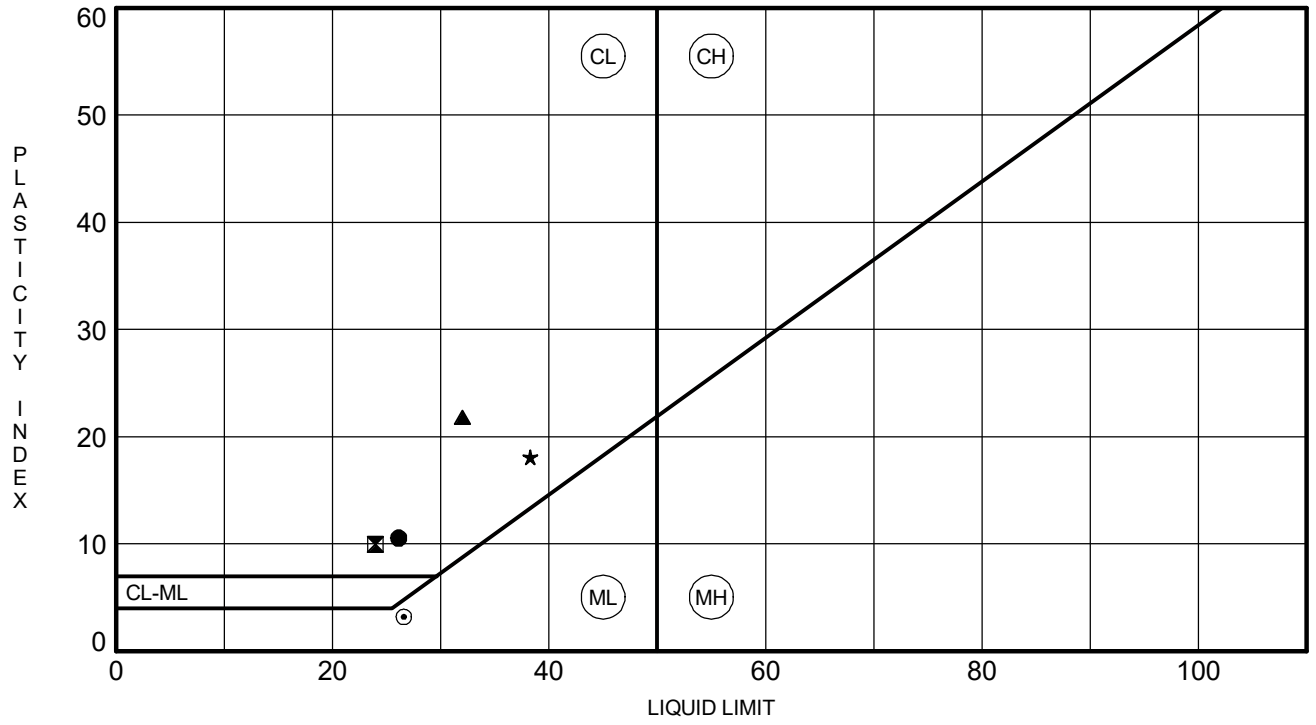
ATTERBERG (OUTSOURCE) G5662.03- CAROLINA CROSSROADS PH 3D.GPJ FME2017.GDT 7/29/25

Laboratory test performed at a non-F&ME AASHTO accreditted laboratory

ATTERBERG LIMITS' RESULTS

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**P3D-B1**	**2.0**	**26**	**16**	**10**	**41.4**	**CLAYEY SAND (SC/A-4)**
⊠	**P3D-B1**	**4.0**	**24**	**14**	**10**	**41.4**	**CLAYEY SAND (SC/A-4)**
▲	**P3D-B1**	**6.0**	**32**	**10**	**22**	**35.1**	**CLAYEY SAND (SC/A-2-6)**
★	**P3D-B1**	**8.0**	**38**	**20**	**18**	**59.8**	**SANDY LEAN CLAY (CL/A-6)**
⊙	**P3D-B1**	**10.0**	**27**	**23**	**4**	**56.5**	**SANDY SILT (ML/A-4)**

ATTERBERG LIMITS G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 7/9/25

REV 12/2023

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	CCR Ph. 3D	**PROJECT NO.:**	G5662.030
SAMPLE NUMBER:	25-1802	**DATE REQUESTED:**	6/10/2025
DESCRIPTION OF SOIL:	Various		
TESTED BY:	BW/MW	**DATE OF TESTING:**	6/24/2025
WEIGHED BY:	MW	**DATE OF WEIGHING:**	6/25/2025

BORING NO.	P3D-B2	P3D-B2	P3D-B2	P3D-B2	
SAMPLE NO.	SS-1	SS-2	SS-3	SS-4	
SAMPLE DEPTH	0.0 - 2.0	2.0 - 4.0	4.0 - 6.0	6.0 - 8.0	
WATER CONTENT, W%	18.7	18.0	17.7	30.1	

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

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

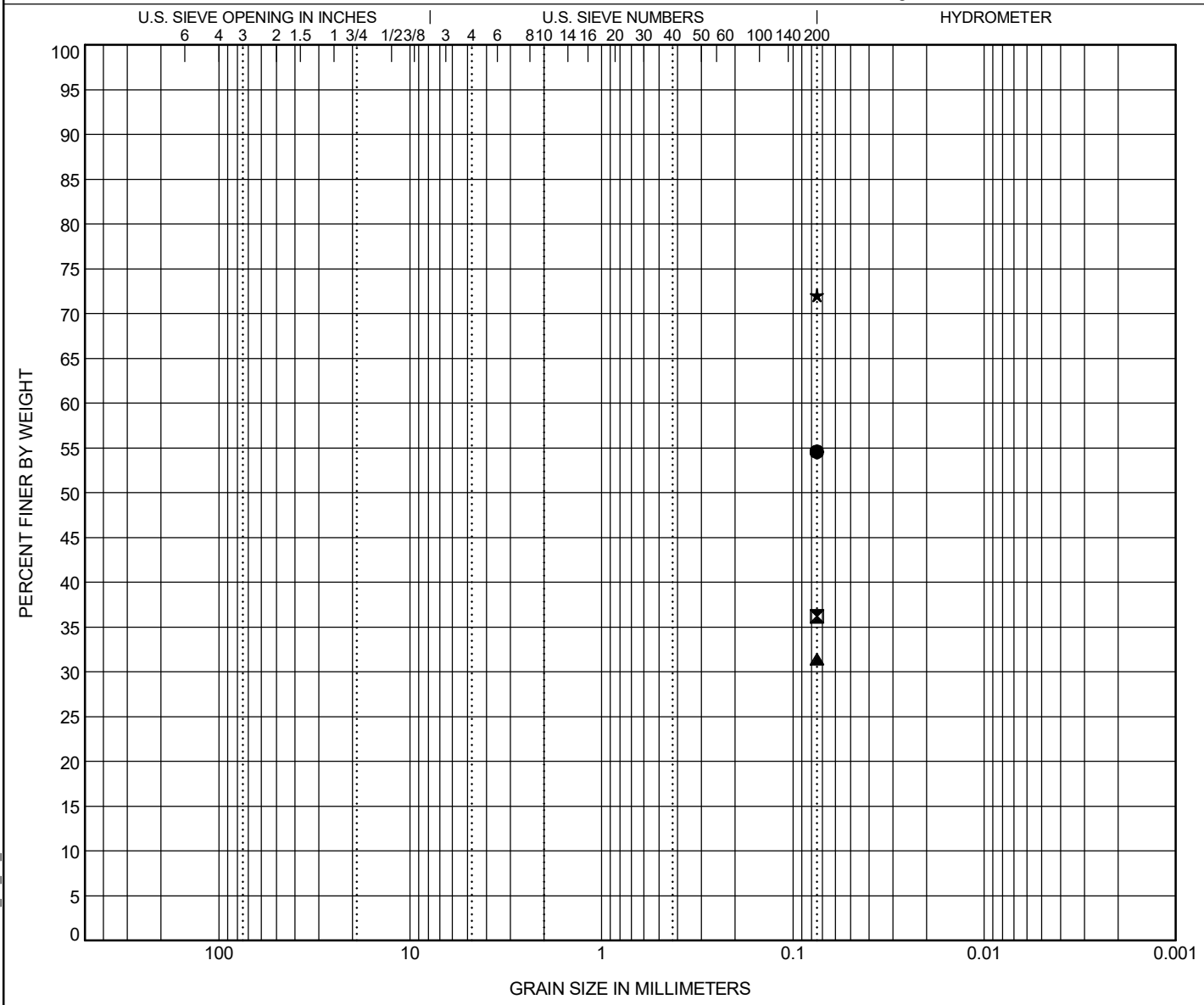
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

This report shall not be reproduced, except in full, without the written approval of F&ME Consultants, Inc.
211 Business Park Boulevard, Columbia SC 29203

GRAIN SIZE DISTRIBUTION

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**P3D-B2**	**2.0**	**SANDY SILT (ML/A-4)**	**31**	**23**	**8**		
⊠	**P3D-B2**	**4.0**	**CLAYEY SAND (SC/A-4)**	**28**	**20**	**8**		
▲	**P3D-B2**	**6.0**	**CLAYEY SAND (SC/A-2-6)**	**27**	**16**	**11**		
★	**P3D-B2**	**8.0**	**SILT with SAND (ML/A-4)**	**NP**	**NP**	**NP**		

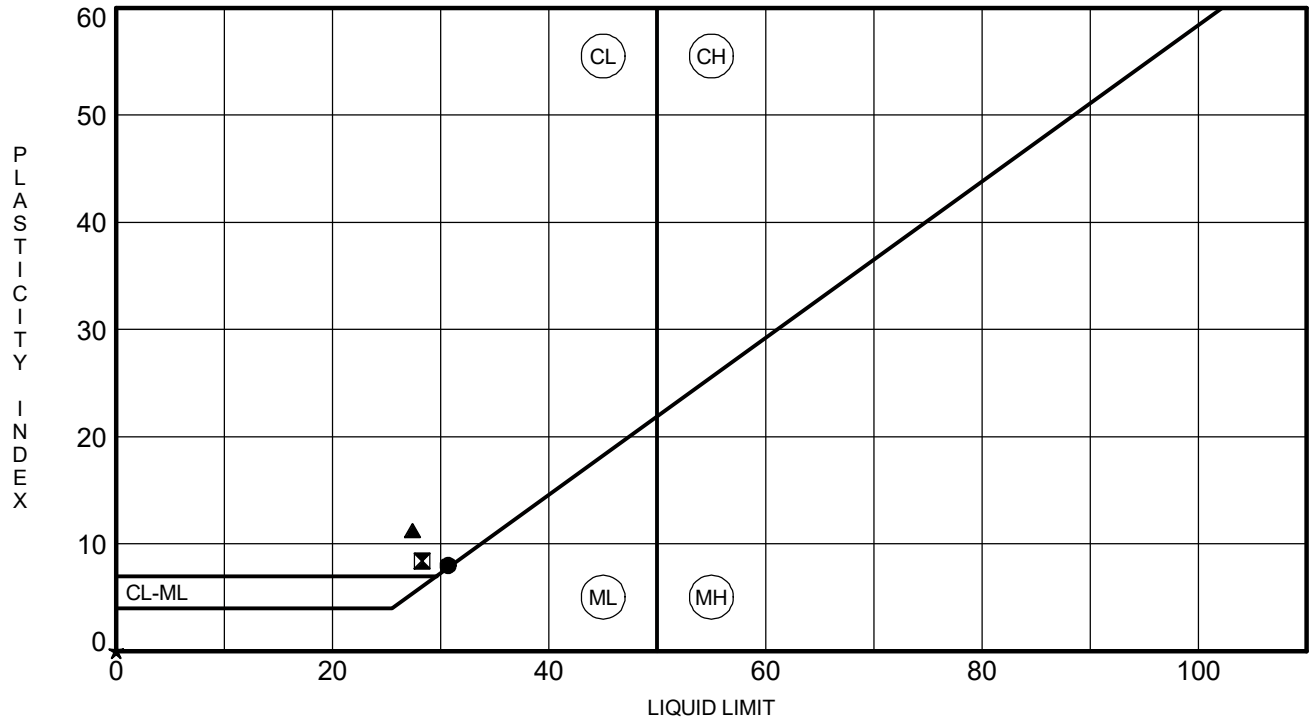
	BOREHOLE	DEPTH	D90	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**P3D-B2**	**2.0**							**54.6**	
⊠	**P3D-B2**	**4.0**							**36.2**	
▲	**P3D-B2**	**6.0**							**31.4**	
★	**P3D-B2**	**8.0**							**72.0**	

GRAIN SIZE G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 7/9/25

ATTERBERG LIMITS' RESULTS

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**P3D-B2**	**2.0**	**31**	**23**	**8**	**54.6**	**SANDY SILT (ML/A-4)**
⊠	**P3D-B2**	**4.0**	**28**	**20**	**8**	**36.2**	**CLAYEY SAND (SC/A-4)**
▲	**P3D-B2**	**6.0**	**27**	**16**	**11**	**31.4**	**CLAYEY SAND (SC/A-2-6)**
★	**P3D-B2**	**8.0**	**NP**	**NP**	**NP**	**72.0**	**SILT with SAND (ML/A-4)**

ATTERBERG LIMITS G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 7/9/25

pH DETERMINATION
(AASHTO T289)

Project Name:	CCR Ph. 3D	Project Number:	G5662.03-00019
Description of Sample:	Soil Sample (Composite)	Date Received	7/9/2025
Tested By:	AG	Date Tested:	7/31/2025

Boring ID	P3D-B2
Boring Depth	0.0 - 15.0
FME Lab ID No.	25-1802
pH Value	5.93
Temperature (˚C)	22.20

Date Reviewed: 8/11/2025 Reviewed By: J. Heirs

This report shall not be reproduced, except in full,
without the written approval of F&ME Consultants, Inc.
211 Business Park Blvd., Columbia, SC 29203

SOIL RESISTIVITY
(AASHTO T288)

Project Name:	CCR Ph. 3D	Project ID:	G5662.03-00019
Location:	Soil Sample (Composite)	FME Lab ID No.:	25-1802
Sampled By:	BV	Date Sampled:	6/6/2025
Soil Description:	Composite	Date Received:	6/6/2025
Tested By:	A. Grier	Date Tested:	8/11/2025

Boring No.	Sample Depth (ft.)	Minimum Soil Resistivity, Ω-cm
P3D-B2	0.0 - 15.0	6,224

Date Reviewed: 8/11/2025 Reviewed By: J. Hiers

This report shall not be reproduced, except in full,
without the written approval of F&ME Consultants, Inc.
211 Business Park Blvd., Columbia, SC 29203

Water-Soluble Sulfate Ion Content in Soil

AASHTO T 290-95 (2020)

Client:	F&ME Consultants, Inc.	Boring No.:	P3D-B2
Client Reference:	CCR Ph. 3D G5662.03	Depth (ft):	0.0-15.0'
Project No.:	2025-517-001	Sample No.:	SS-1/2/3/4/5/6
Lab ID:	2025-517-001-001	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	8	19	45	59	122	157	232

Measurement of Barium Chloride Turbidity

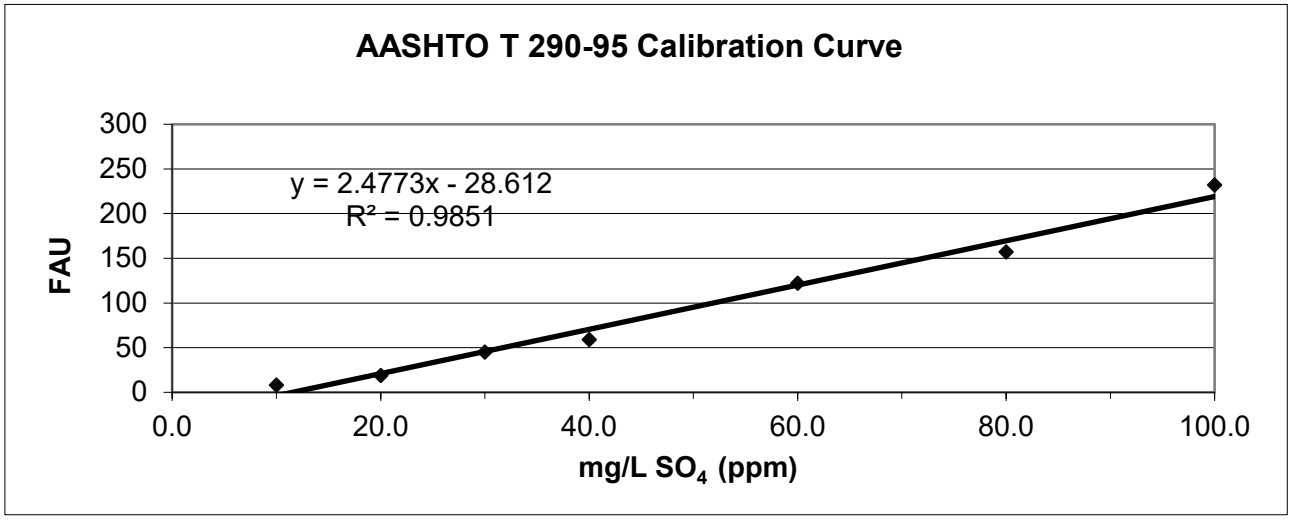
(Sample contains 5.0 mL NaCl solution and 0.3 g $BaCl_2 \cdot 2H_2O$)

Sample Weight (g):	100.0
Water added to Sample (mL):	300.0
Size of Sample Aliquot (mL):	50.0
Sample Reading (FAU):	35
Sample Diluted:	No
Sulfate Solution Added (ml):	0

Sample Moisture Content

Tare Number:	427
Weight of Tare & Wet Sample (g):	213.52
Weight of Tare & Dry Sample (g):	211.99
Weight of Tare (g):	89.46
Weight of Water (g):	1.53
Weight of Dry Sample (g):	122.53
Moisture Content (%):	1.25

Sample Sulfate Ion Concentration:	25.68	**mg/L SO_4 (ppm)**
Sample Sulfate Ion Content:	77.0	**mg/Kg SO_4 (not corrected for moisture)**
Sample Sulfate Ion Content:	78.0	**mg/Kg SO_4 (corrected for moisture)**



Tested by: JAM Date: 8/1/25 Checked by: EG Date: 8/4/2025

544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

CHLORIDE ION CONTENT IN SOILS

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

Client:	F&ME Consultants, Inc.	Boring No.:	P3D-B2
Client Reference:	CCR Ph. 3D G5662.03	Depth (ft):	0.0-15.0'
Project No.:	2025-517-001	Sample No.:	SS-1/2/3/4/5/6
Lab ID:	2025-517-001-001	Description:	Brown

(- # 10 Sieve material)

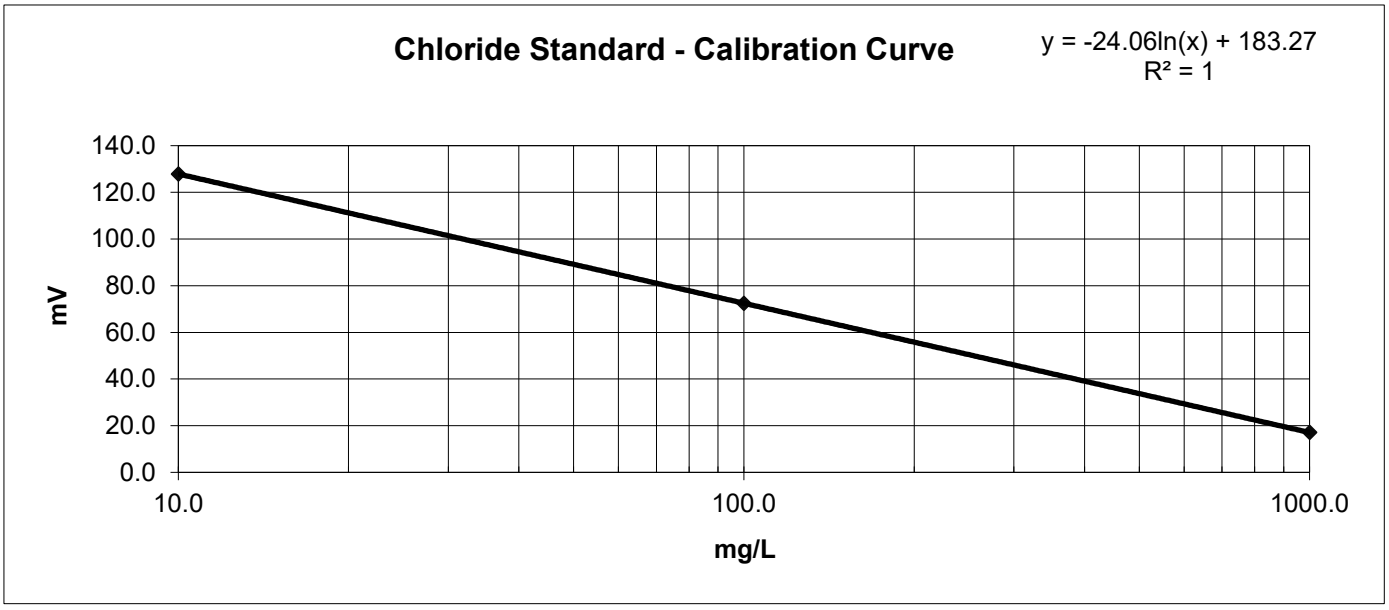
CHLORIDE STANDARD: CALIBRATION CURVE

STANDARD		MILLIVOLTS (mV)
10.0	mg/L	127.9
100.0	mg/L	72.4
1000.0	mg/L	17.1

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):	121.1	13.25	13.25

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°C.



Notes:

Tested By	JAM	Date	8/1/25	Checked By	EG	Date	8/4/25

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

544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	CCR Ph. 3D	**PROJECT NO.:**	G5662.030
SAMPLE NUMBER:	25-2782	**DATE REQUESTED:**	7/23/2025
DESCRIPTION OF SOIL:	Various		
TESTED BY:	AG & JM	**DATE OF TESTING:**	8/19/2025
WEIGHED BY:	AC	**DATE OF WEIGHING:**	8/20/2025

BORING NO.	P3D-B3	P3D-B3	P3D-B3	P3D-B3	
SAMPLE NO.	SS-1	SS-2	SS-3	SS-5	
SAMPLE DEPTH	0.0 - 2.0	2.0 - 4.0	4.0 - 6.0	8.0 - 10.0	
WATER CONTENT, W%	15.5	36.0	33.3	11.8	

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

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

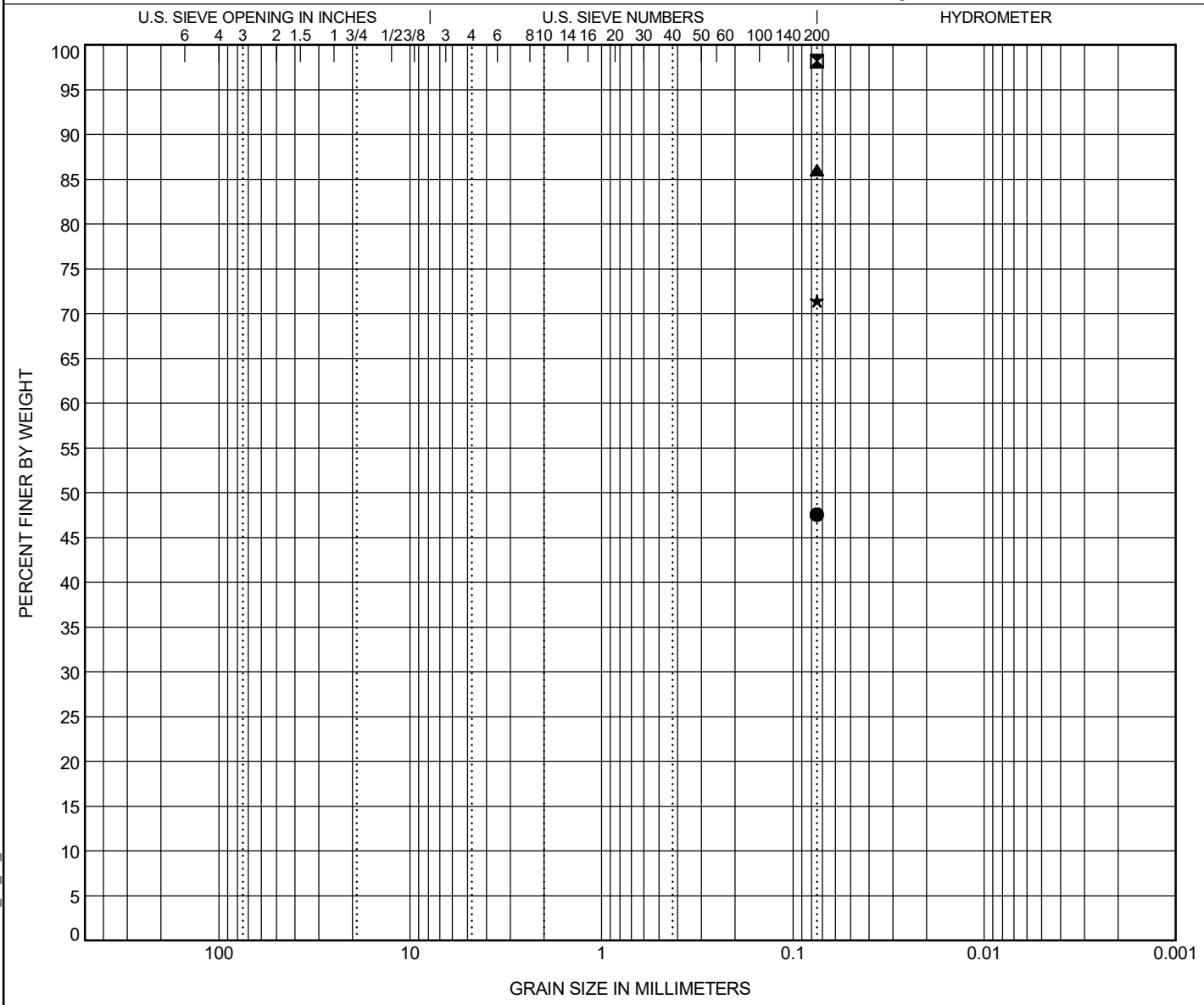
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

This report shall not be reproduced, except in full, without the written approval of F&ME Consultants, Inc.
211 Business Park Boulevard, Columbia SC 29203

GRAIN SIZE DISTRIBUTION

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	P3D-B3	2.0	CLAYEY SAND (SC/A-6)					
⊠	P3D-B3	4.0	FAT CLAY (CH/A-7-6)	56	27	29		
▲	P3D-B3	6.0	FAT CLAY (CH/A-7-6)					
★	P3D-B3	10.0	SILT with SAND (ML/A-4)	26	23	3		

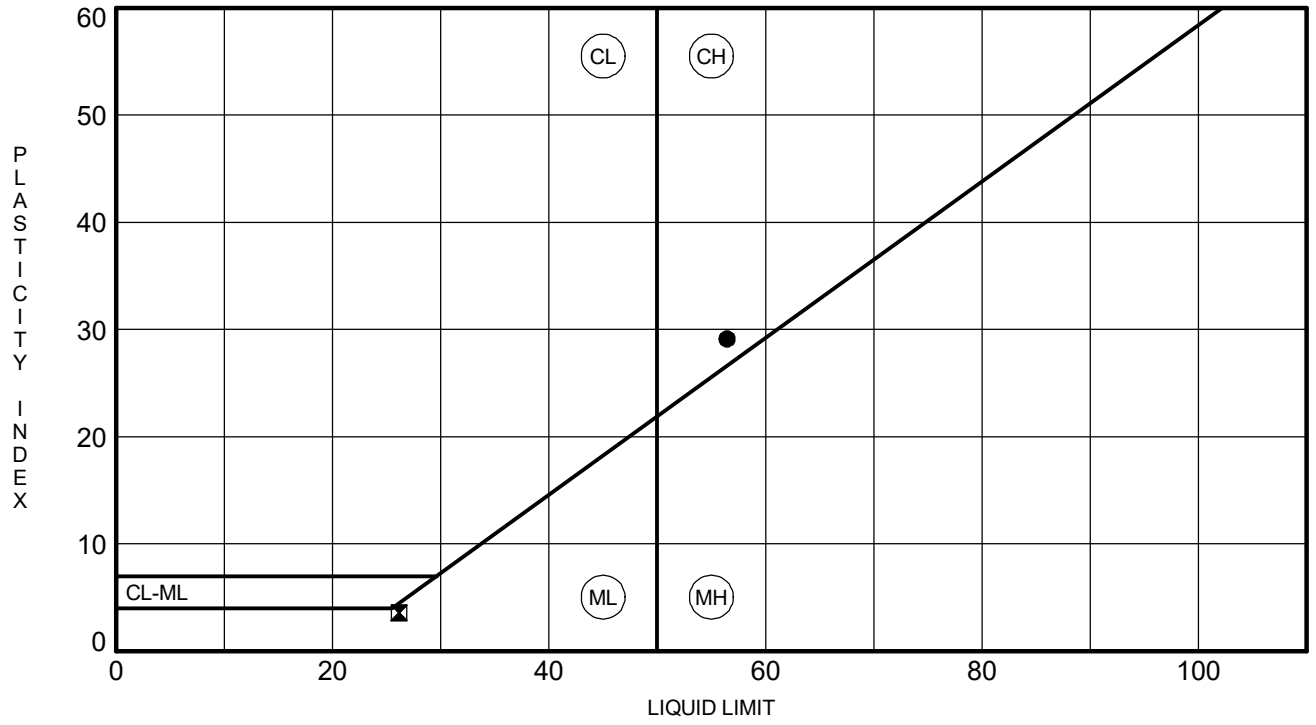
	BOREHOLE	DEPTH	D90	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	P3D-B3	2.0							47.6	
⊠	P3D-B3	4.0							98.2	
▲	P3D-B3	6.0							86.0	
★	P3D-B3	10.0							71.4	

GRAIN SIZE G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 9/15/25

ATTERBERG LIMITS' RESULTS

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



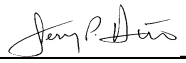
	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**P3D-B3**	**4.0**	**56**	**27**	**29**	**98.2**	**FAT CLAY (CH/A-7-6)**
⊠	**P3D-B3**	**10.0**	**26**	**23**	**3**	**71.4**	**SILT with SAND (ML/A-4)**

pH DETERMINATION
(AASHTO T289)

Project Name:	CCR Ph. 3D (Req. #8)	Project Number:	G5662.03/00019
Description of Sample:	Soil	Date Received	7/31/2025
Tested By:	A. Ross	Date Tested:	8/28/2025

Boring ID	P3D-B3
Boring Depth	6.0 - 8.0
FME Lab ID No.	25-2782
pH Value	7.87
Temperature (˚C)	22.2˚C

Date Reviewed: 8/29/2025

Reviewed By: 

This report shall not be reproduced, except in full,
without the written approval of F&ME Consultants, Inc.
211 Business Park Blvd., Columbia, SC 29203

SOIL RESISTIVITY
(AASHTO T288)

Project Name:	CCR Ph. 3D (Req. #8)	Project ID:	G5662.03-00019
Location:	P3D-B3	FME Lab ID No.:	25-2782
Sampled By:	AF	Date Sampled:	7/31/2025
Soil Description:	--	Date Received:	7/31/2025
Tested By:	A. Ross	Date Tested:	8/21/2025

Boring No.	Sample Depth (ft.)	Minimum Soil Resistivity, Ω-cm
P3D-B3	6.0 - 8.0	4,529 Ω-cm

Date Reviewed: 8/22/2025 Reviewed By: J. Hiers

This report shall not be reproduced, except in full,
without the written approval of F&ME Consultants, Inc.
211 Business Park Blvd., Columbia, SC 29203

Water-Soluble Sulfate Ion Content in Soil

AASHTO T 290-95 (2020)

Client:	F&ME Consultants, Inc.	Boring No.:	P3D-B3
Client Reference:	CCR - Ph. 3D G5662.03	Depth (ft):	6.0-8.0'
Project No.:	2025-595-001	Sample No.:	SS-4
Lab ID:	2025-595-001-001	Soil Description:	Light 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	8	19	45	59	122	157	232

Measurement of Barium Chloride Turbidity

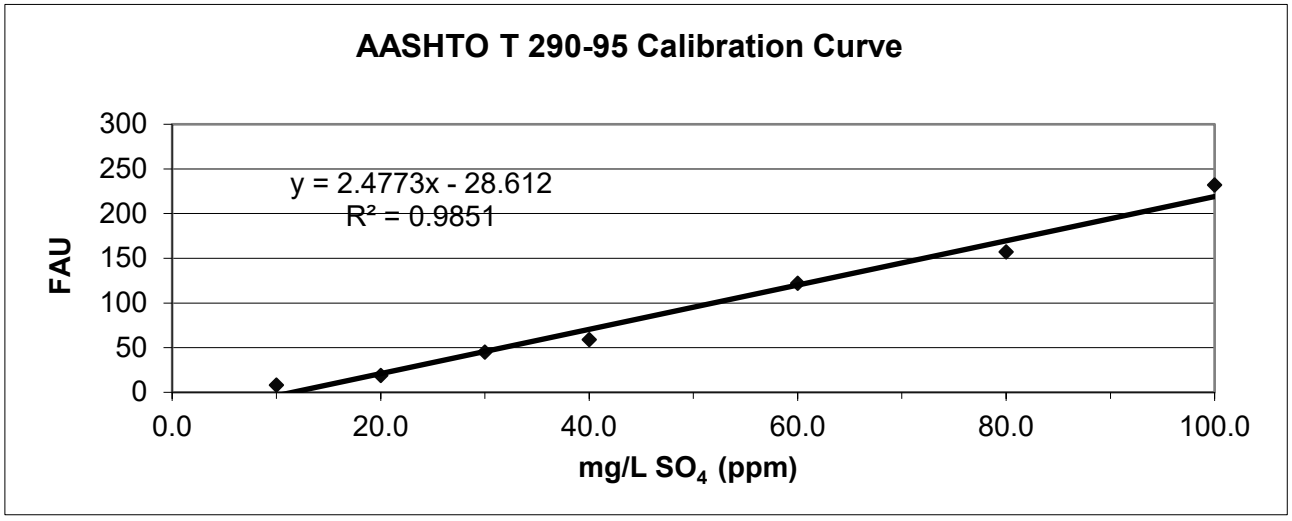
(Sample contains 5.0 mL NaCl solution and 0.3 g $BaCl_2 \cdot 2H_2O$)

Sample Weight (g):	100.0
Water added to Sample (mL):	300.0
Size of Sample Aliquot (mL):	50.0
Sample Reading (FAU):	5
Sample Diluted:	No
Sulfate Solution Added (ml):	0

Sample Moisture Content

Tare Number:	483
Weight of Tare & Wet Sample (g):	204.24
Weight of Tare & Dry Sample (g):	201.64
Weight of Tare (g):	97.32
Weight of Water (g):	2.60
Weight of Dry Sample (g):	104.32
Moisture Content (%):	2.49

Sample Sulfate Ion Concentration:	13.57	**mg/L SO_4 (ppm)**
Sample Sulfate Ion Content:	40.7	**mg/Kg SO_4 (not corrected for moisture)**
Sample Sulfate Ion Content:	41.7	**mg/Kg SO_4 (corrected for moisture)**



Tested by: JAM Date: 9/4/25 Checked by: EG Date: 9/5/2025

544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

CHLORIDE ION CONTENT IN SOILS

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

Client:	F&ME Consultants, Inc.	Boring No.:	P3D-B3
Client Reference:	CCR - Ph. 3D G5662.03	Depth (ft):	6.0-8.0'
Project No.:	2025-595-001	Sample No.:	SS-4
Lab ID:	2025-595-001-001	Description:	Light Brown

(- # 10 Sieve material)

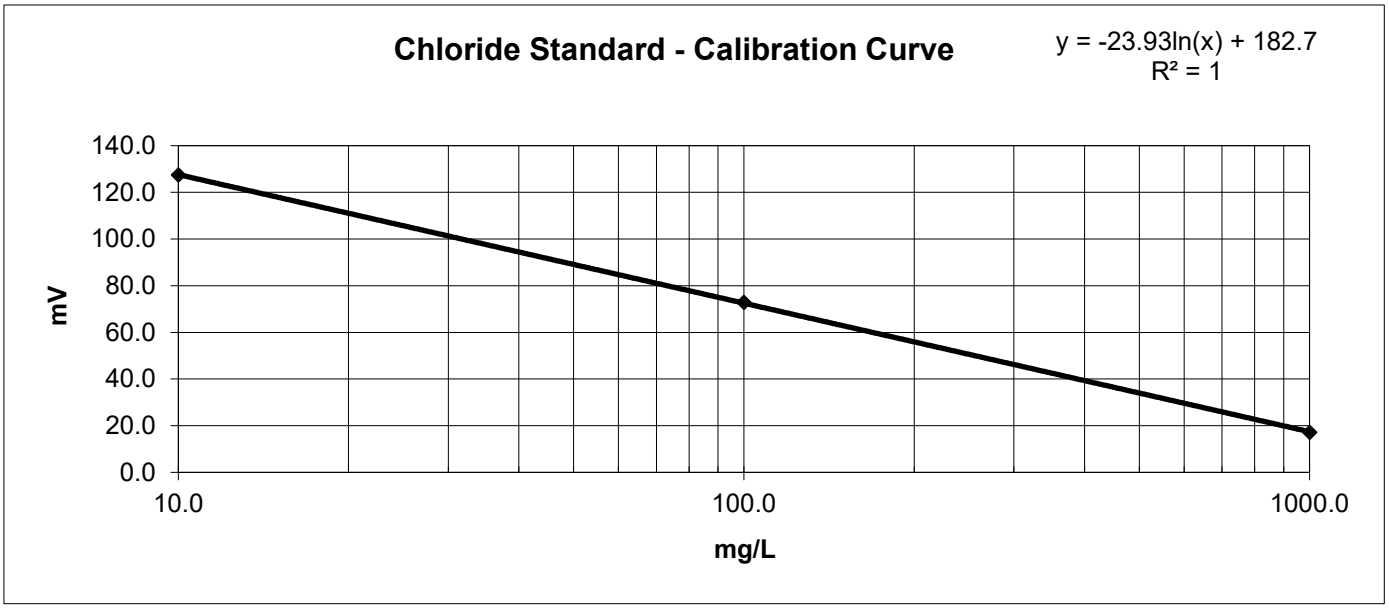
CHLORIDE STANDARD: CALIBRATION CURVE

STANDARD		MILLIVOLTS (mV)
10.0	mg/L	127.4
100.0	mg/L	72.9
1000.0	mg/L	17.2

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):	87.9	52.54	52.54

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°C.



Notes:

Tested By	JAM	Date	9/4/25	Checked By	EG	Date	9/5/25

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

544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	CCR Ph. 3D	**PROJECT NO.:**	G5662.030
SAMPLE NUMBER:	25-2781	**DATE REQUESTED:**	7/23/2025
DESCRIPTION OF SOIL:	Various		
TESTED BY:	LJ	**DATE OF TESTING:**	8/19/2025
WEIGHED BY:	AC	**DATE OF WEIGHING:**	8/20/2025

BORING NO.	P3D-B4	P3D-B4	P3D-B4	P3D-B4	
SAMPLE NO.	SS-1	SS-2	SS-3	SS-4	
SAMPLE DEPTH	0.0 - 2.0	2.0 - 4.0	4.0 - 6.0	6.0 - 8.0	
WATER CONTENT, W%	17.6	28.7	29.6	17.9	

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

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

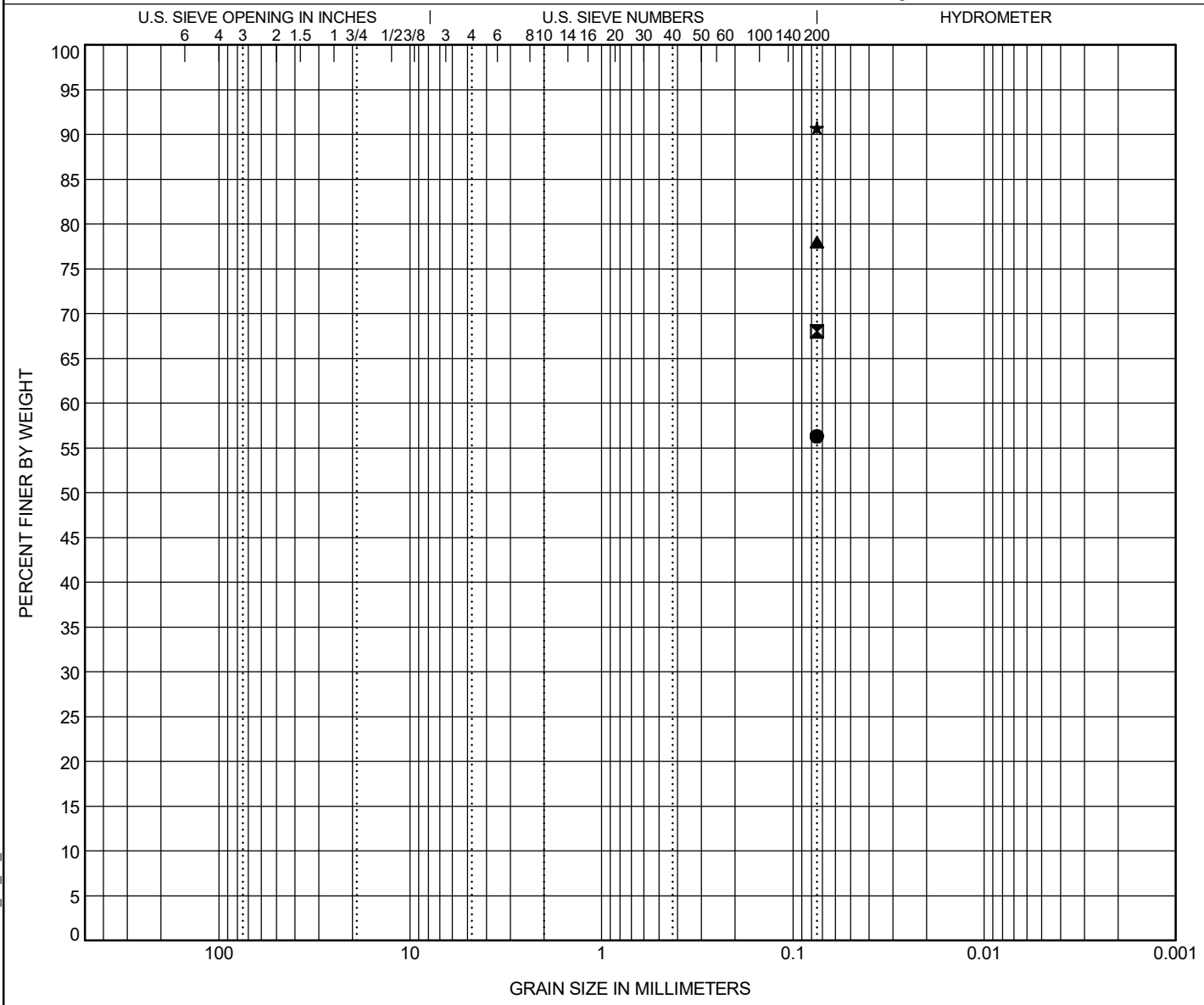
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

This report shall not be reproduced, except in full, without the written approval of F&ME Consultants, Inc.
211 Business Park Boulevard, Columbia SC 29203

GRAIN SIZE DISTRIBUTION

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**P3D-B4**	**2.0**	**SANDY FAT CLAY (CH/A-7-6)**					
⊠	**P3D-B4**	**4.0**	**SANDY FAT CLAY (CH/A-7-6)**	**52**	**18**	**34**		
▲	**P3D-B4**	**6.0**	**SILT with SAND (ML/A-6)**	**39**	**28**	**11**		
★	**P3D-B4**	**8.0**	**SILT (ML/A-6)**	**37**	**25**	**12**		

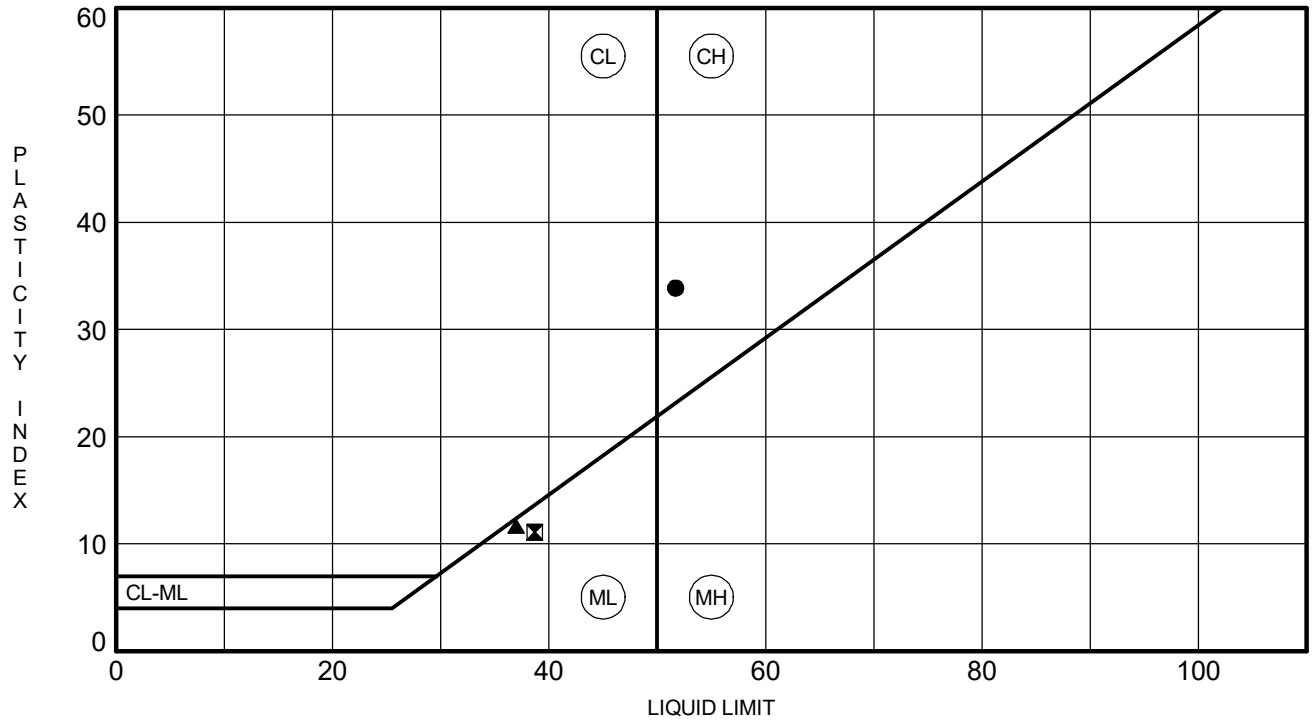
	BOREHOLE	DEPTH	D90	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**P3D-B4**	**2.0**							**56.3**	
⊠	**P3D-B4**	**4.0**							**68.0**	
▲	**P3D-B4**	**6.0**							**78.0**	
★	**P3D-B4**	**8.0**							**90.8**	

GRAIN SIZE G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 9/15/25

ATTERBERG LIMITS' RESULTS

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**P3D-B4**	**4.0**	**52**	**18**	**34**	**68.0**	**SANDY FAT CLAY (CH/A-7-6)**
⊠	**P3D-B4**	**6.0**	**39**	**28**	**11**	**78.0**	**SILT with SAND (ML/A-6)**
▲	**P3D-B4**	**8.0**	**37**	**25**	**12**	**90.8**	**SILT (ML/A-6)**

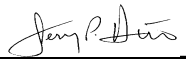
ATTERBERG LIMITS G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 9/15/25

pH DETERMINATION
(AASHTO T289)

Project Name:	CCR Ph. 3D (Req. #8)	Project Number:	G5662.03/00019
Description of Sample:	Soil (Composite)	Date Received	7/31/2025
Tested By:	A. Ross	Date Tested:	8/28/2025

Boring ID	P3D-B4
Boring Depth	4.0 - 10.0
FME Lab ID No.	25-2781
pH Value	7.36
Temperature (˚C)	22.7˚C

Date Reviewed: 8/29/2025

Reviewed By: 

This report shall not be reproduced, except in full,
without the written approval of F&ME Consultants, Inc.
211 Business Park Blvd., Columbia, SC 29203

SOIL RESISTIVITY
(AASHTO T288)

Project Name:	CCR Ph. 3D (Req. #8)	Project ID:	G5662.03-00019
Location:	P3D-B4	FME Lab ID No.:	25-2781
Sampled By:	AF	Date Sampled:	7/31/2025
Soil Description:	Composite	Date Received:	7/31/2025
Tested By:	A. Ross	Date Tested:	8/21/2025

Boring No.	Sample Depth (ft.)	Minimum Soil Resistivity, Ω-cm
P3D-B4	4.0 - 10.0	3,571 Ω-cm

Date Reviewed: 8/22/2025 Reviewed By: J. Hiers

This report shall not be reproduced, except in full,
without the written approval of F&ME Consultants, Inc.
211 Business Park Blvd., Columbia, SC 29203

Water-Soluble Sulfate Ion Content in Soil

AASHTO T 290-95 (2020)

Client:	F&ME Consultants, Inc.	Boring No.:	P3D-B4
Client Reference:	CCR - Ph. 3D G5662.03	Depth (ft):	4.0-10.0'
Project No.:	2025-595-001	Sample No.:	SS-3/SS-4/SS-5
Lab ID:	2025-595-001-002	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	8	19	45	59	122	157	232

Measurement of Barium Chloride Turbidity

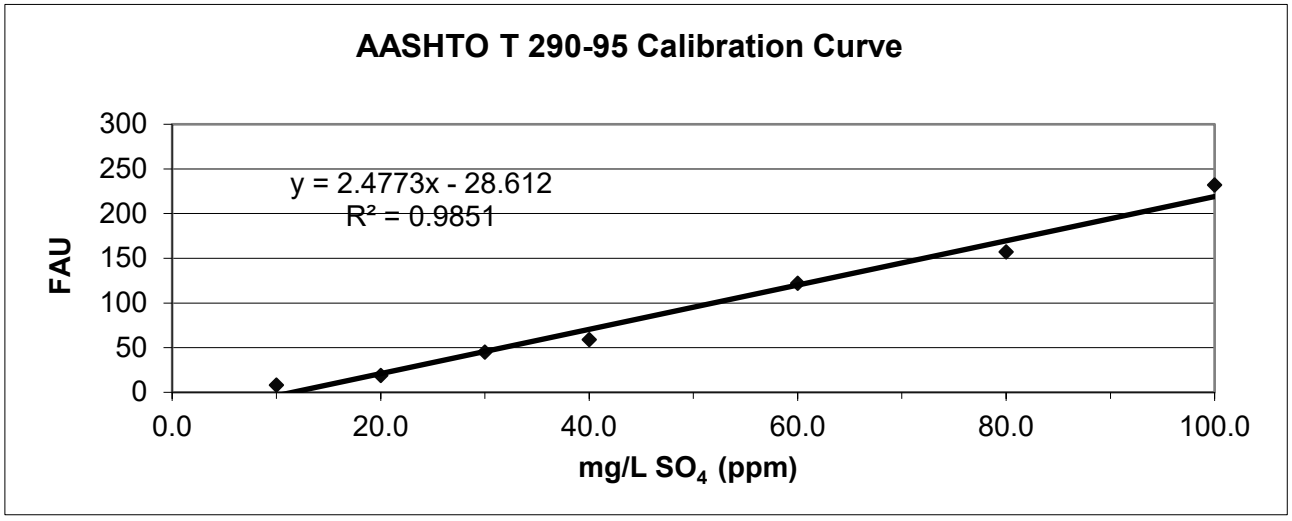
(Sample contains 5.0 mL NaCl solution and 0.3 g $BaCl_2 \cdot 2H_2O$)

Sample Weight (g):	100.0
Water added to Sample (mL):	300.0
Size of Sample Aliquot (mL):	50.0
Sample Reading (FAU):	17
Sample Diluted:	No
Sulfate Solution Added (ml):	0

Sample Moisture Content

Tare Number:	435
Weight of Tare & Wet Sample (g):	201.24
Weight of Tare & Dry Sample (g):	197.69
Weight of Tare (g):	91.48
Weight of Water (g):	3.55
Weight of Dry Sample (g):	106.21
Moisture Content (%):	3.34

Sample Sulfate Ion Concentration:	18.41	**mg/L SO_4 (ppm)**
Sample Sulfate Ion Content:	55.2	**mg/Kg SO_4 (not corrected for moisture)**
Sample Sulfate Ion Content:	57.1	**mg/Kg SO_4 (corrected for moisture)**



Tested by: JAM Date: 9/4/25 Checked by: EG Date: 9/5/2025

544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

CHLORIDE ION CONTENT IN SOILS

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

Client:	F&ME Consultants, Inc.	Boring No.:	P3D-B4
Client Reference:	CCR - Ph. 3D G5662.03	Depth (ft):	4.0-10.0'
Project No.:	2025-595-001	Sample No.:	SS-3/SS-4/SS-5
Lab ID:	2025-595-001-002	Description:	Brown

(- # 10 Sieve material)

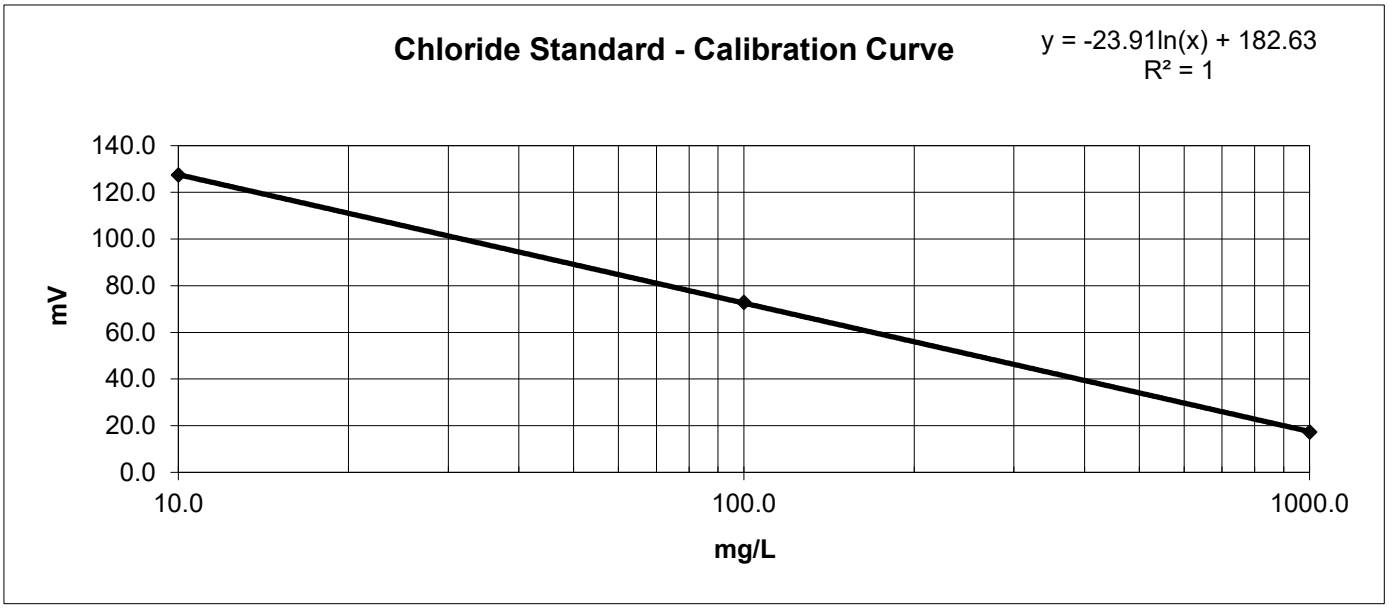
CHLORIDE STANDARD: CALIBRATION CURVE

STANDARD		MILLIVOLTS (mV)
10.0	mg/L	127.4
100.0	mg/L	72.9
1000.0	mg/L	17.3

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):	111.0	20.01	20.01

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°C.



Notes:

Tested By	JAM	Date	9/4/25	Checked By	EG	Date	9/5/25

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

544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	CCR Ph. 3D	**PROJECT NO.:**	G5662.030
SAMPLE NUMBER:	25-2850	**DATE REQUESTED:**	7/23/2025
DESCRIPTION OF SOIL:	Various		
TESTED BY:	AC & CJ	**DATE OF TESTING:**	8/20/2025
WEIGHED BY:	JM	**DATE OF WEIGHING:**	8/21/2025

BORING NO.	P3D-B5	P3D-B5	P3D-B5	P3D-B5	P3D-B5
SAMPLE NO.	SS-1	SS-2	SS-4	SS-5A	SS-5B
SAMPLE DEPTH	0.0 - 2.0	2.0 - 4.0	6.0 - 8.0	8.0 - 8.5	8.5 - 10.0
WATER CONTENT, W%	29.9	26.1	14.3	8.6	23.0

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

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

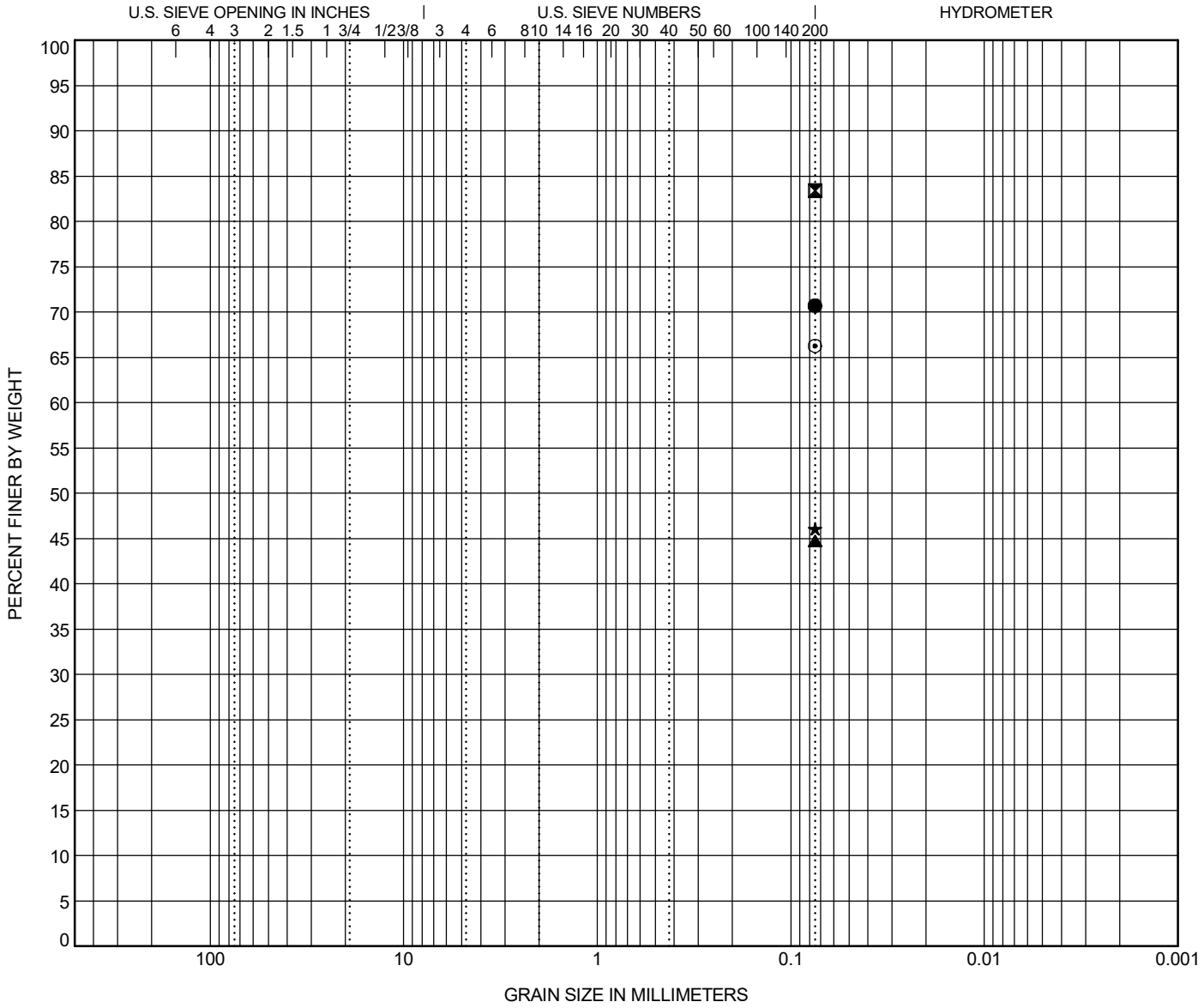
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

This report shall not be reproduced, except in full, without the written approval of F&ME Consultants, Inc.
211 Business Park Boulevard, Columbia SC 29203

GRAIN SIZE DISTRIBUTION

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	P3D-B5	2.0	FAT CLAY with SAND (CH/A-7-6)					
⊠	P3D-B5	4.0	FAT CLAY with SAND (CH/A-7-6)	54	28	26		
▲	P3D-B5	8.0	CLAYEY SAND (SC/A-6)	40	14	26		
★	P3D-B5	8.5	CLAYEY SAND (SC/A-6)					
⊙	P3D-B5	10.0	SANDY LEAN CLAY (CL/A-7-6)	43	15	28		

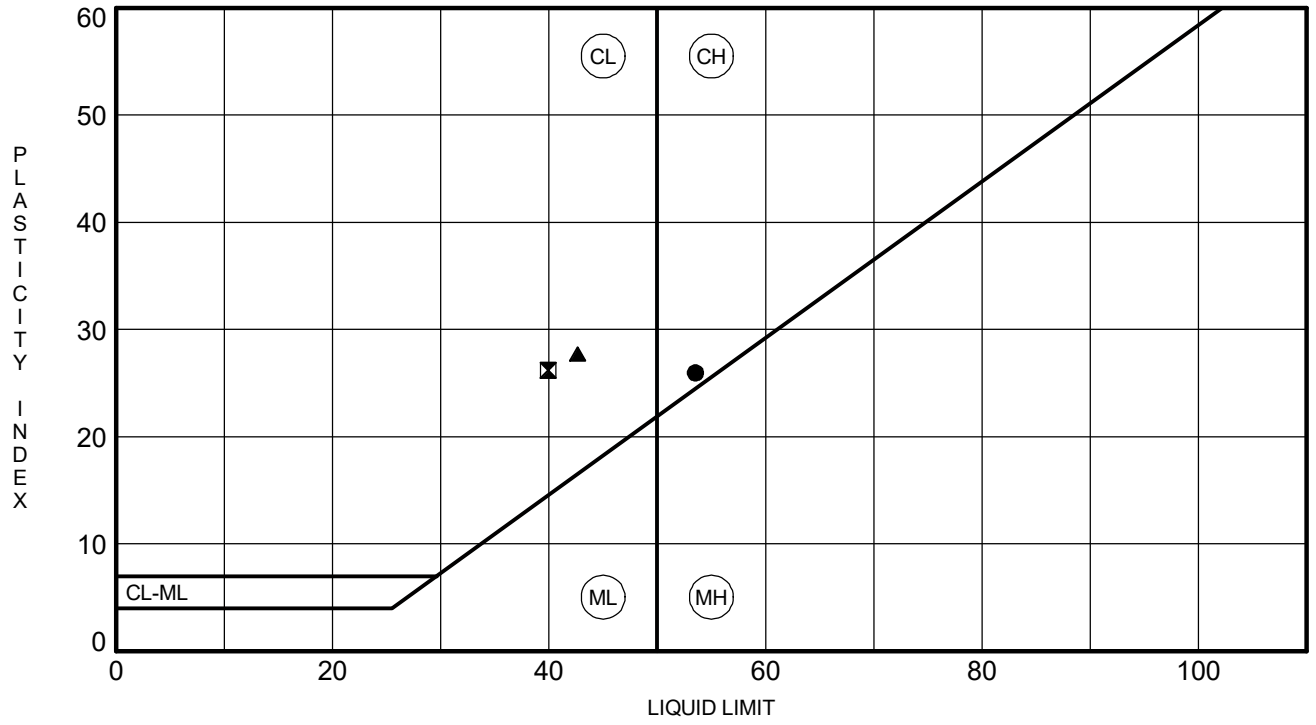
	BOREHOLE	DEPTH	D90	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	P3D-B5	2.0							70.7	
⊠	P3D-B5	4.0							83.4	
▲	P3D-B5	8.0							44.8	
★	P3D-B5	8.5							46.1	
⊙	P3D-B5	10.0							66.3	

GRAIN SIZE G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 9/12/25

ATTERBERG LIMITS' RESULTS

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**P3D-B5**	**4.0**	**54**	**28**	**26**	**83.4**	**FAT CLAY with SAND (CH/A-7-6)**
⊠	**P3D-B5**	**8.0**	**40**	**14**	**26**	**44.8**	**CLAYEY SAND (SC/A-6)**
▲	**P3D-B5**	**10.0**	**43**	**15**	**28**	**66.3**	**SANDY LEAN CLAY (CL/A-7-6)**

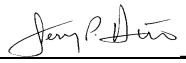
ATTERBERG LIMITS G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 9/12/25

pH DETERMINATION
(AASHTO T289)

Project Name:	CCR Ph. 3D (Req. #9)	Project Number:	G5662.03/00019
Description of Sample:	Soil (Composite)	Date Received	8/8/2025
Tested By:	A. Ross	Date Tested:	8/28/2025

Boring ID	P3D-B5
Boring Depth	4.0 - 6.0
FME Lab ID No.	25-2850
pH Value	4.41
Temperature (˚C)	22.7˚C

Date Reviewed: 8/29/2025

Reviewed By: 

This report shall not be reproduced, except in full,
without the written approval of F&ME Consultants, Inc.
211 Business Park Blvd., Columbia, SC 29203

SOIL RESISTIVITY
(AASHTO T288)

Project Name:	CCR Ph. 3D (Req. #9)	Project ID:	G5662.03-00019
Location:	P3D-B5	FME Lab ID No.:	25-2850
Sampled By:	BV	Date Sampled:	8/8/2025
Soil Description:	Light Yellowish Red, Soil	Date Received:	8/8/2025
Tested By:	A. Ross	Date Tested:	8/26/2025

Boring No.	Sample Depth (ft.)	Minimum Soil Resistivity, Ω-cm
P3D-B5	4.0 - 6.0	11,256 Ω-cm

Date Reviewed: 9/2/2025 Reviewed By: J. Hiers

This report shall not be reproduced, except in full,
without the written approval of F&ME Consultants, Inc.
211 Business Park Blvd., Columbia, SC 29203

Water-Soluble Sulfate Ion Content in Soil

AASHTO T 290-95 (2020)

Client:	F&ME Consultants, Inc.	Boring No.:	P3D-B5
Client Reference:	CCR - Ph. 3D G5662.03	Depth (ft):	4.0-6.0'
Project No.:	2025-595-001	Sample No.:	SS-3
Lab ID:	2025-595-001-003	Soil Description:	Orange 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	8	19	45	59	122	157	232

Measurement of Barium Chloride Turbidity

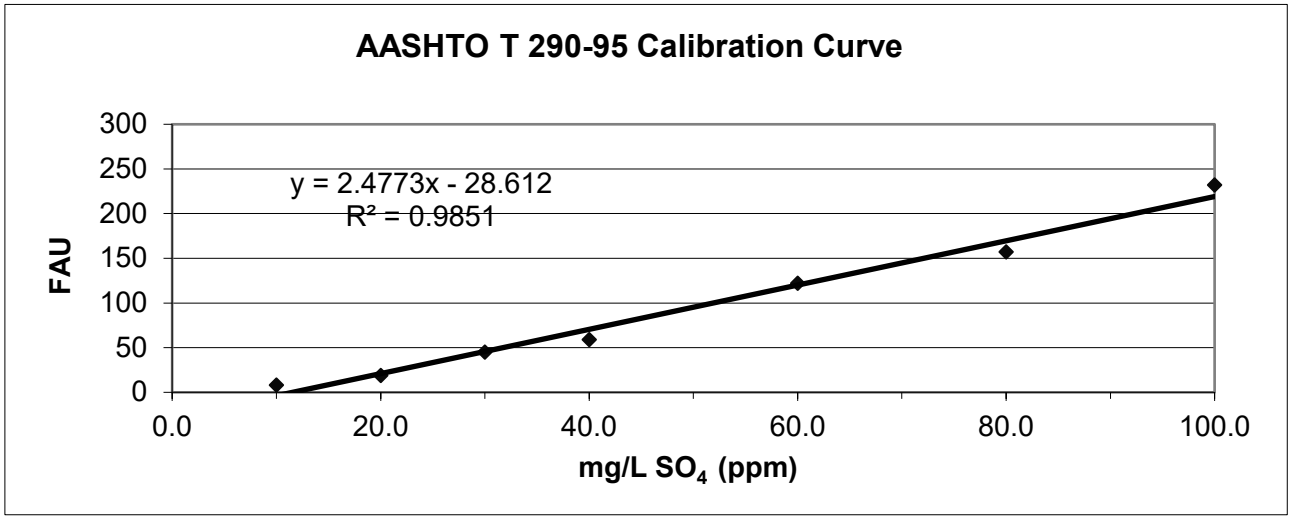
(Sample contains 5.0 mL NaCl solution and 0.3 g $BaCl_2 \cdot 2H_2O$)

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:	406
Weight of Tare & Wet Sample (g):	221.26
Weight of Tare & Dry Sample (g):	219.71
Weight of Tare (g):	97.34
Weight of Water (g):	1.55
Weight of Dry Sample (g):	122.37
Moisture Content (%):	1.27

Sample Sulfate Ion Concentration:	14.38	**mg/L SO_4 (ppm)**
Sample Sulfate Ion Content:	43.1	**mg/Kg SO_4 (not corrected for moisture)**
Sample Sulfate Ion Content:	43.7	**mg/Kg SO_4 (corrected for moisture)**



Tested by: JAM Date: 9/4/25 Checked by: EG Date: 9/5/2025

544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

CHLORIDE ION CONTENT IN SOILS

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

Client:	F&ME Consultants, Inc.	Boring No.:	P3D-B5
Client Reference:	CCR - Ph. 3D G5662.03	Depth (ft):	4.0-6.0'
Project No.:	2025-595-001	Sample No.:	SS-3
Lab ID:	2025-595-001-003	Description:	Orange Brown

(- # 10 Sieve material)

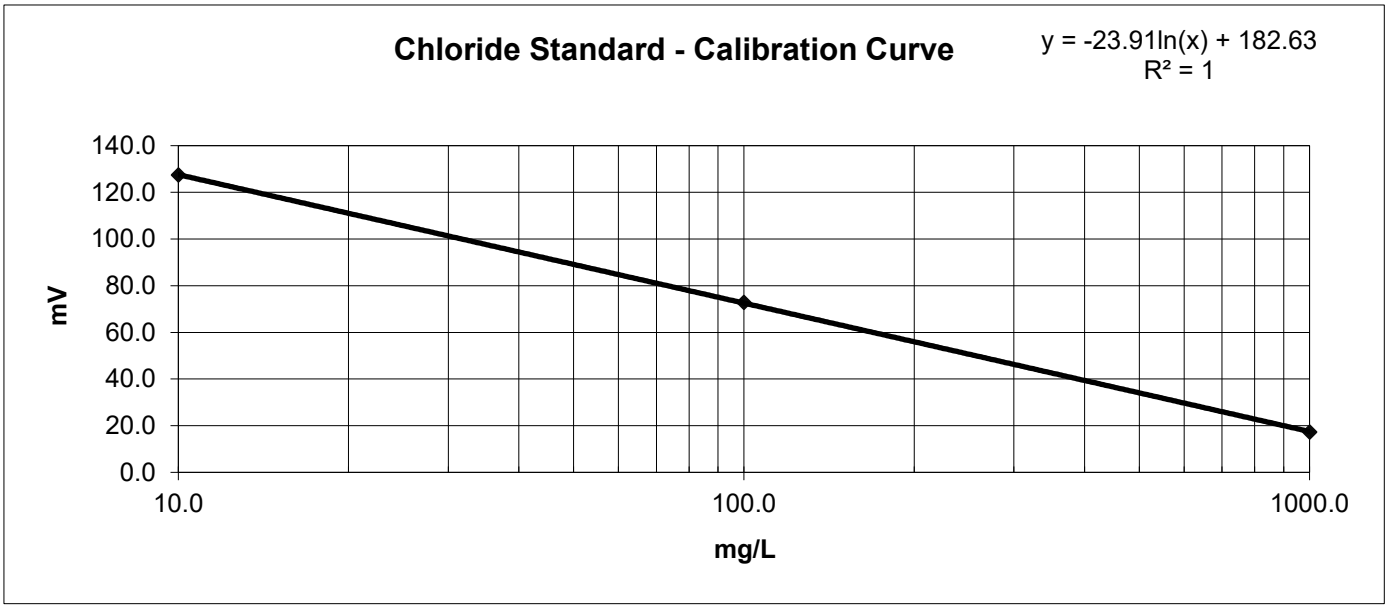
CHLORIDE STANDARD: CALIBRATION CURVE

STANDARD		MILLIVOLTS (mV)
10.0	mg/L	127.4
100.0	mg/L	72.9
1000.0	mg/L	17.3

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):	89.2	49.80	49.80

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°C.



Notes:

Tested By	JAM	Date	9/4/25	Checked By	EG	Date	9/5/25

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

544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	CCR Ph. 3D	**PROJECT NO.:**	G5662.030
SAMPLE NUMBER:	25-2851	**DATE REQUESTED:**	7/23/2025
DESCRIPTION OF SOIL:	Various		
TESTED BY:	AC & CJ	**DATE OF TESTING:**	8/20/2025
WEIGHED BY:	JM	**DATE OF WEIGHING:**	8/21/2025

BORING NO.	P3D-B6	P3D-B6	P3D-B6	P3D-B6	P3D-B6
SAMPLE NO.	SS-1	SS-2	SS-4A	SS-4.B	SS-6
SAMPLE DEPTH	0.0 - 2.0	2.0 - 4.0	6.0 - 7.5	7.5 - 8.0	13.5 - 15.0
WATER CONTENT, W%	28.7	23.4	23.4	9.5	10.0

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

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

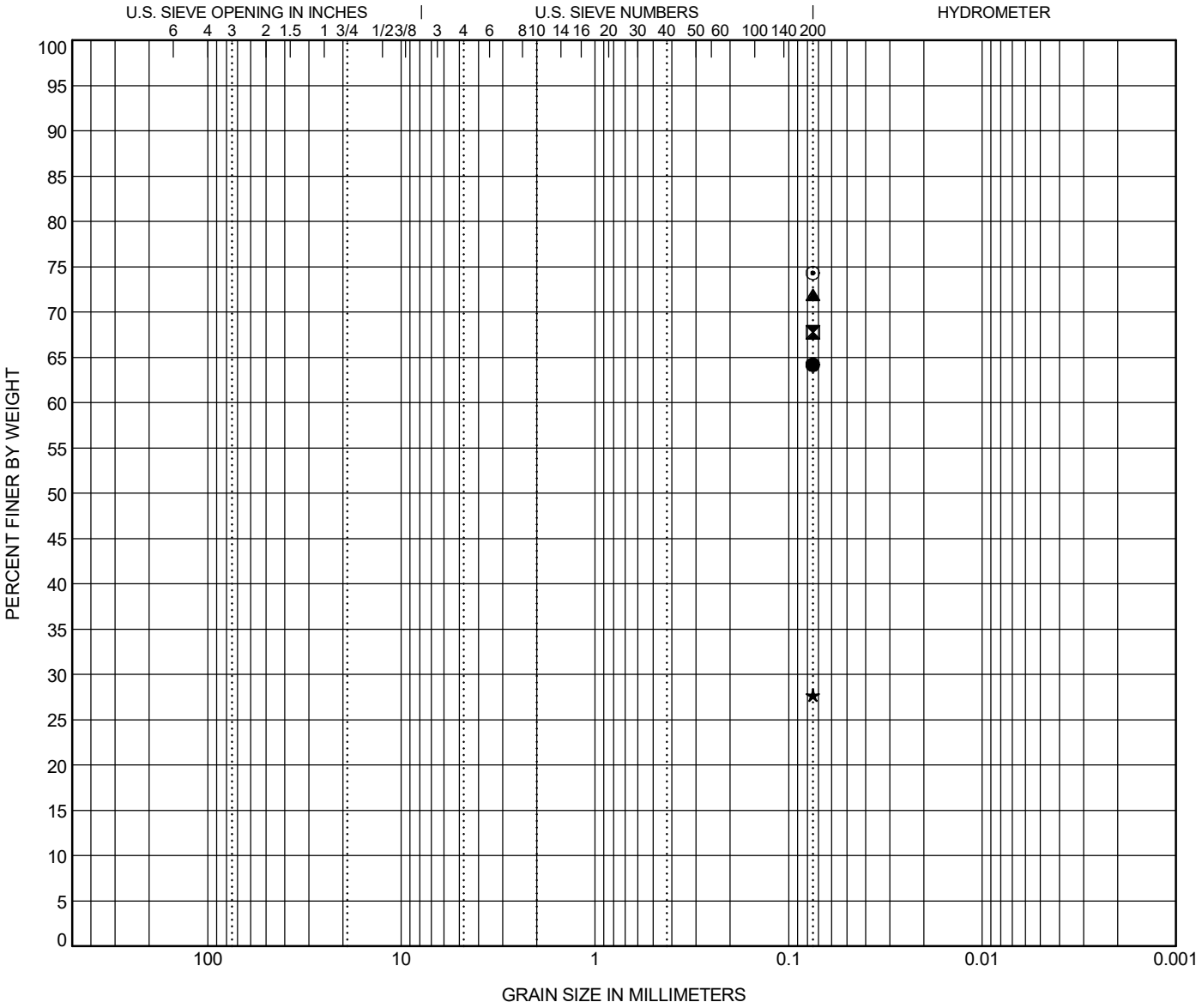
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

This report shall not be reproduced, except in full, without the written approval of F&ME Consultants, Inc.
211 Business Park Boulevard, Columbia SC 29203

GRAIN SIZE DISTRIBUTION

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**P3D-B6**	**2.0**	**SANDY FAT CLAY (CH/A-7-6)**					
⊠	**P3D-B6**	**4.0**	**SANDY FAT CLAY (CH/A-7-6)**	**53**	**24**	**29**		
▲	**P3D-B6**	**7.5**	**FAT CLAY with SAND (CH/A-7-6)**	**54**	**22**	**32**		
★	**P3D-B6**	**8.0**	**SILTY SAND (SM/A-2-4)**					
⊙	**P3D-B6**	**15.0**	**SILT with SAND (ML/A-4)**	**NP**	**NP**	**NP**		

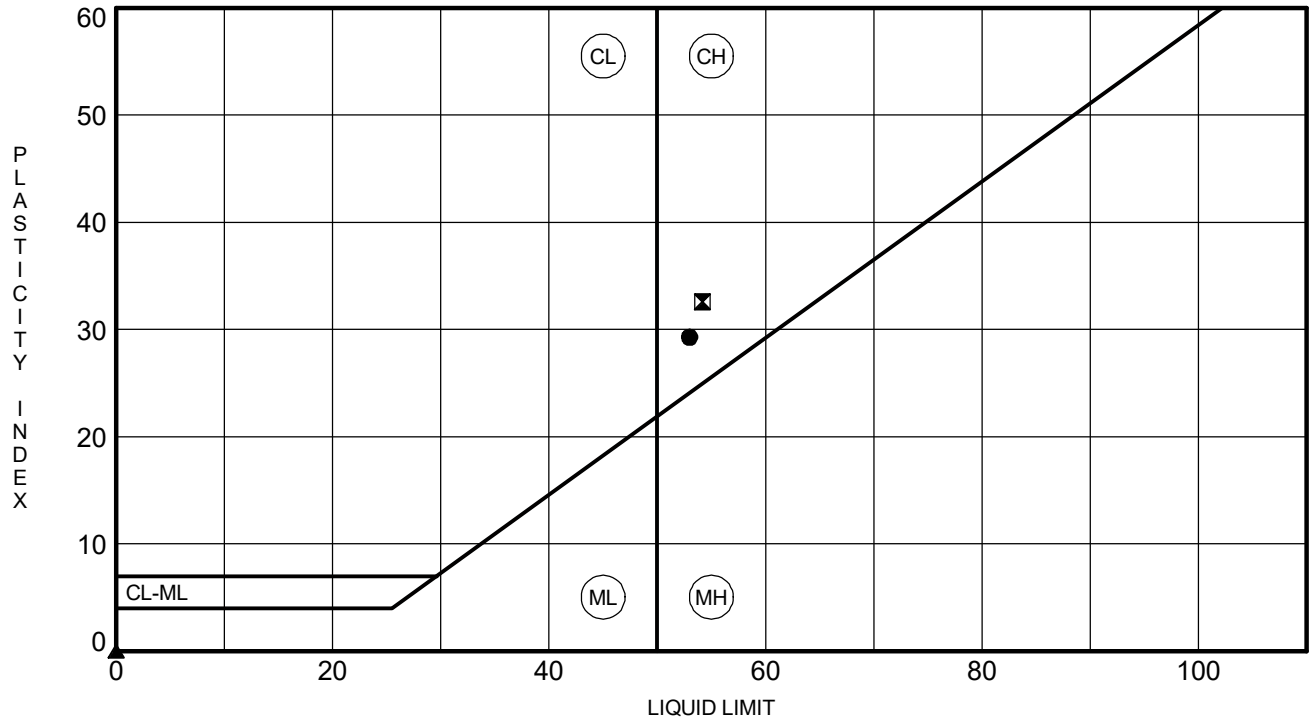
	BOREHOLE	DEPTH	D90	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**P3D-B6**	**2.0**							**64.2**	
⊠	**P3D-B6**	**4.0**							**67.8**	
▲	**P3D-B6**	**7.5**							**71.9**	
★	**P3D-B6**	**8.0**							**27.7**	
⊙	**P3D-B6**	**15.0**							**74.3**	

GRAIN SIZE G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 9/12/25

ATTERBERG LIMITS' RESULTS

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**P3D-B6**	**4.0**	**53**	**24**	**29**	**67.8**	**SANDY FAT CLAY (CH/A-7-6)**
⊠	**P3D-B6**	**7.5**	**54**	**22**	**32**	**71.9**	**FAT CLAY with SAND (CH/A-7-6)**
▲	**P3D-B6**	**15.0**	**NP**	**NP**	**NP**	**74.3**	**SILT with SAND (ML/A-4)**

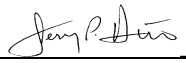
ATTERBERG LIMITS G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 9/12/25

pH DETERMINATION
(AASHTO T289)

Project Name:	CCR Ph. 3D (Req. #9)	Project Number:	G5662.03/00019
Description of Sample:	Soil (Composite)	Date Received	8/8/2025
Tested By:	A. Ross	Date Tested:	8/28/2025

Boring ID	P3D-B6
Boring Depth	4.0 - 6.0
FME Lab ID No.	25-2851
pH Value	4.27
Temperature (˚C)	22.9˚C

Date Reviewed: 8/29/2025

Reviewed By: 

This report shall not be reproduced, except in full,
without the written approval of F&ME Consultants, Inc.
211 Business Park Blvd., Columbia, SC 29203

SOIL RESISTIVITY
(AASHTO T288)

Project Name:	CCR Ph. 3D (Req. #9)	Project ID:	G5662.03-00019
Location:	P3D-B6	FME Lab ID No.:	25-2851
Sampled By:	BV	Date Sampled:	8/8/2025
Soil Description:	Soil (Composite)	Date Received:	8/8/2025
Tested By:	A. Ross	Date Tested:	8/27/2025

Boring No.	Sample Depth (ft.)	Minimum Soil Resistivity, Ω-cm
P3D-B6	4.0 - 6.0	3,263 Ω-cm

Date Reviewed: 9/2/2025 Reviewed By: J. Hiers

This report shall not be reproduced, except in full,
without the written approval of F&ME Consultants, Inc.
211 Business Park Blvd., Columbia, SC 29203

Water-Soluble Sulfate Ion Content in Soil

AASHTO T 290-95 (2020)

Client:	F&ME Consultants, Inc.	Boring No.:	P3D-B6
Client Reference:	CCR - Ph. 3D G5662.03	Depth (ft):	4.0-6.0'
Project No.:	2025-595-001	Sample No.:	SS-3
Lab ID:	2025-595-001-004	Soil Description:	Red 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	8	19	45	59	122	157	232

Measurement of Barium Chloride Turbidity

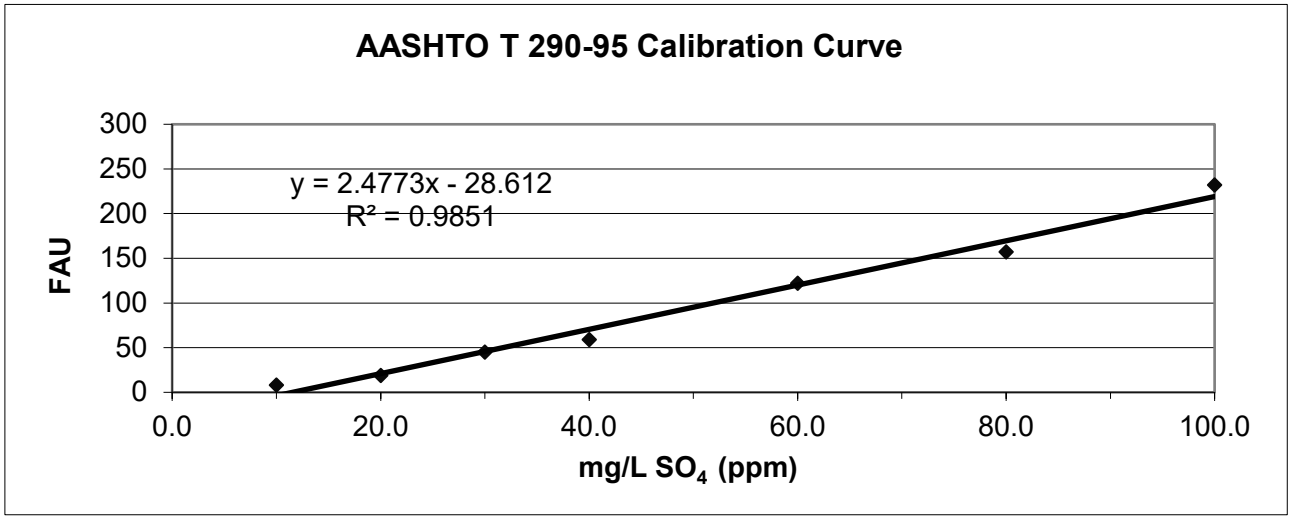
(Sample contains 5.0 mL NaCl solution and 0.3 g $BaCl_2 \cdot 2H_2O$)

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:	490
Weight of Tare & Wet Sample (g):	214.16
Weight of Tare & Dry Sample (g):	212.40
Weight of Tare (g):	86.89
Weight of Water (g):	1.76
Weight of Dry Sample (g):	125.51
Moisture Content (%):	1.40

Sample Sulfate Ion Concentration:	14.38	**mg/L SO_4 (ppm)**
Sample Sulfate Ion Content:	43.1	**mg/Kg SO_4 (not corrected for moisture)**
Sample Sulfate Ion Content:	43.7	**mg/Kg SO_4 (corrected for moisture)**



Tested by: JAM Date: 9/4/25 Checked by: EG Date: 9/5/2025

544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

CHLORIDE ION CONTENT IN SOILS

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

Client:	F&ME Consultants, Inc.	Boring No.:	P3D-B6
Client Reference:	CCR - Ph. 3D G5662.03	Depth (ft):	4.0-6.0'
Project No.:	2025-595-001	Sample No.:	SS-3
Lab ID:	2025-595-001-004	Description:	Red Brown

(- # 10 Sieve material)

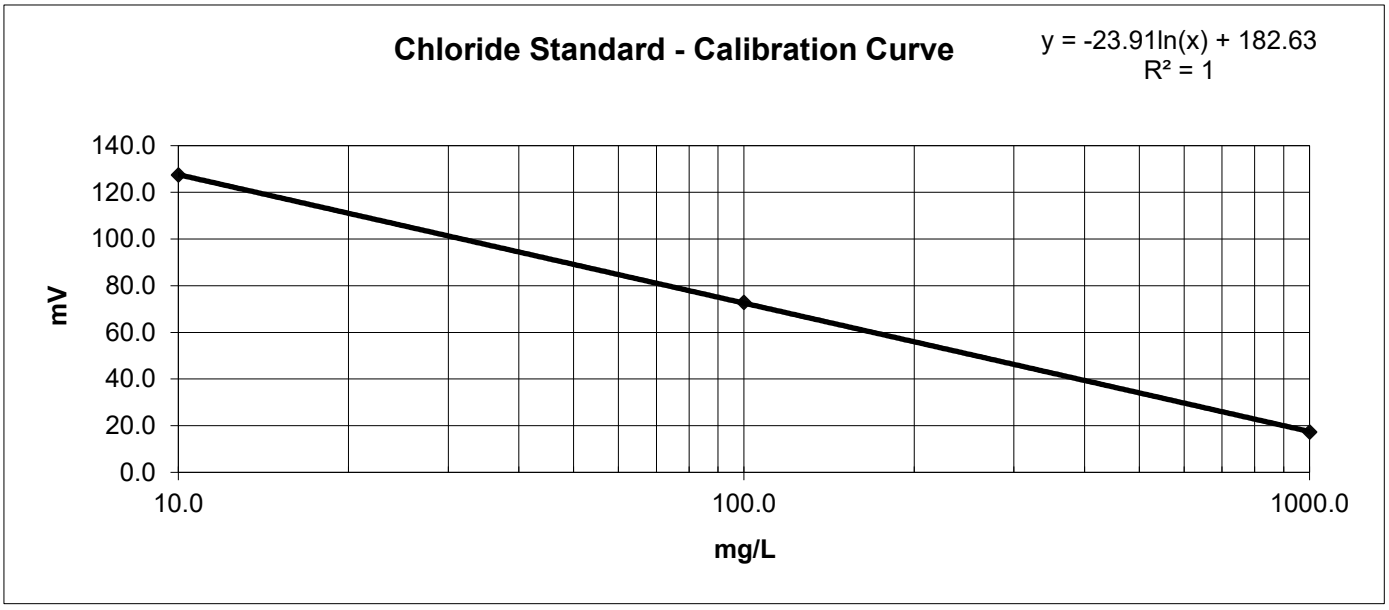
CHLORIDE STANDARD: CALIBRATION CURVE

STANDARD		MILLIVOLTS (mV)
10.0	mg/L	127.4
100.0	mg/L	72.9
1000.0	mg/L	17.3

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):	68.6	117.88	117.88

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°C.



Notes:

Tested By	JAM	Date	9/4/25	Checked By	EG	Date	9/5/25

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

544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	CCR Ph. 3D	**PROJECT NO.:**	G5662.030
SAMPLE NUMBER:	25-3023	**DATE REQUESTED:**	8/15/2025
DESCRIPTION OF SOIL:	Various		
TESTED BY:	AC & CJ	**DATE OF TESTING:**	9/2/2025
WEIGHED BY:	JM	**DATE OF WEIGHING:**	9/3/2025

BORING NO.	P3D-B7	P3D-B7	P3D-B7	P3D-B7	P3D-B7
SAMPLE NO.	SS-2	SS-3	SS-5	SS-6	SS-8
SAMPLE DEPTH	2.0 - 4.0	4.0 - 6.0	8.0 - 10.0	13.5 - 15.0	23.5 - 25.0
WATER CONTENT, W%	38.8	34.0	37.1	35.5	25.3

BORING NO.	P3D-B7	P3D-B7	P3D-B7	P3D-B7	
SAMPLE NO.	SS-10	SS-11	SS-13	SS-15	
SAMPLE DEPTH	33.5 - 35.0	38.5 - 40.0	48.5 - 50.0	58.5 - 60.0	
WATER CONTENT, W%	27.1	45.4	37.3	35.8	

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

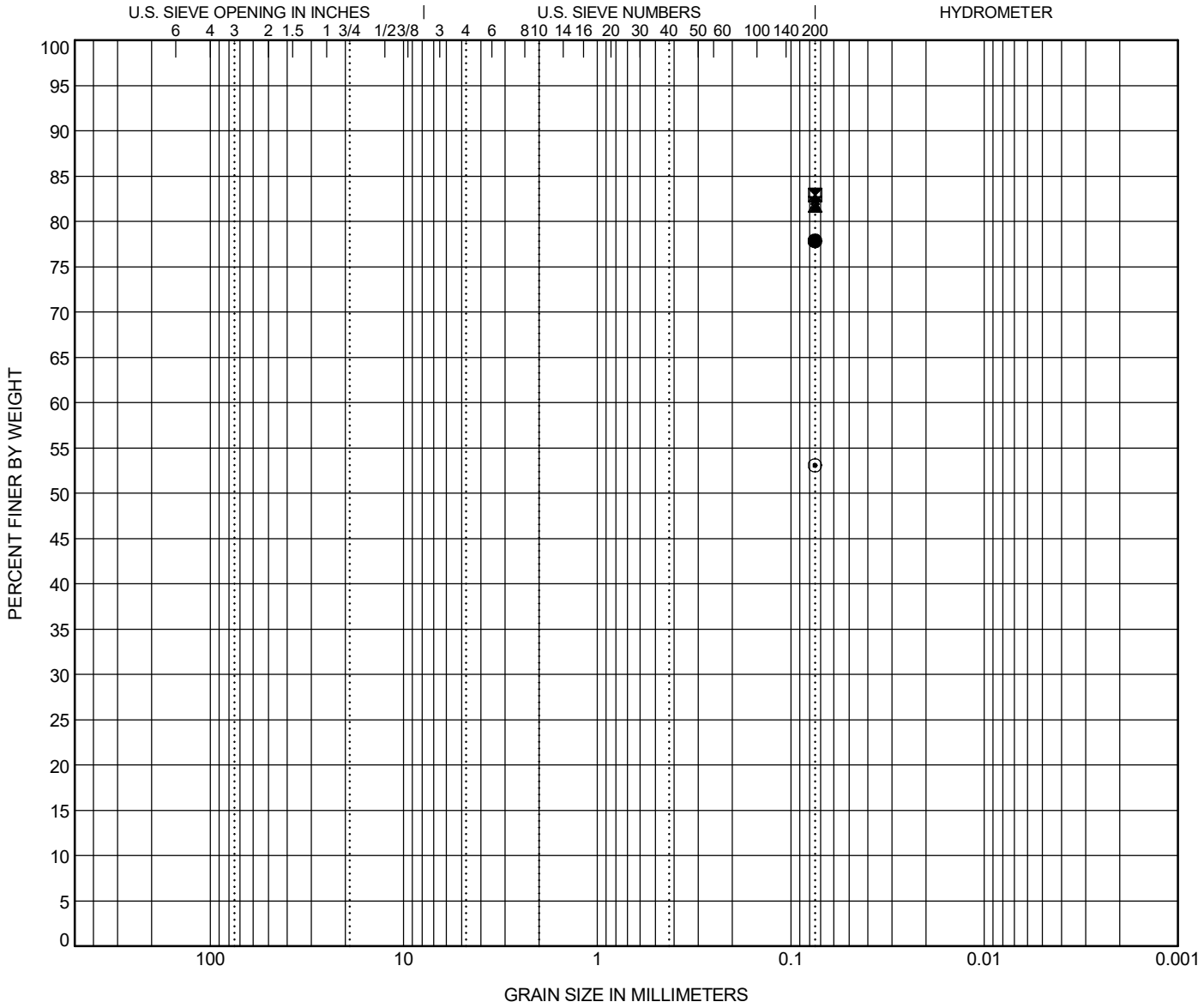
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

This report shall not be reproduced, except in full, without the written approval of F&ME Consultants, Inc.
211 Business Park Boulevard, Columbia SC 29203

GRAIN SIZE DISTRIBUTION

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**P3D-B7**	**4.0**	**SILT with SAND (ML/A-7-5)**	**46**	**31**	**15**		
⊠	**P3D-B7**	**6.0**	**ELASTIC SILT with SAND (MH/A-7-5)**	**50**	**34**	**16**		
▲	**P3D-B7**	**10.0**	**SILT with SAND (ML/A-5)**	**42**	**32**	**10**		
★	**P3D-B7**	**15.0**	**SILT with SAND (ML/A-4)**	**38**	**29**	**9**		
⊙	**P3D-B7**	**25.0**	**SANDY SILT (ML/A-4)**	**34**	**24**	**10**		

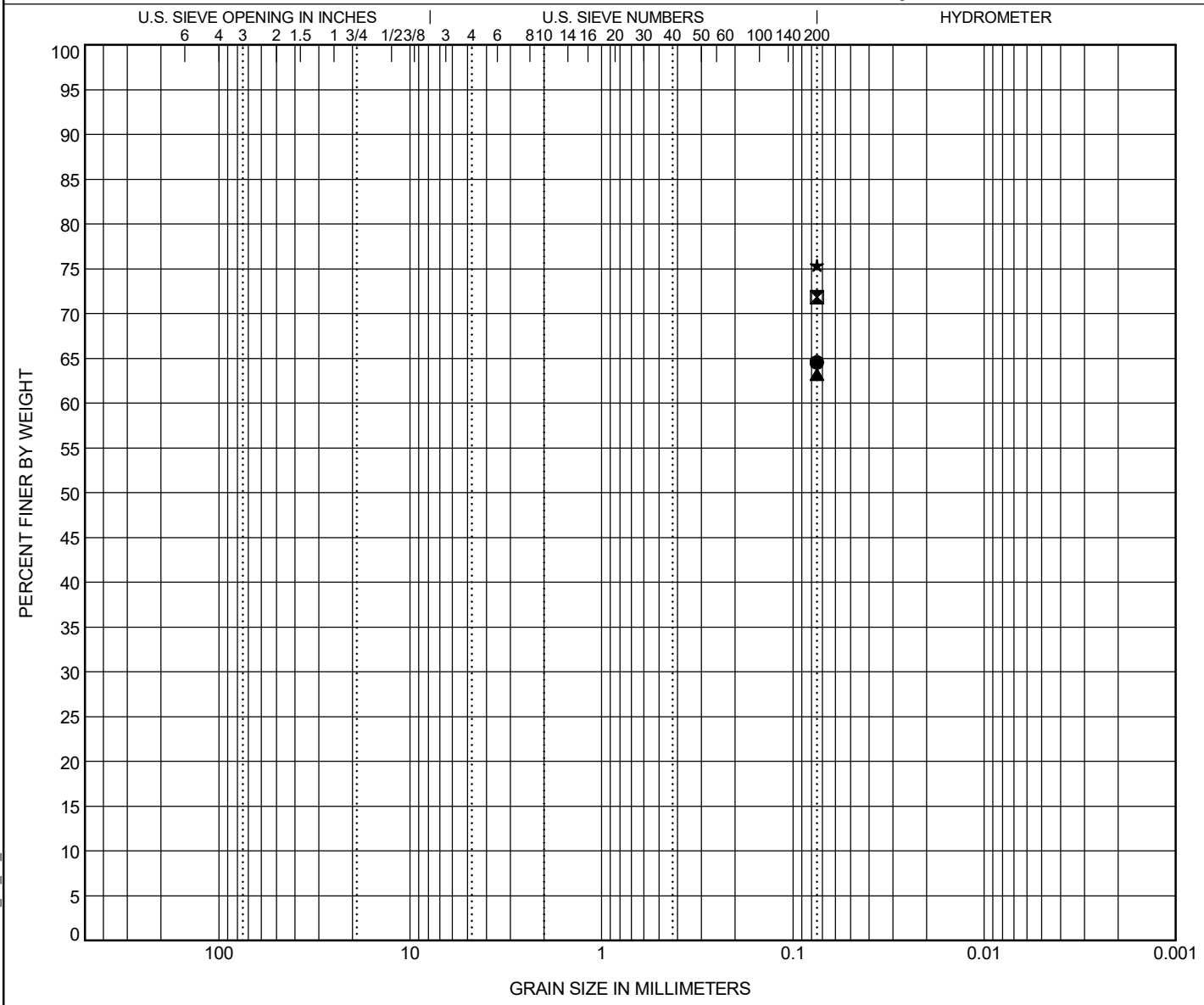
	BOREHOLE	DEPTH	D90	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**P3D-B7**	**4.0**							**77.9**	
⊠	**P3D-B7**	**6.0**							**82.9**	
▲	**P3D-B7**	**10.0**							**81.7**	
★	**P3D-B7**	**15.0**							**82.6**	
⊙	**P3D-B7**	**25.0**							**53.1**	

GRAIN SIZE G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 9/16/25

GRAIN SIZE DISTRIBUTION

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**P3D-B7**	**35.0**	**SANDY ELASTIC SILT (MH/A-7-5)**	**51**	**31**	**20**		
⊠	**P3D-B7**	**40.0**	**SILT with SAND (ML/A-7-6)**	**44**	**28**	**16**		
▲	**P3D-B7**	**50.0**	**SANDY SILT (ML/A-7-6)**					
★	**P3D-B7**	**60.0**	**LEAN CLAY with SAND (CL/A-7-6)**	**48**	**26**	**22**		

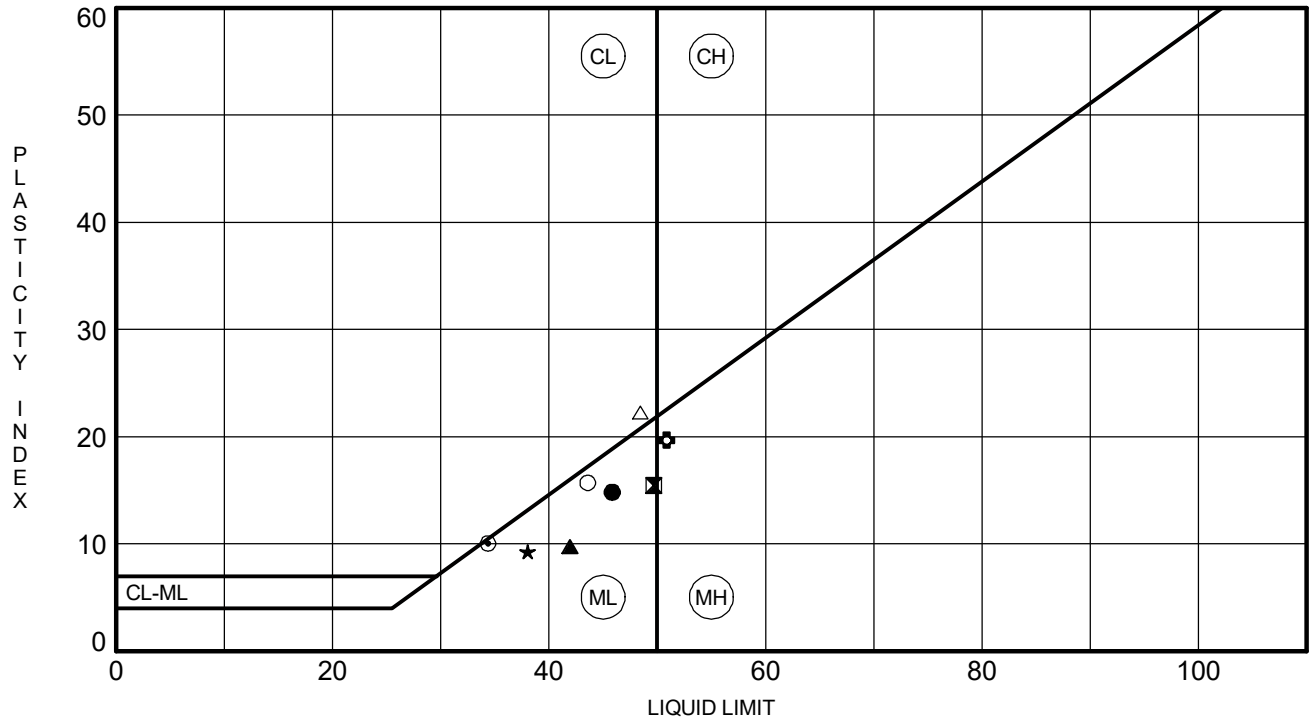
	BOREHOLE	DEPTH	D90	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**P3D-B7**	**35.0**							**64.6**	
⊠	**P3D-B7**	**40.0**							**71.8**	
▲	**P3D-B7**	**50.0**							**63.2**	
★	**P3D-B7**	**60.0**							**75.4**	

GRAIN SIZE G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 9/16/25

ATTERBERG LIMITS' RESULTS

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**P3D-B7**	**4.0**	**46**	**31**	**15**	**77.9**	**SILT with SAND (ML/A-7-5)**
⊠	**P3D-B7**	**6.0**	**50**	**34**	**16**	**82.9**	**ELASTIC SILT with SAND (MH/A-7-5)**
▲	**P3D-B7**	**10.0**	**42**	**32**	**10**	**81.7**	**SILT with SAND (ML/A-5)**
★	**P3D-B7**	**15.0**	**38**	**29**	**9**	**82.6**	**SILT with SAND (ML/A-4)**
⊙	**P3D-B7**	**25.0**	**34**	**24**	**10**	**53.1**	**SANDY SILT (ML/A-4)**
✿	**P3D-B7**	**35.0**	**51**	**31**	**20**	**64.6**	**SANDY ELASTIC SILT (MH/A-7-5)**
○	**P3D-B7**	**40.0**	**44**	**28**	**16**	**71.8**	**SILT with SAND (ML/A-7-6)**
△	**P3D-B7**	**60.0**	**48**	**26**	**22**	**75.4**	**LEAN CLAY with SAND (CL/A-7-6)**

ATTERBERG LIMITS G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 9/16/25

CHLORIDE ION CONTENT IN SOILS

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

Client:	F&ME Consultants, Inc.	Boring No.:	P3D-B7
Client Reference:	CCR - Ph. 3D G5662.03	Depth (ft):	6.0-10.0'
Project No.:	2025-595-001	Sample No.:	SS-4/SS-5
Lab ID:	2025-595-001-005	Description:	Gray

(- # 10 Sieve material)

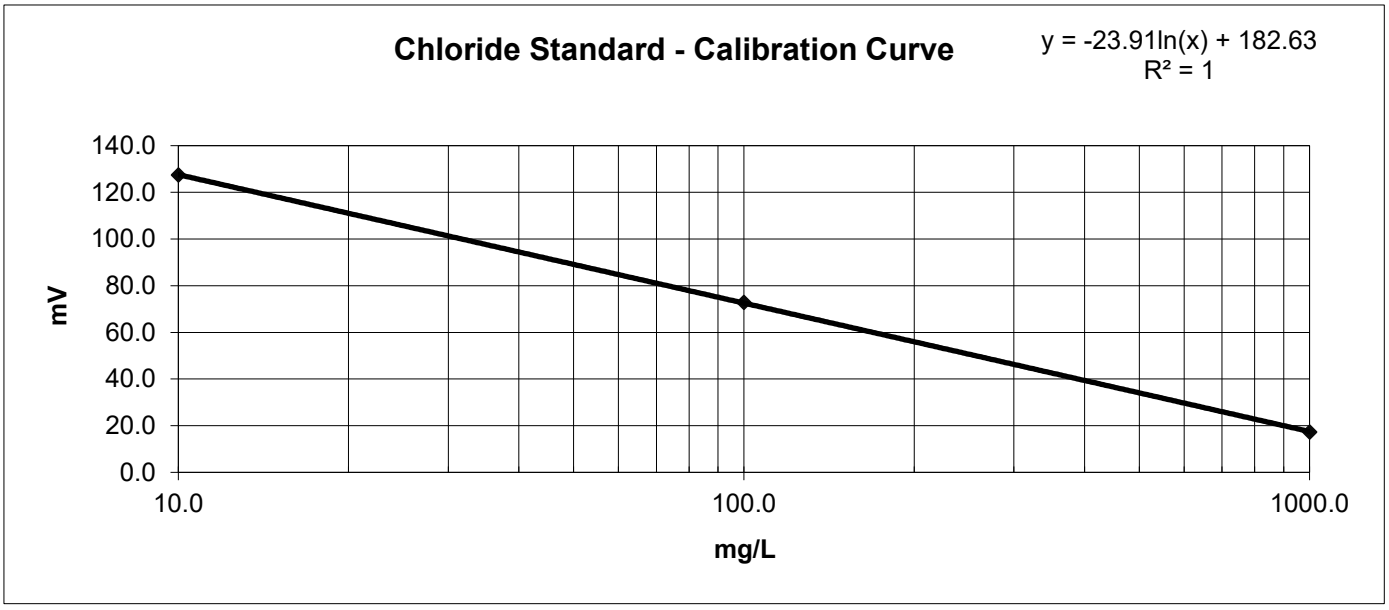
CHLORIDE STANDARD: CALIBRATION CURVE

STANDARD		MILLIVOLTS (mV)
10.0	mg/L	127.4
100.0	mg/L	72.9
1000.0	mg/L	17.3

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):	133.0	7.97	7.97

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°C.



Notes:

Tested By	JAM	Date	9/4/25	Checked By	EG	Date	9/5/25

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

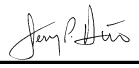
544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

pH DETERMINATION
(AASHTO T289)

Project Name:	CCR Ph. 3D	Project Number:	G5662.03-00019
Description of Sample:	Composite	Date Received	8/15/2025
Tested By:	A. Ross	Date Tested:	8/28/2025

Boring ID	P3D-B7
Boring Depth	6.0 - 10.0
FME Lab ID No.	25-3023
pH Value	7.91
Temperature (˚C)	22.3˚C

Date Reviewed: 8/28/2025

Reviewed By: 

This report shall not be reproduced, except in full,
without the written approval of F&ME Consultants, Inc.
211 Business Park Blvd., Columbia, SC 29203

SOIL RESISTIVITY
(AASHTO T288)

Project Name:	CCR Ph. 3D (Req. #8)	Project ID:	G5662.03-00019
Location:	P3D-B7	FME Lab ID No.:	25-3023
Sampled By:	BV	Date Sampled:	8/15/2025
Soil Description:	Composte	Date Received:	8/15/2025
Tested By:	A. Ross	Date Tested:	8/27/2025

Boring No.	Sample Depth (ft.)	Minimum Soil Resistivity, Ω-cm
P3D-B7	6.0 - 10.0	4,322 Ω-cm

Date Reviewed: 8/29/2025 Reviewed By: J. Hiers

This report shall not be reproduced, except in full,
without the written approval of F&ME Consultants, Inc.
211 Business Park Blvd., Columbia, SC 29203

Water-Soluble Sulfate Ion Content in Soil

AASHTO T 290-95 (2020)

Client:	F&ME Consultants, Inc.	Boring No.:	P3D-B7
Client Reference:	CCR - Ph. 3D G5662.03	Depth (ft):	6.0-10.0'
Project No.:	2025-595-001	Sample No.:	SS-4/SS-5
Lab ID:	2025-595-001-005	Soil Description:	Gray

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
Underrange	Underrange	8	19	45	59	122	157	232

Spectrophotometer Readings (FAU)

Measurement of Barium Chloride Turbidity

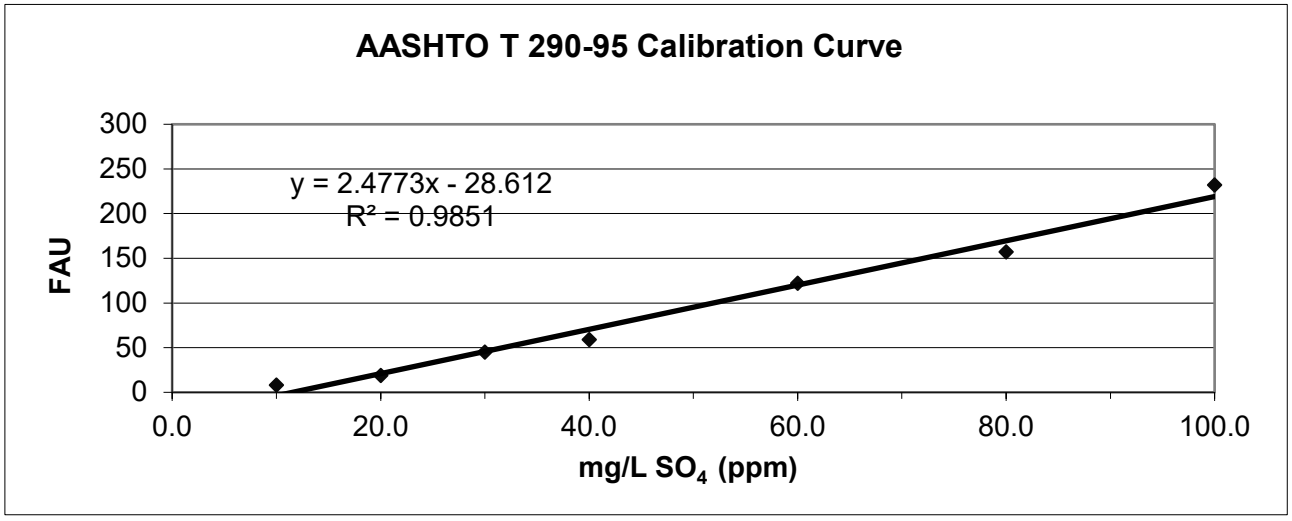
(Sample contains 5.0 mL NaCl solution and 0.3 g $BaCl_2 \cdot 2H_2O$)

Sample Weight (g):	100.0
Water added to Sample (mL):	300.0
Size of Sample Aliquot (mL):	50.0
Sample Reading (FAU):	19
Sample Diluted:	No
Sulfate Solution Added (ml):	0

Sample Moisture Content

Tare Number:	411
Weight of Tare & Wet Sample (g):	209.91
Weight of Tare & Dry Sample (g):	207.19
Weight of Tare (g):	98.80
Weight of Water (g):	2.72
Weight of Dry Sample (g):	108.39
Moisture Content (%):	2.51

Sample Sulfate Ion Concentration:	19.22	**mg/L SO_4 (ppm)**
Sample Sulfate Ion Content:	57.7	**mg/Kg SO_4 (not corrected for moisture)**
Sample Sulfate Ion Content:	59.1	**mg/Kg SO_4 (corrected for moisture)**



Tested by: JAM Date: 9/4/25 Checked by: EG Date: 9/5/2025

544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	CCR Ph. 3D	**PROJECT NO.:**	G5662.030
SAMPLE NUMBER:	25-3632	**DATE REQUESTED:**	10/10/2025
DESCRIPTION OF SOIL:	VARIOUS		
TESTED BY:	JM/JD	**DATE OF TESTING:**	10/17/2025
WEIGHED BY:	ZJ	**DATE OF WEIGHING:**	10/20/2025

BORING NO.	P3D-B8A	P3D-B8A	P3D-B8A		
SAMPLE NO.	SS-1	SS-3	SS-5		
SAMPLE DEPTH	24.9 - 26.9	28.9 - 30.9	32.9 - 34.9		
WATER CONTENT, W%	11.1	31.5	34.7		

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

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

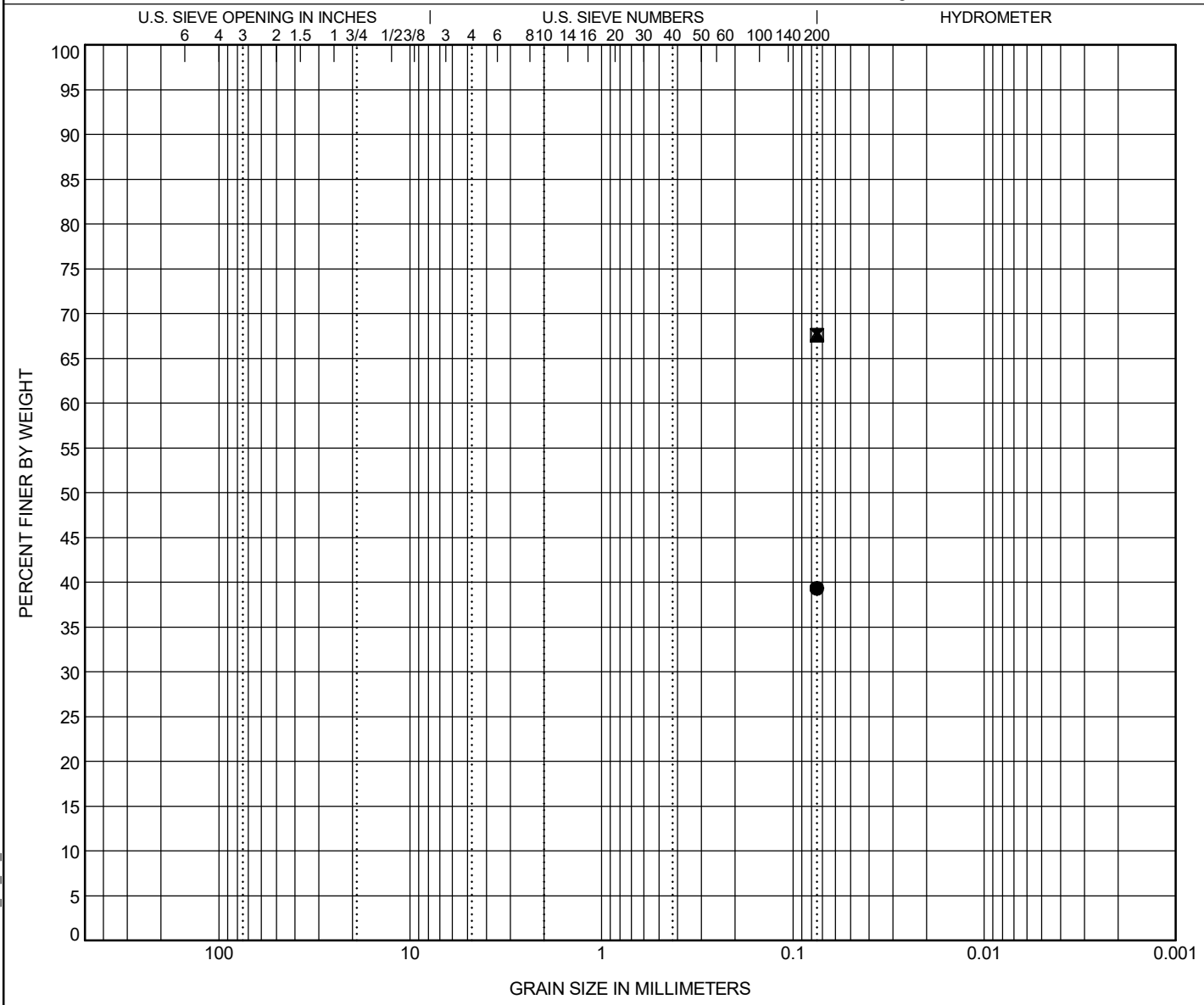
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

This report shall not be reproduced, except in full, without the written approval of F&ME Consultants, Inc.
211 Business Park Boulevard, Columbia SC 29203

GRAIN SIZE DISTRIBUTION

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads Phase 3D

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**P3D-B8A**	**26.9**	**SILTY SAND (SM/A-4)**					
⊠	**P3D-B8A**	**30.9**	**SANDY LEAN CLAY (CL/A-7-6)**	**46**	**16**	**30**		
▲	**P3D-B8A**	**34.9**	**SANDY LEAN CLAY (CL/A-6)**	**40**	**16**	**24**		

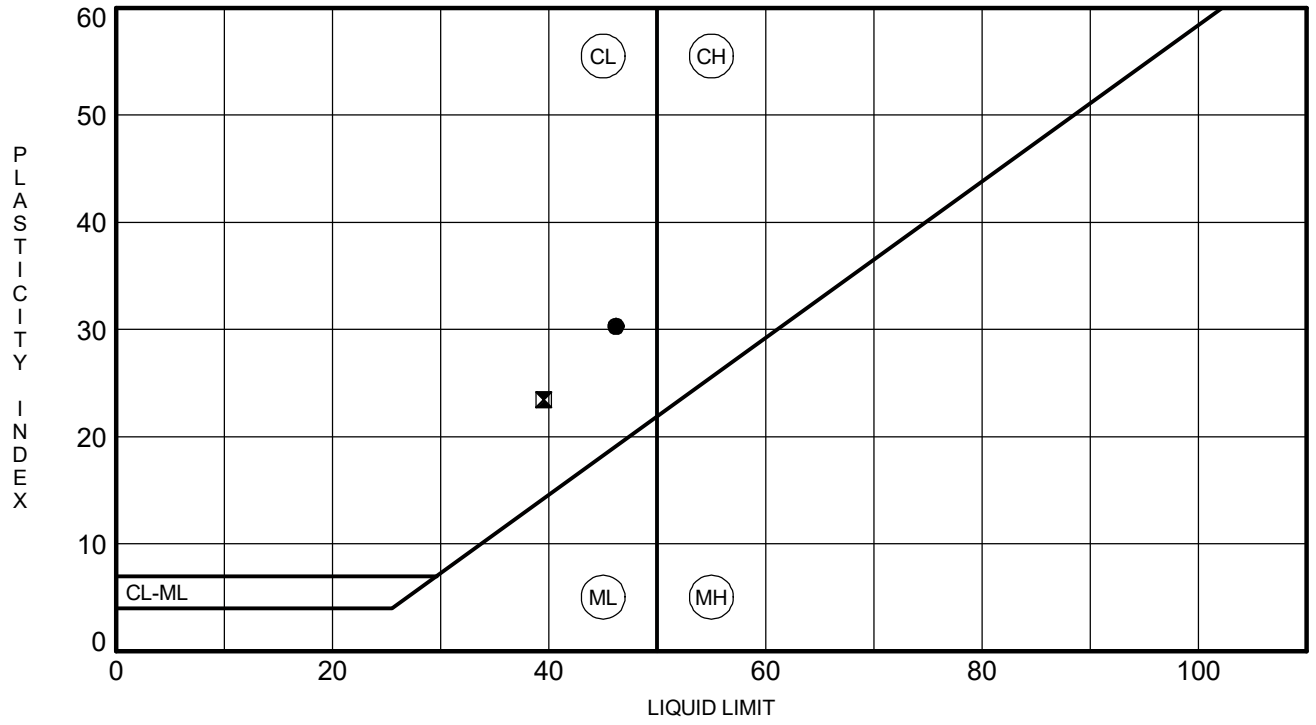
	BOREHOLE	DEPTH	D90	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**P3D-B8A**	**26.9**							**39.3**	
⊠	**P3D-B8A**	**30.9**							**67.6**	
▲	**P3D-B8A**	**34.9**							**67.6**	

GRAIN SIZE G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/22/25

ATTERBERG LIMITS' RESULTS

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads Phase 3D

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**P3D-B8A**	**30.9**	**46**	**16**	**30**	**67.6**	**SANDY LEAN CLAY (CL/A-7-6)**
⊠	**P3D-B8A**	**34.9**	**40**	**16**	**24**	**67.6**	**SANDY LEAN CLAY (CL/A-6)**

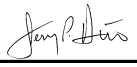
ATTERBERG LIMITS G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/22/25

pH DETERMINATION
(AASHTO T289)

Project Name:	Carolina Crossroads - Phase 3A	Project Number:	G5662.03-00019
Description of Sample:	Soil (Composite)	Date Received	10/9/2025
Tested By:	Alex Ross	Date Tested:	10/23/2025

Boring ID	P3D8A
Boring Depth	28.9 - 32.9
FME Lab ID No.	25-2362
pH Value	5.4
Temperature (˚C)	21.70

Date Reviewed: 10/28/2025

Reviewed By: 

This report shall not be reproduced, except in full,
without the written approval of F&ME Consultants, Inc.
211 Business Park Blvd., Columbia, SC 29203

SOIL RESISTIVITY
(AASHTO T288)

Project Name:	Carolina Crossroads - Phase 3D	Project ID:	G5662.03-00019
Location:	--	FME Lab ID No.:	25-2362
Sampled By:	BV	Date Sampled:	--
Soil Description:	Soil (Composite)	Date Received:	10/9/2025
Tested By:	Alex Ross	Date Tested:	10/23/2025

Boring No.	Sample Depth (ft.)	Minimum Soil Resistivity, Ω-cm
P3D-B8A	28.9 - 32.9	1,199

Date Reviewed: 10/28/2025 Reviewed By: A. Abernethy

This report shall not be reproduced, except in full,
without the written approval of F&ME Consultants, Inc.
211 Business Park Blvd., Columbia, SC 29203

REV 12/2023

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	CCR Ph. 3D	**PROJECT NO.:**	G5662.030
SAMPLE NUMBER:	25-3691	**DATE REQUESTED:**	10/10/2025
DESCRIPTION OF SOIL:	VARIOUS		
TESTED BY:	JM/JD	**DATE OF TESTING:**	10/17/2025
WEIGHED BY:	ZJ	**DATE OF WEIGHING:**	10/20/2025

BORING NO.	P3D-B8B	P3D-B8B	P3D-B8B		
SAMPLE NO.	SS-1	SS-2	SS-3		
SAMPLE DEPTH	28.5 - 30.0	33.5 - 35.0	38.5 - 40.0		
WATER CONTENT, W%	34.7	25.0	24.4		

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

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

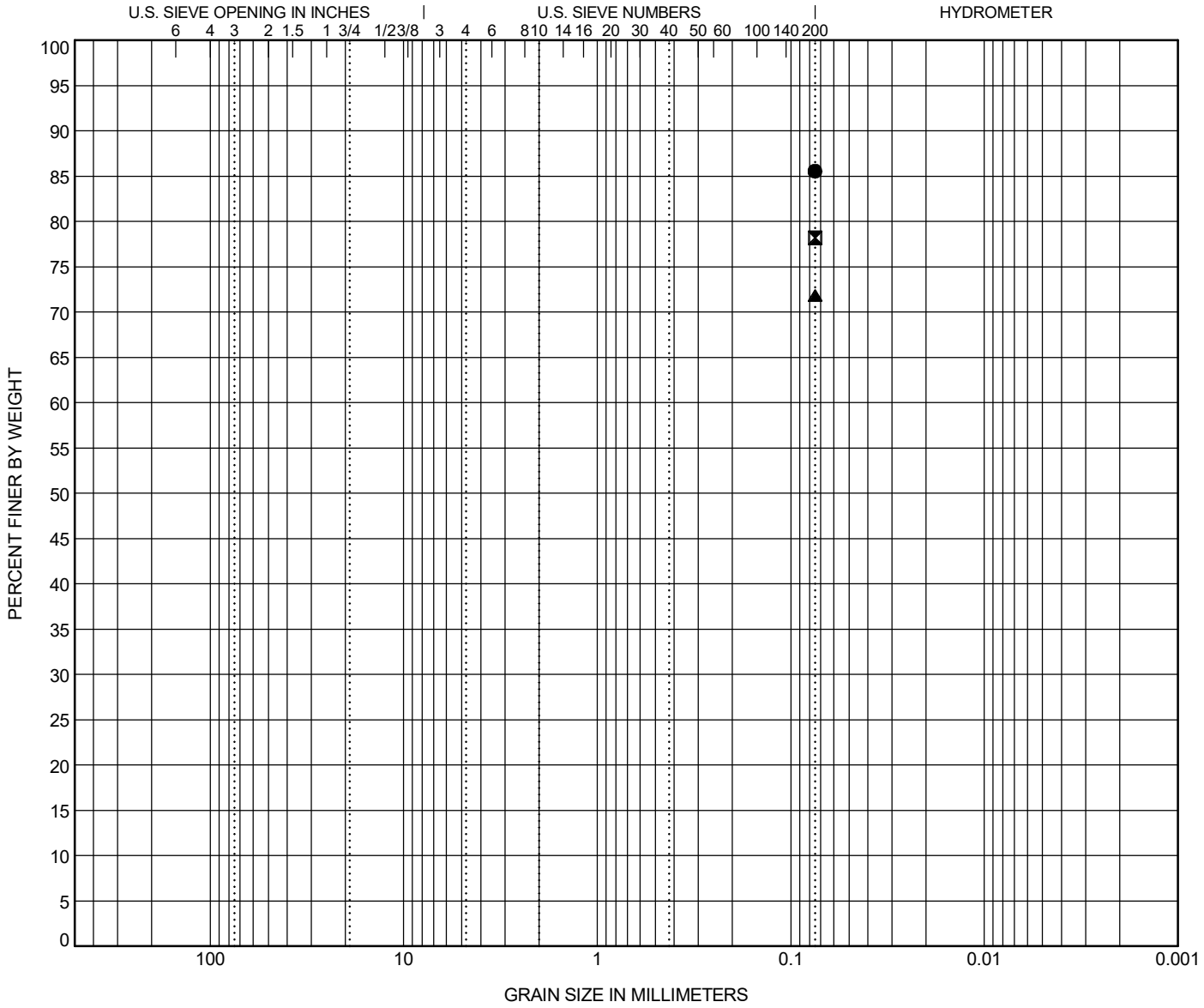
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

This report shall not be reproduced, except in full, without the written approval of F&ME Consultants, Inc.
211 Business Park Boulevard, Columbia SC 29203

GRAIN SIZE DISTRIBUTION

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads Phase 3D

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**P3D-B8B**	**30.0**	**FAT CLAY (CH/A-7-6)**	**62**	**23**	**39**		
⊠	**P3D-B8B**	**35.0**	**FAT CLAY with SAND (CH/A-7-6)**	**55**	**23**	**32**		
▲	**P3D-B8B**	**40.0**	**SILT with SAND (ML/A-4)**	**34**	**30**	**4**		

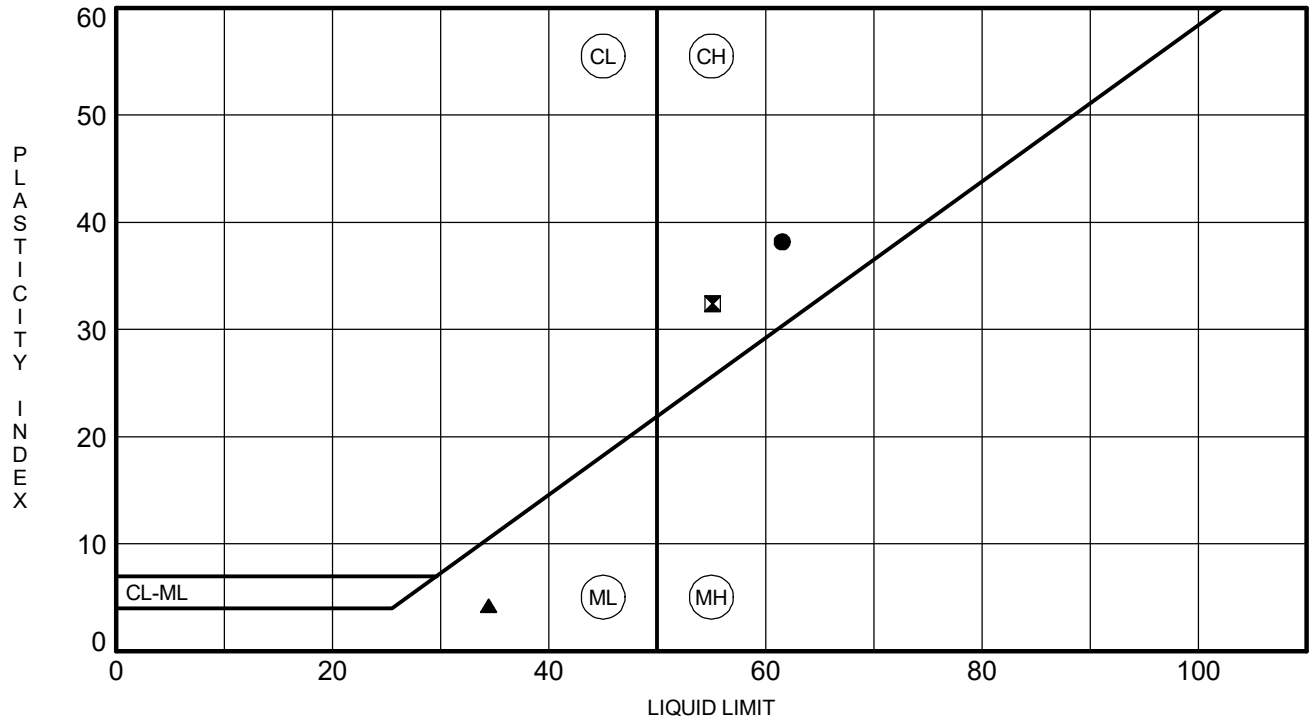
	BOREHOLE	DEPTH	D90	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**P3D-B8B**	**30.0**							**85.6**	
⊠	**P3D-B8B**	**35.0**							**78.2**	
▲	**P3D-B8B**	**40.0**							**71.8**	

GRAIN SIZE G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/22/25

ATTERBERG LIMITS' RESULTS

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads Phase 3D

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**P3D-B8B**	**30.0**	**62**	**23**	**39**	**85.6**	**FAT CLAY (CH/A-7-6)**
⊠	**P3D-B8B**	**35.0**	**55**	**23**	**32**	**78.2**	**FAT CLAY with SAND (CH/A-7-6)**
▲	**P3D-B8B**	**40.0**	**34**	**30**	**4**	**71.8**	**SILT with SAND (ML/A-4)**

ATTERBERG LIMITS G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/22/25

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	CCR Ph. 3D	**PROJECT NO.:**	G5662.030
SAMPLE NUMBER:	25-3588	**DATE REQUESTED:**	10/3/2025
DESCRIPTION OF SOIL:	Various		
TESTED BY:	JM/AKG	**DATE OF TESTING:**	10/12/2025
WEIGHED BY:	AC	**DATE OF WEIGHING:**	10/13/2025

BORING NO.	P3D-B9	P3D-B9	P3D-B9	P3D-B9	P3D-B9
SAMPLE NO.	SS-2	SS-4	SS-5	SS-6	SS-8
SAMPLE DEPTH	2.0 - 4.0	6.0 - 8.0	8.0 - 10.0	13.5 - 15.0	23.5 - 25.0
WATER CONTENT, W%	30.8	28.2	36.8	31.0	39.5

BORING NO.	P3D-B9	P3D-B9			
SAMPLE NO.	SS-9	SS-10			
SAMPLE DEPTH	28.5 - 30.0	33.5 - 35.0			
WATER CONTENT, W%	40.5	39.4			

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

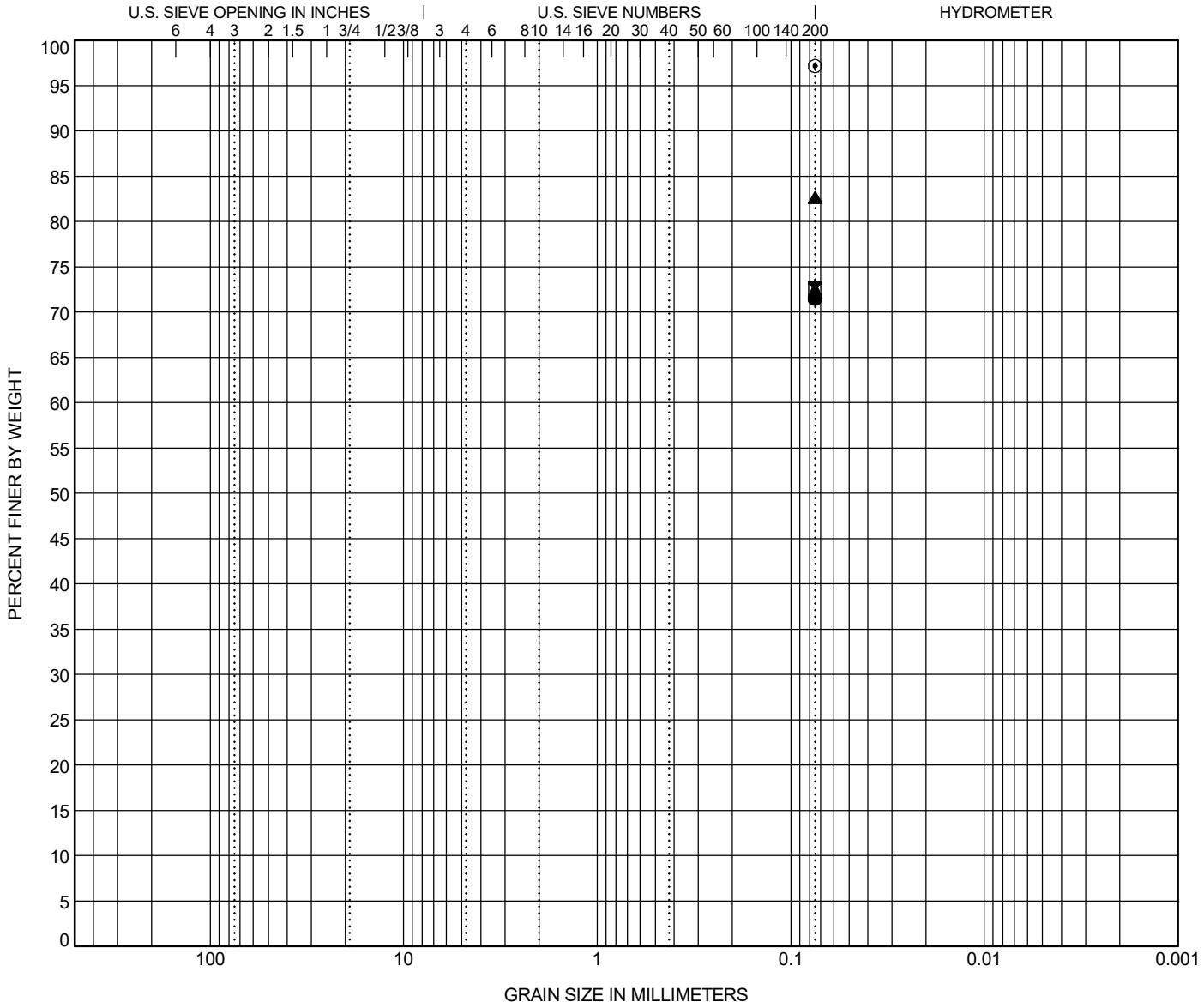
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

This report shall not be reproduced, except in full, without the written approval of F&ME Consultants, Inc.
211 Business Park Boulevard, Columbia SC 29203

GRAIN SIZE DISTRIBUTION

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads Phase 3D

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**P3D-B9**	**4.0**	**SILT with SAND (ML/A-7-6)**	**43**	**28**	**15**		
⊠	**P3D-B9**	**8.0**	**SILT with SAND (ML/A-7-6)**	**42**	**27**	**15**		
▲	**P3D-B9**	**10.0**	**SILT with SAND (ML/A-7-6)**	**41**	**26**	**15**		
★	**P3D-B9**	**15.0**	**SILT with SAND (ML/A-7-6)**					
⊙	**P3D-B9**	**25.0**	**SILT (ML/A-4)**					

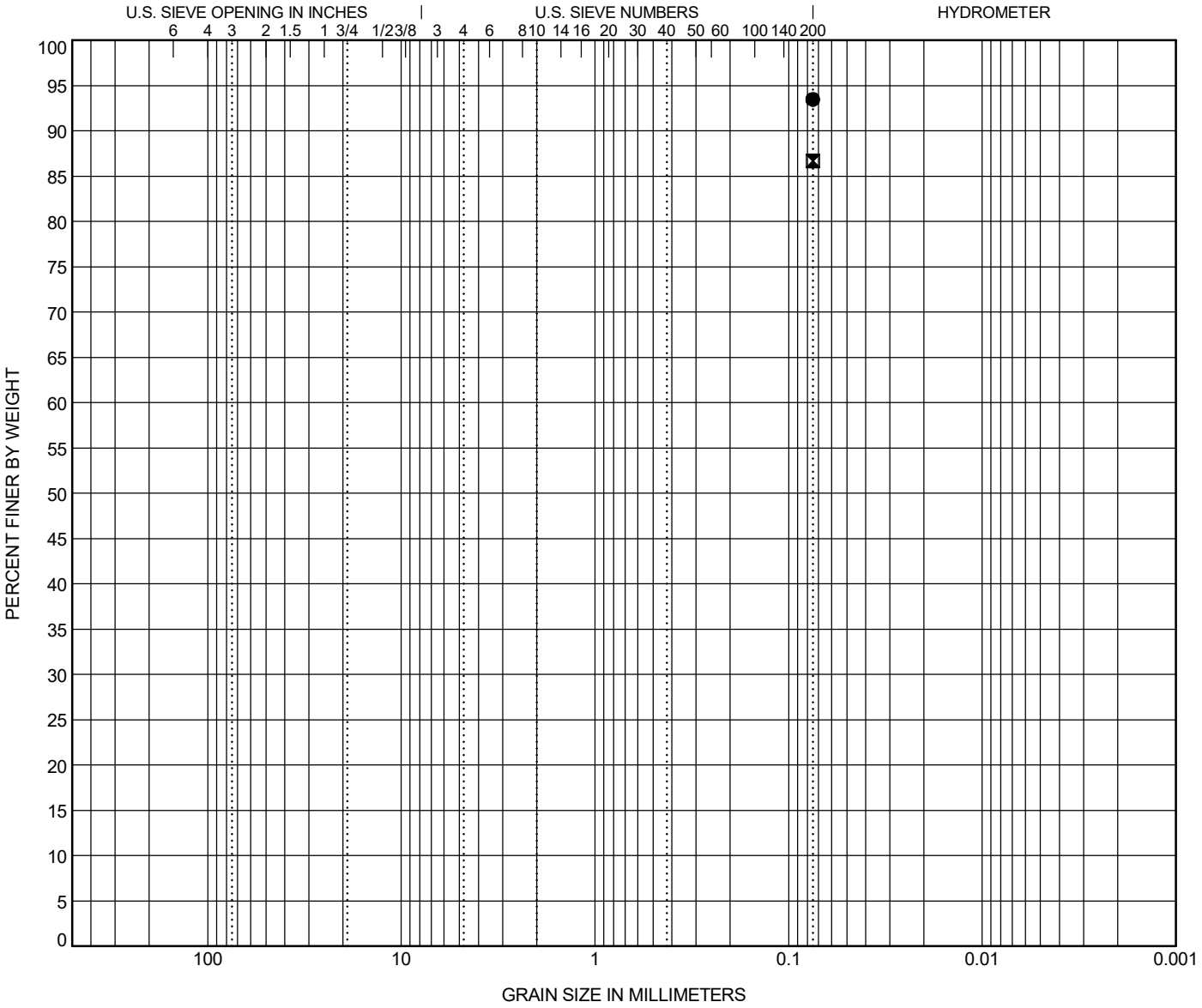
	BOREHOLE	DEPTH	D90	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**P3D-B9**	**4.0**							**71.5**	
⊠	**P3D-B9**	**8.0**							**72.7**	
▲	**P3D-B9**	**10.0**							**82.7**	
★	**P3D-B9**	**15.0**							**73.0**	
⊙	**P3D-B9**	**25.0**							**97.2**	

GRAIN SIZE G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/17/25

GRAIN SIZE DISTRIBUTION

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads Phase 3D

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**P3D-B9**	**30.0**	**FAT CLAY (CH/A-7-6)**	**55**	**29**	**26**		
⊠	**P3D-B9**	**35.0**	**SILT (ML/A-7-5)**	**48**	**36**	**12**		

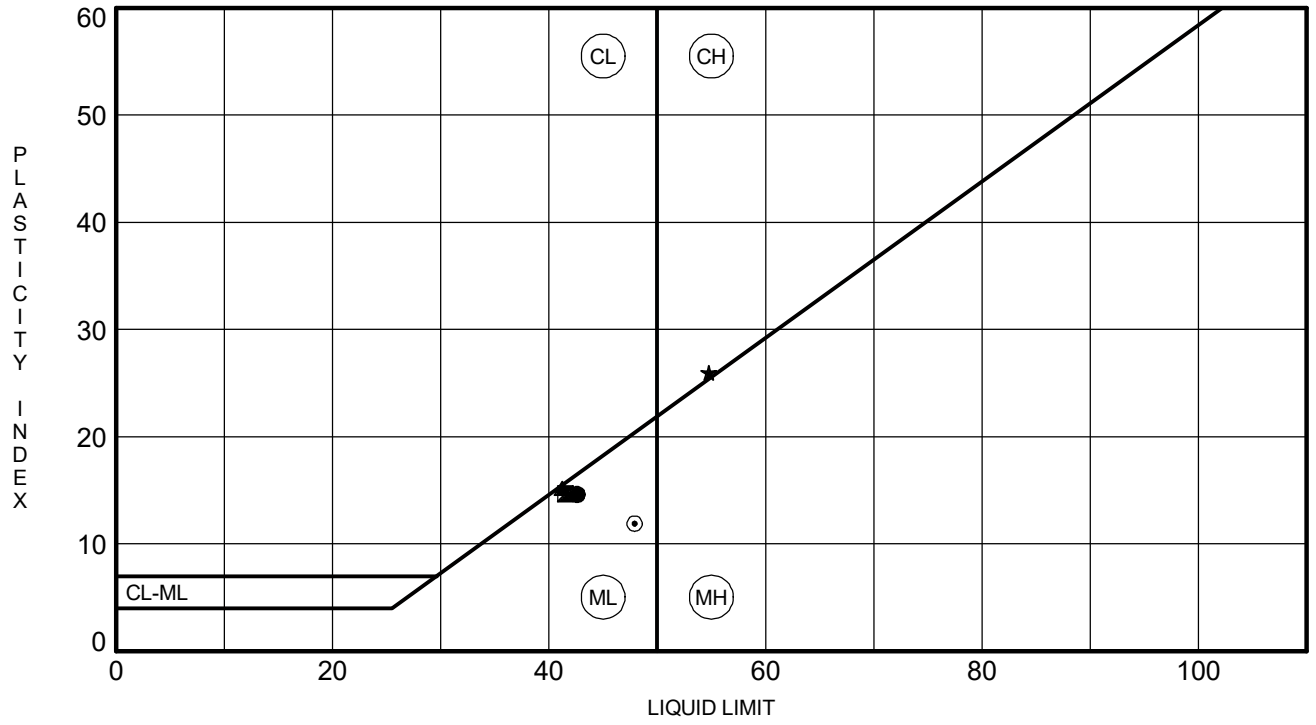
	BOREHOLE	DEPTH	D90	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**P3D-B9**	**30.0**							**93.5**	
⊠	**P3D-B9**	**35.0**							**86.7**	

GRAIN SIZE G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/17/25

ATTERBERG LIMITS' RESULTS

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads Phase 3D

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**P3D-B9**	**4.0**	**43**	**28**	**15**	**71.5**	**SILT with SAND (ML/A-7-6)**
⊠	**P3D-B9**	**8.0**	**42**	**27**	**15**	**72.7**	**SILT with SAND (ML/A-7-6)**
▲	**P3D-B9**	**10.0**	**41**	**26**	**15**	**82.7**	**SILT with SAND (ML/A-7-6)**
★	**P3D-B9**	**30.0**	**55**	**29**	**26**	**93.5**	**FAT CLAY (CH/A-7-6)**
⊙	**P3D-B9**	**35.0**	**48**	**36**	**12**	**86.7**	**SILT (ML/A-7-5)**

ATTERBERG LIMITS G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/17/25

pH DETERMINATION
(AASHTO T289)

Project Name:	CCR Ph. 3D	Project Number:	G5662.03-00019
Description of Sample:	Composite Soil Sample	Date Received	10/3/2025
Tested By:	AHR	Date Tested:	10/15/2025

Boring ID	P3D-B9
Boring Depth	0.0 - 8.0
FME Lab ID No.	25-3588
pH Value	7.44
Temperature (˚C)	21.4

Date Reviewed: 10/20/2025 Reviewed By: J. Heirs

This report shall not be reproduced, except in full,
without the written approval of F&ME Consultants, Inc.
211 Business Park Blvd., Columbia, SC 29203

SOIL RESISTIVITY
(AASHTO T288)

Project Name:	CCR Ph. 3D	Project ID:	G5662.03-00019
Location:	--	FME Lab ID No.:	25-3588
Sampled By:	BV	Date Sampled:	10/3/2025
Soil Description:	SOIL COMPOSITE	Date Received:	10/3/2025
Tested By:	AHR	Date Tested:	10/14/2025

Boring No.	Sample Depth (ft.)	Minimum Soil Resistivity, Ω-cm
P3D-B9	8.0 - 10.0	2,814

Date Reviewed: 10/20/2025 Reviewed By: J. Hiers

This report shall not be reproduced, except in full,
without the written approval of F&ME Consultants, Inc.
211 Business Park Blvd., Columbia, SC 29203

Water-Soluble Sulfate Ion Content in Soil

AASHTO T 290-95 (2020)

Client:	F&ME Consultants, Inc.	Boring No.:	P3D-B9
Client Reference:	CCR - Ph. 3D G5662.03-00019	Depth (ft):	0.0-6.0'
Project No.:	2025-700-001	Sample No.:	SS-1/SS-2/SS-3
Lab ID:	2025-700-001-001	Soil Description:	Gray/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	8	19	45	59	122	157	232

Measurement of Barium Chloride Turbidity

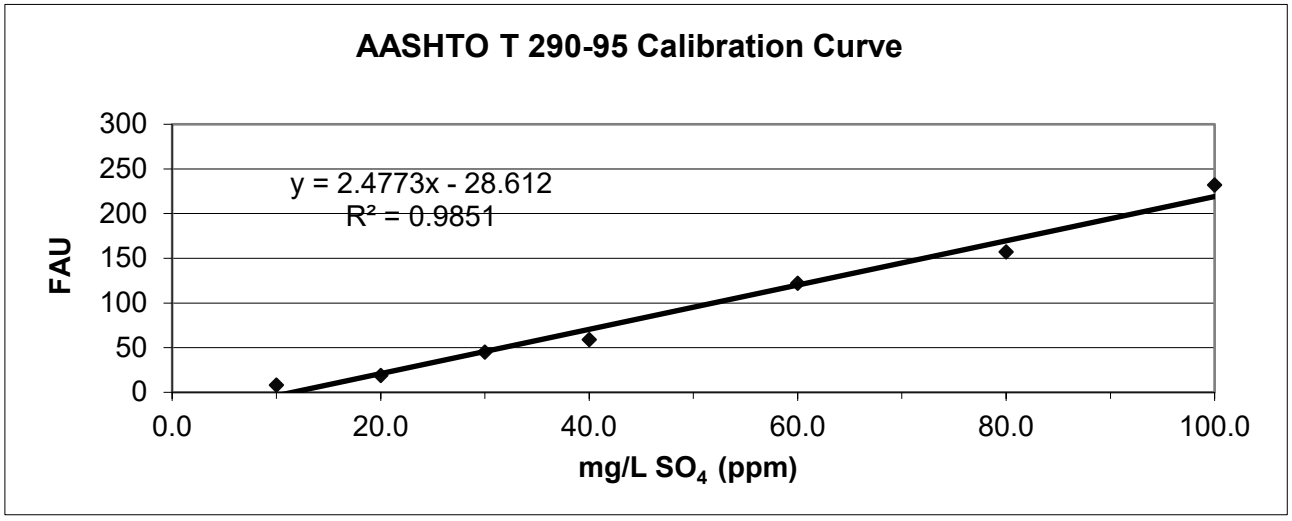
(Sample contains 5.0 mL NaCl solution and 0.3 g $BaCl_2 \cdot 2H_2O$)

Sample Weight (g):	100.0
Water added to Sample (mL):	300.0
Size of Sample Aliquot (mL):	50.0
Sample Reading (FAU):	29
Sample Diluted:	No
Sulfate Solution Added (ml):	0

Sample Moisture Content

Tare Number:	479
Weight of Tare & Wet Sample (g):	206.77
Weight of Tare & Dry Sample (g):	203.40
Weight of Tare (g):	97.73
Weight of Water (g):	3.37
Weight of Dry Sample (g):	105.67
Moisture Content (%):	3.19

Sample Sulfate Ion Concentration:	23.26	**mg/L SO_4 (ppm)**
Sample Sulfate Ion Content:	69.8	**mg/Kg SO_4 (not corrected for moisture)**
Sample Sulfate Ion Content:	72.1	**mg/Kg SO_4 (corrected for moisture)**



Tested by: JAM Date: 10/27/25 Checked by: EG Date: 10/28/2025

544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

CHLORIDE ION CONTENT IN SOILS

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

Client:	F&ME Consultants, Inc.	Boring No.:	P3D-B9
Client Reference:	CCR - Ph. 3D G5662.03-00019	Depth (ft):	0.0-6.0'
Project No.:	2025-700-001	Sample No.:	SS-1/SS-2/SS-3
Lab ID:	2025-700-001-001	Description:	Gray/Brown

(- # 10 Sieve material)

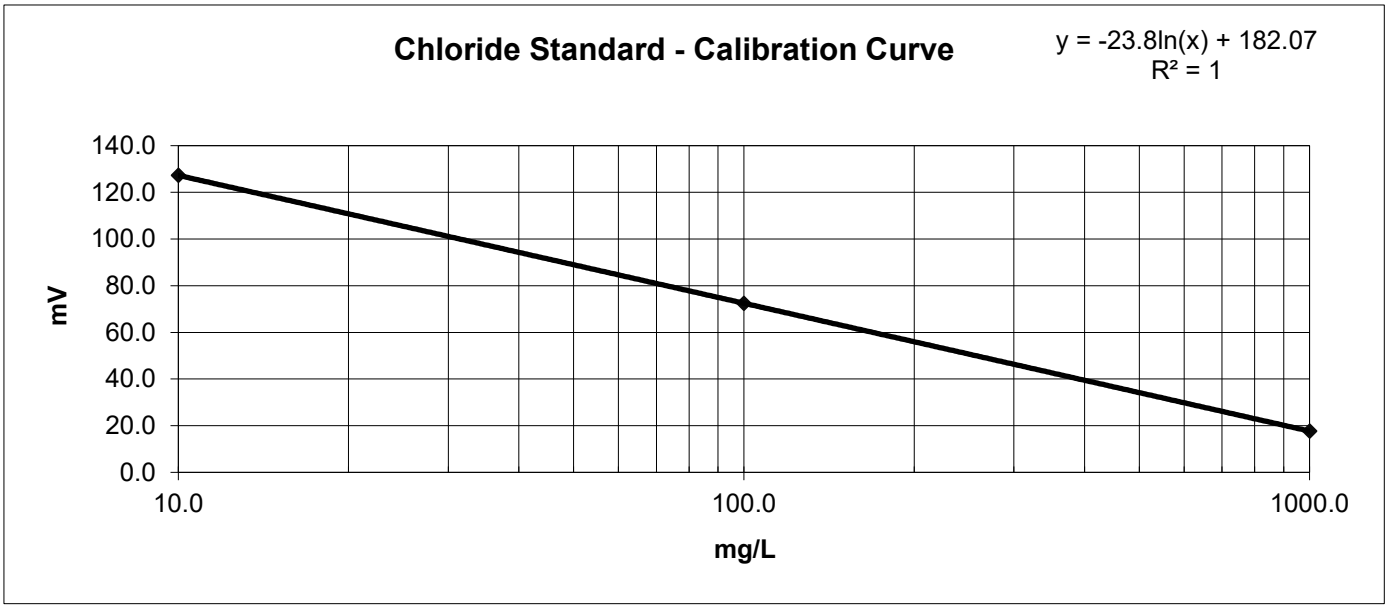
CHLORIDE STANDARD: CALIBRATION CURVE

STANDARD		MILLIVOLTS (mV)
10.0	mg/L	127.3
100.0	mg/L	72.4
1000.0	mg/L	17.7

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):	129.4	9.14	9.14

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°C.



Notes:

Tested By	JAM	Date	10/27/25	Checked By	EG	Date	10/28/25

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

544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	CCR Ph. 3D	**PROJECT NO.:**	G5662.030
SAMPLE NUMBER:	25-2389	**DATE REQUESTED:**	7/23/2025
DESCRIPTION OF SOIL:	Various		
TESTED BY:	LJ	**DATE OF TESTING:**	8/19/2025
WEIGHED BY:	AC	**DATE OF WEIGHING:**	8/20/2025

BORING NO.	P3D-B10	P3D-B10	P3D-B10	P3D-B10	P3D-B10
SAMPLE NO.	SS-2	SS-3	SS-4	SS-7	SS-8
SAMPLE DEPTH	2.0 - 4.0	4.0 - 6.0	6.0 - 8.0	15.1 - 20.1	20.1 - 25.1
WATER CONTENT, W%	24.1	16.5	31.9	43.6	29.4

BORING NO.	P3D-B10				
SAMPLE NO.	SS-10				
SAMPLE DEPTH	33.5 - 35.0				
WATER CONTENT, W%	21.0				

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

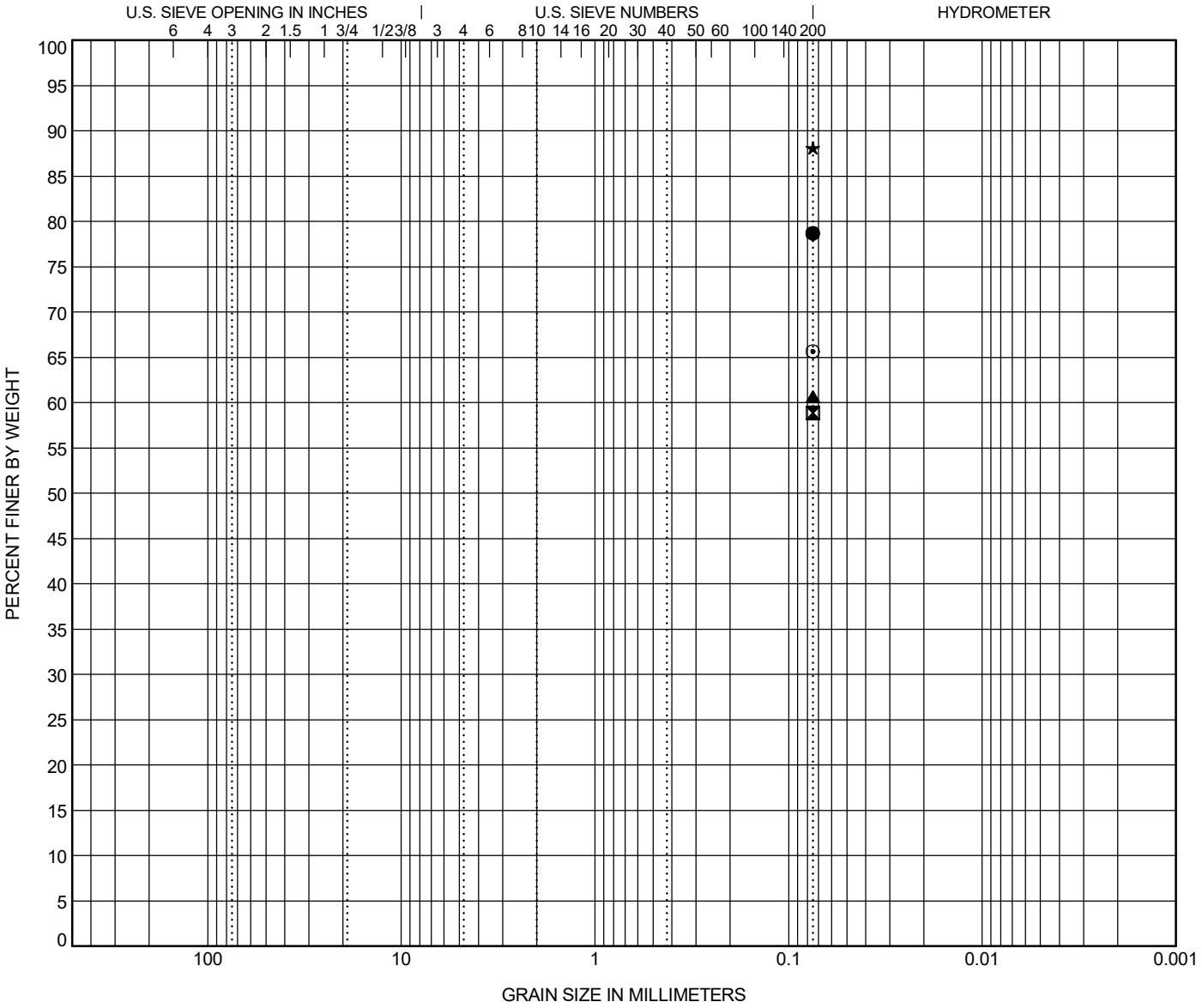
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

This report shall not be reproduced, except in full, without the written approval of F&ME Consultants, Inc.
211 Business Park Boulevard, Columbia SC 29203

GRAIN SIZE DISTRIBUTION

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**P3D-B10**	**4.0**	**SILT with SAND (ML/A-4)**	**33**	**28**	**5**		
⊠	**P3D-B10**	**6.0**	**SANDY SILT (ML/A-4)**	**31**	**27**	**4**		
▲	**P3D-B10**	**8.0**	**SANDY SILT (ML/A-4)**					
★	**P3D-B10**	**20.1**	**ELASTIC SILT (MH/A-7-5)**	**57**	**39**	**18**		
⊙	**P3D-B10**	**25.1**	**SANDY FAT CLAY (CH/A-7-6)**	**51**	**26**	**25**		

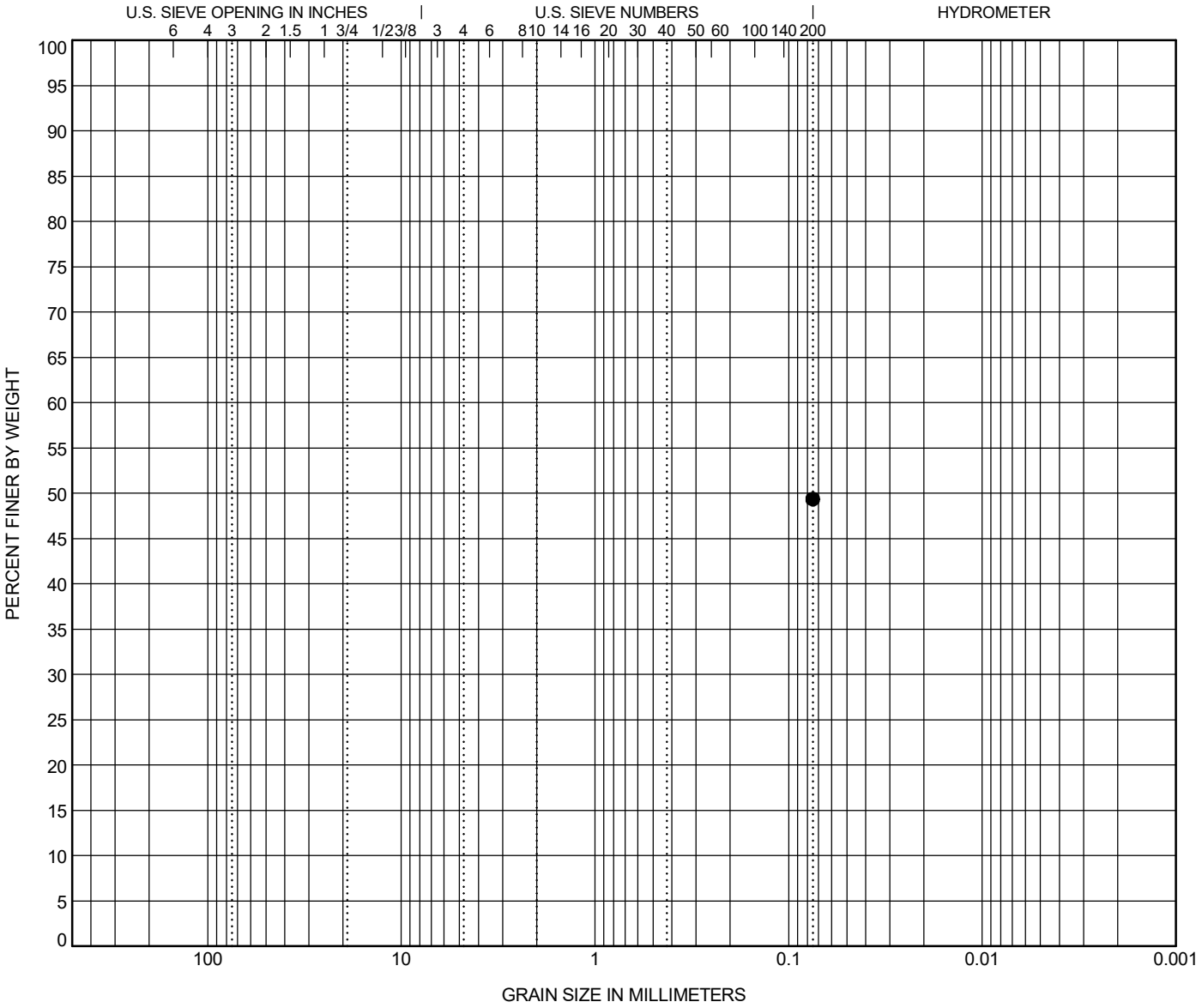
	BOREHOLE	DEPTH	D90	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**P3D-B10**	**4.0**							**78.7**	
⊠	**P3D-B10**	**6.0**							**58.9**	
▲	**P3D-B10**	**8.0**							**60.7**	
★	**P3D-B10**	**20.1**							**88.1**	
⊙	**P3D-B10**	**25.1**							**65.7**	

GRAIN SIZE G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 9/11/25

GRAIN SIZE DISTRIBUTION

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**P3D-B10**	**35.0**	**SILTY SAND (SM/A-7-6)**	**46**	**29**	**17**		

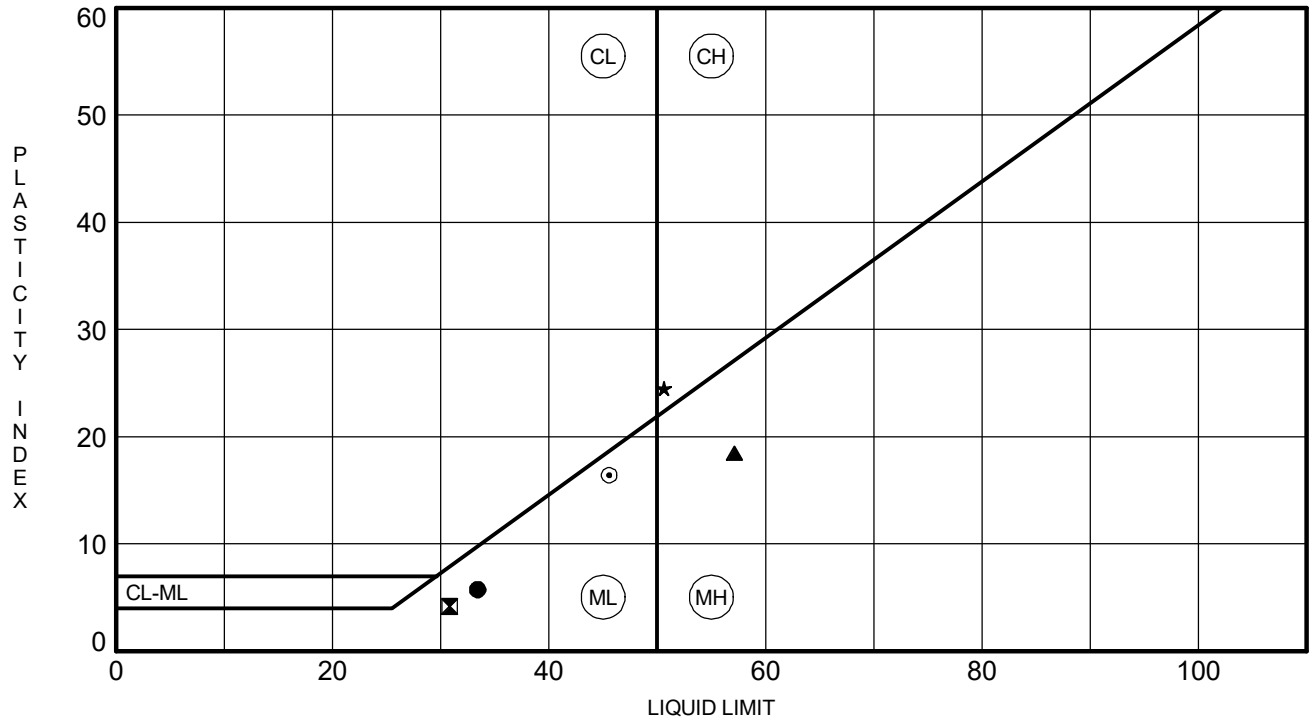
	BOREHOLE	DEPTH	D90	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**P3D-B10**	**35.0**							**49.4**	

GRAIN SIZE G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 9/11/25

ATTERBERG LIMITS' RESULTS

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**P3D-B10**	**4.0**	**33**	**28**	**5**	**78.7**	**SILT with SAND (ML/A-4)**
⊠	**P3D-B10**	**6.0**	**31**	**27**	**4**	**58.9**	**SANDY SILT (ML/A-4)**
▲	**P3D-B10**	**20.1**	**57**	**39**	**18**	**88.1**	**ELASTIC SILT (MH/A-7-5)**
★	**P3D-B10**	**25.1**	**51**	**26**	**25**	**65.7**	**SANDY FAT CLAY (CH/A-7-6)**
⊙	**P3D-B10**	**35.0**	**46**	**29**	**17**	**49.4**	**SILTY SAND (SM/A-7-6)**

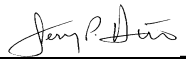
ATTERBERG LIMITS G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 9/11/25

pH DETERMINATION
(AASHTO T289)

Project Name:	CCR Ph. 3D (Req. #7)	Project Number:	G5662.03/00019
Description of Sample:	Composite	Date Received	7/21/2025
Tested By:	A. Ross	Date Tested:	8/28/2025

Boring ID	P3D-B10
Boring Depth	0.0 - 10.0
FME Lab ID No.	25-2389
pH Value	8.06
Temperature (˚C)	22.4˚C

Date Reviewed: 8/29/2025

Reviewed By: 

This report shall not be reproduced, except in full,
without the written approval of F&ME Consultants, Inc.
211 Business Park Blvd., Columbia, SC 29203

SOIL RESISTIVITY
(AASHTO T288)

Project Name:	CCR Ph. 3D (Req. #7)	Project ID:	G5662.03-00019
Location:	P3D-B10	FME Lab ID No.:	25-2389
Sampled By:	BV/AP	Date Sampled:	7/21/2025
Soil Description:	Composite	Date Received:	7/21/2025
Tested By:	A. Ross	Date Tested:	8/21/2025

Boring No.	Sample Depth (ft.)	Minimum Soil Resistivity, Ω-cm
P3D-B10	0.0 - 10.0	2,921 Ω-cm

Date Reviewed: 8/22/2025 Reviewed By: J. Hiers

This report shall not be reproduced, except in full,
without the written approval of F&ME Consultants, Inc.
211 Business Park Blvd., Columbia, SC 29203

Water-Soluble Sulfate Ion Content in Soil

AASHTO T 290-95 (2020)

Client:	F&ME Consultants, Inc.	Boring No.:	P3D-B10
Client Reference:	CCR - Ph. 3D G5662.03	Depth (ft):	0.0-10.0'
Project No.:	2025-595-001	Sample No.:	SS-1 to SS-5
Lab ID:	2025-595-001-006	Soil Description:	Gray

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	8	19	45	59	122	157	232

Measurement of Barium Chloride Turbidity

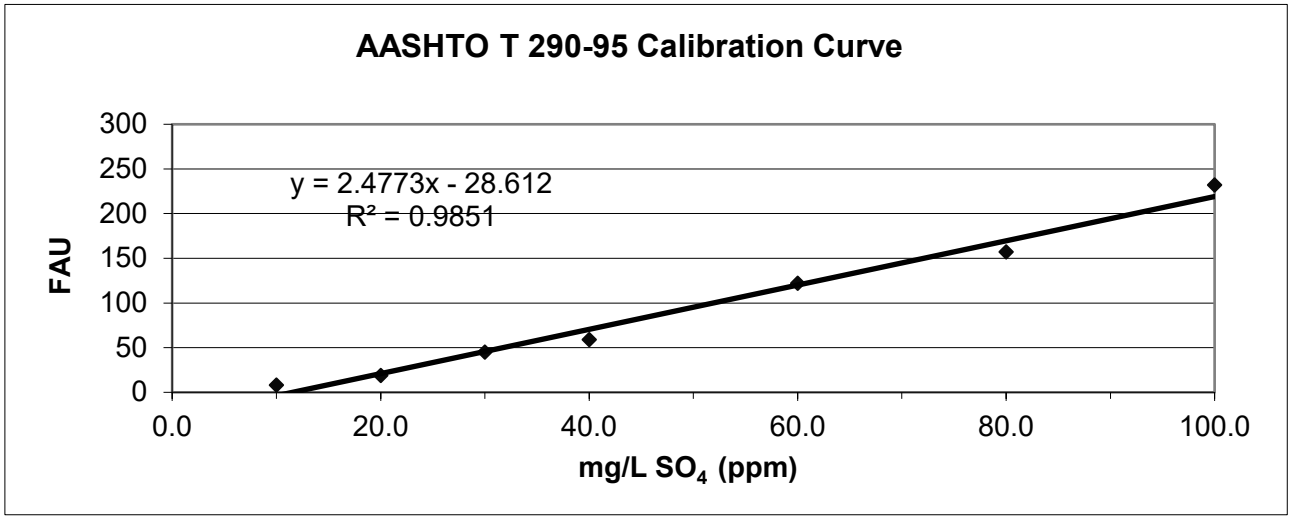
(Sample contains 5.0 mL NaCl solution and 0.3 g $BaCl_2 \cdot 2H_2O$)

Sample Weight (g):	100.0
Water added to Sample (mL):	300.0
Size of Sample Aliquot (mL):	50.0
Sample Reading (FAU):	18
Sample Diluted:	No
Sulfate Solution Added (ml):	0

Sample Moisture Content

Tare Number:	445
Weight of Tare & Wet Sample (g):	169.05
Weight of Tare & Dry Sample (g):	167.16
Weight of Tare (g):	90.21
Weight of Water (g):	1.89
Weight of Dry Sample (g):	76.95
Moisture Content (%):	2.46

Sample Sulfate Ion Concentration:	18.82	**mg/L SO_4 (ppm)**
Sample Sulfate Ion Content:	56.4	**mg/Kg SO_4 (not corrected for moisture)**
Sample Sulfate Ion Content:	57.9	**mg/Kg SO_4 (corrected for moisture)**



Tested by: JAM Date: 9/4/25 Checked by: EG Date: 9/5/2025

544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

CHLORIDE ION CONTENT IN SOILS

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

Client:	F&ME Consultants, Inc.	Boring No.:	P3D-B10
Client Reference:	CCR - Ph. 3D G5662.03	Depth (ft):	0.0-10.0'
Project No.:	2025-595-001	Sample No.:	SS-1 to SS-5
Lab ID:	2025-595-001-006	Description:	Gray

(- # 10 Sieve material)

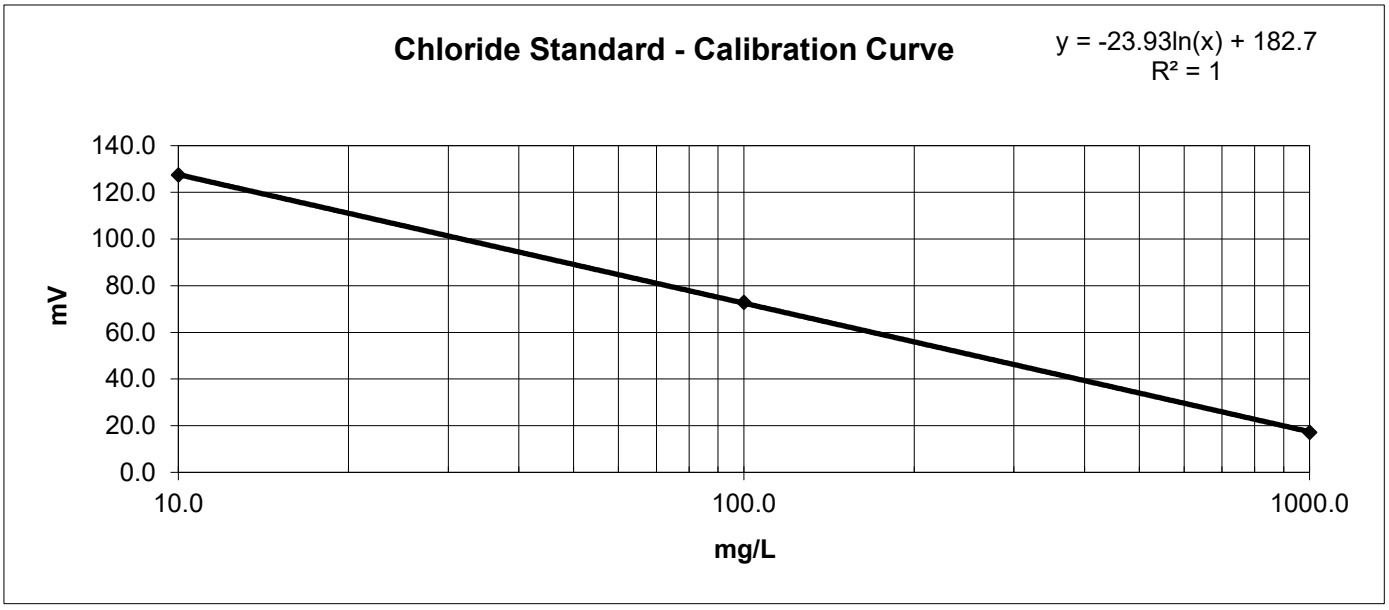
CHLORIDE STANDARD: CALIBRATION CURVE

STANDARD		MILLIVOLTS (mV)
10.0	mg/L	127.4
100.0	mg/L	72.9
1000.0	mg/L	17.2

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):	110.2	20.69	20.69

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°C.



Notes:

Tested By	JAM	Date	9/4/25	Checked By	EG	Date	9/5/25

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

544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	CCR Ph. 3D	**PROJECT NO.:**	G5662.030
SAMPLE NUMBER:	25-1832	**DATE REQUESTED:**	6/10/2025
DESCRIPTION OF SOIL:	Various		
TESTED BY:	BW/MW	**DATE OF TESTING:**	6/24/2025
WEIGHED BY:	MW	**DATE OF WEIGHING:**	6/25/2025

BORING NO.	P3D-B11	P3D-B11	P3D-B11	P3D-B11	P3D-B11
SAMPLE NO.	SS-1	SS-3	SS-4	SS-5	SS-6
SAMPLE DEPTH	0.0 - 2.0	4.0 - 6.0	6.0 - 8.0	8.0 - 10.0	13.5 - 15.0
WATER CONTENT, W%	3.2	18.6	21.3	26.2	21.9

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

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

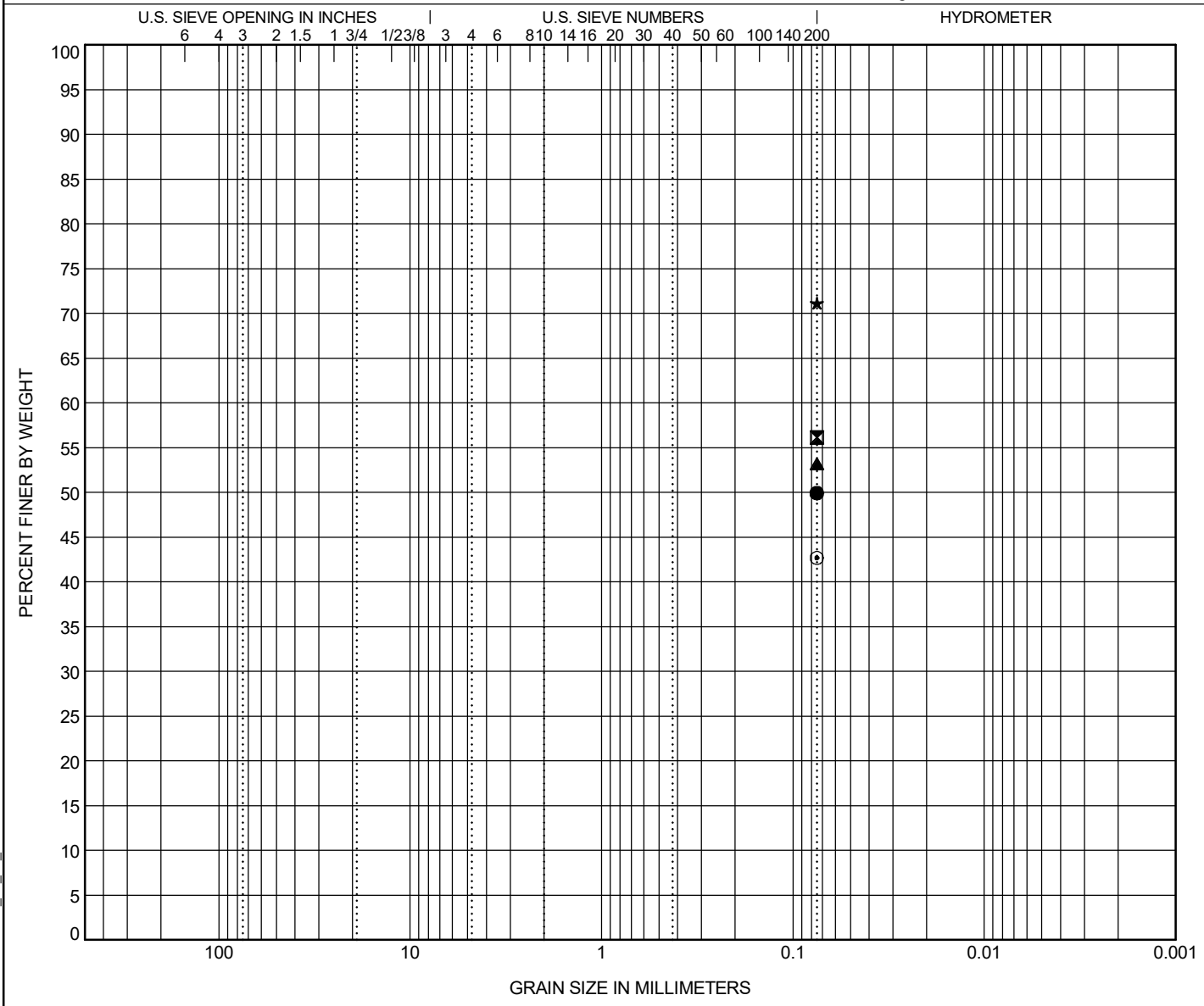
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

This report shall not be reproduced, except in full, without the written approval of F&ME Consultants, Inc.
211 Business Park Boulevard, Columbia SC 29203

GRAIN SIZE DISTRIBUTION

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**P3D-B11**	**2.0**	**CLAYEY SAND (SC/A-6)**	**34**	**15**	**19**		
⊠	**P3D-B11**	**6.0**	**SANDY LEAN CLAY (CL/A-7-6)**	**44**	**21**	**23**		
▲	**P3D-B11**	**8.0**	**SANDY LEAN CLAY (CL/A-6)**	**32**	**16**	**16**		
★	**P3D-B11**	**10.0**	**LEAN CLAY with SAND (CL/A-6)**	**40**	**20**	**20**		
⊙	**P3D-B11**	**15.0**	**CLAYEY SAND (SC/A-6)**	**32**	**20**	**12**		

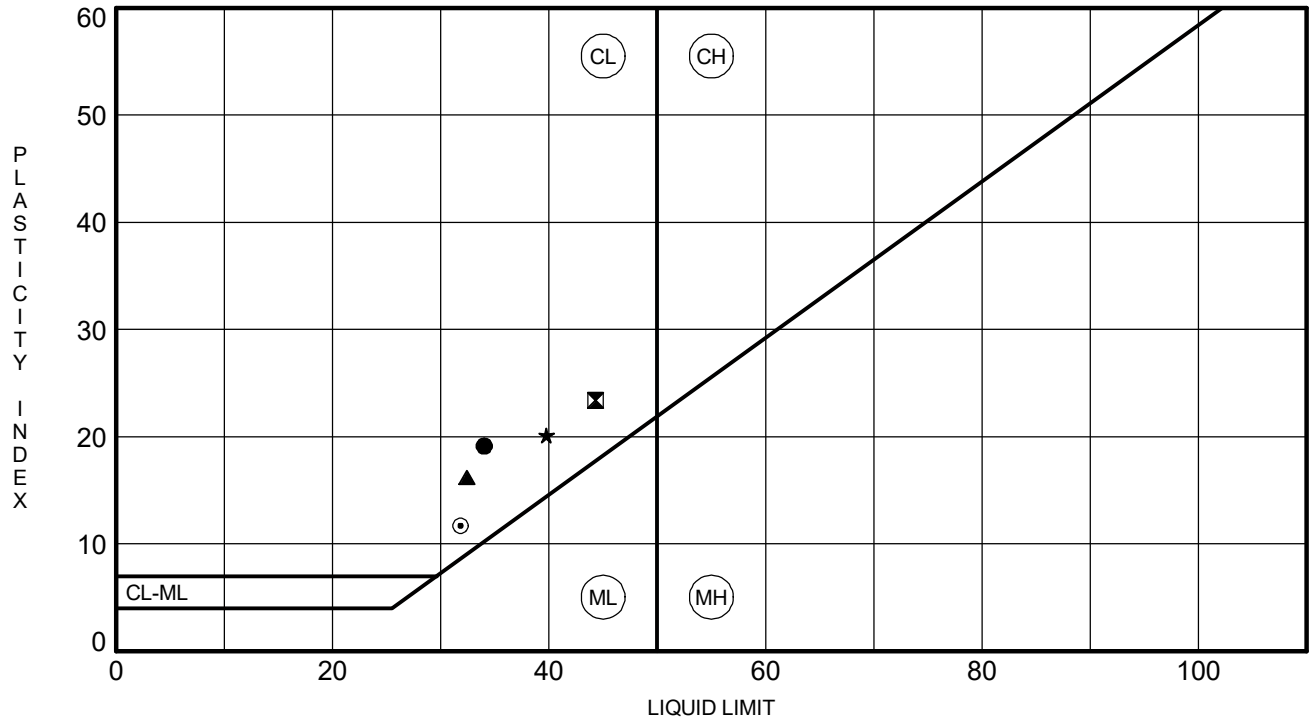
	BOREHOLE	DEPTH	D90	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**P3D-B11**	**2.0**							**49.9**	
⊠	**P3D-B11**	**6.0**							**56.2**	
▲	**P3D-B11**	**8.0**							**53.2**	
★	**P3D-B11**	**10.0**							**71.2**	
⊙	**P3D-B11**	**15.0**							**42.7**	

GRAIN SIZE G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 7/9/25

ATTERBERG LIMITS' RESULTS

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**P3D-B11**	**2.0**	**34**	**15**	**19**	**49.9**	**CLAYEY SAND (SC/A-6)**
⊠	**P3D-B11**	**6.0**	**44**	**21**	**23**	**56.2**	**SANDY LEAN CLAY (CL/A-7-6)**
▲	**P3D-B11**	**8.0**	**32**	**16**	**16**	**53.2**	**SANDY LEAN CLAY (CL/A-6)**
★	**P3D-B11**	**10.0**	**40**	**20**	**20**	**71.2**	**LEAN CLAY with SAND (CL/A-6)**
⊙	**P3D-B11**	**15.0**	**32**	**20**	**12**	**42.7**	**CLAYEY SAND (SC/A-6)**

ATTERBERG LIMITS G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 7/9/25

pH DETERMINATION
(AASHTO T289)

Project Name:	CCR Ph. 3D	Project Number:	G5662.03-00019
Description of Sample:	Soil Sample (Composite)	Date Received	7/9/2025
Tested By:	AG	Date Tested:	7/31/2025

Boring ID	P3D-B11
Boring Depth	0.0 - 20.0
FME Lab ID No.	25-1872
pH Value	5.25
Temperature (˚C)	22.00

Date Reviewed: 8/11/2025 Reviewed By: J. Heirs

This report shall not be reproduced, except in full,
without the written approval of F&ME Consultants, Inc.
211 Business Park Blvd., Columbia, SC 29203

REV 01/2023

SOIL RESISTIVITY
(AASHTO T288)

Project Name:	CCR Ph. 3D	Project ID:	G5662.03-00019
Location:	Soil Sample (Composite)	FME Lab ID No.:	25-1872
Sampled By:	BV	Date Sampled:	6/10/2025
Soil Description:	Composite	Date Received:	6/10/2025
Tested By:	A. Grier	Date Tested:	8/11/2025

Boring No.	Sample Depth (ft.)	Minimum Soil Resistivity, Ω-cm
P3D-B11	0.0 - 20.0	6,399

Date Reviewed: 8/11/2025 Reviewed By: J. Hiers

This report shall not be reproduced, except in full,
without the written approval of F&ME Consultants, Inc.
211 Business Park Blvd., Columbia, SC 29203

Water-Soluble Sulfate Ion Content in Soil

AASHTO T 290-95 (2020)

Client:	F&ME Consultants, Inc.	Boring No.:	P3D-B11
Client Reference:	CCR Ph. 3D G5662.03	Depth (ft):	0.0-20.0'
Project No.:	2025-517-001	Sample No.:	SS-1/2/3/4/5/6/7
Lab ID:	2025-517-001-002	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	8	19	45	59	122	157	232

Measurement of Barium Chloride Turbidity

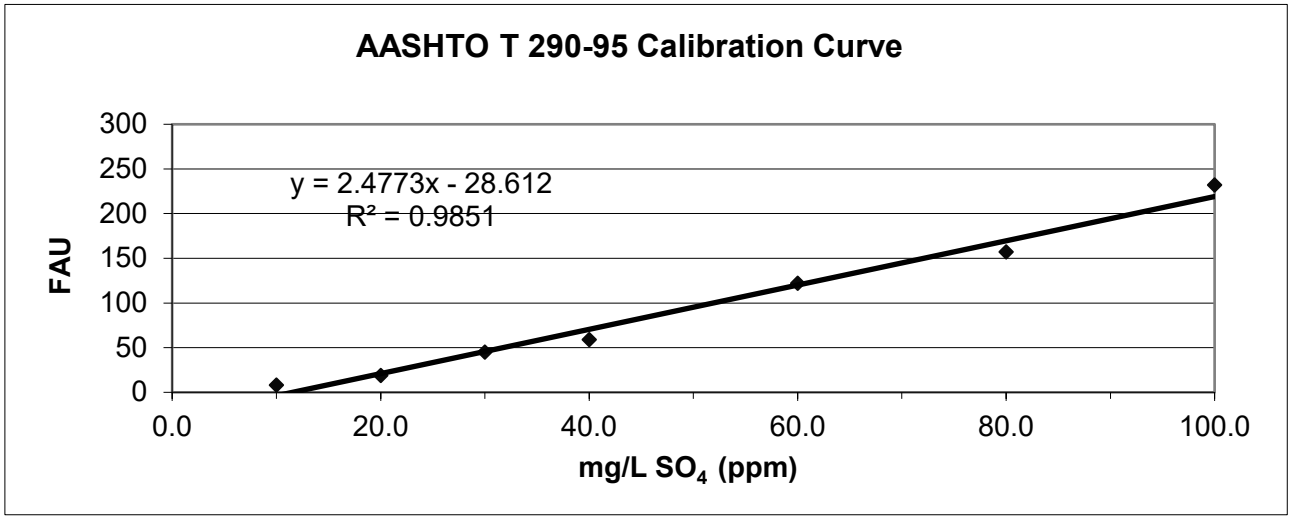
(Sample contains 5.0 mL NaCl solution and 0.3 g $BaCl_2 \cdot 2H_2O$)

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:	466
Weight of Tare & Wet Sample (g):	214.58
Weight of Tare & Dry Sample (g):	212.91
Weight of Tare (g):	90.86
Weight of Water (g):	1.67
Weight of Dry Sample (g):	122.05
Moisture Content (%):	1.37

Sample Sulfate Ion Concentration:	15.18	**mg/L SO_4 (ppm)**
Sample Sulfate Ion Content:	45.5	**mg/Kg SO_4 (not corrected for moisture)**
Sample Sulfate Ion Content:	46.2	**mg/Kg SO_4 (corrected for moisture)**



Tested by: JAM Date: 8/1/25 Checked by: EG Date: 8/4/2025

544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

CHLORIDE ION CONTENT IN SOILS

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

Client:	F&ME Consultants, Inc.	Boring No.:	P3D-B11
Client Reference:	CCR Ph. 3D G5662.03	Depth (ft):	0.0-20.0'
Project No.:	2025-517-001	Sample No.:	SS-1/2/3/4/5/6/7
Lab ID:	2025-517-001-002	Description:	Brown

(- # 10 Sieve material)

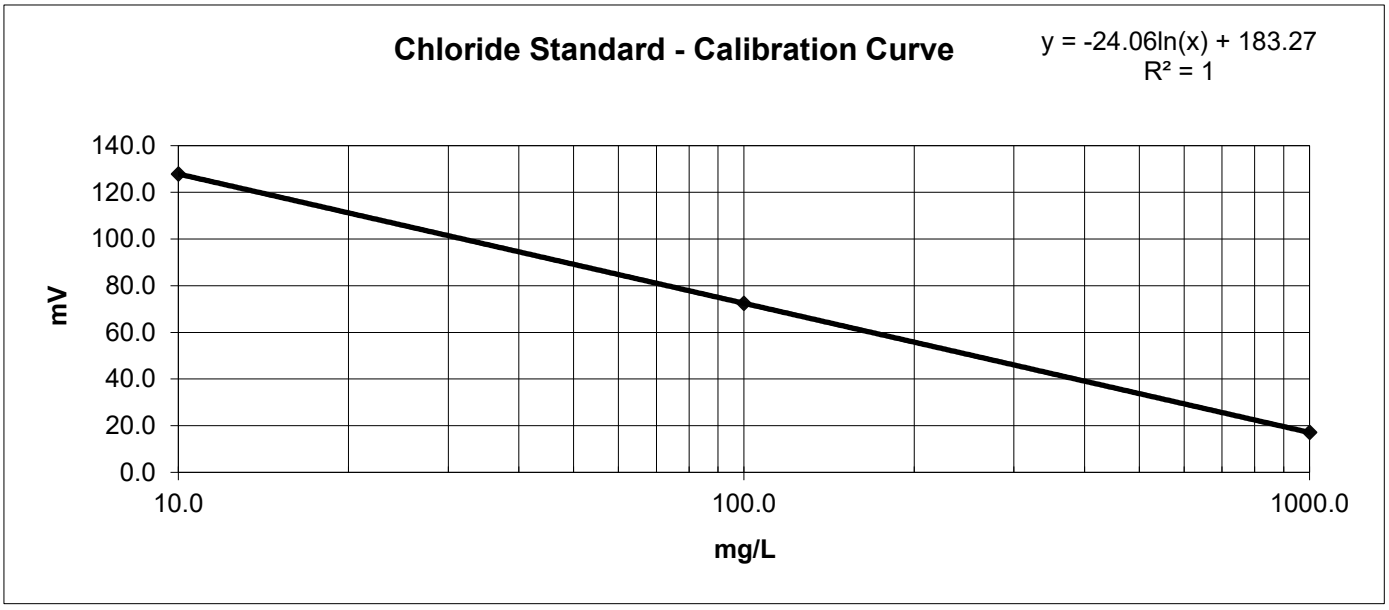
CHLORIDE STANDARD: CALIBRATION CURVE

STANDARD		MILLIVOLTS (mV)
10.0	mg/L	127.9
100.0	mg/L	72.4
1000.0	mg/L	17.1

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):	136.8	6.90	6.90

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°C.



Notes:

Tested By	JAM	Date	8/1/25	Checked By	EG	Date	8/4/25

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

544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

REV 12/2023

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	CCR Ph. 3D	**PROJECT NO.:**	G5662.030
SAMPLE NUMBER:	25-3268	**DATE REQUESTED:**	9/12/2025
DESCRIPTION OF SOIL:	Various		
TESTED BY:	L. Johnson	**DATE OF TESTING:**	10/14/2025
WEIGHED BY:	L. Johnson	**DATE OF WEIGHING:**	10/15/2025

BORING NO.	P3D-B12	P3D-B12	P3D-B12	P3D-B12	P3D-B12
SAMPLE NO.	SS-1	SS-3	SS-4	SS-5	SS-6
SAMPLE DEPTH	0.0 - 2.0	4.0 - 6.0	6.0 - 8.0	8.0 - 10.0	13.5 - 15.0
WATER CONTENT, W%	13.6	23.8	30.2	43.9	13.3

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

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

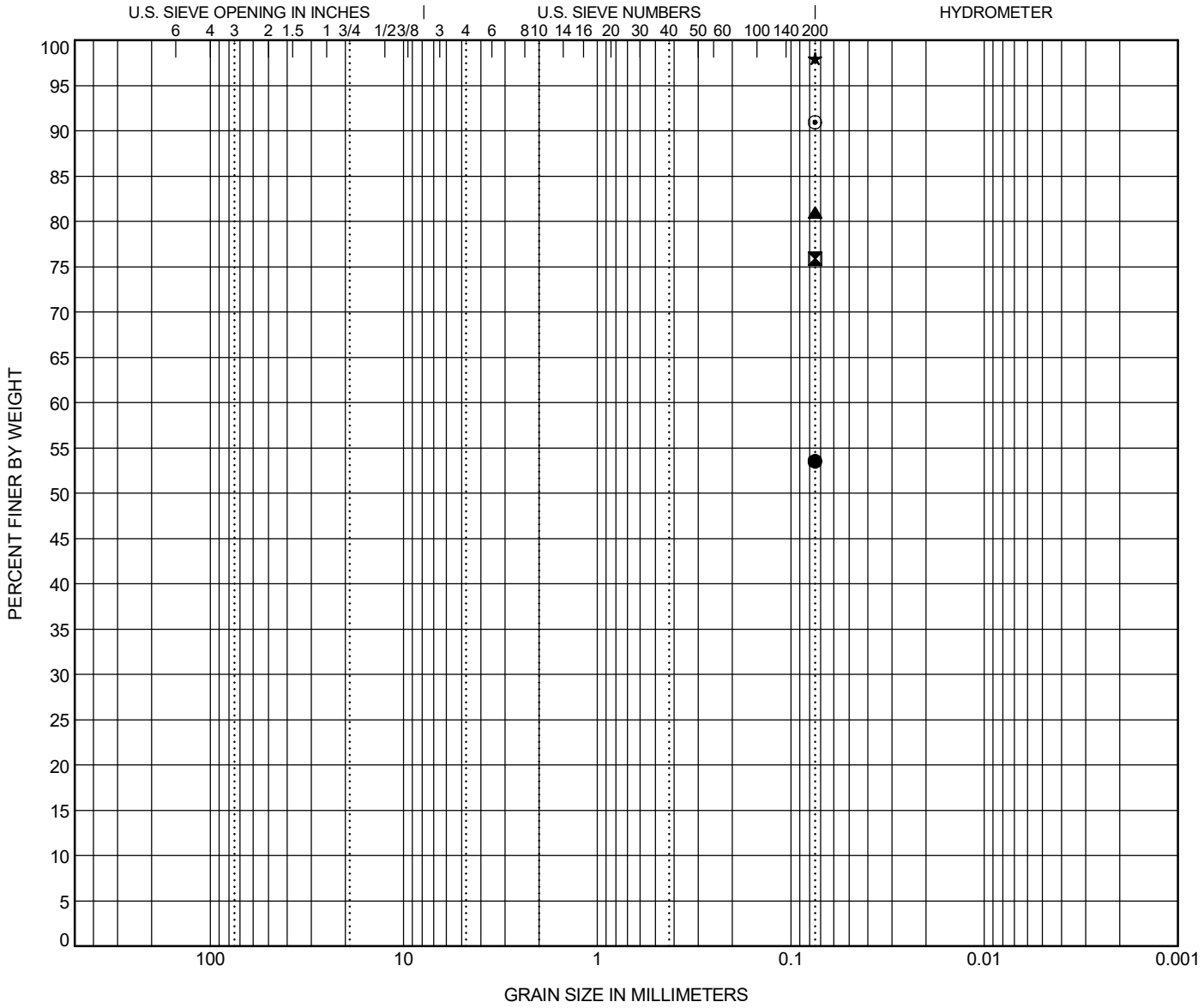
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

This report shall not be reproduced, except in full, without the written approval of F&ME Consultants, Inc.
1613 Paris Ave Suite A, Port Royal, SC 29935

GRAIN SIZE DISTRIBUTION

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads Phase 3D

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**P3D-B12**	**2.0**	**Sandy Lean CLAY (CL/A-6)**	**32**	**18**	**14**		
⊠	**P3D-B12**	**6.0**	**Fat CLAY with Sand (CH/A-7-6)**	**55**	**25**	**30**		
▲	**P3D-B12**	**8.0**	**Fat CLAY with Sand (CH/A-7-6)**	**57**	**24**	**33**		
★	**P3D-B12**	**10.0**	**Fat CLAY (CH/A-7-6)**	**53**	**28**	**25**		
⊙	**P3D-B12**	**15.0**	**SILT (ML/A-4)**	**NP**	**NP**	**NP**		

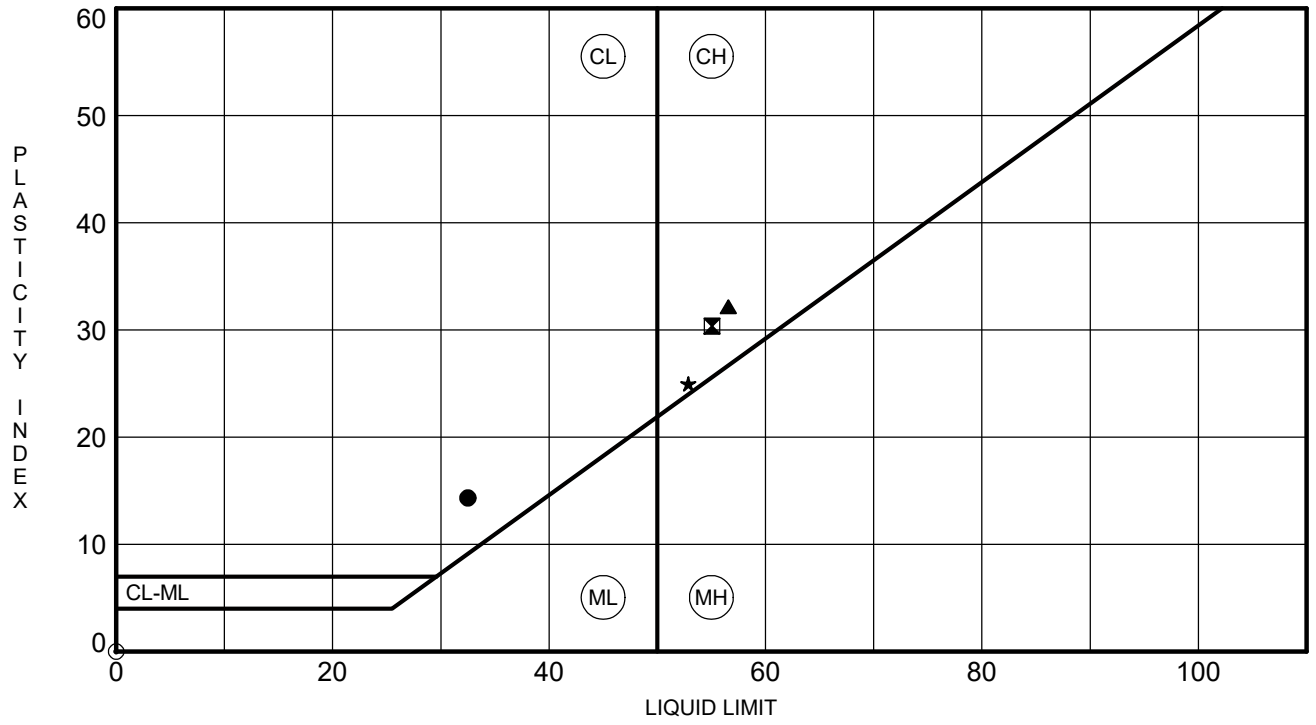
	BOREHOLE	DEPTH	D90	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**P3D-B12**	**2.0**							**53.5**	
⊠	**P3D-B12**	**6.0**							**75.9**	
▲	**P3D-B12**	**8.0**							**81.0**	
★	**P3D-B12**	**10.0**							**98.0**	
⊙	**P3D-B12**	**15.0**							**91.0**	

GRAIN SIZE G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/22/25

ATTERBERG LIMITS' RESULTS

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads Phase 3D

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**P3D-B12**	**2.0**	**32**	**18**	**14**	**53.5**	**SANDY LEAN CLAY (CL/A-6)**
⊠	**P3D-B12**	**6.0**	**55**	**25**	**30**	**75.9**	**FAT CLAY with SAND (CH/A-7-6)**
▲	**P3D-B12**	**8.0**	**57**	**24**	**33**	**81.0**	**FAT CLAY with SAND (CH/A-7-6)**
★	**P3D-B12**	**10.0**	**53**	**28**	**25**	**98.0**	**FAT CLAY (CH/A-7-6)**
⊙	**P3D-B12**	**15.0**	**NP**	**NP**	**NP**	**91.0**	**SILT (ML/A-4)**

ATTERBERG LIMITS G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/22/25

pH DETERMINATION
(AASHTO T289)

Project Name:	CCR Ph. 3D	Project Number:	G5662.03-00019
Description of Sample:	CLAYEY SAND (SC/A-6)	Date Received	9/12/2025
Tested By:	AHR	Date Tested:	10/8/2025

Boring ID	P3D-B12
Boring Depth	2.0 - 4.0
FME Lab ID No.	25-1873
pH Value	5.34
Temperature (˚C)	21.6

Date Reviewed: 10/9/2025 Reviewed By: J. Heirs

This report shall not be reproduced, except in full,
without the written approval of F&ME Consultants, Inc.
211 Business Park Blvd., Columbia, SC 29203

SOIL RESISTIVITY
(AASHTO T288)

Project Name:	Carolina Crossroads - Phase 3D	Project ID:	G5662.03-00019
Location:	--	FME Lab ID No.:	25-3268
Sampled By:	BV	Date Sampled:	9/4/2025
Soil Description:	Sandy SILT (ML)	Date Received:	9/12/2025
Tested By:	A. Grier	Date Tested:	10/10/2025

Boring No.	Sample Depth (ft.)	Minimum Soil Resistivity, Ω-cm
P3D-B12	2.0 - 4.0	11,524

Date Reviewed: 10/21/2025 Reviewed By: A. Abernethy

This report shall not be reproduced, except in full,
without the written approval of F&ME Consultants, Inc.
211 Business Park Blvd., Columbia, SC 29203

Water-Soluble Sulfate Ion Content in Soil

AASHTO T 290-95 (2020)

Client:	F&ME Consultants, Inc.	Boring No.:	P3D-B12
Client Reference:	CCR -Ph. 3D G5662.03	Depth (ft):	2.0-4.0'
Project No.:	2025-595-003	Sample No.:	SS-2
Lab ID:	2025-595-003-001	Soil Description:	Orange 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	8	19	45	59	122	157	232

Measurement of Barium Chloride Turbidity

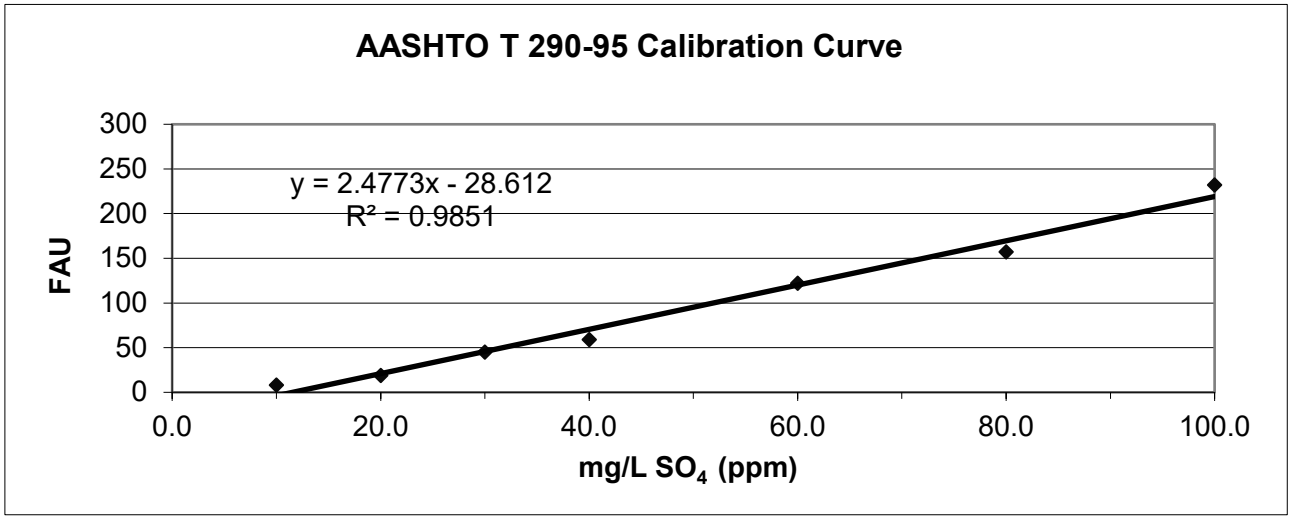
(Sample contains 5.0 mL NaCl solution and 0.3 g $BaCl_2 \cdot 2H_2O$)

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):	10

Sample Moisture Content

Tare Number:	442
Weight of Tare & Wet Sample (g):	212.44
Weight of Tare & Dry Sample (g):	210.19
Weight of Tare (g):	98.57
Weight of Water (g):	2.25
Weight of Dry Sample (g):	111.62
Moisture Content (%):	2.02

Sample Sulfate Ion Concentration:	14.18	**mg/L SO_4 (ppm)**
Sample Sulfate Ion Content:	42.5	**mg/Kg SO_4 (not corrected for moisture)**
Sample Sulfate Ion Content:	43.4	**mg/Kg SO_4 (corrected for moisture)**



Tested by: JAM Date: 10/15/25 Checked by: EG Date: 10/16/2025

544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

CHLORIDE ION CONTENT IN SOILS

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

Client:	F&ME Consultants, Inc.	Boring No.:	P3D-B12
Client Reference:	CCR - Ph. 3D G5662.03	Depth (ft):	2.0-4.0'
Project No.:	2025-595-003	Sample No.:	SS-2
Lab ID:	2025-595-003-001	Description:	Orange Brown

(- # 10 Sieve material)

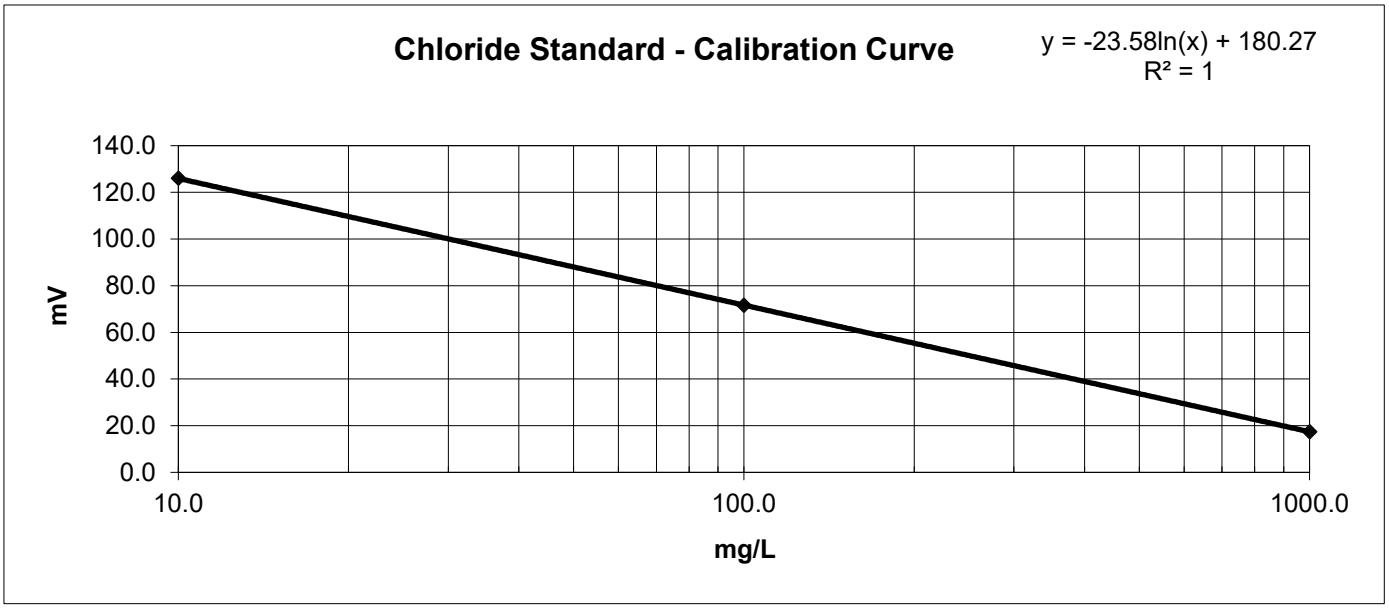
CHLORIDE STANDARD: CALIBRATION CURVE

STANDARD		MILLIVOLTS (mV)
10.0	mg/L	126.0
100.0	mg/L	71.6
1000.0	mg/L	17.4

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):	105.3	24.02	24.02

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°C.



Notes:

Tested By	JAM	Date	10/15/25	Checked By	EG	Date	10/16/25

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

544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	CCR Ph. 3D	**PROJECT NO.:**	G5662.030
SAMPLE NUMBER:	25-3200	**DATE REQUESTED:**	9/22/2025
DESCRIPTION OF SOIL:	Various		
TESTED BY:	MBP/AKG	**DATE OF TESTING:**	9/22/2025
WEIGHED BY:	HM	**DATE OF WEIGHING:**	9/23/2025

BORING NO.	P3D-B13	P3D-B13	P3D-B13	P3D-B13	P3D-B13
SAMPLE NO.	SS-1	SS-4	SS-5	SS-6	SS-7
SAMPLE DEPTH	0.0 - 2.0	6.0 - 8.0	8.0 - 10.0	13.5 - 15.0	18.5 - 20.0
WATER CONTENT, W%	15.0	23.2	32.5	14.6	26.6

BORING NO.	P3D-B13	P3D-B13	P3D-B13		
SAMPLE NO.	SS-9	SS-10	SS-12		
SAMPLE DEPTH	28.5 - 30.0	33.5 - 35.0	43.5 - 45.0		
WATER CONTENT, W%	26.8	12.0	24.3		

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

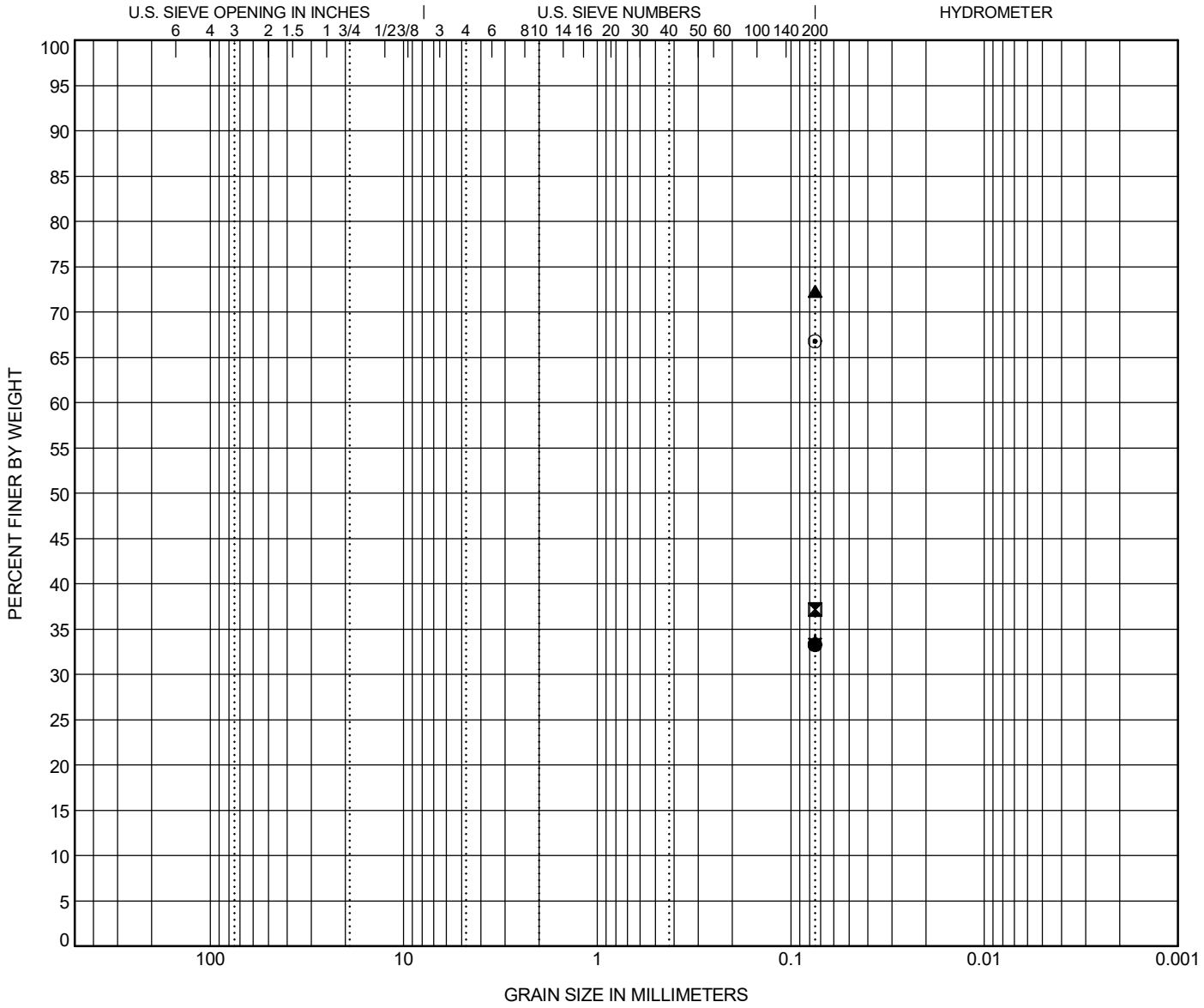
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

This report shall not be reproduced, except in full, without the written approval of F&ME Consultants, Inc.
211 Business Park Boulevard, Columbia SC 29203

GRAIN SIZE DISTRIBUTION

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads Phase 3D

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**P3D-B13**	**2.0**	**CLAYEY SAND (SC/A-2-6)**	**26**	**13**	**13**		
⊠	**P3D-B13**	**8.0**	**SILTY, CLAYEY SAND (SC-SM/A-4)**	**21**	**15**	**6**		
▲	**P3D-B13**	**10.0**	**LEAN CLAY with SAND (CL/A-6)**					
★	**P3D-B13**	**15.0**	**CLAYEY SAND (SC/A-2-6)**	**35**	**17**	**18**		
⊙	**P3D-B13**	**20.0**	**SANDY LEAN CLAY (CL/A-7-6)**	**41**	**24**	**17**		

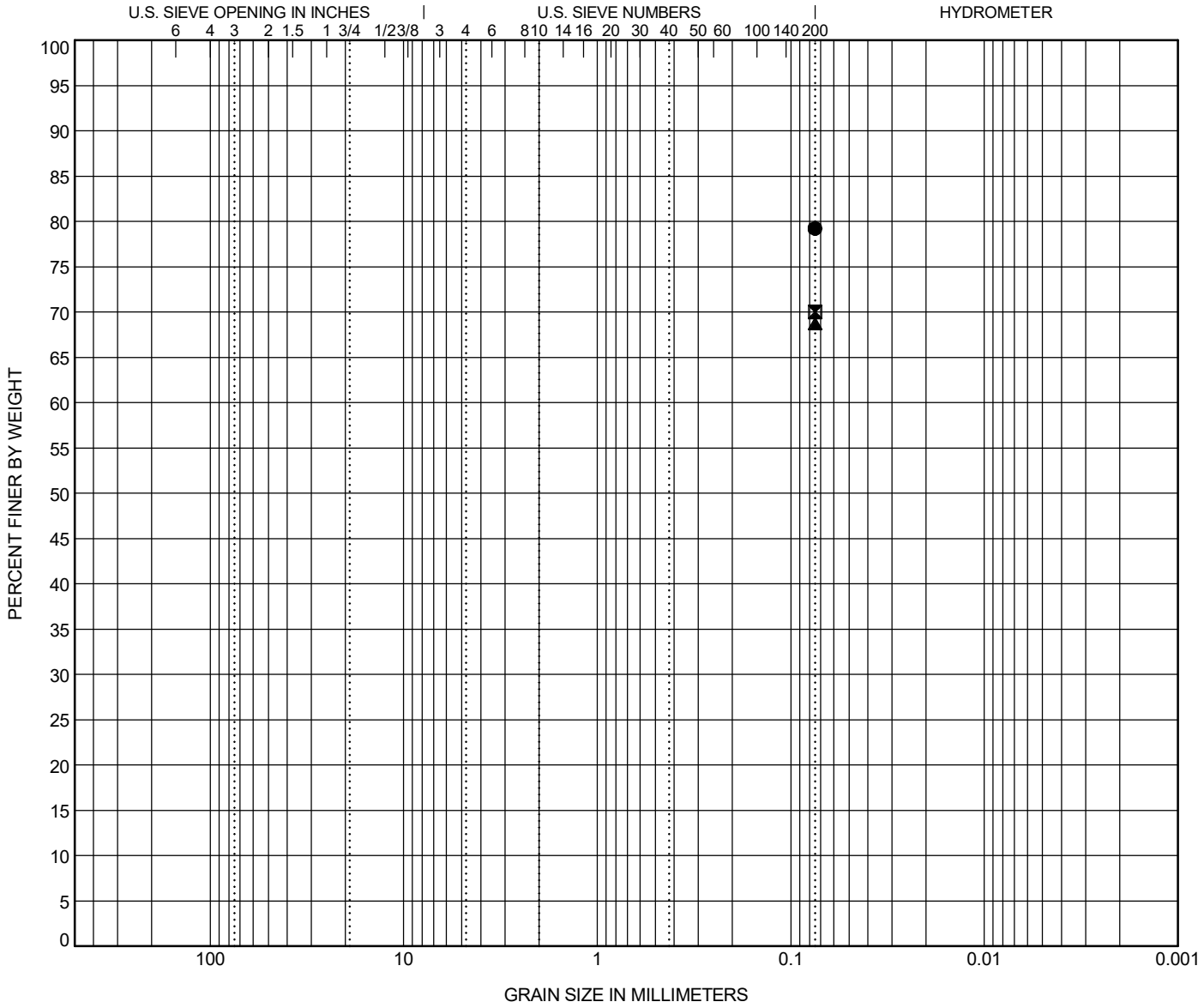
	BOREHOLE	DEPTH	D90	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**P3D-B13**	**2.0**							**33.3**	
⊠	**P3D-B13**	**8.0**							**37.2**	
▲	**P3D-B13**	**10.0**							**72.3**	
★	**P3D-B13**	**15.0**							**33.8**	
⊙	**P3D-B13**	**20.0**							**66.8**	

GRAIN SIZE G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/15/25

GRAIN SIZE DISTRIBUTION

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads Phase 3D

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**P3D-B13**	**30.0**	**LEAN CLAY with SAND (CL/A-6)**	**37**	**19**	**18**		
⊠	**P3D-B13**	**35.0**	**SILT with SAND (ML/A-4)**	**37**	**29**	**8**		
▲	**P3D-B13**	**45.0**	**SANDY SILT (ML/A-7-6)**	**45**	**29**	**16**		

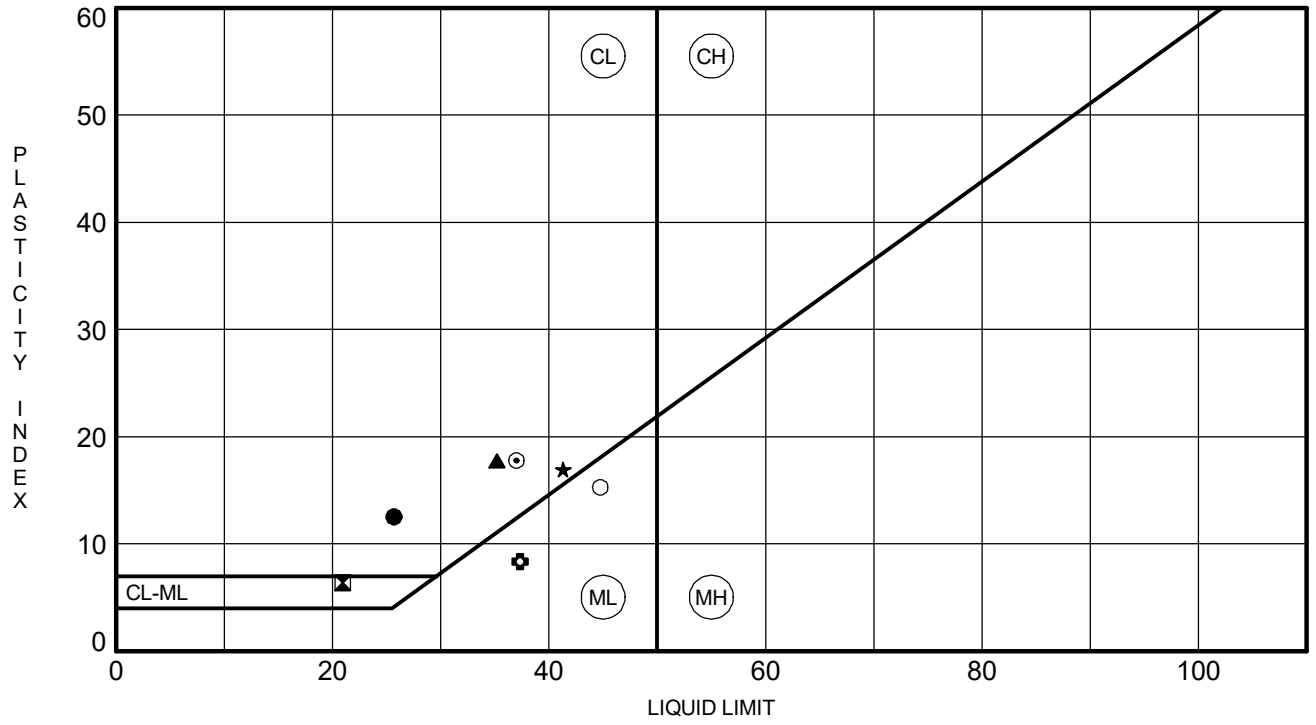
	BOREHOLE	DEPTH	D90	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**P3D-B13**	**30.0**							**79.2**	
⊠	**P3D-B13**	**35.0**							**70.0**	
▲	**P3D-B13**	**45.0**							**68.7**	

GRAIN SIZE G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/15/25

ATTERBERG LIMITS' RESULTS

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads Phase 3D

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**P3D-B13**	**2.0**	**26**	**13**	**13**	**33**	**CLAYEY SAND (SC/A-2-6)**
⊠	**P3D-B13**	**8.0**	**21**	**15**	**6**	**37**	**SILTY, CLAYEY SAND (SC-SM/A-4)**
▲	**P3D-B13**	**15.0**	**35**	**17**	**18**	**34**	**CLAYEY SAND (SC/A-2-6)**
★	**P3D-B13**	**20.0**	**41**	**24**	**17**	**67**	**SANDY LEAN CLAY (CL/A-7-6)**
⊙	**P3D-B13**	**30.0**	**37**	**19**	**18**	**79**	**LEAN CLAY with SAND (CL/A-6)**
✿	**P3D-B13**	**35.0**	**37**	**29**	**8**	**70**	**SILT with SAND (ML/A-4)**
○	**P3D-B13**	**45.0**	**45**	**29**	**16**	**69**	**SANDY SILT (ML/A-7-6)**

ATTERBERG (OUTSOURCE) G5662.03- CAROLINA CROSSROADS PH 3D.GPJ FME2017.GDT 10/15/25

Laboratory test performed at a non-F&ME AASHTO accreditted laboratory

REV 12/2023

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	CCR Ph. 3D	**PROJECT NO.:**	G5662.030
SAMPLE NUMBER:	25-3202	**DATE REQUESTED:**	9/22/2025
DESCRIPTION OF SOIL:	Various		
TESTED BY:	MBP/AKG	**DATE OF TESTING:**	9/22/2025
WEIGHED BY:	HM	**DATE OF WEIGHING:**	9/23/2025

BORING NO.	P3D-B14	P3D-B14	P3D-B14	P3D-B14	P3D-B14
SAMPLE NO.	SS-2	SS-4	SS-5	SS-6	SS-7
SAMPLE DEPTH	2.0 - 4.0	6.0 - 8.0	8.0 - 10.0	13.5 - 15.0	18.5 - 20.0
WATER CONTENT, W%	10.3	16.5	17.3	23.7	32.3

BORING NO.	P3D-B14	P3D-B14	P3D-B14		
SAMPLE NO.	SS-8	SS-10	SS-12		
SAMPLE DEPTH	23.5 - 25.0	33.5 - 35.0	43.5 - 45.0		
WATER CONTENT, W%	40.6	49.5	32.6		

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

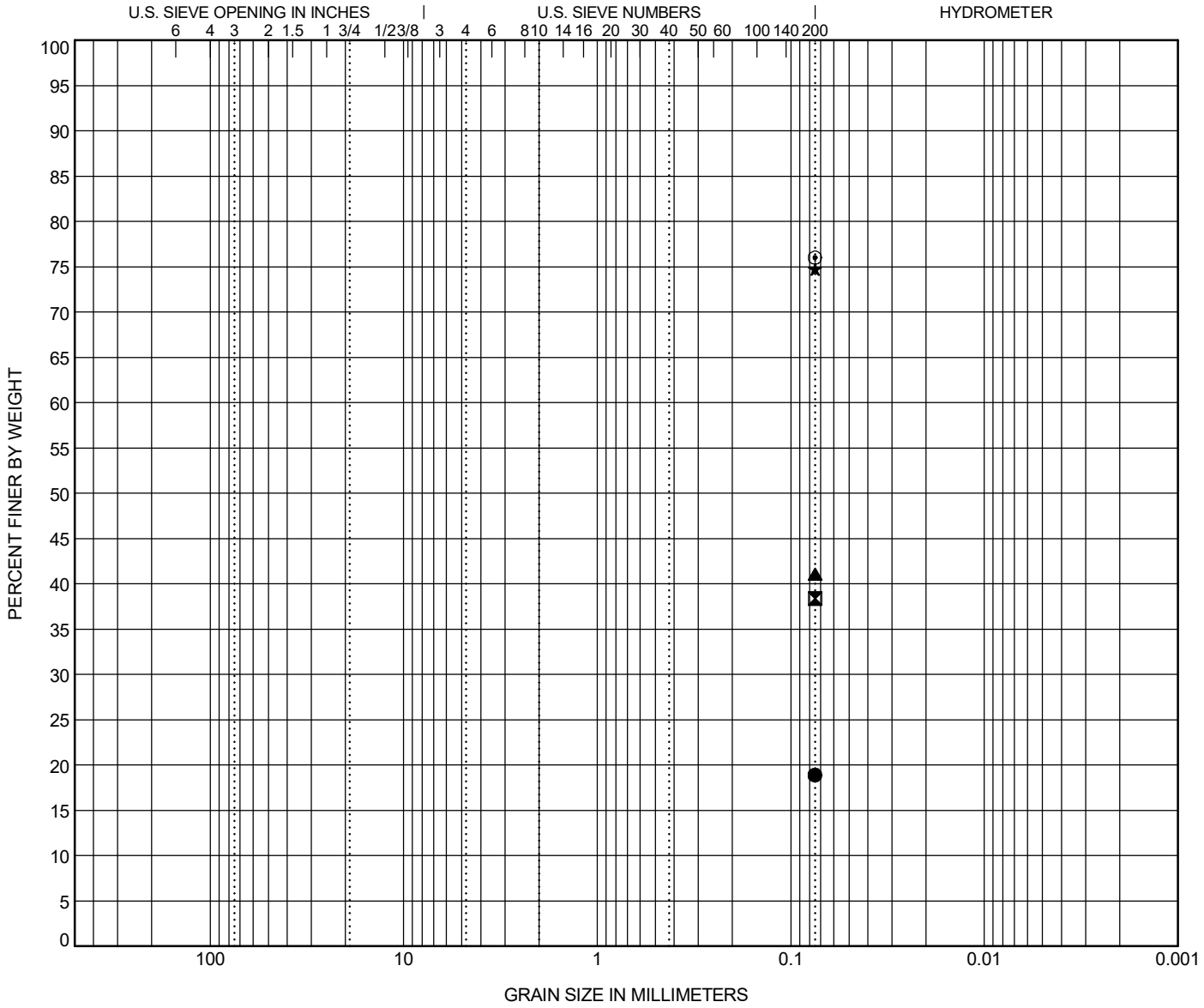
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

This report shall not be reproduced, except in full, without the written approval of F&ME Consultants, Inc.
211 Business Park Boulevard, Columbia SC 29203

GRAIN SIZE DISTRIBUTION

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads Phase 3D

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**P3D-B14**	**4.0**	**SILTY SAND (SM/A-2-4)**	**NP**	**NP**	**NP**		
⊠	**P3D-B14**	**8.0**	**CLAYEY SAND (SC/A-6)**					
▲	**P3D-B14**	**10.0**	**CLAYEY SAND (SC/A-6)**	**36**	**13**	**23**		
★	**P3D-B14**	**15.0**	**SILT with SAND (ML/A-7-6)**	**41**	**29**	**12**		
⊙	**P3D-B14**	**20.0**	**SILT with SAND (ML/A-4)**	**44**	**27**	**17**		

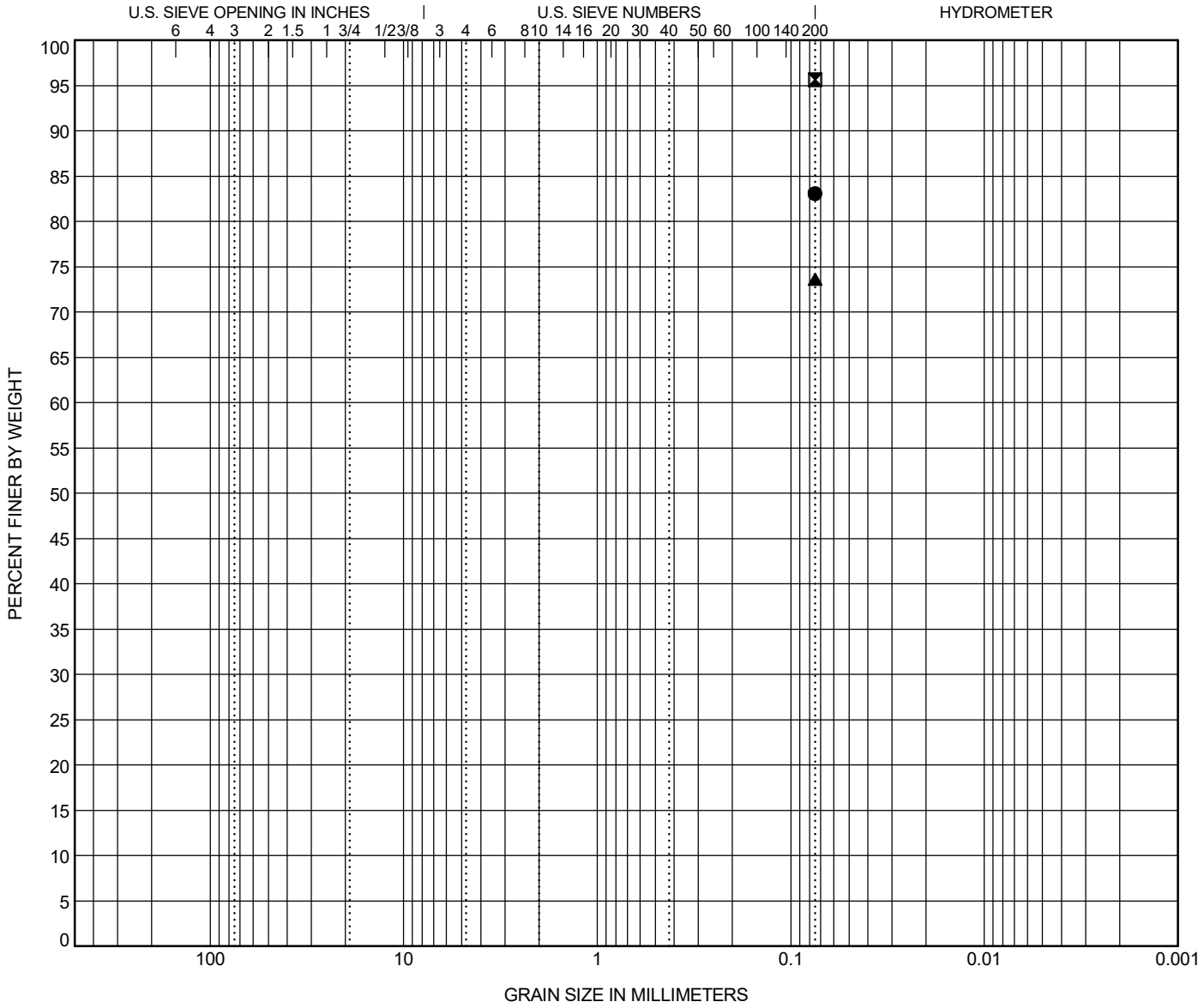
	BOREHOLE	DEPTH	D90	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**P3D-B14**	**4.0**							**18.9**	
⊠	**P3D-B14**	**8.0**							**38.4**	
▲	**P3D-B14**	**10.0**							**41.1**	
★	**P3D-B14**	**15.0**							**74.8**	
⊙	**P3D-B14**	**20.0**							**76.0**	

GRAIN SIZE G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/15/25

GRAIN SIZE DISTRIBUTION

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads Phase 3D

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**P3D-B14**	**25.0**	**SANDY SILT (ML/A-4)**					
⊠	**P3D-B14**	**35.0**	**ELASTIC SILT (MH/A-7-5)**	**52**	**37**	**15**		
▲	**P3D-B14**	**45.0**	**SILT with SAND (ML/A-7-6)**					

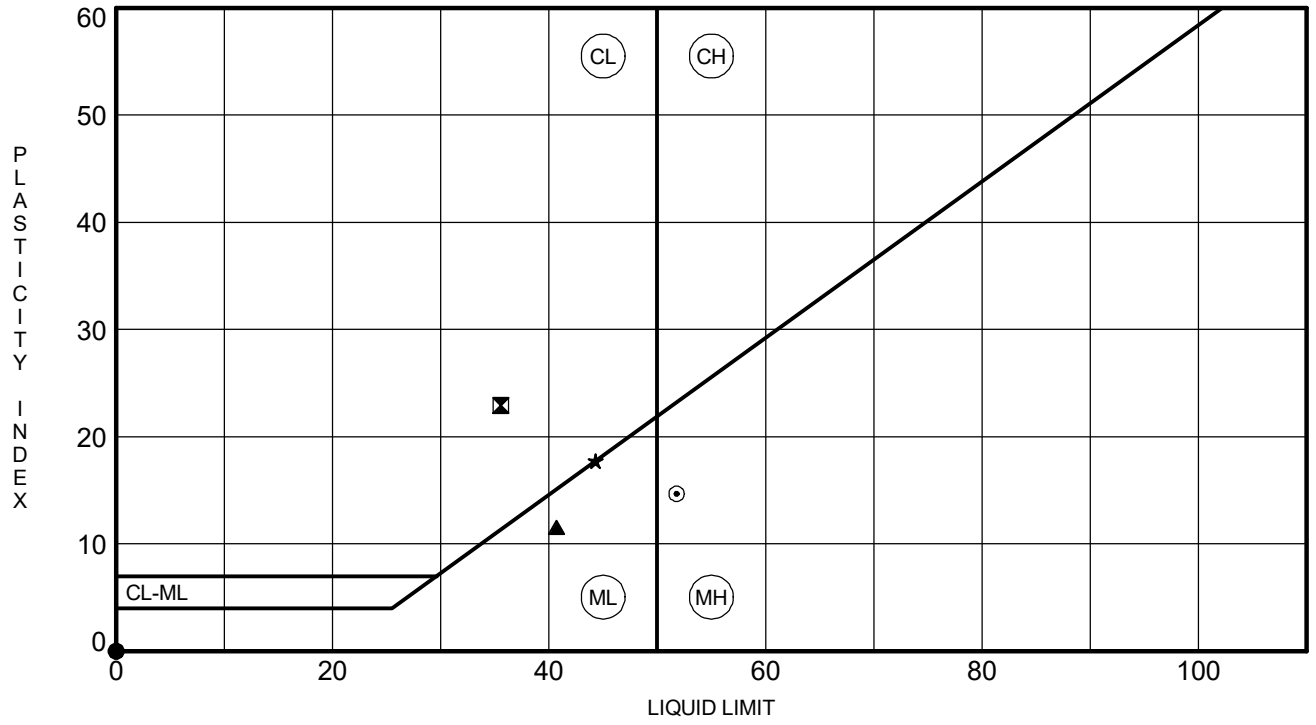
	BOREHOLE	DEPTH	D90	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**P3D-B14**	**25.0**							**83.1**	
⊠	**P3D-B14**	**35.0**							**95.7**	
▲	**P3D-B14**	**45.0**							**73.6**	

GRAIN SIZE G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/15/25

ATTERBERG LIMITS' RESULTS

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads Phase 3D

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**P3D-B14**	**4.0**	**NP**	**NP**	**NP**	**19**	**SILTY SAND (SM/A-2-4)**
⊠	**P3D-B14**	**10.0**	**36**	**13**	**23**	**41**	**CLAYEY SAND (SC/A-6)**
▲	**P3D-B14**	**15.0**	**41**	**29**	**12**	**75**	**SILT with SAND (ML/A-7-6)**
★	**P3D-B14**	**20.0**	**44**	**27**	**17**	**76**	**SILT with SAND (ML/A-7-6)**
⊙	**P3D-B14**	**35.0**	**52**	**37**	**15**	**96**	**ELASTIC SILT (MH/A-7-5)**

ATTERBERG (OUTSOURCE) G5662.03- CAROLINA CROSSROADS PH 3D.GPJ FME2017.GDT 10/15/25

Laboratory test performed at a non-F&ME AASHTO accreditted laboratory

pH DETERMINATION
(AASHTO T289)

Project Name:	CCR Ph. 3D	Project Number:	G5662.03-00019
Description of Sample:	Soil Sample (Composite)	Date Received	9/19/2025
Tested By:	AHR	Date Tested:	9/29/2025

Boring ID	P3D-B14
Boring Depth	4.0 - 6.0
FME Lab ID No.	25-3202
pH Value	4.42
Temperature (˚C)	21.7

Date Reviewed: 10/7/2025 Reviewed By: J. Heirs

This report shall not be reproduced, except in full,
without the written approval of F&ME Consultants, Inc.
211 Business Park Blvd., Columbia, SC 29203

SOIL RESISTIVITY
(AASHTO T288)

Project Name:	CCR Ph. 3D	Project ID:	G5662.03-00019
Location:	--	FME Lab ID No.:	25-2202
Sampled By:	G. Cantelle	Date Sampled:	7/9/2025
Soil Description:	Composite	Date Received:	7/9/2025
Tested By:	JM	Date Tested:	9/30/2025

Boring No.	Sample Depth (ft.)	Minimum Soil Resistivity, Ω-cm
P3D-B14	4.0 - 6.0	6,700

Date Reviewed: 10/7/2025 Reviewed By: J. Hiers

This report shall not be reproduced, except in full,
without the written approval of F&ME Consultants, Inc.
211 Business Park Blvd., Columbia, SC 29203

Water-Soluble Sulfate Ion Content in Soil

AASHTO T 290-95 (2020)

Client:	F&ME Consultants, Inc.	Boring No.:	P3D-B-14
Client Reference:	CCR - Ph. 3D G5662.03	Depth (ft):	4.0-6.0'
Project No.:	2025-595-002	Sample No.:	SS-3
Lab ID:	2025-595-002-001	Soil Description:	Orange 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	8	19	45	59	122	157	232

Measurement of Barium Chloride Turbidity

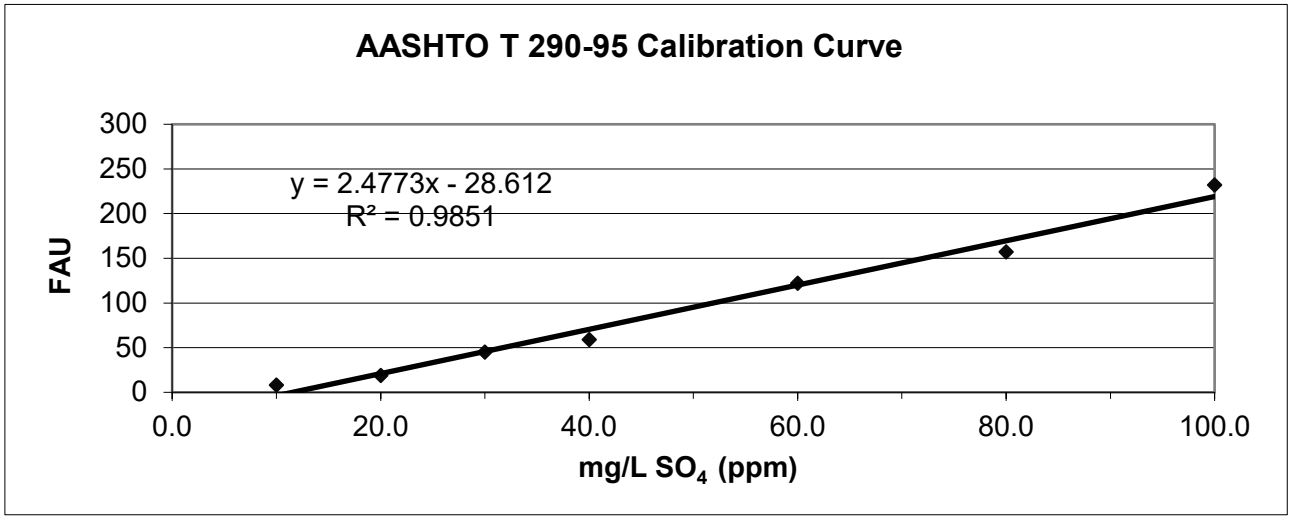
(Sample contains 5.0 mL NaCl solution and 0.3 g $BaCl_2 \cdot 2H_2O$)

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):	10

Sample Moisture Content

Tare Number:	1601
Weight of Tare & Wet Sample (g):	500.42
Weight of Tare & Dry Sample (g):	497.86
Weight of Tare (g):	307.05
Weight of Water (g):	2.56
Weight of Dry Sample (g):	190.81
Moisture Content (%):	1.34

Sample Sulfate Ion Concentration:	13.38	**mg/L SO_4 (ppm)**
Sample Sulfate Ion Content:	40.1	**mg/Kg SO_4 (not corrected for moisture)**
Sample Sulfate Ion Content:	40.7	**mg/Kg SO_4 (corrected for moisture)**



Tested by: JAM Date: 10/1/25 Checked by: EG Date: 10/2/2025

544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

CHLORIDE ION CONTENT IN SOILS

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

Client:	F&ME Consultants, Inc.	Boring No.:	P3D-B-14
Client Reference:	CCR - Ph. 3D G5662.03	Depth (ft):	4.0-6.0'
Project No.:	2025-595-002	Sample No.:	SS-3
Lab ID:	2025-595-002-001	Description:	Orange Brown

(- # 10 Sieve material)

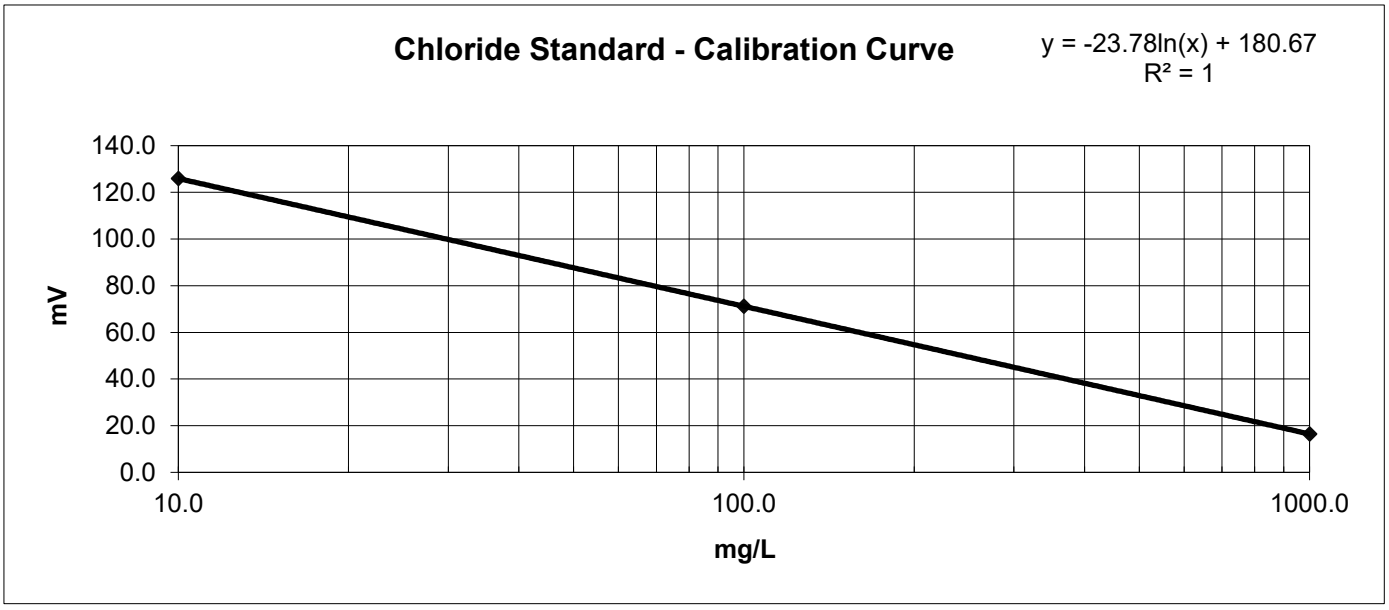
CHLORIDE STANDARD: CALIBRATION CURVE

STANDARD		MILLIVOLTS (mV)
10.0	mg/L	125.9
100.0	mg/L	71.2
1000.0	mg/L	16.4

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):	121.6	11.99	11.99

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°C.



Notes:

Tested By	JAM	Date	10/1/25	Checked By	EG	Date	10/2/25

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

544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	CCR Ph. 3D	**PROJECT NO.:**	G5662.030
SAMPLE NUMBER:	25-3201	**DATE REQUESTED:**	9/22/2025
DESCRIPTION OF SOIL:	Various		
TESTED BY:	MBP/AKG	**DATE OF TESTING:**	9/22/2025
WEIGHED BY:	HM	**DATE OF WEIGHING:**	9/23/2025

BORING NO.	P3D-B15	P3D-B15	P3D-B15	P3D-B15	P3D-B15
SAMPLE NO.	SS-2	SS-4	SS-5	SS-6	SS-7
SAMPLE DEPTH	2.0 - 4.0	6.0 - 8.0	8.0 - 10.0	13.5 - 15.0	18.5 - 20.0
WATER CONTENT, W%	10.5	17.7	21.5	25.9	25.9

BORING NO.	P3D-B15	P3D-B15	P3D-B15	P3D-B15	
SAMPLE NO.	SS-8	SS-9	SS-10	SS-14	
SAMPLE DEPTH	23.5 - 25.0	28.5 - 30.0	33.5 - 35.0	53.5 - 55.0	
WATER CONTENT, W%	23.5	37.6	21.7	25.4	

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

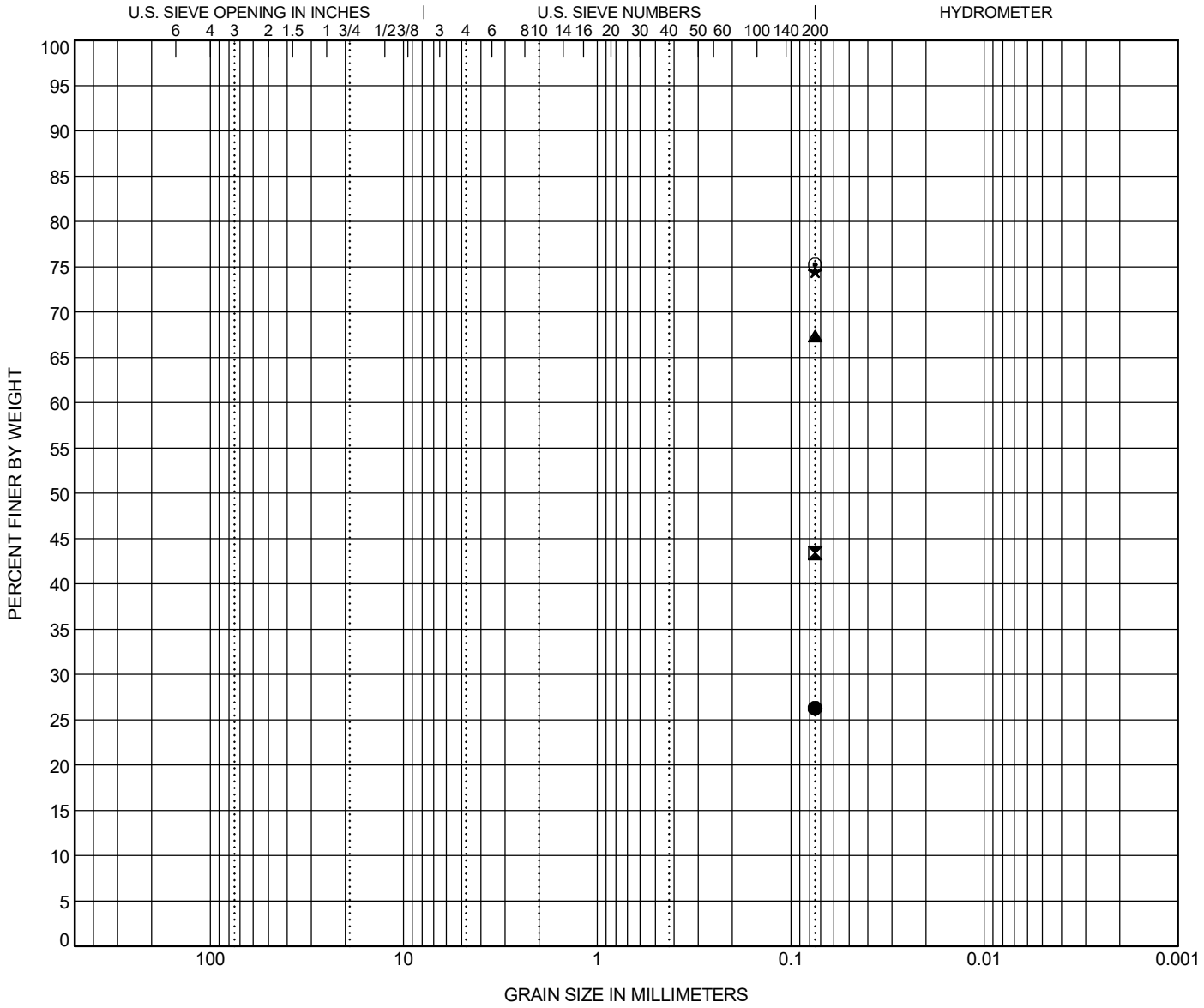
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

This report shall not be reproduced, except in full, without the written approval of F&ME Consultants, Inc.
211 Business Park Boulevard, Columbia SC 29203

GRAIN SIZE DISTRIBUTION

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads Phase 3D

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**P3D-B15**	**4.0**	**CLAYEY SAND (SC/A-2-6)**	**28**	**13**	**15**		
⊠	**P3D-B15**	**8.0**	**CLAYEY SAND (SC/A-7-6)**	**44**	**17**	**27**		
▲	**P3D-B15**	**10.0**	**SANDY LEAN CLAY (CL/A-6)**					
★	**P3D-B15**	**15.0**	**ELASTIC SILT with SAND (MH/A-7-5)**	**59**	**32**	**27**		
⊙	**P3D-B15**	**20.0**	**ELASTIC SILT with SAND (MH/A-7-5)**					

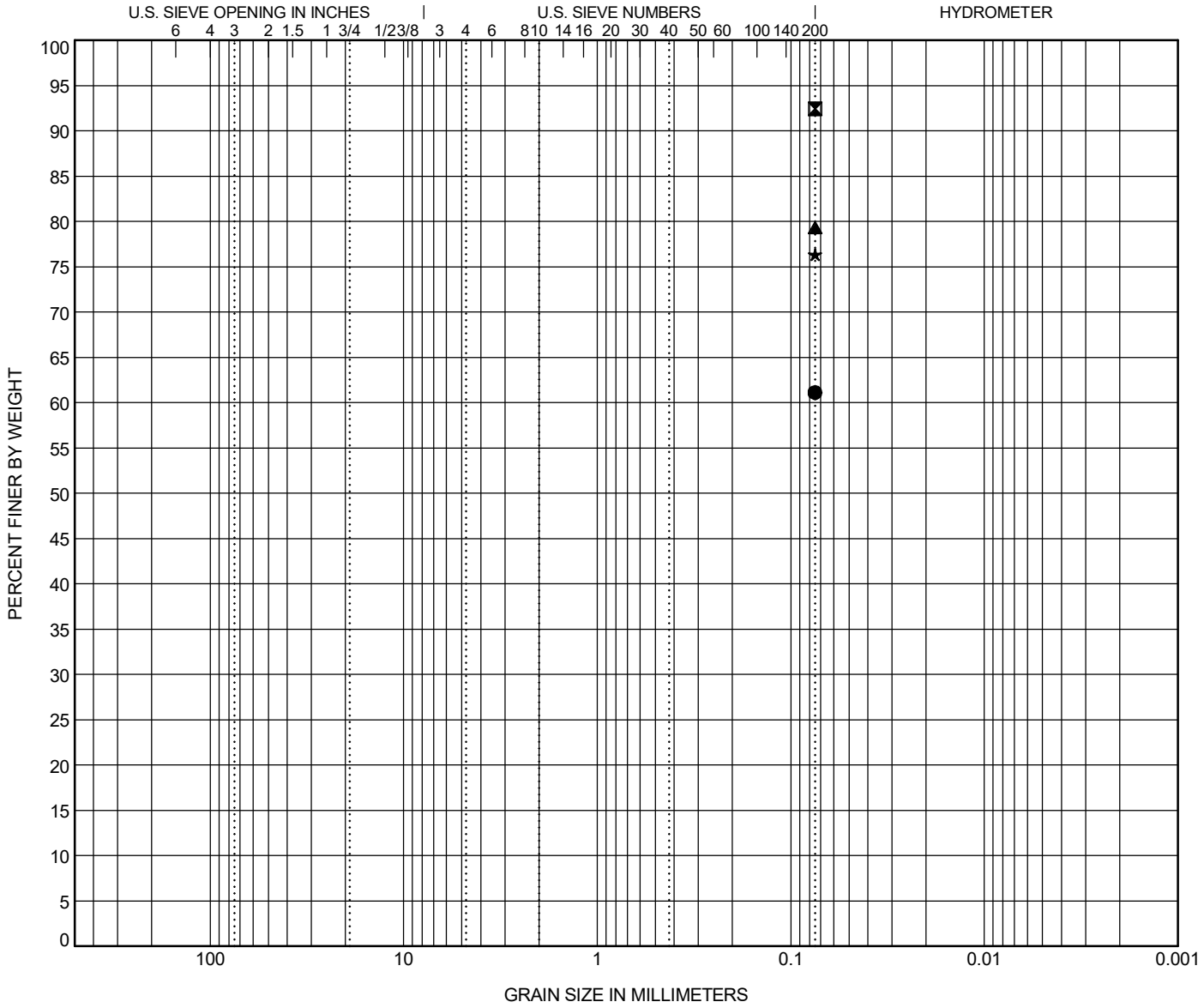
	BOREHOLE	DEPTH	D90	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**P3D-B15**	**4.0**							**26.3**	
⊠	**P3D-B15**	**8.0**							**43.4**	
▲	**P3D-B15**	**10.0**							**67.4**	
★	**P3D-B15**	**15.0**							**74.5**	
⊙	**P3D-B15**	**20.0**							**75.3**	

GRAIN SIZE G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/15/25

GRAIN SIZE DISTRIBUTION

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads Phase 3D

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**P3D-B15**	**25.0**	**SANDY ELASTIC SILT (MH/A-7-5)**					
⊠	**P3D-B15**	**30.0**	**SILT (ML/A-6)**	**40**	**27**	**13**		
▲	**P3D-B15**	**35.0**	**SILT with SAND (ML/A-6)**	**36**	**25**	**11**		
★	**P3D-B15**	**55.0**	**SILT with SAND (ML/A-6)**					

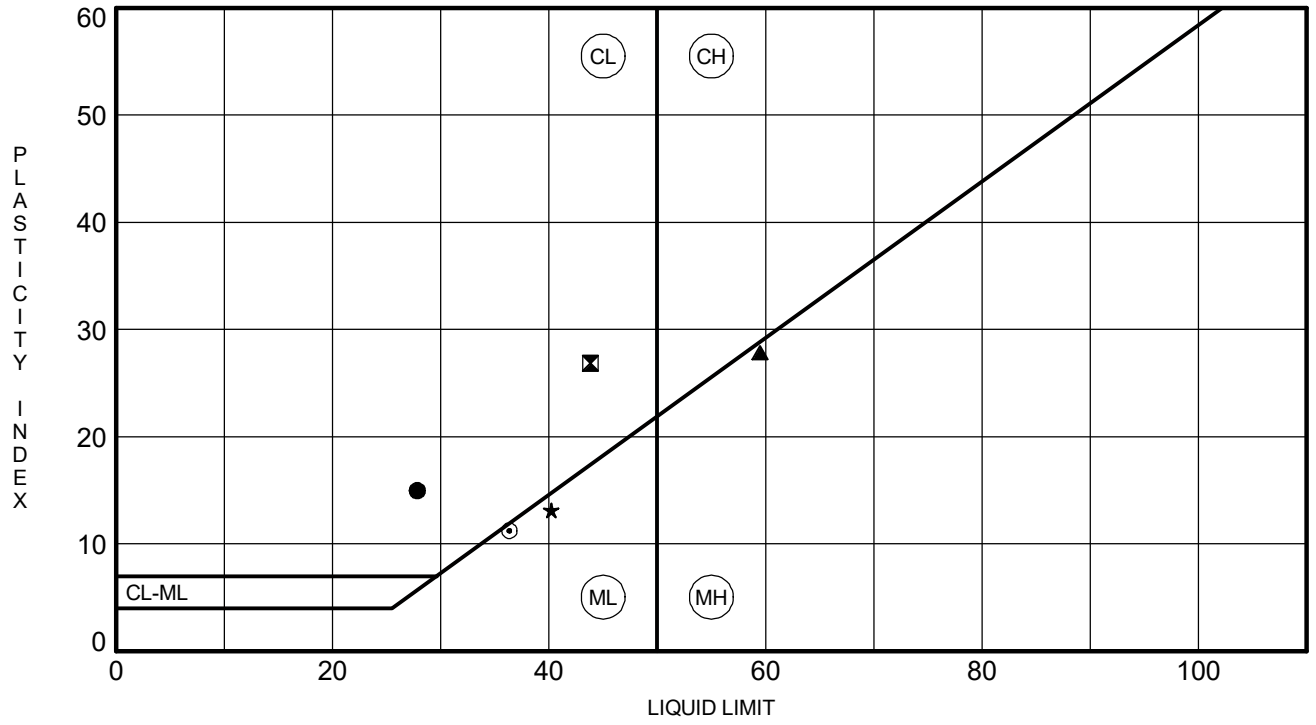
	BOREHOLE	DEPTH	D90	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**P3D-B15**	**25.0**							**61.1**	
⊠	**P3D-B15**	**30.0**							**92.5**	
▲	**P3D-B15**	**35.0**							**79.3**	
★	**P3D-B15**	**55.0**							**76.4**	

GRAIN SIZE G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/15/25

ATTERBERG LIMITS' RESULTS

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads Phase 3D

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**P3D-B15**	**4.0**	**28**	**13**	**15**	**26**	**CLAYEY SAND (SC/A-2-6)**
⊠	**P3D-B15**	**8.0**	**44**	**17**	**27**	**43**	**CLAYEY SAND (SC/A-7-6)**
▲	**P3D-B15**	**15.0**	**59**	**32**	**27**	**74**	**ELASTIC SILT with SAND (MH/A-7-5)**
★	**P3D-B15**	**30.0**	**40**	**27**	**13**	**92**	**SILT (ML/A-6)**
⊙	**P3D-B15**	**35.0**	**36**	**25**	**11**	**79**	**SILT with SAND (ML/A-6)**

ATTERBERG (OUTSOURCE) G5662.03- CAROLINA CROSSROADS PH 3D.GPJ FME2017.GDT 10/15/25

Laboratory test performed at a non-F&ME AASHTO accreditted laboratory

pH DETERMINATION
(AASHTO T289)

Project Name:	CCR Ph. 3D	Project Number:	G5662.03-00019
Description of Sample:	Soil Sample (Composite)	Date Received	9/19/2025
Tested By:	AHR	Date Tested:	9/29/2025

Boring ID	P3D-B15
Boring Depth	8.0 - 25.0
FME Lab ID No.	25-3201
pH Value	4.68
Temperature (˚C)	21.7

Date Reviewed: 10/7/2025 Reviewed By: J. Heirs

This report shall not be reproduced, except in full,
without the written approval of F&ME Consultants, Inc.
211 Business Park Blvd., Columbia, SC 29203

SOIL RESISTIVITY
(AASHTO T288)

Project Name:	CCR Ph. 3D	Project ID:	G5662.03-00019
Location:	--	FME Lab ID No.:	25-3201
Sampled By:	G. Cantelle	Date Sampled:	7/9/2025
Soil Description:	Composite	Date Received:	7/9/2025
Tested By:	JM	Date Tested:	10/8/2025

Boring No.	Sample Depth (ft.)	Minimum Soil Resistivity, Ω-cm
P3D-B15	8.0 - 25.0	12,462

Date Reviewed: 10/15/2025 Reviewed By: J. Hiers

This report shall not be reproduced, except in full,
without the written approval of F&ME Consultants, Inc.
211 Business Park Blvd., Columbia, SC 29203

Water-Soluble Sulfate Ion Content in Soil

AASHTO T 290-95 (2020)

Client:	F&ME Consultants, Inc.	Boring No.:	P3D-B15
Client Reference:	CCR - Ph. 3D G5662.03	Depth (ft):	8.0-25.0'
Project No.:	2025-595-002	Sample No.:	SS-5/SS-6/SS-7
Lab ID:	2025-595-002-002	Soil Description:	Orange 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	8	19	45	59	122	157	232

Measurement of Barium Chloride Turbidity

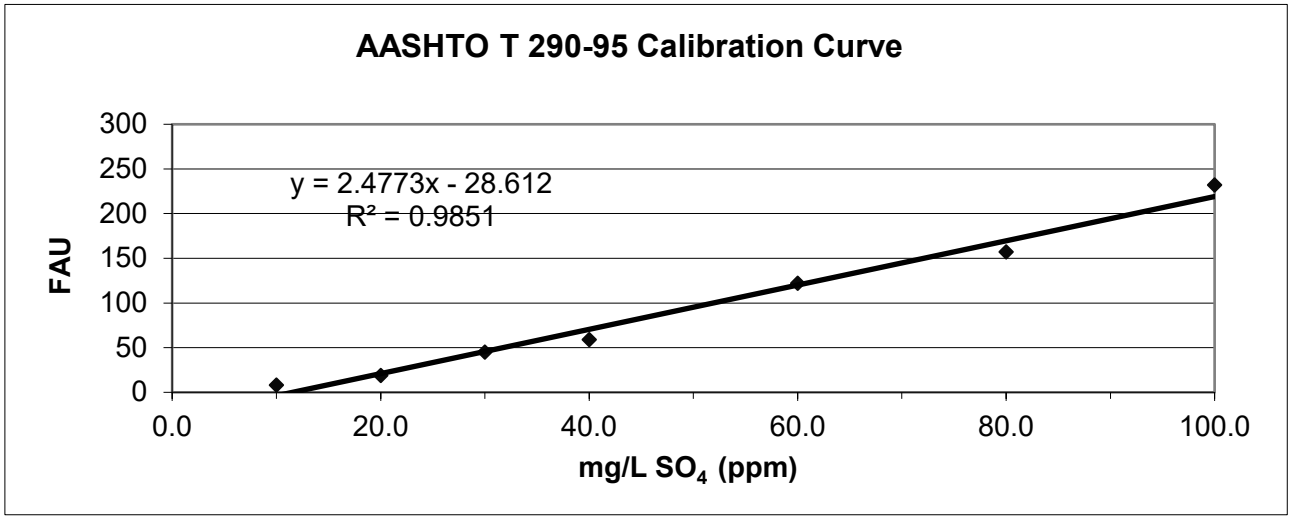
(Sample contains 5.0 mL NaCl solution and 0.3 g $BaCl_2 \cdot 2H_2O$)

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):	10

Sample Moisture Content

Tare Number:	P50
Weight of Tare & Wet Sample (g):	368.54
Weight of Tare & Dry Sample (g):	366.86
Weight of Tare (g):	195.26
Weight of Water (g):	1.68
Weight of Dry Sample (g):	171.60
Moisture Content (%):	0.98

Sample Sulfate Ion Concentration:	14.18	**mg/L SO_4 (ppm)**
Sample Sulfate Ion Content:	42.5	**mg/Kg SO_4 (not corrected for moisture)**
Sample Sulfate Ion Content:	43.0	**mg/Kg SO_4 (corrected for moisture)**



Tested by: JAM Date: 10/1/25 Checked by: EG Date: 10/2/2025

544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

CHLORIDE ION CONTENT IN SOILS

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

Client:	F&ME Consultants, Inc.	Boring No.:	P3D-B15
Client Reference:	CCR - Ph. 3D G5662.03	Depth (ft):	8.0-25.0'
Project No.:	2025-595-002	Sample No.:	SS-5/SS-6/SS-7
Lab ID:	2025-595-002-002	Description:	Orange Brown

(- # 10 Sieve material)

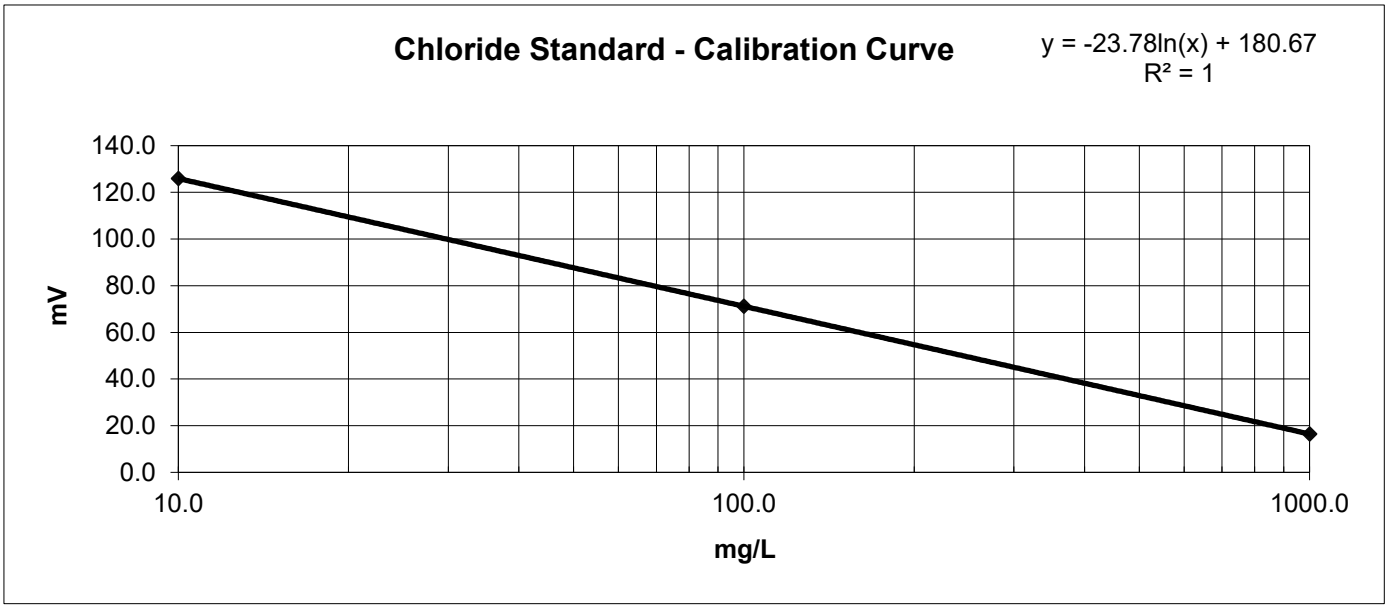
CHLORIDE STANDARD: CALIBRATION CURVE

STANDARD		MILLIVOLTS (mV)
10.0	mg/L	125.9
100.0	mg/L	71.2
1000.0	mg/L	16.4

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):	102.9	26.33	26.33

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°C.



Notes:

Tested By	JAM	Date	10/1/25	Checked By	EG	Date	10/2/25

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

544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	CCR Ph. 3D	**PROJECT NO.:**	G5662.030
SAMPLE NUMBER:	25-3687	**DATE REQUESTED:**	10/15/2025
DESCRIPTION OF SOIL:	VARIOUS		
TESTED BY:	JM/AKG	**DATE OF TESTING:**	10/15/2025
WEIGHED BY:	AC	**DATE OF WEIGHING:**	10/16/2025

BORING NO.	P3D-B16	P3D-B16	P3D-B16	P3D-B16	P3D-B16
SAMPLE NO.	SS-2	SS-3	SS-5	SS-8	SS-9
SAMPLE DEPTH	2.0 - 4.0	4.0 - 6.0	8.0 - 10.0	23.5 - 25.0	28.5 - 30.0
WATER CONTENT, W%	35.0	39.6	34.4	44.0	35.3

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

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

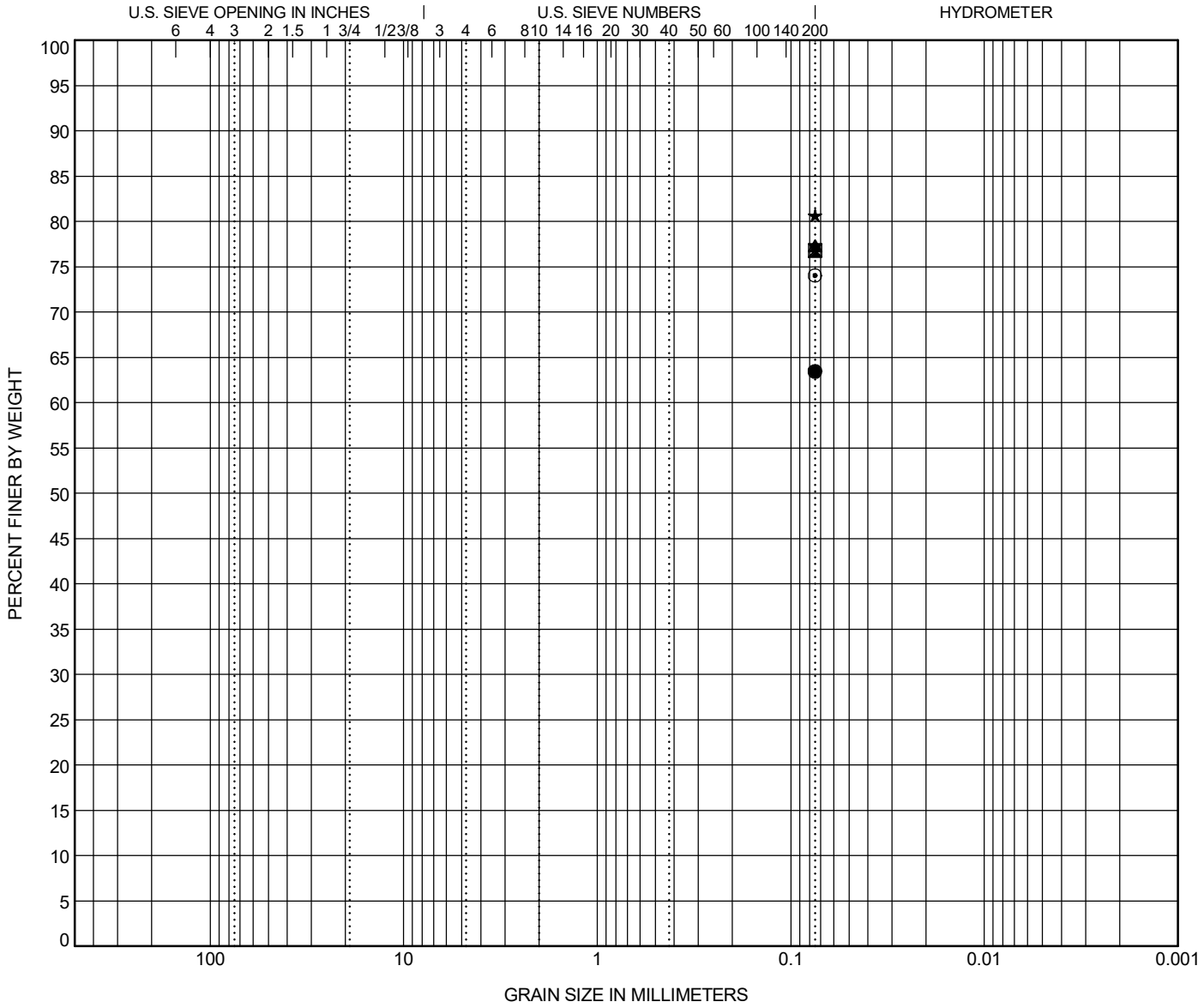
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

This report shall not be reproduced, except in full, without the written approval of F&ME Consultants, Inc.
211 Business Park Boulevard, Columbia SC 29203

GRAIN SIZE DISTRIBUTION

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads Phase 3D

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**P3D-B16**	**4.0**	**SANDY ELASTIC SILT (MH/A-7-5)**	**54**	**38**	**16**		
⊠	**P3D-B16**	**6.0**	**SILT with SAND (ML/A-5)**					
▲	**P3D-B16**	**10.0**	**SILT with SAND (ML/A-5)**	**44**	**34**	**10**		
★	**P3D-B16**	**25.0**	**ELASTIC SILT with SAND (MH/A-7-5)**	**51**	**34**	**17**		
⊙	**P3D-B16**	**30.0**	**ELASTIC SILT with SAND (MH/A-7-5)**					

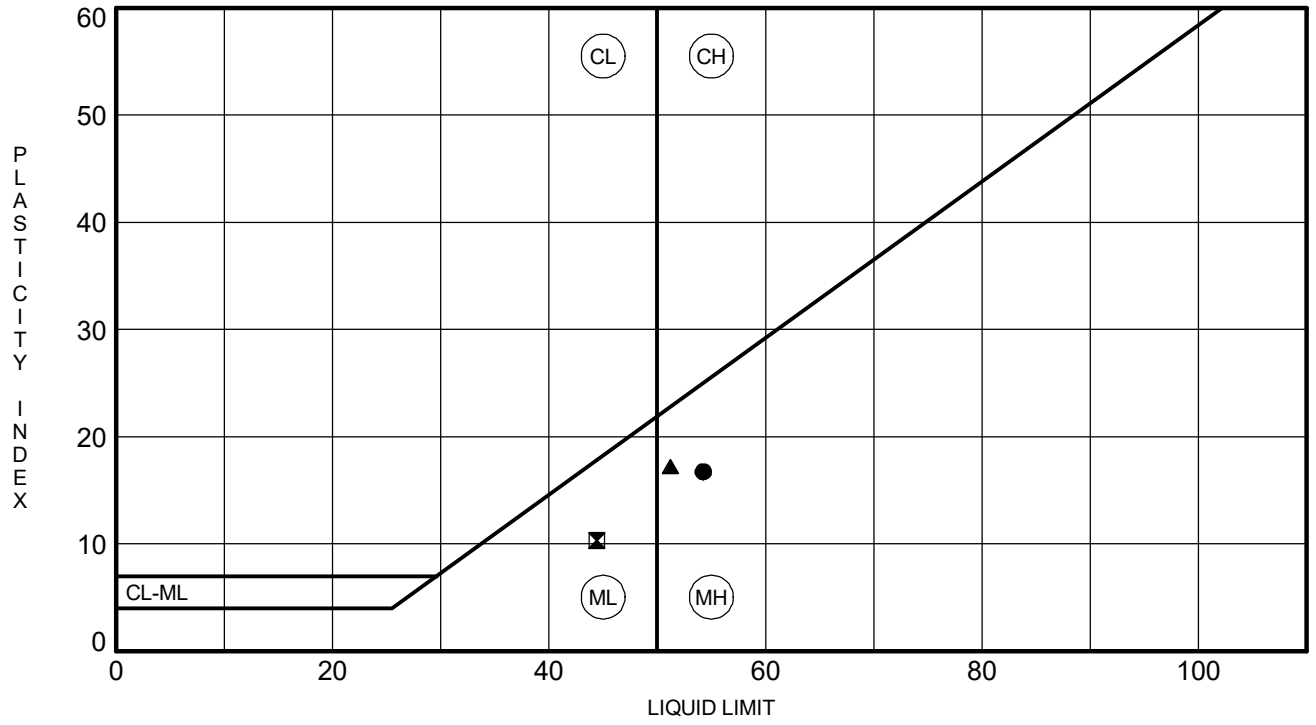
	BOREHOLE	DEPTH	D90	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**P3D-B16**	**4.0**							**63.5**	
⊠	**P3D-B16**	**6.0**							**76.8**	
▲	**P3D-B16**	**10.0**							**77.3**	
★	**P3D-B16**	**25.0**							**80.7**	
⊙	**P3D-B16**	**30.0**							**74.1**	

GRAIN SIZE G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/22/25

ATTERBERG LIMITS' RESULTS

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads Phase 3D

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**P3D-B16**	**4.0**	**54**	**38**	**16**	**63.5**	**SANDY ELASTIC SILT (MH/A-7-5)**
⊠	**P3D-B16**	**10.0**	**44**	**34**	**10**	**77.3**	**SILT with SAND (ML/A-5)**
▲	**P3D-B16**	**25.0**	**51**	**34**	**17**	**80.7**	**ELASTIC SILT with SAND (MH/A-7-5)**

REV 12/2023

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	CCR Ph. 3D	**PROJECT NO.:**	G5662.030
SAMPLE NUMBER:	25-3376	**DATE REQUESTED:**	9/15/2025
DESCRIPTION OF SOIL:	Various		
TESTED BY:	JM/AG	**DATE OF TESTING:**	10/6/2025
WEIGHED BY:	JM	**DATE OF WEIGHING:**	10/7/2025

BORING NO.	P3D-B17	P3D-B17	P3D-B17	P3D-B17	P3D-B17
SAMPLE NO.	SS-1	SS-2	SS-4	SS-5	SS-6
SAMPLE DEPTH	0.0 - 2.0	2.0 - 4.0	6.0 - 8.0	8.0 - 10.0	13.5 - 15.0
WATER CONTENT, W%	12.8	34.0	48.1	44.7	36.2

BORING NO.	P3D-B17				
SAMPLE NO.	SS-7				
SAMPLE DEPTH	18.5 - 20.0				
WATER CONTENT, W%	30.0				

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

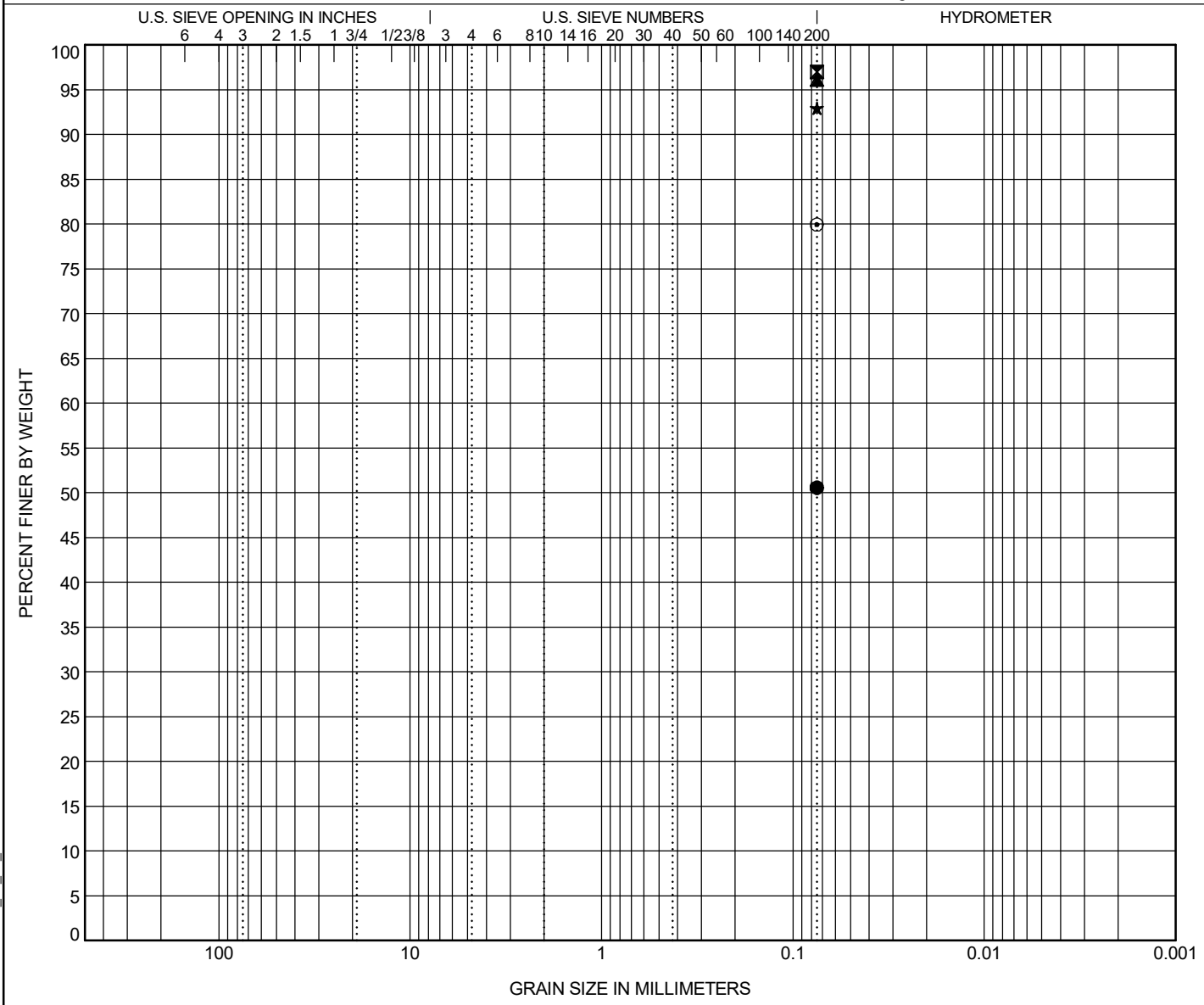
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

This report shall not be reproduced, except in full, without the written approval of F&ME Consultants, Inc.
211 Business Park Boulevard, Columbia SC 29203

GRAIN SIZE DISTRIBUTION

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads Phase 3D

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**P3D-B17**	**2.0**	**SANDY LEAN CLAY (CL/A-6)**	**33**	**13**	**20**		
⊠	**P3D-B17**	**4.0**	**ELASTIC SILT (MH/A-7-5)**	**53**	**30**	**23**		
▲	**P3D-B17**	**8.0**	**ELASTIC SILT (MH/A-7-5)**	**54**	**37**	**17**		
★	**P3D-B17**	**10.0**	**ELASTIC SILT (MH/A-7-5)**	**52**	**33**	**19**		
⊙	**P3D-B17**	**15.0**	**SILT with SAND (ML/A-7-5)**	**47**	**30**	**17**		

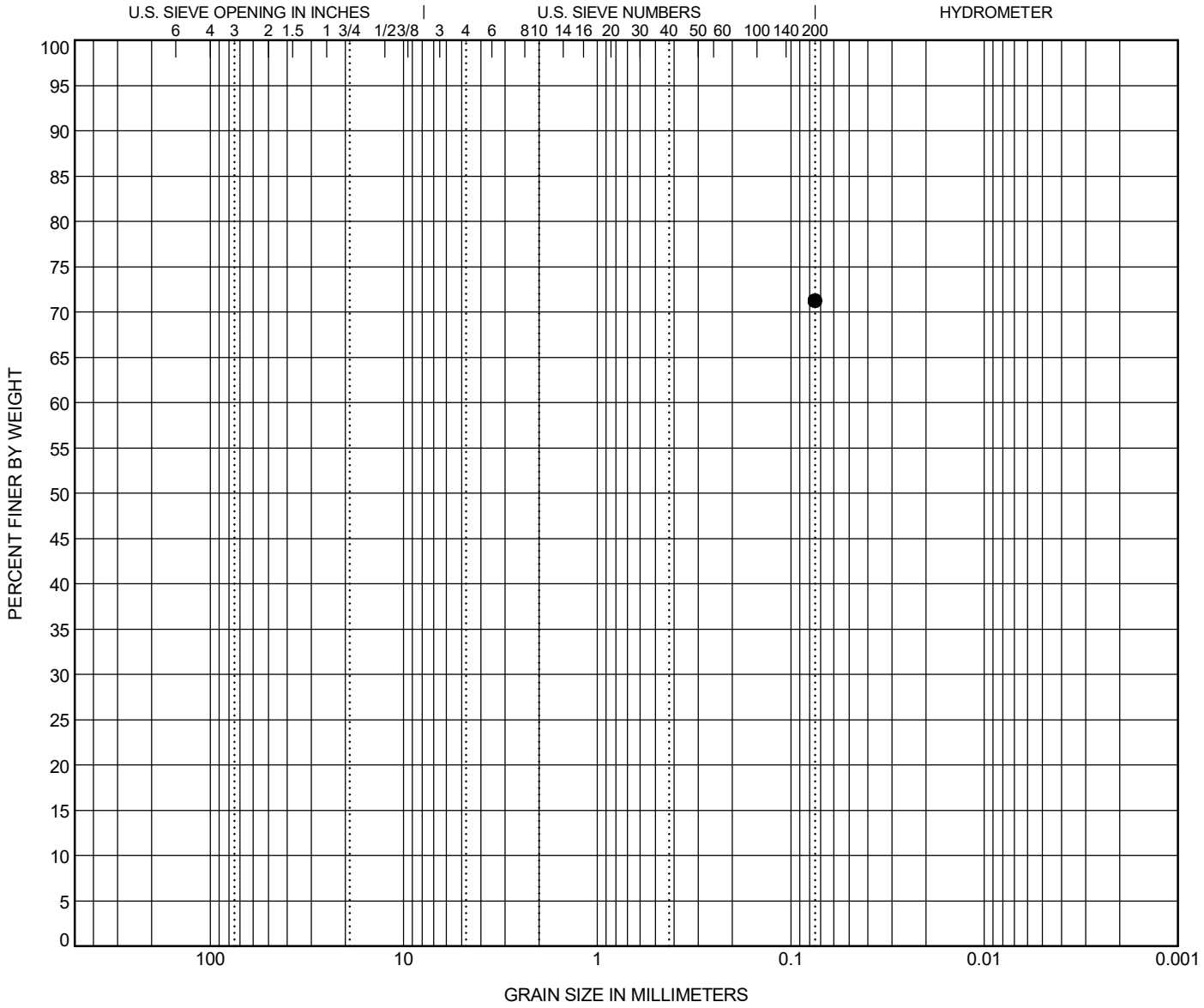
	BOREHOLE	DEPTH	D90	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**P3D-B17**	**2.0**							**50.6**	
⊠	**P3D-B17**	**4.0**							**97.0**	
▲	**P3D-B17**	**8.0**							**96.0**	
★	**P3D-B17**	**10.0**							**92.9**	
⊙	**P3D-B17**	**15.0**							**80.0**	

GRAIN SIZE G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/16/25

GRAIN SIZE DISTRIBUTION

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads Phase 3D

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
● **P3D-B17**	**20.0**	**SILT with SAND (ML/A-5)**	**44**	**37**	**7**		

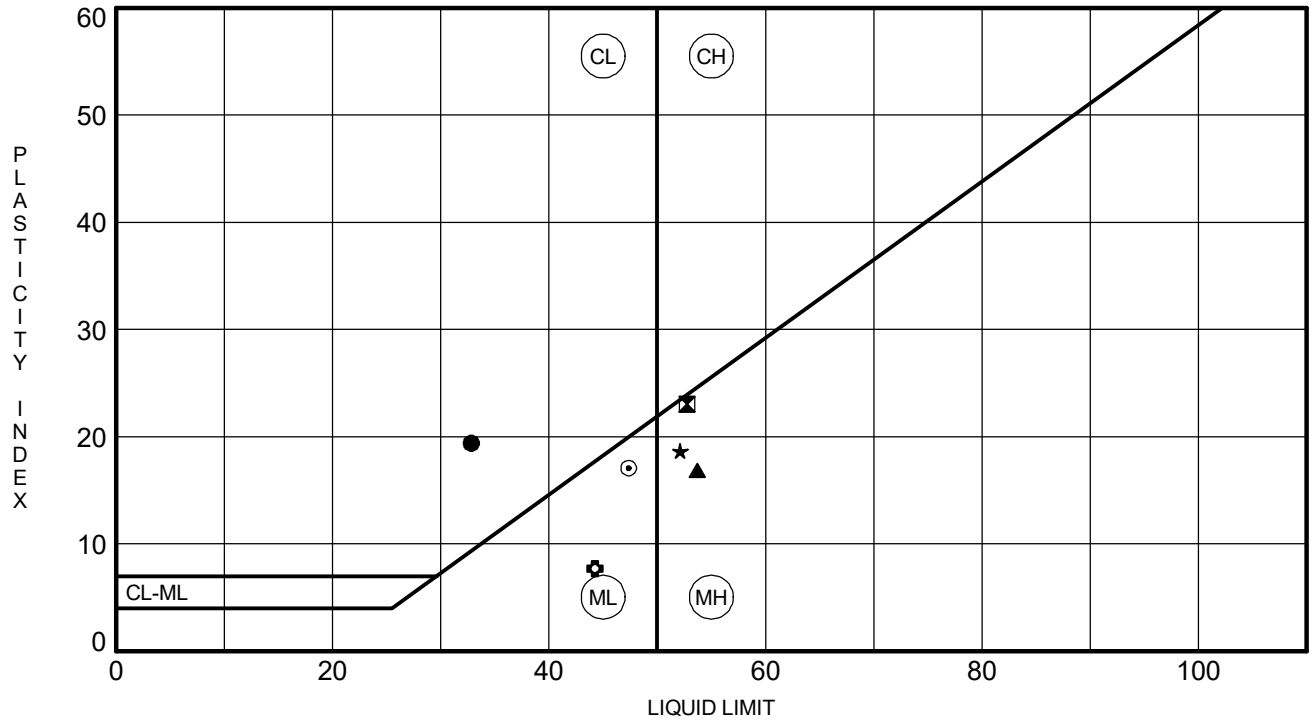
BOREHOLE	DEPTH	D90	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● **P3D-B17**	**20.0**							**71.3**	

GRAIN SIZE G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/16/25

ATTERBERG LIMITS' RESULTS

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads Phase 3D

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**P3D-B17**	**2.0**	**33**	**13**	**20**	**50.6**	**SANDY LEAN CLAY (CL/A-6)**
⊠	**P3D-B17**	**4.0**	**53**	**30**	**23**	**97.0**	**ELASTIC SILT (MH/A-7-5)**
▲	**P3D-B17**	**8.0**	**54**	**37**	**17**	**96.0**	**ELASTIC SILT (MH/A-7-5)**
★	**P3D-B17**	**10.0**	**52**	**33**	**19**	**92.9**	**ELASTIC SILT (MH/A-7-5)**
⊙	**P3D-B17**	**15.0**	**47**	**30**	**17**	**80.0**	**SILT with SAND (ML/A-7-5)**
✿	**P3D-B17**	**20.0**	**44**	**37**	**7**	**71.3**	**SILT with SAND (ML/A-5)**

ATTERBERG LIMITS G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/16/25

pH DETERMINATION
(AASHTO T289)

Project Name:	CCR Ph. 3D	Project Number:	G5662.03-00019
Description of Sample:	ELASTIC SILT (MH/A-7-5)	Date Received	9/12/2025
Tested By:	AHR	Date Tested:	10/8/2025

Boring ID	P3D-B17
Boring Depth	4.0 - 6.0
FME Lab ID No.	25-3376
pH Value	6.94
Temperature (˚C)	21.3

Date Reviewed: 10/20/2025 Reviewed By: J. Heirs

This report shall not be reproduced, except in full,
without the written approval of F&ME Consultants, Inc.
211 Business Park Blvd., Columbia, SC 29203

SOIL RESISTIVITY
(AASHTO T288)

Project Name:	CCR Ph. 3D	Project ID:	G5662.03-00019
Location:	--	FME Lab ID No.:	25-3576
Sampled By:	BV	Date Sampled:	9/12/2025
Soil Description:	ELASTIC SILT (MH/A-7-5)	Date Received:	9/12/2025
Tested By:	AHR	Date Tested:	10/10/2025

Boring No.	Sample Depth (ft.)	Minimum Soil Resistivity, Ω-cm
P3D-B17	4.0 - 6.0	1,688

Date Reviewed: 10/20/2025 Reviewed By: J. Hiers

This report shall not be reproduced, except in full,
without the written approval of F&ME Consultants, Inc.
211 Business Park Blvd., Columbia, SC 29203

Water-Soluble Sulfate Ion Content in Soil

AASHTO T 290-95 (2020)

Client:	F&ME Consultants, Inc.	Boring No.:	P3D-B17
Client Reference:	CCR - Ph. 3D G5662.04-00014	Depth (ft):	4.0-6.0'
Project No.:	2025-699-001	Sample No.:	P3D-B17
Lab ID:	2025-699-001-001	Soil Description:	Light 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	8	19	45	59	122	157	232

Measurement of Barium Chloride Turbidity

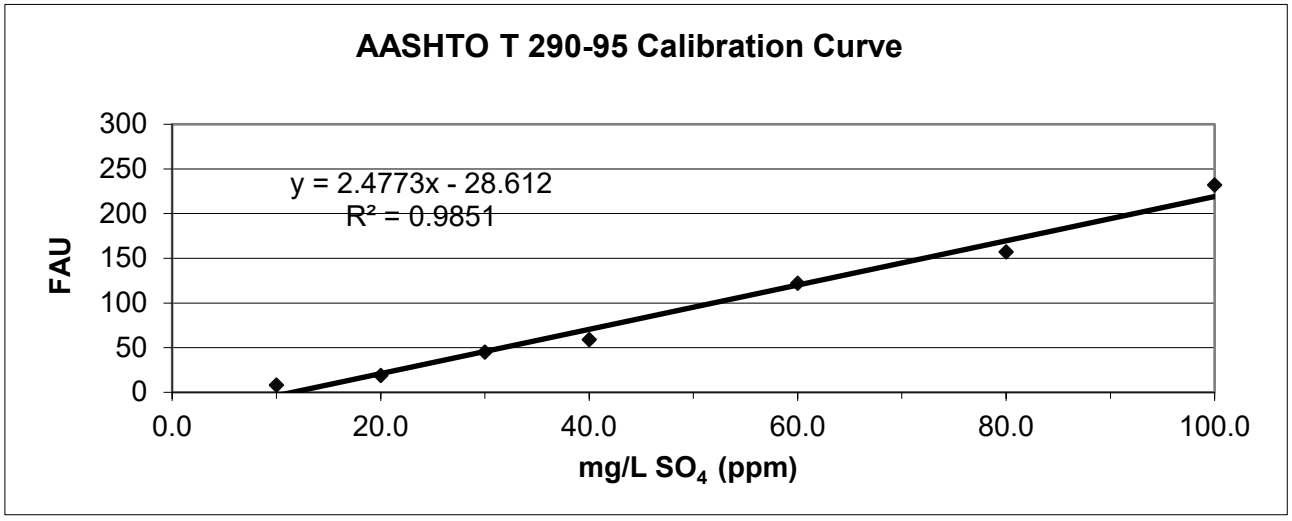
(Sample contains 5.0 mL NaCl solution and 0.3 g $BaCl_2 \cdot 2H_2O$)

Sample Weight (g):	100.0
Water added to Sample (mL):	300.0
Size of Sample Aliquot (mL):	50.0
Sample Reading (FAU):	19
Sample Diluted:	No
Sulfate Solution Added (ml):	0

Sample Moisture Content

Tare Number:	435
Weight of Tare & Wet Sample (g):	202.77
Weight of Tare & Dry Sample (g):	197.81
Weight of Tare (g):	91.49
Weight of Water (g):	4.96
Weight of Dry Sample (g):	106.32
Moisture Content (%):	4.67

Sample Sulfate Ion Concentration:	19.22	**mg/L SO_4 (ppm)**
Sample Sulfate Ion Content:	57.7	**mg/Kg SO_4 (not corrected for moisture)**
Sample Sulfate Ion Content:	60.5	**mg/Kg SO_4 (corrected for moisture)**



Tested by: JAM Date: 10/27/25 Checked by: EG Date: 10/28/2025

544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

CHLORIDE ION CONTENT IN SOILS

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

Client:	F&ME Consultants, Inc.	Boring No.:	P3D-B17
Client Reference:	CCR - Ph. 3D G5662.04-00014	Depth (ft):	4.0-6.0'
Project No.:	2025-699-001	Sample No.:	P3D-B17
Lab ID:	2025-699-001-001	Description:	Light Brown

(- # 10 Sieve material)

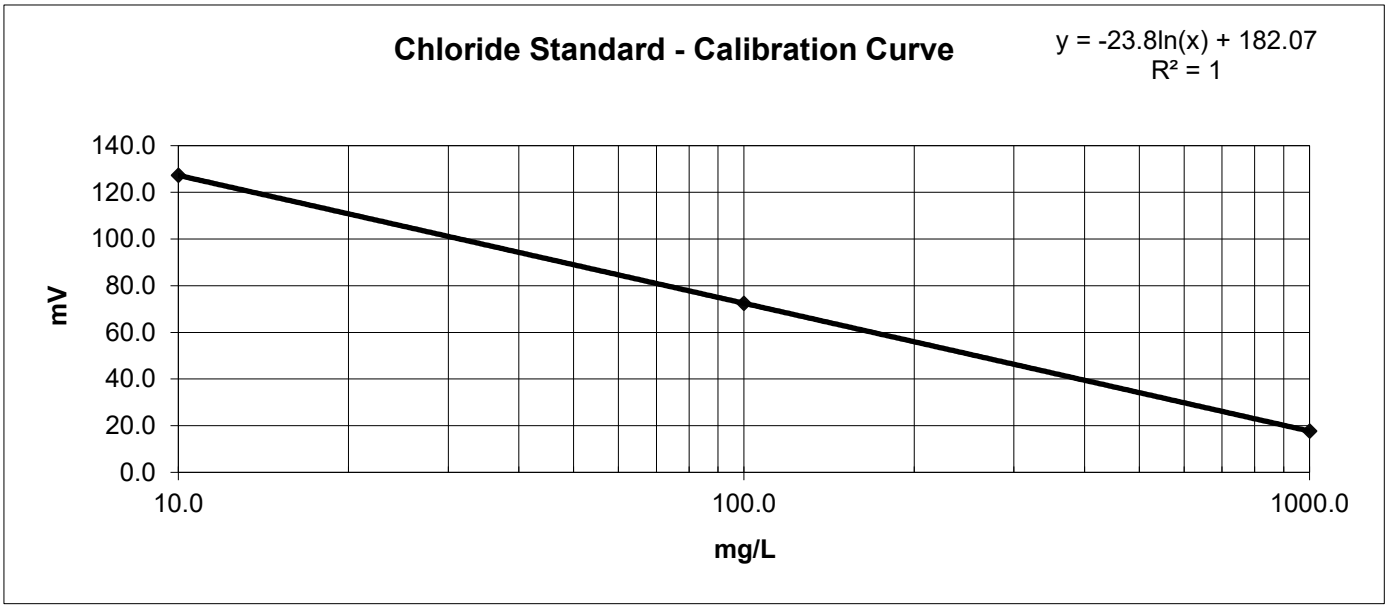
CHLORIDE STANDARD: CALIBRATION CURVE

STANDARD		MILLIVOLTS (mV)
10.0	mg/L	127.3
100.0	mg/L	72.4
1000.0	mg/L	17.7

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):	141.1	5.59	5.59

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°C.



Notes:

Tested By	JAM	Date	10/27/25	Checked By	EG	Date	10/28/25

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

544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	CCR Ph. 3D	**PROJECT NO.:**	G5662.030
SAMPLE NUMBER:	25-3016	**DATE REQUESTED:**	8/15/2025
DESCRIPTION OF SOIL:	Various		
TESTED BY:	AC & CJ	**DATE OF TESTING:**	9/2/2025
WEIGHED BY:	JM	**DATE OF WEIGHING:**	9/3/2025

BORING NO.	P3D-B18	P3D-B18	P3D-B18		
SAMPLE NO.	SS-3	SS-4	SS-6		
SAMPLE DEPTH	4.0 - 6.0	6.0 - 8.0	13.5 - 15.0		
WATER CONTENT, W%	32.4	40.9	22.8		

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

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

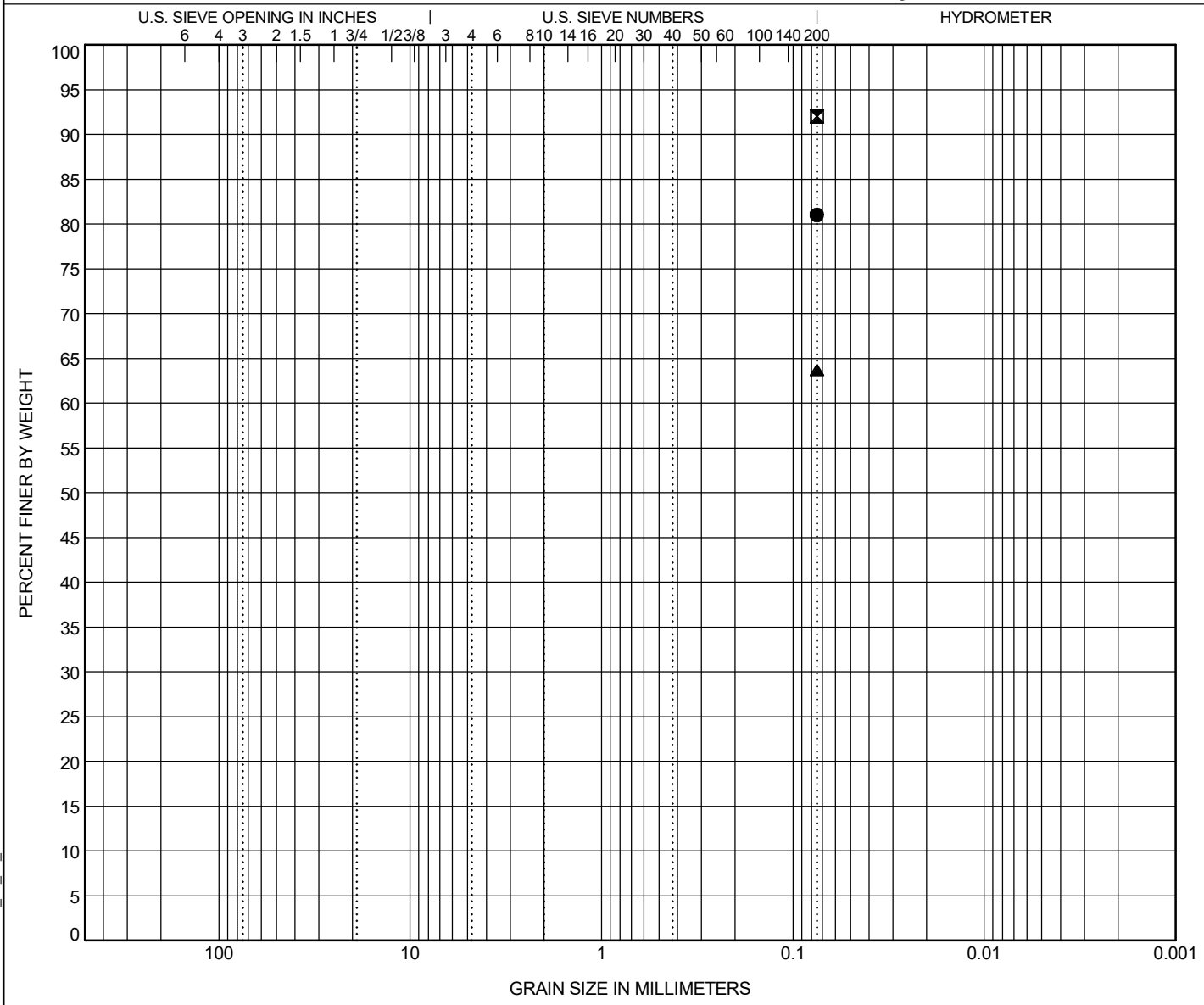
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

This report shall not be reproduced, except in full, without the written approval of F&ME Consultants, Inc.
211 Business Park Boulevard, Columbia SC 29203

GRAIN SIZE DISTRIBUTION

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**P3D-B18**	**6.0**	**SILT with Sand (ML/A-7-6)**					
⊠	**P3D-B18**	**8.0**	**SILT (ML/A-7-6)**	**43**	**28**	**15**		
▲	**P3D-B18**	**15.0**	**SANDY SILT (ML/A-4)**	**32**	**25**	**7**		

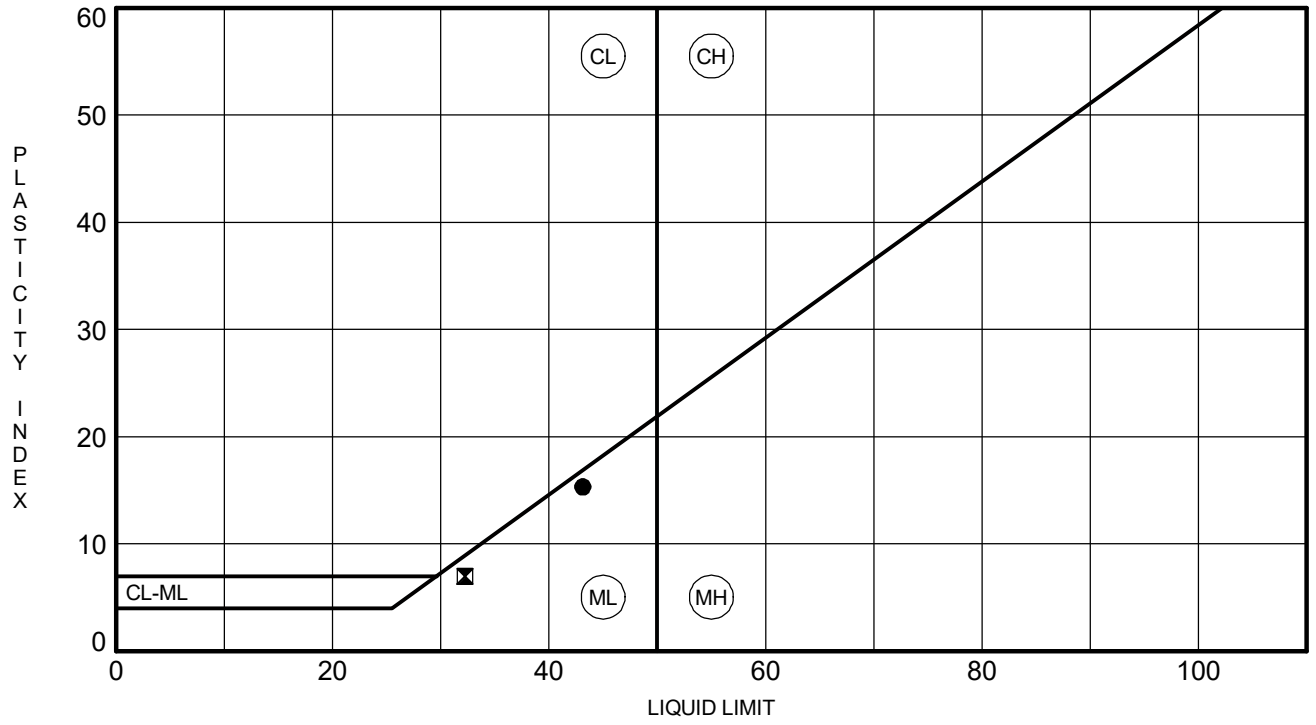
	BOREHOLE	DEPTH	D90	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**P3D-B18**	**6.0**							**81.0**	
⊠	**P3D-B18**	**8.0**							**92.0**	
▲	**P3D-B18**	**15.0**							**63.7**	

GRAIN SIZE G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 9/16/25

ATTERBERG LIMITS' RESULTS

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**P3D-B18**	**8.0**	**43**	**28**	**15**	**92.0**	**SILT (ML/A-7-6)**
⊠	**P3D-B18**	**15.0**	**32**	**25**	**7**	**63.7**	**SANDY SILT (ML/A-4)**

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	CCR Ph. 3D	**PROJECT NO.:**	G5662.030
SAMPLE NUMBER:	25-3017	**DATE REQUESTED:**	8/15/2025
DESCRIPTION OF SOIL:	Various		
TESTED BY:	AC & CJ	**DATE OF TESTING:**	9/2/2025
WEIGHED BY:	JM	**DATE OF WEIGHING:**	9/3/2025

BORING NO.	P3D-B19	P3D-B19	P3D-B19	P3D-B19	P3D-B19
SAMPLE NO.	SS-1	SS-3	SS-4	SS-5	SS-6
SAMPLE DEPTH	0.0 - 2.0	4.0 - 6.0	6.0 - 8.0	8.0 - 10.0	13.5 - 15.0
WATER CONTENT, W%	15.9	21.3	6.3	12.2	7.5

BORING NO.	P3D-B19				
SAMPLE NO.	SS-9				
SAMPLE DEPTH	28.5 - 30.0				
WATER CONTENT, W%	6.7				

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

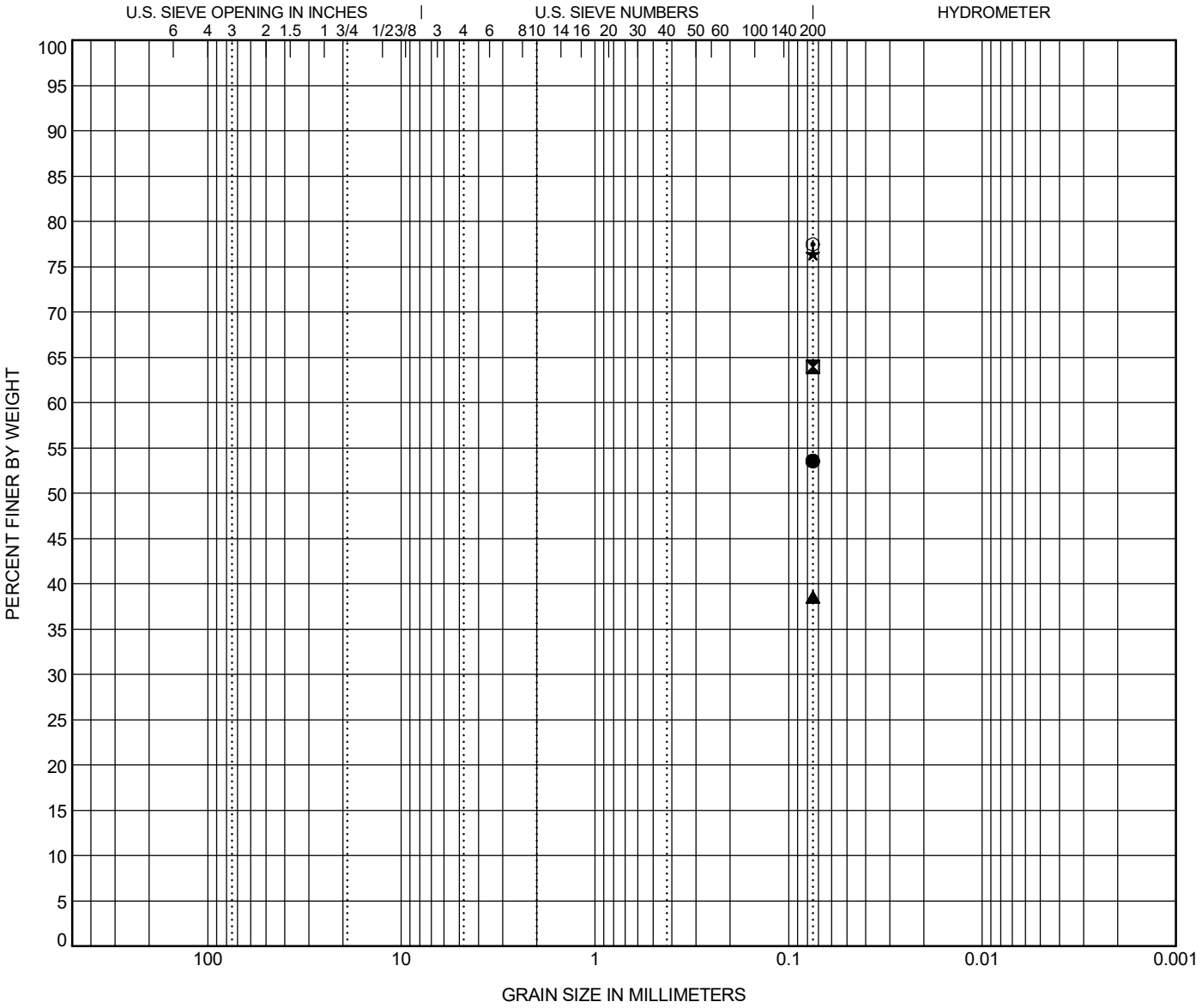
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

This report shall not be reproduced, except in full, without the written approval of F&ME Consultants, Inc.
211 Business Park Boulevard, Columbia SC 29203

GRAIN SIZE DISTRIBUTION

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**P3D-B19**	**2.0**	**SANDY LEAN CLAY (CL/A-6)**	**29**	**13**	**16**		
⊠	**P3D-B19**	**6.0**	**SANDY LEAN CLAY (CL/A-6)**	**38**	**19**	**19**		
▲	**P3D-B19**	**8.0**	**SILTY SAND (SM/A-4)**	**NP**	**NP**	**NP**		
★	**P3D-B19**	**10.0**	**SILTY CLAY with SAND (CL-ML/A-4)**	**26**	**19**	**7**		
⊙	**P3D-B19**	**15.0**	**SILT with SAND (ML/A-4)**					

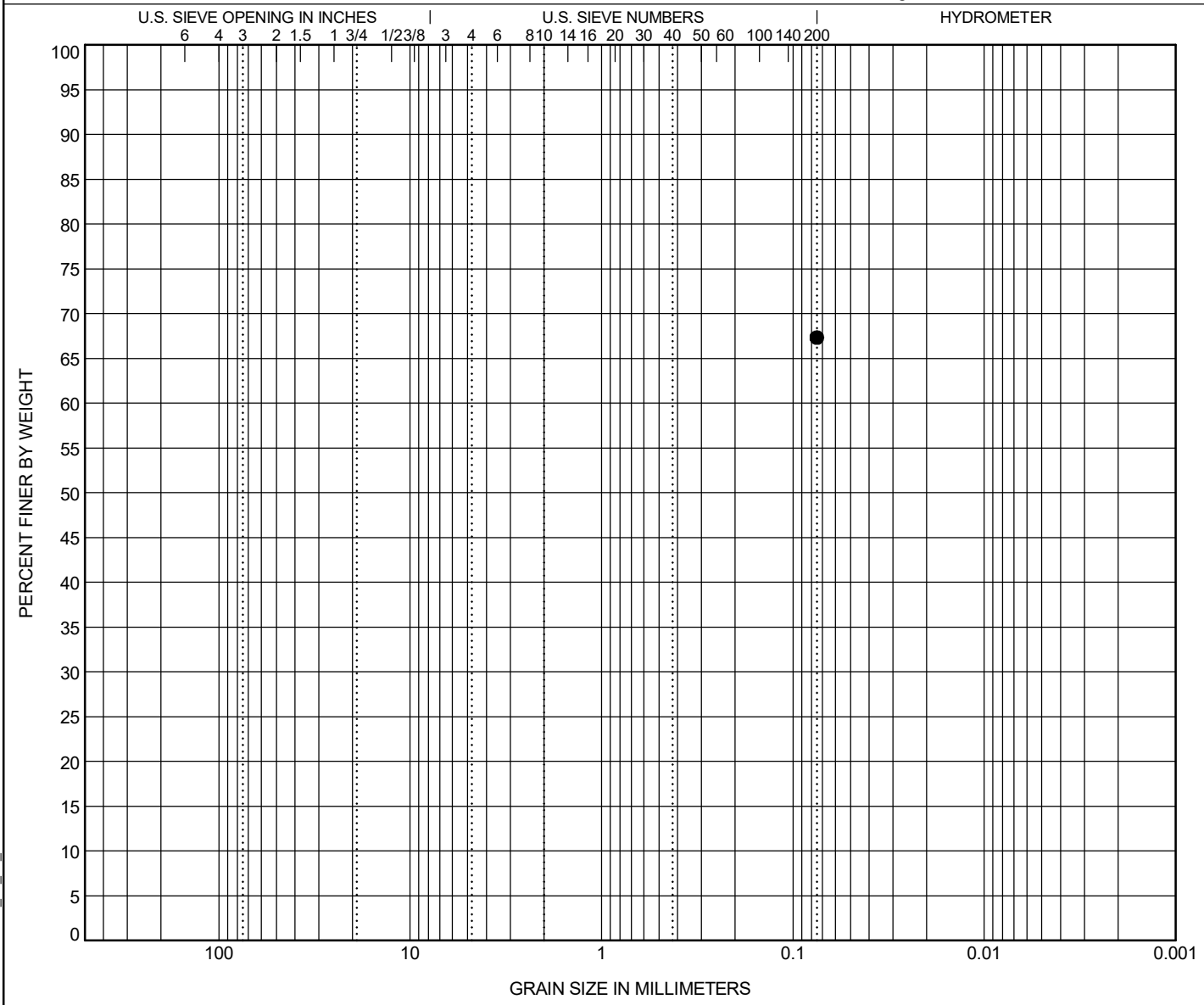
	BOREHOLE	DEPTH	D90	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**P3D-B19**	**2.0**							**53.6**	
⊠	**P3D-B19**	**6.0**							**64.0**	
▲	**P3D-B19**	**8.0**							**38.6**	
★	**P3D-B19**	**10.0**							**76.4**	
⊙	**P3D-B19**	**15.0**							**77.5**	

GRAIN SIZE G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 9/16/25

GRAIN SIZE DISTRIBUTION

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**P3D-B19**	**30.0**	**SANDY SILT (ML/A-4)**	**NP**	**NP**	**NP**		

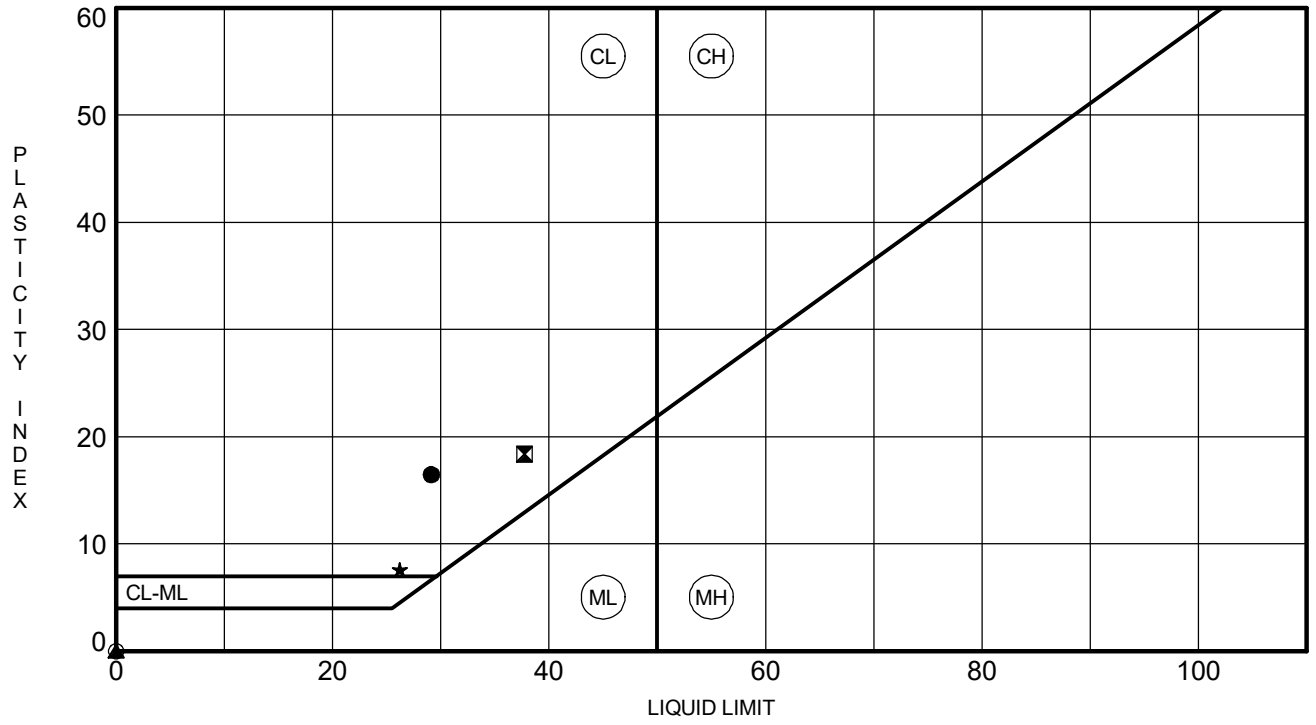
	BOREHOLE	DEPTH	D90	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**P3D-B19**	**30.0**							**67.3**	

GRAIN SIZE G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 9/16/25

ATTERBERG LIMITS' RESULTS

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**P3D-B19**	**2.0**	**29**	**13**	**16**	**53.6**	**SANDY LEAN CLAY (CL/A-6)**
⊠	**P3D-B19**	**6.0**	**38**	**19**	**19**	**64.0**	**SANDY LEAN CLAY (CL/A-6)**
▲	**P3D-B19**	**8.0**	**NP**	**NP**	**NP**	**38.6**	**SILTY SAND (SM/A-4)**
★	**P3D-B19**	**10.0**	**26**	**19**	**7**	**76.4**	**SILTY CLAY with SAND (CL-ML/A-4)**
⊙	**P3D-B19**	**30.0**	**NP**	**NP**	**NP**	**67.3**	**SANDY SILT (ML/A-4)**

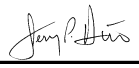
ATTERBERG LIMITS G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 9/16/25

pH DETERMINATION
(AASHTO T289)

Project Name:	CCR Ph. 3D	Project Number:	G5662.03-00019
Description of Sample:	Soil (Composite)	Date Received	8/15/2025
Tested By:	A. Ross	Date Tested:	8/28/2025

Boring ID	P3D-B19
Boring Depth	2.0 - 4.0
FME Lab ID No.	25-3017
pH Value	7.44
Temperature (˚C)	22.8˚C

Date Reviewed: 8/28/2025

Reviewed By: 

This report shall not be reproduced, except in full,
without the written approval of F&ME Consultants, Inc.
211 Business Park Blvd., Columbia, SC 29203

SOIL RESISTIVITY
(AASHTO T288)

Project Name:	CCR Ph. 3D	Project ID:	G5662.03/00019
Location:	P3D-B19	FME Lab ID No.:	25-3017
Sampled By:	AP	Date Sampled:	8/15/2025
Soil Description:	Soil (Composite)	Date Received:	8/15/2025
Tested By:	A. Ross	Date Tested:	8/28/2025

Boring No.	Sample Depth (ft.)	Minimum Soil Resistivity, Ω-cm
P3D-B19	2.0 - 4.0	1,119

Date Reviewed: _____ Reviewed By: J. Hiers

This report shall not be reproduced, except in full,
without the written approval of F&ME Consultants, Inc.
211 Business Park Blvd., Columbia, SC 29203

Water-Soluble Sulfate Ion Content in Soil

AASHTO T 290-95 (2020)

Client:	F&ME Consultants, Inc.	Boring No.:	P3D-B19
Client Reference:	CCR - Ph. 3D G5662.03	Depth (ft):	2.0-4.0'
Project No.:	2025-595-001	Sample No.:	SS-2
Lab ID:	2025-595-001-007	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	8	19	45	59	122	157	232

Measurement of Barium Chloride Turbidity

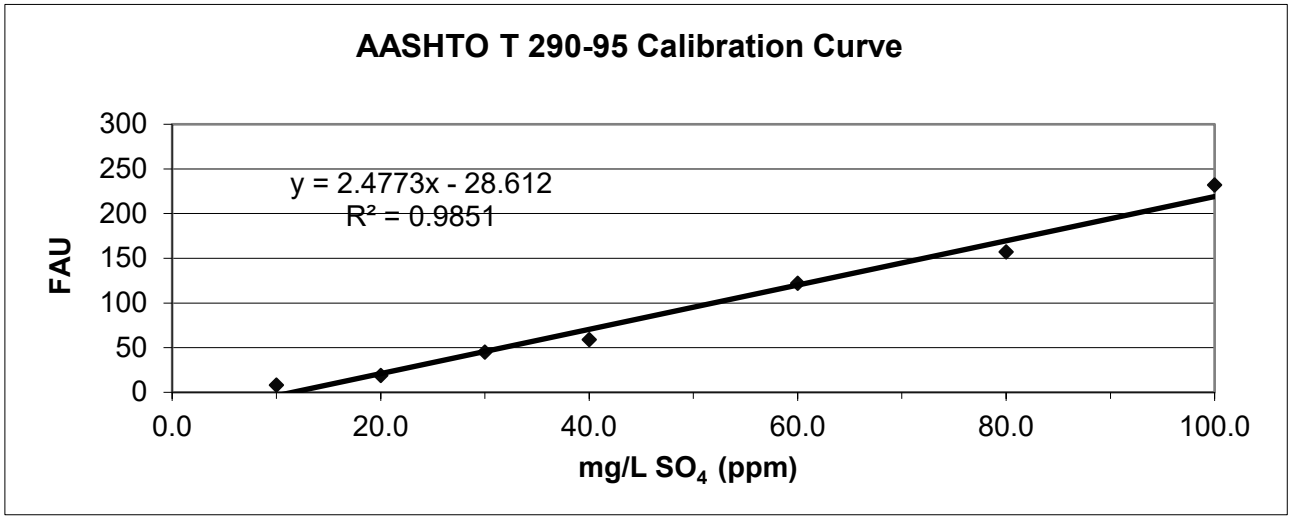
(Sample contains 5.0 mL NaCl solution and 0.3 g $BaCl_2 \cdot 2H_2O$)

Sample Weight (g):	100.0
Water added to Sample (mL):	300.0
Size of Sample Aliquot (mL):	50.0
Sample Reading (FAU):	39
Sample Diluted:	No
Sulfate Solution Added (ml):	0

Sample Moisture Content

Tare Number:	1451
Weight of Tare & Wet Sample (g):	252.82
Weight of Tare & Dry Sample (g):	250.29
Weight of Tare (g):	144.24
Weight of Water (g):	2.53
Weight of Dry Sample (g):	106.05
Moisture Content (%):	2.39

Sample Sulfate Ion Concentration:	27.29	**mg/L SO_4 (ppm)**
Sample Sulfate Ion Content:	81.9	**mg/Kg SO_4 (not corrected for moisture)**
Sample Sulfate Ion Content:	83.9	**mg/Kg SO_4 (corrected for moisture)**



Tested by: JAM Date: 9/4/25 Checked by: EG Date: 9/5/2025

544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

CHLORIDE ION CONTENT IN SOILS

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

Client:	F&ME Consultants, Inc.	Boring No.:	P3D-B19
Client Reference:	CCR - Ph. 3D G5662.03	Depth (ft):	2.0-4.0'
Project No.:	2025-595-001	Sample No.:	SS-2
Lab ID:	2025-595-001-007	Description:	Brown

(- # 10 Sieve material)

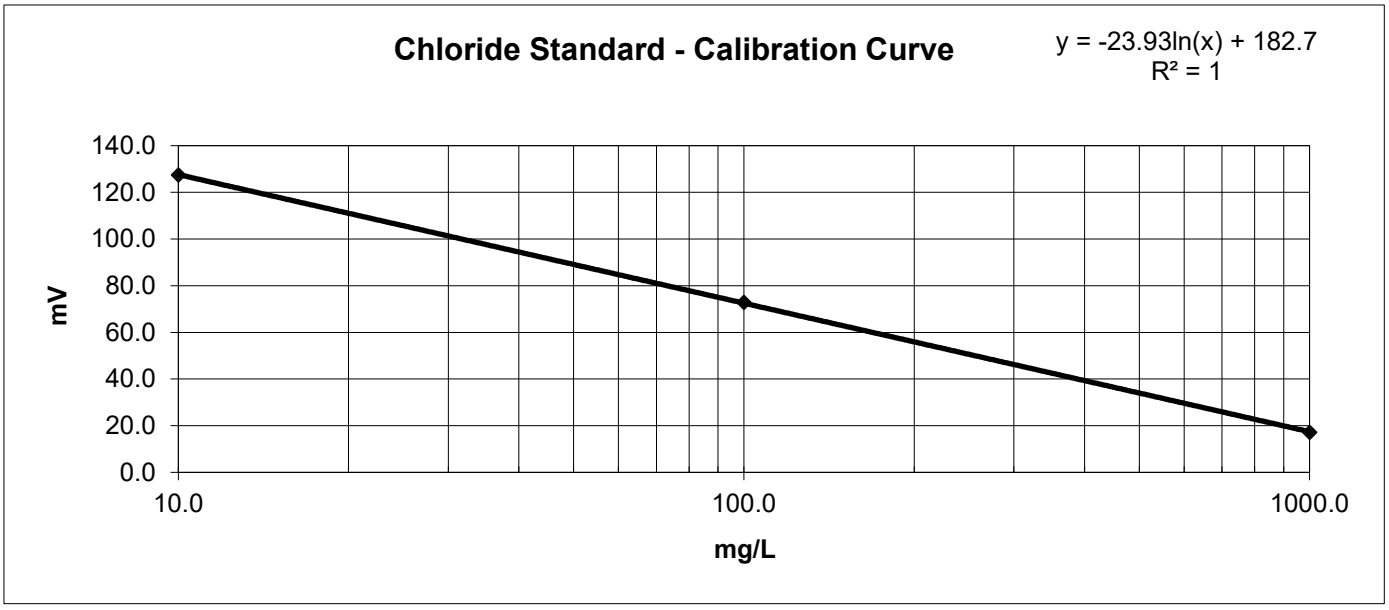
CHLORIDE STANDARD: CALIBRATION CURVE

STANDARD		MILLIVOLTS (mV)
10.0	mg/L	127.4
100.0	mg/L	72.9
1000.0	mg/L	17.2

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):	69.8	111.94	111.94

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°C.



Notes:

Tested By	JAM	Date	9/4/25	Checked By	EG	Date	9/5/25

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

544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	CCR Ph. 3D	**PROJECT NO.:**	G5662.030
SAMPLE NUMBER:	25-3054	**DATE REQUESTED:**	8/27/2025
DESCRIPTION OF SOIL:	Various		
TESTED BY:	AC/MMP	**DATE OF TESTING:**	9/19/2025
WEIGHED BY:	JM/HM	**DATE OF WEIGHING:**	9/22/2025

BORING NO.	P3D-B20	P3D-B20	P3D-B20	P3D-B20	P3D-B20
SAMPLE NO.	SS-1	SS-2	SS-3	SS-5	SS-6
SAMPLE DEPTH	0.0 - 2.0	2.0 - 4.0	4.0 - 6.0	8.0 - 10.0	13.5 - 15.0
WATER CONTENT, W%	10.1	9.1	9.7	13.3	35.8

BORING NO.	P3D-B20	P3D-B20			
SAMPLE NO.	SS-7	SS-9			
SAMPLE DEPTH	18.5 - 20.0	28.5 - 30.0			
WATER CONTENT, W%	36.5	24.5			

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

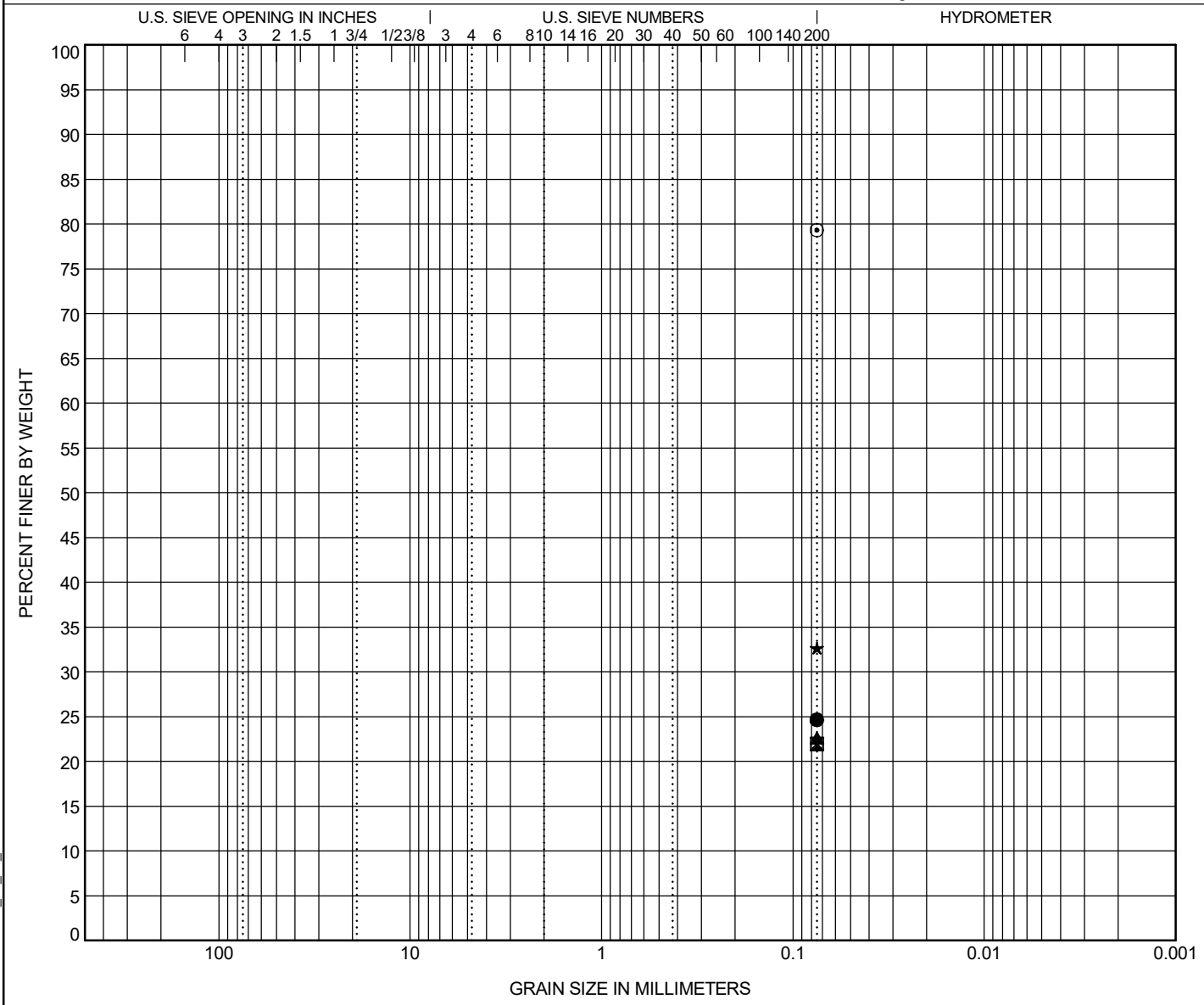
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

This report shall not be reproduced, except in full, without the written approval of F&ME Consultants, Inc.
211 Business Park Boulevard, Columbia SC 29203

GRAIN SIZE DISTRIBUTION

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**P3D-B20**	**2.0**	**CLAYEY SAND (SC/A-2-6)**					
⊠	**P3D-B20**	**4.0**	**CLAYEY SAND (SC/A-2-6)**	**25**	**14**	**11**		
▲	**P3D-B20**	**6.0**	**CLAYEY SAND (SC/A-2-6)**	**30**	**14**	**16**		
★	**P3D-B20**	**10.0**	**CLAYEY SAND (SC/A-2-6)**	**33**	**14**	**19**		
⊙	**P3D-B20**	**15.0**	**SILT with SAND (ML/A-6)**	**40**	**27**	**13**		

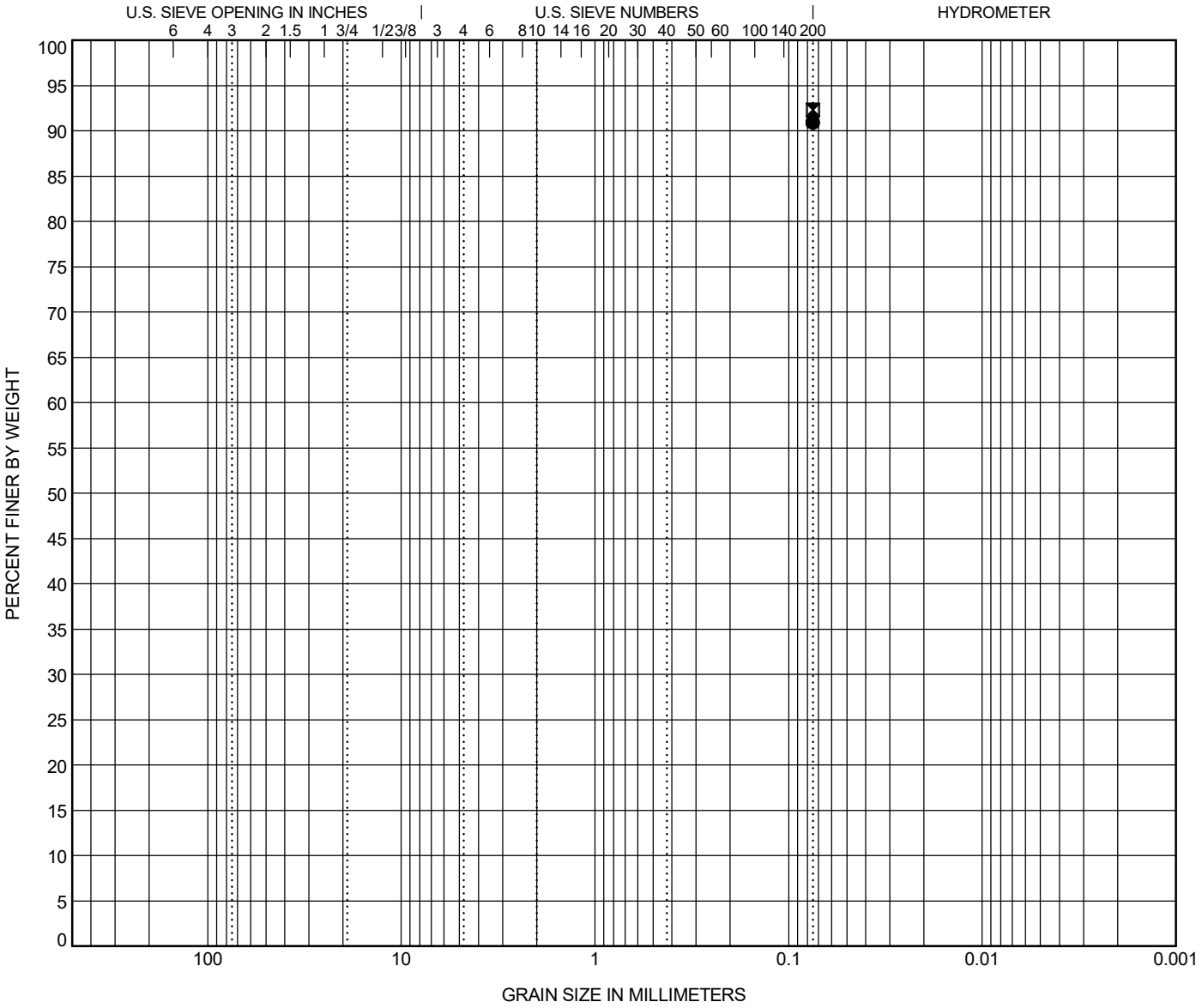
	BOREHOLE	DEPTH	D90	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**P3D-B20**	**2.0**							**24.7**	
⊠	**P3D-B20**	**4.0**							**22.0**	
▲	**P3D-B20**	**6.0**							**22.6**	
★	**P3D-B20**	**10.0**							**32.7**	
⊙	**P3D-B20**	**15.0**							**79.3**	

GRAIN SIZE G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 9/25/25

GRAIN SIZE DISTRIBUTION

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**P3D-B20**	**20.0**	**SILT (ML/A-7-6)**					
⊠	**P3D-B20**	**30.0**	**SILT (ML/A-7-6)**	**41**	**28**	**13**		

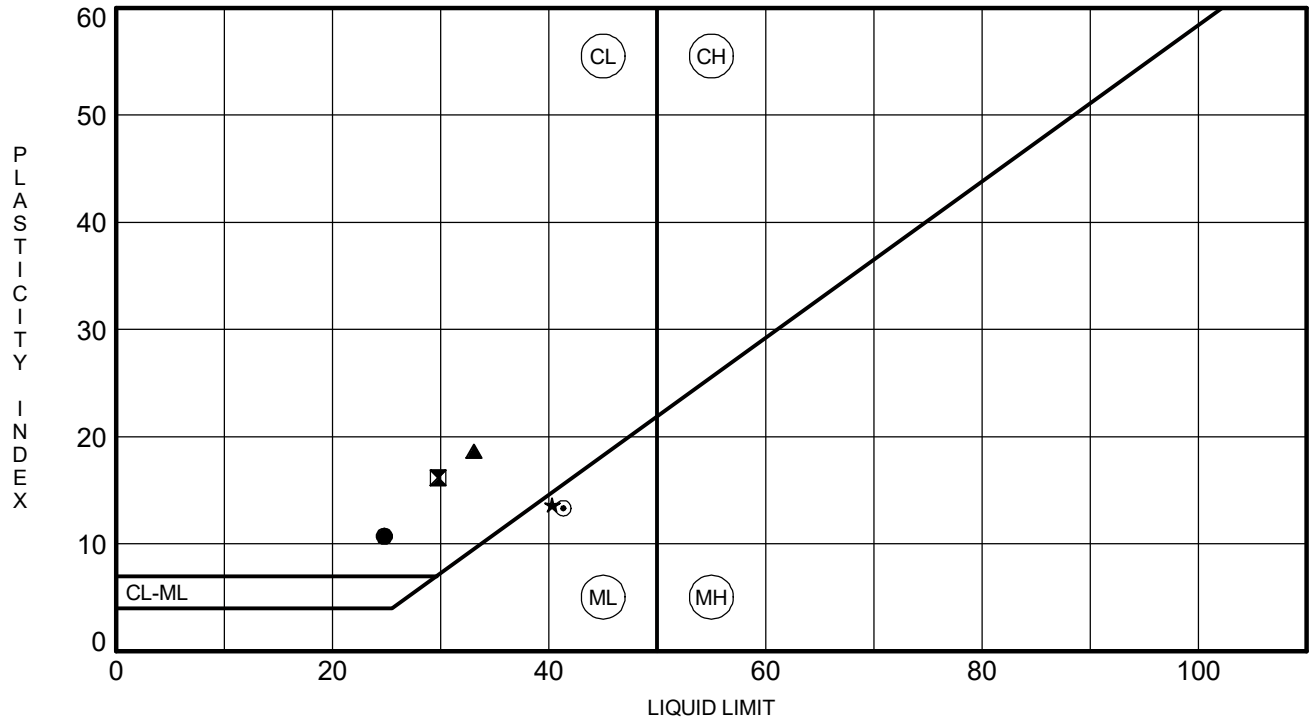
	BOREHOLE	DEPTH	D90	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**P3D-B20**	**20.0**							**90.9**	
⊠	**P3D-B20**	**30.0**							**92.3**	

GRAIN SIZE G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 9/25/25

ATTERBERG LIMITS' RESULTS

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**P3D-B20**	**4.0**	**25**	**14**	**11**	**22.0**	**CLAYEY SAND (SC/A-2-6)**
⧓	**P3D-B20**	**6.0**	**30**	**14**	**16**	**22.6**	**CLAYEY SAND (SC/A-2-6)**
▲	**P3D-B20**	**10.0**	**33**	**14**	**19**	**32.7**	**CLAYEY SAND (SC/A-2-6)**
★	**P3D-B20**	**15.0**	**40**	**27**	**13**	**79.3**	**SILT with SAND (ML/A-6)**
⊙	**P3D-B20**	**30.0**	**41**	**28**	**13**	**92.3**	**SILT (ML/A-7-6)**

ATTERBERG LIMITS G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 9/25/25

pH DETERMINATION
(AASHTO T289)

Project Name:	CCR Ph. 3D	Project Number:	G5662.03-00019
Description of Sample:	Soil Sample (Composite)	Date Received	9/19/2025
Tested By:	AHR	Date Tested:	9/29/2025

Boring ID	P3D-B20
Boring Depth	6.0 - 8.0
FME Lab ID No.	25-2231
pH Value	4.47
Temperature (˚C)	21.6

Date Reviewed: 10/7/2025 Reviewed By: J. Heirs

This report shall not be reproduced, except in full,
without the written approval of F&ME Consultants, Inc.
211 Business Park Blvd., Columbia, SC 29203

SOIL RESISTIVITY
(AASHTO T288)

Project Name:	CCR Ph. 3D	Project ID:	G5662.03-00019
Location:	--	FME Lab ID No.:	25-2231
Sampled By:	G. Cantelle	Date Sampled:	7/9/2025
Soil Description:	Composite	Date Received:	7/9/2025
Tested By:	JM	Date Tested:	9/30/2025

Boring No.	Sample Depth (ft.)	Minimum Soil Resistivity, Ω-cm
P3D-B20	6.0 - 8.0	21,038

Date Reviewed: 10/7/2025 Reviewed By: J. Hiers

This report shall not be reproduced, except in full,
without the written approval of F&ME Consultants, Inc.
211 Business Park Blvd., Columbia, SC 29203

Water-Soluble Sulfate Ion Content in Soil

AASHTO T 290-95 (2020)

Client:	F&ME Consultants, Inc.	Boring No.:	P3D-B20
Client Reference:	CCR - Ph. 3D G5662.03	Depth (ft):	6.0-8.0'
Project No.:	2025-595-002	Sample No.:	SS-4
Lab ID:	2025-595-002-003	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	8	19	45	59	122	157	232

Measurement of Barium Chloride Turbidity

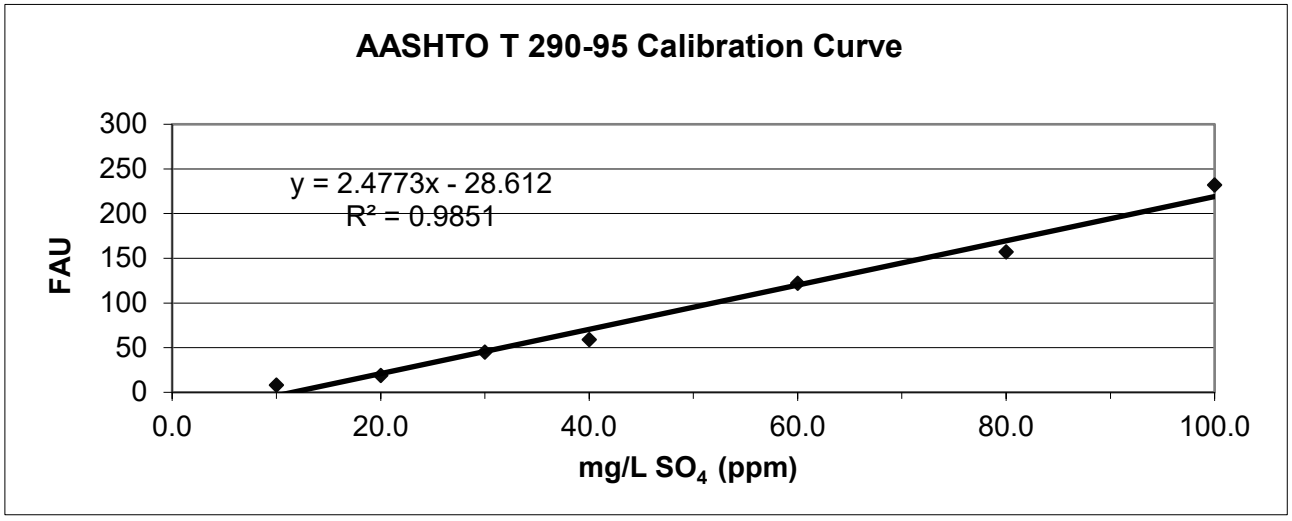
(Sample contains 5.0 mL NaCl solution and 0.3 g $BaCl_2 \cdot 2H_2O$)

Sample Weight (g):	100.0
Water added to Sample (mL):	300.0
Size of Sample Aliquot (mL):	50.0
Sample Reading (FAU):	6
Sample Diluted:	No
Sulfate Solution Added (ml):	10

Sample Moisture Content

Tare Number:	1498
Weight of Tare & Wet Sample (g):	381.11
Weight of Tare & Dry Sample (g):	379.49
Weight of Tare (g):	184.91
Weight of Water (g):	1.62
Weight of Dry Sample (g):	194.58
Moisture Content (%):	0.83

Sample Sulfate Ion Concentration:	12.97	**mg/L SO_4 (ppm)**
Sample Sulfate Ion Content:	38.9	**mg/Kg SO_4 (not corrected for moisture)**
Sample Sulfate Ion Content:	39.2	**mg/Kg SO_4 (corrected for moisture)**



Tested by: JAM Date: 10/1/25 Checked by: EG Date: 10/2/2025

544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

CHLORIDE ION CONTENT IN SOILS

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

Client:	F&ME Consultants, Inc.	Boring No.:	P3D-B20
Client Reference:	CCR - Ph. 3D G5662.03	Depth (ft):	6.0-8.0'
Project No.:	2025-595-002	Sample No.:	SS-4
Lab ID:	2025-595-002-003	Description:	Brown

(- # 10 Sieve material)

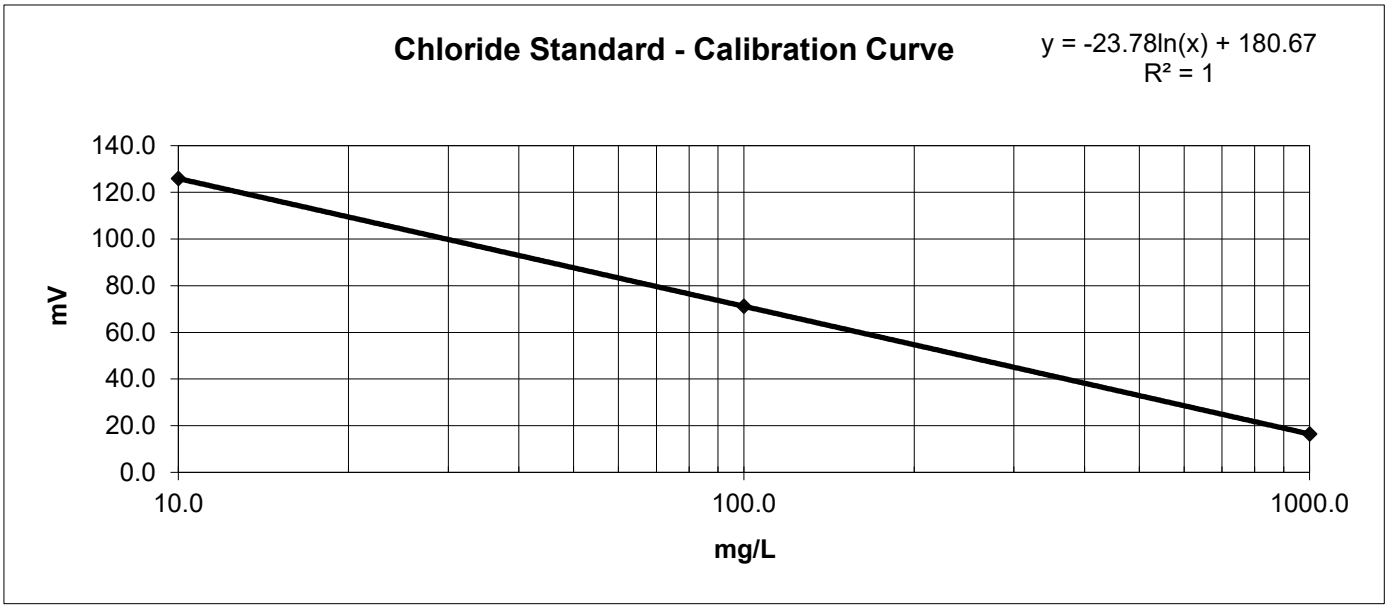
CHLORIDE STANDARD: CALIBRATION CURVE

STANDARD		MILLIVOLTS (mV)
10.0	mg/L	125.9
100.0	mg/L	71.2
1000.0	mg/L	16.4

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):	138.6	5.87	5.87

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°C.



Notes:

Tested By	JAM	Date	10/1/25	Checked By	EG	Date	10/2/25

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

544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	CCR Ph. 3D	**PROJECT NO.:**	G5662.030
SAMPLE NUMBER:	25-3055	**DATE REQUESTED:**	8/27/2025
DESCRIPTION OF SOIL:	Various		
TESTED BY:	AC/MMP	**DATE OF TESTING:**	9/19/2025
WEIGHED BY:	JM/HM	**DATE OF WEIGHING:**	9/22/2025

BORING NO.	P3D-B21	P3D-B21	P3D-B21	P3D-B21	P3D-B21
SAMPLE NO.	SS-1	SS-4	SS-5	SS-6	SS-8
SAMPLE DEPTH	0.0 - 2.0	6.0 - 8.0	8.0 - 10.0	13.5 - 15.0	23.5 - 25.0
WATER CONTENT, W%	20.2	11.9	14.0	29.4	15.7

BORING NO.	P3D-B21				
SAMPLE NO.	SS-9				
SAMPLE DEPTH	28.5 - 30.0				
WATER CONTENT, W%	20.0				

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

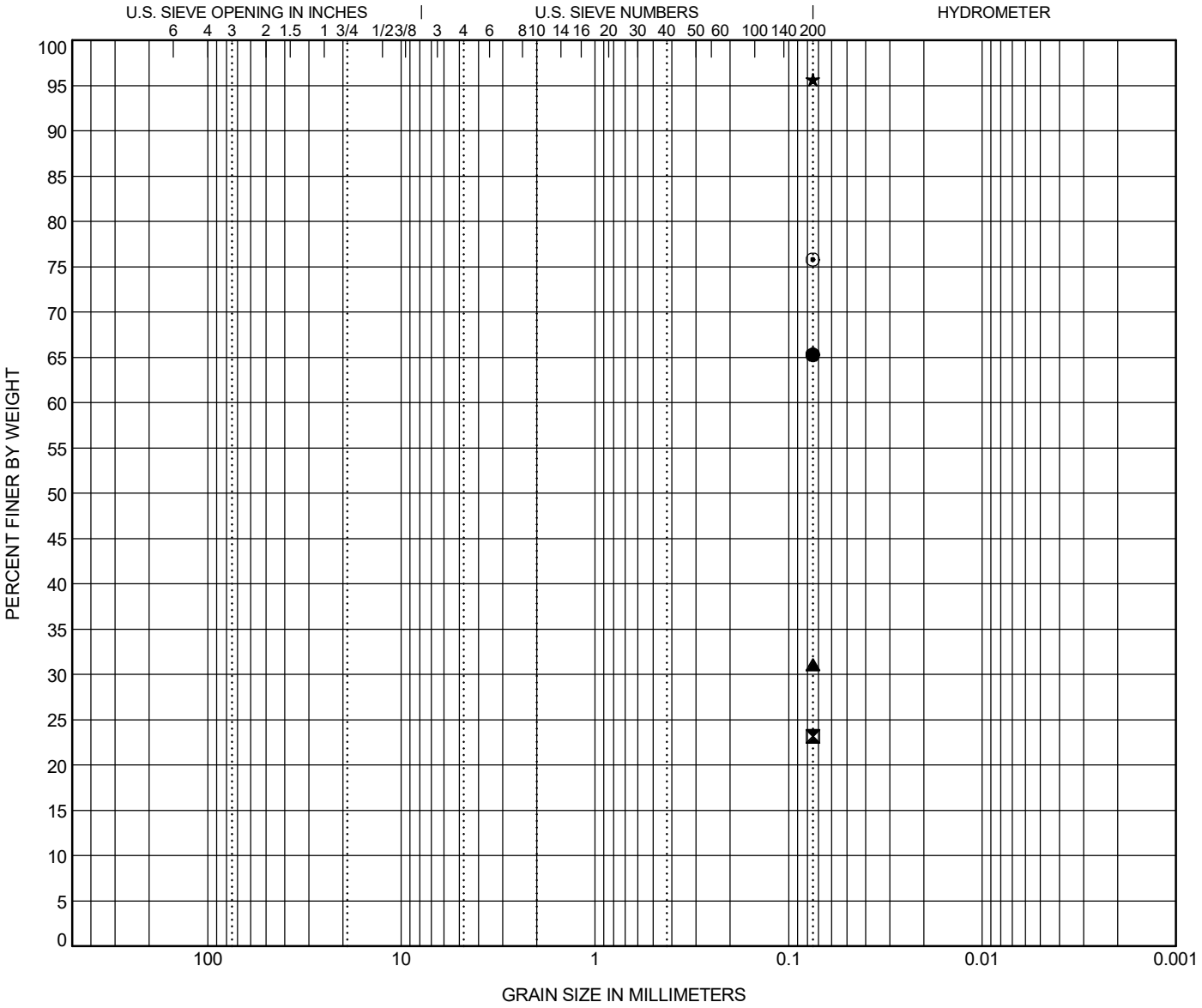
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

This report shall not be reproduced, except in full, without the written approval of F&ME Consultants, Inc.
211 Business Park Boulevard, Columbia SC 29203

GRAIN SIZE DISTRIBUTION

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**P3D-B21**	**2.0**	**SANDY LEAN CLAY (CL/A-6)**	**40**	**14**	**26**		
⊠	**P3D-B21**	**8.0**	**SILTY, CLAYEY SAND (SC-SM/A-2-4)**	**21**	**14**	**7**		
▲	**P3D-B21**	**10.0**	**CLAYEY SAND (SC/A-2-4)**	**23**	**13**	**10**		
★	**P3D-B21**	**15.0**	**SILT (ML/A-4)**	**38**	**28**	**10**		
⊙	**P3D-B21**	**25.0**	**SILT with SAND (ML/A-4)**	**37**	**29**	**8**		

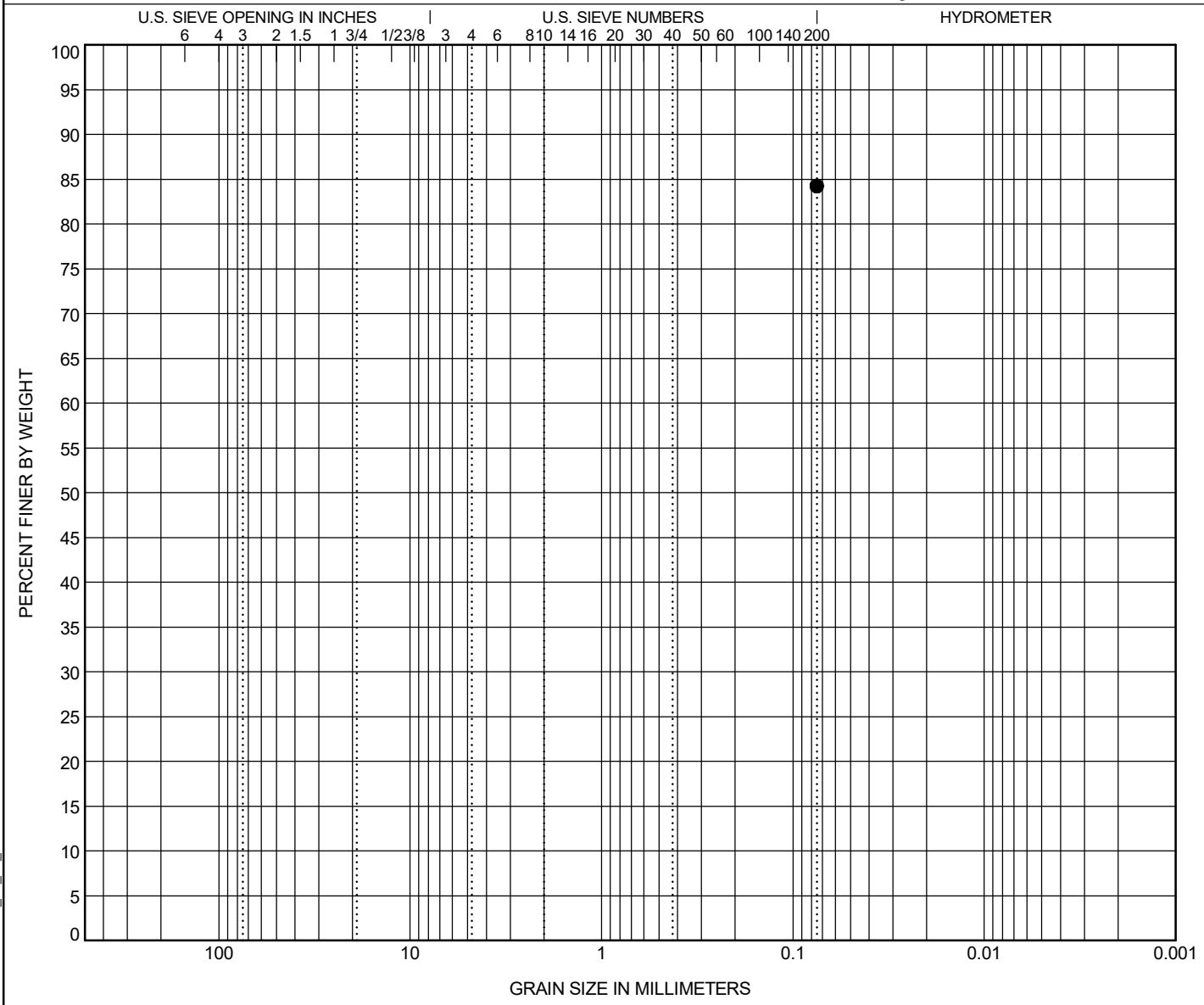
	BOREHOLE	DEPTH	D90	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**P3D-B21**	**2.0**							**65.3**	
⊠	**P3D-B21**	**8.0**							**23.2**	
▲	**P3D-B21**	**10.0**							**31.1**	
★	**P3D-B21**	**15.0**							**95.7**	
⊙	**P3D-B21**	**25.0**							**75.8**	

GRAIN SIZE G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 9/25/25

GRAIN SIZE DISTRIBUTION

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**P3D-B21**	**30.0**	**SILT with SAND (ML/A-6)**	**40**	**28**	**12**		

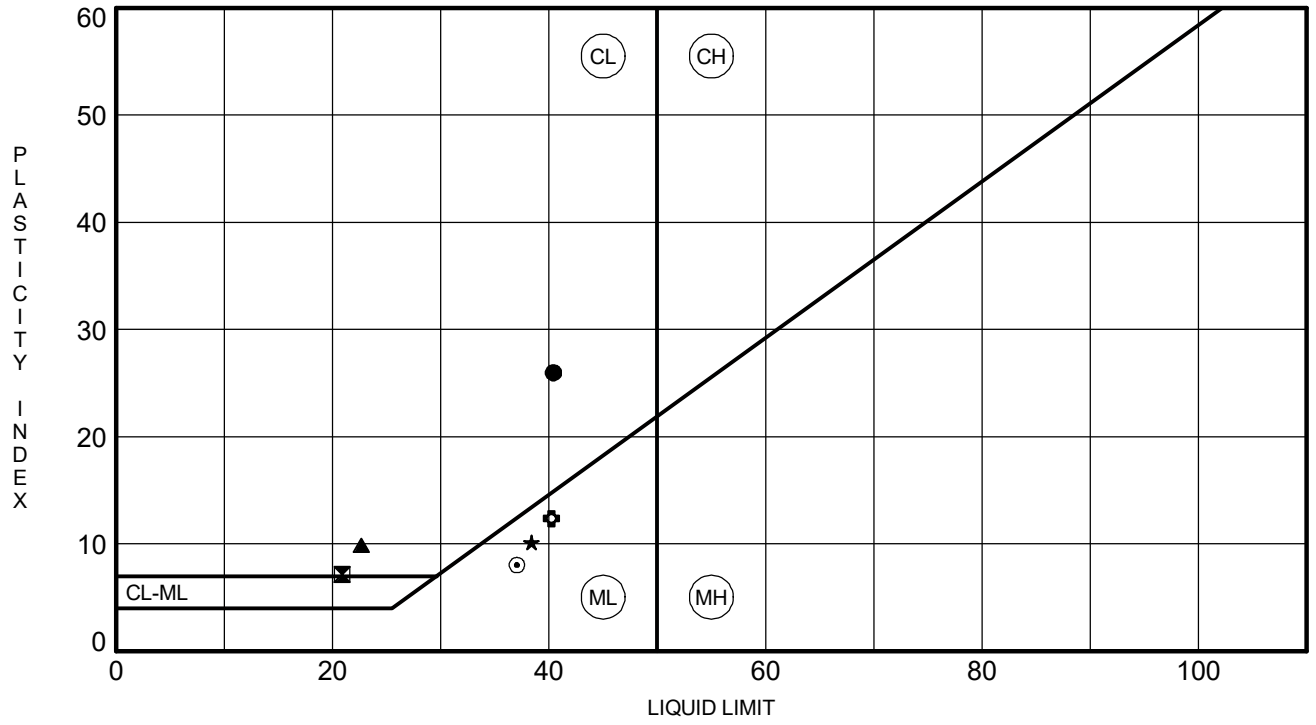
	BOREHOLE	DEPTH	D90	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**P3D-B21**	**30.0**							**84.3**	

GRAIN SIZE G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 9/25/25

ATTERBERG LIMITS' RESULTS

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**P3D-B21**	**2.0**	**40**	**14**	**26**	**65.3**	**SANDY LEAN CLAY (CL/A-6)**
⊠	**P3D-B21**	**8.0**	**21**	**14**	**7**	**23.2**	**SILTY, CLAYEY SAND (SC-SM/A-2-4)**
▲	**P3D-B21**	**10.0**	**23**	**13**	**10**	**31.1**	**CLAYEY SAND (SC/A-2-4)**
★	**P3D-B21**	**15.0**	**38**	**28**	**10**	**95.7**	**SILT (ML/A-4)**
⊙	**P3D-B21**	**25.0**	**37**	**29**	**8**	**75.8**	**SILT with SAND (ML/A-4)**
✿	**P3D-B21**	**30.0**	**40**	**28**	**12**	**84.3**	**SILT with SAND (ML/A-6)**

ATTERBERG LIMITS G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 9/25/25

pH DETERMINATION
(AASHTO T289)

Project Name:	CCR Ph. 3D	Project Number:	G5662.03-00019
Description of Sample:	Soil Sample (Composite)	Date Received	9/19/2025
Tested By:	AHR	Date Tested:	9/29/2025

Boring ID	P3D-B21
Boring Depth	2.0 - 6.0
FME Lab ID No.	25-2231
pH Value	5.14
Temperature (˚C)	21.7

Date Reviewed: 10/7/2025 Reviewed By: J. Heirs

This report shall not be reproduced, except in full,
without the written approval of F&ME Consultants, Inc.
211 Business Park Blvd., Columbia, SC 29203

SOIL RESISTIVITY
(AASHTO T288)

Project Name:	Carolina Crossroads - Phase 3D	Project ID:	G5662.03-00019
Location:	--	FME Lab ID No.:	25-3055
Sampled By:	BV	Date Sampled:	9/4/2025
Soil Description:	Soil (Composite)	Date Received:	9/12/2025
Tested By:	A. Ross	Date Tested:	10/10/2025

Boring No.	Sample Depth (ft.)	Minimum Soil Resistivity, Ω-cm
P3D-B21	2.0 - 4.0	17,420

Date Reviewed: 10/21/2025 Reviewed By: A. Abernethy

This report shall not be reproduced, except in full,
without the written approval of F&ME Consultants, Inc.
211 Business Park Blvd., Columbia, SC 29203

Water-Soluble Sulfate Ion Content in Soil

AASHTO T 290-95 (2020)

Client:	F&ME Consultants, Inc.	Boring No.:	P3D-B21
Client Reference:	CCR - Ph. 3D G5662.03	Depth (ft):	2.0-6.0'
Project No.:	2025-595-002	Sample No.:	SS-2/SS-3
Lab ID:	2025-595-002-004	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	8	19	45	59	122	157	232

Measurement of Barium Chloride Turbidity

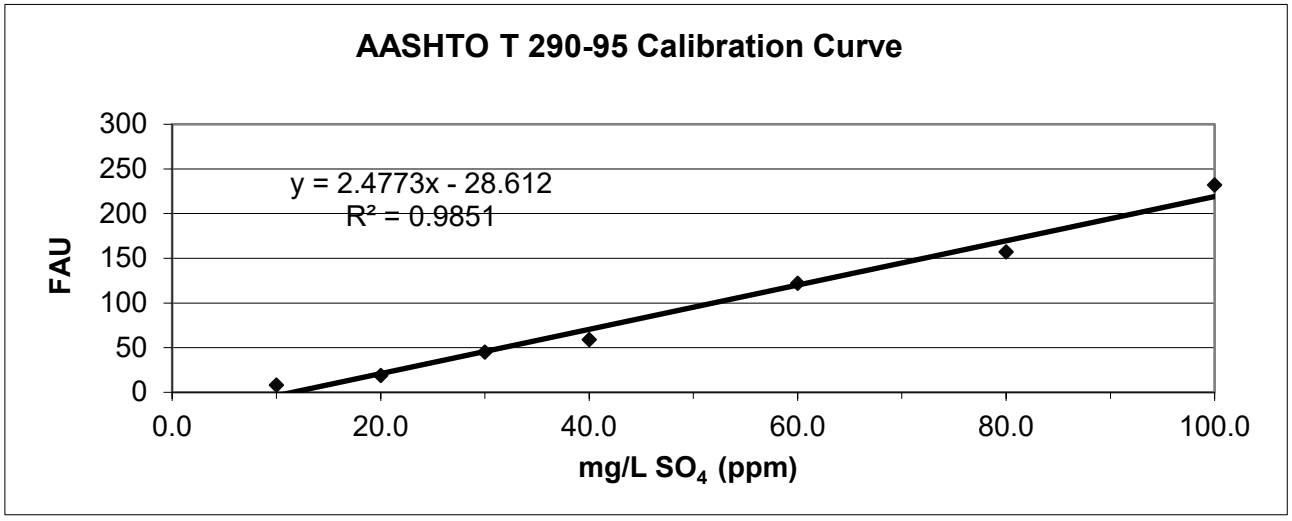
(Sample contains 5.0 mL NaCl solution and 0.3 g $BaCl_2 \cdot 2H_2O$)

Sample Weight (g):	100.0
Water added to Sample (mL):	300.0
Size of Sample Aliquot (mL):	50.0
Sample Reading (FAU):	8
Sample Diluted:	No
Sulfate Solution Added (ml):	10

Sample Moisture Content

Tare Number:	2030
Weight of Tare & Wet Sample (g):	229.22
Weight of Tare & Dry Sample (g):	228.59
Weight of Tare (g):	145.99
Weight of Water (g):	0.63
Weight of Dry Sample (g):	82.60
Moisture Content (%):	0.76

Sample Sulfate Ion Concentration:	13.78	**mg/L SO_4 (ppm)**
Sample Sulfate Ion Content:	41.3	**mg/Kg SO_4 (not corrected for moisture)**
Sample Sulfate Ion Content:	41.7	**mg/Kg SO_4 (corrected for moisture)**



Tested by: JAM Date: 10/1/25 Checked by: EG Date: 10/2/2025

544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

CHLORIDE ION CONTENT IN SOILS

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

Client:	F&ME Consultants, Inc.	Boring No.:	P3D-B21
Client Reference:	CCR - Ph. 3D G5662.03	Depth (ft):	2.0-6.0'
Project No.:	2025-595-002	Sample No.:	SS-2/SS-3
Lab ID:	2025-595-002-004	Description:	Brown

(- # 10 Sieve material)

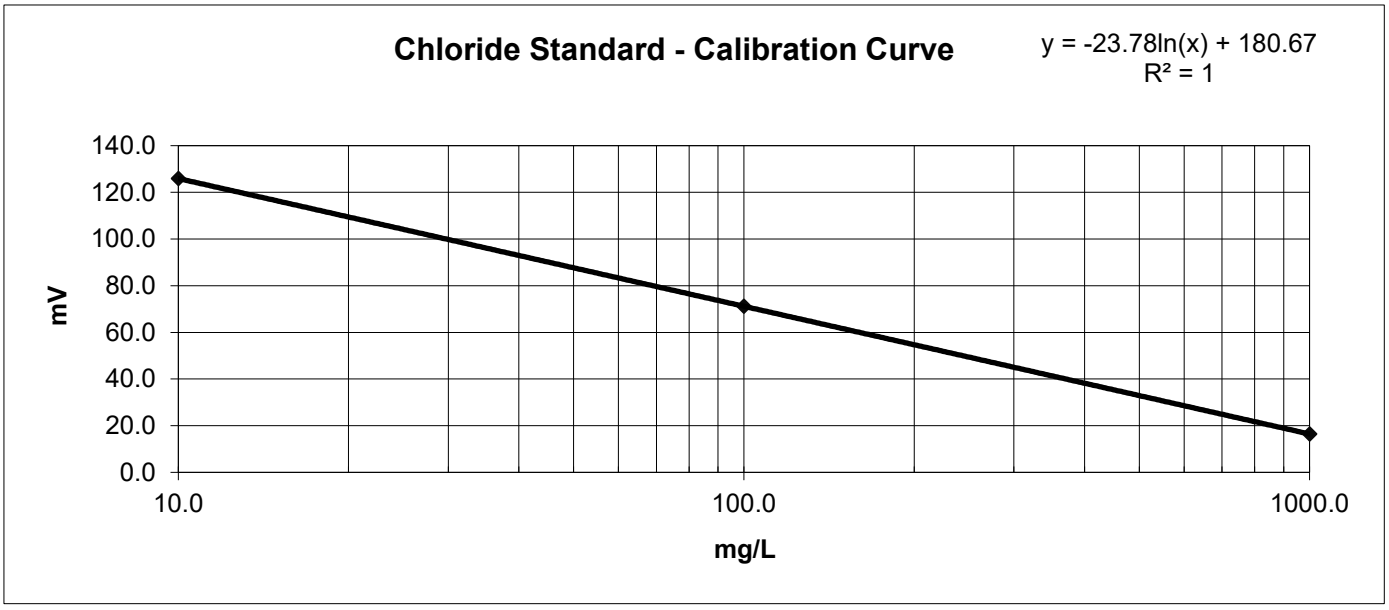
CHLORIDE STANDARD: CALIBRATION CURVE

STANDARD		MILLIVOLTS (mV)
10.0	mg/L	125.9
100.0	mg/L	71.2
1000.0	mg/L	16.4

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):	132.4	7.61	7.61

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°C.



Notes:

Tested By	JAM	Date	10/1/25	Checked By	EG	Date	10/2/25

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

544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	CCR Ph. 3D	**PROJECT NO.:**	G5662.030
SAMPLE NUMBER:	25-3377	**DATE REQUESTED:**	9/15/2025
DESCRIPTION OF SOIL:	Various		
TESTED BY:	JM/AG	**DATE OF TESTING:**	10/6/2025
WEIGHED BY:	JM	**DATE OF WEIGHING:**	10/7/2025

BORING NO.	P3D-B22	P3D-B22	P3D-B22	P3D-B22	P3D-B22
SAMPLE NO.	SS-2	SS-4	SS-5	SS-6	SS-7
SAMPLE DEPTH	2.0 - 4.0	6.0 - 8.0	8.0 - 10.0	13.5 - 15.0	18.5 - 20.0
WATER CONTENT, W%	32.0	30.3	17.8	25.7	20.8

BORING NO.	P3D-B22	P3D-B22			
SAMPLE NO.	SS-8	SS-10			
SAMPLE DEPTH	23.5 -25.0	33.5 - 35.0			
WATER CONTENT, W%	15.7	18.7			

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

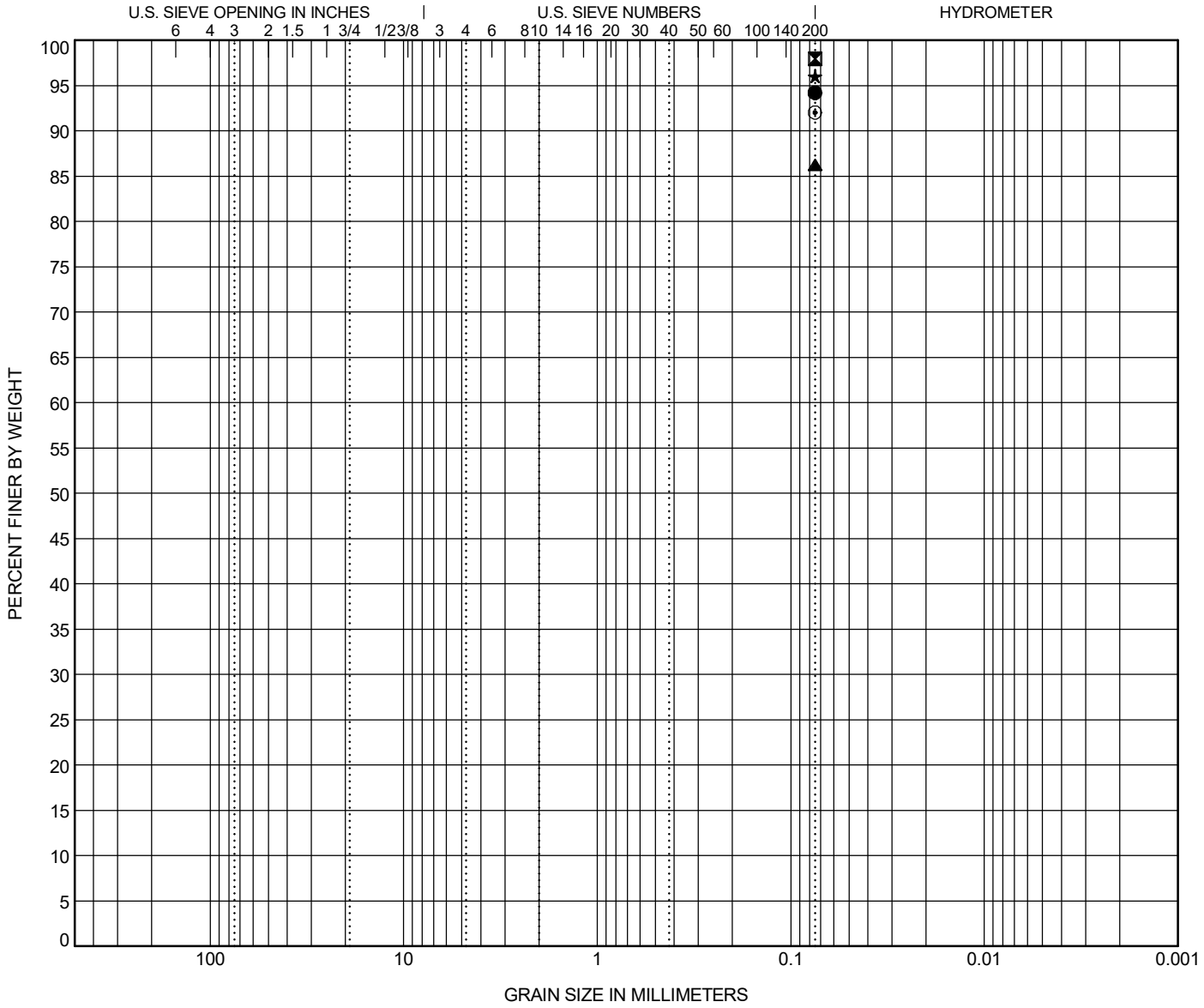
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

This report shall not be reproduced, except in full, without the written approval of F&ME Consultants, Inc.
211 Business Park Boulevard, Columbia SC 29203

GRAIN SIZE DISTRIBUTION

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads Phase 3D

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**P3D-B22**	**4.0**	**LEAN CLAY (CL/A-7-6)**	**43**	**25**	**18**		
⊠	**P3D-B22**	**8.0**	**SILT (ML/A-7-6)**	**43**	**29**	**14**		
▲	**P3D-B22**	**10.0**	**SILT (ML/A-7-6)**					
★	**P3D-B22**	**15.0**	**SILT (ML/A-6)**	**40**	**29**	**11**		
⊙	**P3D-B22**	**20.0**	**SILT (ML/A-6)**					

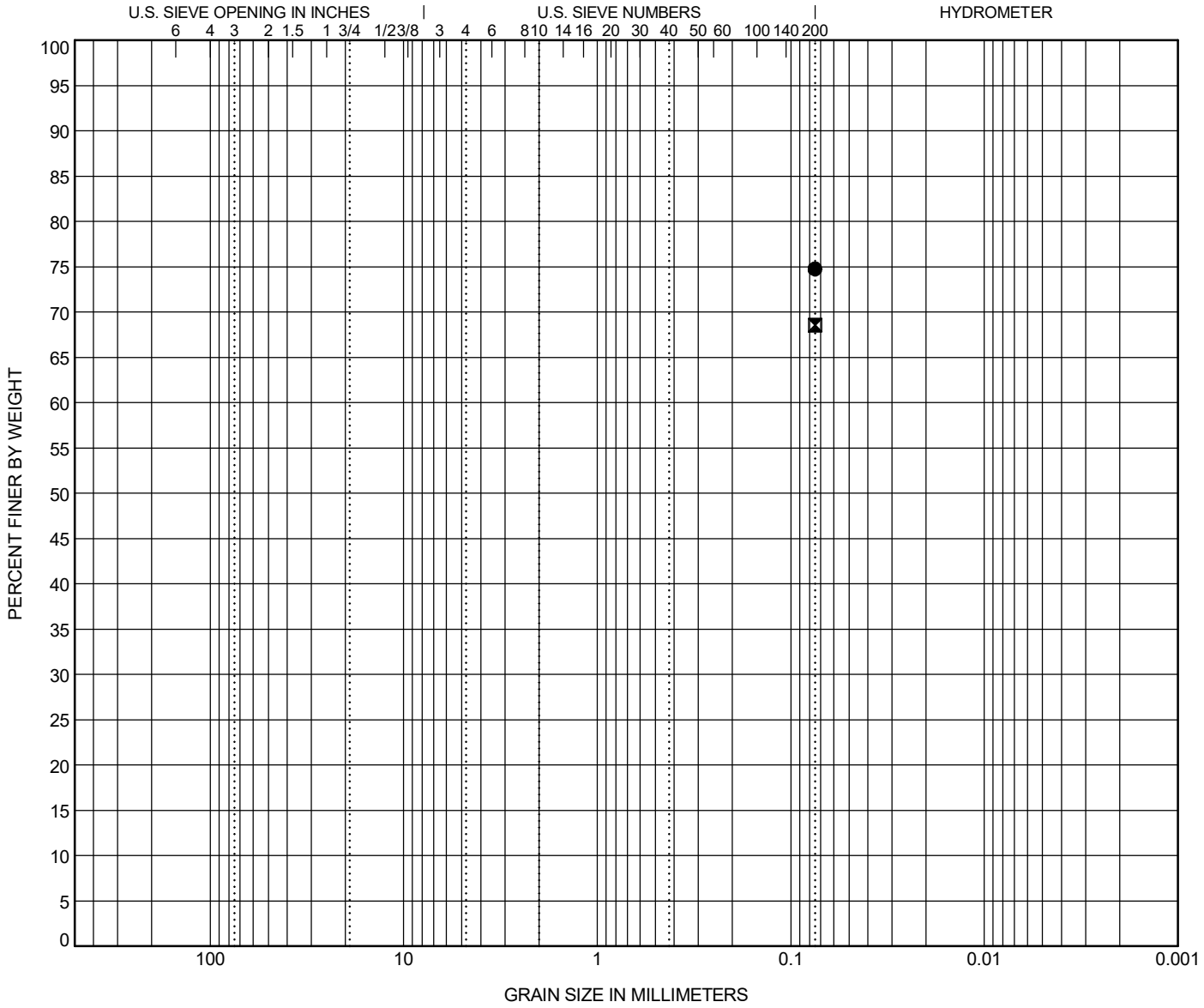
	BOREHOLE	DEPTH	D90	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**P3D-B22**	**4.0**							**94.2**	
⊠	**P3D-B22**	**8.0**							**98.0**	
▲	**P3D-B22**	**10.0**							**86.3**	
★	**P3D-B22**	**15.0**							**96.0**	
⊙	**P3D-B22**	**20.0**							**92.0**	

GRAIN SIZE G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/16/25

GRAIN SIZE DISTRIBUTION

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads Phase 3D

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**P3D-B22**	**25.0**	**SILT with SAND (ML/A-4)**					
⊠	**P3D-B22**	**35.0**	**SANDY SILT (ML/A-4)**					

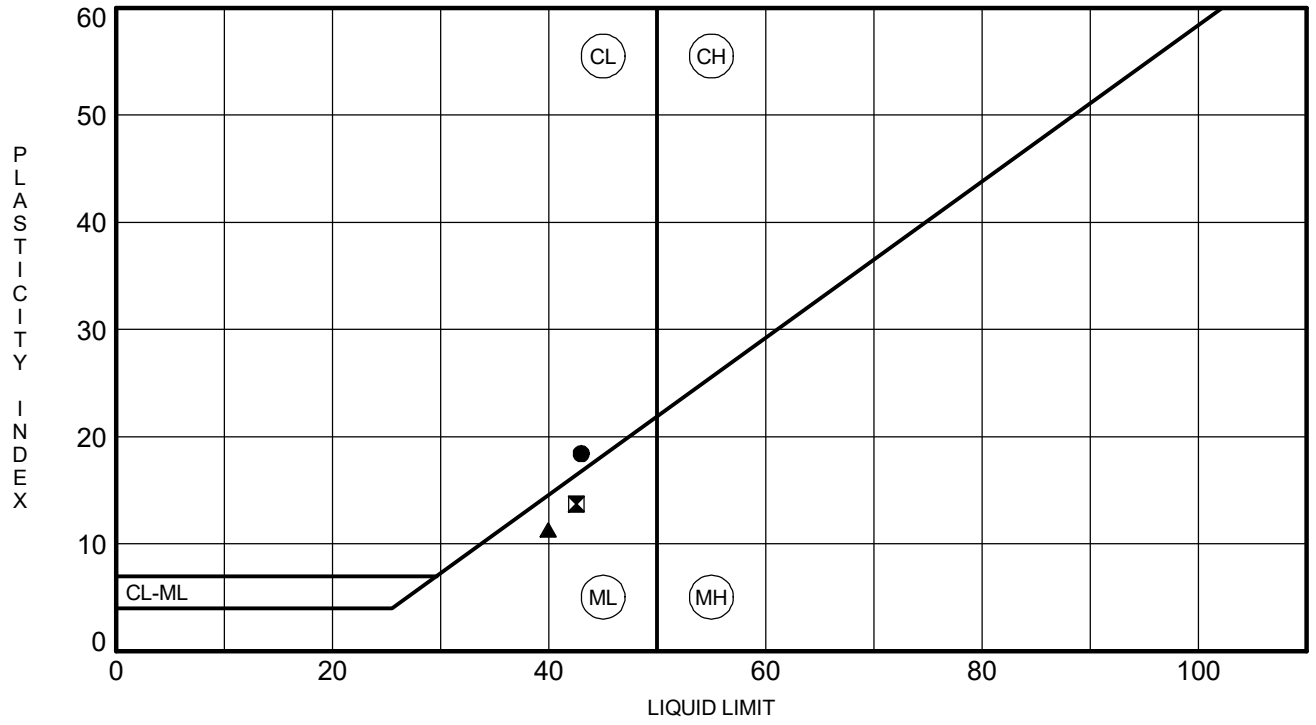
	BOREHOLE	DEPTH	D90	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**P3D-B22**	**25.0**							**74.8**	
⊠	**P3D-B22**	**35.0**							**68.6**	

GRAIN SIZE G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/16/25

ATTERBERG LIMITS' RESULTS

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads Phase 3D

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**P3D-B22**	**4.0**	**43**	**25**	**18**	**94.2**	**LEAN CLAY (CL/A-7-6)**
⊠	**P3D-B22**	**8.0**	**43**	**29**	**14**	**98.0**	**SILT (ML/A-7-6)**
▲	**P3D-B22**	**15.0**	**40**	**29**	**11**	**96.0**	**SILT (ML/A-6)**

pH DETERMINATION
(AASHTO T289)

Project Name:	CCR Ph. 3D	Project Number:	G5662.03-00019
Description of Sample:	LEAN CLAY (CL/A-7-6)	Date Received	9/12/2025
Tested By:	AHR	Date Tested:	10/8/2025

Boring ID	P3D-B22
Boring Depth	4.0 - 6.0
FME Lab ID No.	25-3377
pH Value	6.95
Temperature (˚C)	21.5

Date Reviewed: 10/20/2025 Reviewed By: J. Heirs

This report shall not be reproduced, except in full,
without the written approval of F&ME Consultants, Inc.
211 Business Park Blvd., Columbia, SC 29203

SOIL RESISTIVITY
(AASHTO T288)

Project Name:	CCR Ph. 3D	Project ID:	G5662.03-00019
Location:	--	FME Lab ID No.:	25-3577
Sampled By:	BV	Date Sampled:	9/12/2025
Soil Description:	LEAN CLAY (CL/A-7-6)	Date Received:	9/12/2025
Tested By:	AHR	Date Tested:	10/10/2025

Boring No.	Sample Depth (ft.)	Minimum Soil Resistivity, Ω-cm
P3D-B22	4.0 - 6.0	2,615

Date Reviewed: 10/20/2025 Reviewed By: J. Hiers

This report shall not be reproduced, except in full,
without the written approval of F&ME Consultants, Inc.
211 Business Park Blvd., Columbia, SC 29203

Water-Soluble Sulfate Ion Content in Soil

AASHTO T 290-95 (2020)

Client:	F&ME Consultants, Inc.	Boring No.:	P3D-B22
Client Reference:	CCR - Ph. 3D G5662.04-00014	Depth (ft):	4.0-6.0'
Project No.:	2025-699-001	Sample No.:	P3D-B22
Lab ID:	2025-699-001-002	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	8	19	45	59	122	157	232

Measurement of Barium Chloride Turbidity

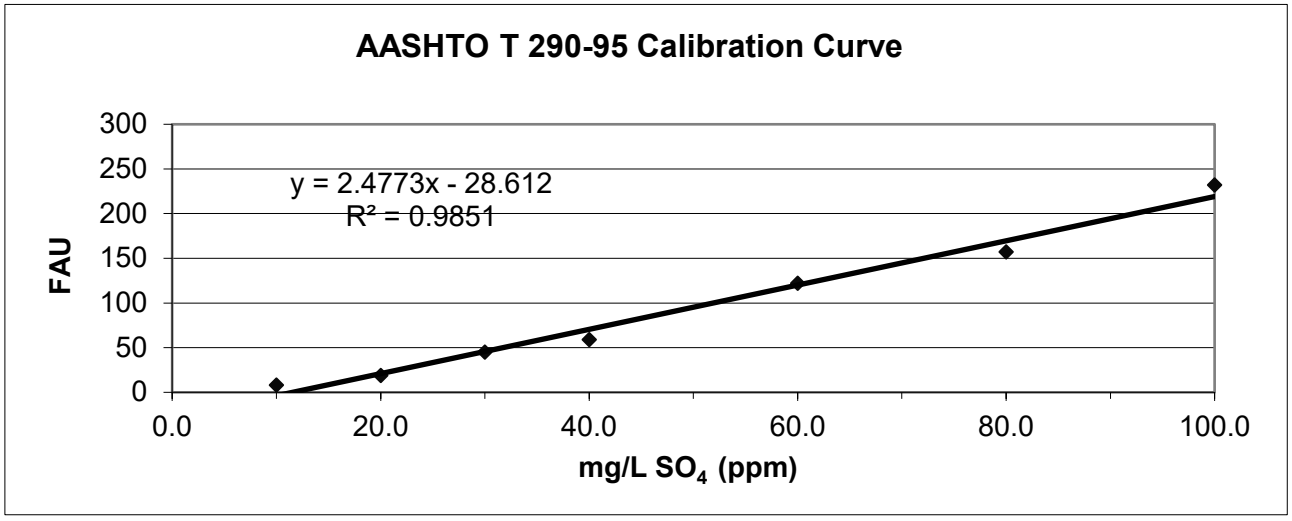
(Sample contains 5.0 mL NaCl solution and 0.3 g $BaCl_2 \cdot 2H_2O$)

Sample Weight (g):	100.0
Water added to Sample (mL):	300.0
Size of Sample Aliquot (mL):	50.0
Sample Reading (FAU):	22
Sample Diluted:	No
Sulfate Solution Added (ml):	0

Sample Moisture Content

Tare Number:	406
Weight of Tare & Wet Sample (g):	249.79
Weight of Tare & Dry Sample (g):	245.61
Weight of Tare (g):	97.34
Weight of Water (g):	4.18
Weight of Dry Sample (g):	148.27
Moisture Content (%):	2.82

Sample Sulfate Ion Concentration:	20.43	**mg/L SO_4 (ppm)**
Sample Sulfate Ion Content:	61.3	**mg/Kg SO_4 (not corrected for moisture)**
Sample Sulfate Ion Content:	63.1	**mg/Kg SO_4 (corrected for moisture)**



Tested by: JAM Date: 10/27/25 Checked by: EG Date: 10/28/2025

544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

CHLORIDE ION CONTENT IN SOILS

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

Client:	F&ME Consultants, Inc.	Boring No.:	P3D-B22
Client Reference:	CCR - Ph. 3D G5662.04-00014	Depth (ft):	4.0-6.0'
Project No.:	2025-699-001	Sample No.:	P3D-B22
Lab ID:	2025-699-001-002	Description:	Brown

(- # 10 Sieve material)

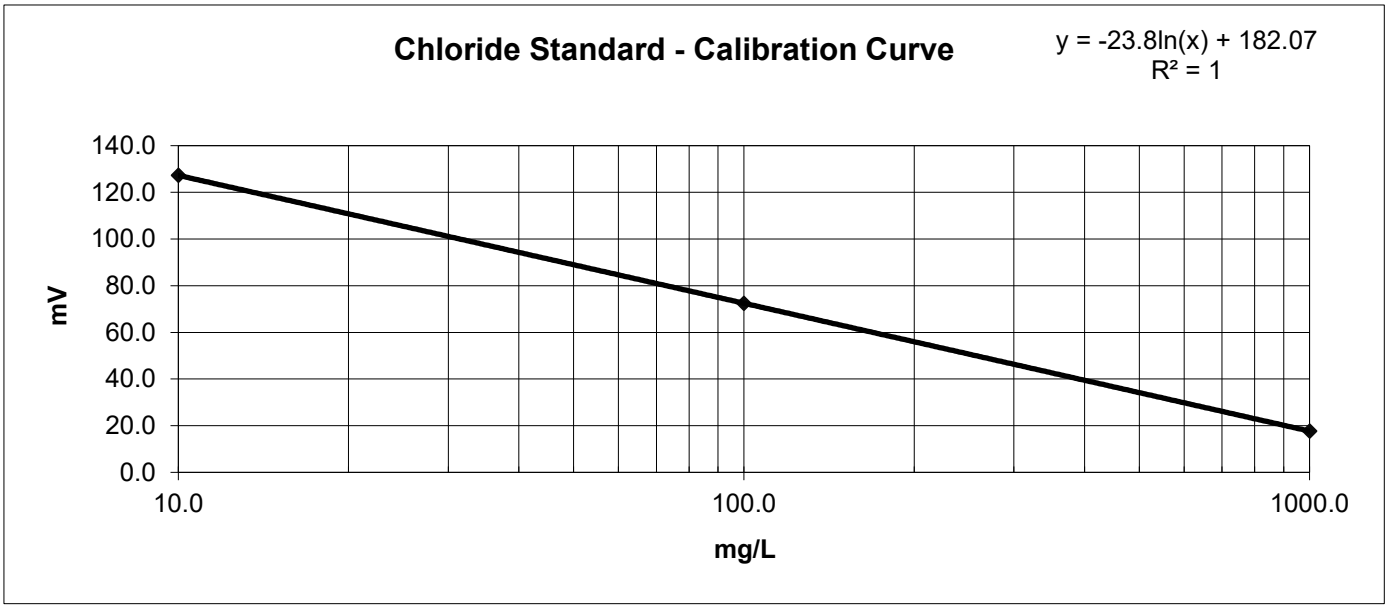
CHLORIDE STANDARD: CALIBRATION CURVE

STANDARD		MILLIVOLTS (mV)
10.0	mg/L	127.3
100.0	mg/L	72.4
1000.0	mg/L	17.7

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):	124.0	11.47	11.47

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°C.



Notes:

Tested By	JAM	Date	10/27/25	Checked By	EG	Date	10/28/25

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

544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	CCR Ph. 3D	**PROJECT NO.:**	G5662.030
SAMPLE NUMBER:	25-2231	**DATE REQUESTED:**	7/14/2025
DESCRIPTION OF SOIL:	Various		
TESTED BY:	MBP/AR	**DATE OF TESTING:**	7/16/2025
WEIGHED BY:	JM	**DATE OF WEIGHING:**	7/17/2025

BORING NO.	P3D-B23	P3D-B23	P3D-B23	P3D-B23	P3D-B23
SAMPLE NO.	SS-2	SS-4	SS-5	SS-6	SS-8
SAMPLE DEPTH	2.0 - 4.0	6.0 - 8.0	8.0 - 10.0	13.5 - 15.0	23.5 - 25.0
WATER CONTENT, W%	31.6	24.0	24.9	23.7	23.8

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

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

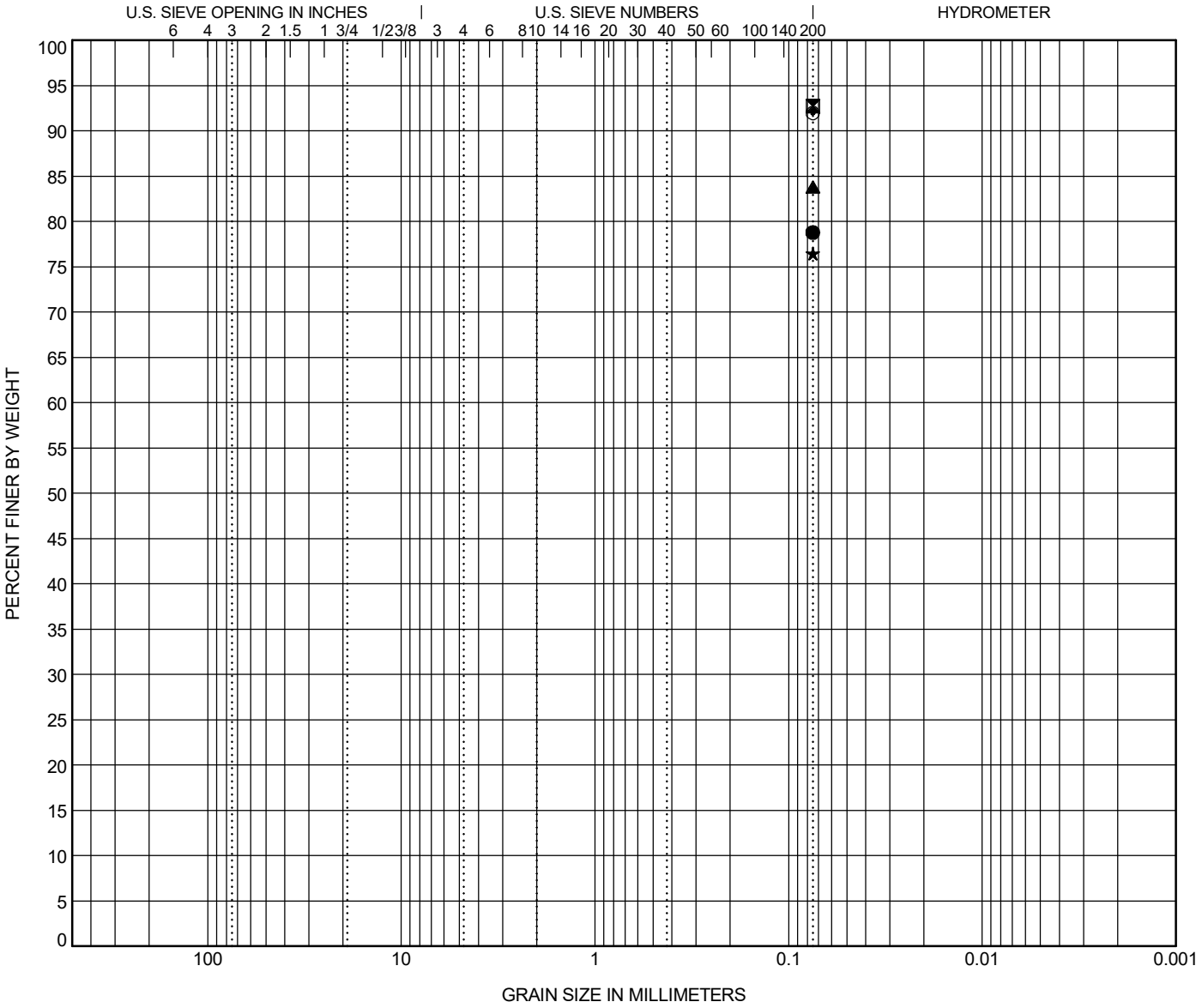
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

This report shall not be reproduced, except in full, without the written approval of F&ME Consultants, Inc.
211 Business Park Boulevard, Columbia SC 29203

GRAIN SIZE DISTRIBUTION

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**P3D-B23**	**4.0**	**SILT with SAND (ML/A-5)**	**42**	**32**	**10**		
⊠	**P3D-B23**	**8.0**	**SILT (ML/A-4)**	**35**	**28**	**7**		
▲	**P3D-B23**	**10.0**	**SILT with SAND (ML/A-4)**	**NP**	**NP**	**NP**		
★	**P3D-B23**	**15.0**	**SILTY CLAY with SAND (CL-ML/A-4)**	**29**	**22**	**7**		
⊙	**P3D-B23**	**25.0**	**SILT (ML/A-4)**	**33**	**25**	**8**		

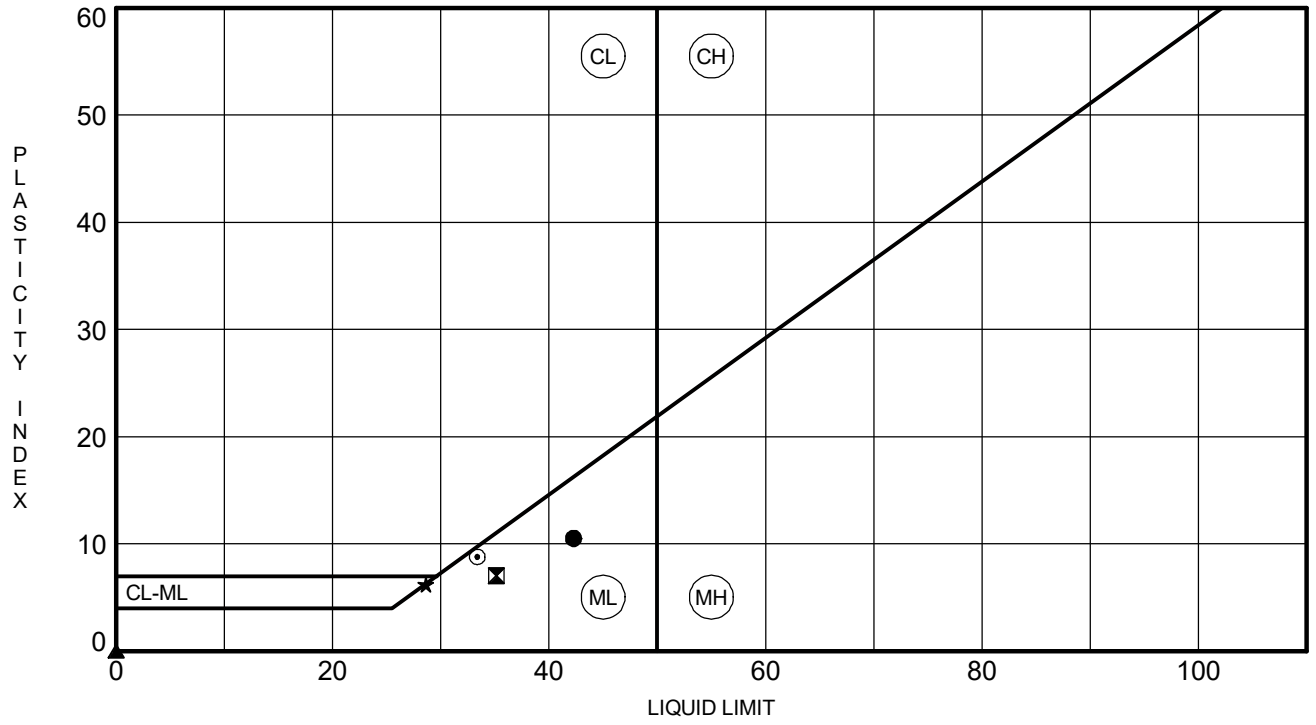
	BOREHOLE	DEPTH	D90	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**P3D-B23**	**4.0**							**78.8**	
⊠	**P3D-B23**	**8.0**							**92.7**	
▲	**P3D-B23**	**10.0**							**83.8**	
★	**P3D-B23**	**15.0**							**76.5**	
⊙	**P3D-B23**	**25.0**							**92.0**	

GRAIN SIZE G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 8/7/25

ATTERBERG LIMITS' RESULTS

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**P3D-B23**	**4.0**	**42**	**32**	**10**	**78.8**	**SILT with SAND (ML/A-5)**
⊠	**P3D-B23**	**8.0**	**35**	**28**	**7**	**92.7**	**SILT (ML/A-4)**
▲	**P3D-B23**	**10.0**	**NP**	**NP**	**NP**	**83.8**	**SILT with SAND (ML/A-4)**
★	**P3D-B23**	**15.0**	**29**	**22**	**7**	**76.5**	**SILTY CLAY with SAND (CL-ML/A-4)**
⊙	**P3D-B23**	**25.0**	**33**	**25**	**8**	**92.0**	**SILT (ML/A-4)**

ATTERBERG LIMITS G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 8/7/25

pH DETERMINATION
(AASHTO T289)

Project Name:	CCR Ph. 3D	Project Number:	G5662.03-00019
Description of Sample:	Soil Sample (Composite)	Date Received	7/9/2025
Tested By:	AG	Date Tested:	7/31/2025

Boring ID	P3D-B23
Boring Depth	0.0 - 20.0
FME Lab ID No.	25-2231
pH Value	7.43
Temperature (˚C)	22.30

Date Reviewed: 8/11/2025 Reviewed By: J. Heirs

This report shall not be reproduced, except in full,
without the written approval of F&ME Consultants, Inc.
211 Business Park Blvd., Columbia, SC 29203

SOIL RESISTIVITY
(AASHTO T288)

Project Name:	CCR Ph. 3D	Project ID:	G5662.03-00019
Location:	Soil Sample (Composite)	FME Lab ID No.:	25-2231
Sampled By:	G. Cantelle	Date Sampled:	7/9/2025
Soil Description:	Composite	Date Received:	7/9/2025
Tested By:	A. Ross	Date Tested:	8/11/2025

Boring No.	Sample Depth (ft.)	Minimum Soil Resistivity, Ω-cm
P3D-B23	0.0 - 20.0	4,362

Date Reviewed: 8/11/2025 Reviewed By: J. Hiers

This report shall not be reproduced, except in full,
without the written approval of F&ME Consultants, Inc.
211 Business Park Blvd., Columbia, SC 29203

Water-Soluble Sulfate Ion Content in Soil

AASHTO T 290-95 (2020)

Client:	F&ME Consultants, Inc.	Boring No.:	P3D-B23
Client Reference:	CCR Ph. 3D G5662.03	Depth (ft):	0.0-20.0'
Project No.:	2025-517-001	Sample No.:	SS-1/2/3/4/5/6/7
Lab ID:	2025-517-001-003	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	8	19	45	59	122	157	232

Measurement of Barium Chloride Turbidity

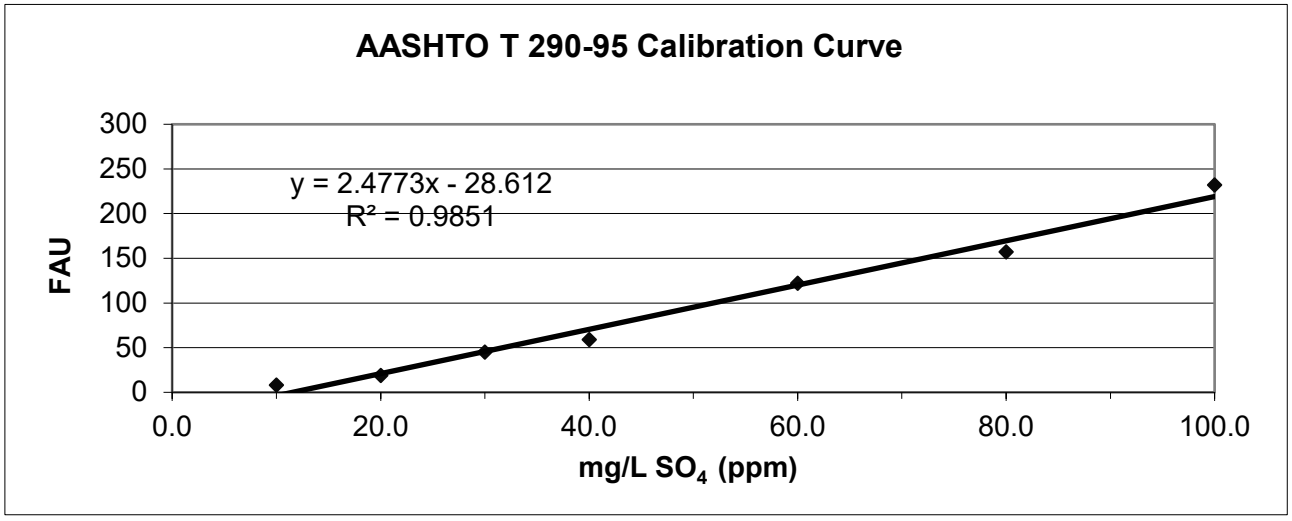
(Sample contains 5.0 mL NaCl solution and 0.3 g $BaCl_2 \cdot 2H_2O$)

Sample Weight (g):	100.0
Water added to Sample (mL):	300.0
Size of Sample Aliquot (mL):	50.0
Sample Reading (FAU):	19
Sample Diluted:	No
Sulfate Solution Added (ml):	0

Sample Moisture Content

Tare Number:	479
Weight of Tare & Wet Sample (g):	233.60
Weight of Tare & Dry Sample (g):	229.75
Weight of Tare (g):	97.70
Weight of Water (g):	3.85
Weight of Dry Sample (g):	132.05
Moisture Content (%):	2.92

Sample Sulfate Ion Concentration:	19.22	**mg/L SO_4 (ppm)**
Sample Sulfate Ion Content:	57.7	**mg/Kg SO_4 (not corrected for moisture)**
Sample Sulfate Ion Content:	59.4	**mg/Kg SO_4 (corrected for moisture)**



Tested by: JAM Date: 8/1/25 Checked by: EG Date: 8/4/2025

544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

CHLORIDE ION CONTENT IN SOILS

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

Client:	F&ME Consultants, Inc.	Boring No.:	P3D-B23
Client Reference:	CCR Ph. 3D G5662.03	Depth (ft):	0.0-20.0'
Project No.:	2025-517-001	Sample No.:	SS-1/2/3/4/5/6/7
Lab ID:	2025-517-001-003	Description:	Brown

(- # 10 Sieve material)

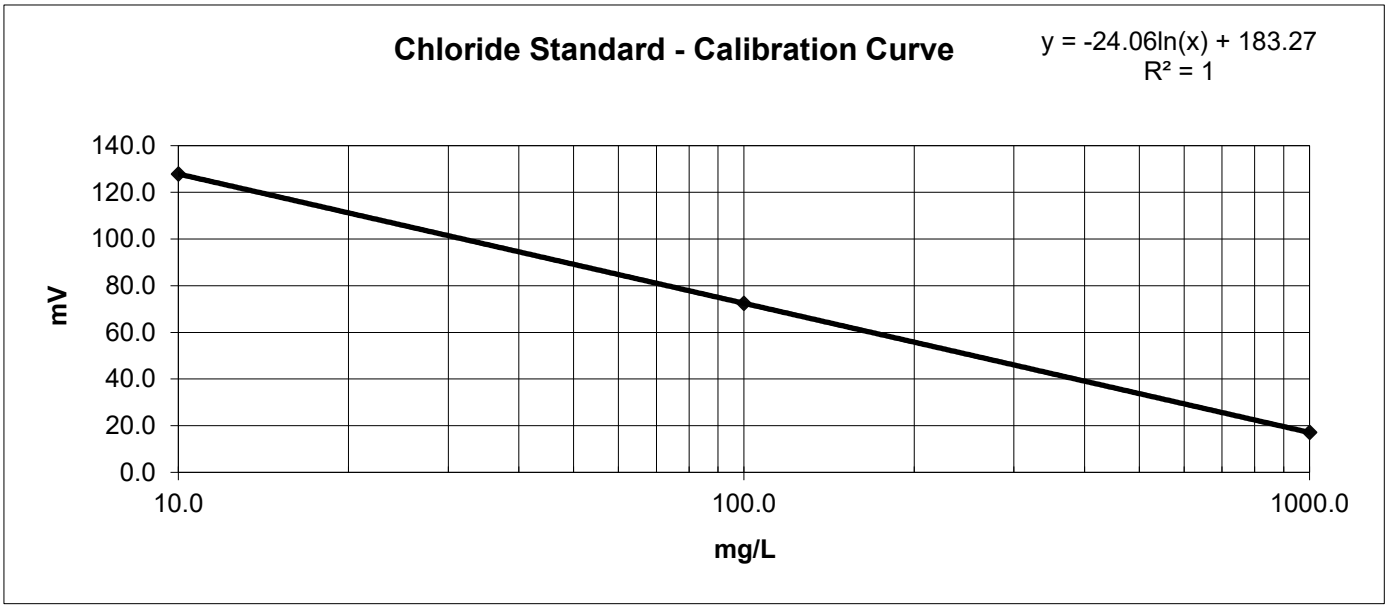
CHLORIDE STANDARD: CALIBRATION CURVE

STANDARD		MILLIVOLTS (mV)
10.0	mg/L	127.9
100.0	mg/L	72.4
1000.0	mg/L	17.1

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):	119.4	14.22	14.22

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°C.



Notes:

Tested By	JAM	Date	8/1/25	Checked By	EG	Date	8/4/25

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

544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	CCR Ph. 3D	**PROJECT NO.:**	G5662.030
SAMPLE NUMBER:	25-3405	**DATE REQUESTED:**	9/19/2025
DESCRIPTION OF SOIL:	Various		
TESTED BY:	AHR/MMP	**DATE OF TESTING:**	10/7/2025
WEIGHED BY:	JM	**DATE OF WEIGHING:**	10/8/2025

BORING NO.	P3D-B24	P3D-B24	P3D-B24	P3D-B24	P3D-B24
SAMPLE NO.	SS-1	SS-2	SS-4	SS-6	SS-7
SAMPLE DEPTH	0.0 - 2.0	2.0 - 4.0	6.0 - 8.0	13.5 - 15.0	18.5 - 20.0
WATER CONTENT, W%	14.0	15.2	17.9	19.3	29.1

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

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

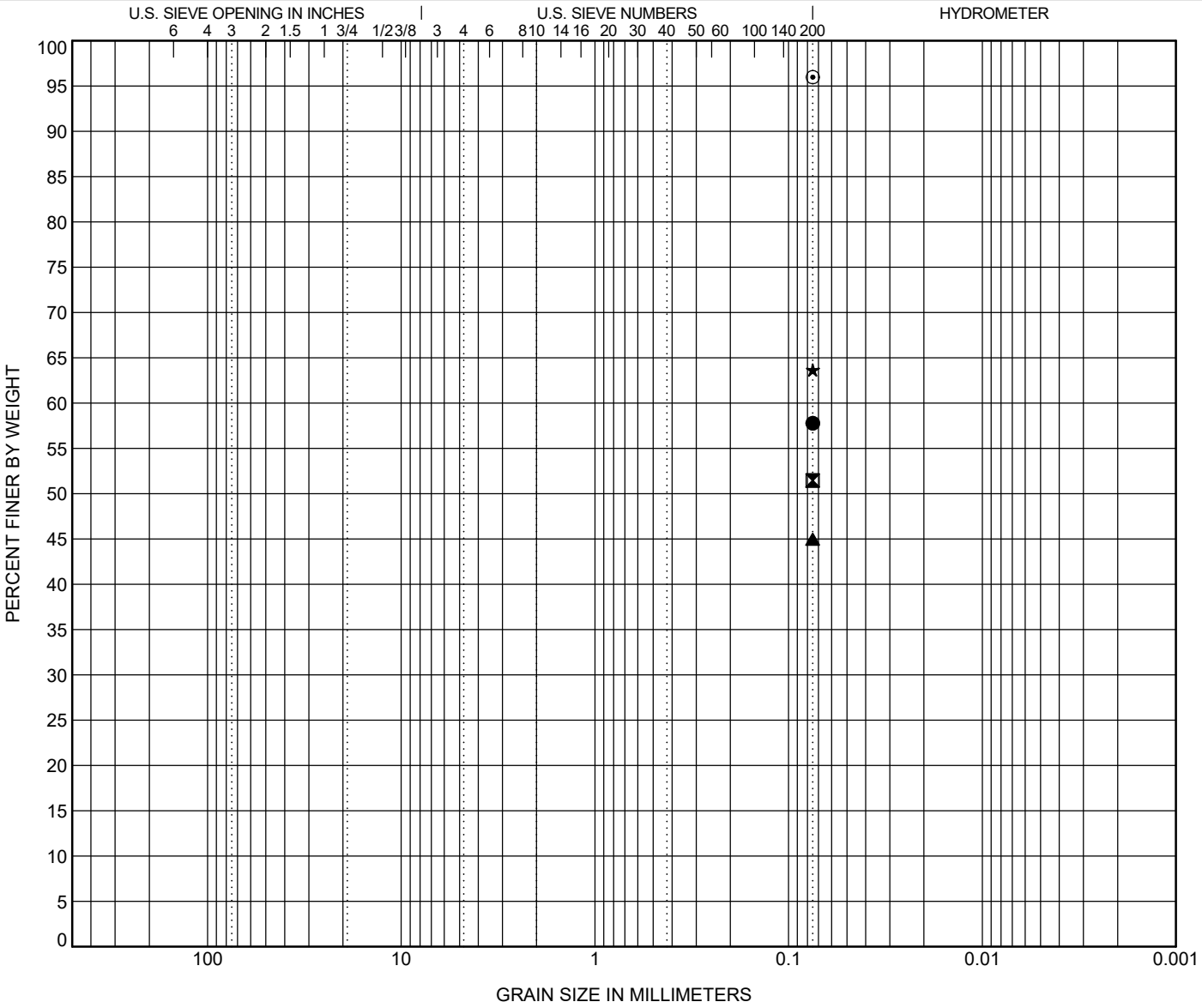
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

This report shall not be reproduced, except in full, without the written approval of F&ME Consultants, Inc.
211 Business Park Boulevard, Columbia SC 29203

GRAIN SIZE DISTRIBUTION

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads Phase 3D

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**P3D-B24**	**2.0**	**SANDY LEAN CLAY (CL/A-6)**	**33**	**19**	**14**		
⊠	**P3D-B24**	**4.0**	**SANDY LEAN CLAY (CL/A-6)**					
▲	**P3D-B24**	**8.0**	**CLAYEY SAND (SC/A-6)**	**34**	**23**	**11**		
★	**P3D-B24**	**15.0**	**SANDY SILTY CLAY (CL-ML/A-4)**	**23**	**18**	**5**		
⊙	**P3D-B24**	**20.0**	**LEAN CLAY (CL/A-7-6)**	**44**	**21**	**23**		

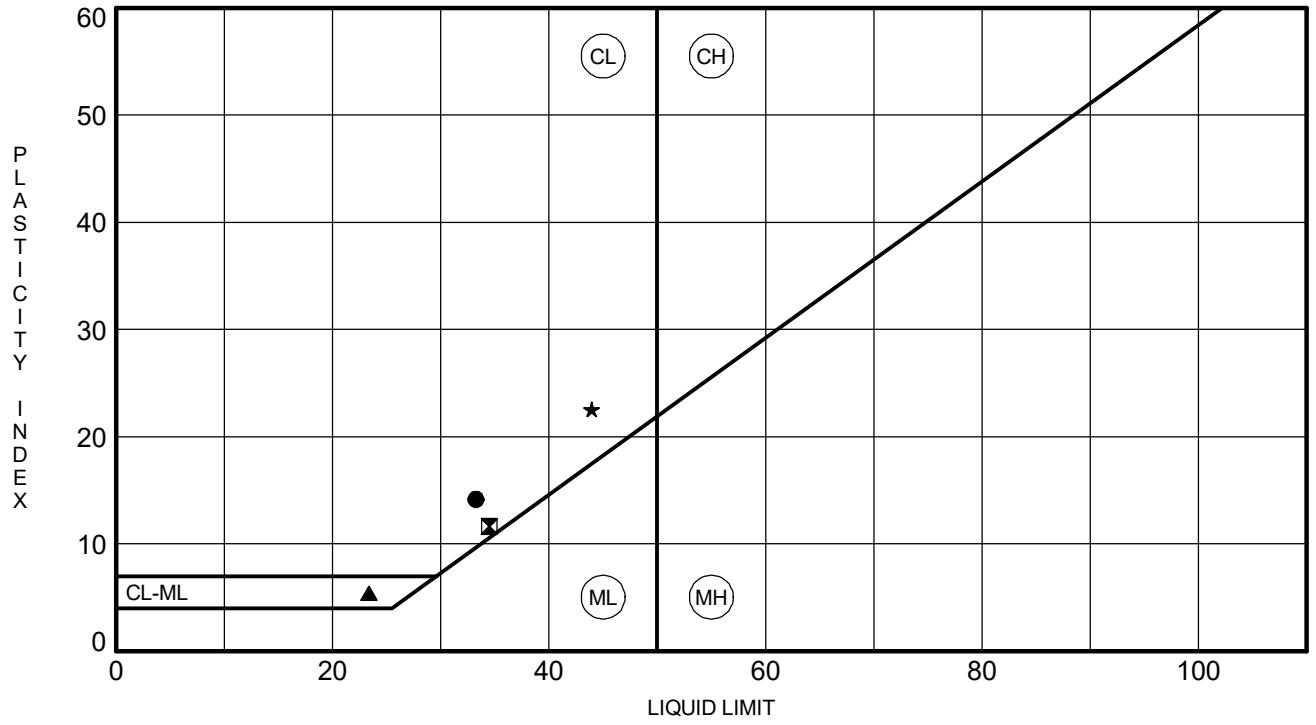
	BOREHOLE	DEPTH	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**P3D-B24**	**2.0**	**0.075**						**57.8**	
⊠	**P3D-B24**	**4.0**	**0.075**						**51.4**	
▲	**P3D-B24**	**8.0**	**0.075**						**45.0**	
★	**P3D-B24**	**15.0**	**0.075**						**63.7**	
⊙	**P3D-B24**	**20.0**	**0.075**						**96.0**	

GRAIN SIZE G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/24/25

ATTERBERG LIMITS' RESULTS

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads Phase 3D

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**P3D-B24**	**2.0**	**33**	**19**	**14**	**57.8**	**SANDY LEAN CLAY (CL/A-6)**
⊠	**P3D-B24**	**8.0**	**34**	**23**	**11**	**45.0**	**CLAYEY SAND (SC/A-6)**
▲	**P3D-B24**	**15.0**	**23**	**18**	**5**	**63.7**	**SANDY SILTY CLAY (CL-ML/A-4)**
★	**P3D-B24**	**20.0**	**44**	**21**	**23**	**96.0**	**LEAN CLAY (CL/A-7-6)**

ATTERBERG LIMITS G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/21/25

REV 12/2023

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	CCR Ph. 3D	**PROJECT NO.:**	G5662.030
SAMPLE NUMBER:	25-3590	**DATE REQUESTED:**	10/3/2025
DESCRIPTION OF SOIL:	Various		
TESTED BY:	JM/AKG	**DATE OF TESTING:**	10/12/2025
WEIGHED BY:	AC	**DATE OF WEIGHING:**	10/13/2025

BORING NO.	P3D-B26	P3D-B26	P3D-B26	P3D-B26	P3D-B26
SAMPLE NO.	SS-1	SS-2	SS-3	SS-5	SS-7
SAMPLE DEPTH	15.2 - 17.2	17.2 - 19.2	19.2 - 21.2	23.2 - 25.2	33.7 - 25.7
WATER CONTENT, W%	21.6	32.2	48.3	49.2	10.3

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

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

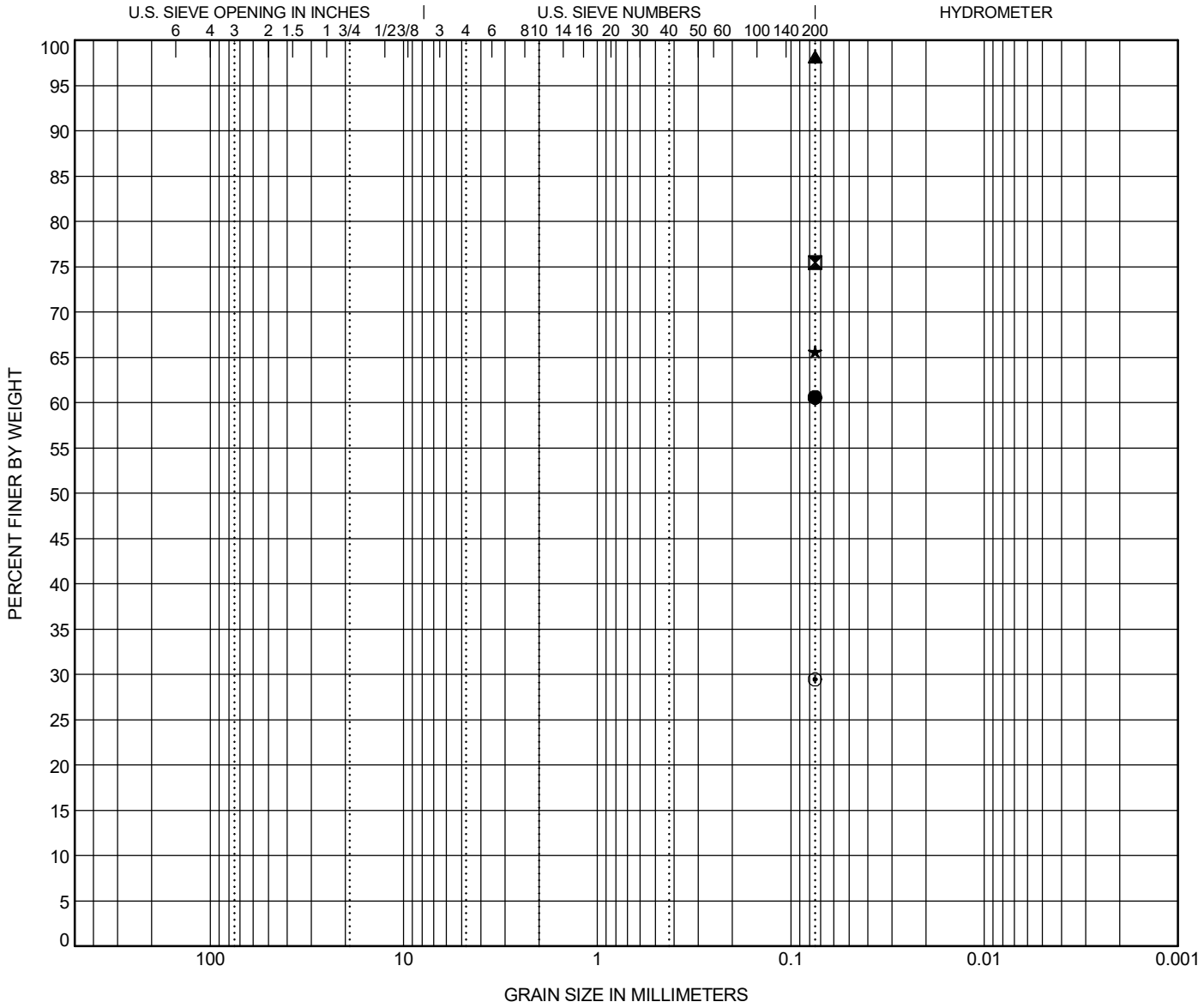
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

This report shall not be reproduced, except in full, without the written approval of F&ME Consultants, Inc.
211 Business Park Boulevard, Columbia SC 29203

GRAIN SIZE DISTRIBUTION

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads Phase 3D

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**P3D-B26**	**17.2**	**SANDY LEAN CLAY (CL/A-6)**	**37**	**18**	**19**		
⊠	**P3D-B26**	**19.2**	**LEAN CLAY with SAND (CL/A-6)**	**34**	**18**	**16**		
▲	**P3D-B26**	**21.2**	**LEAN CLAY (CL/A-7-6)**	**47**	**22**	**25**		
★	**P3D-B26**	**25.2**	**SANDY LEAN CLAY (CL/A-6)**	**33**	**18**	**15**		
⊙	**P3D-B26**	**35.7**	**CLAYEY SAND (SC/A-2-6)**					

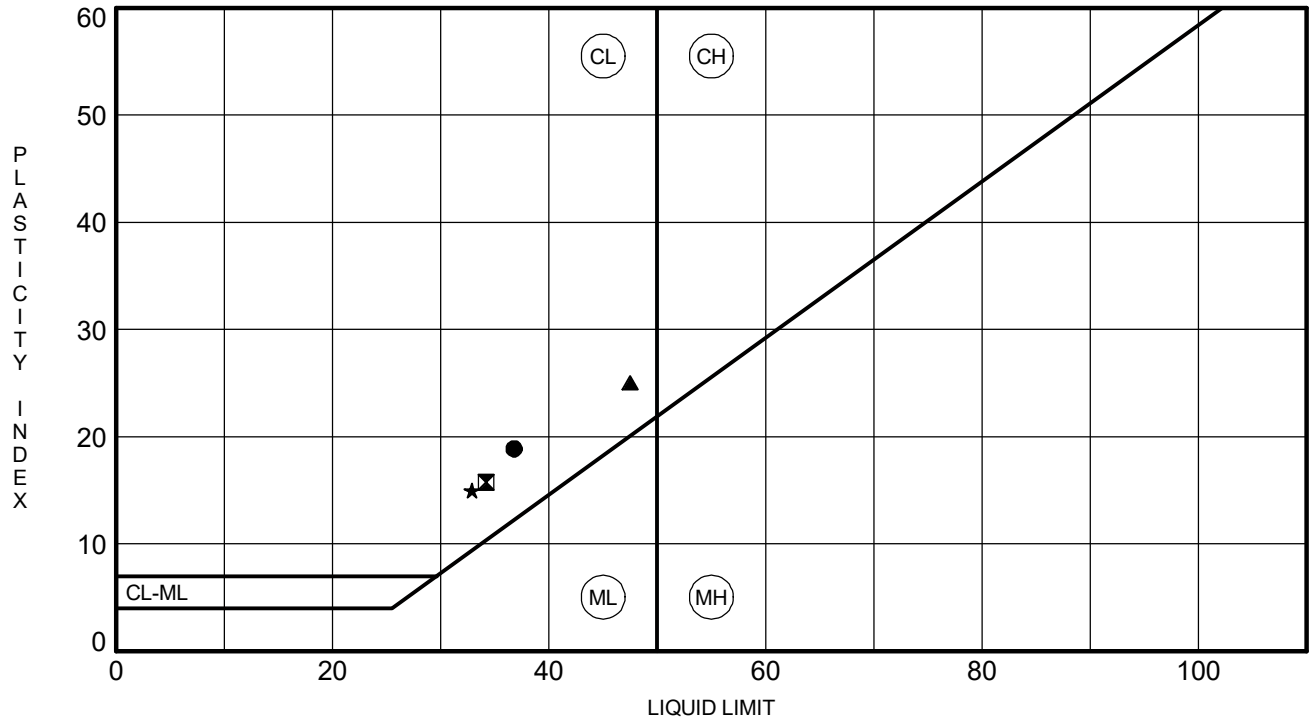
	BOREHOLE	DEPTH	D90	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**P3D-B26**	**17.2**							**60.6**	
⊠	**P3D-B26**	**19.2**							**75.5**	
▲	**P3D-B26**	**21.2**							**98.2**	
★	**P3D-B26**	**25.2**							**65.6**	
⊙	**P3D-B26**	**35.7**							**29.5**	

GRAIN SIZE G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/17/25

ATTERBERG LIMITS' RESULTS

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads Phase 3D

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**P3D-B26**	**17.2**	**37**	**18**	**19**	**60.6**	**SANDY LEAN CLAY (CL/A-6)**
⊠	**P3D-B26**	**19.2**	**34**	**18**	**16**	**75.5**	**LEAN CLAY with SAND (CL/A-6)**
▲	**P3D-B26**	**21.2**	**47**	**22**	**25**	**98.2**	**LEAN CLAY (CL/A-7-6)**
★	**P3D-B26**	**25.2**	**33**	**18**	**15**	**65.6**	**SANDY LEAN CLAY (CL/A-6)**

ATTERBERG LIMITS G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/17/25

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	CCR Ph. 3D	**PROJECT NO.:**	G5662.030
SAMPLE NUMBER:	25-3589	**DATE REQUESTED:**	10/3/2025
DESCRIPTION OF SOIL:	Various		
TESTED BY:	JM/AKG	**DATE OF TESTING:**	10/12/2025
WEIGHED BY:	AC	**DATE OF WEIGHING:**	10/13/2025

BORING NO.	P3D-B27	P3D-B27	P3D-B27	P3D-B27	
SAMPLE NO.	SS-2	SS-4	SS-6	SS-8	
SAMPLE DEPTH	2.0 - 4.0	6.0 - 8.0	13.5 - 15.0	23.5 - 25.0	
WATER CONTENT, W%	18.3	20.9	30.2	23.5	

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

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

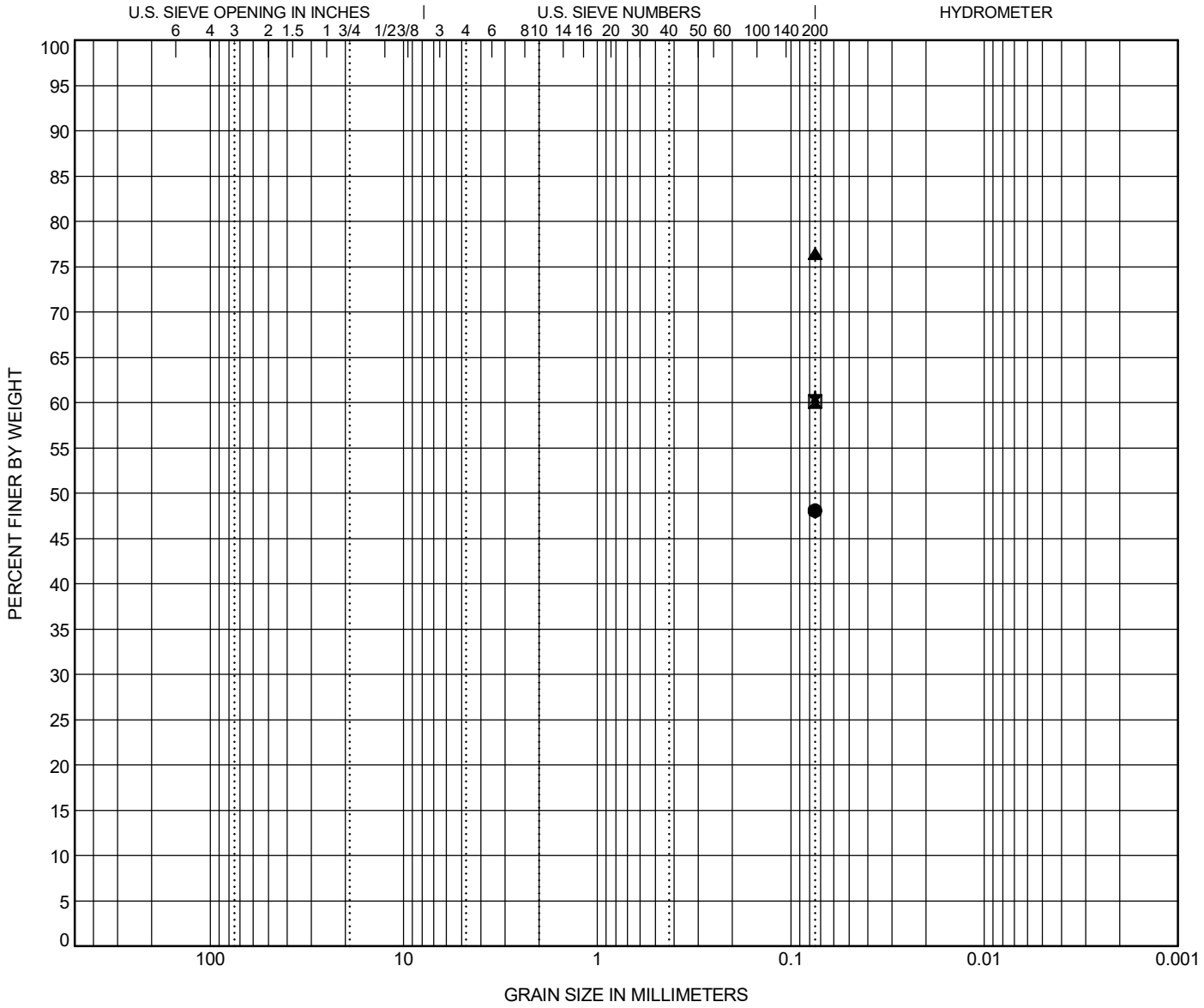
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

This report shall not be reproduced, except in full, without the written approval of F&ME Consultants, Inc.
211 Business Park Boulevard, Columbia SC 29203

GRAIN SIZE DISTRIBUTION

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads Phase 3D

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**P3D-B27**	**4.0**	**CLAYEY SAND (SC/A-7-6)**	**47**	**22**	**25**		
⊠	**P3D-B27**	**8.0**	**SANDY LEAN CLAY (CL/A-6)**	**39**	**17**	**22**		
▲	**P3D-B27**	**15.0**	**SILT with SAND (ML/A-7-6)**	**45**	**28**	**17**		
★	**P3D-B27**	**25.0**	**SANDY LEAN CLAY (CL/A-6)**	**30**	**17**	**13**		

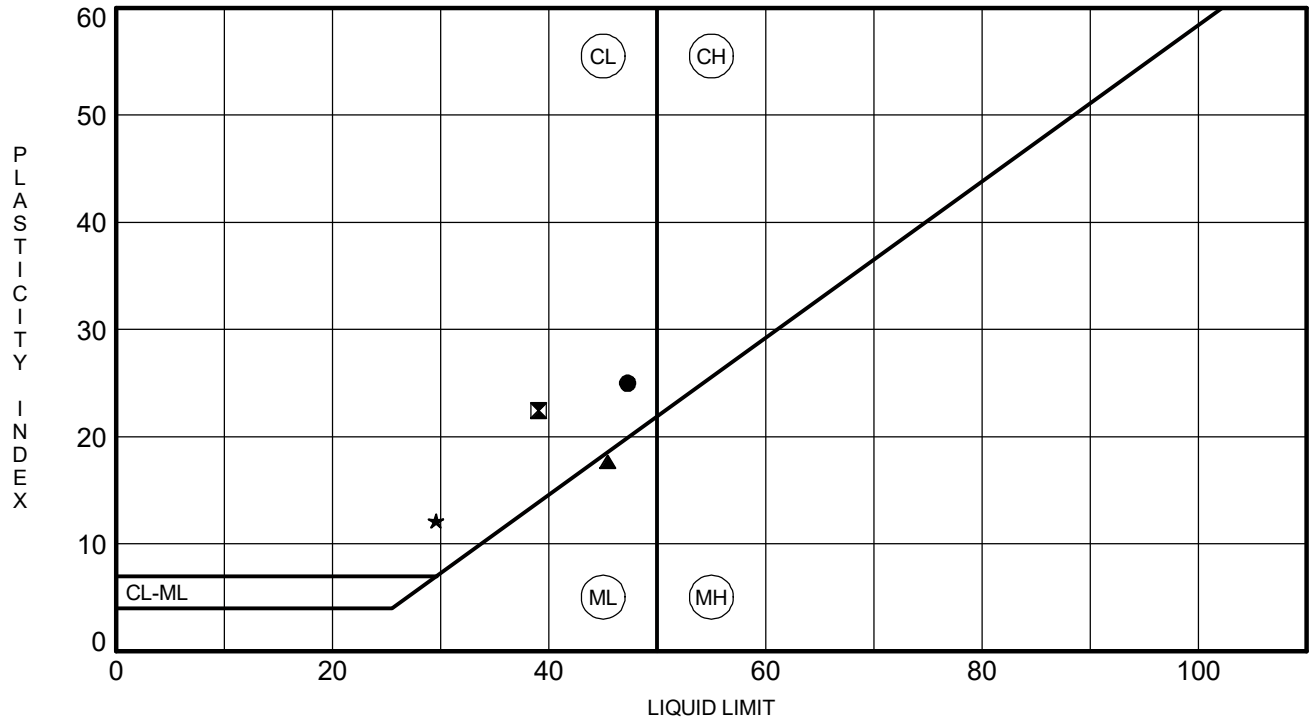
	BOREHOLE	DEPTH	D90	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**P3D-B27**	**4.0**							**48.1**	
⊠	**P3D-B27**	**8.0**							**60.2**	
▲	**P3D-B27**	**15.0**							**76.5**	
★	**P3D-B27**	**25.0**							**60.6**	

GRAIN SIZE G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/17/25

ATTERBERG LIMITS' RESULTS

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads Phase 3D

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**P3D-B27**	**4.0**	**47**	**22**	**25**	**48.1**	**CLAYEY SAND (SC/A-7-6)**
⊠	**P3D-B27**	**8.0**	**39**	**17**	**22**	**60.2**	**SANDY LEAN CLAY (CL/A-6)**
▲	**P3D-B27**	**15.0**	**45**	**28**	**17**	**76.5**	**SILT with SAND (ML/A-7-6)**
★	**P3D-B27**	**25.0**	**30**	**17**	**13**	**60.6**	**SANDY LEAN CLAY (CL/A-6)**

ATTERBERG LIMITS G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/17/25

pH DETERMINATION
(AASHTO T289)

Project Name:	CCR Ph. 3D	Project Number:	G5662.03-00019
Description of Sample:	SANDY LEAN CLAY (CL/A-6)	Date Received	10/3/2025
Tested By:	AHR	Date Tested:	10/15/2025

Boring ID	P3D-B27
Boring Depth	8.0 - 10.0
FME Lab ID No.	25-3589
pH Value	7.17
Temperature (˚C)	21.5

Date Reviewed: 10/20/2025 Reviewed By: J. Heirs

This report shall not be reproduced, except in full,
without the written approval of F&ME Consultants, Inc.
211 Business Park Blvd., Columbia, SC 29203

SOIL RESISTIVITY
(AASHTO T288)

Project Name:	CCR Ph. 3D	Project ID:	G5662.03-00019
Location:	--	FME Lab ID No.:	25-3589
Sampled By:	BV	Date Sampled:	10/3/2025
Soil Description:	SANDY LEAN CLAY (CL/A-6)	Date Received:	10/3/2025
Tested By:	AHR	Date Tested:	10/14/2025

Boring No.	Sample Depth (ft.)	Minimum Soil Resistivity, Ω-cm
P3D-B27	8.0 - 10.0	2,888

Date Reviewed: 10/20/2025 Reviewed By: J. Hiers

This report shall not be reproduced, except in full,
without the written approval of F&ME Consultants, Inc.
211 Business Park Blvd., Columbia, SC 29203

Water-Soluble Sulfate Ion Content in Soil

AASHTO T 290-95 (2020)

Client:	F&ME Consultants, Inc.	Boring No.:	P3D-B27
Client Reference:	CCR - Ph. 3D G5662.03-00019	Depth (ft):	8.0-10.0'
Project No.:	2025-700-001	Sample No.:	SS-1/SS-2/SS-3
Lab ID:	2025-700-001-002	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	8	19	45	59	122	157	232

Measurement of Barium Chloride Turbidity

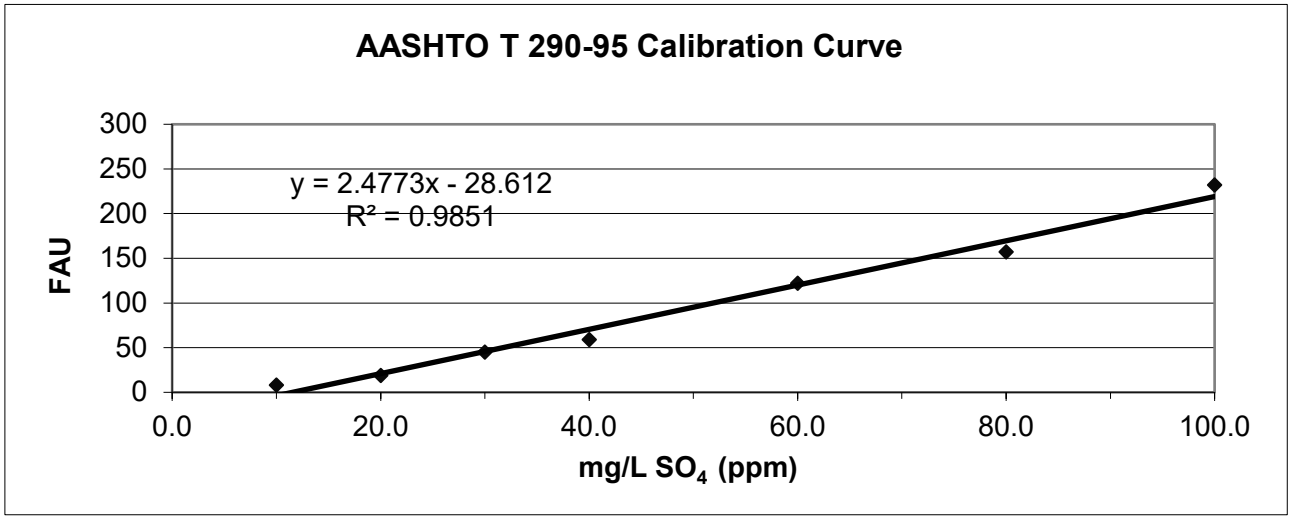
(Sample contains 5.0 mL NaCl solution and 0.3 g $BaCl_2 \cdot 2H_2O$)

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:	442
Weight of Tare & Wet Sample (g):	251.70
Weight of Tare & Dry Sample (g):	248.00
Weight of Tare (g):	98.54
Weight of Water (g):	3.70
Weight of Dry Sample (g):	149.46
Moisture Content (%):	2.48

Sample Sulfate Ion Concentration:	17.20	**mg/L SO_4 (ppm)**
Sample Sulfate Ion Content:	51.6	**mg/Kg SO_4 (not corrected for moisture)**
Sample Sulfate Ion Content:	52.9	**mg/Kg SO_4 (corrected for moisture)**



Tested by: JAM Date: 10/27/25 Checked by: EG Date: 10/28/2025

544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

CHLORIDE ION CONTENT IN SOILS

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

Client:	F&ME Consultants, Inc.	Boring No.:	P3D-B27
Client Reference:	CCR - Ph. 3D G5662.03-00019	Depth (ft):	8.0-10.0'
Project No.:	2025-700-001	Sample No.:	SS-1/SS-2/SS-3
Lab ID:	2025-700-001-002	Description:	Brown

(- # 10 Sieve material)

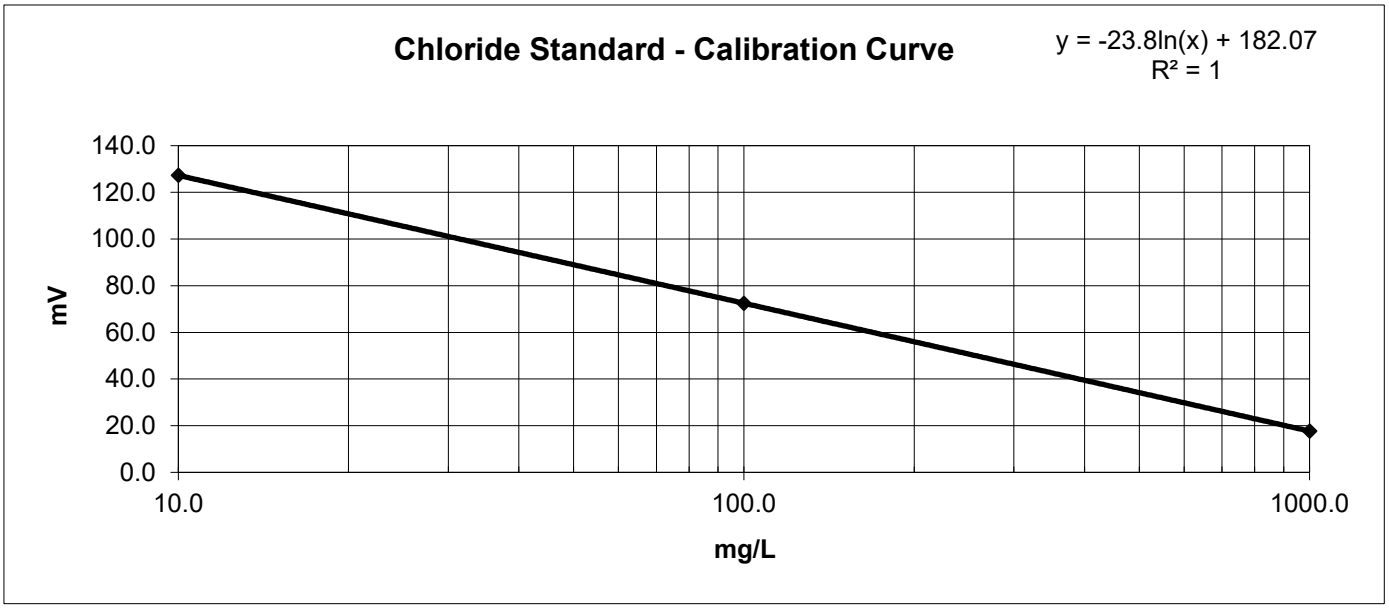
CHLORIDE STANDARD: CALIBRATION CURVE

STANDARD		MILLIVOLTS (mV)
10.0	mg/L	127.3
100.0	mg/L	72.4
1000.0	mg/L	17.7

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):	110.6	20.14	20.14

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°C.



Notes:

Tested By	JAM	Date	10/27/25	Checked By	EG	Date	10/28/25

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

544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	CCR Ph. 3D	**PROJECT NO.:**	G5662.030
SAMPLE NUMBER:	25-1803	**DATE REQUESTED:**	6/10/2025
DESCRIPTION OF SOIL:	Various		
TESTED BY:	BW/MW	**DATE OF TESTING:**	6/24/2025
WEIGHED BY:	MW	**DATE OF WEIGHING:**	6/25/2025

BORING NO.	P3D-C1	P3D-C1	P3D-C1	P3D-C1	
SAMPLE NO.	SS-1	SS-2	SS-3	SS-5	
SAMPLE DEPTH	0.0 - 2.0	2.0 - 4.0	4.0 - 6.0	8.0 - 10.0	
WATER CONTENT, W%	22.0	11.5	16.3	13.9	

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

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

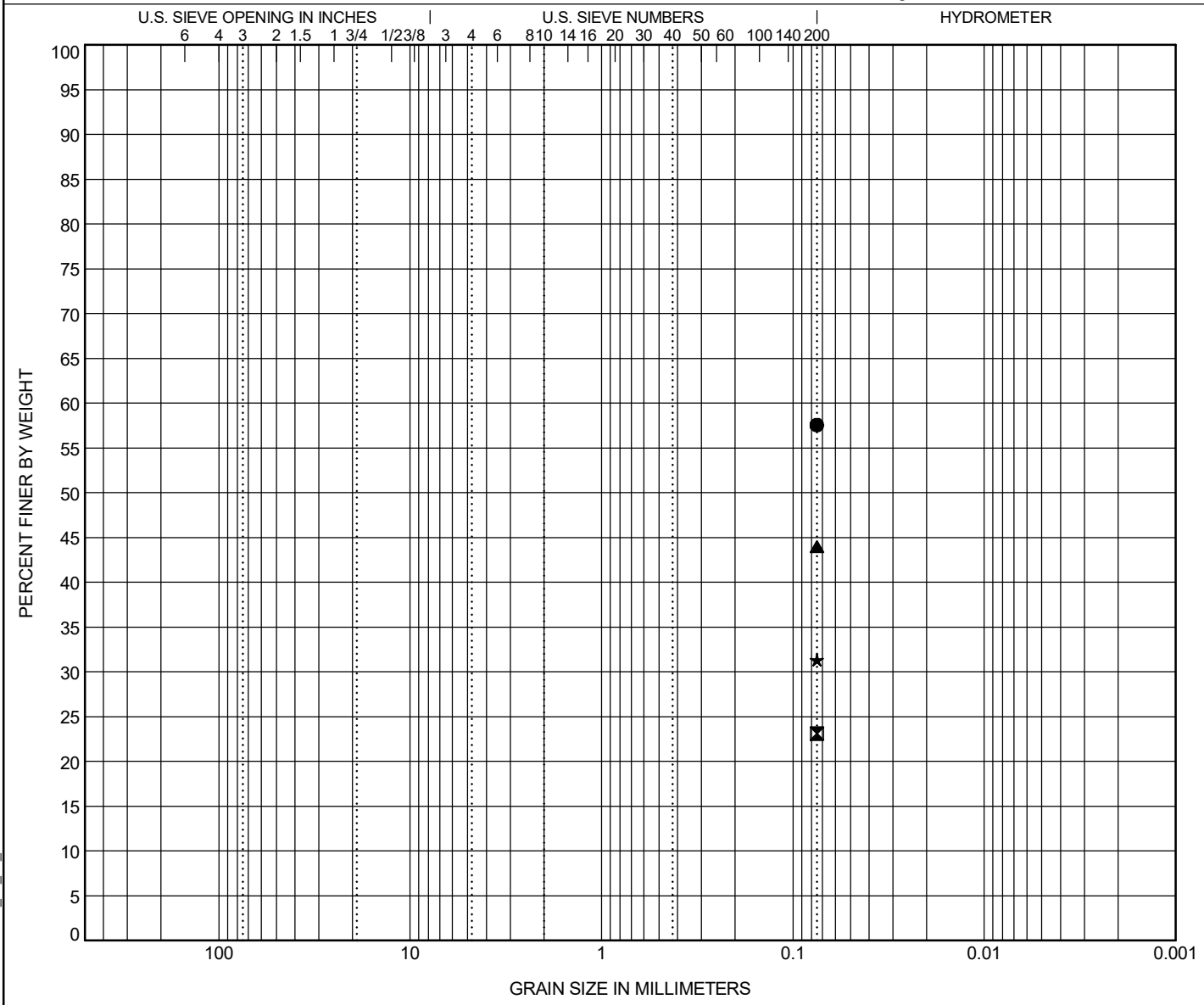
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

This report shall not be reproduced, except in full, without the written approval of F&ME Consultants, Inc.
211 Business Park Boulevard, Columbia SC 29203

GRAIN SIZE DISTRIBUTION

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**P3D-C1**	**2.0**	**SANDY LEAN CLAY (CL/A-4)**	**28**	**19**	**9**		
⊠	**P3D-C1**	**4.0**	**SILTY, CLAYEY SAND (SC-SM/A-2-4)**	**18**	**14**	**4**		
▲	**P3D-C1**	**6.0**	**CLAYEY SAND (SC/A-6)**	**33**	**14**	**19**		
★	**P3D-C1**	**10.0**	**CLAYEY SAND (SC/A-2-6)**	**30**	**15**	**15**		

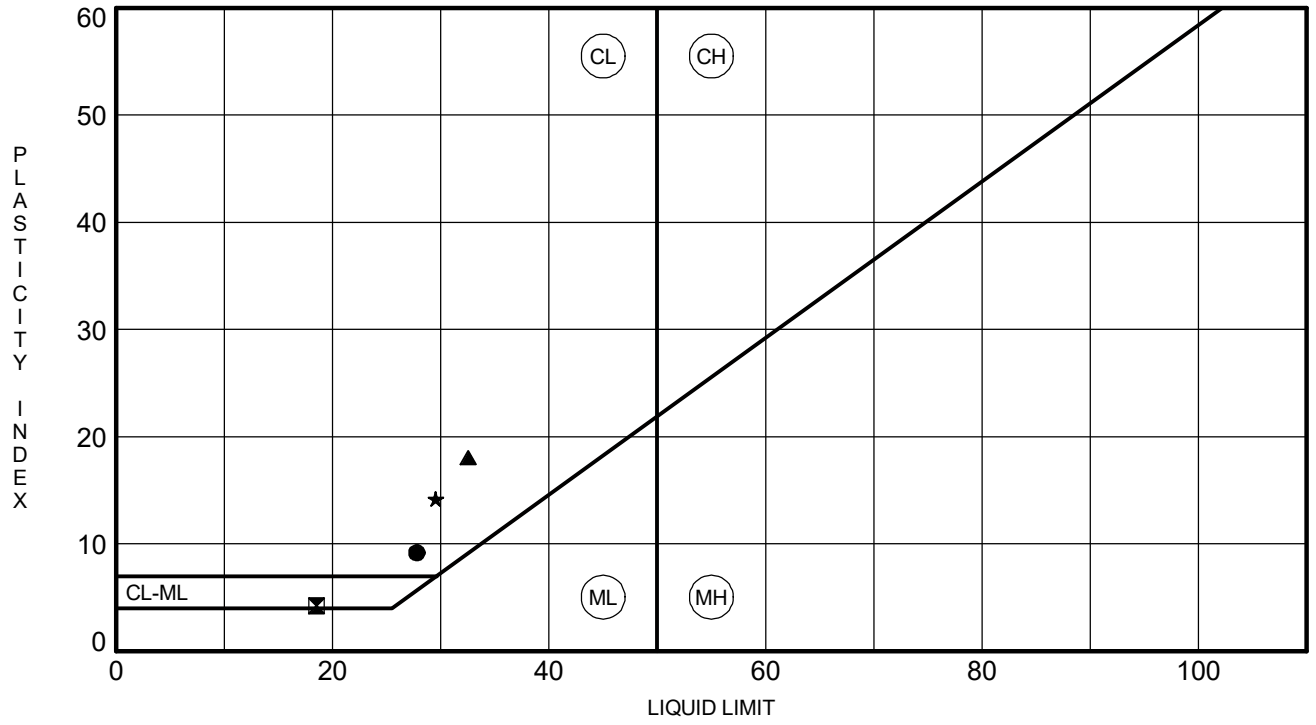
	BOREHOLE	DEPTH	D90	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**P3D-C1**	**2.0**							**57.6**	
⊠	**P3D-C1**	**4.0**							**23.1**	
▲	**P3D-C1**	**6.0**							**44.0**	
★	**P3D-C1**	**10.0**							**31.3**	

GRAIN SIZE G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 7/9/25

ATTERBERG LIMITS' RESULTS

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**P3D-C1**	**2.0**	**28**	**19**	**9**	**57.6**	**SANDY LEAN CLAY (CL/A-4)**
⊠	**P3D-C1**	**4.0**	**18**	**14**	**4**	**23.1**	**SILTY, CLAYEY SAND (SC-SM/A-2-4)**
▲	**P3D-C1**	**6.0**	**33**	**14**	**19**	**44.0**	**CLAYEY SAND (SC/A-6)**
★	**P3D-C1**	**10.0**	**30**	**15**	**15**	**31.3**	**CLAYEY SAND (SC/A-2-6)**

ATTERBERG LIMITS G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 7/9/25

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	CCR Ph. 3D	**PROJECT NO.:**	G5662.030
SAMPLE NUMBER:	25-1804	**DATE REQUESTED:**	6/10/2025
DESCRIPTION OF SOIL:	Various		
TESTED BY:	BW/MW	**DATE OF TESTING:**	6/24/2025
WEIGHED BY:	MW	**DATE OF WEIGHING:**	6/25/2025

BORING NO.	P3D-C2	P3D-C2	P3D-C2	P3D-C2	P3D-C2
SAMPLE NO.	SS-1	SS-2	SS-3	SS-4	SS-5
SAMPLE DEPTH	0.0 - 2.0	2.0 - 4.0	4.0 - 6.0	6.0 - 8.0	8.0 - 10.0
WATER CONTENT, W%	24.5	19.9	11.7	17.1	16.9

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

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

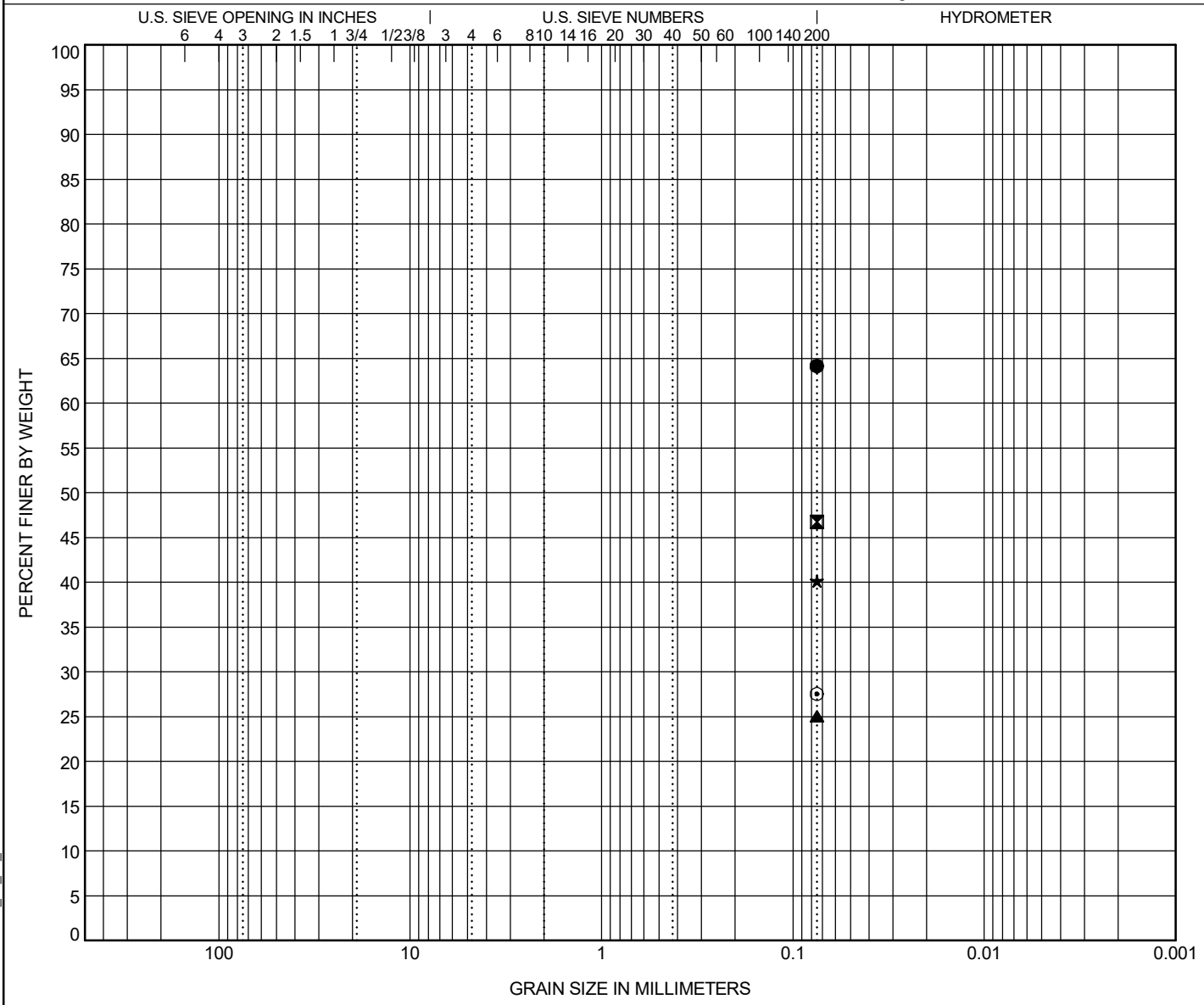
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

This report shall not be reproduced, except in full, without the written approval of F&ME Consultants, Inc.
211 Business Park Boulevard, Columbia SC 29203

GRAIN SIZE DISTRIBUTION

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	P3D-C2	2.0	SANDY LEAN CLAY (CL/A-6)	37	22	15		
⊠	P3D-C2	4.0	SILTY, CLAYEY SAND (SC-SM/A-4)	19	14	5		
▲	P3D-C2	6.0	SILTY SAND (SM/A-2-4)	NP	NP	NP		
★	P3D-C2	8.0	CLAYEY SAND (SC/A-6)	31	12	19		
⊙	P3D-C2	10.0	CLAYEY SAND (SC/A-2-6)	29	13	16		

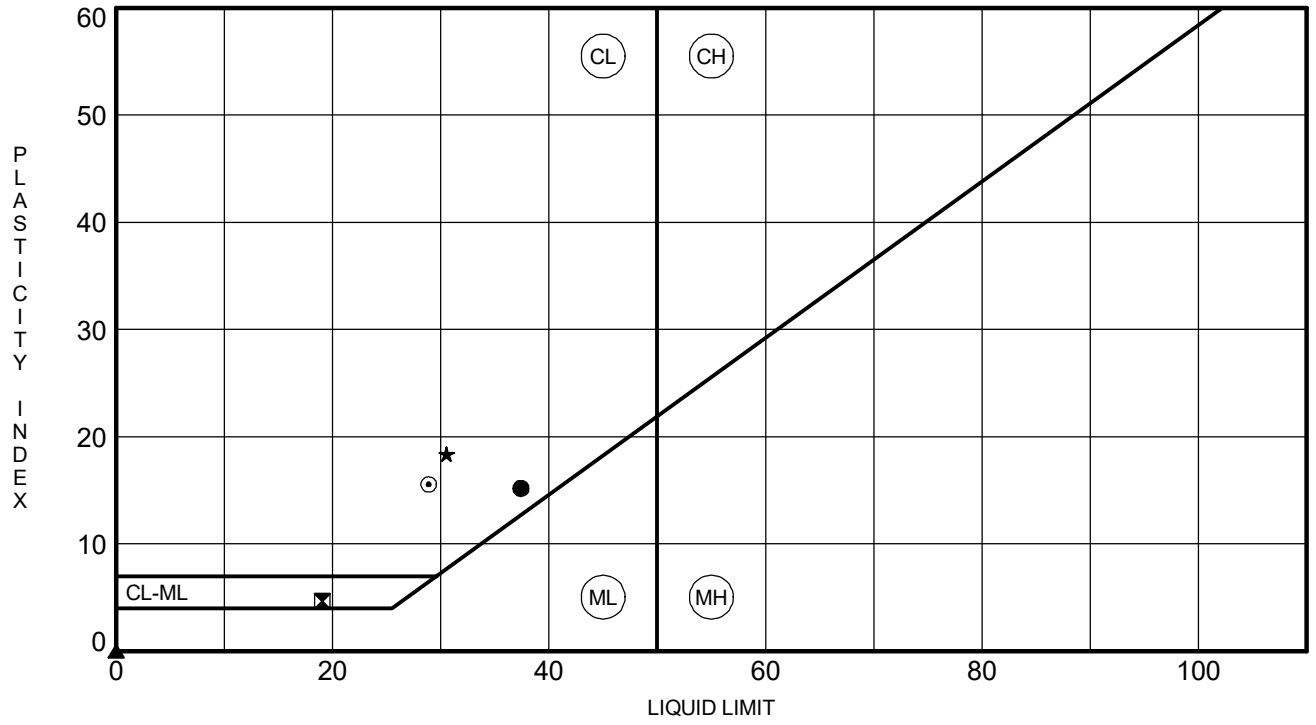
	BOREHOLE	DEPTH	D90	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	P3D-C2	2.0							64.2	
⊠	P3D-C2	4.0							46.8	
▲	P3D-C2	6.0							25.1	
★	P3D-C2	8.0							40.2	
⊙	P3D-C2	10.0							27.5	

GRAIN SIZE G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 7/9/25

ATTERBERG LIMITS' RESULTS

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**P3D-C2**	**2.0**	**37**	**22**	**15**	**64.2**	**SANDY LEAN CLAY (CL/A-6)**
⊠	**P3D-C2**	**4.0**	**19**	**14**	**5**	**46.8**	**SILTY, CLAYEY SAND (SC-SM/A-4)**
▲	**P3D-C2**	**6.0**	**NP**	**NP**	**NP**	**25.1**	**SILTY SAND (SM/A-2-4)**
★	**P3D-C2**	**8.0**	**31**	**12**	**19**	**40.2**	**CLAYEY SAND (SC/A-6)**
⊙	**P3D-C2**	**10.0**	**29**	**13**	**16**	**27.5**	**CLAYEY SAND (SC/A-2-6)**

ATTERBERG LIMITS G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 7/9/25

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	CCR Ph. 3D	**PROJECT NO.:**	G5662.030
SAMPLE NUMBER:	25-1805	**DATE REQUESTED:**	6/10/2025
DESCRIPTION OF SOIL:	Various		
TESTED BY:	BW/MW	**DATE OF TESTING:**	6/24/2025
WEIGHED BY:	MW	**DATE OF WEIGHING:**	6/25/2025

BORING NO.	P3D-C3	P3D-C3	P3D-C3	P3D-C3	P3D-C3
SAMPLE NO.	SS-1	SS-2	SS-3	SS-4	SS-5
SAMPLE DEPTH	0.0 - 2.0	2.0 - 4.0	4.0 - 6.0	6.0 - 8.0	8.0 - 10.0
WATER CONTENT, W%	35.7	25.0	19.8	26.2	18.2

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

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

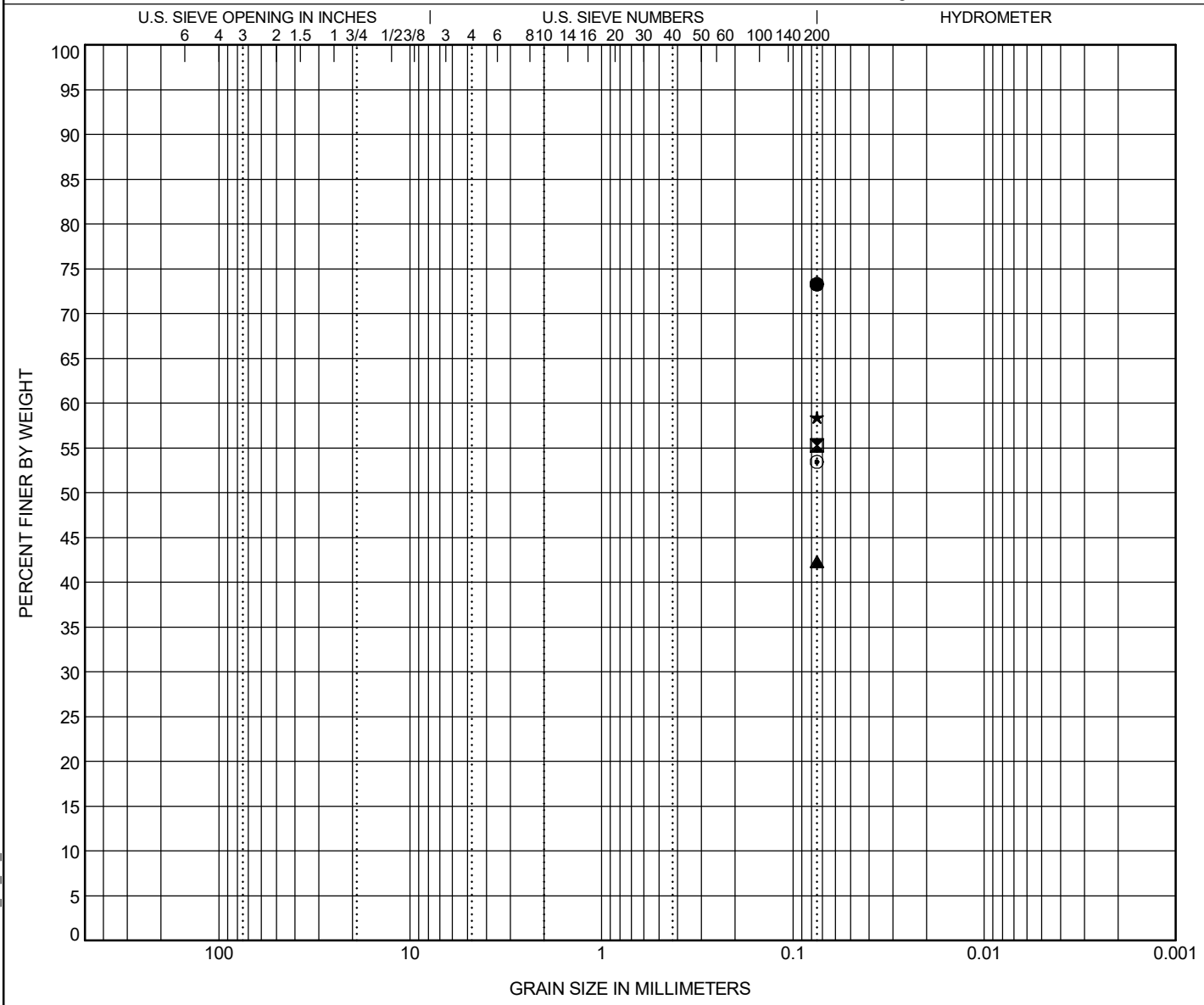
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

This report shall not be reproduced, except in full, without the written approval of F&ME Consultants, Inc.
211 Business Park Boulevard, Columbia SC 29203

GRAIN SIZE DISTRIBUTION

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	P3D-C3	2.0	LEAN CLAY with SAND (CL/A-7-6)	41	21	20		
⊠	P3D-C3	4.0	SANDY SILTY CLAY (CL-ML/A-4)	21	15	6		
▲	P3D-C3	6.0	SILTY SAND (SM/A-4)	19	16	3		
★	P3D-C3	8.0	SANDY LEAN CLAY (CL/A-6)	37	16	21		
⊙	P3D-C3	10.0	SANDY SILT (ML/A-4)	NP	NP	NP		

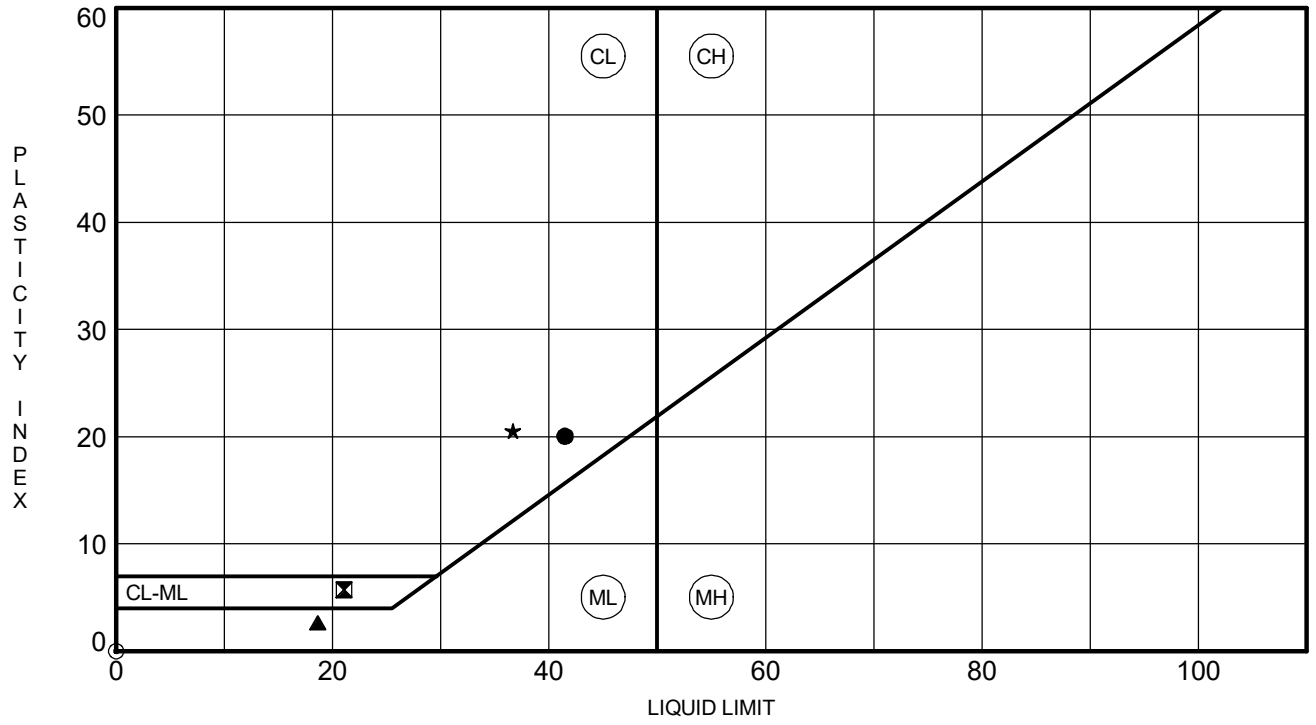
	BOREHOLE	DEPTH	D90	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	P3D-C3	2.0							73.3	
⊠	P3D-C3	4.0							55.3	
▲	P3D-C3	6.0							42.3	
★	P3D-C3	8.0							58.4	
⊙	P3D-C3	10.0							53.5	

GRAIN SIZE G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 7/10/25

ATTERBERG LIMITS' RESULTS

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**P3D-C3**	**2.0**	**41**	**21**	**20**	**73.3**	**LEAN CLAY with SAND (CL/A-7-6)**
⊠	**P3D-C3**	**4.0**	**21**	**15**	**6**	**55.3**	**SANDY SILTY CLAY (CL-ML/A-4)**
▲	**P3D-C3**	**6.0**	**19**	**16**	**3**	**42.3**	**SILTY SAND (SM/A-4)**
★	**P3D-C3**	**8.0**	**37**	**16**	**21**	**58.4**	**SANDY LEAN CLAY (CL/A-6)**
⊙	**P3D-C3**	**10.0**	**NP**	**NP**	**NP**	**53.5**	**SANDY SILT (ML/A-4)**

ATTERBERG LIMITS G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 7/10/25

REV 12/2023

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	CCR Ph. 3D	**PROJECT NO.:**	G5662.030
SAMPLE NUMBER:	25-1806	**DATE REQUESTED:**	6/10/2025
DESCRIPTION OF SOIL:	Various		
TESTED BY:	BW/MW	**DATE OF TESTING:**	6/24/2025
WEIGHED BY:	MW	**DATE OF WEIGHING:**	6/25/2025

BORING NO.	P3D-C4	P3D-C4	P3D-C4		
SAMPLE NO.	SS-2	SS-3	SS-4		
SAMPLE DEPTH	2.0 - 4.0	4.0 - 6.0	6.0 - 8.0		
WATER CONTENT, W%	23.3	25.0	19.6		

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

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

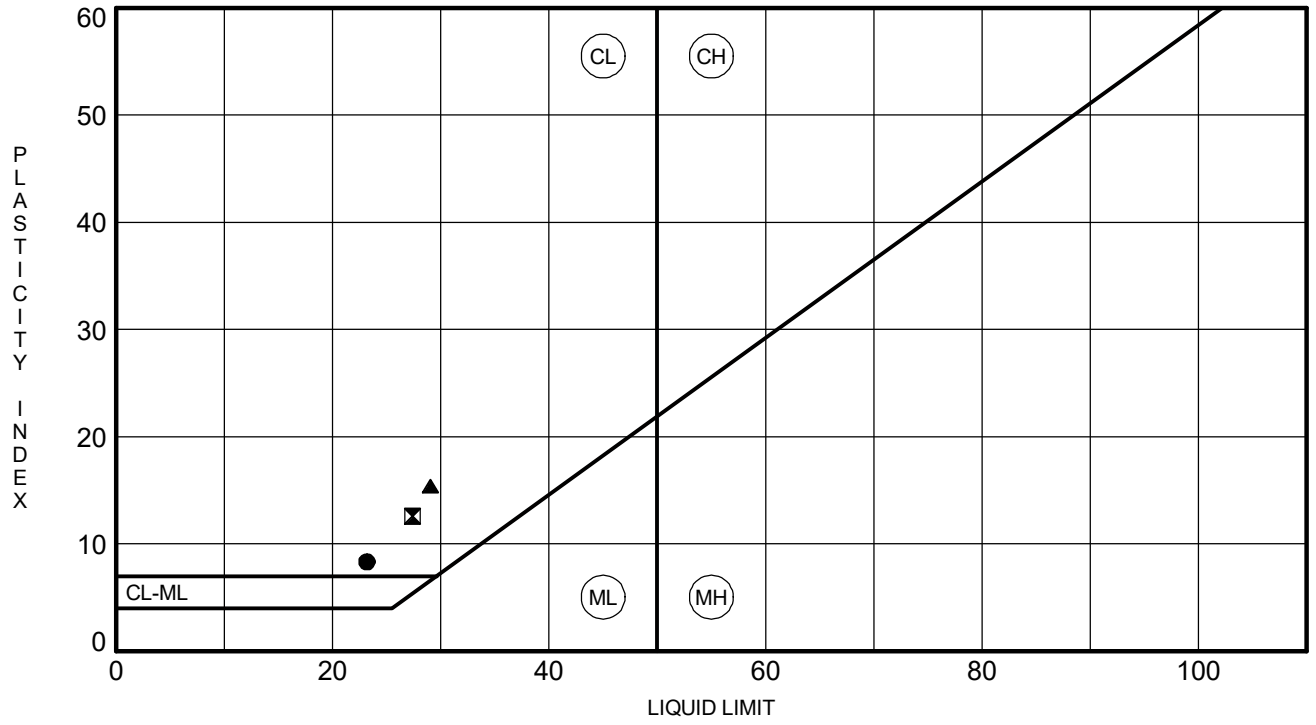
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

This report shall not be reproduced, except in full, without the written approval of F&ME Consultants, Inc.
211 Business Park Boulevard, Columbia SC 29203

ATTERBERG LIMITS' RESULTS

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



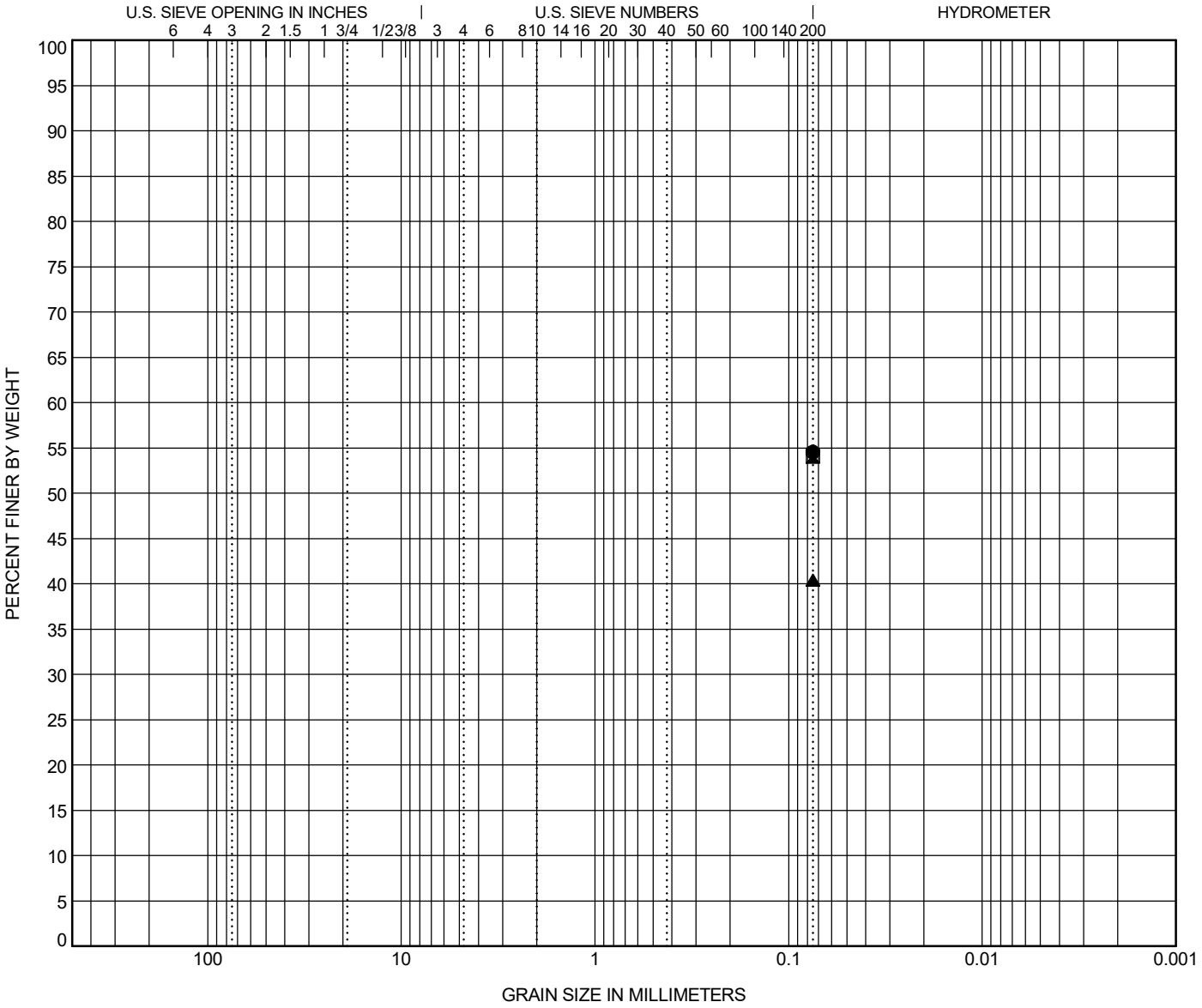
	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**P3D-C4**	**4.0**	**23**	**15**	**8**	**54.6**	**SANDY LEAN CLAY (CL/A-4)**
⊠	**P3D-C4**	**6.0**	**27**	**15**	**12**	**54.1**	**SANDY LEAN CLAY (CL/A-6)**
▲	**P3D-C4**	**8.0**	**29**	**14**	**15**	**40.4**	**CLAYEY SAND (SC/A-6)**

ATTERBERG LIMITS G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 7/10/25

GRAIN SIZE DISTRIBUTION

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**P3D-C4**	**4.0**	**SANDY LEAN CLAY (CL/A-4)**	**23**	**15**	**8**		
⊠	**P3D-C4**	**6.0**	**SANDY LEAN CLAY (CL/A-6)**	**27**	**15**	**12**		
▲	**P3D-C4**	**8.0**	**CLAYEY SAND (SC/A-6)**	**29**	**14**	**15**		

	BOREHOLE	DEPTH	D90	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**P3D-C4**	**4.0**							**54.6**	
⊠	**P3D-C4**	**6.0**							**54.1**	
▲	**P3D-C4**	**8.0**							**40.4**	

GRAIN SIZE G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 7/10/25

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	CCR Ph. 3D	**PROJECT NO.:**	G5662.030
SAMPLE NUMBER:	25-3631	**DATE REQUESTED:**	10/10/2025
DESCRIPTION OF SOIL:	VARIOUS		
TESTED BY:	JM/JD	**DATE OF TESTING:**	10/17/2025
WEIGHED BY:	ZJ	**DATE OF WEIGHING:**	10/20/2025

BORING NO.	P3D-C5	P3D-C5	P3D-C5	P3D-C5	P3D-C5
SAMPLE NO.	SS-1	SS-2	SS-5	SS-7	SS-9
SAMPLE DEPTH	0.0 - 2.0	2.0 - 4.0	8.0 - 10.0	18.5 - 20.0	28.5 - 30.0
WATER CONTENT, W%	12.8	20.9	25.0	23.8	19.2

BORING NO.	P3D-C5				
SAMPLE NO.	SS-11				
SAMPLE DEPTH	38.5 - 40.0				
WATER CONTENT, W%	22.6				

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

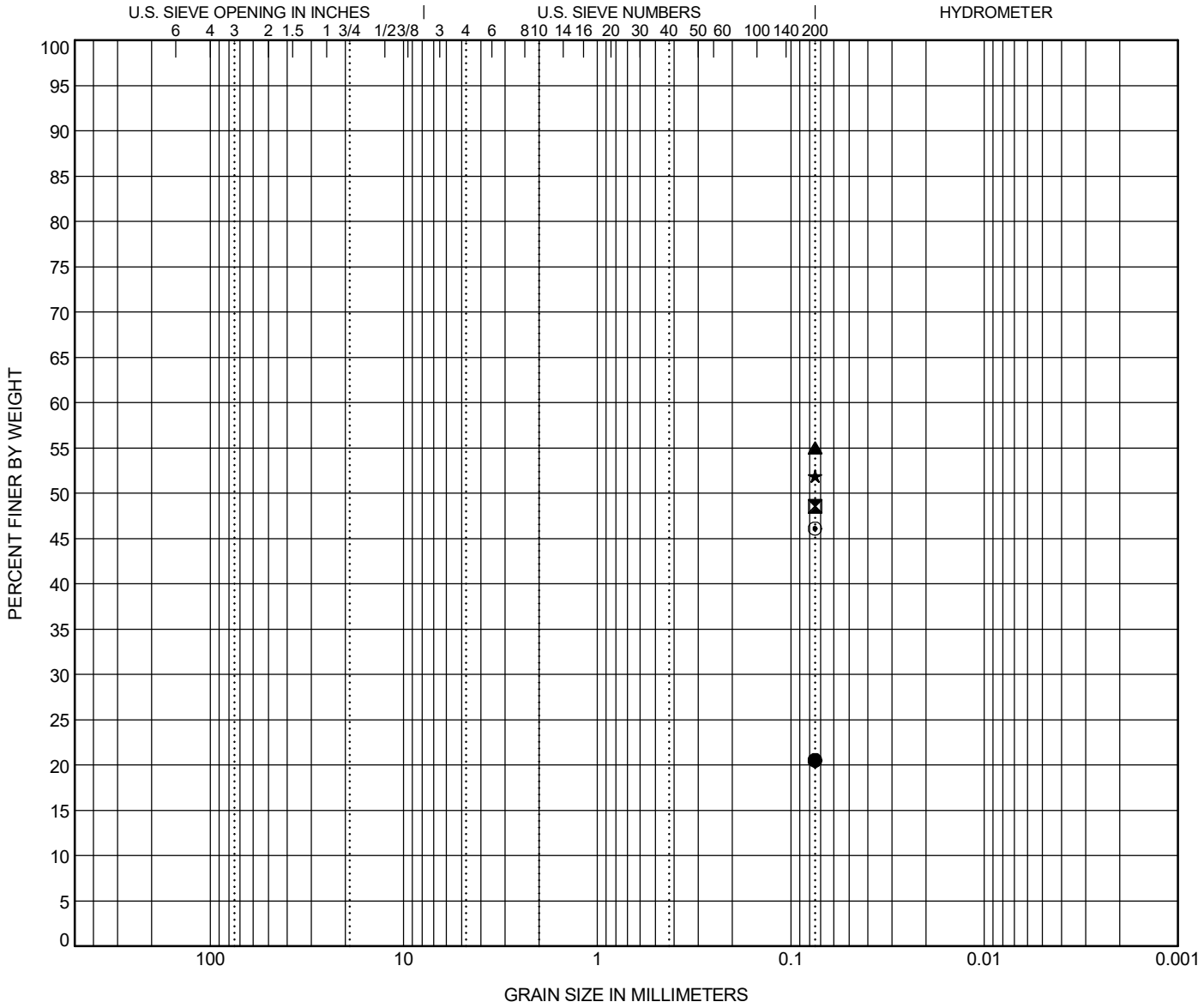
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

This report shall not be reproduced, except in full, without the written approval of F&ME Consultants, Inc.
211 Business Park Boulevard, Columbia SC 29203

GRAIN SIZE DISTRIBUTION

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads Phase 3D

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**P3D-C5**	**2.0**	**CLAYEY SAND (SC/A-7-6)**					
⊠	**P3D-C5**	**4.0**	**CLAYEY SAND (SC/A-7-6)**	**42**	**21**	**21**		
▲	**P3D-C5**	**10.0**	**SANDY LEAN CLAY (CL/A-7-6)**	**48**	**22**	**26**		
★	**P3D-C5**	**20.0**	**SANDY LEAN CLAY (CL/A-7-6)**	**48**	**24**	**24**		
⊙	**P3D-C5**	**30.0**	**CLAYEY SAND (SC/A-7-6)**	**47**	**23**	**24**		

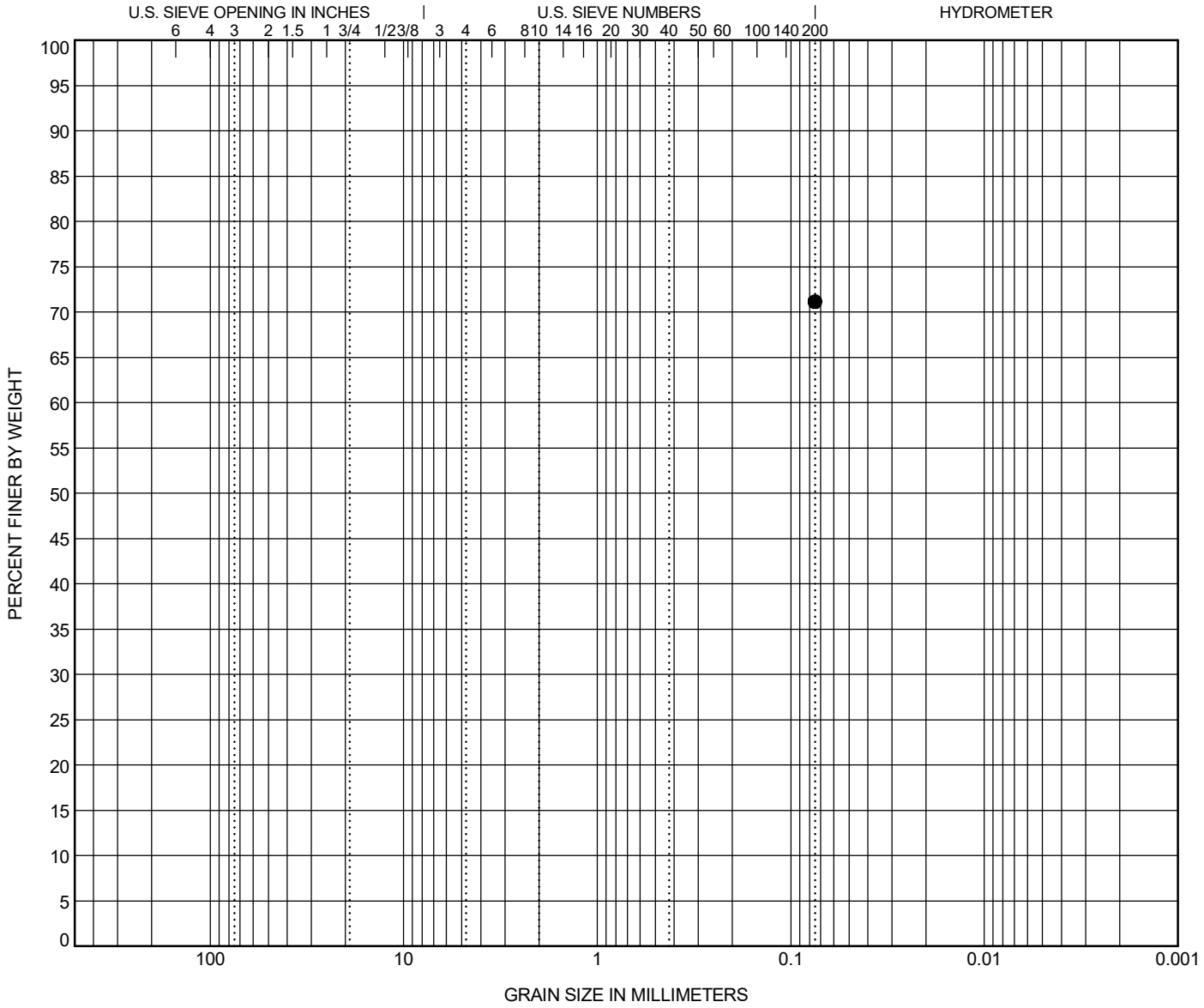
	BOREHOLE	DEPTH	D90	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**P3D-C5**	**2.0**							**20.5**	
⊠	**P3D-C5**	**4.0**							**48.6**	
▲	**P3D-C5**	**10.0**							**55.0**	
★	**P3D-C5**	**20.0**							**51.9**	
⊙	**P3D-C5**	**30.0**							**46.1**	

GRAIN SIZE G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/22/25

GRAIN SIZE DISTRIBUTION

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads Phase 3D

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
● **P3D-C5**	**40.0**	**LEAN CLAY with SAND (CL/A-7-6)**	**49**	**21**	**28**		

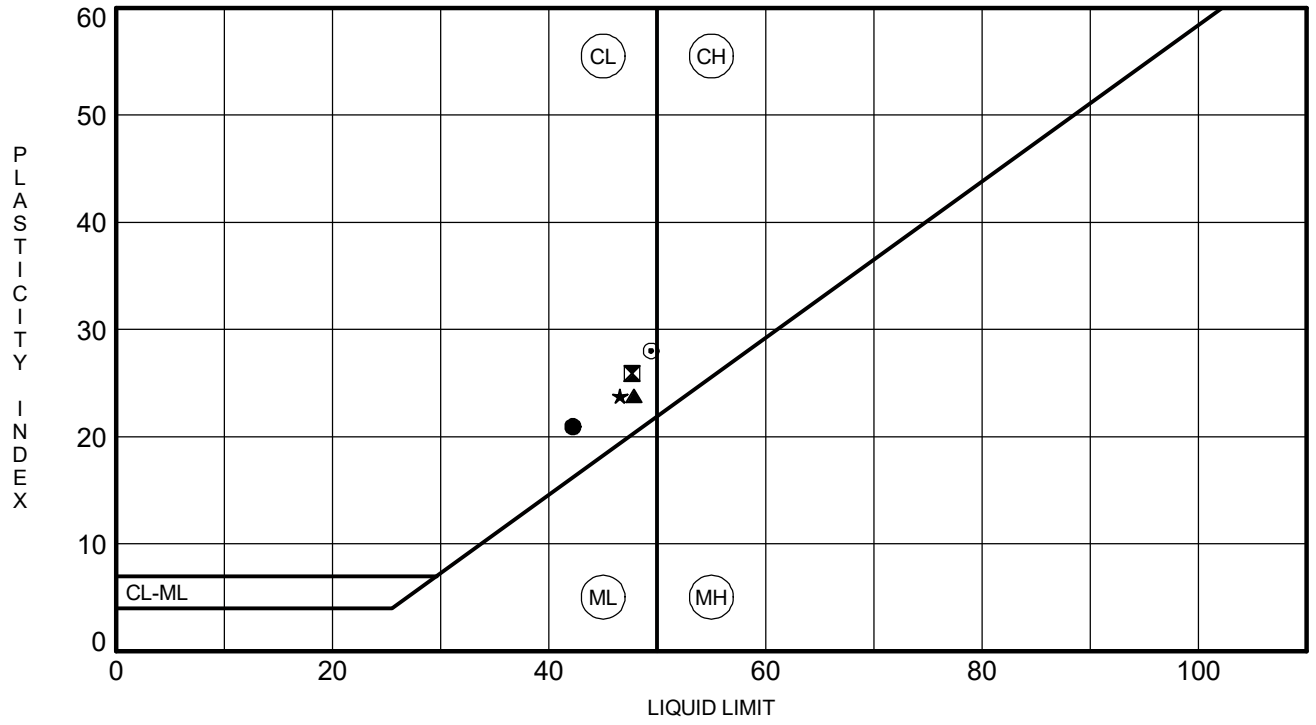
BOREHOLE	DEPTH	D90	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● **P3D-C5**	**40.0**							**71.2**	

GRAIN SIZE G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/22/25

ATTERBERG LIMITS' RESULTS

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads Phase 3D

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**P3D-C5**	**4.0**	**42**	**21**	**21**	**48.6**	**CLAYEY SAND (SC/A-7-6)**
⊠	**P3D-C5**	**10.0**	**48**	**22**	**26**	**55.0**	**SANDY LEAN CLAY (CL/A-7-6)**
▲	**P3D-C5**	**20.0**	**48**	**24**	**24**	**51.9**	**SANDY LEAN CLAY (CL/A-7-6)**
★	**P3D-C5**	**30.0**	**47**	**23**	**24**	**46.1**	**CLAYEY SAND (SC/A-7-6)**
⊙	**P3D-C5**	**40.0**	**49**	**21**	**28**	**71.2**	**LEAN CLAY with SAND (CL/A-7-6)**

ATTERBERG LIMITS G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/22/25

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	CCR Ph. 3D	**PROJECT NO.:**	G5662.030
SAMPLE NUMBER:	25-3199	**DATE REQUESTED:**	9/22/2025
DESCRIPTION OF SOIL:	Various		
TESTED BY:	MBP/AKG	**DATE OF TESTING:**	9/22/2025
WEIGHED BY:	HM	**DATE OF WEIGHING:**	9/23/2025

BORING NO.	P3D-C6	P3D-C6	P3D-C6	P3D-C6	P3D-C6
SAMPLE NO.	SS-1	SS-2	SS-5	SS-7	SS-10
SAMPLE DEPTH	0.0 - 2.0	2.0 - 4.0	8.0 - 10.0	18.5 - 20.0	33.5 - 35.0
WATER CONTENT, W%	9.9	19.9	21.5	21.7	18.9

BORING NO.	P3D-C6				
SAMPLE NO.	SS-11				
SAMPLE DEPTH	38.5 - 40.0				
WATER CONTENT, W%	18.5				

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

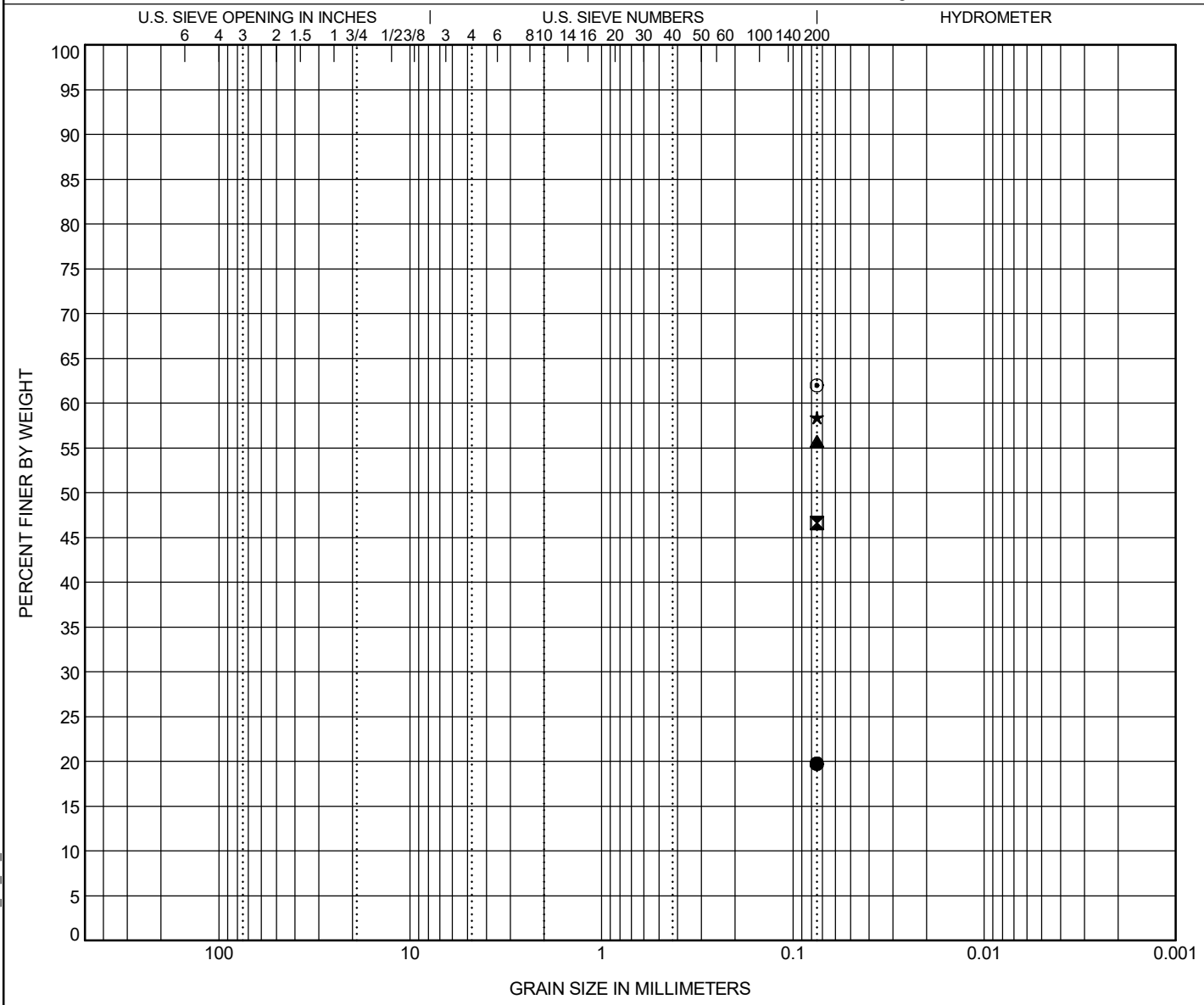
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

This report shall not be reproduced, except in full, without the written approval of F&ME Consultants, Inc.
211 Business Park Boulevard, Columbia SC 29203

GRAIN SIZE DISTRIBUTION

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads Phase 3D

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**P3D-C6**	**2.0**	**CLAYEY SAND (SC/A-6)**					
⊠	**P3D-C6**	**4.0**	**CLAYEY SAND (SC/A-6)**	**39**	**21**	**18**		
▲	**P3D-C6**	**10.0**	**SANDY SILT (ML/A-7-6)**	**42**	**28**	**14**		
★	**P3D-C6**	**20.0**	**SANDY LEAN CLAY (CL/A-7-6)**	**49**	**24**	**25**		
⊙	**P3D-C6**	**35.0**	**SANDY LEAN CLAY (CL/A-6)**	**38**	**19**	**19**		

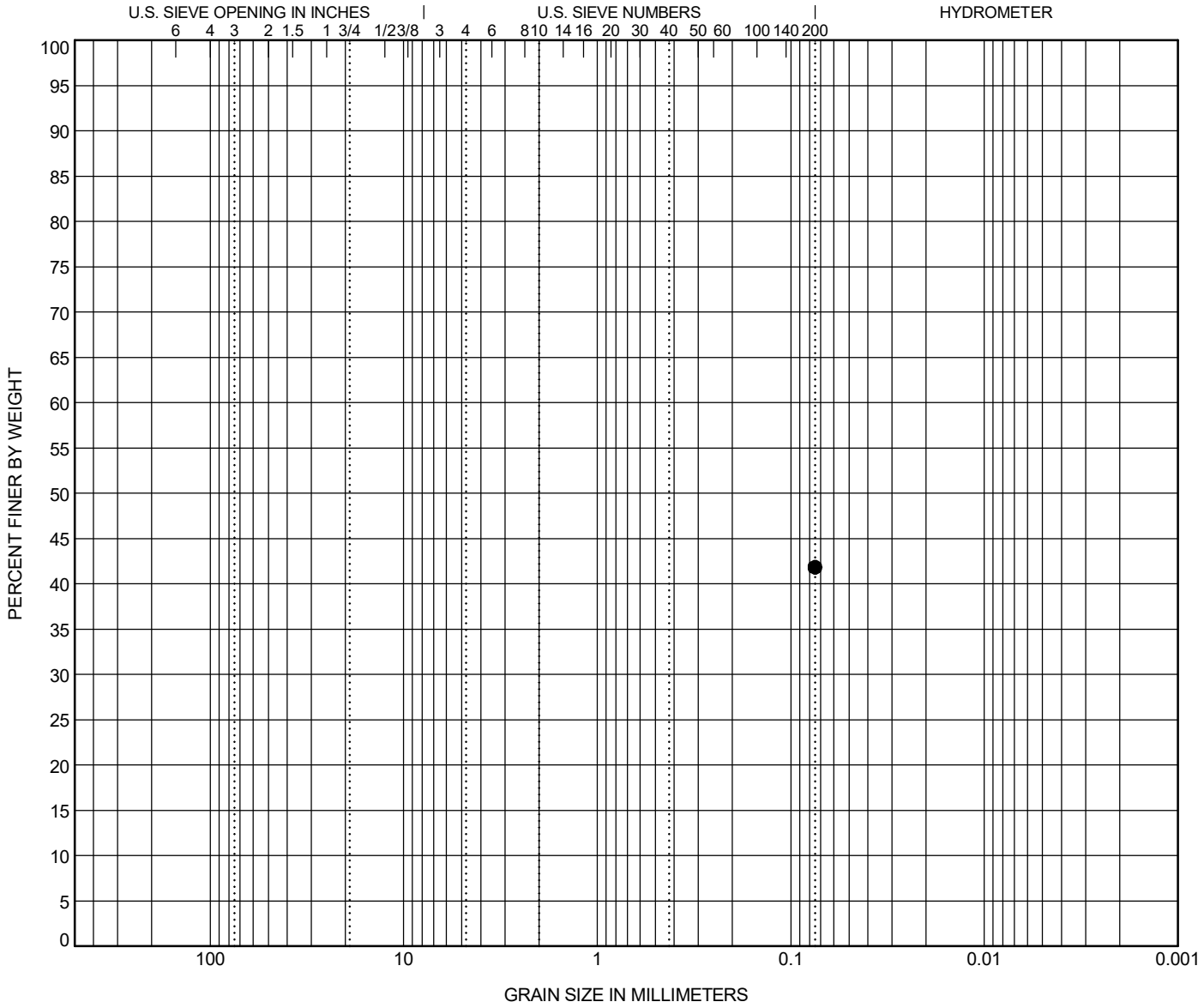
	BOREHOLE	DEPTH	D90	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**P3D-C6**	**2.0**							**19.8**	
⊠	**P3D-C6**	**4.0**							**46.6**	
▲	**P3D-C6**	**10.0**							**55.8**	
★	**P3D-C6**	**20.0**							**58.4**	
⊙	**P3D-C6**	**35.0**							**62.0**	

GRAIN SIZE G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/15/25

GRAIN SIZE DISTRIBUTION

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads Phase 3D

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**P3D-C6**	**40.0**	**CLAYEY SAND (SC/A-6)**	**39**	**13**	**26**		

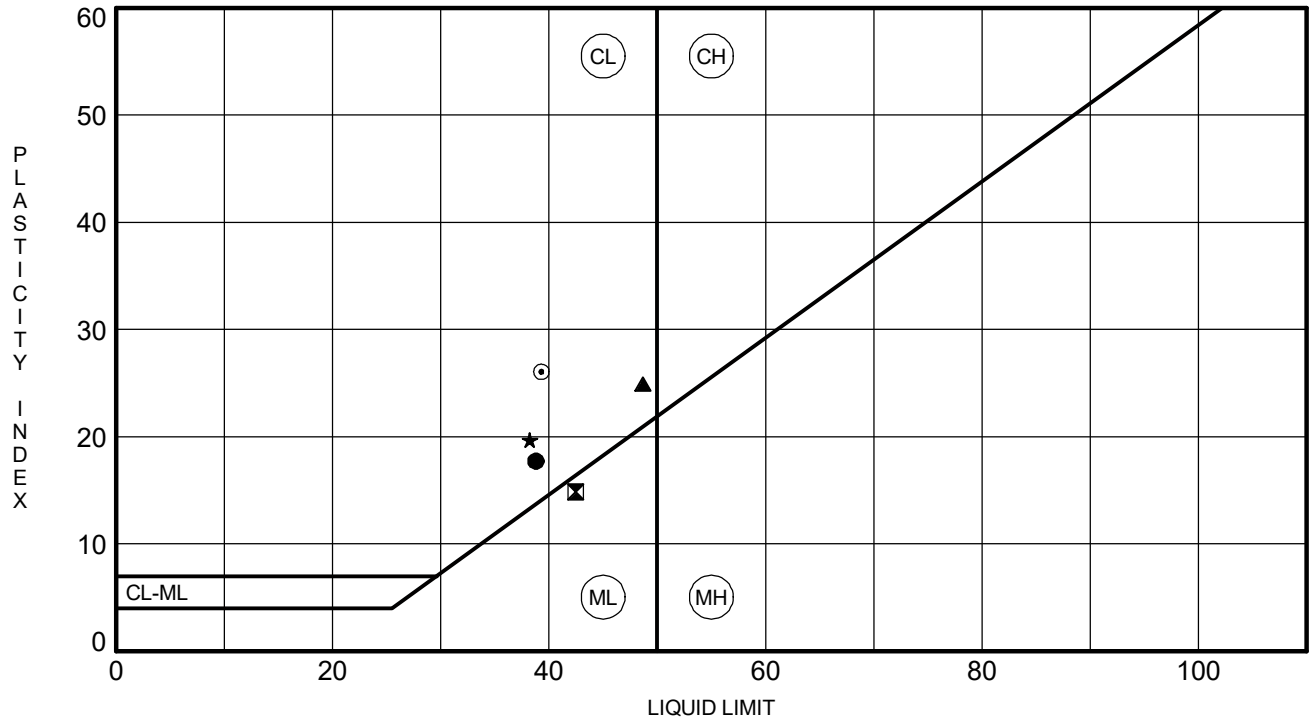
	BOREHOLE	DEPTH	D90	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**P3D-C6**	**40.0**							**41.8**	

GRAIN SIZE G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/15/25

ATTERBERG LIMITS' RESULTS

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads Phase 3D

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**P3D-C6**	**4.0**	**39**	**21**	**18**	**47**	**CLAYEY SAND (SC/A-6)**
⊠	**P3D-C6**	**10.0**	**42**	**28**	**14**	**56**	**SANDY SILT (ML/A-7-6)**
▲	**P3D-C6**	**20.0**	**49**	**24**	**25**	**58**	**SANDY LEAN CLAY (CL/A-7-6)**
★	**P3D-C6**	**35.0**	**38**	**19**	**19**	**62**	**SANDY LEAN CLAY (CL/A-6)**
⊙	**P3D-C6**	**40.0**	**39**	**13**	**26**	**42**	**CLAYEY SAND (SC/A-6)**

ATTERBERG (OUTSOURCE) G5662.03- CAROLINA CROSSROADS PH 3D.GPJ FME2017.GDT 10/15/25

Laboratory test performed at a non-F&ME AASHTO accreditted laboratory

REV 12/2023

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	CCR Ph. 3D	**PROJECT NO.:**	G5662.030
SAMPLE NUMBER:	25-1807	**DATE REQUESTED:**	6/10/2025
DESCRIPTION OF SOIL:	Various		
TESTED BY:	BW/MW	**DATE OF TESTING:**	6/24/2025
WEIGHED BY:	MW	**DATE OF WEIGHING:**	6/25/2025

BORING NO.	P3D-C7	P3D-C7	P3D-C7	P3D-C7	
SAMPLE NO.	SS-1	SS-3	SS-4	SS-5	
SAMPLE DEPTH	0.0 - 2.0	4.0 - 6.0	6.0 - 8.0	8.0 - 10.0	
WATER CONTENT, W%	22.2	39.5	23.8	17.1	

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

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

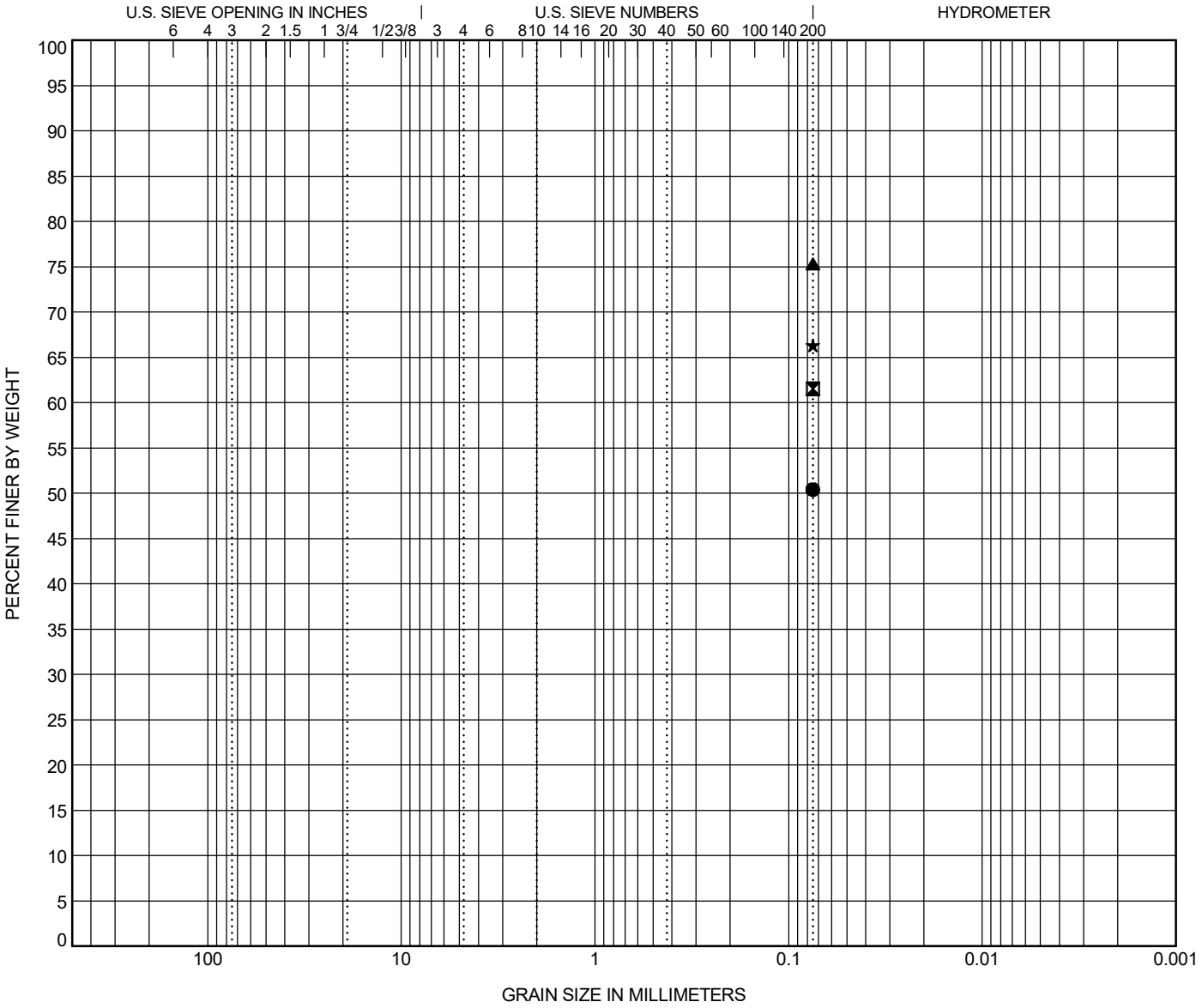
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

This report shall not be reproduced, except in full, without the written approval of F&ME Consultants, Inc.
211 Business Park Boulevard, Columbia SC 29203

GRAIN SIZE DISTRIBUTION

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**P3D-C7**	**2.0**	**SANDY LEAN CLAY (CL/A-6)**	**40**	**24**	**16**		
⊠	**P3D-C7**	**6.0**	**SANDY LEAN CLAY (CL/A-7-6)**	**43**	**25**	**18**		
▲	**P3D-C7**	**8.0**	**LEAN CLAY with SAND (CL/A-6)**	**26**	**15**	**11**		
★	**P3D-C7**	**10.0**	**SANDY LEAN CLAY (CL/A-6)**	**36**	**15**	**21**		

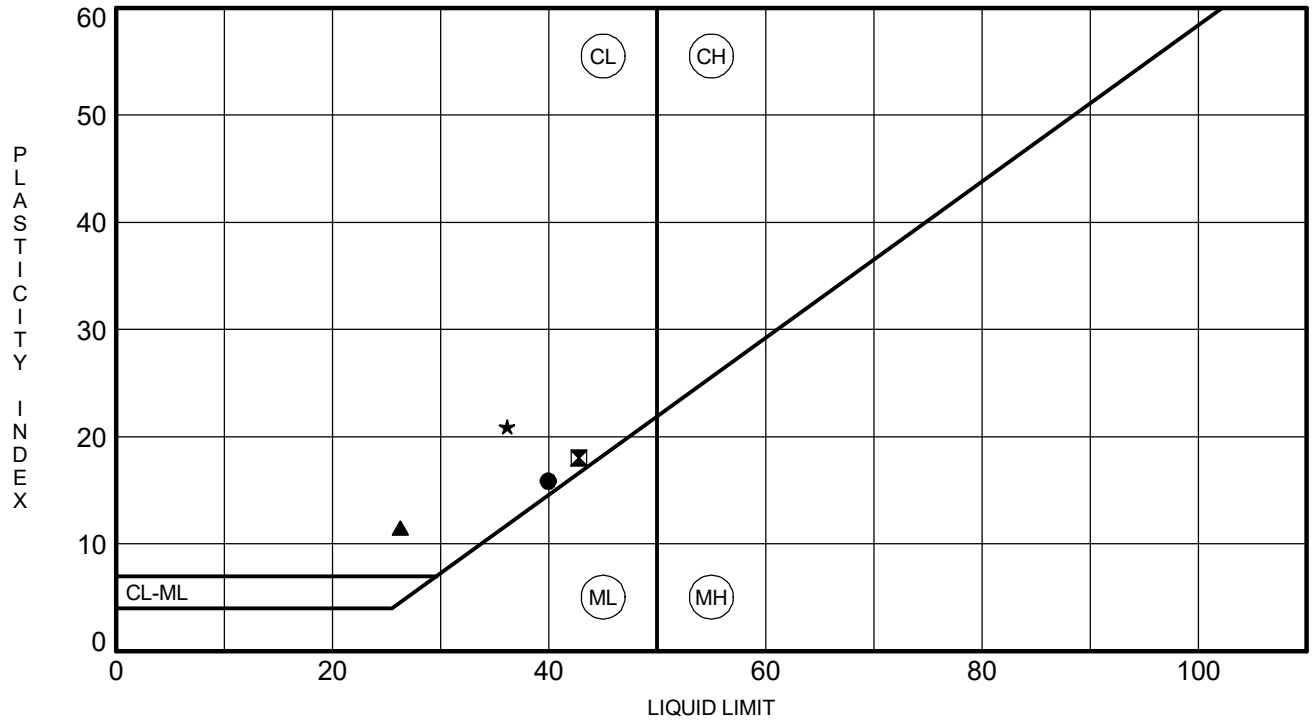
	BOREHOLE	DEPTH	D90	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**P3D-C7**	**2.0**							**50.4**	
⊠	**P3D-C7**	**6.0**							**61.5**	
▲	**P3D-C7**	**8.0**							**75.3**	
★	**P3D-C7**	**10.0**							**66.3**	

GRAIN SIZE G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 7/9/25

ATTERBERG LIMITS' RESULTS

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**P3D-C7**	**2.0**	**40**	**24**	**16**	**50.4**	**SANDY LEAN CLAY (CL/A-6)**
⊠	**P3D-C7**	**6.0**	**43**	**25**	**18**	**61.5**	**SANDY LEAN CLAY (CL/A-7-6)**
▲	**P3D-C7**	**8.0**	**26**	**15**	**11**	**75.3**	**LEAN CLAY with SAND (CL/A-6)**
★	**P3D-C7**	**10.0**	**36**	**15**	**21**	**66.3**	**SANDY LEAN CLAY (CL/A-6)**

ATTERBERG LIMITS G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 7/9/25

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	CCR Ph. 3D	**PROJECT NO.:**	G5662.030
SAMPLE NUMBER:	25-1564	**DATE REQUESTED:**	7/10/2025
DESCRIPTION OF SOIL:	Various		
TESTED BY:	MP/BW	**DATE OF TESTING:**	7/11/2025
WEIGHED BY:	AC	**DATE OF WEIGHING:**	7/14/2025

BORING NO.	P3D-C8	P3D-C8	P3D-C8	P3D-C8	
SAMPLE NO.	SS-1	SS-3	SS-5	SS-7	
SAMPLE DEPTH	0.0 - 2.0	4.0 - 6.0	8.0 - 10.0	18.5 - 20.0	
WATER CONTENT, W%	17.7	18.7	21.0	14.5	

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

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

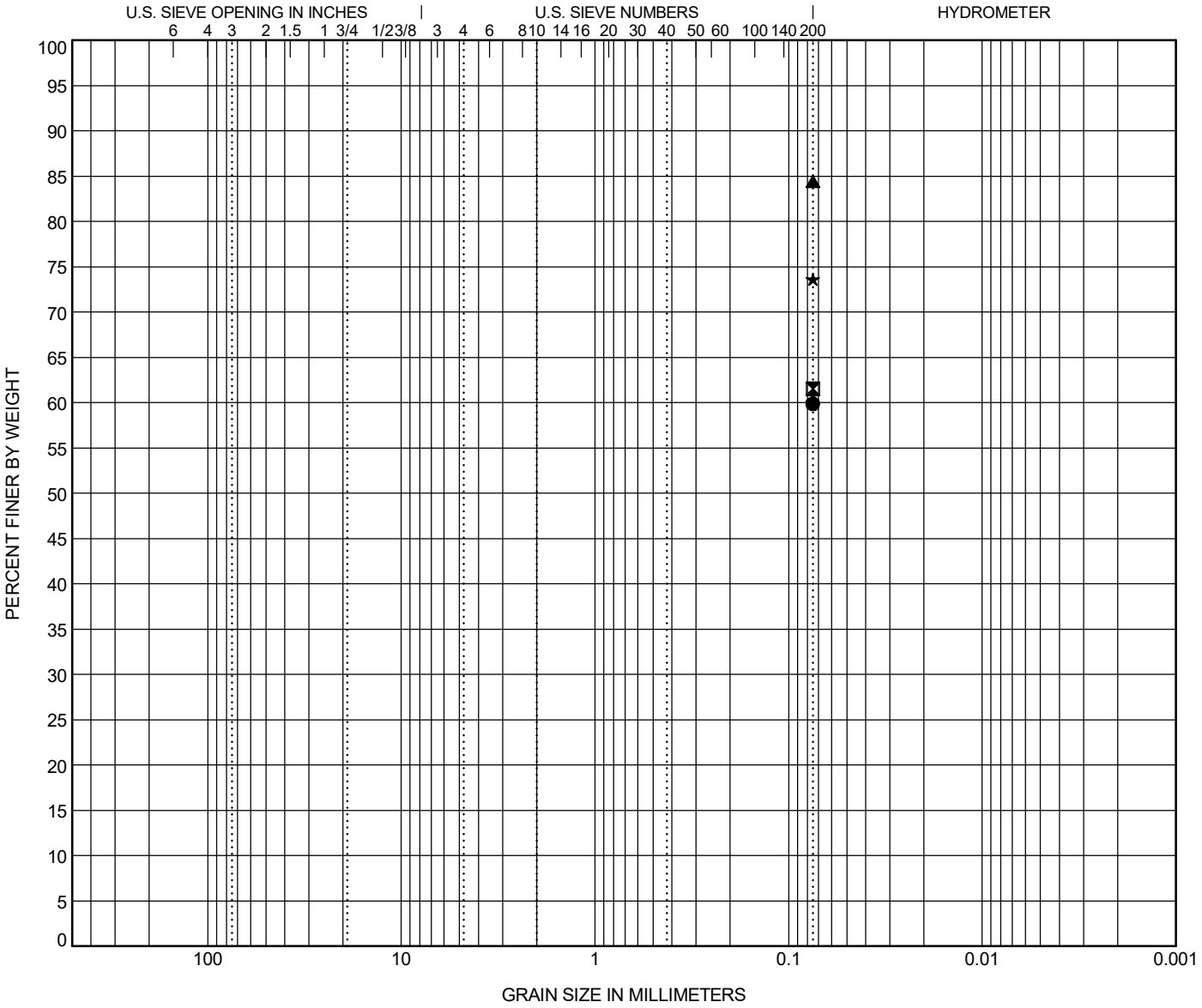
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

This report shall not be reproduced, except in full, without the written approval of F&ME Consultants, Inc.
211 Business Park Boulevard, Columbia SC 29203

GRAIN SIZE DISTRIBUTION

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**P3D-C8**	**2.0**	**SANDY LEAN CLAY (CL/A-6)**	**34**	**18**	**16**		
⊠	**P3D-C8**	**6.0**	**SANDY LEAN CLAY (CL/A-6)**	**31**	**15**	**16**		
▲	**P3D-C8**	**10.0**	**LEAN CLAY with SAND (CL/A-7-6)**	**44**	**14**	**30**		
★	**P3D-C8**	**20.0**	**LEAN CLAY with SAND (CL/A-4)**	**28**	**20**	**8**		

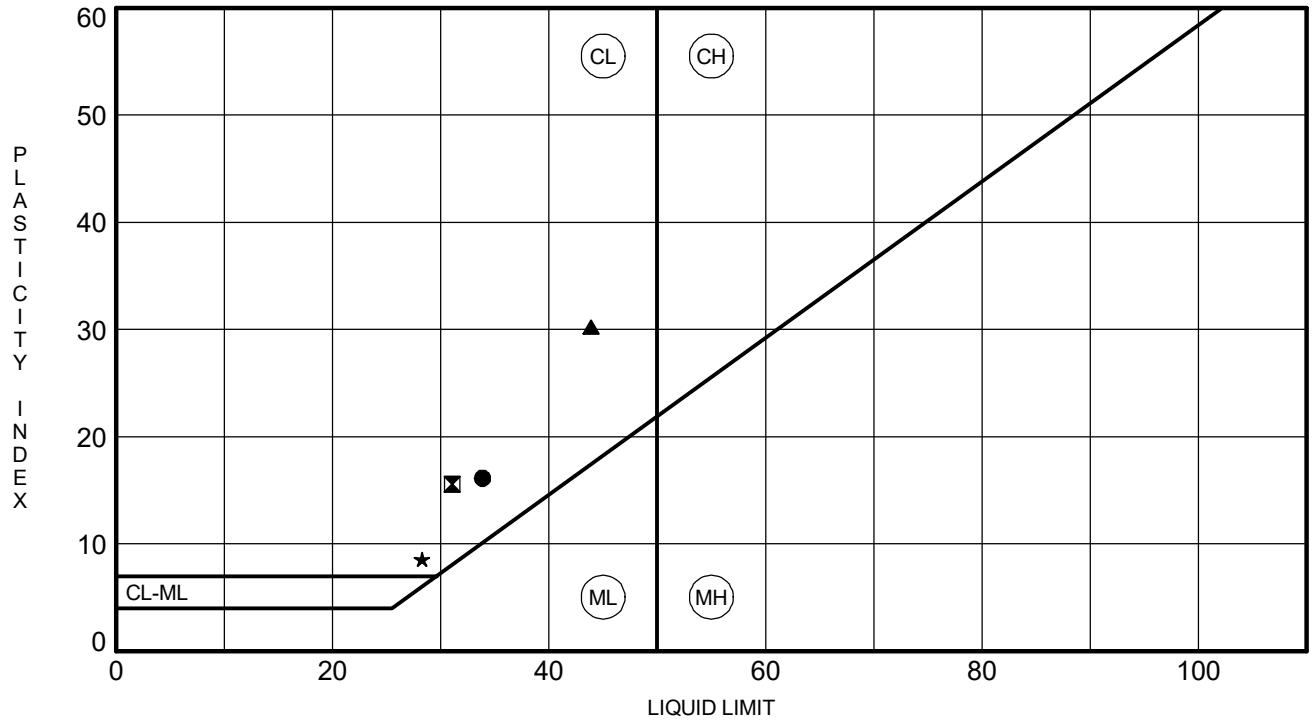
	BOREHOLE	DEPTH	D90	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**P3D-C8**	**2.0**							**59.9**	
⊠	**P3D-C8**	**6.0**							**61.6**	
▲	**P3D-C8**	**10.0**							**84.4**	
★	**P3D-C8**	**20.0**							**73.6**	

GRAIN SIZE G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 7/21/25

ATTERBERG LIMITS' RESULTS

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**P3D-C8**	**2.0**	**34**	**18**	**16**	**59.9**	**SANDY LEAN CLAY (CL/A-6)**
⧓	**P3D-C8**	**6.0**	**31**	**15**	**16**	**61.6**	**SANDY LEAN CLAY (CL/A-6)**
▲	**P3D-C8**	**10.0**	**44**	**14**	**30**	**84.4**	**LEAN CLAY with SAND (CL/A-7-6)**
★	**P3D-C8**	**20.0**	**28**	**20**	**8**	**73.6**	**LEAN CLAY with SAND (CL/A-4)**

ATTERBERG LIMITS G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 7/21/25

REV 12/2023

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	CCR Ph. 3D	**PROJECT NO.:**	G5662.030
SAMPLE NUMBER:	25-1565	**DATE REQUESTED:**	7/10/2025
DESCRIPTION OF SOIL:	Various		
TESTED BY:	MP/BW	**DATE OF TESTING:**	7/11/2025
WEIGHED BY:	AC	**DATE OF WEIGHING:**	7/14/2025

BORING NO.	P3D-C9	P3D-C9	P3D-C9		
SAMPLE NO.	SS-1	SS-2	SS-5		
SAMPLE DEPTH	0.0 - 2.0	2.0 - 4.0	8.0 - 10.0		
WATER CONTENT, W%	18.0	20.9	28.0		

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

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

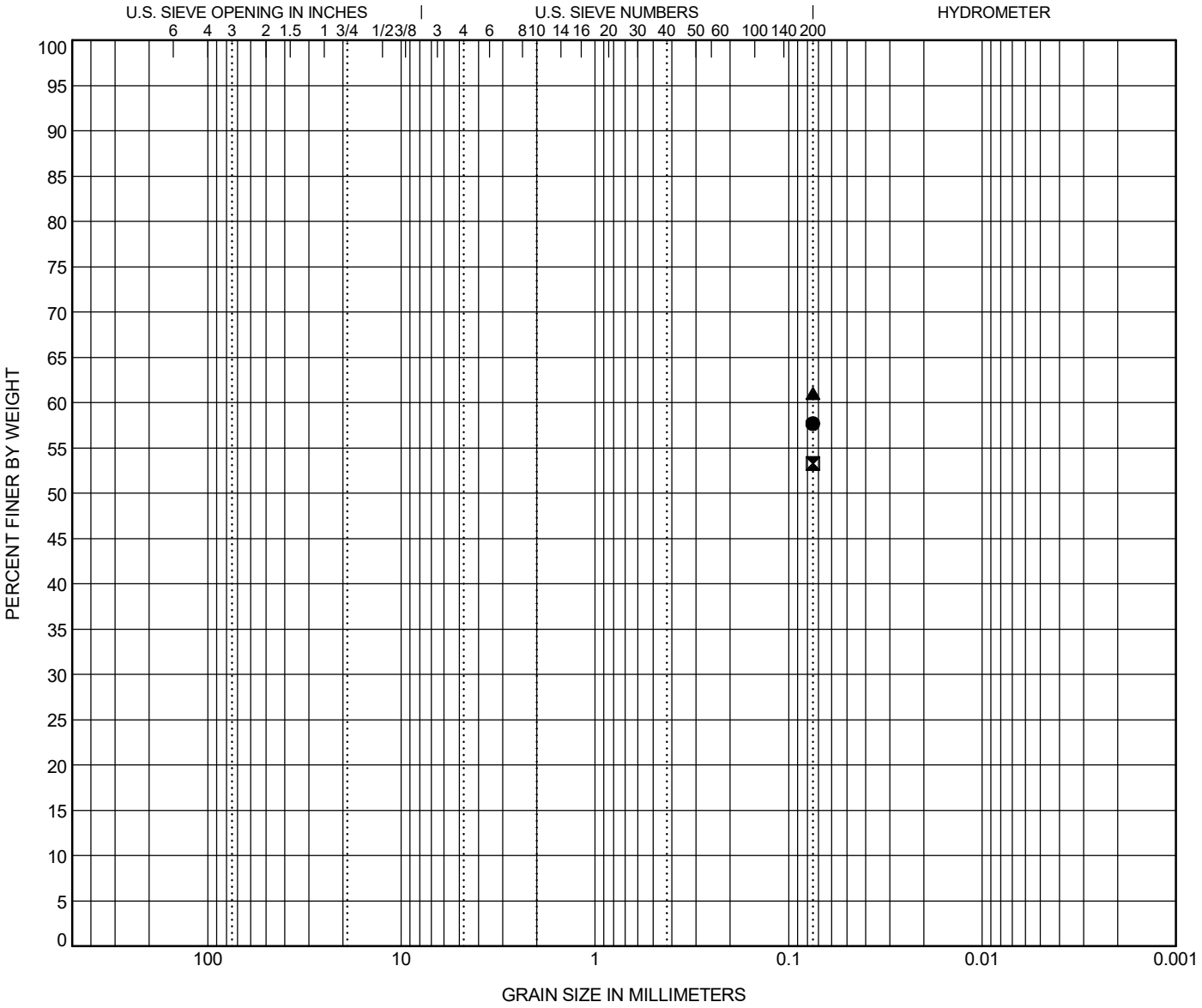
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

This report shall not be reproduced, except in full, without the written approval of F&ME Consultants, Inc.
211 Business Park Boulevard, Columbia SC 29203

GRAIN SIZE DISTRIBUTION

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**P3D-C9**	**2.0**	**SANDY LEAN CLAY (CL/A-6)**	**36**	**16**	**20**		
⊠	**P3D-C9**	**4.0**	**SANDY LEAN CLAY (CL/A-7-6)**	**48**	**15**	**33**		
▲	**P3D-C9**	**10.0**	**SANDY LEAN CLAY (CL/A-6)**	**36**	**14**	**22**		

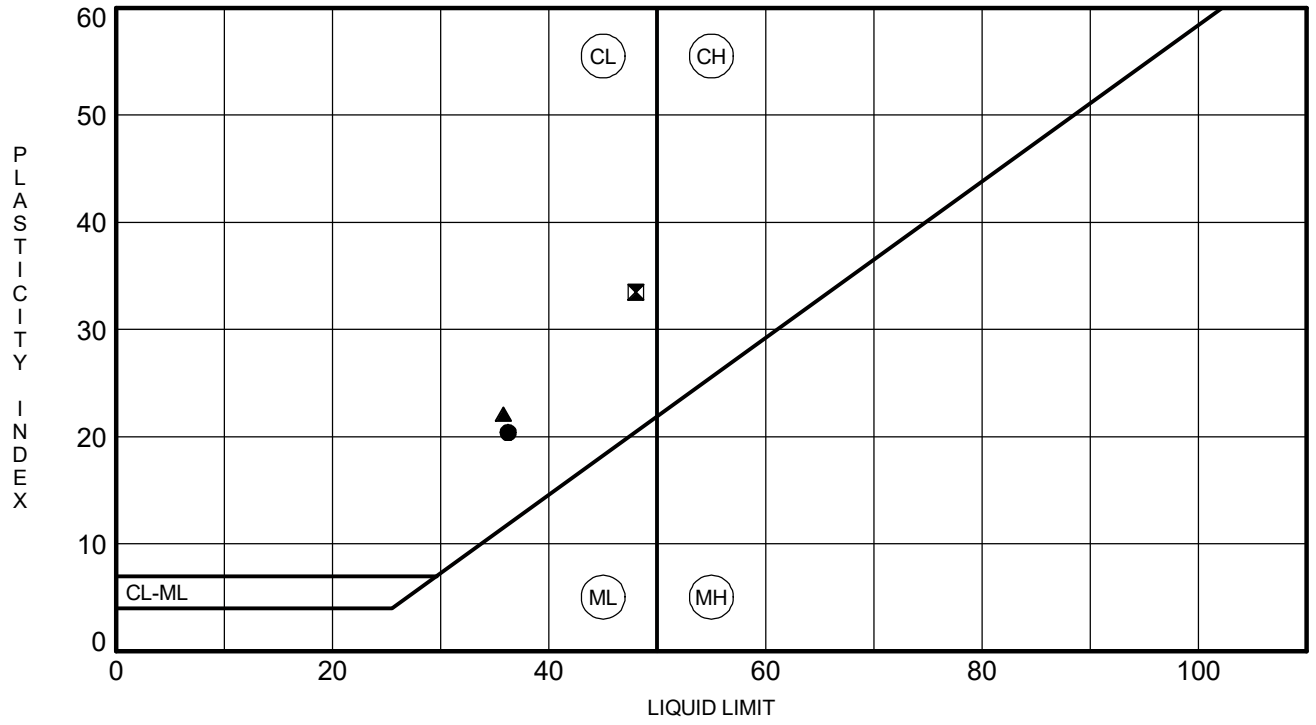
	BOREHOLE	DEPTH	D90	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**P3D-C9**	**2.0**							**57.7**	
⊠	**P3D-C9**	**4.0**							**53.3**	
▲	**P3D-C9**	**10.0**							**61.0**	

GRAIN SIZE G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 7/21/25

ATTERBERG LIMITS' RESULTS

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**P3D-C9**	**2.0**	**36**	**16**	**20**	**57.7**	**SANDY LEAN CLAY (CL/A-6)**
⊠	**P3D-C9**	**4.0**	**48**	**15**	**33**	**53.3**	**SANDY LEAN CLAY (CL/A-7-6)**
▲	**P3D-C9**	**10.0**	**36**	**14**	**22**	**61.0**	**SANDY LEAN CLAY (CL/A-6)**

ATTERBERG LIMITS G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 7/21/25

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	CCR Ph. 3D	**PROJECT NO.:**	G5662.030
SAMPLE NUMBER:	25-2368	**DATE REQUESTED:**	7/18/2025
DESCRIPTION OF SOIL:	Various		
TESTED BY:	LJ	**DATE OF TESTING:**	7/25/2025
WEIGHED BY:	AC	**DATE OF WEIGHING:**	7/28/2025

BORING NO.	P3D-C10	P3D-C10	P3D-C10	P3D-C10	P3D-C10
SAMPLE NO.	SS-1	SS-4	SS-5	SS-6	SS-9
SAMPLE DEPTH	0.0 - 2.0	6.0 - 8.0	8.0 - 10.0	13.5 - 15.0	28.5 - 30.0
WATER CONTENT, W%	16.9	28.1	24.4	27.2	12.9

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

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

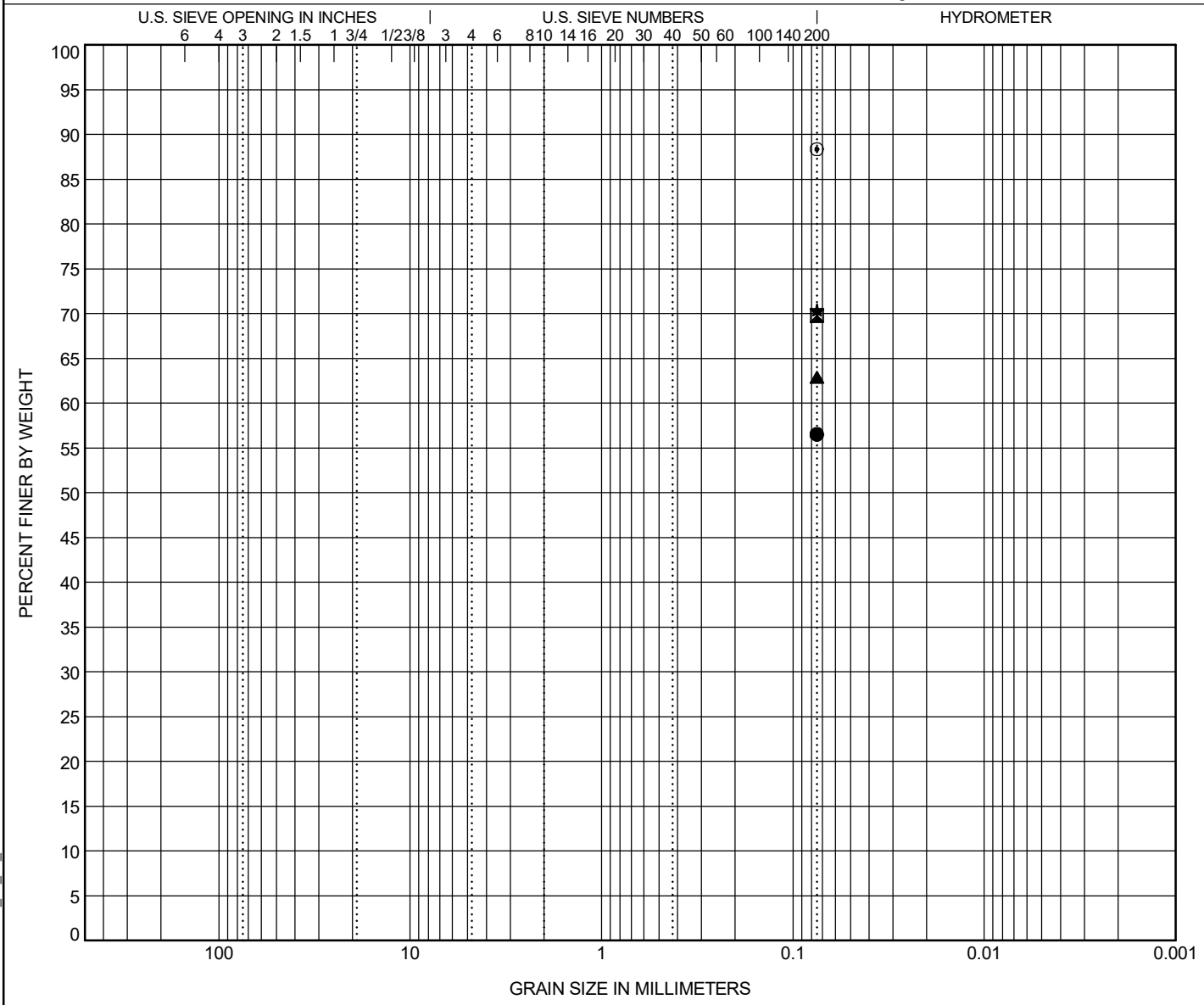
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

This report shall not be reproduced, except in full, without the written approval of F&ME Consultants, Inc.
211 Business Park Boulevard, Columbia SC 29203

GRAIN SIZE DISTRIBUTION

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**P3D-C10**	**2.0**	**SANDY FAT CLAY (CH/A-7-6)**	**57**	**26**	**31**		
⊠	**P3D-C10**	**8.0**	**SANDY LEAN CLAY (CL/A-6)**	**39**	**18**	**21**		
▲	**P3D-C10**	**10.0**	**SANDY LEAN CLAY (CL/A-7-6)**	**47**	**21**	**26**		
★	**P3D-C10**	**15.0**	**FAT CLAY with SAND (CH/A-7-6)**	**62**	**20**	**42**		
⊙	**P3D-C10**	**30.0**	**SILT (ML/A-4)**	**NP**	**NP**	**NP**		

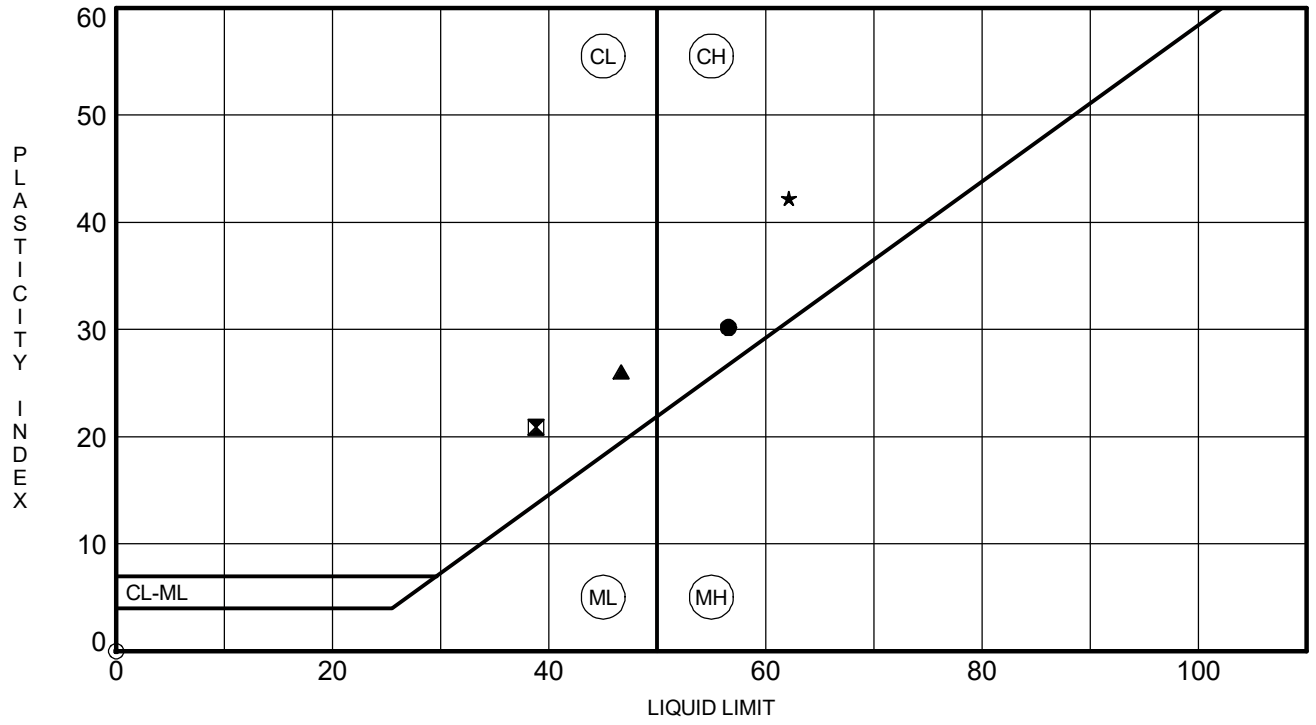
	BOREHOLE	DEPTH	D90	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**P3D-C10**	**2.0**							**56.5**	
⊠	**P3D-C10**	**8.0**							**69.8**	
▲	**P3D-C10**	**10.0**							**62.9**	
★	**P3D-C10**	**15.0**							**70.4**	
⊙	**P3D-C10**	**30.0**							**88.4**	

GRAIN SIZE G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 8/8/25

ATTERBERG LIMITS' RESULTS

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**P3D-C10**	**2.0**	**57**	**26**	**31**	**56.5**	**SANDY FAT CLAY (CH/A-7-6)**
⊠	**P3D-C10**	**8.0**	**39**	**18**	**21**	**69.8**	**SANDY LEAN CLAY (CL/A-6)**
▲	**P3D-C10**	**10.0**	**47**	**21**	**26**	**62.9**	**SANDY LEAN CLAY (CL/A-7-6)**
★	**P3D-C10**	**15.0**	**62**	**20**	**42**	**70.4**	**FAT CLAY with SAND (CH/A-7-6)**
⊙	**P3D-C10**	**30.0**	**NP**	**NP**	**NP**	**88.4**	**SILT (ML/A-4)**

ATTERBERG LIMITS G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 8/8/25

REV 12/2023

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	CCR Ph. 3D	**PROJECT NO.:**	G5662.030
SAMPLE NUMBER:	25-3195	**DATE REQUESTED:**	9/22/2025
DESCRIPTION OF SOIL:	Various		
TESTED BY:	MBP/AKG	**DATE OF TESTING:**	9/22/2025
WEIGHED BY:	HM	**DATE OF WEIGHING:**	9/23/2025

BORING NO.	P3D-C11	P3D-C11	P3D-C11	P3D-C11	P3D-C11
SAMPLE NO.	SS-3	SS-4	SS-6	SS-7	SS-11
SAMPLE DEPTH	4.0 - 6.0	6.0 - 8.0	13.5 - 15.0	18.5 - 20.0	38.5 - 40.0
WATER CONTENT, W%	13.3	16.2	40.7	42.2	37.5

BORING NO.	P3D-C11				
SAMPLE NO.	SS-12				
SAMPLE DEPTH	43.5 - 45.0				
WATER CONTENT, W%	25.7				

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

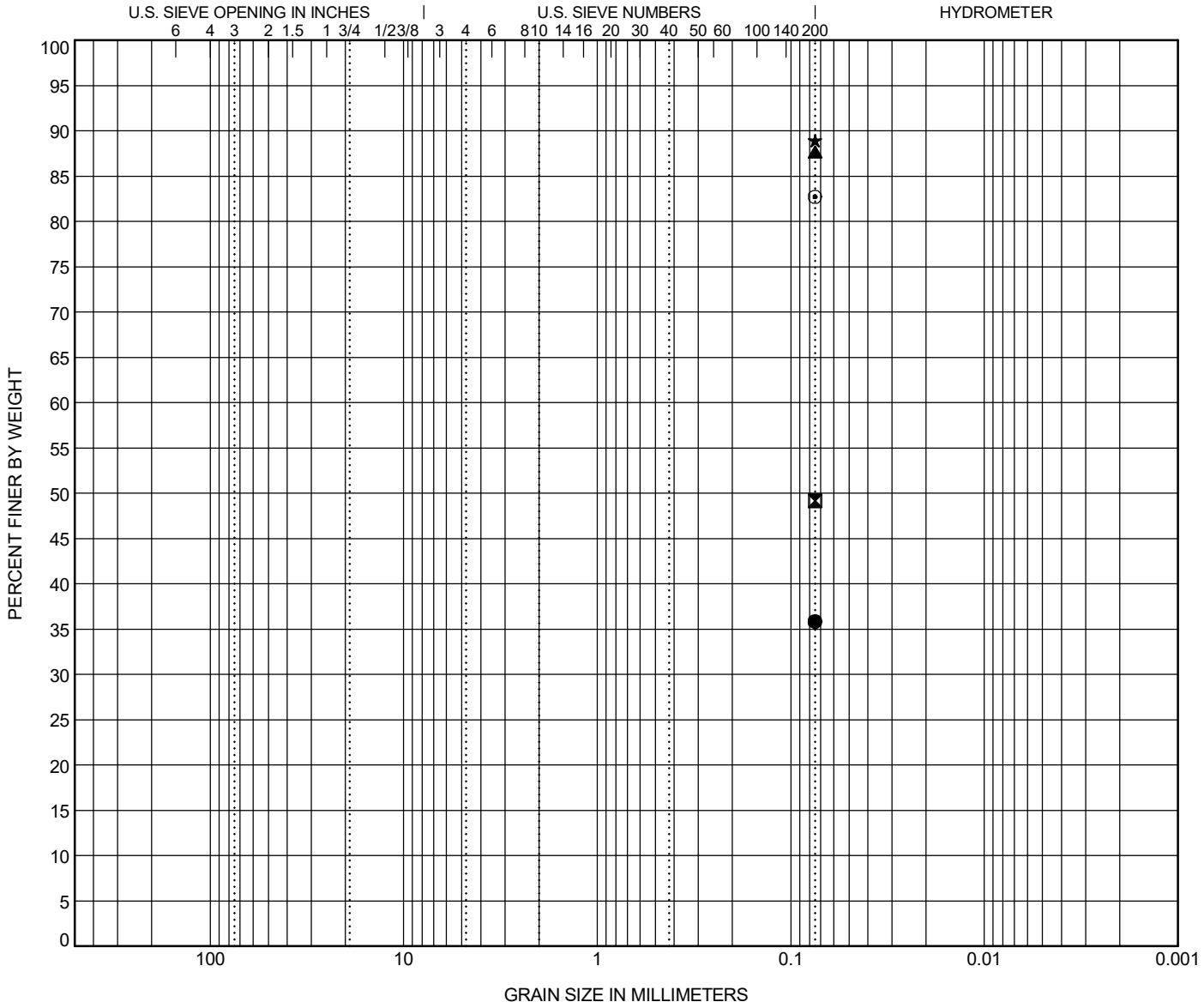
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

This report shall not be reproduced, except in full, without the written approval of F&ME Consultants, Inc.
211 Business Park Boulevard, Columbia SC 29203

GRAIN SIZE DISTRIBUTION

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads Phase 3D

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**P3D-C11**	**6.0**	**CLAYEY SAND (SC/A-6)**	**27**	**12**	**15**		
⊠	**P3D-C11**	**8.0**	**CLAYEY SAND (SC/A-6)**					
▲	**P3D-C11**	**15.0**	**SILT (ML/A-4)**	**39**	**34**	**5**		
★	**P3D-C11**	**20.0**	**SILT (ML/A-7-5)**	**45**	**34**	**11**		
⊙	**P3D-C11**	**40.0**	**SILT with SAND (ML/A-7-5)**	**49**	**37**	**12**		

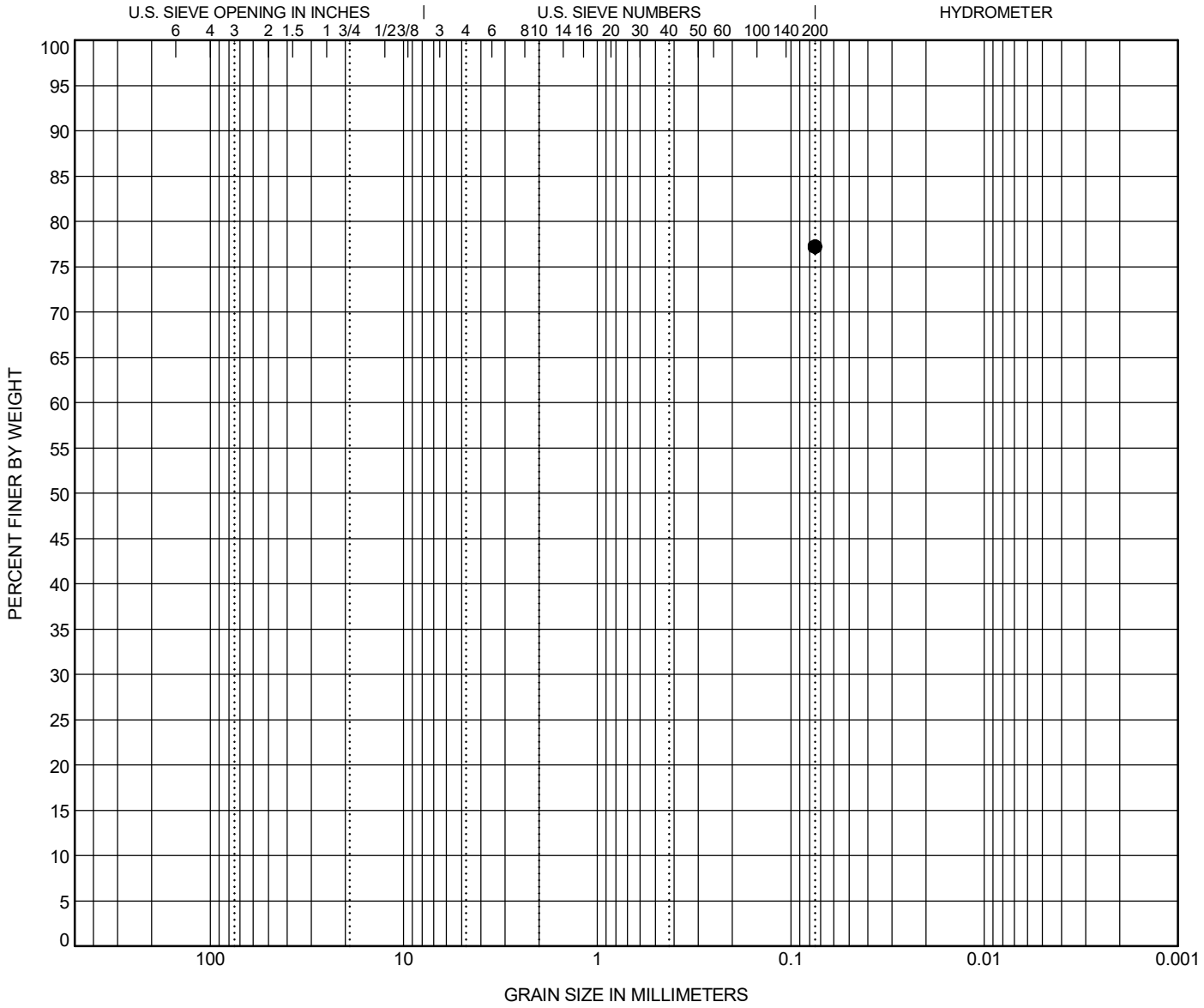
	BOREHOLE	DEPTH	D90	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**P3D-C11**	**6.0**							**35.9**	
⊠	**P3D-C11**	**8.0**							**49.2**	
▲	**P3D-C11**	**15.0**							**87.7**	
★	**P3D-C11**	**20.0**							**88.9**	
⊙	**P3D-C11**	**40.0**							**82.7**	

GRAIN SIZE G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/15/25

GRAIN SIZE DISTRIBUTION

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads Phase 3D

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**P3D-C11**	**45.0**	**SILT with SAND (ML/A-6)**	**38**	**26**	**12**		

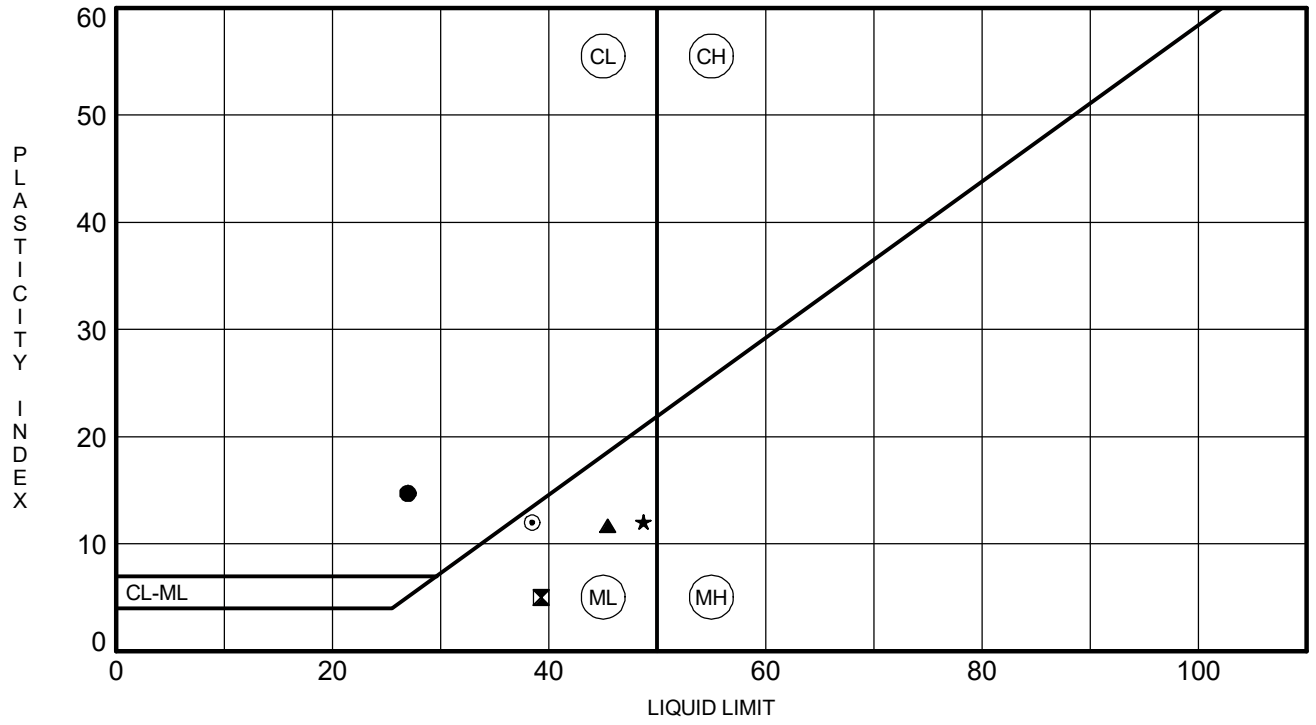
	BOREHOLE	DEPTH	D90	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**P3D-C11**	**45.0**							**77.2**	

GRAIN SIZE G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/15/25

ATTERBERG LIMITS' RESULTS

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads Phase 3D

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**P3D-C11**	**6.0**	**27**	**12**	**15**	**36**	**CLAYEY SAND (SC/A-6)**
⊠	**P3D-C11**	**15.0**	**39**	**34**	**5**	**88**	**SILT (ML/A-4)**
▲	**P3D-C11**	**20.0**	**45**	**34**	**11**	**89**	**SILT (ML/A-7-5)**
★	**P3D-C11**	**40.0**	**49**	**37**	**12**	**83**	**SILT with SAND (ML/A-7-5)**
⊙	**P3D-C11**	**45.0**	**38**	**26**	**12**	**77**	**SILT with SAND (ML/A-6)**

ATTERBERG (OUTSOURCE) G5662.03- CAROLINA CROSSROADS PH 3D.GPJ FME2017.GDT 10/15/25

Laboratory test performed at a non-F&ME AASHTO accreditted laboratory

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	CCR Ph. 3D	**PROJECT NO.:**	G5662.030
SAMPLE NUMBER:	25-2848	**DATE REQUESTED:**	7/23/2025
DESCRIPTION OF SOIL:	Various		
TESTED BY:	AC & CJ	**DATE OF TESTING:**	8/20/2025
WEIGHED BY:	JM	**DATE OF WEIGHING:**	8/21/2025

BORING NO.	P3D-W1	P3D-W1	P3D-W1	P3D-W1	
SAMPLE NO.	SS-1	SS-2	SS-3	SS-5	
SAMPLE DEPTH	0.0 - 2.0	2.0 - 4.0	4.0 - 6.0	8.0 - 10.0	
WATER CONTENT, W%	28.5	13.6	15.1	14.7	

.

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

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

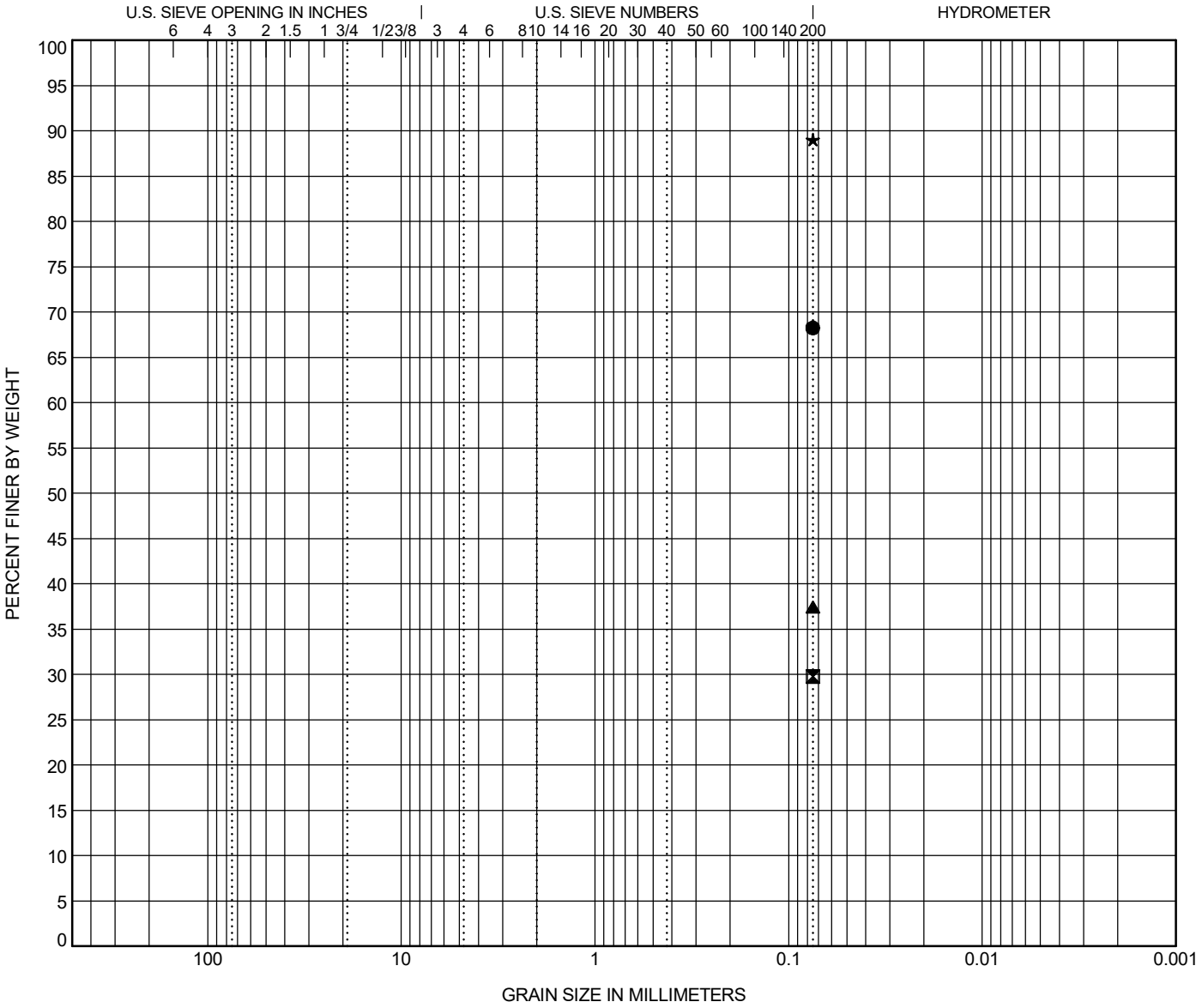
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

This report shall not be reproduced, except in full, without the written approval of F&ME Consultants, Inc.
211 Business Park Boulevard, Columbia SC 29203

GRAIN SIZE DISTRIBUTION

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**P3D-W1**	**2.0**	**SANDY FAT CLAY (CH/A-7-6)**	**53**	**22**	**31**		
⊠	**P3D-W1**	**4.0**	**SILTY SAND (SM/A-2-4)**					
▲	**P3D-W1**	**6.0**	**SILTY SAND (SM/A-4)**					
★	**P3D-W1**	**10.0**	**SILT (ML/A-6)**	**37**	**25**	**12**		

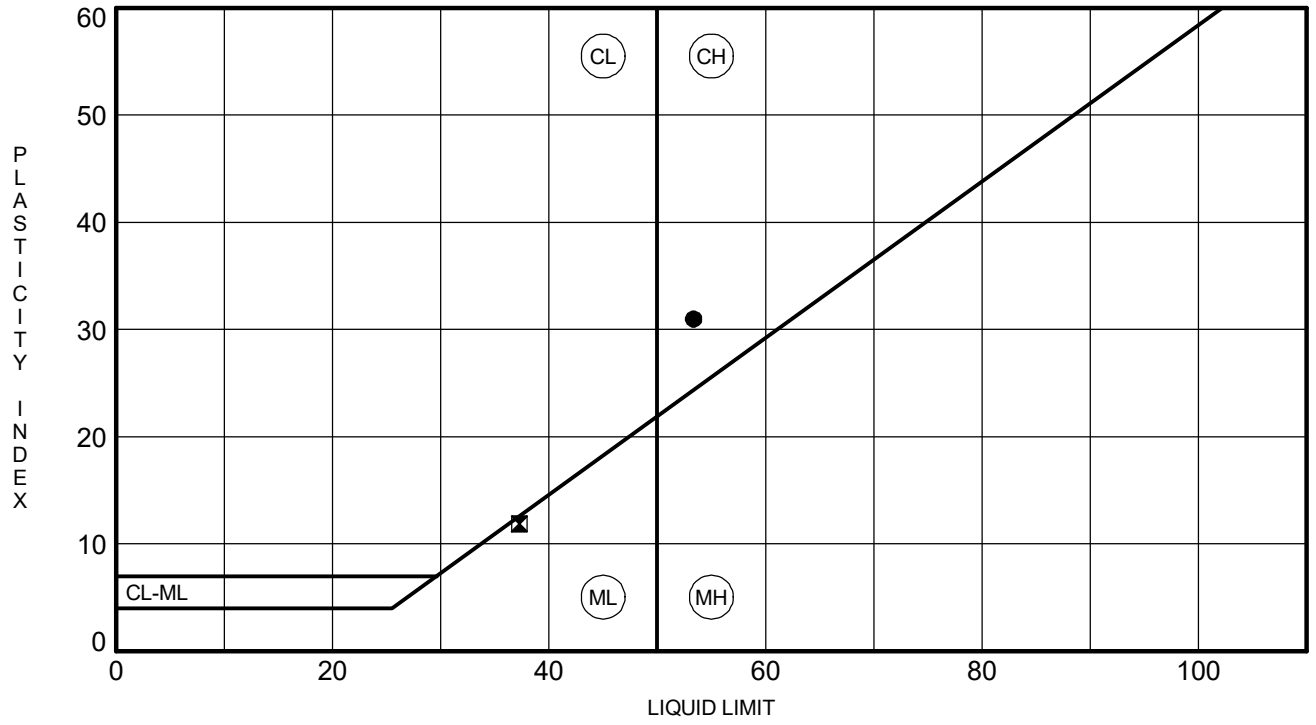
	BOREHOLE	DEPTH	D90	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**P3D-W1**	**2.0**							**68.3**	
⊠	**P3D-W1**	**4.0**							**29.8**	
▲	**P3D-W1**	**6.0**							**37.5**	
★	**P3D-W1**	**10.0**							**89.0**	

GRAIN SIZE G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 9/12/25

ATTERBERG LIMITS' RESULTS

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**P3D-W1**	**2.0**	**53**	**22**	**31**	**68.3**	**SANDY FAT CLAY (CH/A-7-6)**
⊠	**P3D-W1**	**10.0**	**37**	**25**	**12**	**89.0**	**SILT (ML/A-6)**

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	CCR Ph. 3D	**PROJECT NO.:**	G5662.030
SAMPLE NUMBER:	25-2849	**DATE REQUESTED:**	8/15/2025
DESCRIPTION OF SOIL:	Various		
TESTED BY:	AC & CJ	**DATE OF TESTING:**	9/2/2025
WEIGHED BY:	JM	**DATE OF WEIGHING:**	9/3/2025

BORING NO.	P3D-W2	P3D-W2	P3D-W2	P3D-W2	P3D-W2
SAMPLE NO.	SS-1	SS-2	SS-3	SS-4	SS-5
SAMPLE DEPTH	0.0 - 2.0	2.0 - 4.0	4.0 - 6.0	6.0 - 8.0	8.0 - 10.0
WATER CONTENT, W%	23.4	20.0	31.9	35.9	28.6

BORING NO.	P3D-W2	P3D-W2			
SAMPLE NO.	SS-6	SS-8			
SAMPLE DEPTH	13.5 - 15.0	23.5 - 25.0			
WATER CONTENT, W%	18.3	20.4			

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

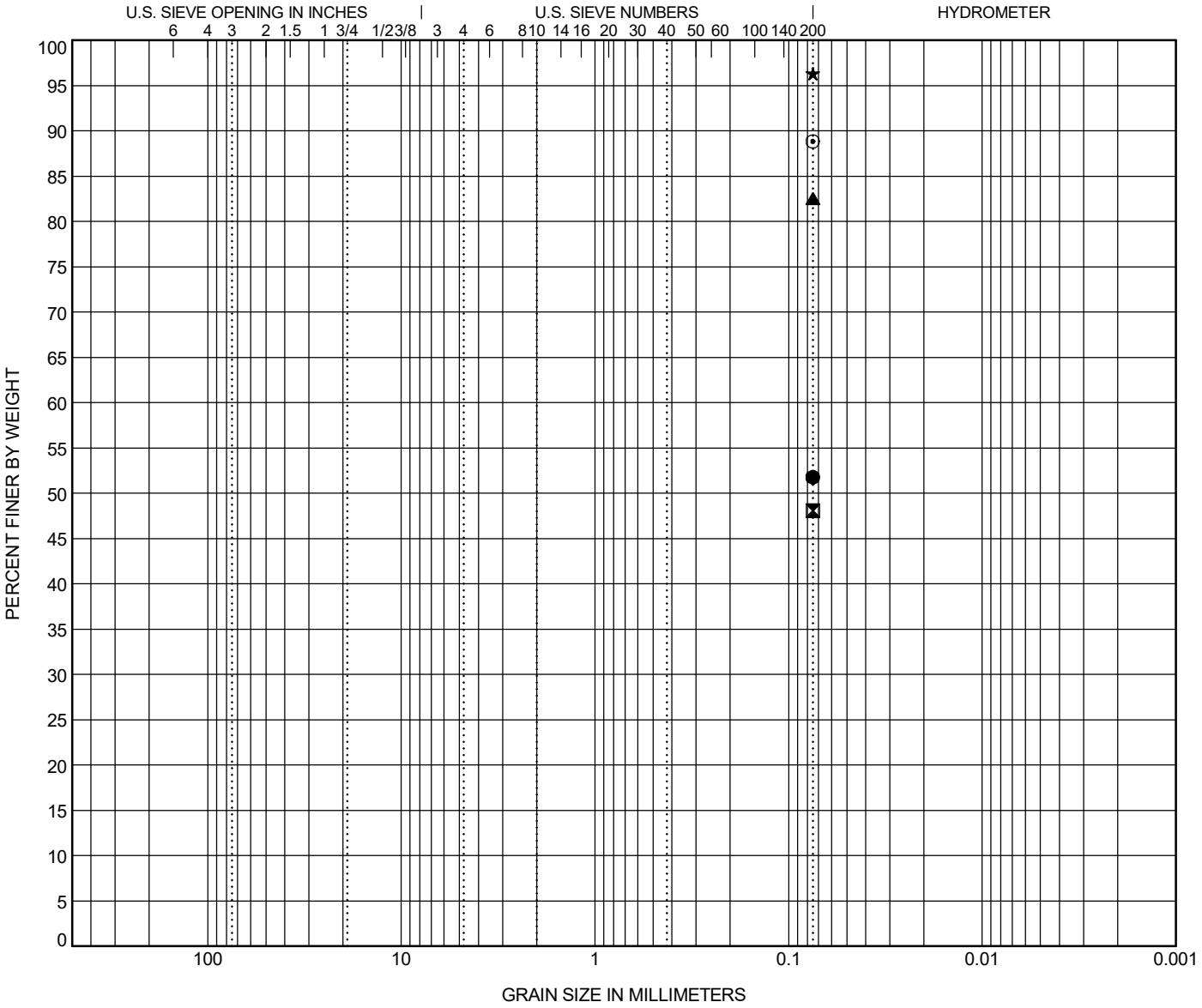
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

This report shall not be reproduced, except in full, without the written approval of F&ME Consultants, Inc.
211 Business Park Boulevard, Columbia SC 29203

GRAIN SIZE DISTRIBUTION

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**P3D-W2**	**2.0**	**SANDY LEAN CLAY (CL/A-6)**					
⊠	**P3D-W2**	**4.0**	**CLAYEY SAND (SC/A-7-6)**	**53**	**17**	**36**		
▲	**P3D-W2**	**6.0**	**FAT CLAY with SAND (CH/A-7-6)**	**77**	**22**	**55**		
★	**P3D-W2**	**8.0**	**LEAN CLAY (CL/A-7-6)**	**48**	**24**	**24**		
⊙	**P3D-W2**	**10.0**	**SILT (ML/A-6)**	**40**	**29**	**11**		

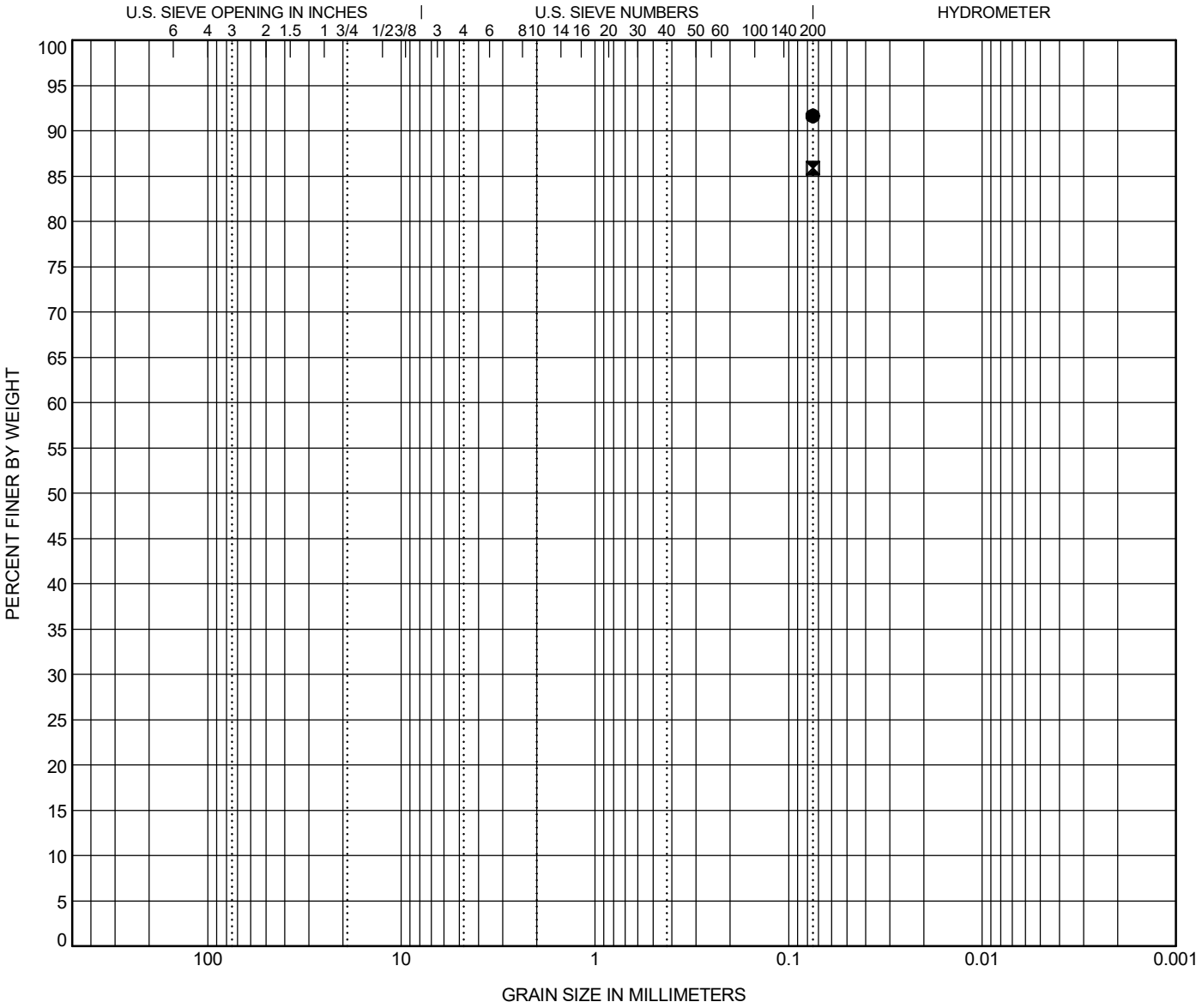
	BOREHOLE	DEPTH	D90	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**P3D-W2**	**2.0**							**51.8**	
⊠	**P3D-W2**	**4.0**							**48.1**	
▲	**P3D-W2**	**6.0**							**82.6**	
★	**P3D-W2**	**8.0**							**96.3**	
⊙	**P3D-W2**	**10.0**							**88.9**	

GRAIN SIZE G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 9/16/25

GRAIN SIZE DISTRIBUTION

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**P3D-W2**	**15.0**	**SILT (ML/A-4)**	**37**	**27**	**10**		
⊠	**P3D-W2**	**25.0**	**SILT (ML/A-4)**	**38**	**28**	**10**		

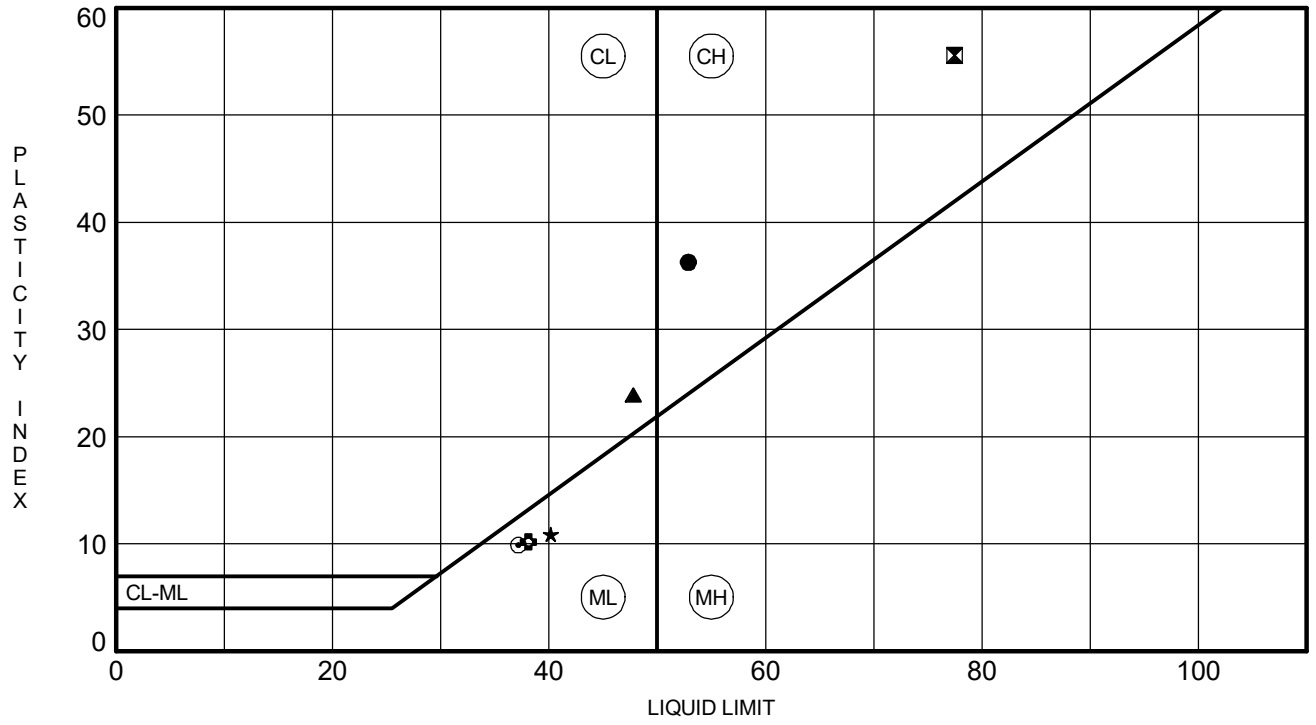
	BOREHOLE	DEPTH	D90	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**P3D-W2**	**15.0**							**91.7**	
⊠	**P3D-W2**	**25.0**							**85.9**	

GRAIN SIZE G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 9/16/25

ATTERBERG LIMITS' RESULTS

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**P3D-W2**	**4.0**	**53**	**17**	**36**	**48.1**	**CLAYEY SAND (SC/A-7-6)**
⊠	**P3D-W2**	**6.0**	**77**	**22**	**55**	**82.6**	**FAT CLAY with SAND (CH/A-7-6)**
▲	**P3D-W2**	**8.0**	**48**	**24**	**24**	**96.3**	**LEAN CLAY (CL/A-7-6)**
★	**P3D-W2**	**10.0**	**40**	**29**	**11**	**88.9**	**SILT (ML/A-6)**
⊙	**P3D-W2**	**15.0**	**37**	**27**	**10**	**91.7**	**SILT (ML/A-4)**
✿	**P3D-W2**	**25.0**	**38**	**28**	**10**	**85.9**	**SILT (ML/A-4)**

ATTERBERG LIMITS G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 9/16/25

REV 12/2023

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	CCR Ph. 3D	**PROJECT NO.:**	G5662.030
SAMPLE NUMBER:	25-3053	**DATE REQUESTED:**	8/27/2025
DESCRIPTION OF SOIL:	Various		
TESTED BY:	AC/MMP	**DATE OF TESTING:**	9/19/2025
WEIGHED BY:	JM/HM	**DATE OF WEIGHING:**	9/22/2025

BORING NO.	P3D-W3	P3D-W3	P3D-W3	P3D-W3	P3D-W3
SAMPLE NO.	SS-1	SS-2	SS-4	SS-6	SS-7
SAMPLE DEPTH	0.0 - 2.0	2.0 - 4.0	6.0 - 8.0	13.5 - 15.0	18.5 - 20.0
WATER CONTENT, W%	26.0	22.3	14.4	26.1	35.7

BORING NO.	P3D-W3	P3D-W3			
SAMPLE NO.	SS-10	SS-11			
SAMPLE DEPTH	33.5 - 35.0	38.5 - 40.0			
WATER CONTENT, W%	24.3	28.1			

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

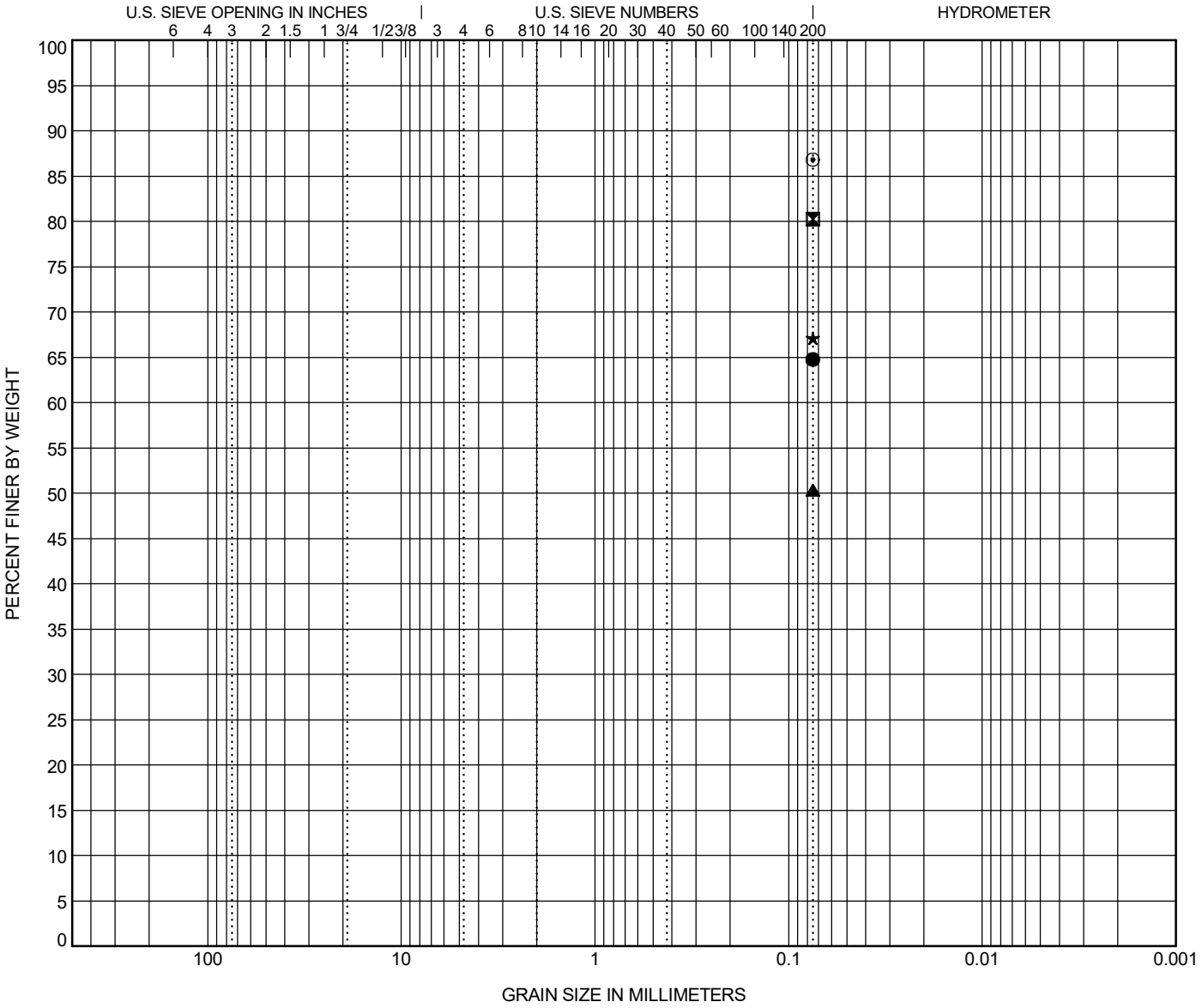
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

This report shall not be reproduced, except in full, without the written approval of F&ME Consultants, Inc.

GRAIN SIZE DISTRIBUTION

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**P3D-W3**	**2.0**	**SANDY SILT (ML/A-7-5)**	**46**	**31**	**15**		
⊠	**P3D-W3**	**4.0**	**SILT with SAND (ML/A-7-5)**	**44**	**31**	**13**		
▲	**P3D-W3**	**8.0**	**SANDY SILT (ML/A-4)**	**33**	**24**	**9**		
★	**P3D-W3**	**15.0**	**SANDY SILT (ML/A-4)**					
⊙	**P3D-W3**	**20.0**	**SILT (ML/A-7-5)**	**46**	**32**	**14**		

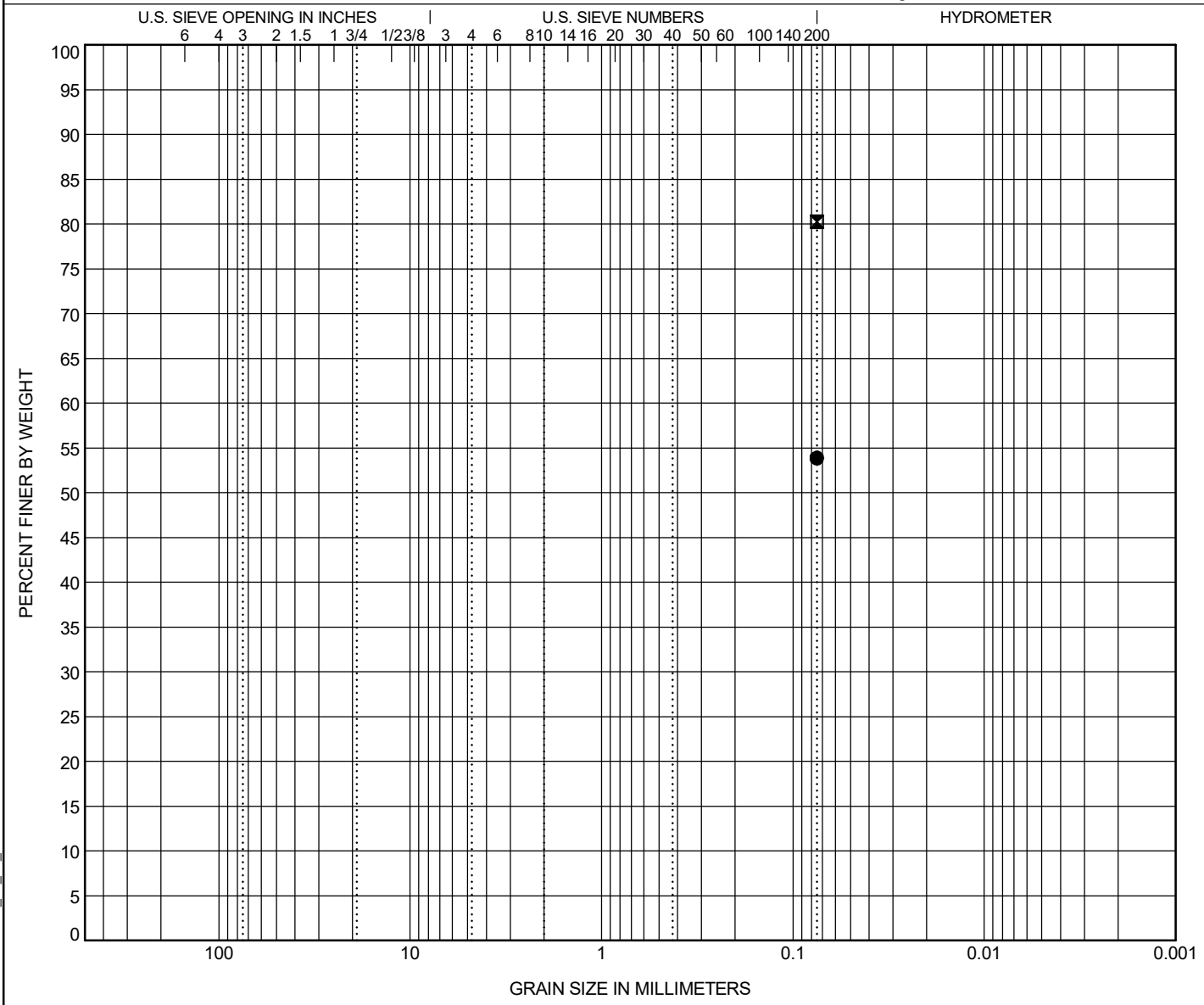
	BOREHOLE	DEPTH	D90	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**P3D-W3**	**2.0**							**64.8**	
⊠	**P3D-W3**	**4.0**							**80.3**	
▲	**P3D-W3**	**8.0**							**50.3**	
★	**P3D-W3**	**15.0**							**67.1**	
⊙	**P3D-W3**	**20.0**							**86.8**	

GRAIN SIZE G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 9/25/25

GRAIN SIZE DISTRIBUTION

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**P3D-W3**	**35.0**	**SANDY SILT (ML/A-6)**	**37**	**26**	**11**		
⊠	**P3D-W3**	**40.0**	**SILT with SAND (ML/A-6)**	**40**	**26**	**14**		

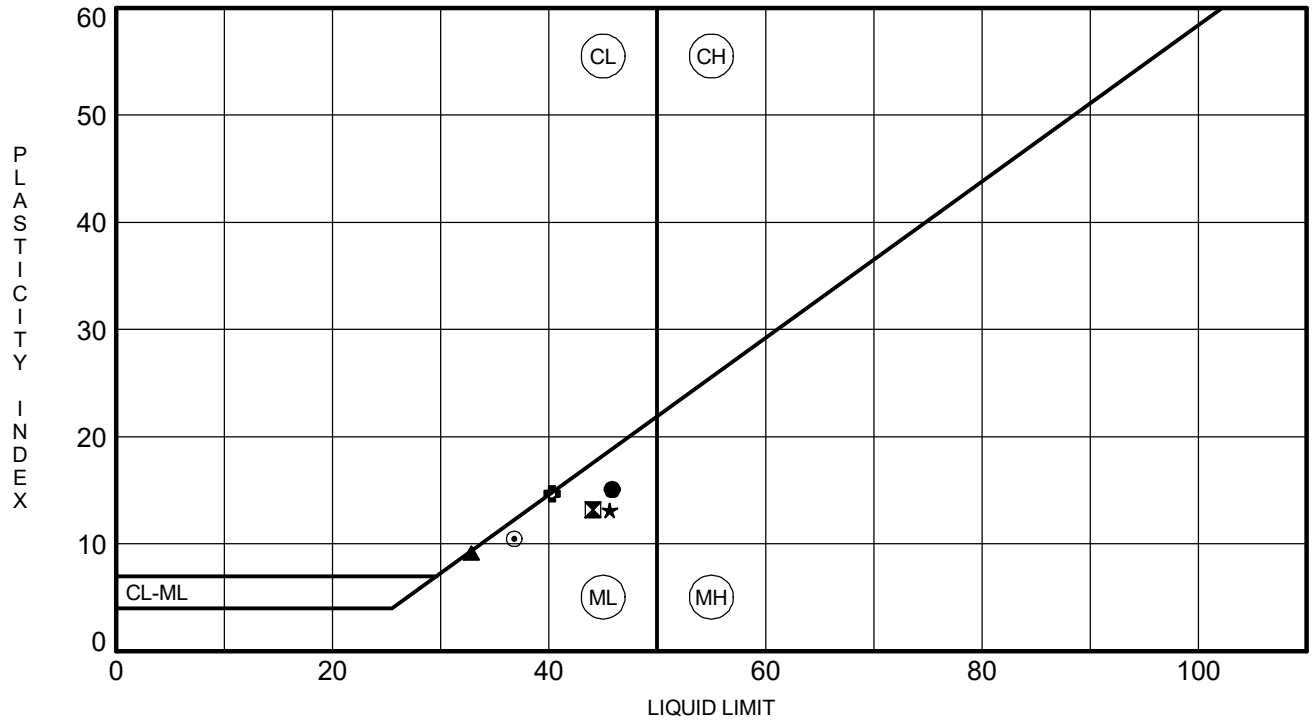
	BOREHOLE	DEPTH	D90	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**P3D-W3**	**35.0**							**53.9**	
⊠	**P3D-W3**	**40.0**							**80.3**	

GRAIN SIZE G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 9/25/25

ATTERBERG LIMITS' RESULTS

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**P3D-W3**	**2.0**	**46**	**31**	**15**	**64.8**	**SANDY SILT (ML/A-7-5)**
⊠	**P3D-W3**	**4.0**	**44**	**31**	**13**	**80.3**	**SILT with SAND (ML/A-7-5)**
▲	**P3D-W3**	**8.0**	**33**	**24**	**9**	**50.3**	**SANDY SILT (ML/A-4)**
★	**P3D-W3**	**20.0**	**46**	**32**	**14**	**86.8**	**SILT (ML/A-7-5)**
⊙	**P3D-W3**	**35.0**	**37**	**26**	**11**	**53.9**	**SANDY SILT (ML/A-6)**
✿	**P3D-W3**	**40.0**	**40**	**26**	**14**	**80.3**	**SILT with SAND (ML/A-6)**

ATTERBERG LIMITS G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 9/25/25

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	CCR Ph. 3D	**PROJECT NO.:**	G5662.030
SAMPLE NUMBER:	25-2365	**DATE REQUESTED:**	7/18/2025
DESCRIPTION OF SOIL:	Various		
TESTED BY:	LJ	**DATE OF TESTING:**	7/25/2025
WEIGHED BY:	AC	**DATE OF WEIGHING:**	7/28/2025

BORING NO.	P3D-W4	P3D-W4	P3D-W4	P3D-W4	
SAMPLE NO.	SS-1	SS-2	SS-3	SS-5	
SAMPLE DEPTH	0.0 - 2.0	2.0 - 4.0	4.0 - 6.0	8.0 - 10.0	
WATER CONTENT, W%	9.8	14.8	48.4	50.6	

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

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

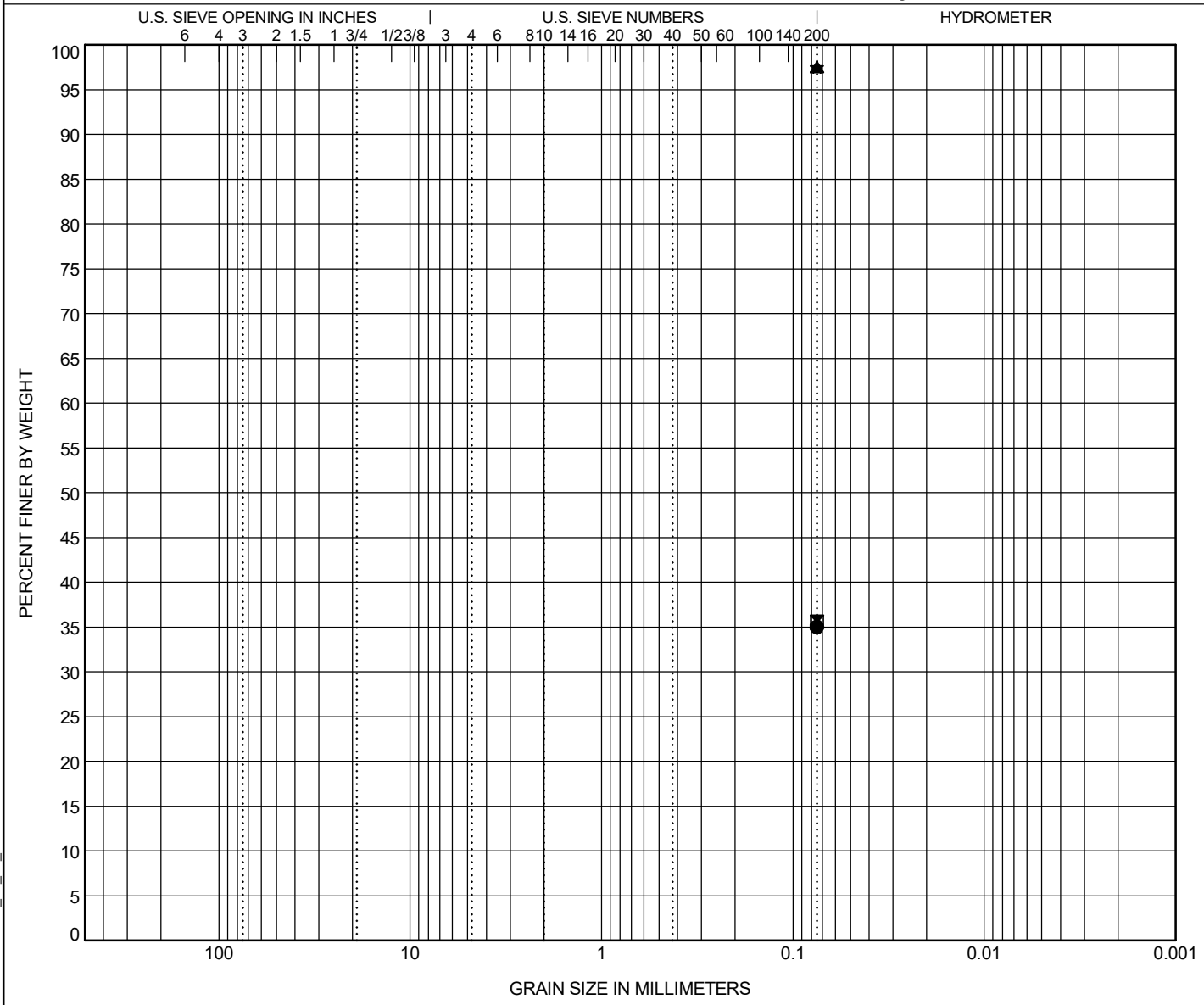
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

This report shall not be reproduced, except in full, without the written approval of F&ME Consultants, Inc.
211 Business Park Boulevard, Columbia SC 29203

GRAIN SIZE DISTRIBUTION

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**P3D-W4**	**2.0**	**CLAYEY SAND (SC/A-2-6)**	**26**	**15**	**11**		
⊠	**P3D-W4**	**4.0**	**CLAYEY SAND (SC/A-6)**	**31**	**12**	**19**		
▲	**P3D-W4**	**6.0**	**ELASTIC SILT (MH/A-7-5)**	**60**	**43**	**17**		
★	**P3D-W4**	**10.0**	**ELASTIC SILT (MH/A-7-5)**	**55**	**35**	**20**		

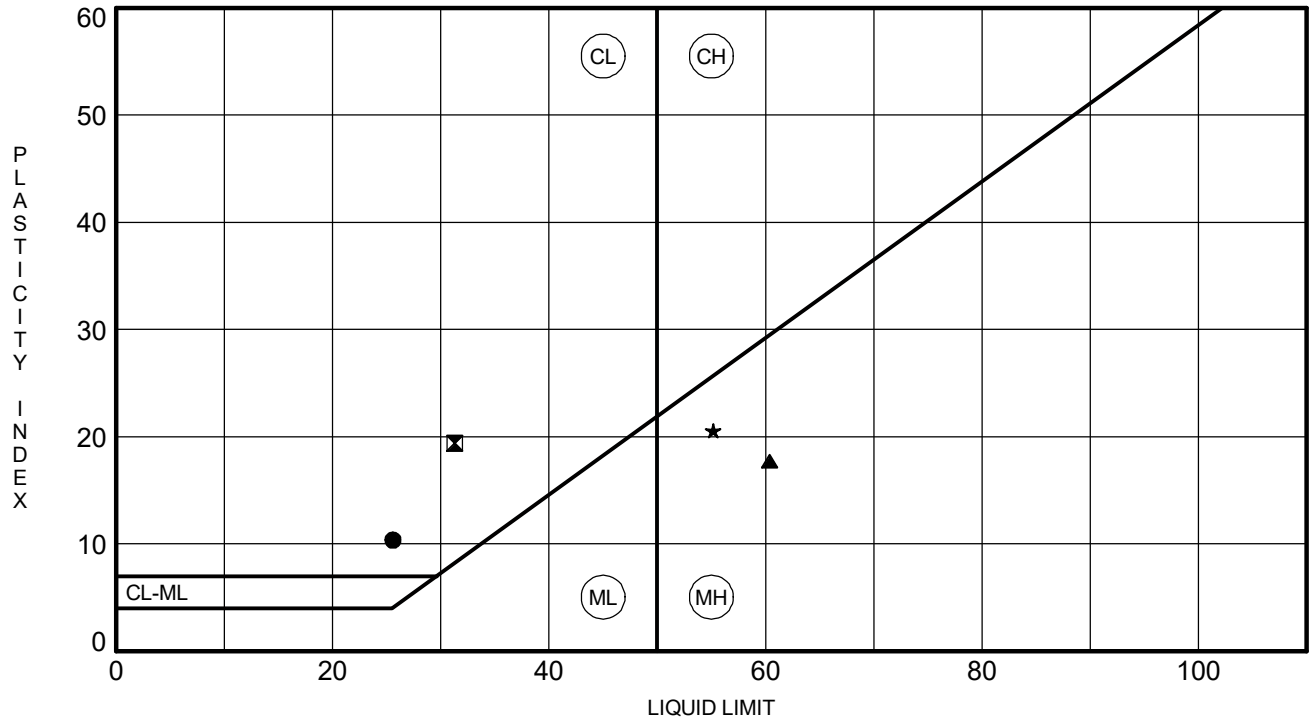
	BOREHOLE	DEPTH	D90	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**P3D-W4**	**2.0**							**35.0**	
⊠	**P3D-W4**	**4.0**							**35.6**	
▲	**P3D-W4**	**6.0**							**97.5**	
★	**P3D-W4**	**10.0**							**97.5**	

GRAIN SIZE G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 8/8/25

ATTERBERG LIMITS' RESULTS

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**P3D-W4**	**2.0**	**26**	**15**	**11**	**35.0**	**CLAYEY SAND (SC/A-2-6)**
⊠	**P3D-W4**	**4.0**	**31**	**12**	**19**	**35.6**	**CLAYEY SAND (SC/A-6)**
▲	**P3D-W4**	**6.0**	**60**	**43**	**17**	**97.5**	**ELASTIC SILT (MH/A-7-5)**
★	**P3D-W4**	**10.0**	**55**	**35**	**20**	**97.5**	**ELASTIC SILT (MH/A-7-5)**

ATTERBERG LIMITS G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 8/8/25

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	CCR Ph. 3D	**PROJECT NO.:**	G5662.030
SAMPLE NUMBER:	25-2366	**DATE REQUESTED:**	7/18/2025
DESCRIPTION OF SOIL:	Various		
TESTED BY:	LJ	**DATE OF TESTING:**	7/25/2025
WEIGHED BY:	AC	**DATE OF WEIGHING:**	7/28/2025

BORING NO.	P3D-W5	P3D-W5	P3D-W5	P3D-W5	P3D-W5
SAMPLE NO.	SS-4	SS-5	SS-6	SS-8	SS-13
SAMPLE DEPTH	6.0 - 8.0	8.0 - 10.0	13.5 - 15.0	23.5 - 25.0	48.5 - 50.0
WATER CONTENT, W%	18.4	26.5	28.1	31.3	35.8

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

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

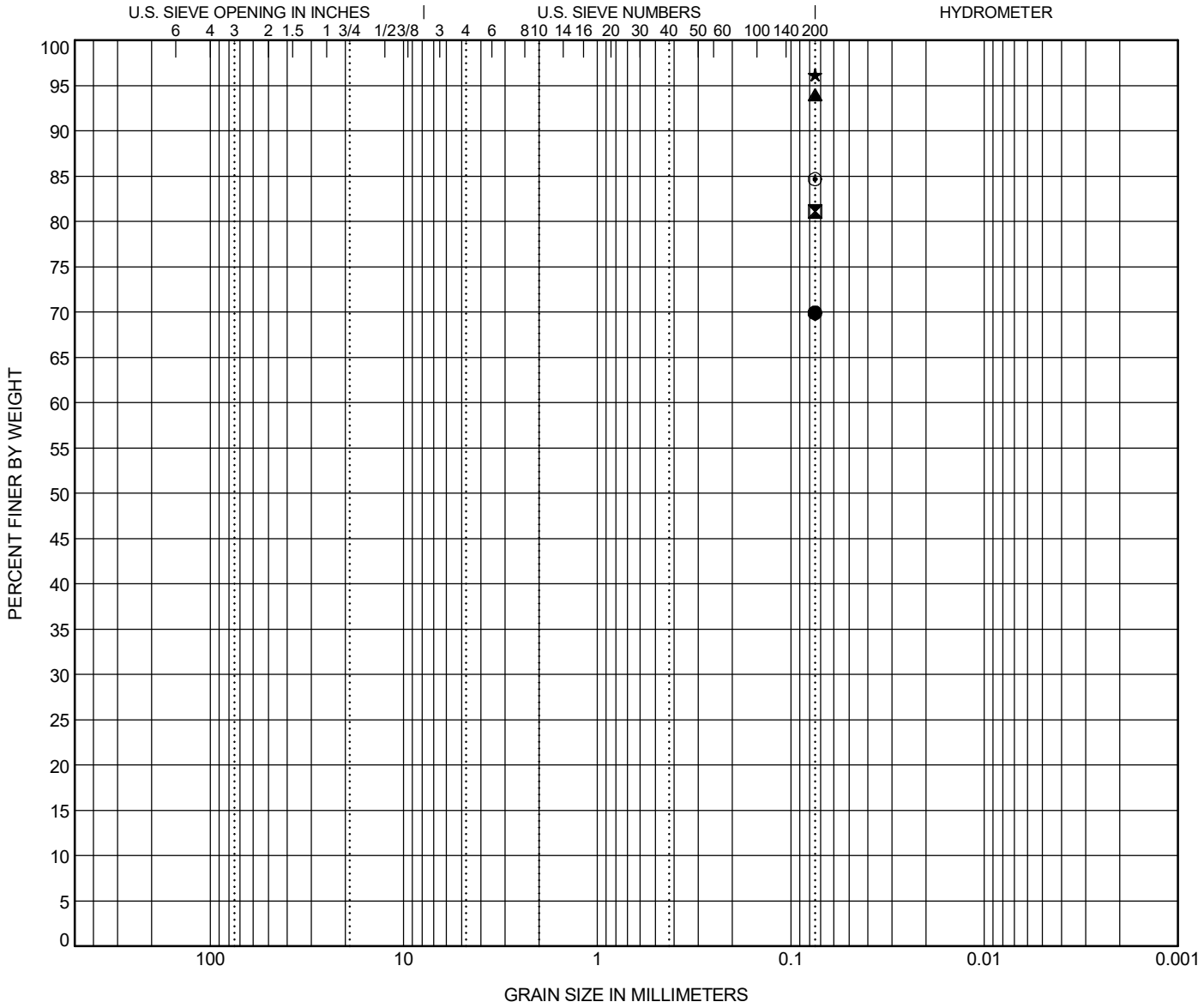
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

This report shall not be reproduced, except in full, without the written approval of F&ME Consultants, Inc.
211 Business Park Boulevard, Columbia SC 29203

GRAIN SIZE DISTRIBUTION

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**P3D-W5**	**8.0**	**SANDY LEAN CLAY (CL/A-6)**	**35**	**16**	**19**		
⊠	**P3D-W5**	**10.0**	**FAT CLAY with SAND (CH/A-7-6)**	**59**	**23**	**36**		
▲	**P3D-W5**	**15.0**	**LEAN CLAY (CL/A-7-6)**	**44**	**26**	**18**		
★	**P3D-W5**	**25.0**	**SILT (ML/A-4)**	**38**	**28**	**10**		
⊙	**P3D-W5**	**50.0**	**SILT with SAND (ML/A-4)**	**40**	**30**	**10**		

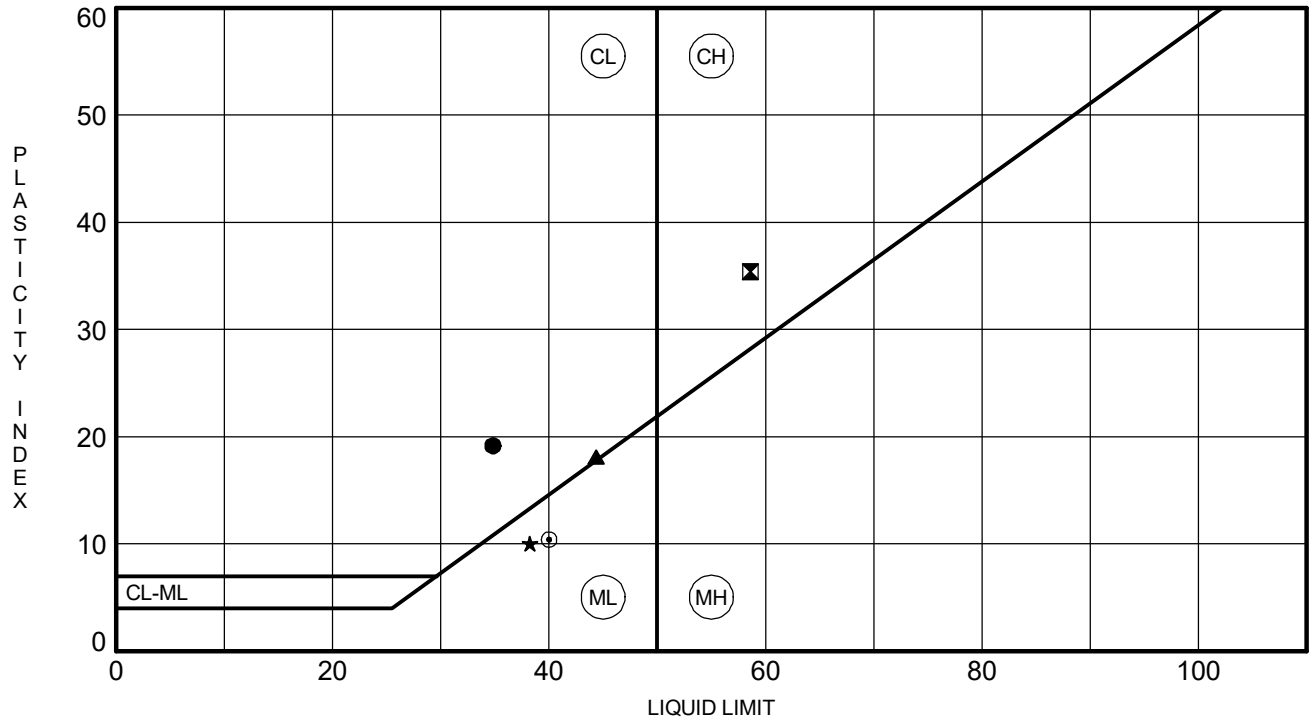
	BOREHOLE	DEPTH	D90	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**P3D-W5**	**8.0**							**69.9**	
⊠	**P3D-W5**	**10.0**							**81.1**	
▲	**P3D-W5**	**15.0**							**94.0**	
★	**P3D-W5**	**25.0**							**96.2**	
⊙	**P3D-W5**	**50.0**							**84.7**	

GRAIN SIZE G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 8/8/25

ATTERBERG LIMITS' RESULTS

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**P3D-W5**	**8.0**	**35**	**16**	**19**	**69.9**	**SANDY LEAN CLAY (CL/A-6)**
⊠	**P3D-W5**	**10.0**	**59**	**23**	**36**	**81.1**	**FAT CLAY with SAND (CH/A-7-6)**
▲	**P3D-W5**	**15.0**	**44**	**26**	**18**	**94.0**	**LEAN CLAY (CL/A-7-6)**
★	**P3D-W5**	**25.0**	**38**	**28**	**10**	**96.2**	**SILT (ML/A-4)**
⊙	**P3D-W5**	**50.0**	**40**	**30**	**10**	**84.7**	**SILT with SAND (ML/A-4)**

ATTERBERG LIMITS G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 8/8/25

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	CCR Ph. 3D	**PROJECT NO.:**	G5662.030
SAMPLE NUMBER:	25-2242	**DATE REQUESTED:**	7/14/2025
DESCRIPTION OF SOIL:	Various		
TESTED BY:	MBP/AR	**DATE OF TESTING:**	7/16/2025
WEIGHED BY:	JM	**DATE OF WEIGHING:**	7/17/2025

BORING NO.	P3D-W6	P3D-W6	P3D-W6	P3D-W6	P3D-W6
SAMPLE NO.	SS-1	SS-3	SS-5	SS-6	SS-7
SAMPLE DEPTH	0.0 - 2.0	4.0 - 6.0	8.0 - 10.0	13.5 - 15.0	18.5 - 20.0
WATER CONTENT, W%	17.0	34.1	43.2	17.2	32.6

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

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

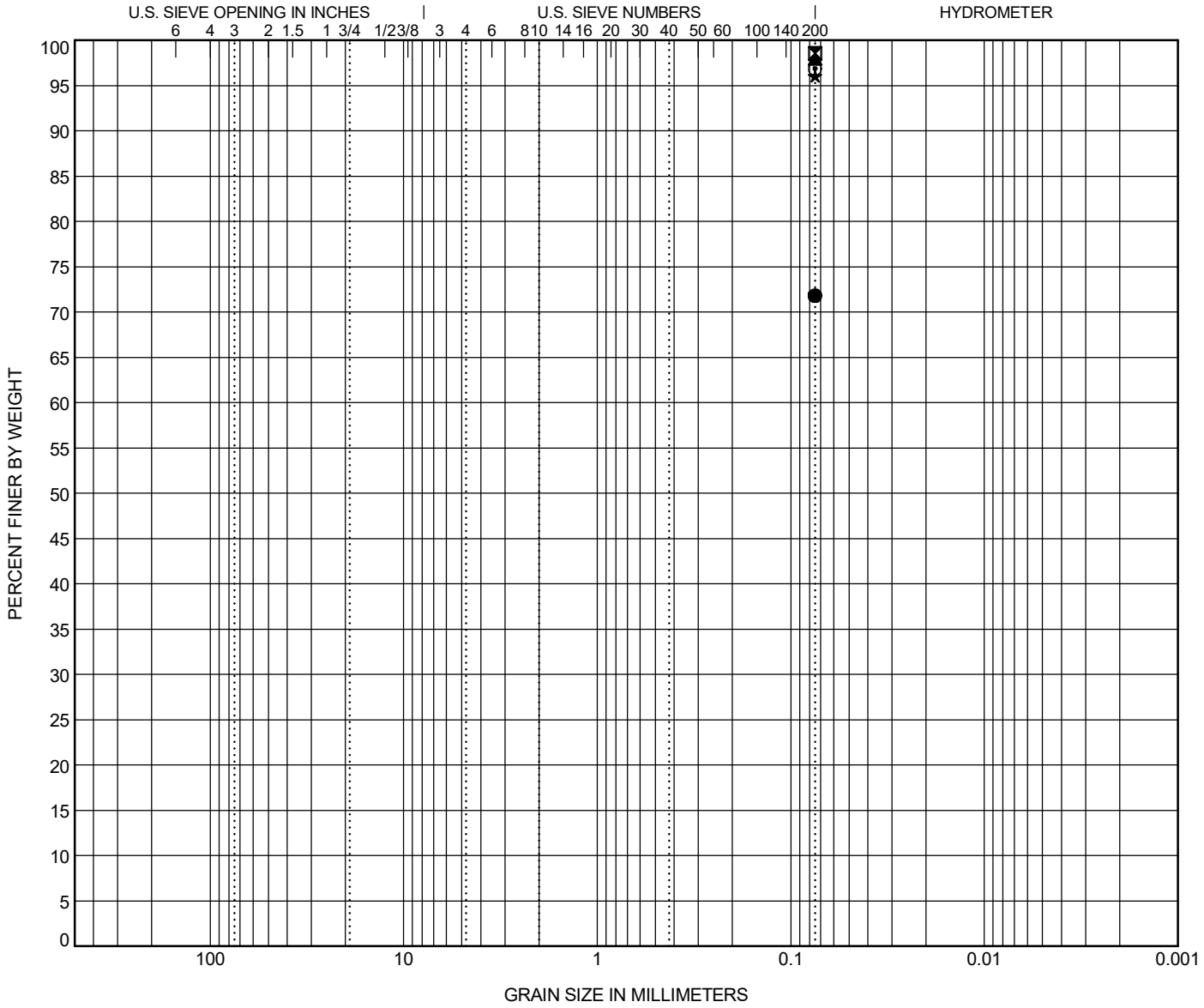
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

This report shall not be reproduced, except in full, without the written approval of F&ME Consultants, Inc.
211 Business Park Boulevard, Columbia SC 29203

GRAIN SIZE DISTRIBUTION

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**P3D-W6**	**2.0**	**LEAN CLAY with SAND (CL/A-6)**	**40**	**20**	**20**		
⊠	**P3D-W6**	**6.0**	**ELASTIC SILT (MH/A-7-5)**	**52**	**35**	**17**		
▲	**P3D-W6**	**10.0**	**ELASTIC SILT (MH/A-7-5)**					
★	**P3D-W6**	**15.0**	**SILT (ML/A-4)**	**NP**	**NP**	**NP**		
⊙	**P3D-W6**	**20.0**	**SILT (ML/A-4)**	**NP**	**NP**	**NP**		

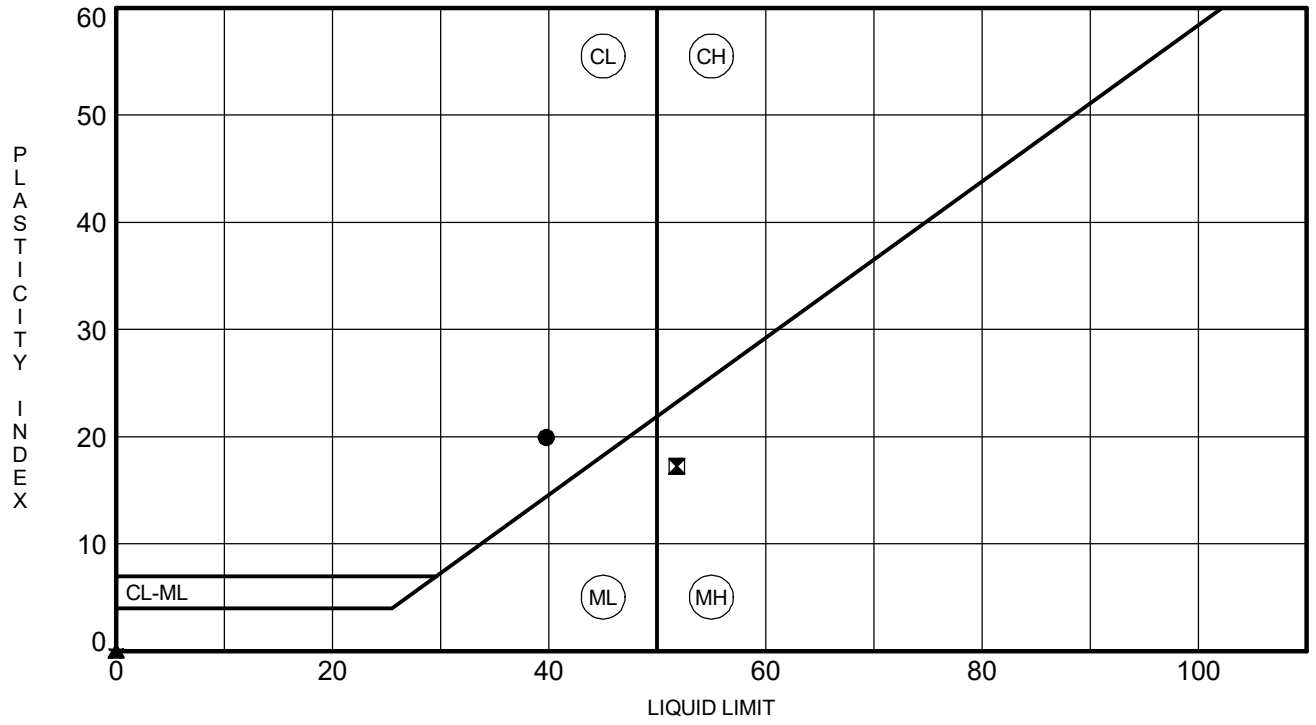
	BOREHOLE	DEPTH	D90	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**P3D-W6**	**2.0**							**71.8**	
⊠	**P3D-W6**	**6.0**							**98.6**	
▲	**P3D-W6**	**10.0**							**98.0**	
★	**P3D-W6**	**15.0**							**96.1**	
⊙	**P3D-W6**	**20.0**							**96.9**	

GRAIN SIZE G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 8/7/25

ATTERBERG LIMITS' RESULTS

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**P3D-W6**	**2.0**	**40**	**20**	**20**	**71.8**	**LEAN CLAY with SAND (CL/A-6)**
⧓	**P3D-W6**	**6.0**	**52**	**35**	**17**	**98.6**	**ELASTIC SILT (MH/A-7-5)**
▲	**P3D-W6**	**15.0**	**NP**	**NP**	**NP**	**96.1**	**SILT (ML/A-4)**
★	**P3D-W6**	**20.0**	**NP**	**NP**	**NP**	**96.9**	**SILT (ML/A-4)**

ATTERBERG LIMITS G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 8/7/25

REV 12/2023

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	CCR Ph. 3D	**PROJECT NO.:**	G5662.030
SAMPLE NUMBER:	25-2367	**DATE REQUESTED:**	7/18/2025
DESCRIPTION OF SOIL:	Various		
TESTED BY:	LJ	**DATE OF TESTING:**	7/25/2025
WEIGHED BY:	AC	**DATE OF WEIGHING:**	7/28/2025

BORING NO.	P3D-W7	P3D-W7	P3D-W7	P3D-W7	P3D-W7
SAMPLE NO.	SS-1	SS-4	SS-5	SS-7	SS-8
SAMPLE DEPTH	0.0 - 2.0	6.0 - 8.0	8.0 - 10.0	18.5 - 20.0	23.5 - 25.0
WATER CONTENT, W%	17.7	13.6	22.1	44.7	43.5

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

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

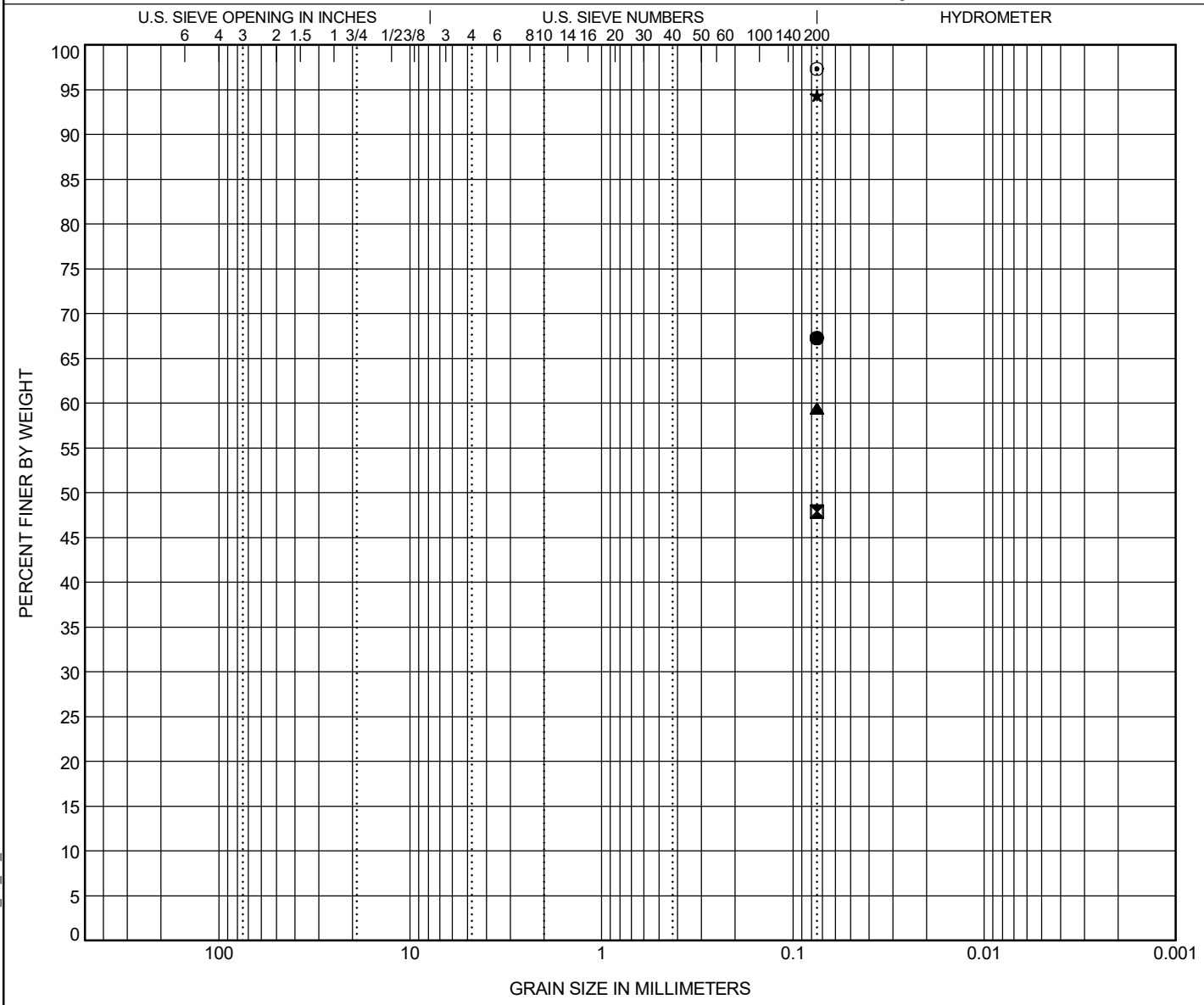
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

This report shall not be reproduced, except in full, without the written approval of F&ME Consultants, Inc.
211 Business Park Boulevard, Columbia SC 29203

GRAIN SIZE DISTRIBUTION

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**P3D-W7**	**2.0**	**SANDY FAT CLAY (CH/A-7-6)**	**53**	**22**	**31**		
⊠	**P3D-W7**	**8.0**	**CLAYEY SAND (SC/A-6)**	**32**	**17**	**15**		
▲	**P3D-W7**	**10.0**	**SANDY FAT CLAY (CH/A-7-6)**	**58**	**23**	**35**		
★	**P3D-W7**	**20.0**	**ELASTIC SILT (MH/A-7-6)**	**51**	**29**	**22**		
⊙	**P3D-W7**	**25.0**	**SILT (ML/A-7-5)**	**47**	**31**	**16**		

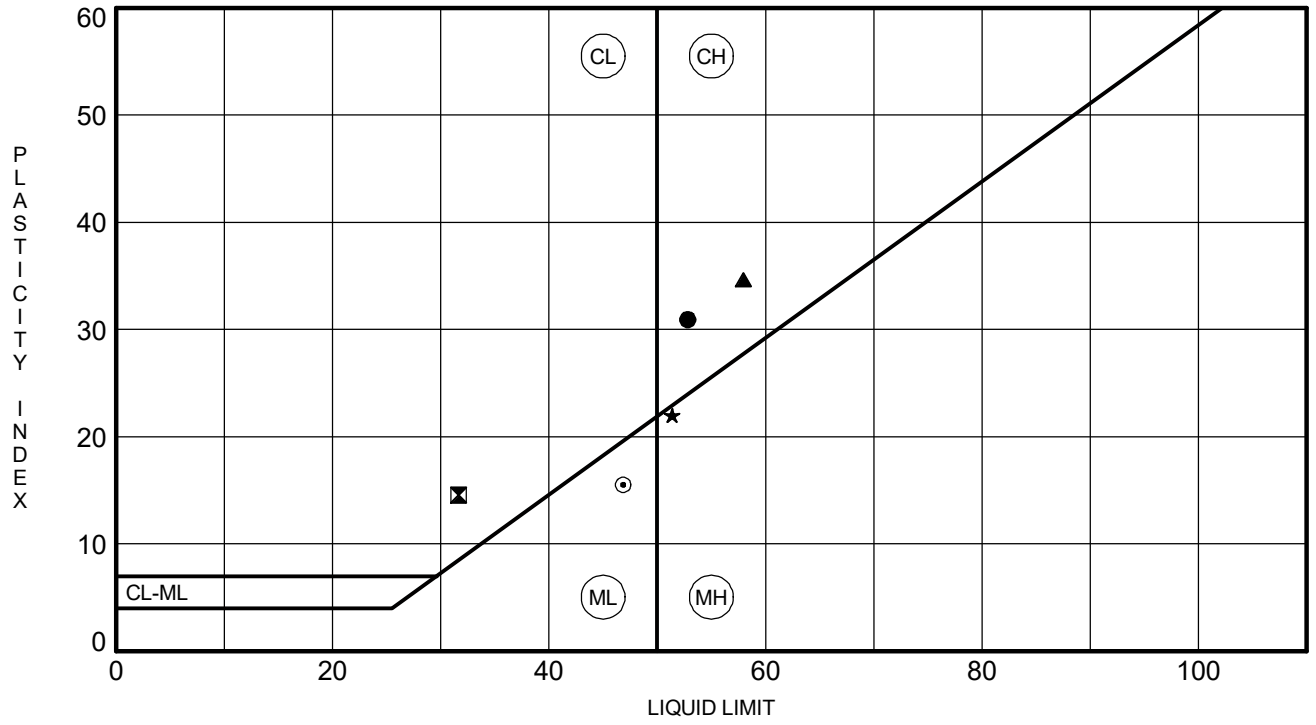
	BOREHOLE	DEPTH	D90	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**P3D-W7**	**2.0**							**67.3**	
⊠	**P3D-W7**	**8.0**							**47.9**	
▲	**P3D-W7**	**10.0**							**59.4**	
★	**P3D-W7**	**20.0**							**94.4**	
⊙	**P3D-W7**	**25.0**							**97.3**	

GRAIN SIZE G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 8/8/25

ATTERBERG LIMITS' RESULTS

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**P3D-W7**	**2.0**	**53**	**22**	**31**	**67.3**	**SANDY FAT CLAY (CH/A-7-6)**
⊠	**P3D-W7**	**8.0**	**32**	**17**	**15**	**47.9**	**CLAYEY SAND (SC/A-6)**
▲	**P3D-W7**	**10.0**	**58**	**23**	**35**	**59.4**	**SANDY FAT CLAY (CH/A-7-6)**
★	**P3D-W7**	**20.0**	**51**	**29**	**22**	**94.4**	**ELASTIC SILT (MH/A-7-6)**
⊙	**P3D-W7**	**25.0**	**47**	**31**	**16**	**97.3**	**SILT (ML/A-7-5)**

ATTERBERG LIMITS G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 8/8/25

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	CCR Ph. 3D	**PROJECT NO.:**	G5662.030
SAMPLE NUMBER:	25-3425	**DATE REQUESTED:**	9/19/2025
DESCRIPTION OF SOIL:	Various		
TESTED BY:	AHR/MMP	**DATE OF TESTING:**	10/7/2025
WEIGHED BY:	JM	**DATE OF WEIGHING:**	10/8/2025

BORING NO.	P3D-W8	P3D-W8	P3D-W8	P3D-W8	P3D-W8
SAMPLE NO.	SS-1	SS-2	SS-4	SS-5	SS-6
SAMPLE DEPTH	0.0 - 2.0	2.0 - 4.0	6.0 - 8.0	8.0 - 10.0	13.5 - 15.0
WATER CONTENT, W%	13.6	11.1	12.2	14.3	11.4

BORING NO.	P3D-W8	P3D-W8			
SAMPLE NO.	SS-7	SS-9			
SAMPLE DEPTH	18.5 - 20.0	28.5 - 30.0			
WATER CONTENT, W%	18.7	17.5			

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

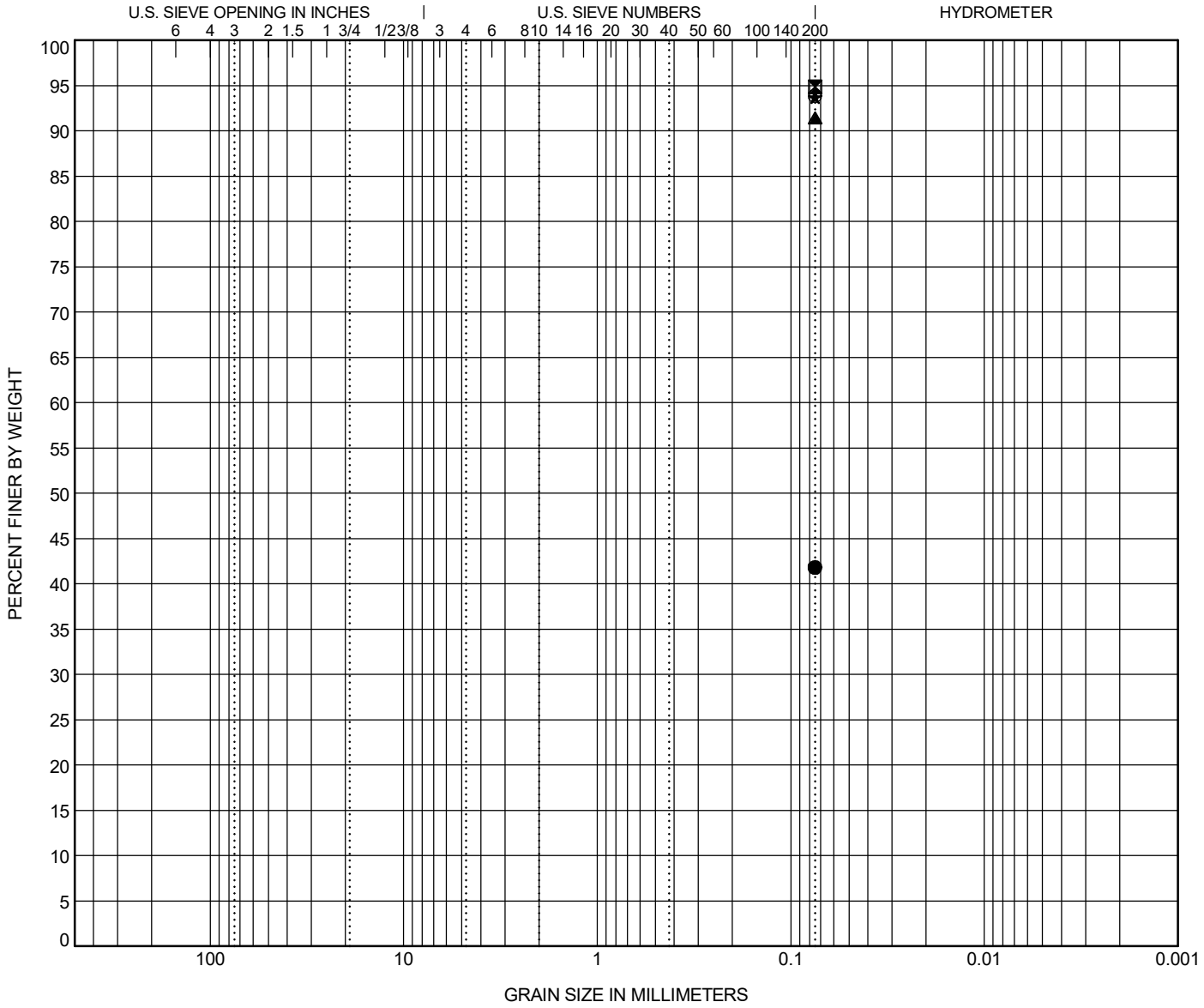
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

This report shall not be reproduced, except in full, without the written approval of F&ME Consultants, Inc.
211 Business Park Boulevard, Columbia SC 29203

GRAIN SIZE DISTRIBUTION

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads Phase 3D

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**P3D-W8**	**2.0**	**SILTY SAND (SM/A-4)**					
⊠	**P3D-W8**	**4.0**	**SILT (ML/A-4)**	**28**	**27**	**1**		
▲	**P3D-W8**	**8.0**	**SILT (ML/A-4)**	**NP**	**NP**	**NP**		
★	**P3D-W8**	**10.0**	**SILT (ML/A-4)**					
⊙	**P3D-W8**	**15.0**	**SILT (ML/A-4)**	**30**	**25**	**5**		

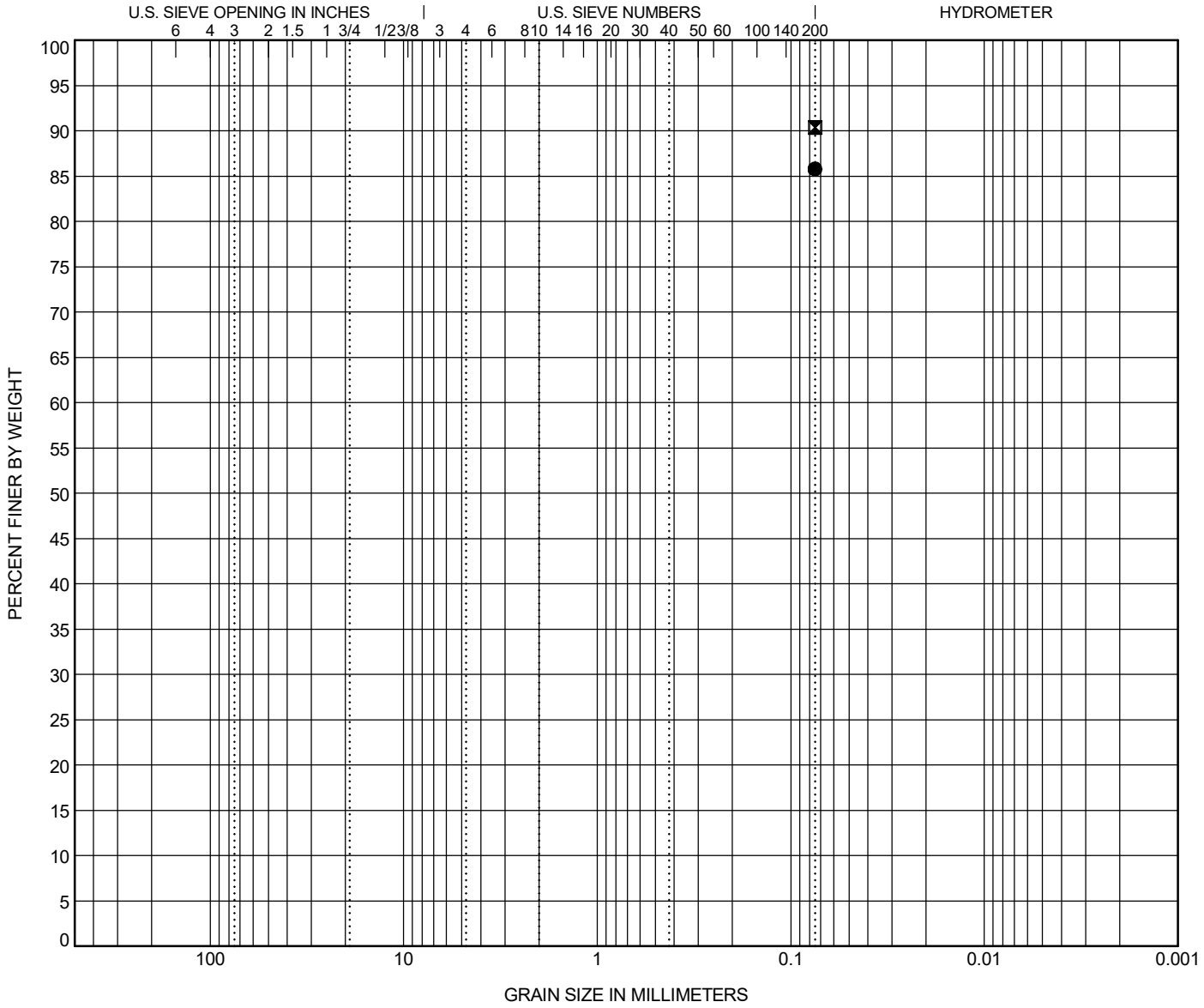
	BOREHOLE	DEPTH	D90	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**P3D-W8**	**2.0**							**41.8**	
⊠	**P3D-W8**	**4.0**							**94.9**	
▲	**P3D-W8**	**8.0**							**91.5**	
★	**P3D-W8**	**10.0**							**93.7**	
⊙	**P3D-W8**	**15.0**							**93.9**	

GRAIN SIZE G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/21/25

GRAIN SIZE DISTRIBUTION

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads Phase 3D

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**P3D-W8**	**20.0**	**SILT (ML/A-4)**					
⊠	**P3D-W8**	**30.0**	**SILT (ML/A-4)**					

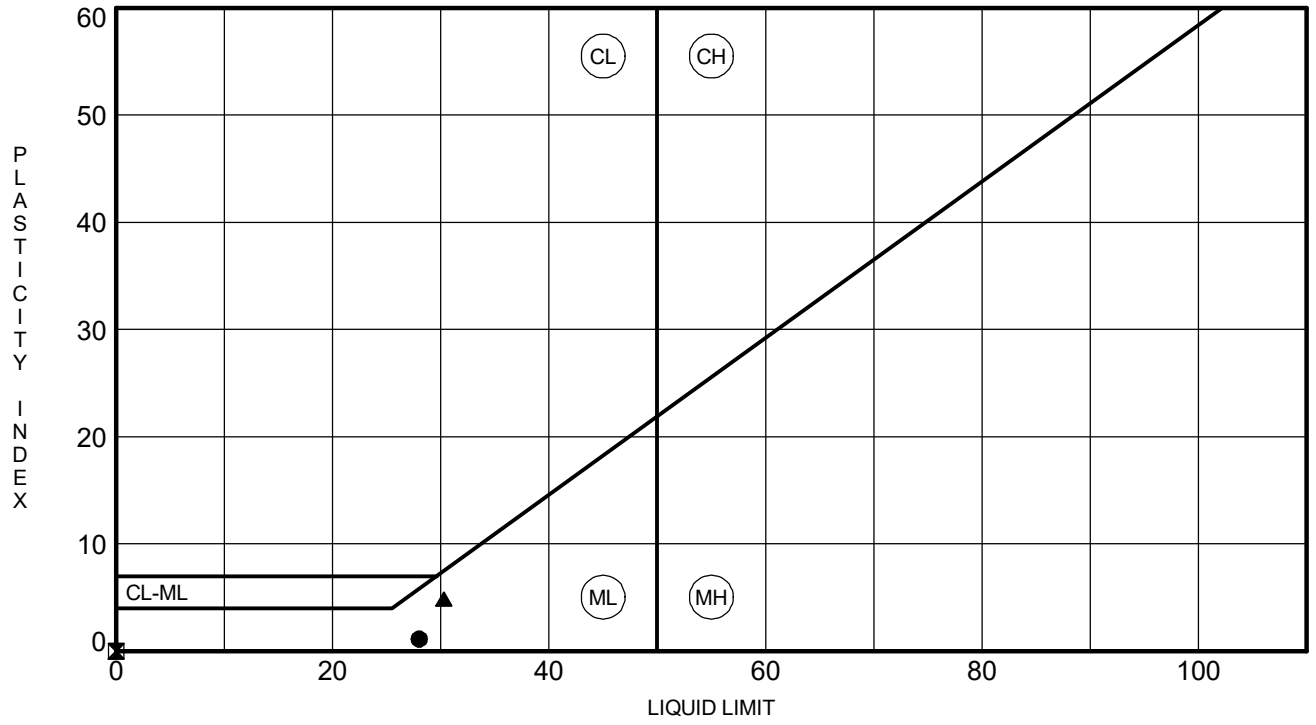
	BOREHOLE	DEPTH	D90	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**P3D-W8**	**20.0**							**85.8**	
⊠	**P3D-W8**	**30.0**							**90.4**	

GRAIN SIZE G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/21/25

ATTERBERG LIMITS' RESULTS

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads Phase 3D

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**P3D-W8**	**4.0**	**28**	**27**	**1**	**94.9**	**SILT (ML/A-4)**
⊠	**P3D-W8**	**8.0**	**NP**	**NP**	**NP**	**91.5**	**SILT (ML/A-4)**
▲	**P3D-W8**	**15.0**	**30**	**25**	**5**	**93.9**	**SILT (ML/A-4)**

ATTERBERG LIMITS G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/21/25

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	CCR Ph. 3D	**PROJECT NO.:**	G5662.030
SAMPLE NUMBER:	25-3426	**DATE REQUESTED:**	9/19/2025
DESCRIPTION OF SOIL:	Various		
TESTED BY:	AHR/MMP	**DATE OF TESTING:**	10/7/2025
WEIGHED BY:	JM	**DATE OF WEIGHING:**	10/8/2025

BORING NO.	P3D-W9	P3D-W9	P3D-W9	P3D-W9	P3D-W9
SAMPLE NO.	SS-2	SS-3	SS-4	SS-5	SS-6
SAMPLE DEPTH	2.0 - 4.0	4.0 - 6.0	6.0 - 8.0	8.0 - 10.0	13.5 - 15.0
WATER CONTENT, W%	12.3	7.6	18.9	23.6	14.3

BORING NO.	P3D-W9	P3D-W9	P3D-W9		
SAMPLE NO.	SS-7	SS-8	SS-11		
SAMPLE DEPTH	18.5 - 20.0	23.5 - 25.0	38.5 - 40.0		
WATER CONTENT, W%	16.0	21.8	20.2		

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

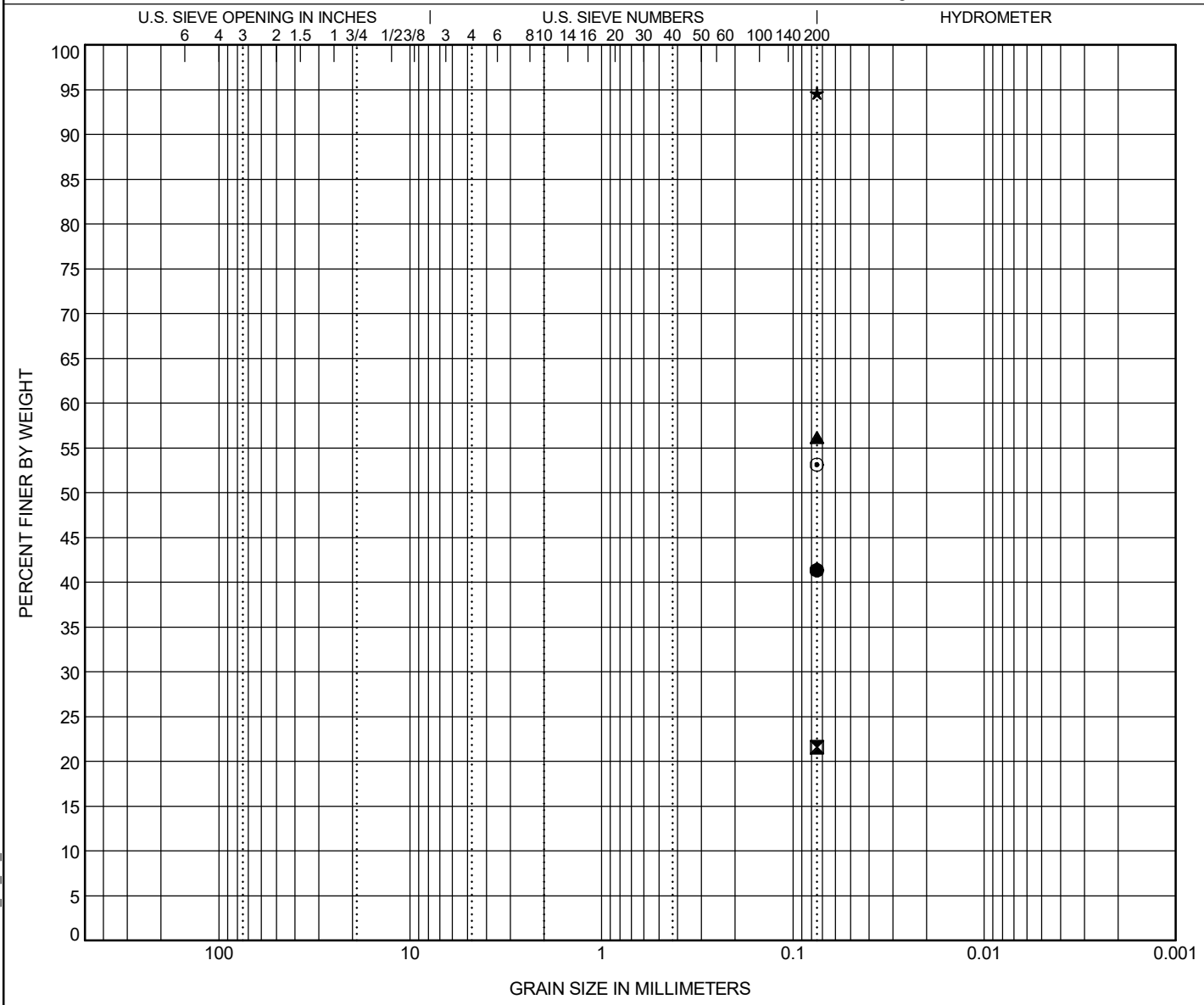
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

This report shall not be reproduced, except in full, without the written approval of F&ME Consultants, Inc.
211 Business Park Boulevard, Columbia SC 29203

GRAIN SIZE DISTRIBUTION

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads Phase 3D

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**P3D-W9**	**4.0**	**SILTY SAND (SM/A-4)**					
⊠	**P3D-W9**	**6.0**	**SILTY SAND (SM/A-2-4)**					
▲	**P3D-W9**	**8.0**	**SANDY SILT (ML/A-7-6)**	**42**	**29**	**13**		
★	**P3D-W9**	**10.0**	**SILT (ML/A-5)**	**41**	**31**	**10**		
⊙	**P3D-W9**	**15.0**	**SANDY SILT (ML/A-4)**					

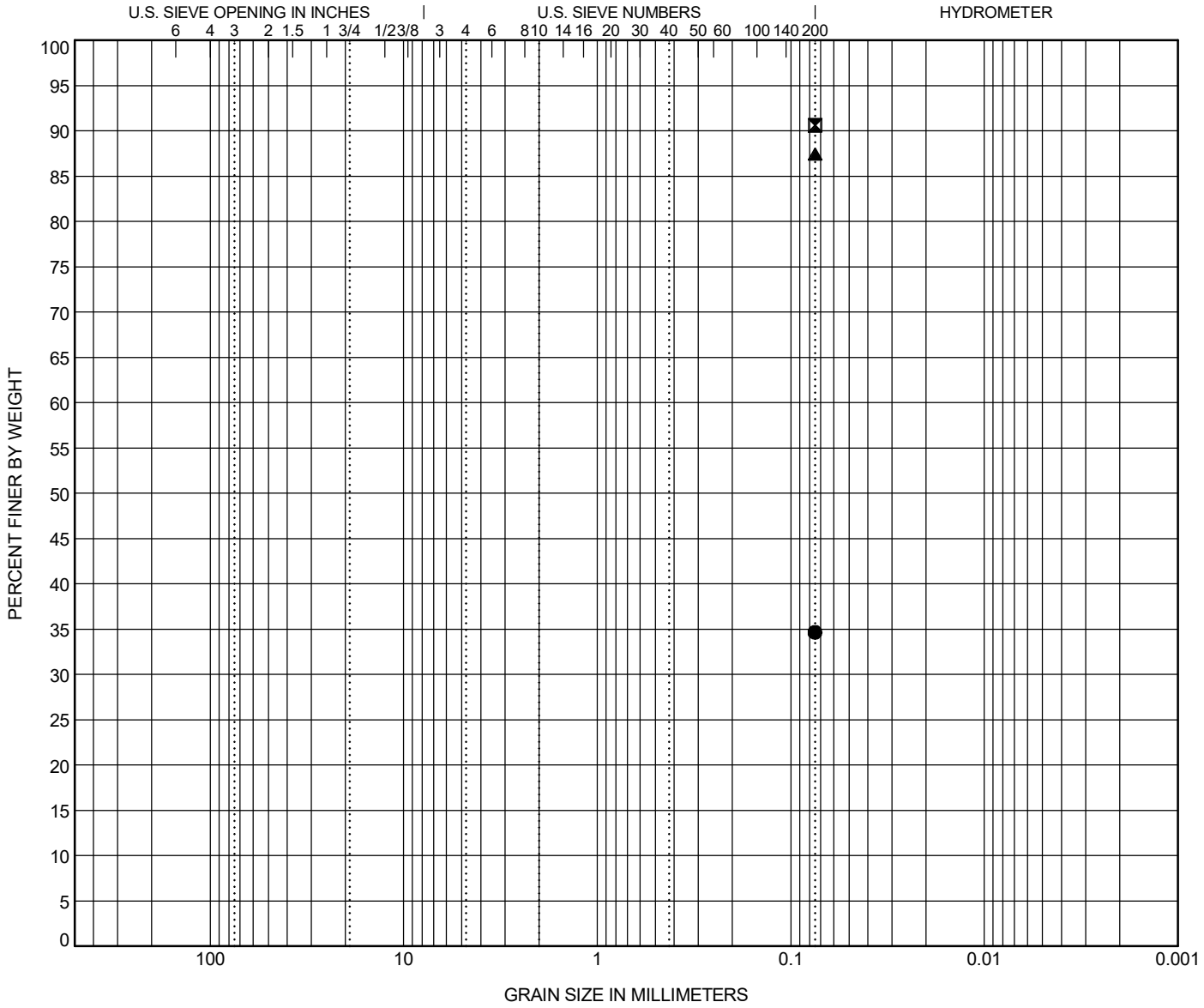
	BOREHOLE	DEPTH	D90	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**P3D-W9**	**4.0**							**41.4**	
⊠	**P3D-W9**	**6.0**							**21.6**	
▲	**P3D-W9**	**8.0**							**56.2**	
★	**P3D-W9**	**10.0**							**94.6**	
⊙	**P3D-W9**	**15.0**							**53.1**	

GRAIN SIZE G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/21/25

GRAIN SIZE DISTRIBUTION

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads Phase 3D

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**P3D-W9**	**20.0**	**SILTY, CLAYEY SAND (SC-SM/A-2-4)**	**27**	**20**	**7**		
⊠	**P3D-W9**	**25.0**	**SILT (ML/A-4)**	**37**	**28**	**9**		
▲	**P3D-W9**	**40.0**	**SILT (ML/A-4)**					

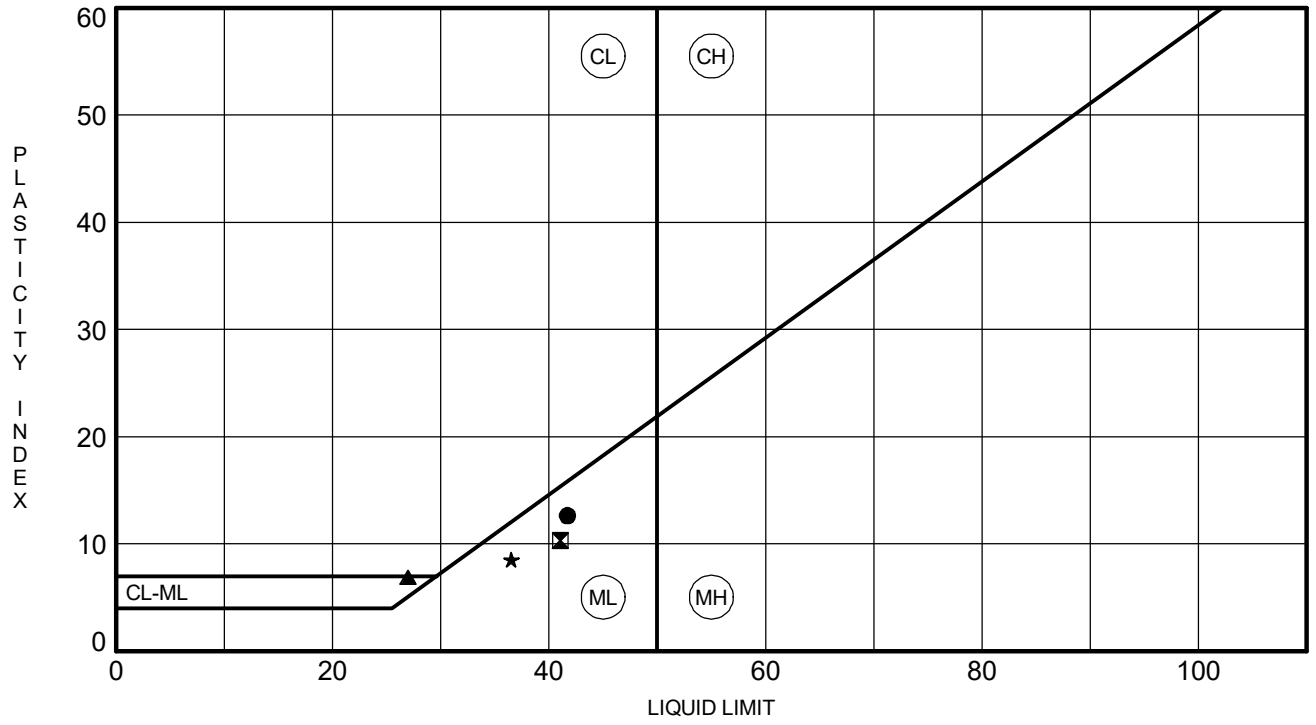
	BOREHOLE	DEPTH	D90	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**P3D-W9**	**20.0**							**34.7**	
⊠	**P3D-W9**	**25.0**							**90.6**	
▲	**P3D-W9**	**40.0**							**87.5**	

GRAIN SIZE G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/21/25

ATTERBERG LIMITS' RESULTS

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads Phase 3D

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**P3D-W9**	**8.0**	**42**	**29**	**13**	**56.2**	**SANDY SILT (ML/A-7-6)**
⊠	**P3D-W9**	**10.0**	**41**	**31**	**10**	**94.6**	**SILT (ML/A-5)**
▲	**P3D-W9**	**20.0**	**27**	**20**	**7**	**34.7**	**SILTY, CLAYEY SAND (SC-SM/A-2-4)**
★	**P3D-W9**	**25.0**	**37**	**28**	**9**	**90.6**	**SILT (ML/A-4)**

ATTERBERG LIMITS G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/21/25

REV 12/2023

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	CCR Ph. 3D	**PROJECT NO.:**	G5662.030
SAMPLE NUMBER:	25-3359	**DATE REQUESTED:**	9/12/2025
DESCRIPTION OF SOIL:	Various		
TESTED BY:	L. Johnson	**DATE OF TESTING:**	10/14/2025
WEIGHED BY:	L. Johnson	**DATE OF WEIGHING:**	10/15/2025

BORING NO.	P3D-W10	P3D-W10	P3D-W10	P3D-W10	P3D-W10
SAMPLE NO.	SS-1	SS-2	SS-3	SS-4	SS-5
SAMPLE DEPTH	0.0 - 2.0	2.0 - 4.0	4.0 - 6.0	6.0 - 8.0	8.0 - 10.0
WATER CONTENT, W%	22.5	17.5	29.0	29.9	14.7

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

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

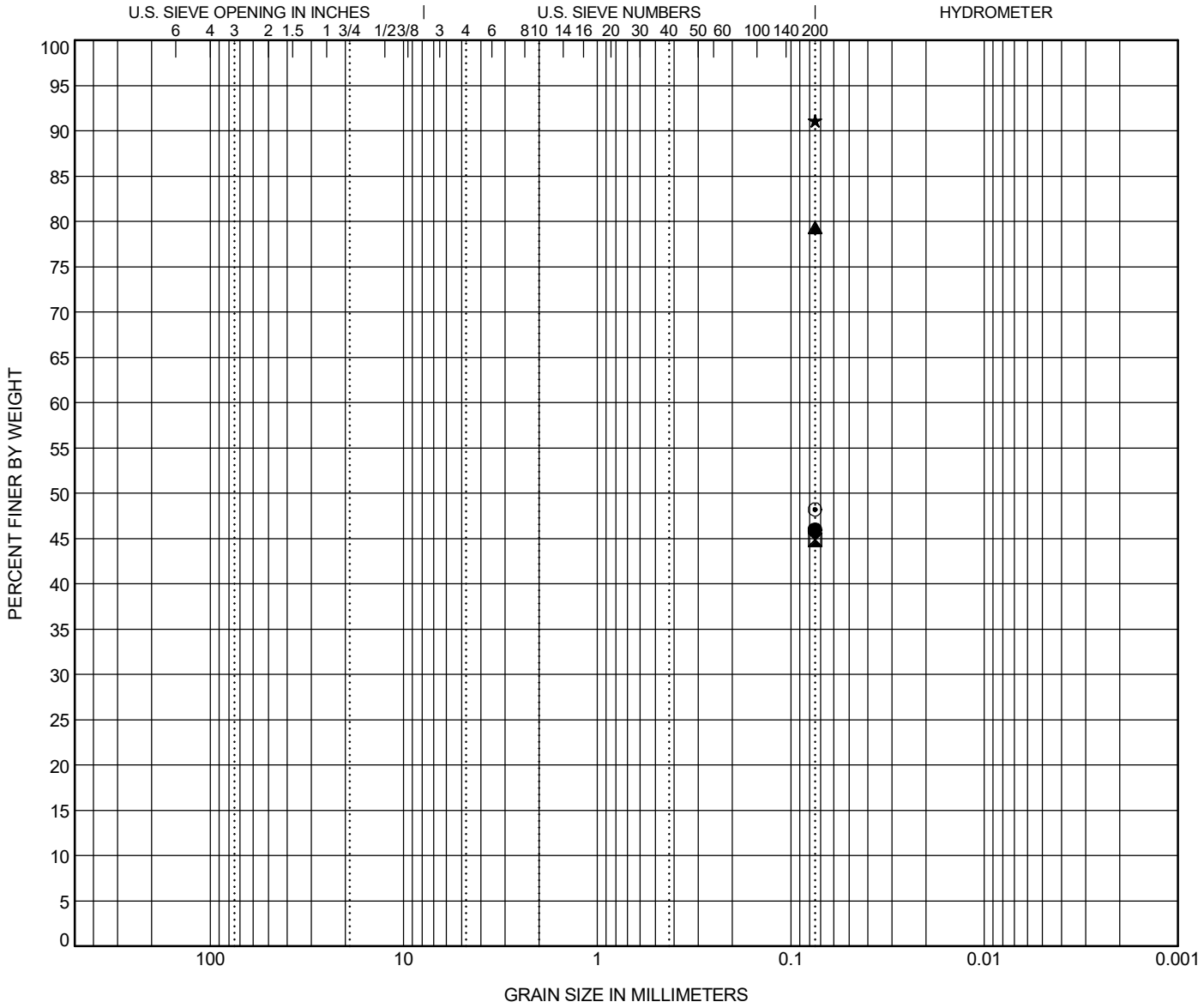
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

This report shall not be reproduced, except in full, without the written
approval of F&ME Consultants, Inc.
1613 Paris Ave Suite A, Port Royal, SC 29935

GRAIN SIZE DISTRIBUTION

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads Phase 3D

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**P3D-W10**	**2.0**	**Clayey SAND (SC/A-4)**	**28**	**20**	**8**		
⊠	**P3D-W10**	**4.0**	**Clayey SAND (SC/A-6)**	**30**	**15**	**15**		
▲	**P3D-W10**	**6.0**	**Lean CLAY with Sand (CL/A-7-6)**	**44**	**22**	**22**		
★	**P3D-W10**	**8.0**	**SILT (ML/A-4)**	**40**	**32**	**8**		
⊙	**P3D-W10**	**10.0**	**Silty SAND (SM/A-4)**	**34**	**28**	**6**		

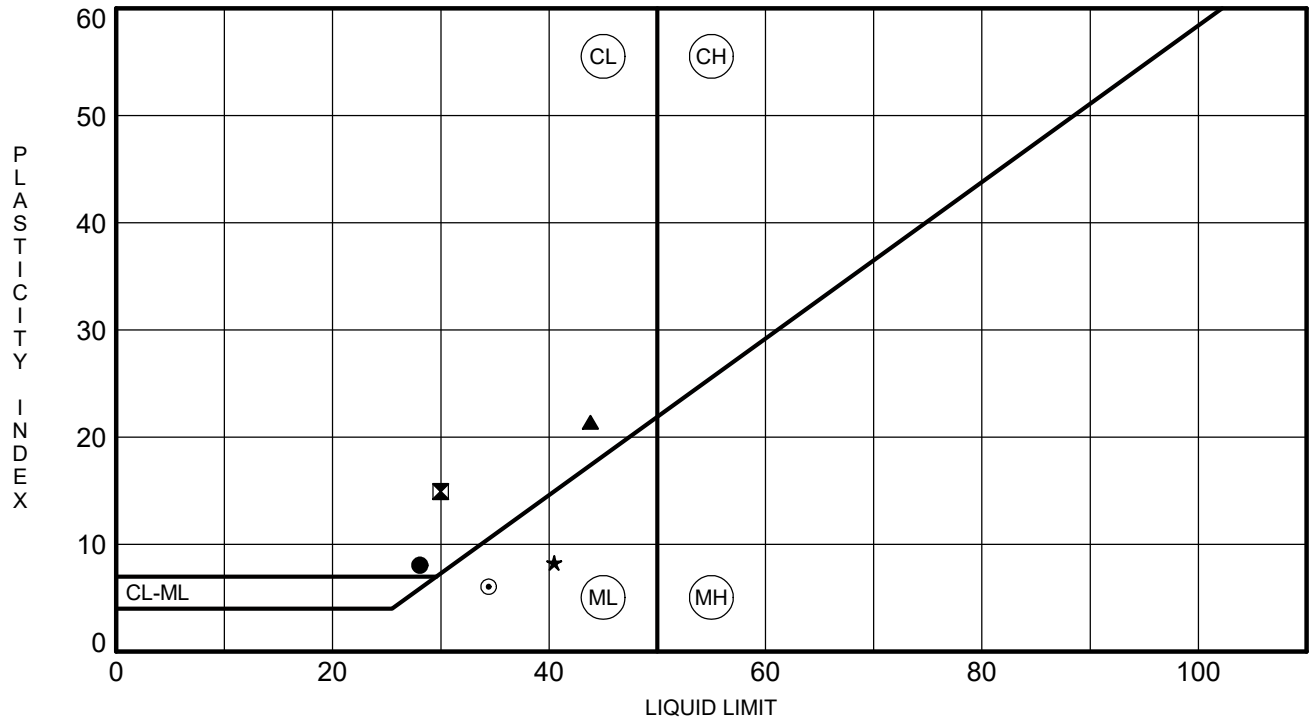
	BOREHOLE	DEPTH	D90	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**P3D-W10**	**2.0**							**46.0**	
⊠	**P3D-W10**	**4.0**							**44.9**	
▲	**P3D-W10**	**6.0**							**79.3**	
★	**P3D-W10**	**8.0**							**91.1**	
⊙	**P3D-W10**	**10.0**							**48.2**	

GRAIN SIZE G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/22/25

ATTERBERG LIMITS' RESULTS

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads Phase 3D

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**P3D-W10**	**2.0**	**28**	**20**	**8**	**46.0**	**CLAYEY SAND (SC/A-4)**
⊠	**P3D-W10**	**4.0**	**30**	**15**	**15**	**44.9**	**CLAYEY SAND (SC/A-6)**
▲	**P3D-W10**	**6.0**	**44**	**22**	**22**	**79.3**	**LEAN CLAY with SAND (CL/A-7-6)**
★	**P3D-W10**	**8.0**	**40**	**32**	**8**	**91.1**	**SILT (ML/A-4)**
⊙	**P3D-W10**	**10.0**	**34**	**28**	**6**	**48.2**	**SILTY SAND (SM/A-4)**

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	CCR Ph. 3D	**PROJECT NO.:**	G5662.030
SAMPLE NUMBER:	25-3360	**DATE REQUESTED:**	9/12/2025
DESCRIPTION OF SOIL:	Various		
TESTED BY:	L. Johnson	**DATE OF TESTING:**	10/14/2025
WEIGHED BY:	L. Johnson	**DATE OF WEIGHING:**	10/15/2025

BORING NO.	P3D-W11	P3D-W11	P3D-W11	P3D-W11	P3D-W11
SAMPLE NO.	SS-1	SS-3	SS-4	SS-5	SS-6
SAMPLE DEPTH	0.0 - 2.0	4.0 - 6.0	6.0 - 8.0	8.0 - 10.0	13.5 - 15.0
WATER CONTENT, W%	8.1	33.3	36.0	20.7	33.2

BORING NO.	P3D-W11				
SAMPLE NO.	SS-7				
SAMPLE DEPTH	18.5 - 20.0				
WATER CONTENT, W%	34.9				

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

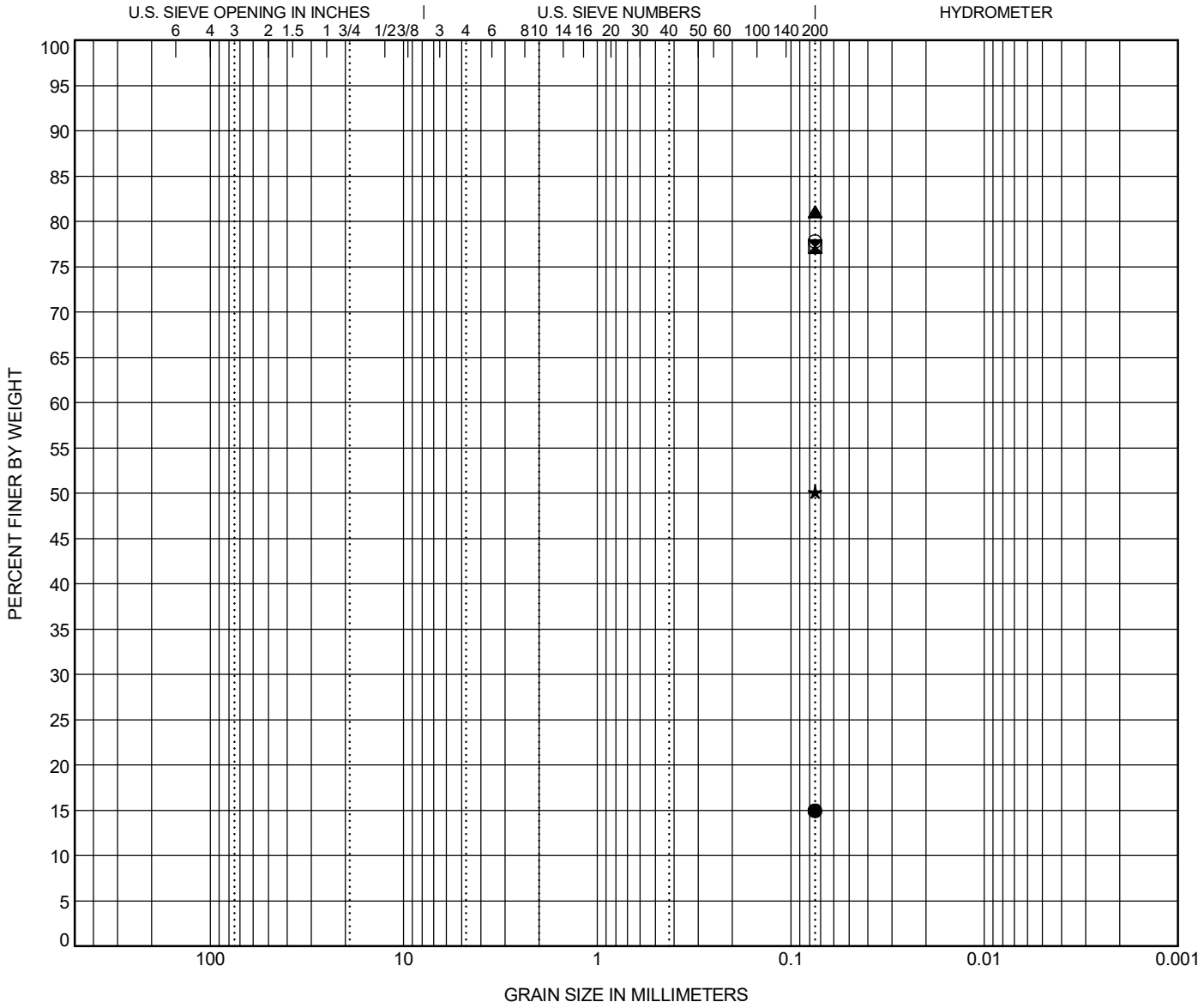
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

This report shall not be reproduced, except in full, without the written approval of F&ME Consultants, Inc.
1613 Paris Ave Suite A, Port Royal, SC 29935

GRAIN SIZE DISTRIBUTION

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads Phase 3D

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**P3D-W11**	**2.0**	**Silty SAND (SM/A-2-4)**	**NP**	**NP**	**NP**		
⊠	**P3D-W11**	**6.0**	**SILT with Sand (ML/A-7-5)**	**45**	**30**	**15**		
▲	**P3D-W11**	**8.0**	**Elastic SILT with SAND (MH/A-7-5)**	**54**	**30**	**24**		
★	**P3D-W11**	**10.0**	**Sandy Lean CLAY (CL/A-7-6)**	**26**	**15**	**11**		
⊙	**P3D-W11**	**15.0**	**Lean CLAY with Sand (CL/A-7-6)**	**48**	**26**	**22**		

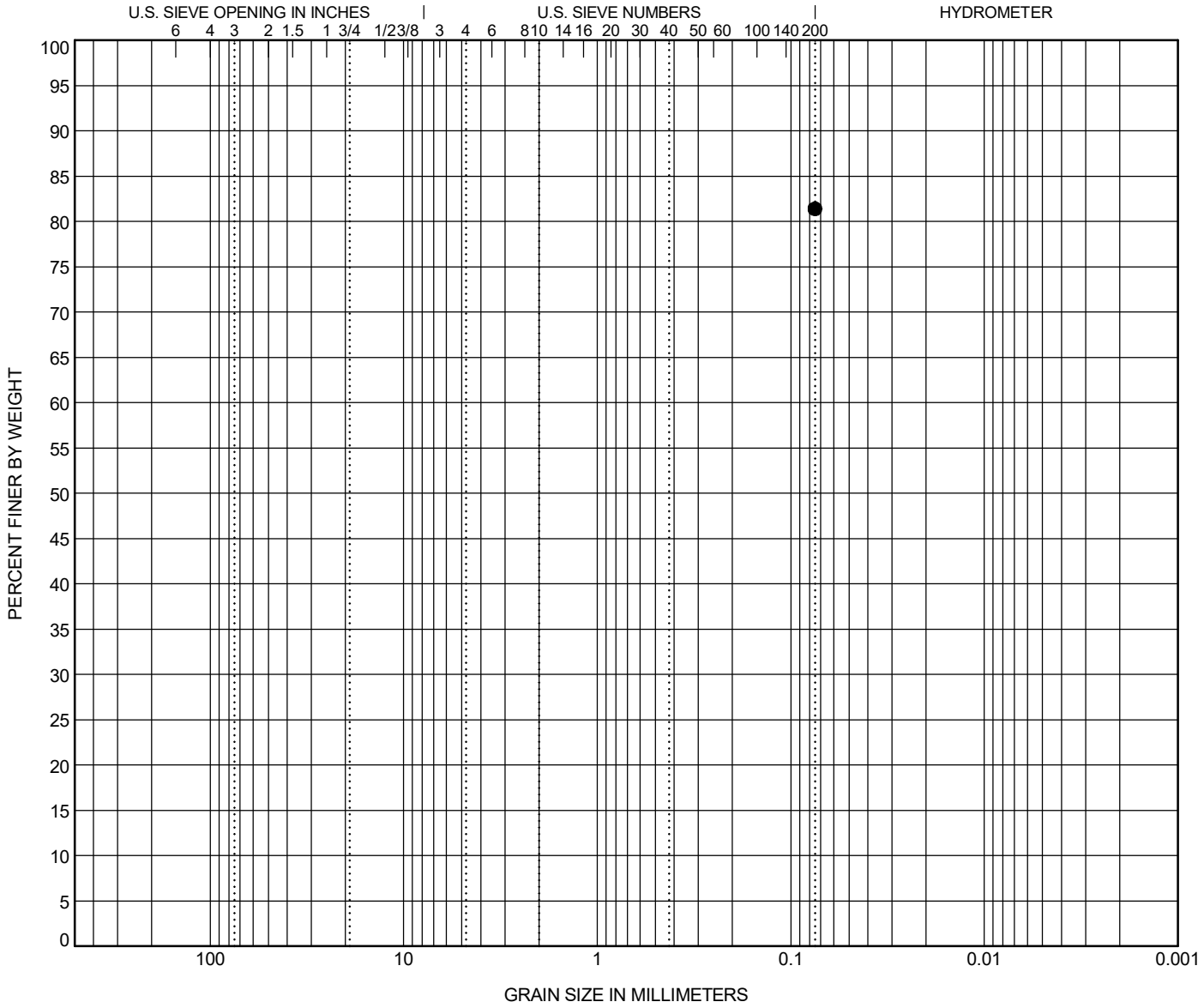
	BOREHOLE	DEPTH	D90	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**P3D-W11**	**2.0**							**15.0**	
⊠	**P3D-W11**	**6.0**							**77.3**	
▲	**P3D-W11**	**8.0**							**81.1**	
★	**P3D-W11**	**10.0**							**50.1**	
⊙	**P3D-W11**	**15.0**							**77.8**	

GRAIN SIZE G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/22/25

GRAIN SIZE DISTRIBUTION

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads Phase 3D

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**P3D-W11**	**20.0**	**SILT with Sand (ML/A-4)**	**NP**	**NP**	**NP**		

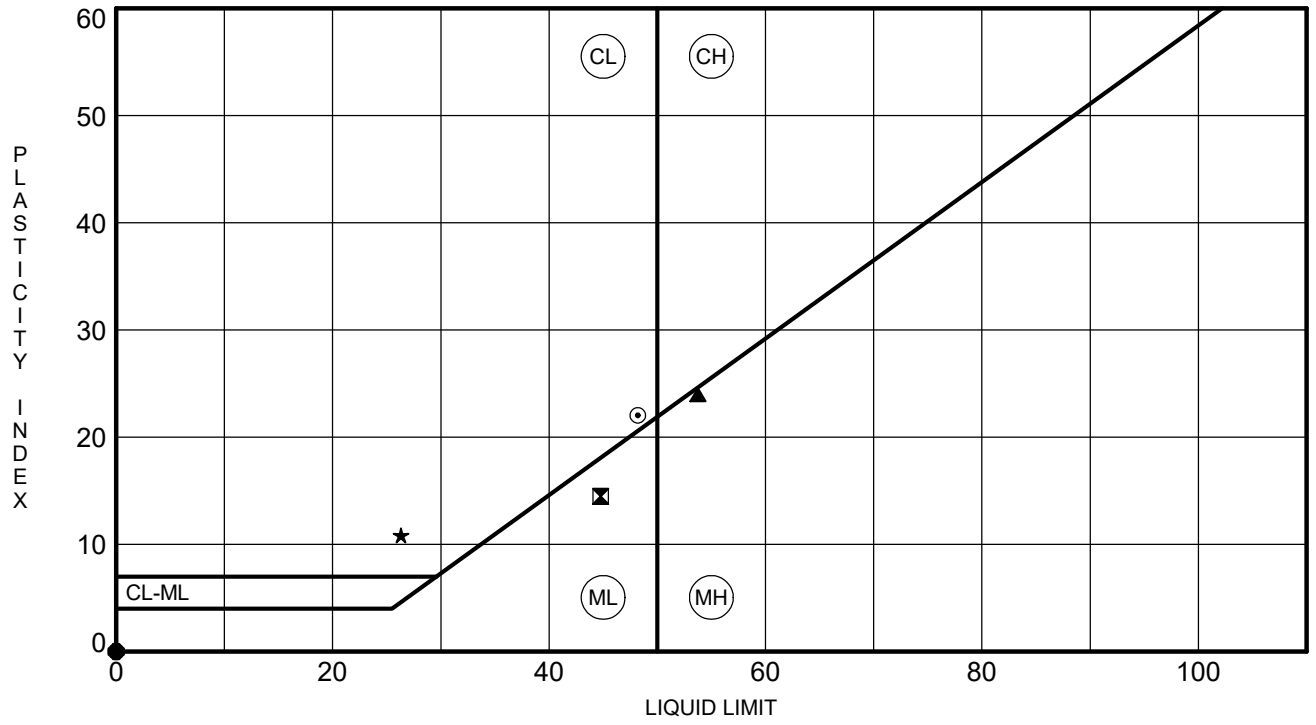
	BOREHOLE	DEPTH	D90	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**P3D-W11**	**20.0**							**81.4**	

GRAIN SIZE G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/22/25

ATTERBERG LIMITS' RESULTS

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads Phase 3D

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**P3D-W11**	**2.0**	**NP**	**NP**	**NP**	**15.0**	**SILTY SAND (SM/A-2-4)**
⊠	**P3D-W11**	**6.0**	**45**	**30**	**15**	**77.3**	**SILT with SAND (ML/A-7-5)**
▲	**P3D-W11**	**8.0**	**54**	**30**	**24**	**81.1**	**ELASTIC SILT with SAND (MH/A-7-5)**
★	**P3D-W11**	**10.0**	**26**	**15**	**11**	**50.1**	**SANDY LEAN CLAY (CL/A-6)**
⊙	**P3D-W11**	**15.0**	**48**	**26**	**22**	**77.8**	**LEAN CLAY with SAND (CL/A-7-6)**
✿	**P3D-W11**	**20.0**	**NP**	**NP**	**NP**	**81.4**	**SILT with SAND (ML/A-4)**

ATTERBERG LIMITS G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/22/25

REV 12/2023

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	CCR Ph. 3D	**PROJECT NO.:**	G5662.030
SAMPLE NUMBER:	25-3361	**DATE REQUESTED:**	9/12/2025
DESCRIPTION OF SOIL:	Various		
TESTED BY:	L. Johnson	**DATE OF TESTING:**	10/14/2025
WEIGHED BY:	L. Johnson	**DATE OF WEIGHING:**	10/15/2025

BORING NO.	P3D-W12	P3D-W12	P3D-W12	P3D-W12	
SAMPLE NO.	SS-3	SS-4	SS-5	SS-6	
SAMPLE DEPTH	4.0 - 6.0	6.0 - 8.0	8.0 - 10.0	13.5- 15.0	
WATER CONTENT, W%	8.0	8.2	12.7	16.3	

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

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

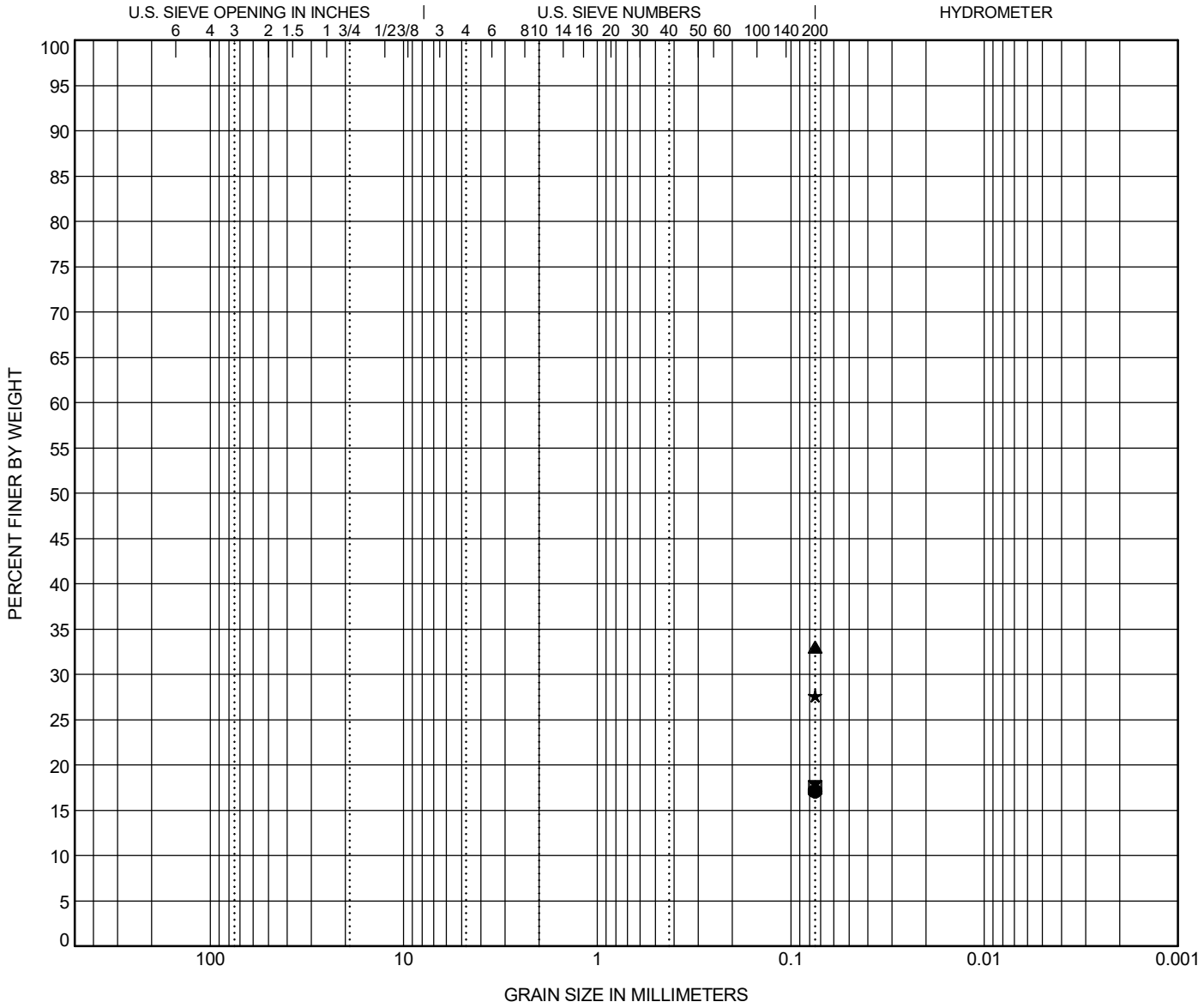
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

This report shall not be reproduced, except in full, without the written approval of F&ME Consultants, Inc.
1613 Paris Ave Suite A, Port Royal, SC 29935

GRAIN SIZE DISTRIBUTION

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads Phase 3D

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**P3D-W12**	**6.0**	**Silty SAND (SM/A-2-4)**	**NP**	**NP**	**NP**		
⊠	**P3D-W12**	**8.0**	**Silty SAND (SM/A-2-4)**	**NP**	**NP**	**NP**		
▲	**P3D-W12**	**10.0**	**Clayey SAND (SC/A-2-4)**	**25**	**15**	**10**		
★	**P3D-W12**	**15.0**	**Clayey SAND (SC/A-2-6)**	**31**	**18**	**13**		

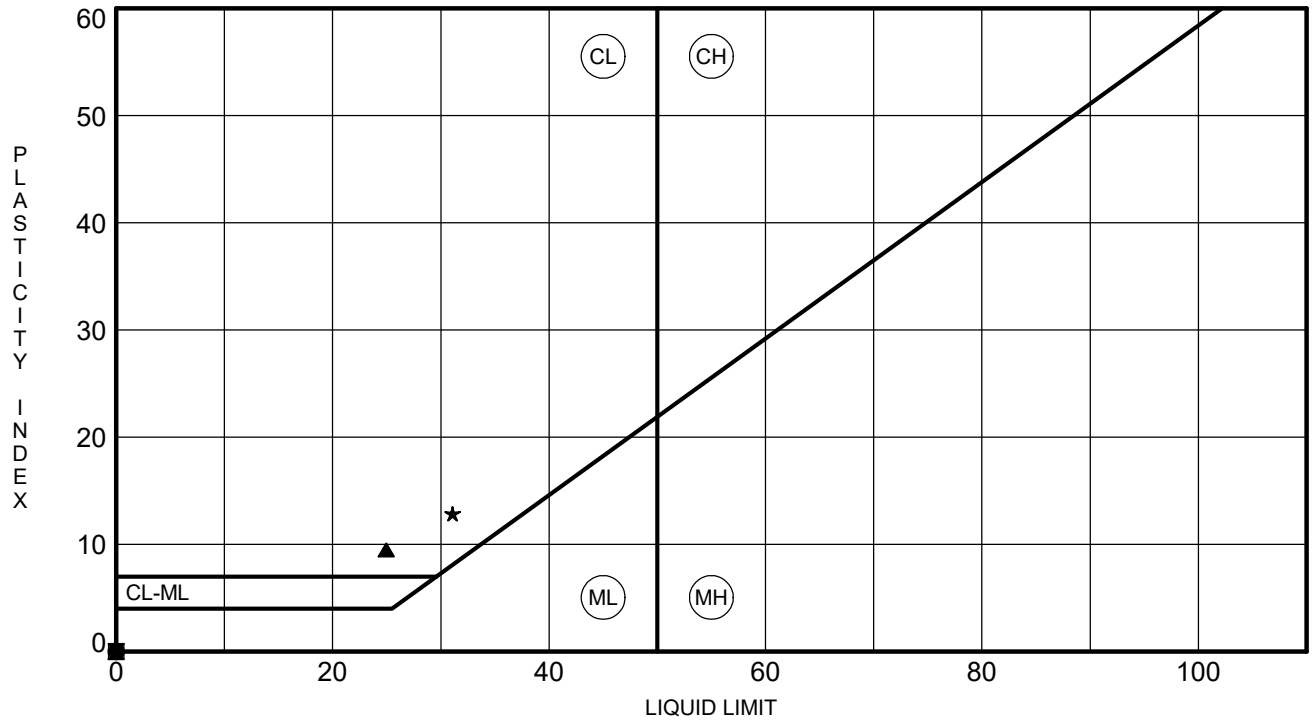
	BOREHOLE	DEPTH	D90	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**P3D-W12**	**6.0**							**17.1**	
⊠	**P3D-W12**	**8.0**							**17.5**	
▲	**P3D-W12**	**10.0**							**33.0**	
★	**P3D-W12**	**15.0**							**27.6**	

GRAIN SIZE G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/22/25

ATTERBERG LIMITS' RESULTS

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads Phase 3D

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**P3D-W12**	**6.0**	**NP**	**NP**	**NP**	**17.1**	**SILTY SAND (SM/A-2-4)**
⊠	**P3D-W12**	**8.0**	**NP**	**NP**	**NP**	**17.5**	**SILTY SAND (SM/A-2-4)**
▲	**P3D-W12**	**10.0**	**25**	**15**	**10**	**33.0**	**CLAYEY SAND (SC/A-2-4)**
★	**P3D-W12**	**15.0**	**31**	**18**	**13**	**27.6**	**CLAYEY SAND (SC/A-2-6)**

ATTERBERG LIMITS G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/22/25

FME & SME 2018 INVESTIGATION

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	I-20/26/126 Corridor Improvements	**PROJECT NO.:**	G5662.01
SAMPLE NUMBER:	18-0155	**DATE SAMPLE RECEIVED:**	1/26/2018
DESCRIPTION OF SOIL:	VARIOUS		
TESTED BY:	MB	**DATE OF TESTING:**	1/29/2018
		DATE OF WEIGHING:	1/30/2018

BORING NO.	DH-3	DH-3			
SAMPLE NO.	18-0155C SS-1	18-0155F SS-4			
SAMPLE DEPTH	0.0-2.0'	6.0-8.0'			
WATER CONTENT, W%	27.8	26.4			

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

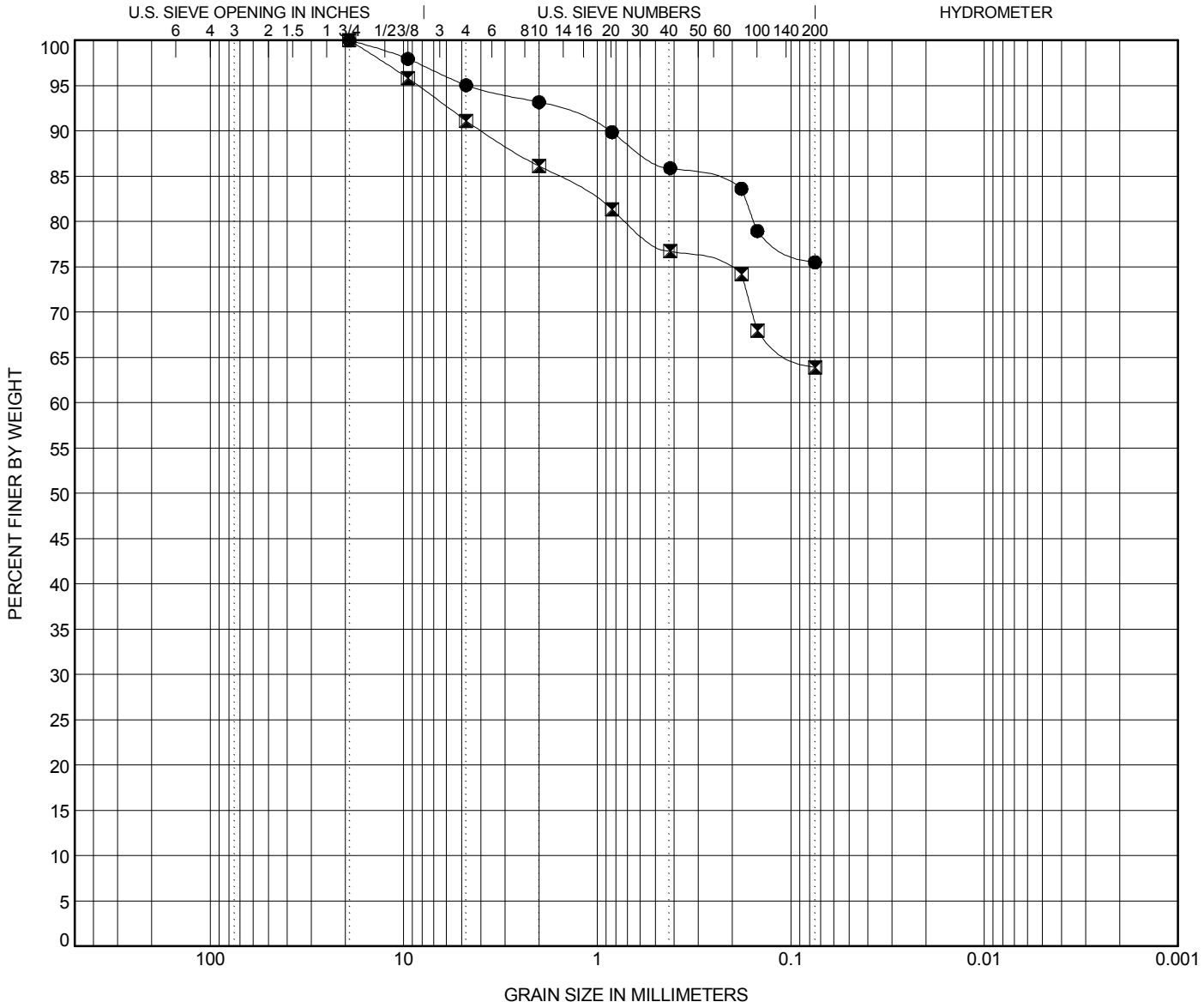
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

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

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**DH-3**	**2.0**	**SILT (ML) with F/M Sand A-7-5(12)**	**45**	**31**	**14**		
⧓	**DH-3**	**8.0**	**Sandy SILT (ML) A-4(3)**	**32**	**26**	**6**		

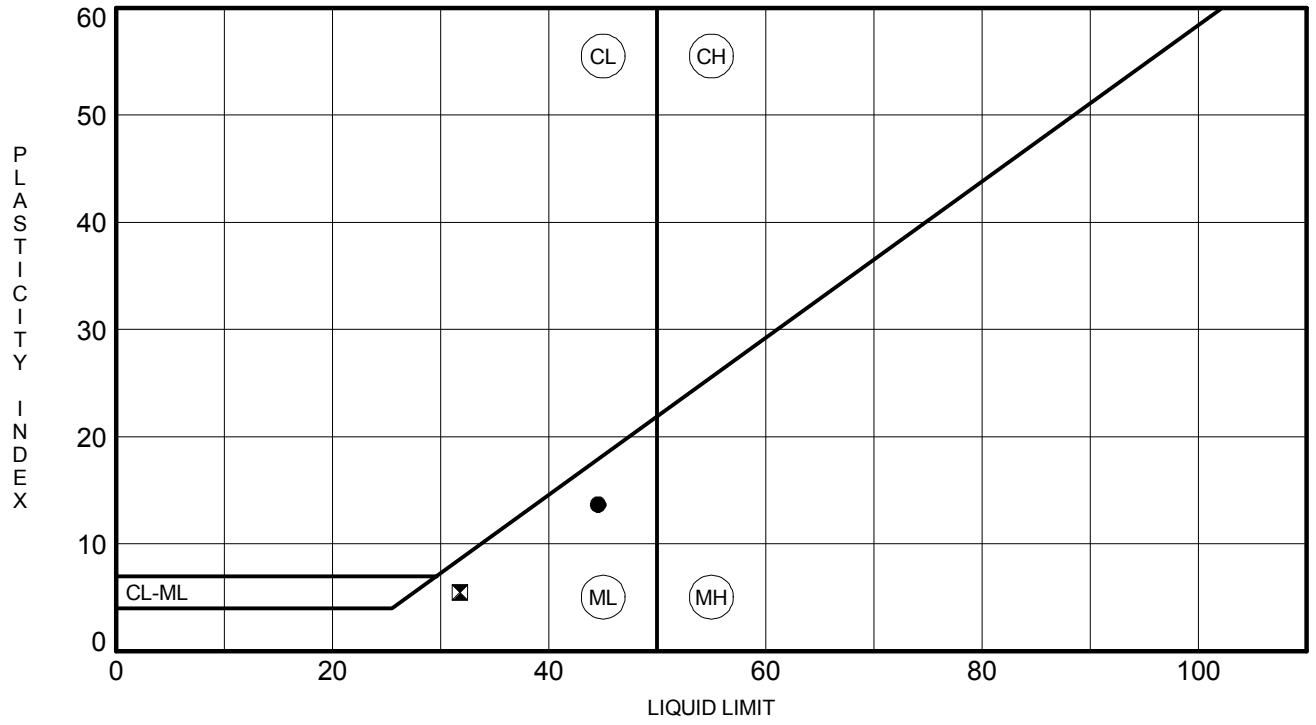
	BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**DH-3**	**2.0**	**19.1**	**4.617**			**4.9**	**19.5**	**75.5**	
⧓	**DH-3**	**8.0**	**19.1**	**8.407**			**8.9**	**27.2**	**63.9**	

GRAIN SIZE - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 2/13/18

ATTERBERG LIMITS' RESULTS

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**DH-3**	**2.0**	**45**	**31**	**14**	**76**	**SILT (ML) with F/M Sand A-7-5(12)**
⊠	**DH-3**	**8.0**	**32**	**26**	**6**	**64**	**Sandy SILT (ML) A-4(3)**

ATTERBERG LIMITS - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 2/13/18

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	I-20/26/126 Corridor Improvements	**PROJECT NO.:**	G5662.01
SAMPLE NUMBER:	18-0155	**DATE SAMPLE RECEIVED:**	1/26/2018
DESCRIPTION OF SOIL:	VARIOUS		
TESTED BY:	MB	**DATE OF TESTING:**	1/29/2018
		DATE OF WEIGHING:	1/30/2018

BORING NO.	DH-3A	DH-3A			
SAMPLE NO.	18-0155I SS-6	18-0155L SS-8			
SAMPLE DEPTH	43.5-45.0'	53.5-55.0'			
WATER CONTENT, W%	28.2	47.2			

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

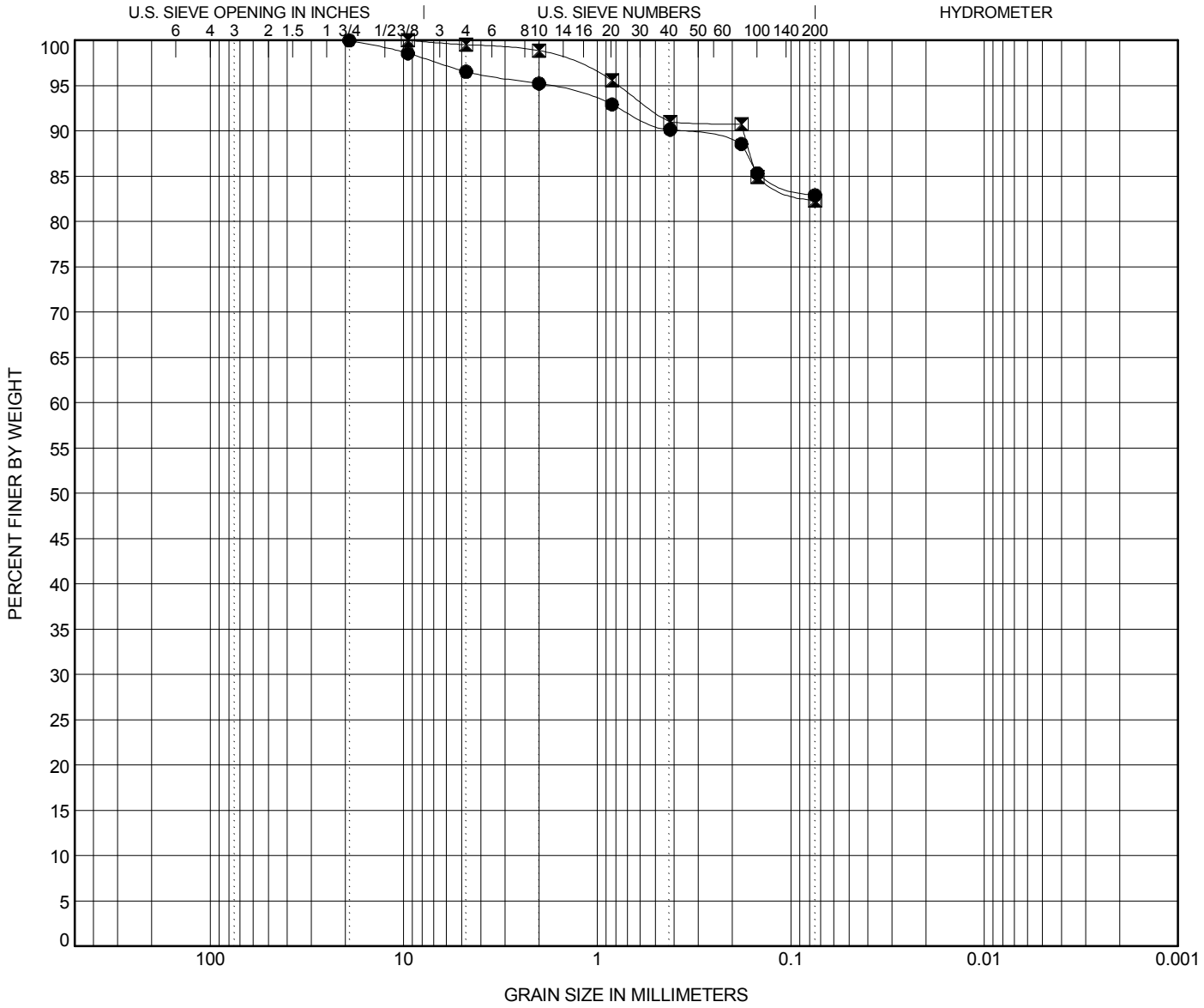
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

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

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** Carolina Crossroads I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**DH-3A**	**45.0**	**Sandy SILT (ML) A-7-5(8)**	**42**	**31**	**11**		
⧓	**DH-3A**	**55.0**	**Elastic SILT (MH) with F/M Sand A-7-5(17)**	**53**	**36**	**17**		

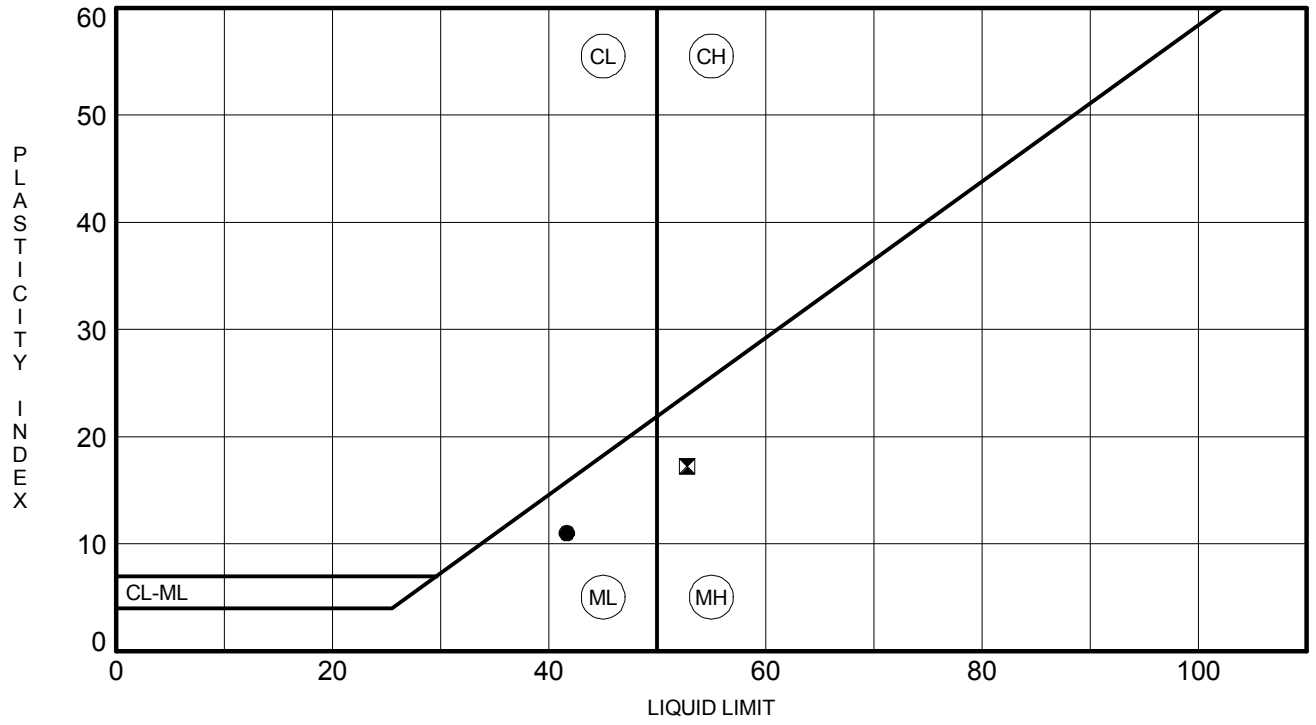
	BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**DH-3A**	**45.0**	**19.1**	**1.82**			**3.4**	**13.6**	**82.9**	
⧓	**DH-3A**	**55.0**	**9.52**	**0.77**			**0.5**	**17.2**	**82.3**	

GRAIN SIZE - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 7/30/18

ATTERBERG LIMITS' RESULTS

PROJECT ID P027662 **PROJECT NAME** Carolina Crossroads I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**DH-3A**	**45.0**	**42**	**31**	**11**	**83**	**Sandy SILT (ML) A-7-5(8)**
⊠	**DH-3A**	**55.0**	**53**	**36**	**17**	**82**	**Elastic SILT (MH) with F/M Sand A-7-5(17)**

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

ROCK CORE COMPRESSION TEST

PROJECT: I-20/26/126 Corridor Improvements **PROJECT NO:** G5662.01

SAMPLED BY: RW **DATE SAMPLED:** 1/22/2018

TESTED BY: BF **DATE TESTED:** 2/2/2018

Lab No.	18-0156A	18-0156B	18-0156C	18-0156D	18-0156E
Boring No.	DH-3A	DH-3A	DH-3A	DH-3A	DH-3A
Sample No.	NQ-1	NQ-4	NQ-9	NQ-10	NQ-10
Depth	2.9-3.2	21.1-21.4	72.3-72.6	76.5-76.8	80.6-80.9
Length (in)	4.08	3.86	3.94	4.02	3.97
Diameter (in)	1.86	1.85	1.85	1.85	1.86
Mass (g)	566.99	498.97	510.35	549.26	519.50
Cross Sectional Area (in^2)	2.72	2.68	2.70	2.70	2.71
Load (lb)	189270	98135	60965	37020	45430
Compressive Strength (psi)	69510	36670	22610	13710	16760
Corrected Compressive Strength (psi)					
Unit Weight (lb/ft^3)	194.66	184.14	183.17	192.95	183.95

Signature: _____

Remarks: _____

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

ROCK CORE COMPRESSION TEST

PROJECT: I-20/26/126 Corridor Improvements **PROJECT NO:** G5662.01

SAMPLED BY: RW **DATE SAMPLED:** 1/22/2018

TESTED BY: BF **DATE TESTED:** 2/2/2018

Lab No.	18-0156F	18-0156G	18-0156H		
Boring No.	DH-3A	DH-3A	DH-3A		
Sample No.	NQ-11	NQ-12	NQ-15		
Depth	84.6-84.9	89.6-89.9	103.3-103.6		
Length (in)	3.99	4.00	3.97		
Diameter (in)	1.86	1.86	1.86		
Mass (g)	524.43	522.69	518.34		
Cross Sectional Area (in^2)	2.71	2.71	2.72		
Load (lb)	77635	101135	79100		
Compressive Strength (psi)	28600	37260	29080		
Corrected Compressive Strength (psi)					
Unit Weight (lb/ft^3)	184.71	183.45	182.95		

Signature: _____

Remarks: _____

Form No: TR-D2216-T265-2
Revision No. 1
Revision Date: 08/16/17

LABORATORY DETERMINATION OF WATER CONTENT

ASTM D 2216 ☑ *AASHTO T 265* ☐

S&ME, Inc. - Spartanburg: 301 Zima Park Drive, Spartanburg, SC 29301

Project #:	1461-16-047.2B	Report Date:	2/22/18
Project Name:	Carolina Crossroads Project	Test Date(s):	2/20 - 2/22/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sampled by:	S&ME	Sample Date(s):	1/29 - 2/14/18
Sampling Method:	Split-spoon	Drill Rig:	CME 55/Diedrich D-50

Method: **A (1%)** ☐ **B (0.1%)** ☑ Balance ID. 7536 Calibration Date: 1/31/18 Oven ID. 7621 Calibration Date: 7/28/17

Boring No.	Sample No.	Sample Depth	Tare #	Tare Weight	Tare Wt.+ Wet Wt	Tare Wt. + Dry Wt	Water Weight	Percent Moisture
		ft.		grams	grams	grams	grams	%
B-29	SS-1	1.0 - 3.0	300	0.00	55.71	49.45	6.26	12.7%
B-29	SS-5	9.0 - 11.0	306	0.00	27.46	22.20	5.26	23.7%
B-29	SS-8	24.5 - 26.0	312	0.00	54.59	37.47	17.12	45.7%
B-29	SS-12	44.5 - 46.0	319	0.00	69.45	56.65	12.80	22.6%
B-34	SS-2	3.0 - 5.0	320	0.00	36.34	28.16	8.18	29.0%
B-34	SS-5	9.0 - 11.0	324	0.00	41.63	35.12	6.51	18.5%
B-34	SS-10	33.5 - 35.0	329	0.00	54.46	43.73	10.73	24.5%
B-34	SS-11	38.5 - 40.0	331	0.00	62.29	47.59	14.70	30.9%
B-40	SS-3	4.8 - 6.8	332	0.00	48.56	42.98	5.58	13.0%
B-40	SS-5	8.8 - 10.8	336	0.00	28.97	23.80	5.17	21.7%
B-40	SS-7	18.5 - 20.0	346	0.00	12.06	8.75	3.31	37.8%
B-40	SS-8	23.5 - 25.0	349	0.00	28.02	22.39	5.63	25.1%
B-45	SS-1	0.8 - 2.8	350	0.00	31.53	28.40	3.13	11.0%
B-47	SS-1	1.0 - 3.0	365	0.00	50.72	43.99	6.73	15.3%
B-47	SS-4	7.0 - 9.0	367	0.00	41.83	35.55	6.28	17.7%
B-47	SS-8	24.5 - 26.0	374	0.00	49.80	40.33	9.47	23.5%

Notes / Deviations / References Tare #'s were zeroed prior to recording Wet Weights

ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass

Matt Jacobs	NICET Lab Level III / 118202	2/22/18
Technician Name	*Certification Type / No.*	*Date*
Matthew F. Cooke, P.G.	Project Manager	2/22/18
Technical Responsibility	*Position*	*Date*

This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Form No: TR-D2216-T265-1
Revision No. 1
Revision Date: 08/16/17

LABORATORY DETERMINATION OF WATER CONTENT

ASTM D 2216 ☑ *AASHTO T 265* ☐

S&ME, Inc. - Atlanta: 4350 River Green Parkway, Suite 200, Duluth, GA 30096

Project #: 1461-16-047.2B Report Date: 5/21/18

Project Name: Carolina Crossroads Project

Boring No.	Sample No.	Sample Depth	Tare #	Tare Weight	Tare Wt.+ Wet Wt	Tare Wt. + Dry Wt	Water Weight	Percent Moisture	Note
		ft. or m.		grams	grams	grams	grams	%	
P-56	SS-1	0.9'-2.9'	J88	98.65	228.18	210.10	18.08	16.2%	
P-58	SS-1	1.1'-3.1'	J16	91.97	224.95	207.28	17.67	15.3%	
P-60	SS-1	1'-3'	P100	91.28	191.91	165.74	26.17	35.1%	
P-62	SS-1	1.1'-3.1'	J15	97.70	214.70	194.67	20.03	20.7%	
B-30	SS-3	4'-6'	J1	91.54	310.68	280.66	30.02	15.9%	
B-36	SS-1	0'-2'	J4	97.73	279.64	262.77	16.87	10.2%	
B-36	SS-2	2'-4'	TD2	106.22	252.22	235.22	17.00	13.2%	
B-43	SS-2	16.8'-18.8'	5050	92.31	253.75	226.16	27.59	20.6%	
B-43	SS-6	28.3'-29.8'	5024	92.74	338.71	299.08	39.63	19.2%	
B-52	SS-9	28.5'-30'	5064	98.00	309.42	270.61	38.81	22.5%	
B-36	SS-8	23.5'-25'	5047	90.81	217.00	182.26	34.74	38.0%	
B-36	SS-10	33.5'-35'	5030	96.19	271.99	241.53	30.46	21.0%	
P-51	SS-1	2.6'-3.6'	G-4	96.99	237.25	215.30	21.95	18.6%	
B-52	SS-1	0'-2'	5044	90.44	214.92	199.67	15.25	14.0%	
B-52	SS-2	2'-4'	5062	96.34	281.16	261.55	19.61	11.9%	
B-30	SS-8	23.5'-25'	M5	96.09	249.94	206.54	43.40	39.3%	
B-30	SS-19	78.5'-80'	J6	96.85	322.28	287.36	34.92	18.3%	
B-53	SS-1	0'-2'	5036	98.68	296.90	277.65	19.25	10.8%	
B-53	SS-5	8'-10'	5012	93.52	281.48	247.10	34.38	22.4%	
B-43	SS-1	14.8'-16.8'	5013	95.80	335.77	298.21	37.56	18.6%	
B-36	SS-5	8'-10'	5059	96.55	246.08	222.43	23.65	18.8%	
B-30	SS-16	63.5'-65'	J88	90.57	239.13	214.02	25.11	20.3%	
P-64	SS-1	1.1'-3.1'	J18	98.01	228.28	208.12	20.16	18.3%	
B-52	SS-6	13.5'-15'	5004	96.54	289.09	254.03	35.06	22.3%	

Notes / Deviations / References

Form No: TR-D2216-T265-1
Revision No. 1
Revision Date: 08/16/17

LABORATORY DETERMINATION OF WATER CONTENT

ASTM D 2216 ☑ *AASHTO T 265* ☐

S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	4/27/18
Project Name:	Carolina Crossroads Project	Test Date(s):	3/28 - 3/29/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sampled by:	S&ME	Sample Date(s):	3/01 - 3/08/18
Sampling Method:	Split-spoon		

Method: **A (1%)** ☐ **B (0.1%)** ☑ Balance ID. 13942 Calibration Date: 8/18/17 Oven ID. 13978 Calibration Date: 10/07/17

Boring No.	Sample No.	Sample Depth	Tare #	Tare Weight	Tare Wt.+ Wet Wt	Tare Wt. + Dry Wt	Water Weight	Percent Moisture	Note
		ft.		grams	grams	grams	grams	%	
B-31	SS-1	0.0 - 2.0	262	0.00	54.53	43.52	11.01	25.3%	
B-31	SS-5	8.0 - 10.0	FU-24	0.00	53.27	41.67	11.60	27.8%	
B-33	SS-1	0.0 - 2.0	BC	0.00	53.75	45.93	7.82	17.0%	
B-33	SS-3	4.0 - 6.0	CT	0.00	52.42	43.41	9.01	20.8%	
B-33	SS-5	8.0 - 10.0	CL-4	0.00	55.23	39.20	16.03	40.9%	
B-35	SS-1	0.0 - 2.0	CL-3	0.00	54.31	44.30	10.01	22.6%	
B-35	SS-5	8.0 - 10.0	CL-6	0.00	53.55	45.65	7.90	17.3%	
B-37	SS-1	0.4 - 2.4	CL-5	0.00	56.59	47.61	8.98	18.9%	
B-37	SS-3	4.4 - 6.4	CL-1	0.00	52.74	39.68	13.06	32.9%	
B-37	SS-6	9.5 - 11.5	BK-2	0.00	149.05	116.44	32.61	28.0%	
B-37	SS-8	18.5 - 20.0	PC-1	0.00	53.94	46.57	7.37	15.8%	
B-42	SS-1	0.8 - 2.8	BK-1	0.00	55.65	47.46	8.19	17.3%	
B-42	SS-3	4.8 - 6.8	BK-11	0.00	52.07	42.01	10.06	23.9%	
B-42	SS-7	18.5 - 20.0	BK-5	0.00	54.46	42.84	11.62	27.1%	
B-42	SS-10	33.5 - 35.0	BK-9	0.00	52.25	41.57	10.68	25.7%	

Notes / Deviations / References

AASHTO T 265: Laboratory Determination of Moisture Content of Soils

ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass

Benjamin Kovaleski	Benjamin J. Kovaleski	NICET Lab Level III/117226	4/27/18
Technician Name	*Signature*	*Certification Type / No.*	*Date*
Matthew F. Cooke, P.G.		Project Manager	4/27/18
Technical Responsibility		*Position*	*Date*

Form No: TR-D2216-T265-1
Revision No. 1
Revision Date: 08/16/17

LABORATORY DETERMINATION OF WATER CONTENT

ASTM D 2216 ☑ *AASHTO T 265* ☐

S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	5/04/18
Project Name:	Carolina Crossroads Project	Test Date(s):	4/28 - 4/29/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sampled by:	S&ME	Sample Date(s):	3/13, 3/16 & 3/21/18
Sampling Method:	Split-spoon	Drill Rig:	CME 55/Diedrich D-50

Method: **A (1%)** ☐ **B (0.1%)** ☑ Balance ID. 13942 Calibration Date: 8/18/17 Oven ID. 13978 Calibration Date: 10/07/17

Boring No.	Sample No.	Sample Depth	Tare #	Tare Weight	Tare Wt.+ Wet Wt	Tare Wt. + Dry Wt	Water Weight	Percent Moisture	Note
		ft.		grams	grams	grams	grams	%	
B-32	SS-1	0.0 - 2.0	D-3	0.00	50.42	39.91	10.51	26.3%	
B-32	SS-2	2.0 - 4.0	FU-24	0.00	52.09	46.96	5.13	10.9%	
B-32	SS-4	6.0 - 8.0	B-141	0.00	52.87	39.27	13.60	34.6%	
B-44	SS-1	0.0 - 2.0	262	0.00	55.29	47.40	7.89	16.6%	
B-56	SS-1	0.0 - 2.0	P	0.00	51.47	42.54	8.93	21.0%	
B-56	SS-2	2.0 - 4.0	D-27	0.00	53.36	44.74	8.62	19.3%	
B-56	SS-10	33.5 - 35.0	H	0.00	50.66	36.55	14.11	38.6%	

Notes / Deviations / References

AASHTO T 265: Laboratory Determination of Moisture Content of Soils

ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass

Benjamin Kovaleski	Benjamin J. Kovaleski	NICET Lab Level III/117226	5/04/18
Technician Name	*Signature*	*Certification Type / No.*	*Date*
Matthew F. Cooke, P.G.		Project Manager	5/04/18
Technical Responsibility		*Position*	*Date*

Form No: TR-D2216-T265-1
Revision No. 1
Revision Date: 08/16/17

LABORATORY DETERMINATION OF WATER CONTENT

Quality Assurance *ASTM D 2216* ☑ *AASHTO T 265* ☐

S&ME, Inc. - Knoxville: 1413 Topside Road, Louisville, TN 37777

Project #:	1461-16-047.2B	Report Date:	5/23/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	4/24/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave. North Charleston, South Carolina		
Sampled by:	S&ME	Sample Date(s):	Various
Sampling Method:	Split Spoon	Log # :	43-2321

Method: **A (1%)** ☐ **B (0.1%)** ☑ Balance ID. 18435 Calibration Date: 4/10/2018 Oven ID. 12872 Calibration Date: 3/17/2018

Boring No.	Sample No.	Sample Depth	Tare #	Tare Weight	Tare Wt.+ Wet Wt	Tare Wt. + Dry Wt	Water Weight	Percent Moisture	Note
		ft		grams	grams	grams	grams	%	
B-46	SS-1	0.0 - 2.0	C-7	30.80	121.77	101.48	20.29	28.7%	
B-46	SS-2	2.0 - 4.0	C-11	30.37	120.71	105.22	15.49	20.7%	
B-48	SS-1	0.0 - 2.0	C-24	29.90	120.88	110.40	10.48	13.0%	
B-48	SS-2	2.0 - 4.0	C-51	31.32	120.76	100.47	20.29	29.3%	
B-48	SS-4	6.0 - 8.0	C-70	31.53	165.48	146.01	19.47	17.0%	
B-54	SS-1	0.4 - 2.4	C-8	30.37	121.74	105.07	16.67	22.3%	
B-54	SS-2	2.4 - 4.4	C-26	31.39	121.46	103.13	18.33	25.6%	
B-54	SS-10	33.9 - 35.4	C-37	31.01	122.65	99.40	23.25	34.0%	
B-58	SS-1	0.0 - 2.0	C-34	30.74	105.52	96.93	8.59	13.0%	
B-58	SS-6	13.5 - 15.0	C-30	31.29	116.75	102.01	14.74	20.8%	
B-58	SS-8	23.5 - 25.0	C-41	31.04	107.48	95.77	11.71	18.1%	
B-58	SS-10	33.5 - 35.0	C-72	31.97	110.24	96.06	14.18	22.1%	
B-58	SS-13	48.5 - 50.0	C-28	30.86	102.21	86.60	15.61	28.0%	
B-60	SS-1	0.0 - 2.0	C-69	30.75	103.91	92.11	11.80	19.2%	
B-60	SS-2	2.0 - 4.0	C-19	30.22	100.60	93.60	7.00	11.0%	
B-60	SS-3	4.0 - 6.0	C-35	30.86	102.05	91.63	10.42	17.1%	

Notes / Deviations / References

ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass

Derek Baker — *Technician Name* — 4/24/2018 *Date*

Michael D. Kelso, E.I. — *Technical Responsibility* — _____ *Signature* — Staff Professional *Position* — 5/23/2018 *Date*

This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Form No: TR-D2216-T265-1
Revision No. 1
Revision Date: 08/16/17

LABORATORY DETERMINATION OF WATER CONTENT

Quality Assurance *ASTM D 2216* ☑ *AASHTO T 265* ☐

S&ME, Inc. - Knoxville: 1413 Topside Road, Louisville, TN 37777

Project #: 1461-16-047.2B Report Date: 43243

Project Name: Carolina Crossroads Project

Boring No.	Sample No.	Sample Depth	Tare #	Tare Weight	Tare Wt.+ Wet Wt	Tare Wt. + Dry Wt	Water Weight	Percent Moisture	Note
		ft		grams	grams	grams	grams	%	
B-61	SS-1	0.0 - 2.0	C-32	31.08	101.15	92.16	8.99	14.7%	1
B-61	SS-6	13.5 - 15.0	C-38	31.26	101.03	87.06	13.97	25.0%	2
B-61	SS-7	18.5 - 20.0	C-49	31.24	100.30	90.25	10.05	17.0%	
B-62	SS-1	0.0 - 2.0	C-60	31.22	103.55	91.71	11.84	19.6%	
B-62	SS-2	2.0 - 4.0	C-25	31.77	101.59	94.58	7.01	11.2%	
B-62	SS-5	8.0 - 10.0	C-46	31.31	101.11	86.21	14.90	27.1%	

Notes / Deviations / References

Form No: TR-D2216-T265-1
Revision No. 1
Revision Date: 08/16/17

LABORATORY DETERMINATION OF WATER CONTENT

ASTM D 2216 ☑ *AASHTO T 265* ☐

S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	4/26/18
Project Name:	Carolina Crossroads Project	Test Date(s):	3/28 - 3/29/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sampled by:	S&ME	Sample Date(s):	3/05, 3/08 & 3/09/18
Sampling Method:	Split-spoon	Drill Rig:	CME 55

Method: **A (1%)** ☐ **B (0.1%)** ☑ Balance ID. 13942 Calibration Date: 8/18/17 Oven ID. 13978 Calibration Date: 10/07/17

Boring No.	Sample No.	Sample Depth	Tare #	Tare Weight	Tare Wt.+ Wet Wt	Tare Wt. + Dry Wt	Water Weight	Percent Moisture	Note
		ft.		grams	grams	grams	grams	%	
W-18	SS-1	0.4 - 2.4	D-117	0.00	54.56	46.03	8.53	18.5%	
W-18	SS-2	2.4 - 4.4	D-13	0.00	53.06	43.04	10.02	23.3%	
W-18	SS-3	4.4 - 6.4	D-1	0.00	53.65	46.97	6.68	14.2%	
W-18	SS-5	8.4 - 10.4	F	0.00	52.82	44.57	8.25	18.5%	
W-18	SS-6	13.5 - 15.0	26	0.00	52.22	43.00	9.22	21.4%	
W-23	SS-1	0.2 - 2.2	H	0.00	53.92	46.00	7.92	17.2%	
W-23	SS-4	6.2 - 8.2	R	0.00	53.41	42.32	11.09	26.2%	
W-24	SS-1	0.0 - 2.0	E	0.00	52.01	48.70	3.31	6.8%	
W-24	SS-2	2.0 - 4.0	P	0.00	53.26	45.83	7.43	16.2%	
W-24	SS-5	8.0 - 10.0	B-141	0.00	53.38	43.26	10.12	23.4%	
W-24	SS-7	18.5 - 20.0	D-27	0.00	52.56	40.18	12.38	30.8%	

Notes / Deviations / References

AASHTO T 265: Laboratory Determination of Moisture Content of Soils

ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass

Benjamin Kovaleski	Benjamin J. Kovaleski	NICET Lab Level III/117226	4/26/18
Technician Name	*Signature*	*Certification Type / No.*	*Date*
Matthew F. Cooke, P.G.		Project Manager	4/26/18
Technical Responsibility		*Position*	*Date*

Form No: TR-D2216-T265-1
Revision No. 1
Revision Date: 08/16/17

LABORATORY DETERMINATION OF WATER CONTENT

ASTM D 2216 ☑ *AASHTO T 265* ☐

S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	3/16/18
Project Name:	Carolina Crossroads Project	Test Date(s):	3/08 - 3/09/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sampled by:	S&ME	Sample Date(s):	2/05 - 2/07/18
Sampling Method:	Split-spoon	Drill Rig:	CME 55/Diedrich D-50

Method: **A (1%)** ☐ **B (0.1%)** ☑ Balance ID. 13942 Calibration Date: 8/18/17 Oven ID. 13978 Calibration Date: 10/07/17

Boring No.	Sample No.	Sample Depth	Tare #	Tare Weight	Tare Wt.+ Wet Wt	Tare Wt. + Dry Wt	Water Weight	Percent Moisture	Note
		ft.		grams	grams	grams	grams	%	
W-22	SS-1	0.0 - 2.0	262	0.00	75.19	65.48	9.71	14.8%	
W-22	SS-4	6.0 - 8.0	D-27	0.00	75.61	62.78	12.83	20.4%	
W-22	SS-6	13.5 - 15.0	P	0.00	84.59	68.94	15.65	22.7%	
W-22	SS-8	23.5 - 25.0	B-141	0.00	71.19	61.13	10.06	16.5%	
W-25	SS-2	2.0 - 4.0	E	0.00	73.25	55.63	17.62	31.7%	
W-25	SS-5	8.0 - 10.0	T-1	0.00	70.02	58.51	11.51	19.7%	
W-25	SS-8	23.5 - 25.0	A-2	0.00	73.30	57.65	15.65	27.1%	
W-32	SS-2	2.0 - 4.0	D-3	0.00	74.58	63.48	11.10	17.5%	
W-32	SS-5	8.0 - 10.0	D-117	0.00	78.52	68.27	10.25	15.0%	
W-32	SS-6	13.5 - 15.0	JJ	0.00	76.83	71.42	5.41	7.6%	
W-32	SS-11	38.5 - 40.0	T-2	0.00	73.60	59.22	14.38	24.3%	

Notes / Deviations / References

AASHTO T 265: Laboratory Determination of Moisture Content of Soils

ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass

Benjamin Kovaleski	Benjamin J. Kovaleski	NICET Lab Level III/117226	3/16/18
Technician Name	*Signature*	*Certification Type / No.*	*Date*
Brian Vaughan, P.E.	Brian Vaughan	Group Leader	3/16/18
Technical Responsibility	*Signature*	*Position*	*Date*

Form No: TR-D2216-T265-1
Revision No. 1
Revision Date: 08/16/17

LABORATORY DETERMINATION OF WATER CONTENT

ASTM D 2216 ☑ *AASHTO T 265* ☐

S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	2/14/18
Project Name:	Carolina Crossroads Project	Test Date(s):	2/12 - 2/13/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sampled by:	S&ME	Sample Date(s):	1/24 - 1/25/18
Sampling Method:	Split-spoon	Drill Rig:	CME 55

Method: **A (1%)** ☐ **B (0.1%)** ☑ Balance ID. 13942 Calibration Date: 8/18/17 Oven ID. 13978 Calibration Date: 10/07/17

Boring No.	Sample No.	Sample Depth	Tare #	Tare Weight	Tare Wt.+ Wet Wt	Tare Wt. + Dry Wt	Water Weight	Percent Moisture	Note
		ft.		grams	grams	grams	grams	%	
RW-37	SS-3	4.0 - 6.0	D-16	0.00	70.96	62.07	8.89	14.3%	
RW-37	SS-6	13.5 - 15.0	D-17	0.00	70.92	56.09	14.83	26.4%	
RW-37	SS-8	23.5 - 25.0	D-18	0.00	73.37	61.58	11.79	19.1%	
RW-35	SS-3	4.0 - 6.0	D-8	0.00	73.49	53.36	20.13	37.7%	
RW-35	SS-5	8.0 - 10.0	D-6	0.00	70.63	60.51	10.12	16.7%	
RW-35	SS-8	23.5 - 25.0	D-15	0.00	73.81	60.45	13.36	22.1%	

Notes / Deviations / References

AASHTO T 265: Laboratory Determination of Moisture Content of Soils

ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass

Benjamin Kovaleski	Benjamin J. Kovaleski	NICET Lab Level III/117226	2/14/18
Technician Name	*Signature*	*Certification Type / No.*	*Date*
Brian Vaughan, P.E.	Brian Vaughan	Group Leader	2/14/18
Technical Responsibility	*Signature*	*Position*	*Date*

Form No: TR-D2216-T265-1
Revision No. 1
Revision Date: 08/16/17

LABORATORY DETERMINATION OF WATER CONTENT

ASTM D 2216 ☑ *AASHTO T 265* ☐

S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	4/26/18
Project Name:	Carolina Crossroads Project	Test Date(s):	3/28 - 3/29/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sampled by:	S&ME	Sample Date(s):	3/01/18
Sampling Method:	Split-spoon	Drill Rig:	Diedrich D-50

Method: **A (1%)** ☐ **B (0.1%)** ☑ Balance ID. 13942 Calibration Date: 8/18/17 Oven ID. 13978 Calibration Date: 10/07/17

Boring No.	Sample No.	Sample Depth	Tare #	Tare Weight	Tare Wt.+ Wet Wt	Tare Wt. + Dry Wt	Water Weight	Percent Moisture	Note
		ft.		grams	grams	grams	grams	%	
RW-36	SS-1	0.0 - 2.0	A-2	0.00	54.72	43.70	11.02	25.2%	
RW-36	SS-4	6.0 - 8.0	T-2	0.00	53.26	46.28	6.98	15.1%	

Notes / Deviations / References

AASHTO T 265: Laboratory Determination of Moisture Content of Soils

ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass

Benjamin Kovaleski	Benjamin J. Kovaleski	NICET Lab Level III/117226	4/26/18
Technician Name	*Signature*	*Certification Type / No.*	*Date*
Matthew F. Cooke, P.G.		Project Manager	4/26/18
Technical Responsibility		*Position*	*Date*

Form No: TR-D2216-T265-1
Revision No. 1
Revision Date: 08/16/17

LABORATORY DETERMINATION OF WATER CONTENT

Quality Assurance *ASTM D 2216* ☑ *AASHTO T 265* ☐

S&ME, Inc. - Knoxville: 1413 Topside Road, Louisville, TN 37777

Project #:	1461-16-047.2B	Report Date:	5/31/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	4/25/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave. North Charleston, South Carolina		
Sampled by:	S&ME	Sample Date(s):	Various
Sampling Method:	Split Spoon	Log # :	43-2321

Method: **A (1%)** ☐ **B (0.1%)** ☑ Balance ID. 18435 Calibration Date: 4/10/2018 Oven ID. 12872 Calibration Date: 3/17/2018

Boring No.	Sample No.	Sample Depth	Tare #	Tare Weight	Tare Wt.+ Wet Wt	Tare Wt. + Dry Wt	Water Weight	Percent Moisture	Note
		ft		grams	grams	grams	grams	%	
RW-38	SS-1A	0.0 - 1.0	C-66	30.88	182.93	171.51	11.42	8.1%	
RW-38	SS-2	2.0 - 4.0	C-15	30.86	80.60	71.21	9.39	23.3%	
RW-38	SS-4	6.0 - 8.0	C-33	30.36	83.49	72.57	10.92	25.9%	
RW-43	SS-1A	0.0 - 1.0	C-62	31.39	88.65	86.17	2.48	4.5%	
RW-43	SS-2	2.0 - 4.0	C-45	31.34	79.71	69.86	9.85	25.6%	
RW-43	SS-3	4.0 - 6.0	C-5	29.82	80.68	74.41	6.27	14.1%	
RW-43	SS-8	23.5 - 25.0	C-29	31.54	88.59	67.03	21.56	60.7%	

Notes / Deviations / References

ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass

Derek Baker — *Technician Name* — 4/25/2018 *Date*

Michael D. Kelso, E.I. — *Technical Responsibility* — Signature — Staff Professional — *Position* — 5/31/2018 *Date*

This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Form No: TR-D2216-T265-1
Revision No. 1
Revision Date: 08/16/17

LABORATORY DETERMINATION OF WATER CONTENT

ASTM D 2216 ☑ *AASHTO T 265* ☐

S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #: 1461-16-047.2B Report Date: 2/21/2018

Project Name: Carolina Crossroads Project

Boring No.	Sample No.	Sample Depth	Tare #	Tare Weight	Tare Wt.+ Wet Wt	Tare Wt. + Dry Wt	Water Weight	Percent Moisture	Note
		ft.		grams	grams	grams	grams	%	
P-32	SS-1	.9-2.9	211	20.83	42.46	38.48	3.98	23%	
P-33	SS-1	1.3-3.3	201	20.87	41.71	38.30	3.41	20%	
P-34	SS-1	.7-2.7	45	20.76	47.08	42.98	4.10	19%	
P-35	SS-1	.9-2.9	209	21.08	42.99	38.58	4.41	25%	
P-36	SS-1	.9-2.9	1	20.64	42.12	39.82	2.30	12%	
P-37	SS-1	2-4	31	20.81	42.08	35.61	6.47	44%	
P-39	SS-1	.8-2.8	200	20.86	42.22	40.12	2.10	11%	
P-40	SS-1	.9-2.9	7	20.80	40.62	38.19	2.43	14%	
P-41	SS-1	2-4	207	20.93	42.12	38.15	3.97	23%	
P-43	SS-1	.2-2.2	8	20.60	41.71	38.35	3.36	19%	
P-65	SS-1	.8-2.8	100	20.56	41.00	36.52	4.48	28%	

Notes / Deviations / References

Form No: TR-D2216-T265-1
Revision No. 1
Revision Date: 08/16/17

LABORATORY DETERMINATION OF WATER CONTENT

ASTM D 2216 ☑ *AASHTO T 265* ☐

S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	4/25/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	2/22-2/23/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sample by:	S&ME	Sample Date(s):	Various
Sampling Method:	Split-spoon	Drill Rig :	CME 55/Diedrich D-50

Method: **A (1%)** ☑ **B (0.1%)** ☐ Balance ID. 25711 Calibration Date: 8/30/17 Oven ID. 25722 Calibration Date: 8/18/17

Boring No.	Sample No.	Sample Depth	Tare #	Tare Weight	Tare Wt.+ Wet Wt	Tare Wt. + Dry Wt	Water Weight	Percent Moisture	Note
		ft.		grams	grams	grams	grams	%	
P-2	SS-1	1.0 - 3.0	16	20.69	42.06	39.26	2.80	15%	
P-4	SS-1	0.8 - 2.8	240	20.77	41.25	40.44	0.81	4%	
P-6	SS-1	1.1 - 3.1	201	20.86	43.15	36.55	6.60	42%	
P-8	SS-1	0.8 - 2.8	46	20.74	41.15	36.33	4.82	31%	
P-10	SS-1	1.6 - 3.6	44	20.77	41.92	39.94	1.98	10%	
P-12	SS-1	1.2 - 3.2	123	20.56	40.57	39.52	1.05	6%	
P-14	SS-1	0.7 - 2.7	210	20.97	41.42	37.20	4.22	26%	
P-16	SS-1	0.8 - 2.8	211	20.84	41.02	39.19	1.83	10%	
P-18	SS-1	1.3 - 3.3	32	20.45	42.11	38.51	3.60	20%	
P-20	SS-1	1.5 - 3.5	146	20.55	41.46	37.62	3.84	22%	
P-22	SS-1	1.4 - 3.4	1	20.67	41.49	39.63	1.86	10%	
P-24	SS-1	0.7 - 2.7	195	20.55	42.02	40.32	1.70	9%	
P-26	SS-1	0.6 - 2.6	235	20.76	41.16	35.51	5.65	38%	
P-28	SS-1	0.7 - 2.7	9	20.80	42.92	40.83	2.09	10%	
P-30	SS-1	0.7 - 2.7	45	20.75	41.08	38.07	3.01	17%	
P-38	SS-1	0.8 - 2.8	222	20.85	41.99	39.32	2.67	14%	

Notes / Deviations / References

ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass

Matthew Wolfe
Technician Name

NICET 123218
Certification Type / No.

Matthew F. Cooke, P.G.
Technical Responsibility

Project Manager
Position

5/3/2018
Date

Form No: TR-D2216-T265-1
Revision No. 1
Revision Date: 08/16/17

LABORATORY DETERMINATION OF WATER CONTENT

ASTM D 2216 ☑ *AASHTO T 265* ☐

S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #: 1461-16-047.2B Report Date: 4/25/2018

Project Name: Carolina Crossroads Project

Boring No.	Sample No.	Sample Depth	Tare #	Tare Weight	Tare Wt.+ Wet Wt	Tare Wt. + Dry Wt	Water Weight	Percent Moisture	Note
		ft.		grams	grams	grams	grams	%	
P-48	SS-1	1.0 - 3.0	3	20.80	41.06	37.80	3.26	19%	
P-50	SS-1	1.0 - 3.0	229	20.74	40.90	36.83	4.07	25%	
P-52	SS-1	1.2 - 3.2	36	20.94	42.37	39.10	3.27	18%	
P-53	SS-1	0.6 - 2.6	30	20.82	41.93	37.61	4.32	26%	
P-55	SS-1	0.9 - 2.9	4	20.53	43.24	39.54	3.70	19%	
P-57	SS-1	1.1 - 3.1	217	20.90	41.48	38.60	2.88	16%	
P-59	SS-1	1.4 - 3.4	19	20.57	44.50	40.57	3.93	20%	
P-61	SS-1	1.4 - 3.4	116	20.63	43.66	39.44	4.22	22%	
P-63	SS-1	1.3 - 3.3	39	20.81	41.75	39.68	2.07	11%	
P-67	SS-1	0.6 - 2.6	25	20.62	42.32	38.47	3.85	22%	
P-68	SS-1	1.1 - 3.1	6	20.58	44.94	43.09	1.85	8%	
P-69	SS-1	1.0 - 3.0	214	20.84	43.02	39.42	3.60	19%	
P-70	SS-1	0.6 - 2.6	7	20.82	43.32	39.96	3.36	18%	
P-71	SS-1	1.3 - 3.3	29	20.80	43.18	41.34	1.84	9%	

Notes / Deviations / References

Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

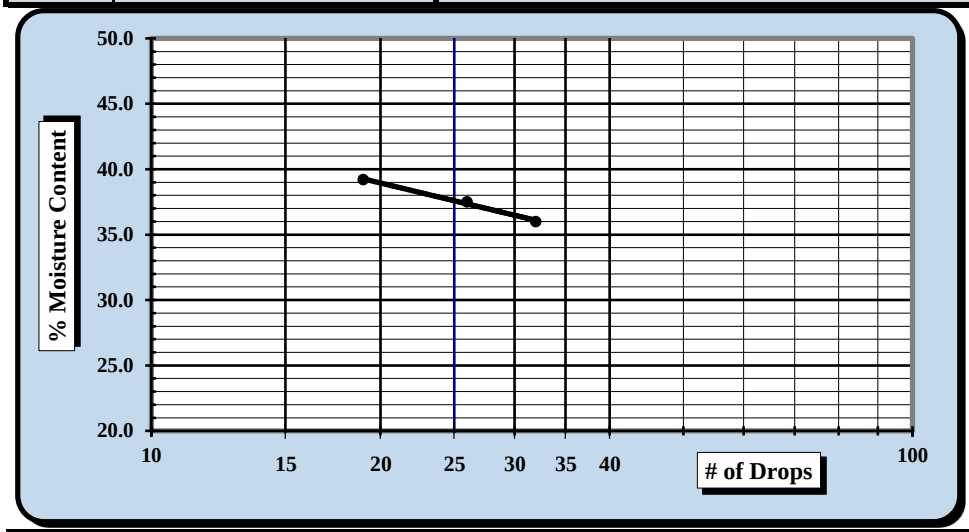
S&ME, Inc. - Atlanta: 4350 River Green Parkway, Suite 200, Duluth, GA 30096

Project #:	1461-16-047.2B	Report Date:	4/30/18
Project Name:	Carolina Crossroads Project	Test Date(s)	4/27-4/28/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-30	Sample #: SS-3		Sample Date: Various	
Location:	Bridge Boring	Offset: N/A		Depth: 4.0' - 6.0'	
Sample Description:	Clayey Sand (SC, A-6 (5))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	25128	3/17/2017	Grooving tool	26551	2/23/2018
LL Apparatus	31336	2/23/2018	Grooving tool		
Oven	31332	2/20/2018	Grooving tool		

		Liquid Limit						Plastic Limit		
Pan #	175									
	Tare #:	45	46	47				48	49	
A	Tare Weight	15.28	15.89	15.70				15.35	15.34	
B	Wet Soil Weight + A	27.75	26.38	26.57				22.76	22.54	
C	Dry Soil Weight + A	24.45	23.52	23.51				21.72	21.53	
D	Water Weight (B-C)	3.30	2.86	3.06				1.04	1.01	
E	Dry Soil Weight (C-A)	9.17	7.63	7.81				6.37	6.19	
F	% Moisture (D/E)*100	36.0%	37.5%	39.2%				16.3%	16.3%	
N	# OF DROPS	32	26	19				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**16.3%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**37**
Plastic Limit	**16**
Plastic Index	**21**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☐ Air Dried ☑

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

Jimmy Hanson	4/28/2018		4/30/2018
Technician Name	*Date*	*Technical Responsibility*	*Date*

This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Form No: TR-D7928-3
Revision No.: 0
Revision Date: 02/21/17

Particle Size Analysis of Soils

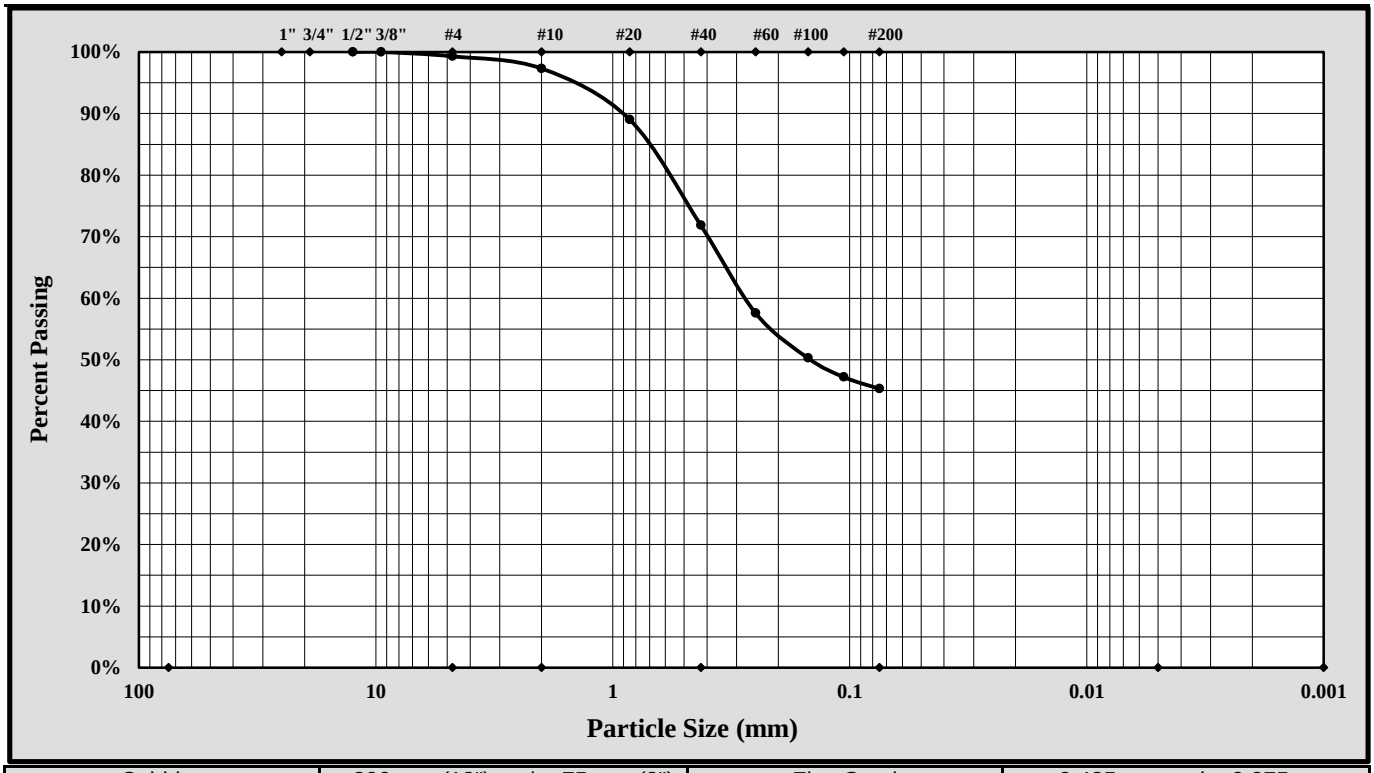
ASTM D6913/D7928

Quality Assurance

Sample Log No.:

S&ME, Inc., 4350 Rivergreen Parkway, Suite 200, Duluth, GA 30096

S&ME Project #:	1461-16-047.2B	Report Date:	4/23/18
Project Name:	Carolina Crossroads Project	Test Date(s):	4/19-4/20/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sample ID:	B-30 Type: Split Spoon	Sample Date:	Various
Location:	Bridge Boring Sample No.: SS-3	Depth:	4.0' - 6.0'
Sample Description:	Clayey Sand (SC, A-6 (5))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:		Gravel:	0.7%
Silt & Clay (% Passing #200):	45.3%	Total Sand:	54.0%
Assumed Specific Gravity:	2.65		
Liquid Limit	37	Plastic Limit	16
		Plastic Index	21

$Cc = D_{30}^2/(D_{10} \times D_{60})$ $Cu = D_{60}/D_{10}$

Description of Sand and Gravel	Rounded	☐	Angular	☒	Hard & Durable	☒	Soft	☐	Weathered & Friable ☐
Sample Prep Method: Moist Prep	Dispersion Period:	1 min.	Dispersing Agent:	Sodium Hexametaphosphate:	50 g./ Liter				

References / Comments / Deviations:

Nathan Price		Laboratory Group Leader	5/7/2018
Technical Responsibility	*Signature*	*Position*	*Date*

This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

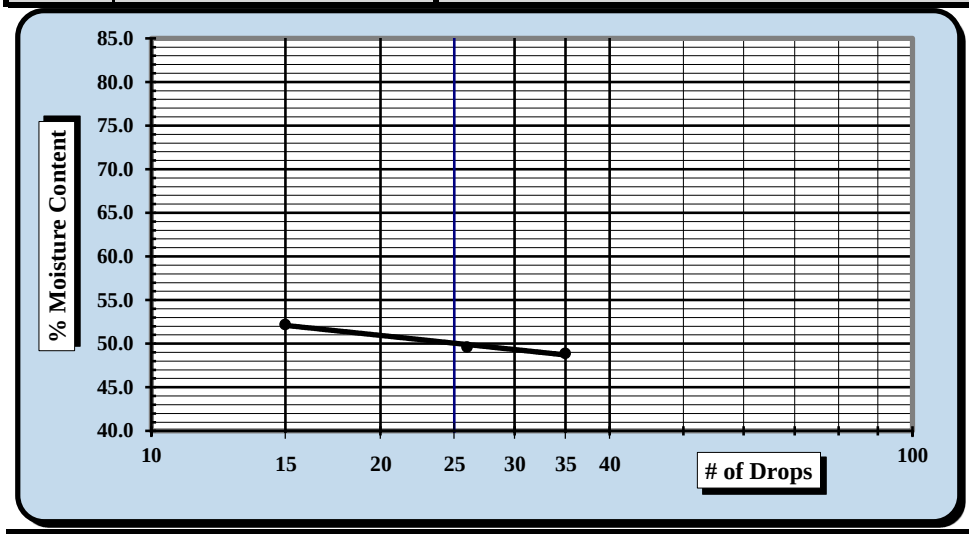
ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Atlanta: 4350 River Green Parkway, Suite 200, Duluth, GA 30096

Project #:	1461-16-047.2B	Report Date:	5-3-18
Project Name:	Carolina Crossroads Project	Test Date(s)	4/27-4/28/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-30	Sample #: SS-8	Sample Date: Various
Location:	Bridge Boring	Offset: N/A	Depth: 23.5' - 25.0'
Sample Description:	Fat Clay (CH, A-7-6 (25))		

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	25128	3/17/2017	Grooving tool	26551	2/23/2018
LL Apparatus	31336	2/23/2018	Grooving tool		
Oven	31332	2/20/2018	Grooving tool		

Pan # 324		Liquid Limit						Plastic Limit		
	Tare #:	25	26	27				28	65	
A	Tare Weight	15.23	16.02	15.97				16.08	16.04	
B	Wet Soil Weight + A	27.41	29.47	29.20				22.15	22.57	
C	Dry Soil Weight + A	23.41	25.01	24.66				20.88	21.24	
D	Water Weight (B-C)	4.00	4.46	4.54				1.27	1.33	
E	Dry Soil Weight (C-A)	8.18	8.99	8.69				4.80	5.20	
F	% Moisture (D/E)*100	48.9%	49.6%	52.2%				26.5%	25.6%	
N	# OF DROPS	35	26	15				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**26.1%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**50**
Plastic Limit	**26**
Plastic Index	**24**
Group Symbol	**CH**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☐ Air Dried ☑

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

Jimmy Hanson	4/28/2018		5/4/2018
Technician Name	*Date*	*Technical Responsibility*	*Date*

This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Particle Size Analysis of Soils

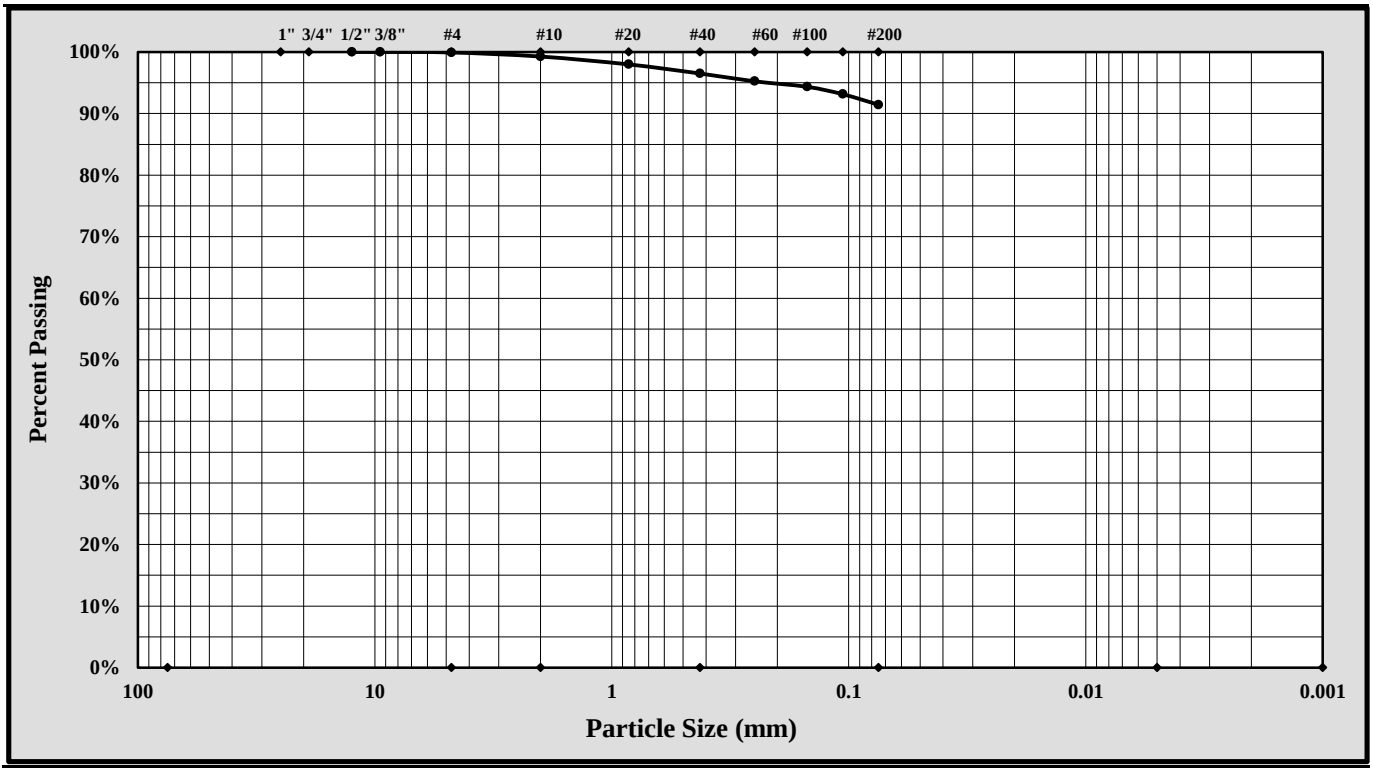
ASTM D6913/D7928

Sample Log No.:

Quality Assurance

S&ME, Inc., 4350 Rivergreen Parkway, Suite 200, Duluth, GA 30096

S&ME Project #:	1461-16-047.2B	Report Date:	4/23/18
Project Name:	Carolina Crossroads Project	Test Date(s):	4/19-4/20/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sample ID:	B-30 Type: Split Spoon	Sample Date:	Various
Location:	Bridge Boring Sample No.: SS-8	Depth:	23.5' - 25.0'
Sample Description:	Fat Clay (CH, A-7-6 (25))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:		Gravel:	0.1%
Silt & Clay (% Passing #200):	91.4%	Total Sand:	8.5%
Assumed Specific Gravity:	2.65		

Liquid Limit	50	Plastic Limit	26	Plastic Index	24

$Cc = D_{30}^2/(D_{10} \times D_{60})$ $Cu = D_{60}/D_{10}$

Description of Sand and Gravel	Rounded ☐	Angular ☐	Hard & Durable ☐	Soft ☐	Weathered & Friable ☐
Sample Prep Method: Moist Prep	Dispersion Period:	1 min.	Dispersing Agent:	Sodium Hexametaphosphate:	50 g./ Liter

References / Comments / Deviations:

Nathan Price		Laboratory Group Leader	5/7/2018
Technical Responsibility	*Signature*	*Position*	*Date*

This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

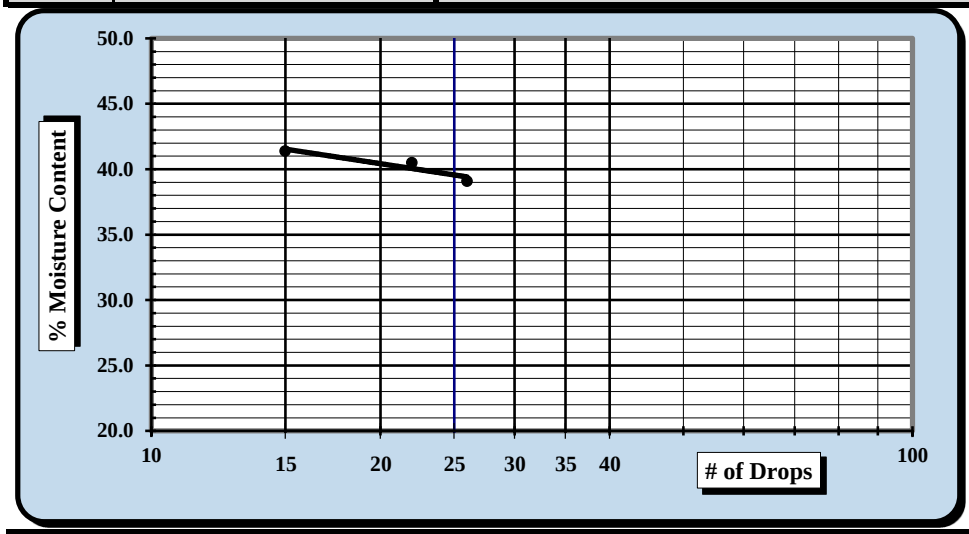
ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Atlanta: 4350 River Green Parkway, Suite 200, Duluth, GA 30096

Project #:	1461-16-047.2B	Report Date:	5-4-18
Project Name:	Carolina Crossroads Project	Test Date(s)	4/27-4/28/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-30	Sample #: SS-19	Sample Date: Various
Location:	Bridge Boring	Offset: N/A	Depth: 63.5' - 65.0'
Sample Description:	Silt with Sand (ML, A-6 (9))		

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	25128	3/17/2017	Grooving tool	26551	2/23/2018
LL Apparatus	31336	2/23/2018	Grooving tool		
Oven	31332	2/20/2018	Grooving tool		

Pan # 384		Liquid Limit						Plastic Limit		
	Tare #:	30	31	32				35	36	
A	Tare Weight	15.20	15.99	15.13				15.48	15.12	
B	Wet Soil Weight + A	27.52	28.17	29.41				21.55	21.70	
C	Dry Soil Weight + A	24.06	24.66	25.23				20.20	20.27	
D	Water Weight (B-C)	3.46	3.51	4.18				1.35	1.43	
E	Dry Soil Weight (C-A)	8.86	8.67	10.10				4.72	5.15	
F	% Moisture (D/E)*100	39.1%	40.5%	41.4%				28.6%	27.8%	
N	# OF DROPS	26	22	15				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**28.2%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**39**
Plastic Limit	**28**
Plastic Index	**11**
Group Symbol	**ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☐ Air Dried ☑

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

Jimmy Hanson	4/28/2018		5/4/2018
Technician Name	*Date*	*Technical Responsibility*	*Date*

This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Form No: TR-D7928-3
Revision No.: 0
Revision Date: 02/21/17

Particle Size Analysis of Soils

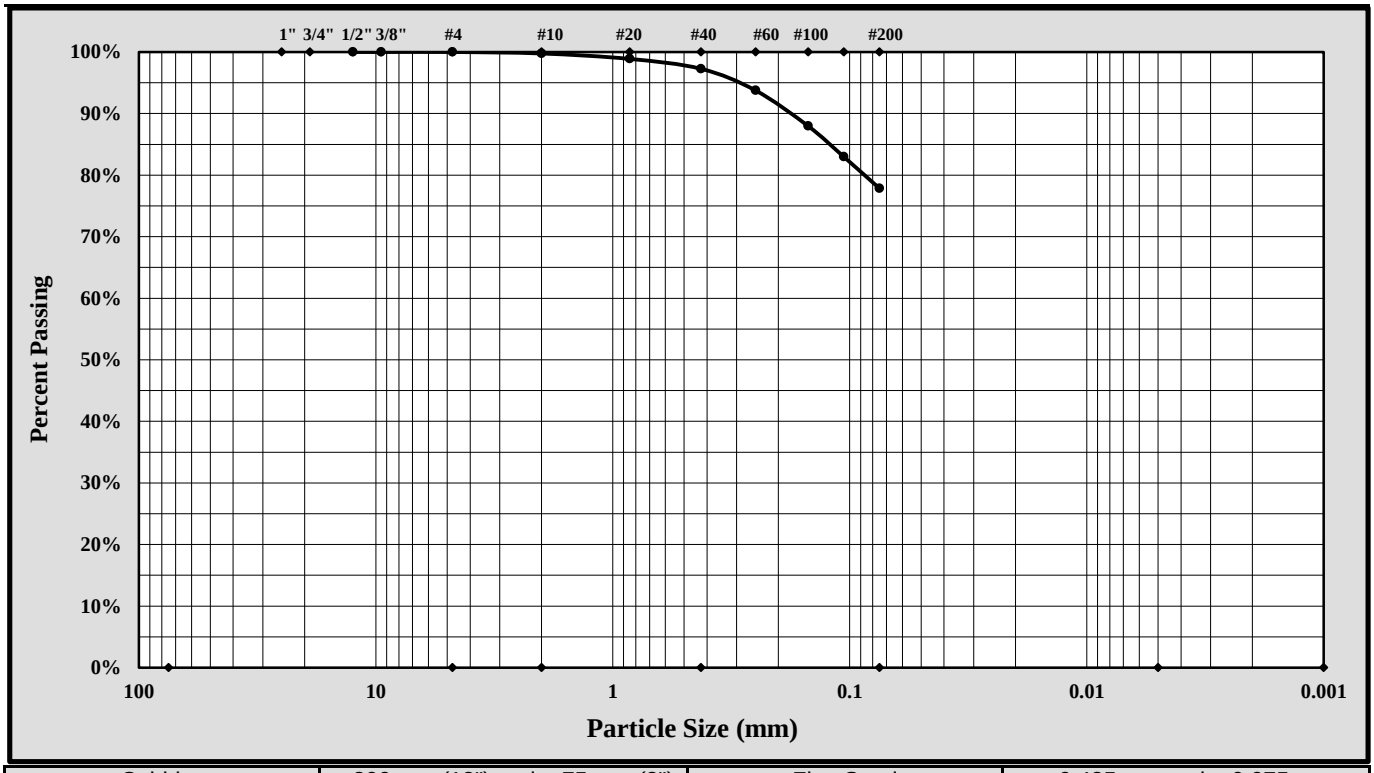
ASTM D6913/D7928

Quality Assurance

Sample Log No.:

S&ME, Inc., 4350 Rivergreen Parkway, Suite 200, Duluth, GA 30096

S&ME Project #:	1461-16-047.2B	Report Date:	4/23/18
Project Name:	Carolina Crossroads Project	Test Date(s):	4/19-4/20/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sample ID:	B-30 Type: Split Spoon	Sample Date:	Various
Location:	Bridge Boring Sample No.: SS-16	Depth:	63.5' - 65.0'
Sample Description:	Silt with Sand (ML, A-6 (9))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:		Gravel:	0.0%
Silt & Clay (% Passing #200):	77.9%	Total Sand:	22.1%
Assumed Specific Gravity:	2.65		

Liquid Limit	39	Plastic Limit	28	Plastic Index	11

$Cc = D_{30}^2/(D_{10} \times D_{60})$ $Cu = D_{60}/D_{10}$

Description of Sand and Gravel	Rounded ☐	Angular ☐	Hard & Durable ☐	Soft ☐	Weathered & Friable ☐
Sample Prep Method: Moist Prep	Dispersion Period:	1 min.	Dispersing Agent:	Sodium Hexametaphosphate:	50 g./ Liter

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*

Project Manager — *Position*

6/7/2018 — *Date*

This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

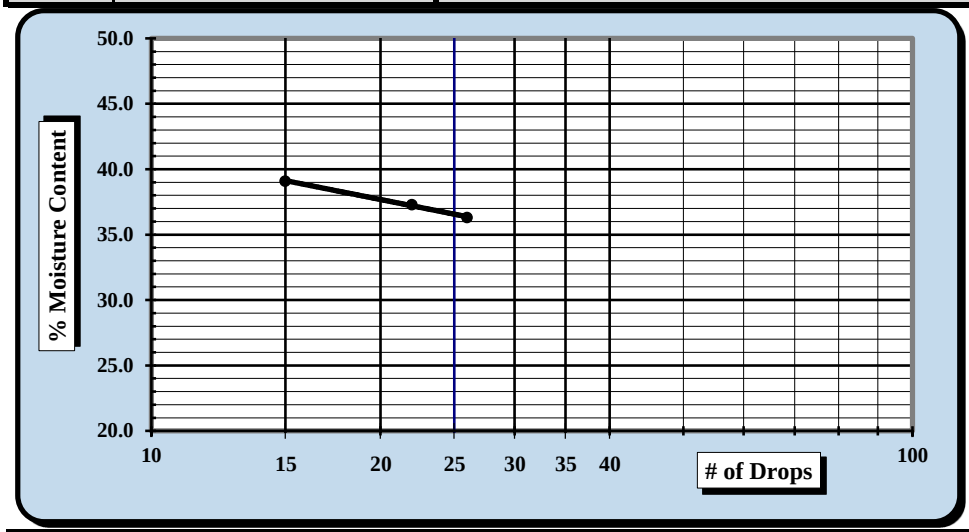
ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Atlanta: 4350 River Green Parkway, Suite 200, Duluth, GA 30096

Project #:	1461-16-047.2B	Report Date:	5-4-18
Project Name:	Carolina Crossroads Project	Test Date(s)	4/27-4/28/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-30	Sample #: SS-19	Sample Date: Various
Location:	Bridge Boring	Offset: N/A	Depth: 78.5' - 80.0'
Sample Description:	Silt with Sand (ML, A-6 (8))		

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	25128	3/17/2017	Grooving tool	26551	2/23/2018
LL Apparatus	31336	2/23/2018	Grooving tool		
Oven	31332	2/20/2018	Grooving tool		

Pan # 384		Liquid Limit						Plastic Limit		
	Tare #:	30	31	32				35	36	
A	Tare Weight	15.35	15.45	15.18				15.98	15.10	
B	Wet Soil Weight + A	28.18	30.09	27.28				22.46	21.31	
C	Dry Soil Weight + A	24.76	26.11	23.88				21.14	20.08	
D	Water Weight (B-C)	3.42	3.98	3.40				1.32	1.23	
E	Dry Soil Weight (C-A)	9.41	10.66	8.70				5.16	4.98	
F	% Moisture (D/E)*100	36.3%	37.3%	39.1%				25.6%	24.7%	
N	# OF DROPS	26	22	15				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**25.2%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**36**
Plastic Limit	**25**
Plastic Index	**11**
Group Symbol	**ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☐ Air Dried ☑

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

Jimmy Hanson	4/28/2018		5/4/2018
Technician Name	*Date*	*Technical Responsibility*	*Date*

This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Form No: TR-D7928-3
Revision No.: 0
Revision Date: 02/21/17

Particle Size Analysis of Soils

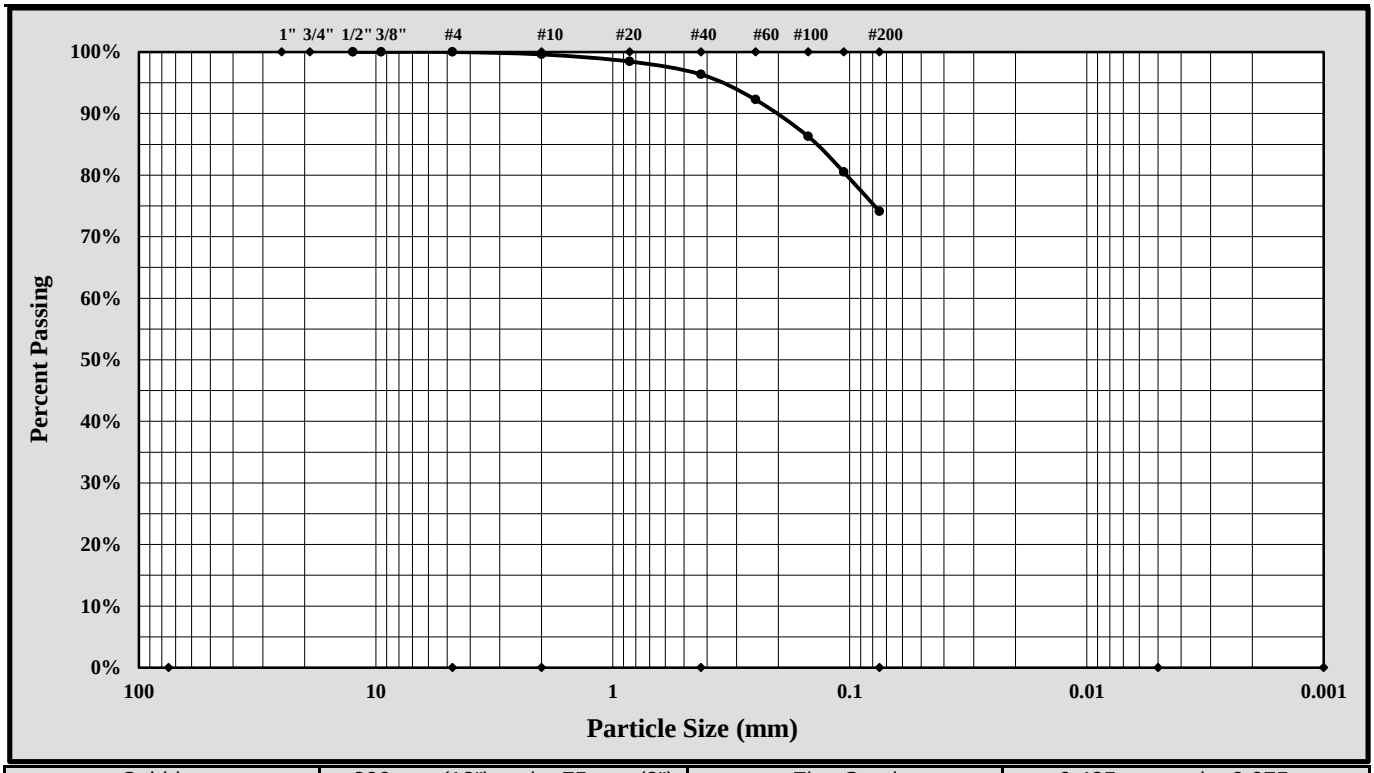
ASTM D6913/D7928

Quality Assurance

Sample Log No.:

S&ME, Inc., 4350 Rivergreen Parkway, Suite 200, Duluth, GA 30096

S&ME Project #:	1461-16-047.2B	Report Date:	4/23/18
Project Name:	Carolina Crossroads Project	Test Date(s):	4/19-4/20/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sample ID:	B-30 Type: Split Spoon	Sample Date:	Various
Location:	Bridge Boring Sample No.: SS-19	Depth:	78.5' - 80.0'
Sample Description:	Silt with Sand (ML, A-6 (8))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:		Gravel:	0.0%
Silt & Clay (% Passing #200):	74.1%	Total Sand:	25.9%
Assumed Specific Gravity:	2.65		

Liquid Limit	36	Plastic Limit	25	Plastic Index	11

$Cc = D_{30}^2/(D_{10} \times D_{60})$ $Cu = D_{60}/D_{10}$

Description of Sand and Gravel	Rounded ☐	Angular ☐	Hard & Durable ☐	Soft ☐	Weathered & Friable ☐
Sample Prep Method: Moist Prep	Dispersion Period:	1 min.	Dispersing Agent:	Sodium Hexametaphosphate:	50 g./ Liter

References / Comments / Deviations:

Nathan Price		Laboratory Group Leader	5/7/2018
Technical Responsibility	*Signature*	*Position*	*Date*

This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

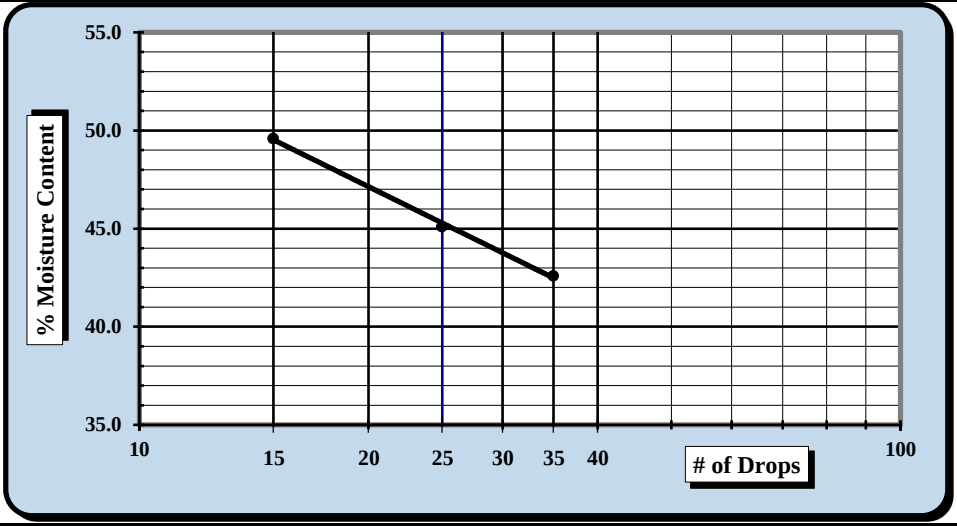
Project #:	1461-16-047.2B	Report Date:	4/27/18
Project Name:	Carolina Crossroads Project	Test Date:	4/24/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-31	Sample #:	SS-1	Sample Date:	3/05/18
Location:	Bridge Boring	Type:	Split-spoon	Depth:	0.0' - 2.0'

Sample Description: Silt with Sand (ML, A-7-6(13))

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	21	22	23				24	25	
A	Tare Weight	28.08	25.68	27.34				25.99	26.80	
B	Wet Soil Weight + A	42.14	38.99	42.57				33.46	34.67	
C	Dry Soil Weight + A	37.94	34.85	37.52				31.84	32.93	
D	Water Weight (B-C)	4.20	4.14	5.05				1.62	1.74	
E	Dry Soil Weight (C-A)	9.86	9.17	10.18				5.85	6.13	
F	% Moisture (D/E)*100	42.6%	45.1%	49.6%				27.7%	28.4%	
N	# OF DROPS	35	25	15				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**28.1%**		



One Point Liquid Limit

N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**45**
Plastic Limit	**28**
Plastic Index	**17**
Group Symbol	**ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	4/27/18	Matthew F. Cooke, P.G.	4/27/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

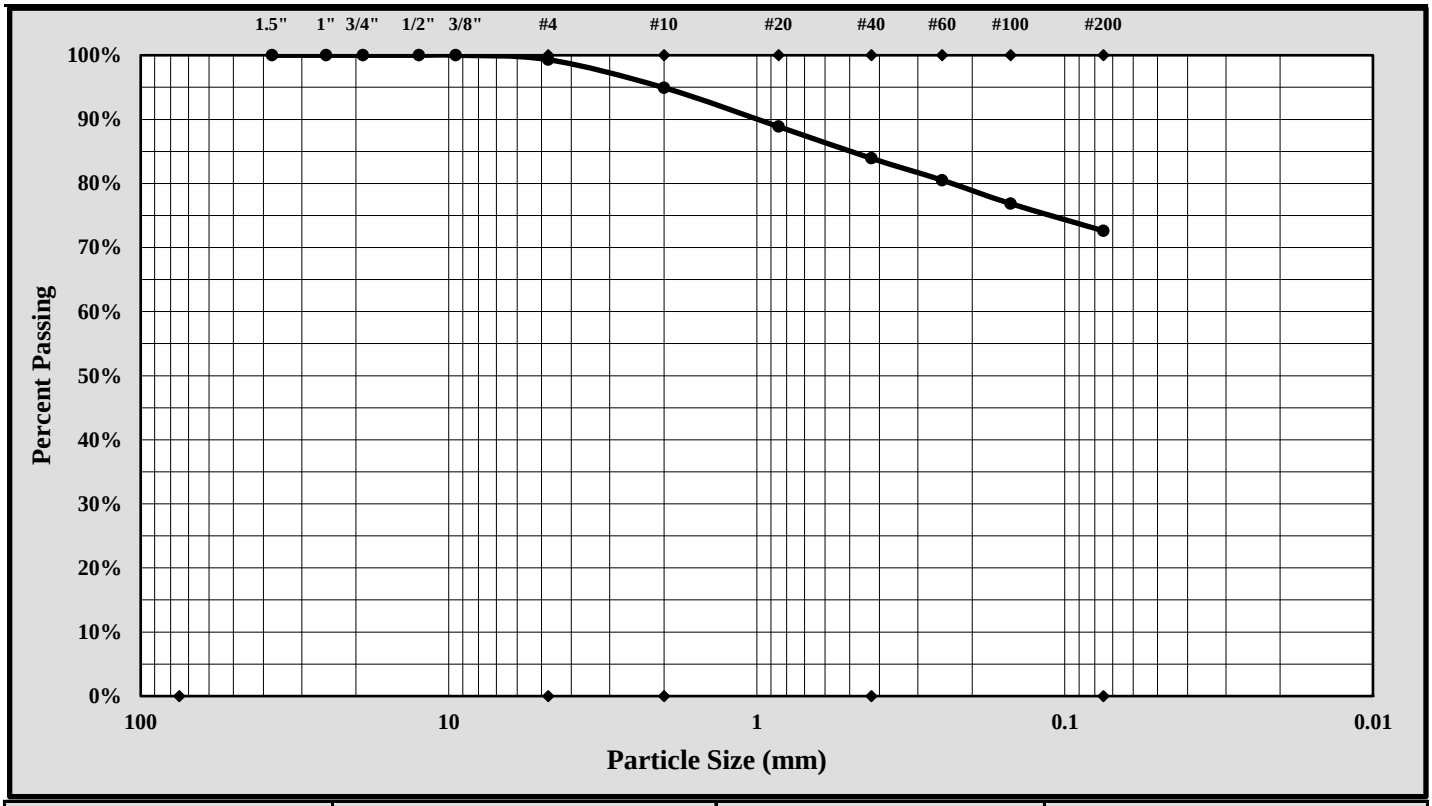
This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	4/27/18
Project Name:	Carolina Crossroads Project	Test Date(s):	4/15 - 4/26/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-31 Sample #: SS-1	Sample Date:	3/05/18
Location:	Bridge Boring Type: Split-spoon	Depth:	0.0' - 2.0'
Sample Description:	Silt with Sand (ML, A-7-6(13))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	4.75 mm	Gravel:	0.7%
Silt & Clay (% Passing #200):	72.6%	Total Sand:	26.7%

Liquid Limit	45	Plastic Limit	28	Plastic Index	17
Coarse Sand:	4.4%	Medium Sand:	11.0%	Fine Sand:	11.3%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/27/18 — *Date*

This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

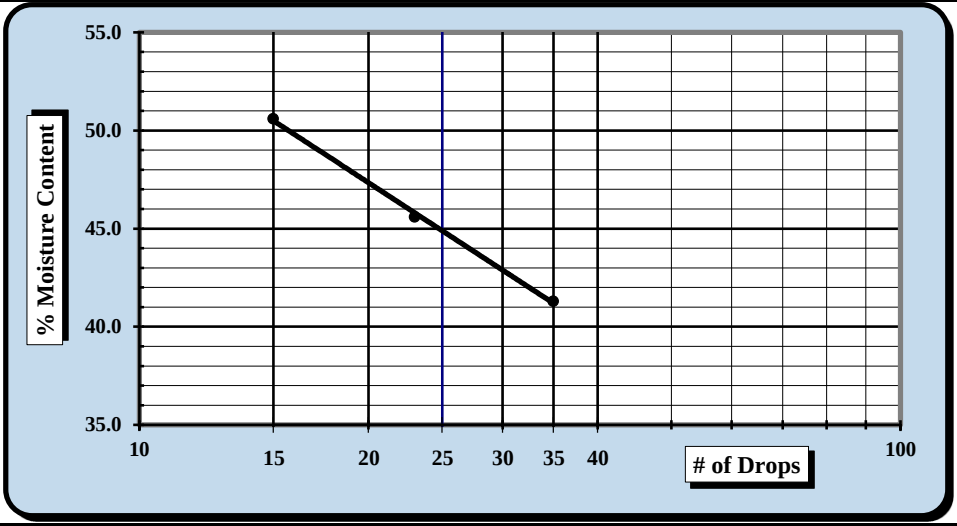
Project #:	1461-16-047.2B	Report Date:	4/27/18
Project Name:	Carolina Crossroads Project	Test Date:	4/24/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-31	Sample #:	SS-5	Sample Date:	3/05/18
Location:	Bridge Boring	Type:	Split-spoon	Depth:	8.0' - 10.0'

Sample Description: Silt with Sand (ML, A-7-5(13))

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	26	27	28				29	30	
A	Tare Weight	27.35	27.00	26.83				26.99	27.37	
B	Wet Soil Weight + A	43.75	44.31	40.34				32.99	34.43	
C	Dry Soil Weight + A	38.96	38.89	35.80				31.51	32.73	
D	Water Weight (B-C)	4.79	5.42	4.54				1.48	1.70	
E	Dry Soil Weight (C-A)	11.61	11.89	8.97				4.52	5.36	
F	% Moisture (D/E)*100	41.3%	45.6%	50.6%				32.7%	31.7%	
N	# OF DROPS	35	23	15				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**32.2%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**45**
Plastic Limit	**32**
Plastic Index	**13**
Group Symbol	**ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	4/27/18	Matthew F. Cooke, P.G.	4/27/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

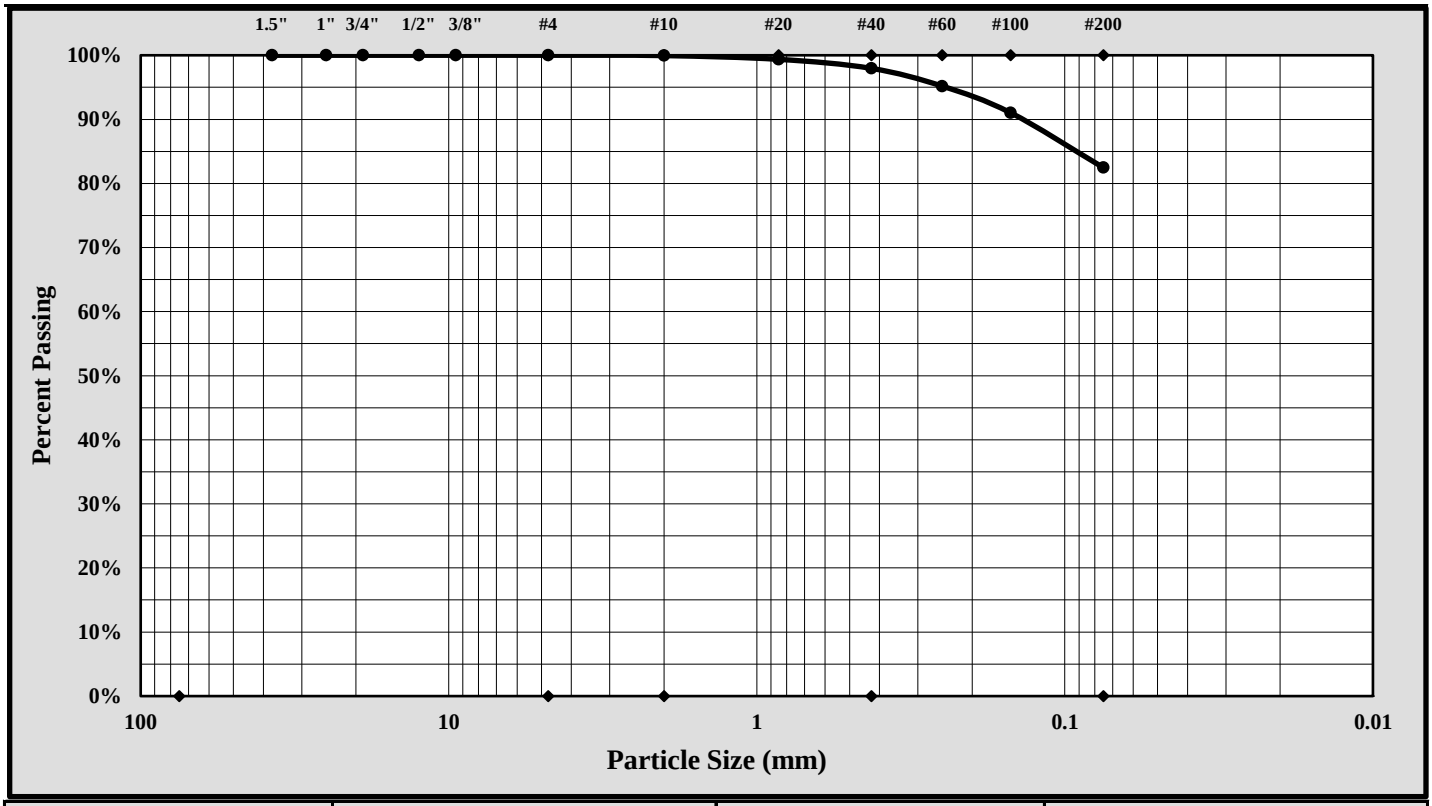
This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	4/27/18
Project Name:	Carolina Crossroads Project	Test Date(s):	4/15 - 4/26/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-31	Sample #: SS-5	Sample Date: 3/05/18
Location:	Bridge Boring	Type: Split-spoon	Depth: 8.0' - 10.0'
Sample Description:	Silt with Sand (ML, A-7-5(13))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	0.85 mm	Gravel:	0.0%
Silt & Clay (% Passing #200):	82.5%	Total Sand:	17.5%

Liquid Limit	45	Plastic Limit	32	Plastic Index	13
Coarse Sand:	0.1%	Medium Sand:	2.0%	Fine Sand:	15.5%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/27/18 — *Date*

This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

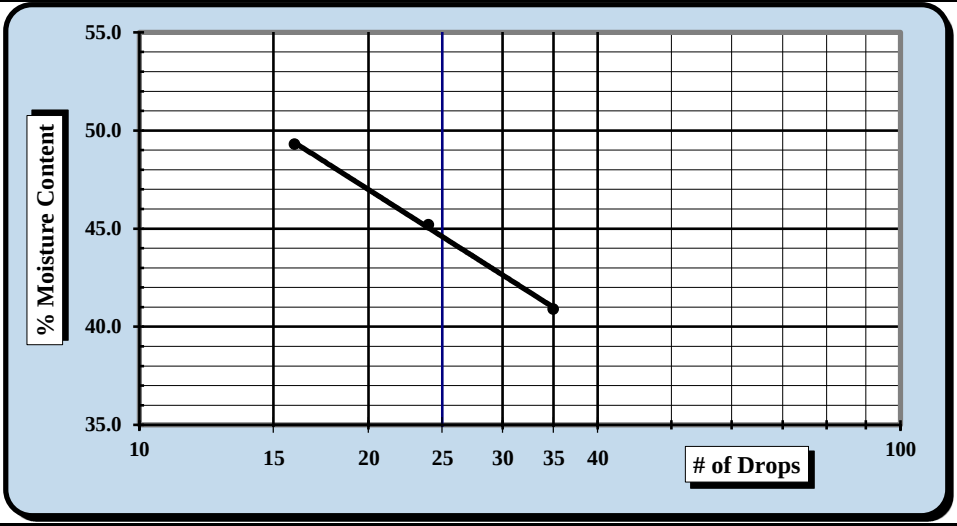
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	5/04/18
Project Name:	Carolina Crossroads Project	Test Date:	5/03/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-32	Sample #:	SS-1	Sample Date:	3/13/18
Location:	Bridge Boring	Type:	Split-spoon	Depth:	0.0' - 2.0'
Sample Description:	Clayey Sand with Gravel (SC, A-7-6(8))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	1	2	3				4	5	
A	Tare Weight	26.69	26.47	26.32				25.92	26.94	
B	Wet Soil Weight + A	40.60	39.16	38.92				32.09	33.16	
C	Dry Soil Weight + A	36.56	35.21	34.76				31.01	32.07	
D	Water Weight (B-C)	4.04	3.95	4.16				1.08	1.09	
E	Dry Soil Weight (C-A)	9.87	8.74	8.44				5.09	5.13	
F	% Moisture (D/E)*100	40.9%	45.2%	49.3%				21.2%	21.2%	
N	# OF DROPS	35	24	16				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**21.2%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**45**
Plastic Limit	**21**
Plastic Index	**24**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	5/04/18	Matthew F. Cooke, P.G.	5/04/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

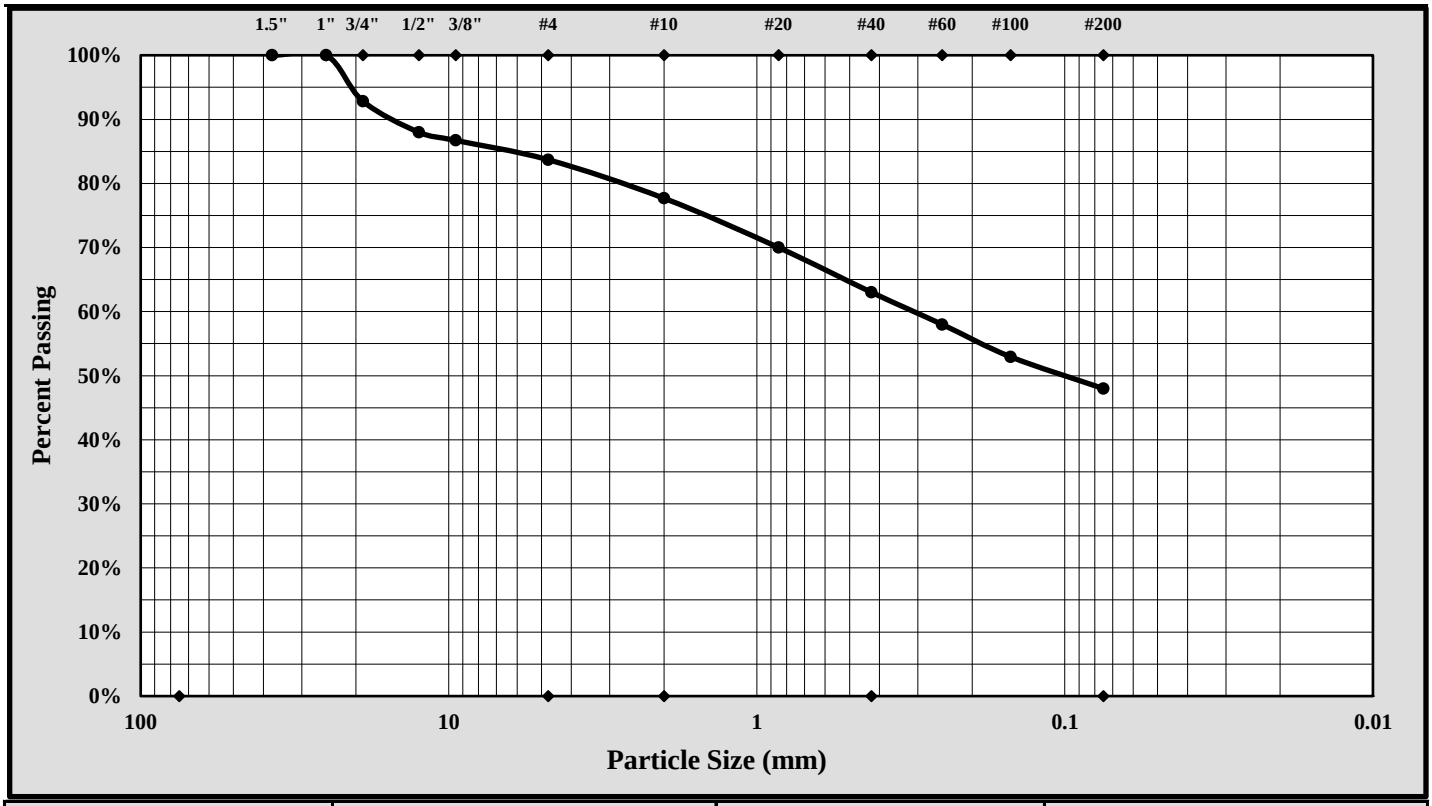
This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	5/04/18
Project Name:	Carolina Crossroads Project	Test Date(s):	5/02 - 5/04/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-32	Sample #: SS-1	Sample Date: 3/13/18
Location:	Bridge Boring	Type: Split-spoon	Depth: 0.0' - 2.0'
Sample Description:	Clayey Sand with Gravel (SC, A-7-6(8))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	25.0 mm	Gravel:	16.3%
Silt & Clay (% Passing #200):	48.0%	Total Sand:	35.7%

Liquid Limit	45	Plastic Limit	21	Plastic Index	24
Coarse Sand:	6.0%	Medium Sand:	14.7%	Fine Sand:	15.0%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
5/04/18 — *Date*

This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

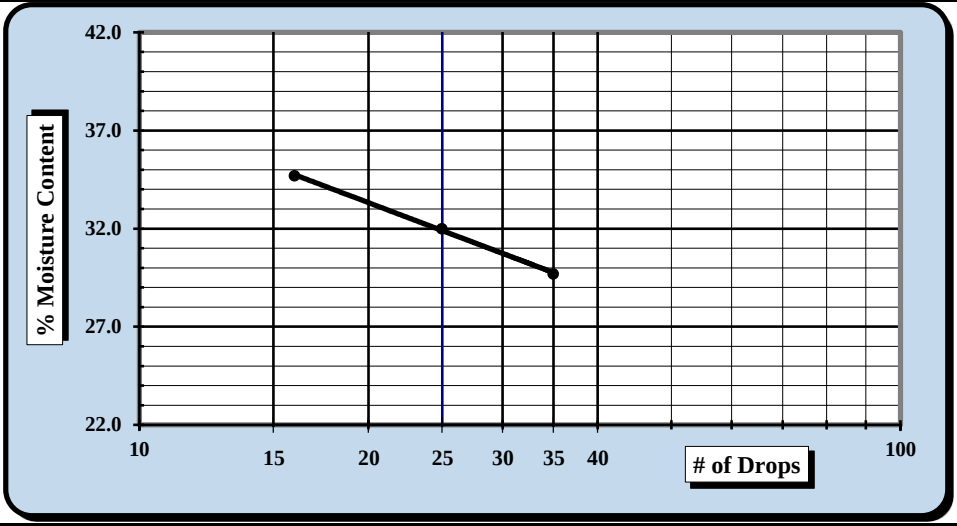
Project #:	1461-16-047.2B	Report Date:	5/04/18
Project Name:	Carolina Crossroads Project	Test Date:	5/03/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-32	Sample #:	SS-2	Sample Date:	3/13/18
Location:	Bridge Boring	Type:	Split-spoon	Depth:	2.0' - 4.0'

Sample Description: Clayey Gravel with Sand (GC, A-2-6(0))

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	6	7	8				9	10	
A	Tare Weight	27.76	26.31	27.31				26.83	26.74	
B	Wet Soil Weight + A	40.11	37.53	40.52				33.57	33.21	
C	Dry Soil Weight + A	37.28	34.81	37.12				32.62	32.27	
D	Water Weight (B-C)	2.83	2.72	3.40				0.95	0.94	
E	Dry Soil Weight (C-A)	9.52	8.50	9.81				5.79	5.53	
F	% Moisture (D/E)*100	29.7%	32.0%	34.7%				16.4%	17.0%	
N	# OF DROPS	35	25	16				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**16.7%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**32**
Plastic Limit	**17**
Plastic Index	**15**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	5/04/18	Matthew F. Cooke, P.G.	5/04/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

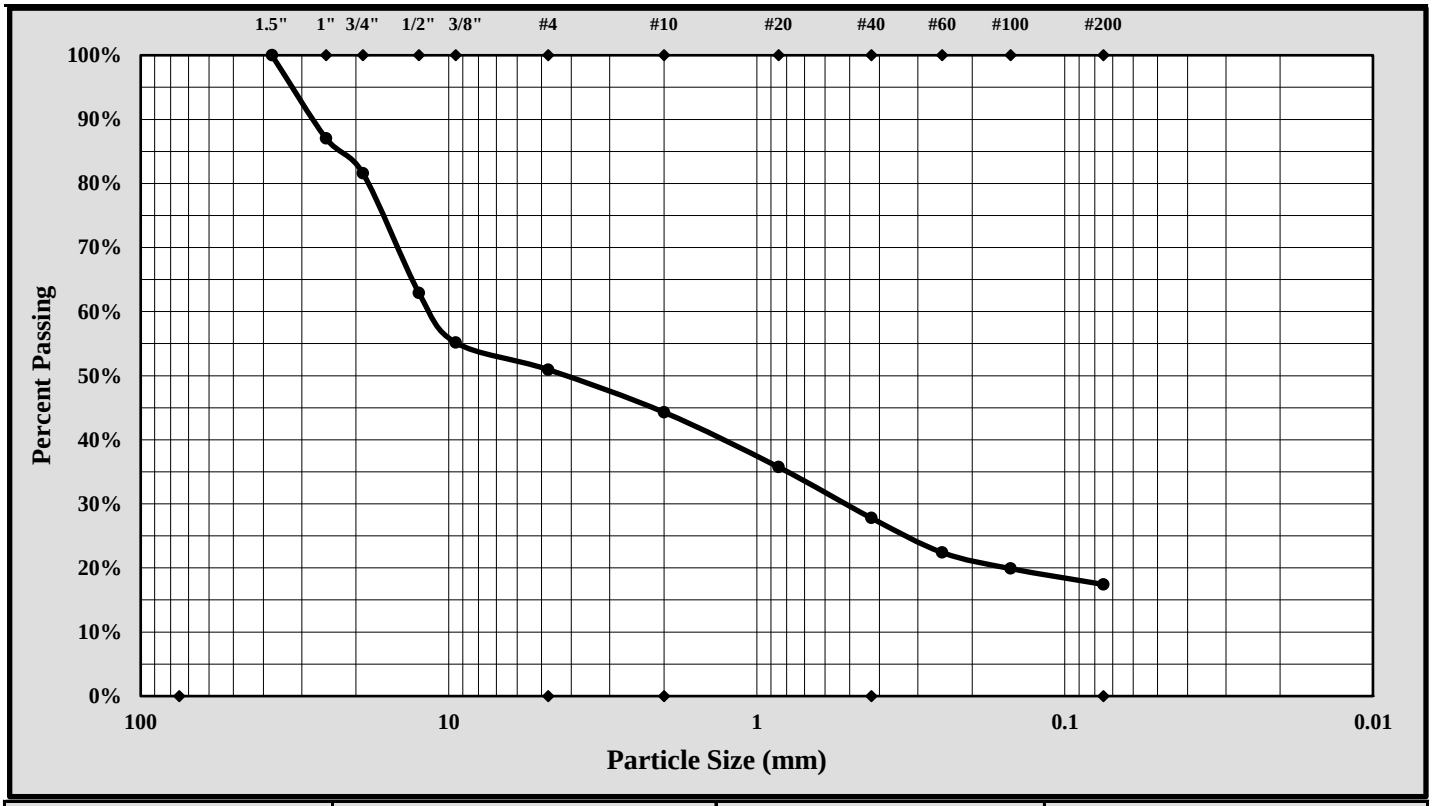
This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	5/04/18
Project Name:	Carolina Crossroads Project	Test Date(s):	5/02 - 5/04/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-32 Sample #: SS-2	Sample Date:	3/13/18
Location:	Bridge Boring Type: Split-spoon	Depth:	2.0' - 4.0'
Sample Description:	Clayey Gravel with Sand (GC, A-2-6(0))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	37.5 mm	Gravel:	49.1%
Silt & Clay (% Passing #200):	17.4%	Total Sand:	33.5%

Liquid Limit	32	Plastic Limit	17	Plastic Index	15
Coarse Sand:	6.7%	Medium Sand:	16.5%	Fine Sand:	10.4%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
5/04/18 — *Date*

This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

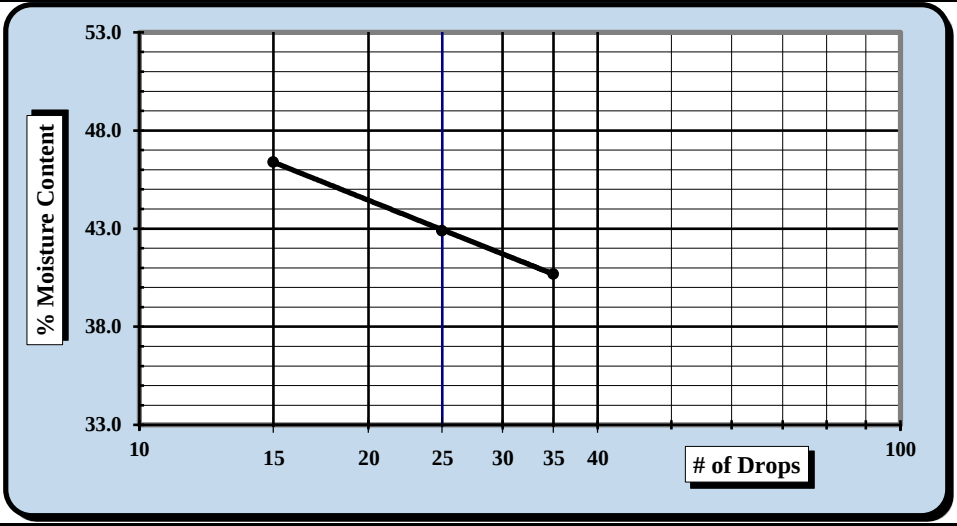
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	5/04/18
Project Name:	Carolina Crossroads Project	Test Date:	5/03/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-32	Sample #:	SS-4	Sample Date:	3/13/18
Location:	Bridge Boring	Type:	Split-spoon	Depth:	6.0' - 8.0'
Sample Description:	Silt with Sand (ML, A-7-5(8))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	11	12	13				14	15	
A	Tare Weight	26.68	26.65	26.77				26.65	27.59	
B	Wet Soil Weight + A	43.84	43.03	42.81				32.78	35.10	
C	Dry Soil Weight + A	38.88	38.11	37.73				31.29	33.30	
D	Water Weight (B-C)	4.96	4.92	5.08				1.49	1.80	
E	Dry Soil Weight (C-A)	12.20	11.46	10.96				4.64	5.71	
F	% Moisture (D/E)*100	40.7%	42.9%	46.4%				32.1%	31.5%	
N	# OF DROPS	35	25	15				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**31.8%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**43**
Plastic Limit	**32**
Plastic Index	**11**
Group Symbol	**ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	5/04/18	Matthew F. Cooke, P.G.	5/04/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

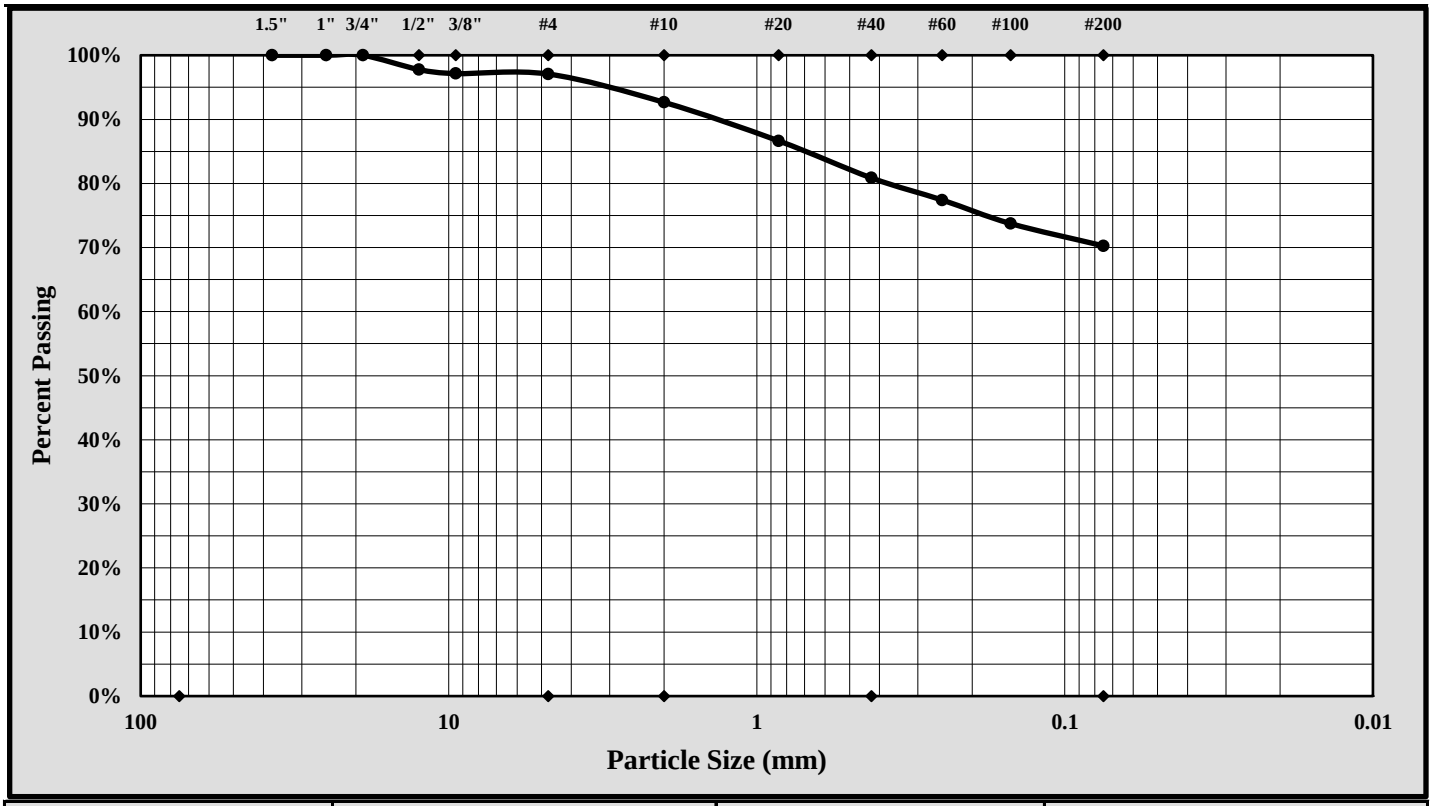
This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	5/04/18
Project Name:	Carolina Crossroads Project	Test Date(s):	5/02 - 5/04/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-32 Sample #: SS-4	Sample Date:	3/13/18
Location:	Bridge Boring Type: Split-spoon	Depth:	6.0' - 8.0'
Sample Description:	Silt with Sand (ML, A-7-5(8))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	19.0 mm	Gravel:	2.9%
Silt & Clay (% Passing #200):	70.3%	Total Sand:	26.8%

Liquid Limit	43	Plastic Limit	32	Plastic Index	11
Coarse Sand:	4.4%	Medium Sand:	11.8%	Fine Sand:	10.6%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
5/04/18 — *Date*

This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

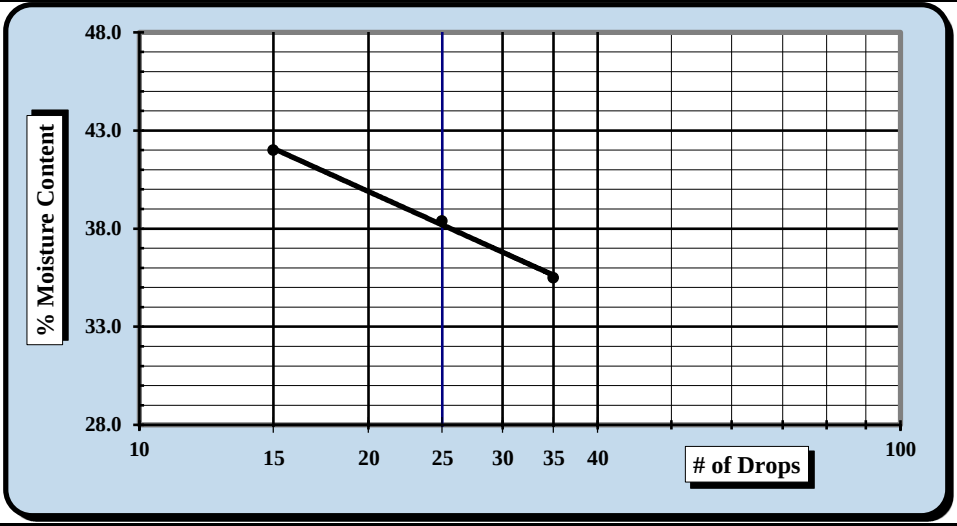
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	4/27/18
Project Name:	Carolina Crossroads Project	Test Date:	4/24/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-33	Sample #:	SS-1	Sample Date:	3/08/18
Location:	Bridge Boring	Type:	Split-spoon	Depth:	0.0' - 2.0'
Sample Description:	Lean Clay with Sand (CL, A-6(14))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	31	32	33				34	35	
A	Tare Weight	28.59	27.65	26.68				28.25	26.95	
B	Wet Soil Weight + A	41.38	43.63	42.22				34.37	34.44	
C	Dry Soil Weight + A	38.03	39.20	37.62				33.45	33.31	
D	Water Weight (B-C)	3.35	4.43	4.60				0.92	1.13	
E	Dry Soil Weight (C-A)	9.44	11.55	10.94				5.20	6.36	
F	% Moisture (D/E)*100	35.5%	38.4%	42.0%				17.7%	17.8%	
N	# OF DROPS	35	25	15				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**17.8%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**38**
Plastic Limit	**18**
Plastic Index	**20**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	4/27/18	Matthew F. Cooke, P.G.	4/27/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

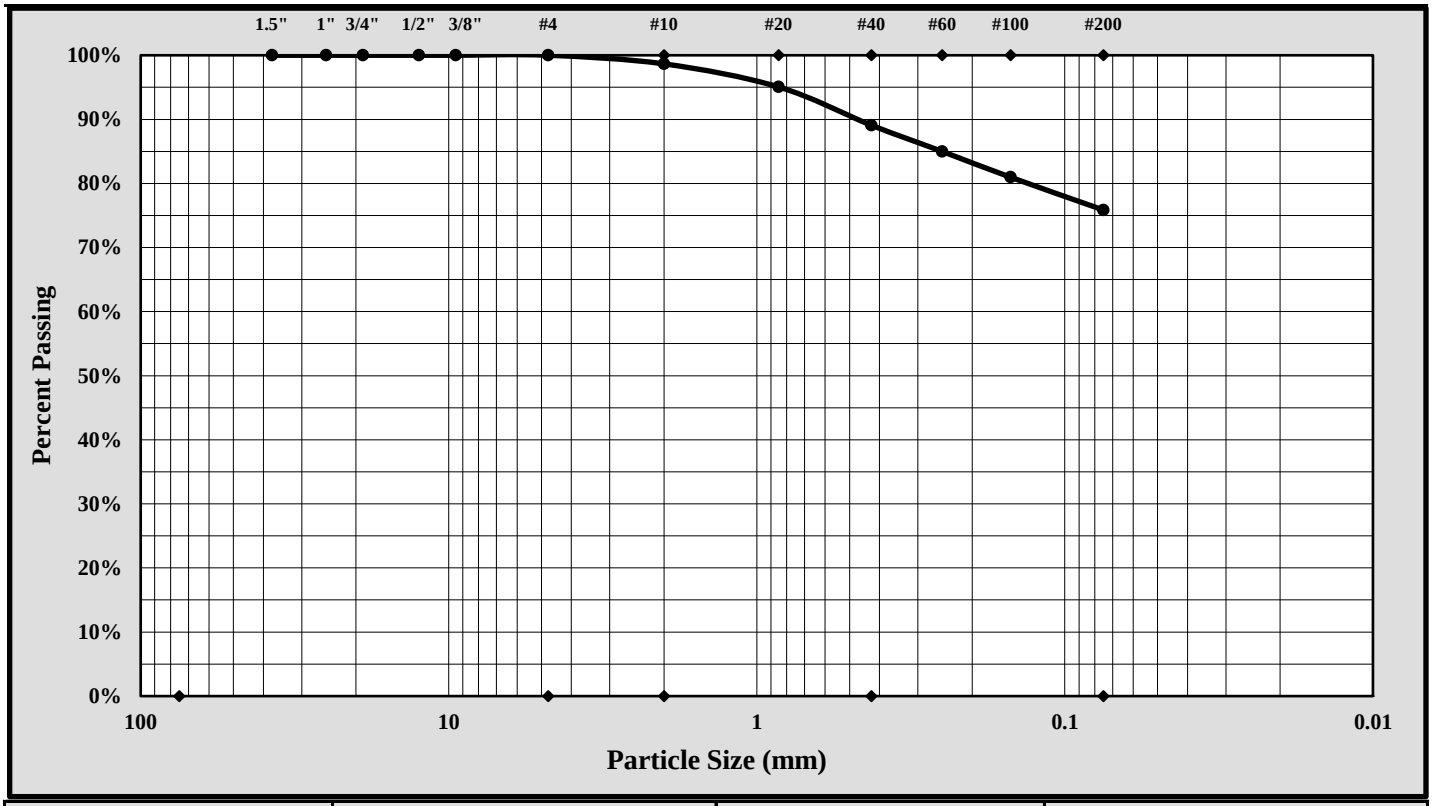
This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	4/27/18
Project Name:	Carolina Crossroads Project	Test Date(s):	4/15 - 4/26/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-33	Sample #: SS-1	Sample Date: 3/08/18
Location:	Bridge Boring	Type: Split-spoon	Depth: 0.0' - 2.0'
Sample Description:	Lean Clay with Sand (CL, A-6(14))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	4.75 mm	Gravel:	0.0%
Silt & Clay (% Passing #200):	75.9%	Total Sand:	24.1%

Liquid Limit	38	Plastic Limit	18	Plastic Index	20
Coarse Sand:	1.3%	Medium Sand:	9.6%	Fine Sand:	13.2%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/27/18 — *Date*

This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

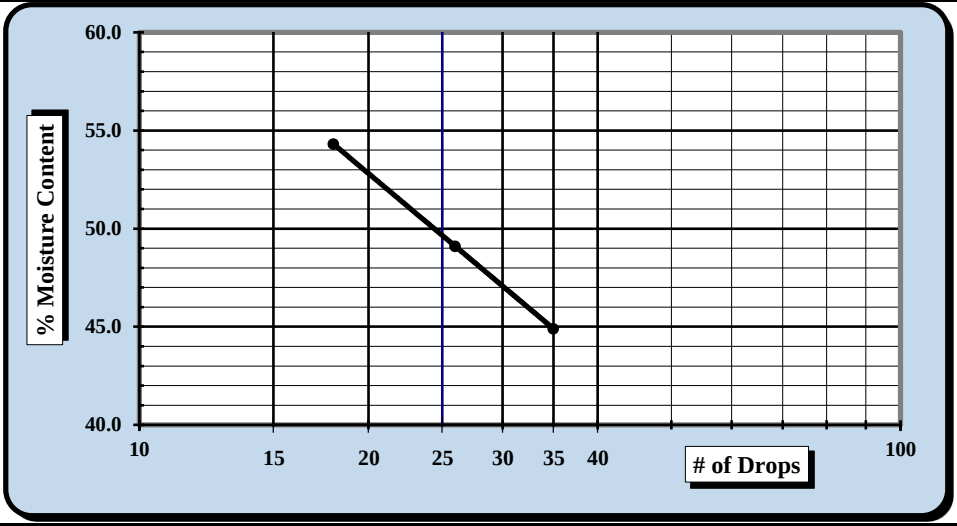
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	4/27/18
Project Name:	Carolina Crossroads Project	Test Date:	4/24/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-33	Sample #:	SS-3	Sample Date:	3/08/18
Location:	Bridge Boring	Type:	Split-spoon	Depth:	4.0' - 6.0'
Sample Description:	Sandy Elastic Silt [MH, A-7-6(14)]				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	36	37	38				39	40	
A	Tare Weight	25.68	26.21	26.29				25.88	26.27	
B	Wet Soil Weight + A	40.39	42.19	41.52				32.33	33.02	
C	Dry Soil Weight + A	35.83	36.93	36.16				30.88	31.51	
D	Water Weight (B-C)	4.56	5.26	5.36				1.45	1.51	
E	Dry Soil Weight (C-A)	10.15	10.72	9.87				5.00	5.24	
F	% Moisture (D/E)*100	44.9%	49.1%	54.3%				29.0%	28.8%	
N	# OF DROPS	35	26	18				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**28.9%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**50**
Plastic Limit	**29**
Plastic Index	**21**
Group Symbol	**MH**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	4/27/18	Matthew F. Cooke, P.G.	4/27/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

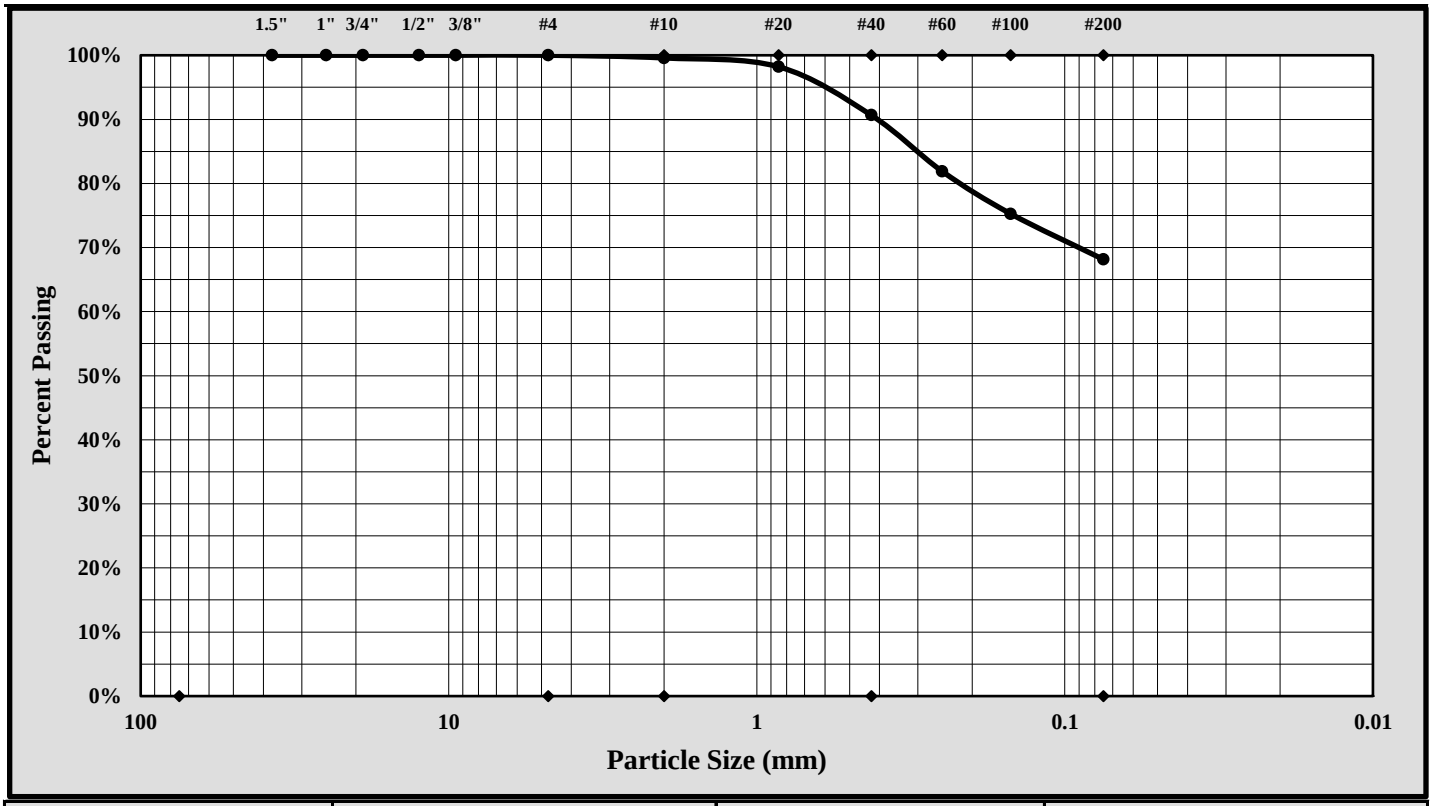
This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	4/27/18
Project Name:	Carolina Crossroads Project	Test Date(s):	4/15 - 4/26/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-33	Sample #: SS-3	Sample Date: 3/08/18
Location:	Bridge Boring	Type: Split-spoon	Depth: 4.0' - 6.0'
Sample Description:	Sandy Elastic Silt (MH, A-7-6(14))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	2.00 mm	Gravel:	0.0%
Silt & Clay (% Passing #200):	68.1%	Total Sand:	31.9%

Liquid Limit	50	Plastic Limit	29	Plastic Index	21
Coarse Sand:	0.4%	Medium Sand:	8.9%	Fine Sand:	22.5%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/27/18 — *Date*

This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

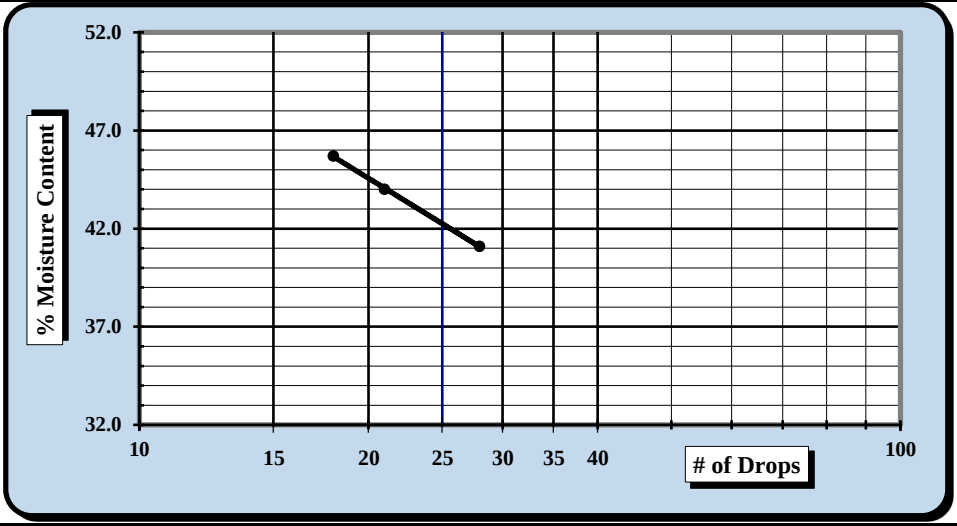
Project #:	1461-16-047.2B	Report Date:	4/27/18
Project Name:	Carolina Crossroads Project	Test Date:	4/24/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-33	Sample #:	SS-5	Sample Date:	3/08/18
Location:	Bridge Boring	Type:	Split-spoon	Depth:	8.0' - 10.0'

Sample Description: Silt (ML, A-7-5(13))

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	41	42	43				44	45	
A	Tare Weight	28.76	28.63	28.37				25.77	25.09	
B	Wet Soil Weight + A	48.60	46.59	45.75				32.20	31.84	
C	Dry Soil Weight + A	42.82	41.10	40.30				30.68	30.22	
D	Water Weight (B-C)	5.78	5.49	5.45				1.52	1.62	
E	Dry Soil Weight (C-A)	14.06	12.47	11.93				4.91	5.13	
F	% Moisture (D/E)*100	41.1%	44.0%	45.7%				31.0%	31.6%	
N	# OF DROPS	28	21	18				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**31.3%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**42**
Plastic Limit	**31**
Plastic Index	**11**
Group Symbol	**ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	4/27/18	Matthew F. Cooke, P.G.	4/27/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

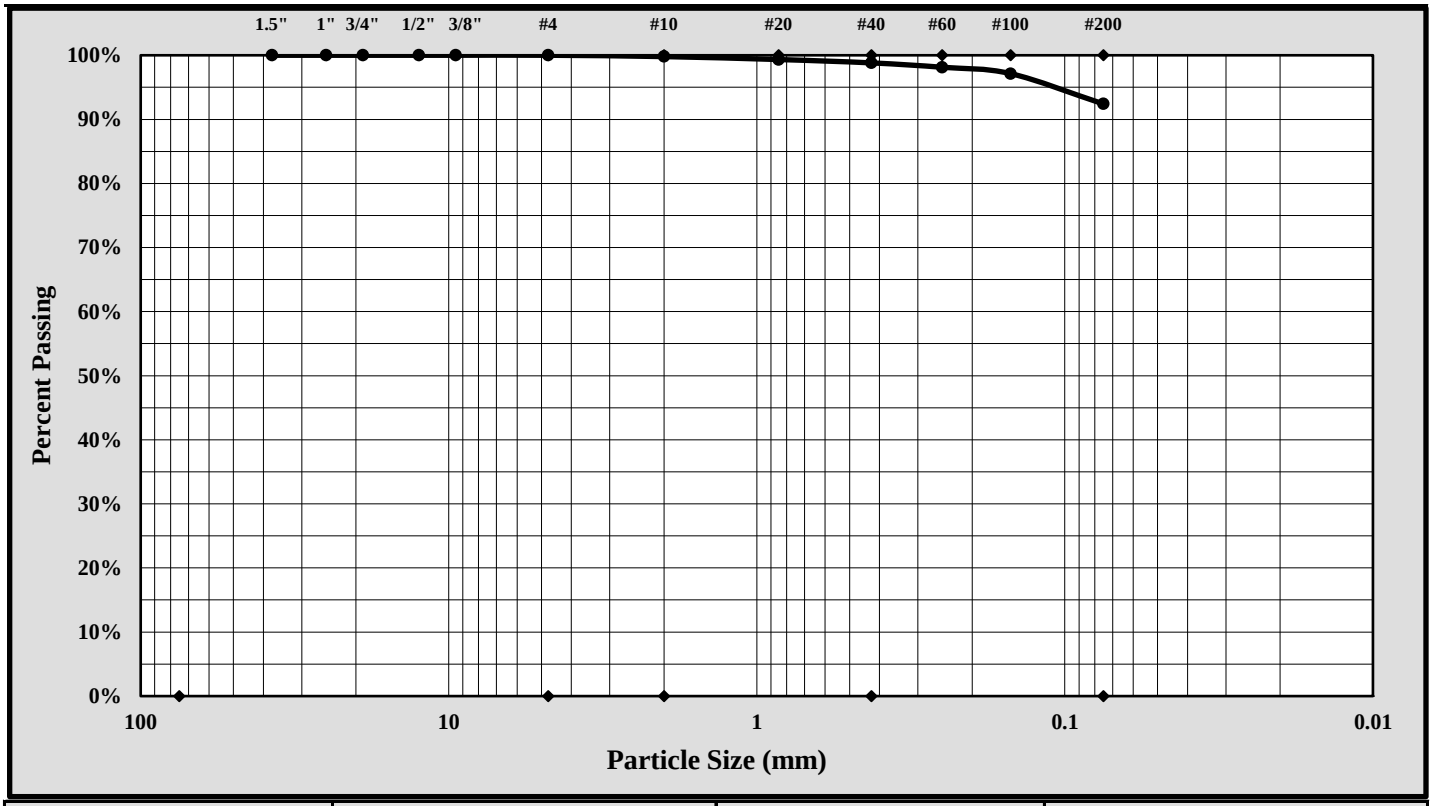
This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	4/27/18
Project Name:	Carolina Crossroads Project	Test Date(s):	4/15 - 4/27/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-33	Sample #: SS-5	Sample Date: 3/08/18
Location:	Bridge Boring	Type: Split-spoon	Depth: 8.0' - 10.0'
Sample Description:	Silt (ML, A-7-5(13))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	0.85 mm	Gravel:	0.0%
Silt & Clay (% Passing #200):	92.4%	Total Sand:	7.6%

Liquid Limit	42	Plastic Limit	31	Plastic Index	11
Coarse Sand:	0.2%	Medium Sand:	1.0%	Fine Sand:	6.4%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/27/18 — *Date*

This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ *AASHTO T 89* ☐ *AASHTO T 90* ☐

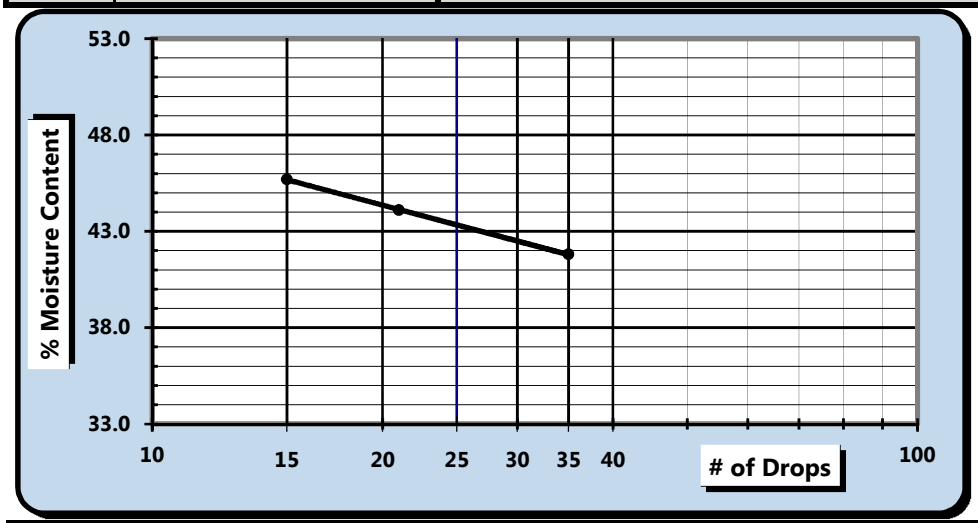
S&ME, Inc. - Spartanburg: 301 Zima Park Drive, Spartanburg, SC 29301

Project #:	1461-16-047.2B	Report Date:	3/15/18
Project Name:	Carolina Crossroads Project	Test Date:	3/14/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-34	Sample #:	SS-2	Sample Date:	2/5/18
Location:	Bridge Boring	Type:	Split-spoon	Depth:	3.0' - 5.0'
Sample Description:	Sandy Silt (ML, A-7-6(9))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	7537	1/31/2018	Grooving tool	14185	9/12/2017
LL Apparatus	13859	9/12/2017			
Oven	7313	7/28/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	P-4	P-5	P-6				12	13	
A	Tare Weight	16.62	16.61	15.97				11.16	12.11	
B	Wet Soil Weight + A	35.53	36.43	35.46				18.73	19.42	
C	Dry Soil Weight + A	29.96	30.36	29.35				17.11	17.87	
D	Water Weight (B-C)	5.57	6.07	6.11				1.62	1.55	
E	Dry Soil Weight (C-A)	13.34	13.75	13.38				5.95	5.76	
F	% Moisture (D/E)*100	41.8%	44.1%	45.7%				27.2%	26.9%	
N	# OF DROPS	35	21	15				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							27.1%		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**43**
Plastic Limit	**27**
Plastic Index	**16**
Group Symbol	**ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Matt Jacobs	NICET 118202	Matthew F. Cooke, P.G.	3/15/18
Technician Name	*Certification#*	*Technical Responsibility*	*Date*

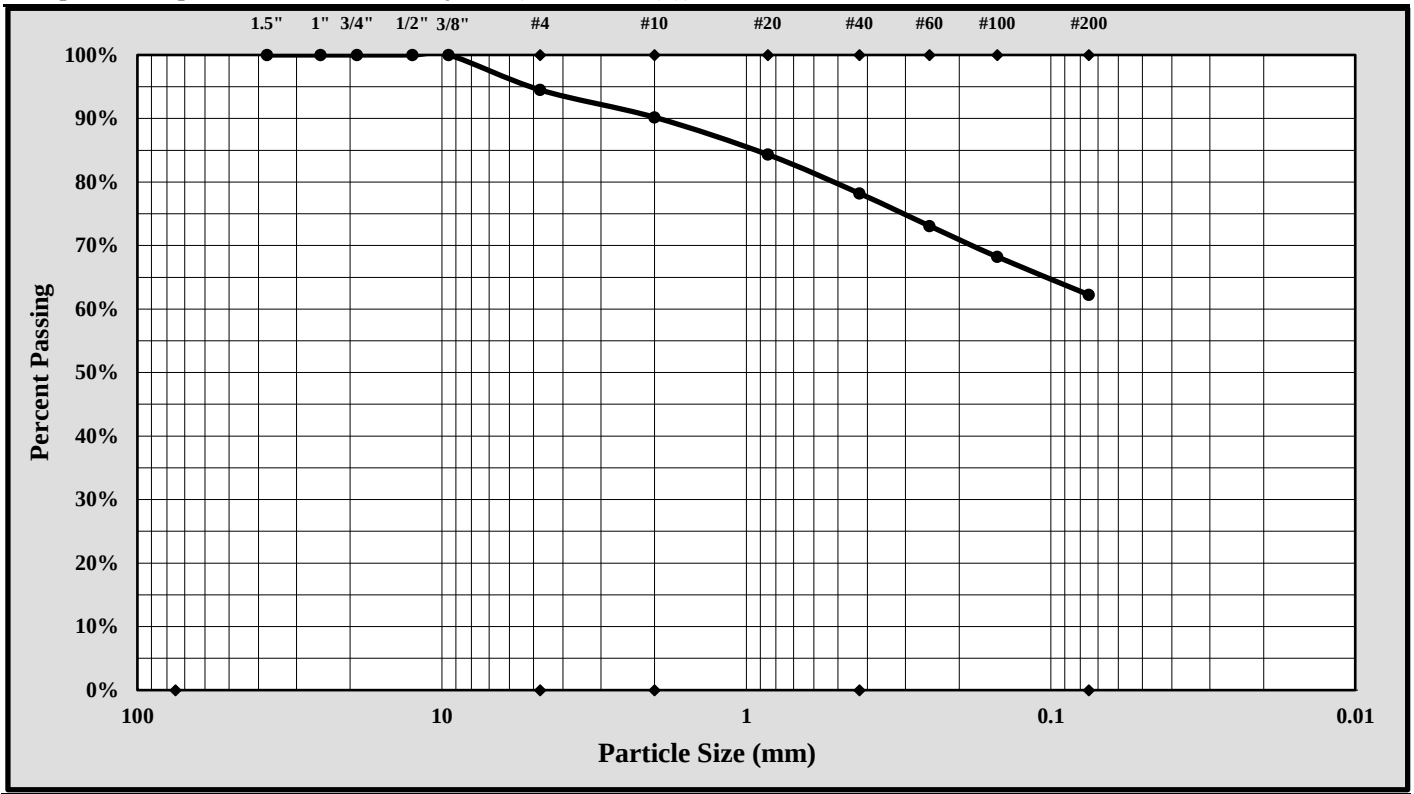
This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. - Spartanburg 301 Zima Park Dr. Spartanburg, SC 29301

S&ME Project #:	1461-16-047.2B	Report Date:	3/15/18
Project Name:	Carolina Crossroads Project	Test Date(s):	2/20 - 2/23/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-34	Sample #: SS-2	Sample Date: 2/5/18
Location:	Bridge Boring	Type: Split-spoon	Depth: 3.0' - 5.0'
Sample Description:	Sandy Silt (ML, A-7-6(9))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	9.50 mm	Gravel:	5.5%
Silt & Clay (% Passing #200):	62.2%	Total Sand:	32.2%

Liquid Limit	43	Plastic Limit	27	Plastic Index	16
Coarse Sand:	4.3%	Medium Sand:	12.0%	Fine Sand:	16.0%

Description of Sand and Gravel — Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
3/15/18 — *Date*

This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ *AASHTO T 89* ☐ *AASHTO T 90* ☐

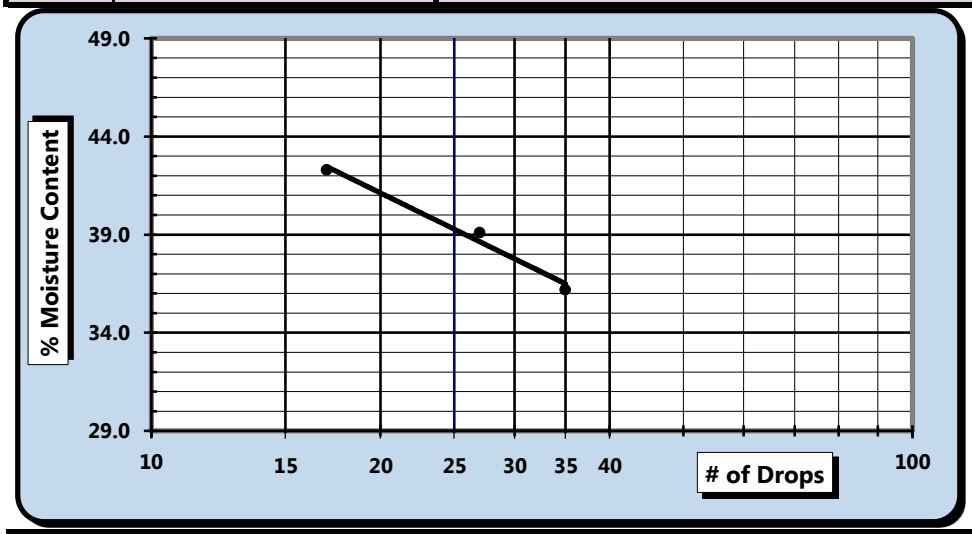
S&ME, Inc. - Spartanburg: 301 Zima Park Drive, Spartanburg, SC 29301

Project #:	1461-16-047.2B	Report Date:	3/15/18
Project Name:	Carolina Crossroads Project	Test Date:	3/14/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-34	Sample #:	SS-5	Sample Date:	2/5/18
Location:	Bridge Boring	Type:	Split-spoon	Depth:	9.0' - 11.0'
Sample Description:	Clayey Sand (SC, A-6(4))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	7537	1/31/2018	Grooving tool	14185	9/12/2017
LL Apparatus	13859	9/12/2017			
Oven	7313	7/28/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	Q-4	Q-5	Q-6				17	18	
A	Tare Weight	16.69	16.84	16.81				12.11	12.12	
B	Wet Soil Weight + A	35.74	36.72	36.48				19.44	19.20	
C	Dry Soil Weight + A	30.68	31.13	30.63				18.31	18.10	
D	Water Weight (B-C)	5.06	5.59	5.85				1.13	1.10	
E	Dry Soil Weight (C-A)	13.99	14.29	13.82				6.20	5.98	
F	% Moisture (D/E)*100	36.2%	39.1%	42.3%				18.2%	18.4%	
N	# OF DROPS	35	27	17				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							18.3%		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**39**
Plastic Limit	**18**
Plastic Index	**21**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Matt Jacobs	NICET 118202	Matthew F. Cooke, P.G.	3/15/18
Technician Name	*Certification#*	*Technical Responsibility*	*Date*

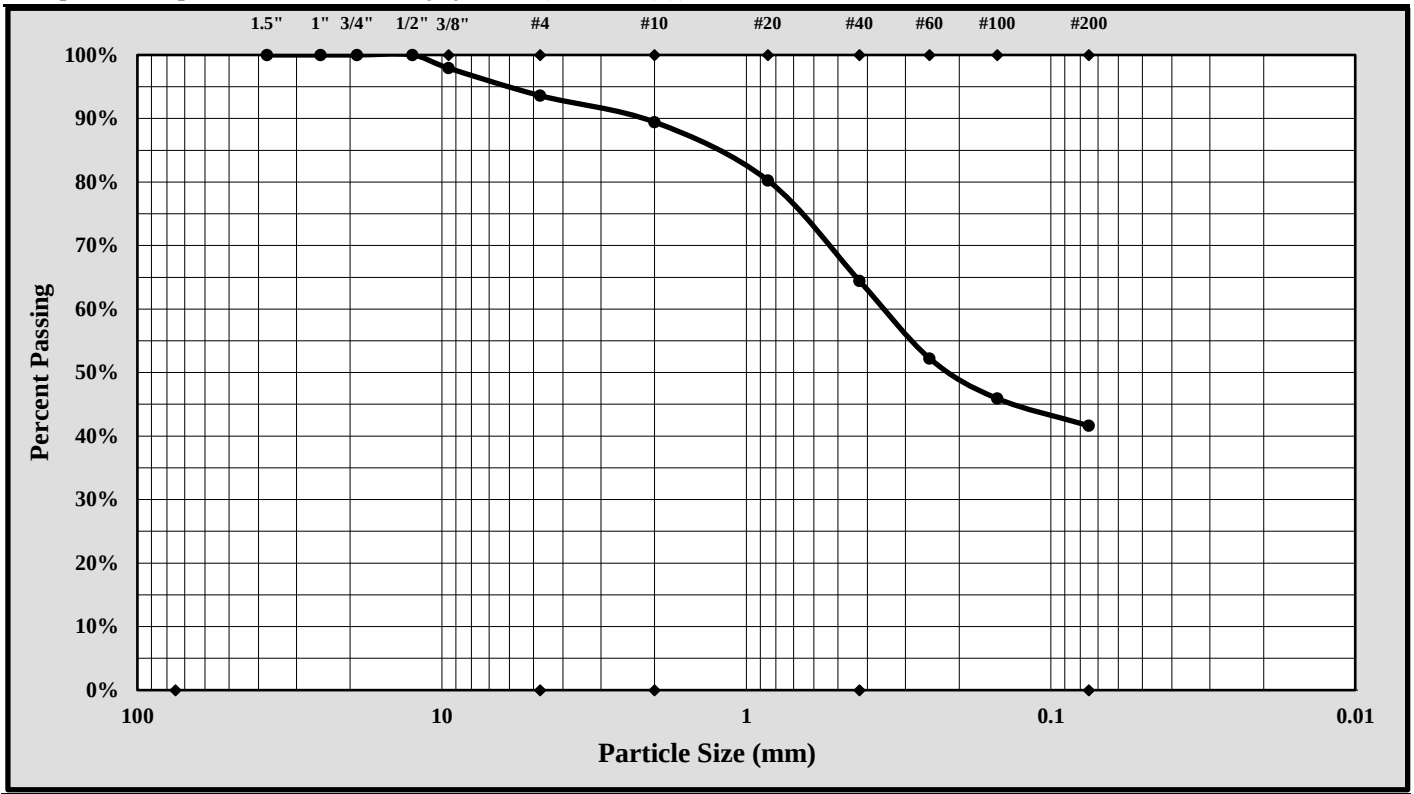
This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. - Spartanburg 301 Zima Park Dr. Spartanburg, SC 29301

S&ME Project #:	1461-16-047.2B	Report Date:	3/15/18
Project Name:	Carolina Crossroads Project	Test Date(s):	2/20 - 2/23/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-34	Sample #: SS-5	Sample Date: 2/5/18
Location:	Bridge Boring	Type: Split-spoon	Depth: 9.0' - 11.0'
Sample Description:	Clayey Sand (SC, A-6(4))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	12.50 mm	Gravel:	6.4%
Silt & Clay (% Passing #200):	41.6%	Total Sand:	52.0%

Liquid Limit	39	Plastic Limit	18	Plastic Index	21
Coarse Sand:	4.2%	Medium Sand:	25.0%	Fine Sand:	22.8%

Description of Sand and Gravel — Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
3/15/18 — *Date*

This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ *AASHTO T 89* ☐ *AASHTO T 90* ☐

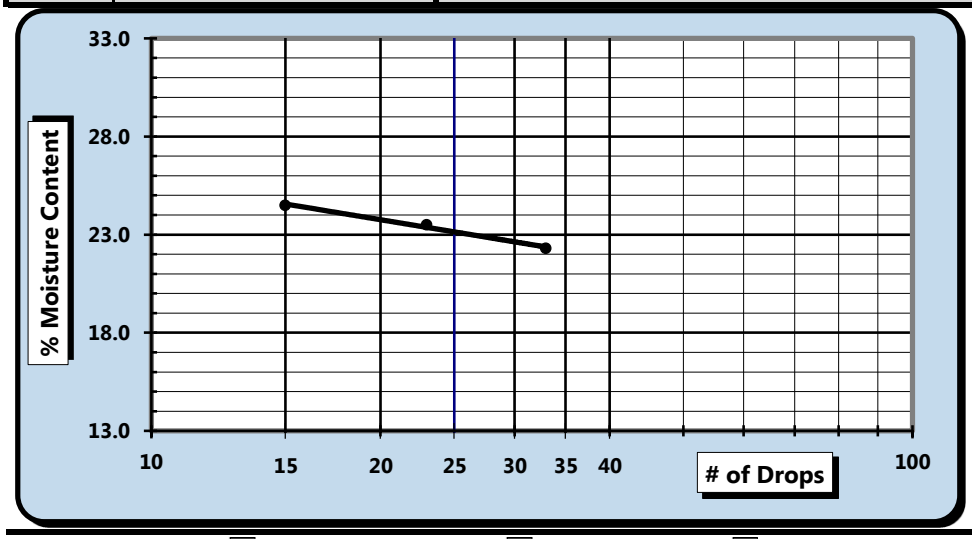
S&ME, Inc. - Spartanburg: 301 Zima Park Drive, Spartanburg, SC 29301

Project #:	1461-16-047.2B	Report Date:	3/15/18
Project Name:	Carolina Crossroads Project	Test Date:	3/14/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-34	Sample #:	SS-10	Sample Date:	2/5/18
Location:	Bridge Boring	Type:	Split-spoon	Depth:	33.5' - 35.0'
Sample Description:	Sandy Silty Clay (CL-ML, A-4(2))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	7537	1/31/2018	Grooving tool	14185	9/12/2017
LL Apparatus	13859	9/12/2017			
Oven	7313	7/28/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	Y-4	Y-5	Y-6				20	21	
A	Tare Weight	16.82	16.74	15.92				12.12	12.07	
B	Wet Soil Weight + A	37.17	38.39	36.70				19.83	19.59	
C	Dry Soil Weight + A	33.46	34.27	32.61				18.76	18.57	
D	Water Weight (B-C)	3.71	4.12	4.09				1.07	1.02	
E	Dry Soil Weight (C-A)	16.64	17.53	16.69				6.64	6.50	
F	% Moisture (D/E)*100	22.3%	23.5%	24.5%				16.1%	15.7%	
N	# OF DROPS	33	23	15				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							15.9%		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**23**
Plastic Limit	**16**
Plastic Index	**7**
Group Symbol	**CL-ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Matt Jacobs	NICET 118202	Matthew F. Cooke, P.G.	3/15/18
Technician Name	*Certification#*	*Technical Responsibility*	*Date*

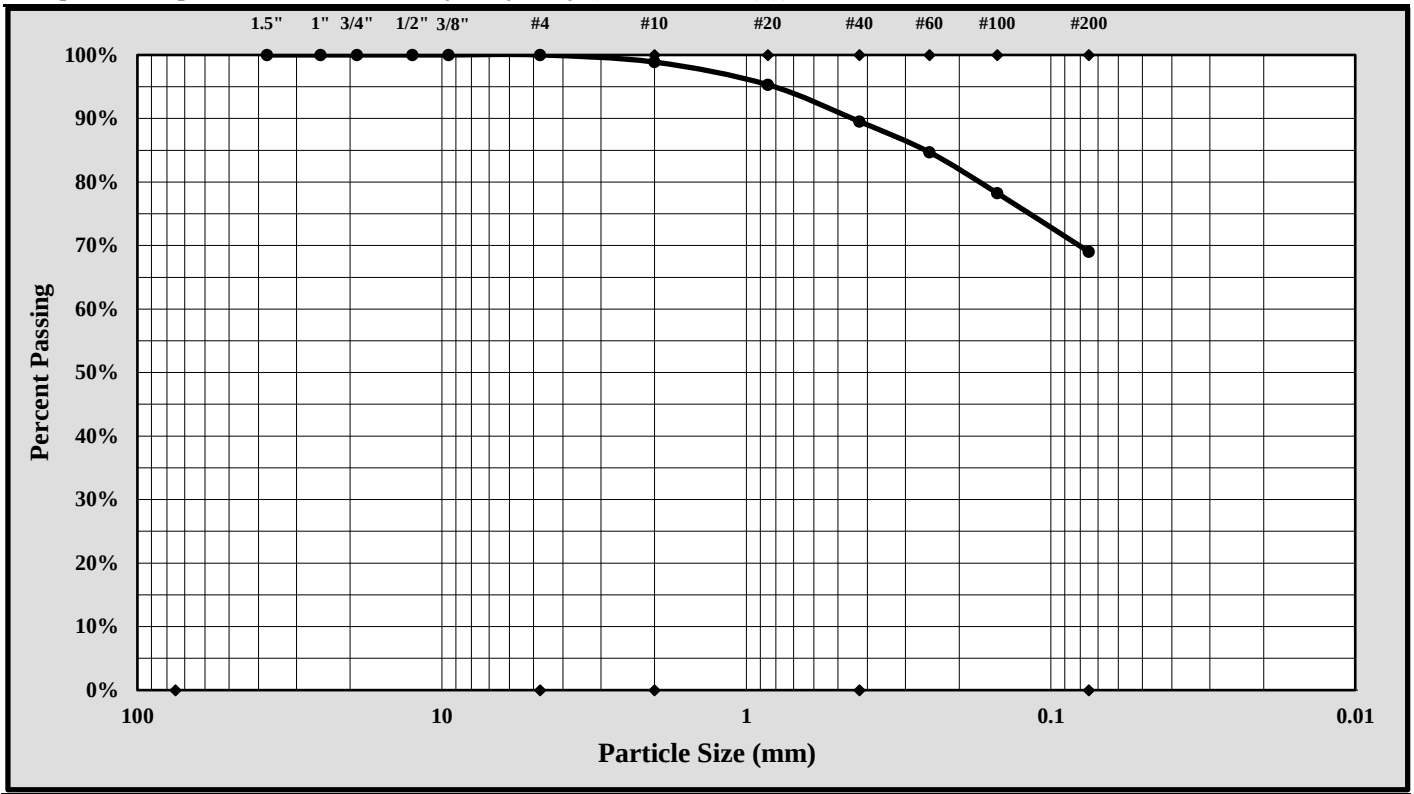
This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. - Spartanburg 301 Zima Park Dr. Spartanburg, SC 29301

S&ME Project #:	1461-16-047.2B	Report Date:	3/15/18
Project Name:	Carolina Crossroads Project	Test Date(s):	2/20 - 2/23/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-34	Sample #: SS-10	Sample Date: 2/5/18
Location:	Bridge Boring	Type: Split-spoon	Depth: 33.5' - 35.0'
Sample Description:	Sandy Silty Clay (CL-ML, A-4(2))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	4.75 mm	Gravel:	0.0%
Silt & Clay (% Passing #200):	69.0%	Total Sand:	31.0%

Liquid Limit	23	Plastic Limit	16	Plastic Index	7
Coarse Sand:	1.1%	Medium Sand:	9.4%	Fine Sand:	20.5%

Description of Sand and Gravel — Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
3/15/18 — *Date*

This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ *AASHTO T 89* ☐ *AASHTO T 90* ☐

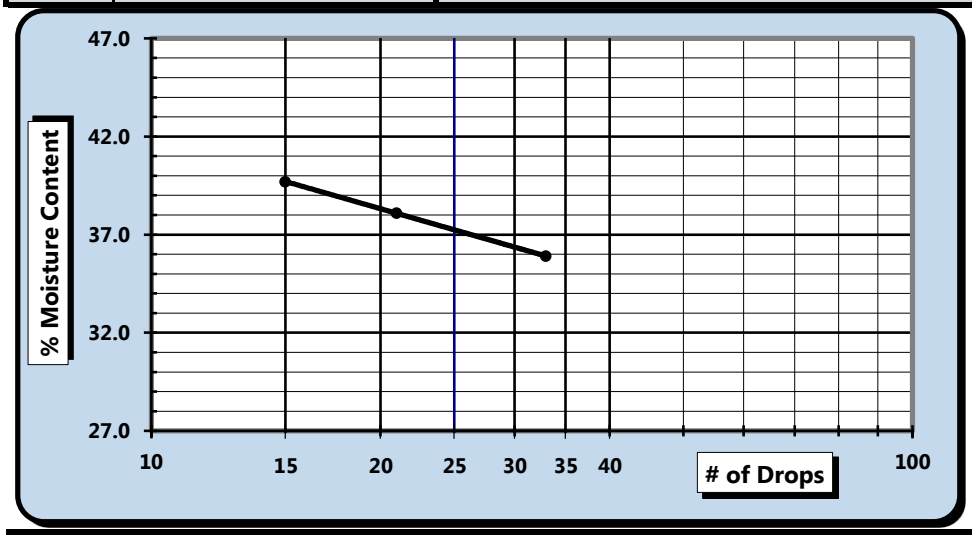
S&ME, Inc. - Spartanburg: 301 Zima Park Drive, Spartanburg, SC 29301

Project #:	1461-16-047.2B	Report Date:	3/16/18
Project Name:	Carolina Crossroads Project	Test Date:	3/15/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-34	Sample #:	SS-11	Sample Date:	2/5/18
Location:	Bridge Boring	Type:	Split-spoon	Depth:	38.5' - 40.0'
Sample Description:	Sandy Lean Clay (CL, A-6(8))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	7537	1/31/2018	Grooving tool	14185	9/12/2017
LL Apparatus	13859	9/12/2017			
Oven	7313	7/28/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	Z-4	Z-5	Z-6				22	23	
A	Tare Weight	15.76	15.57	16.91				11.92	12.07	
B	Wet Soil Weight + A	34.46	34.87	36.12				19.00	19.31	
C	Dry Soil Weight + A	29.52	29.55	30.66				17.68	17.98	
D	Water Weight (B-C)	4.94	5.32	5.46				1.32	1.33	
E	Dry Soil Weight (C-A)	13.76	13.98	13.75				5.76	5.91	
F	% Moisture (D/E)*100	35.9%	38.1%	39.7%				22.9%	22.5%	
N	# OF DROPS	33	21	15				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							22.7%		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**37**
Plastic Limit	**23**
Plastic Index	**14**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Matt Jacobs	NICET 118202	Matthew F. Cooke, P.G.	3/16/18
Technician Name	*Certification#*	*Technical Responsibility*	*Date*

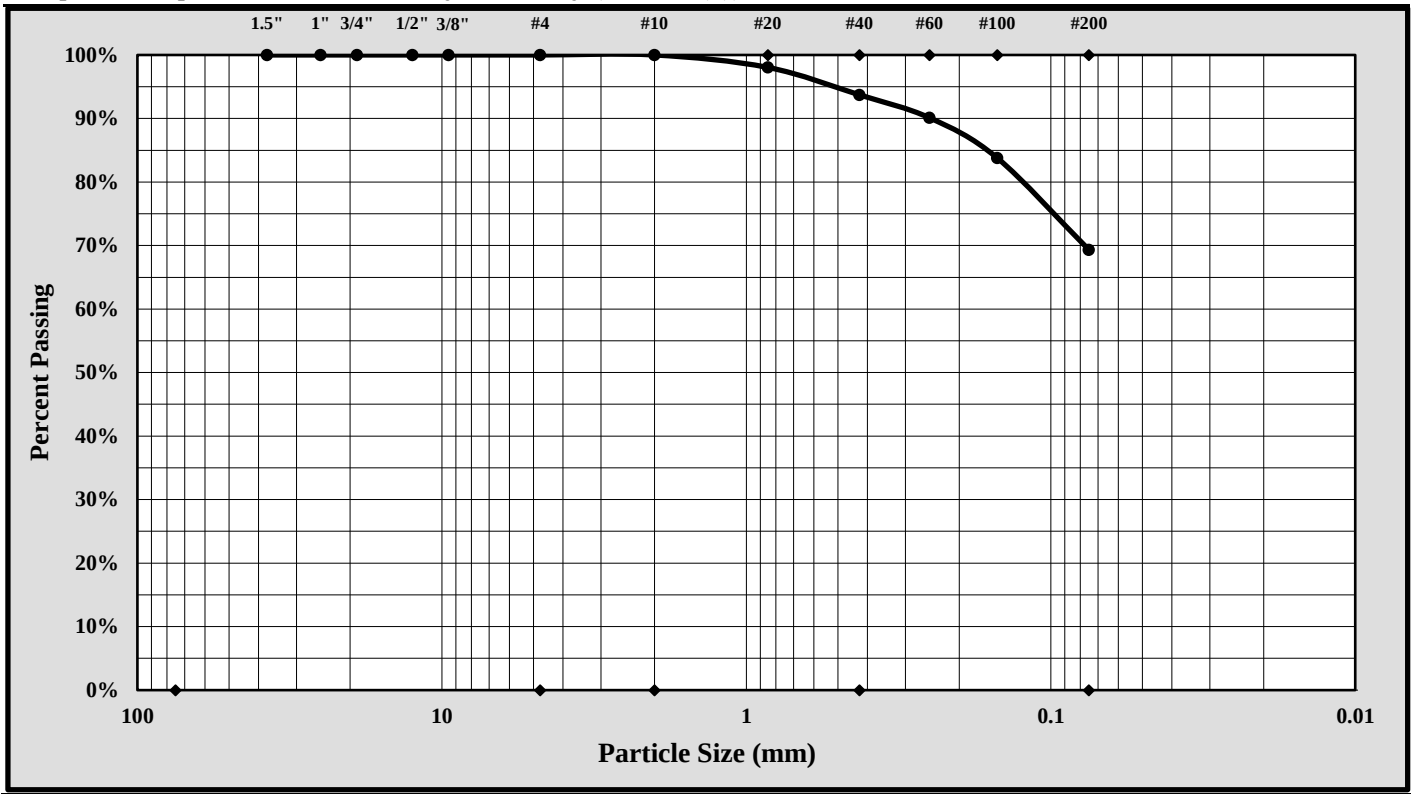
This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. - Spartanburg 301 Zima Park Dr. Spartanburg, SC 29301

S&ME Project #:	1461-16-047.2B	Report Date:	3/16/18
Project Name:	Carolina Crossroads Project	Test Date(s):	2/20 - 2/23/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-34	Sample #: SS-11	Sample Date: 2/5/18
Location:	Bridge Boring	Type: Split-spoon	Depth: 38.5' - 40.0'
Sample Description:	Sandy Lean Clay (CL, A-6(8))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	2.00 mm	Gravel:	0.0%
Silt & Clay (% Passing #200):	69.3%	Total Sand:	30.7%

Liquid Limit	37	Plastic Limit	23	Plastic Index	14
Coarse Sand:	0.0%	Medium Sand:	6.3%	Fine Sand:	24.4%

Description of Sand and Gravel — Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
3/16/18 — *Date*

This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

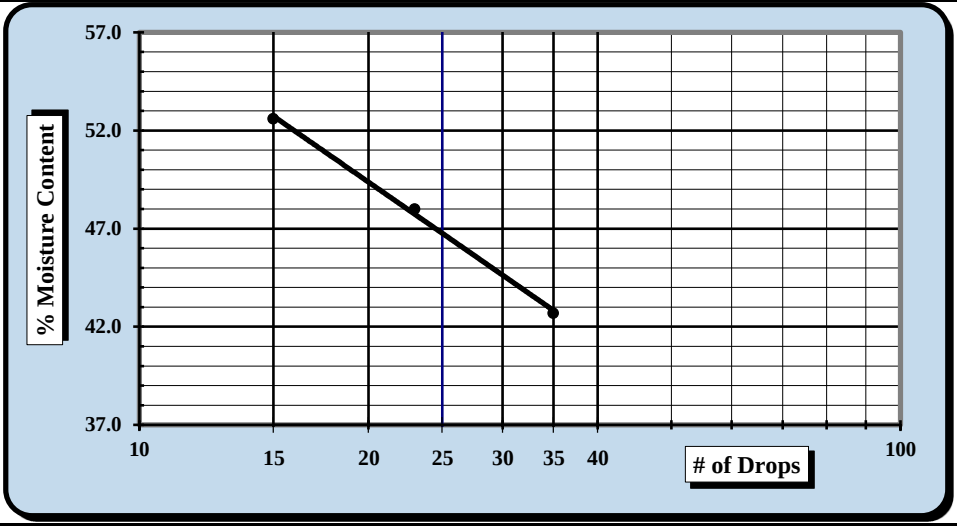
Project #:	1461-16-047.2B	Report Date:	4/27/18
Project Name:	Carolina Crossroads Project	Test Date:	4/24/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-35	Sample #:	SS-1	Sample Date:	3/02/18
Location:	Bridge Boring	Type:	Split-spoon	Depth:	0.0' - 2.0'

Sample Description: Silt with Sand (ML, A-7-6(15))

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	46	47	48				49	50	
A	Tare Weight	27.57	25.82	26.38				28.62	28.88	
B	Wet Soil Weight + A	43.91	42.04	43.56				36.61	36.60	
C	Dry Soil Weight + A	39.02	36.78	37.64				34.84	34.88	
D	Water Weight (B-C)	4.89	5.26	5.92				1.77	1.72	
E	Dry Soil Weight (C-A)	11.45	10.96	11.26				6.22	6.00	
F	% Moisture (D/E)*100	42.7%	48.0%	52.6%				28.5%	28.7%	
N	# OF DROPS	35	23	15				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**28.6%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**47**
Plastic Limit	**29**
Plastic Index	**18**
Group Symbol	**ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	4/27/18	Matthew F. Cooke, P.G.	4/27/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

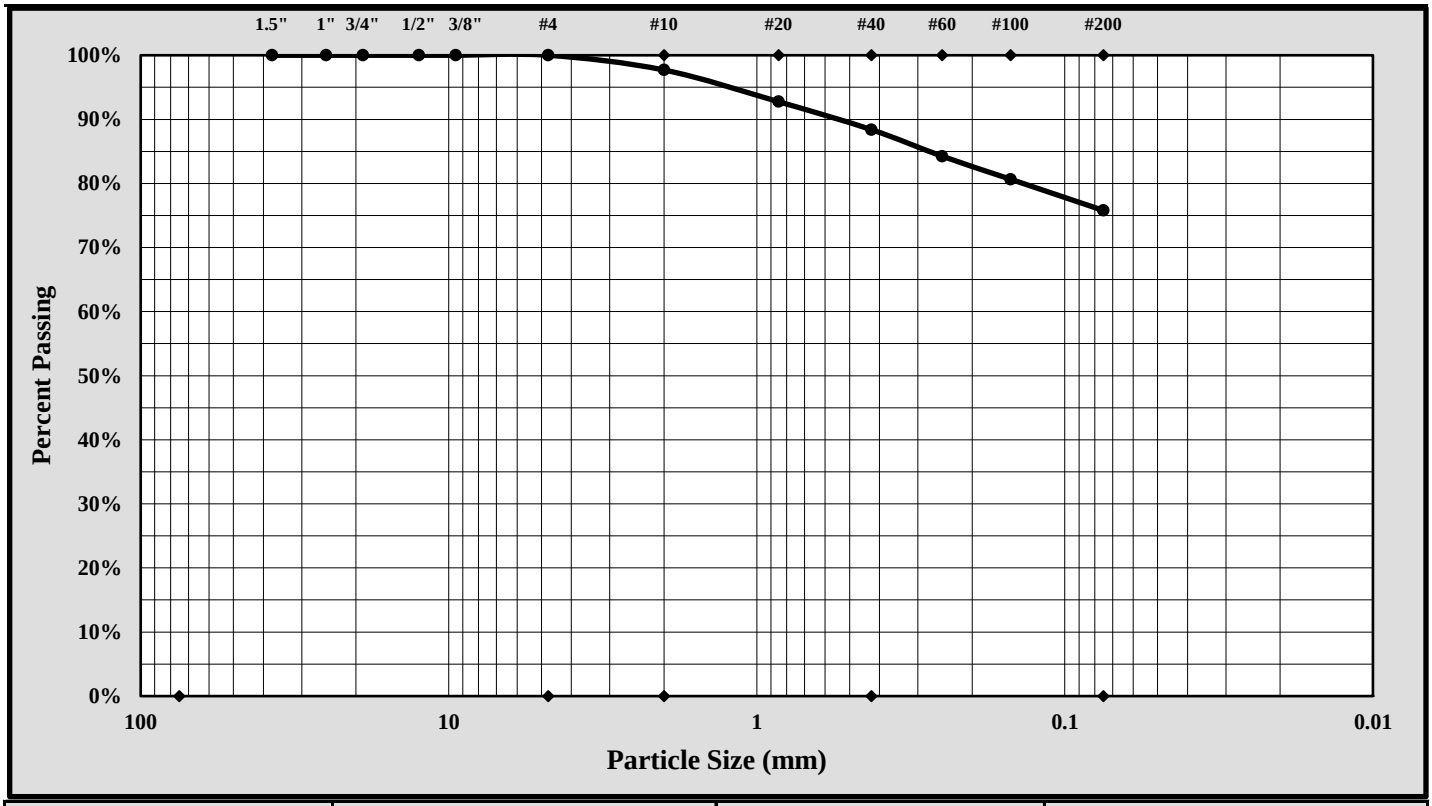
This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	4/27/18
Project Name:	Carolina Crossroads Project	Test Date(s):	4/15 - 4/27/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-35	Sample #: SS-1	Sample Date: 3/02/18
Location:	Bridge Boring	Type: Split-spoon	Depth: 0.0' - 2.0'
Sample Description:	Silt with Sand (ML, A-7-6(15))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	4.75 mm	Gravel:	0.0%
Silt & Clay (% Passing #200):	75.8%	Total Sand:	24.2%

Liquid Limit	47	Plastic Limit	29	Plastic Index	18
Coarse Sand:	2.3%	Medium Sand:	9.3%	Fine Sand:	12.6%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/27/18 — *Date*

This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

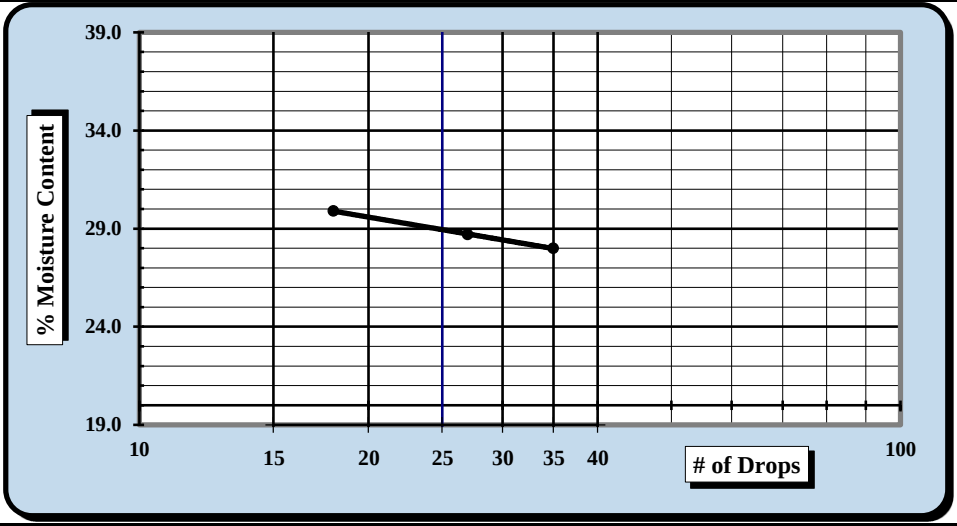
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	4/27/18
Project Name:	Carolina Crossroads Project	Test Date:	4/24/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-35	Sample #:	SS-5	Sample Date:	3/02/18
Location:	Bridge Boring	Type:	Split-spoon	Depth:	8.0' - 10.0'
Sample Description:	Lean Clay with Sand (CL, A-4(5))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	51	52	53				54	55	
A	Tare Weight	28.44	24.97	28.37				27.58	26.02	
B	Wet Soil Weight + A	50.31	46.07	47.78				34.13	34.53	
C	Dry Soil Weight + A	45.52	41.36	43.31				33.05	33.09	
D	Water Weight (B-C)	4.79	4.71	4.47				1.08	1.44	
E	Dry Soil Weight (C-A)	17.08	16.39	14.94				5.47	7.07	
F	% Moisture (D/E)*100	28.0%	28.7%	29.9%				19.7%	20.4%	
N	# OF DROPS	35	27	18				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**20.1%**		



One Point Liquid Limit

N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**29**
Plastic Limit	**20**
Plastic Index	**9**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	4/27/18	Matthew F. Cooke, P.G.	4/27/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

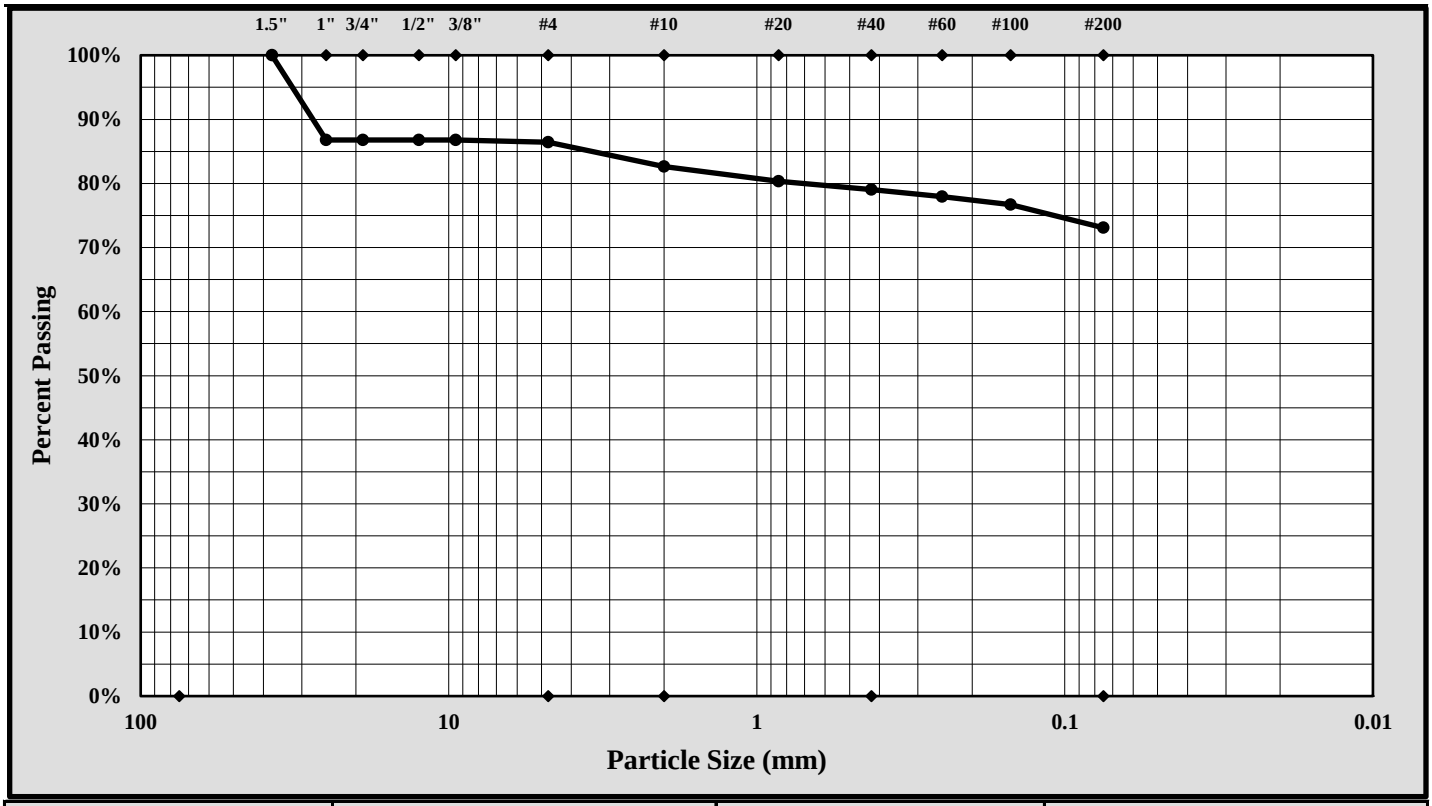
This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	4/27/18
Project Name:	Carolina Crossroads Project	Test Date(s):	4/15 - 4/27/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-35	Sample #: SS-5	Sample Date: 3/02/18
Location:	Bridge Boring	Type: Split-spoon	Depth: 8.0' - 10.0'
Sample Description:	Lean Clay with Sand (CL, A-4(5))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	37.5 mm	Gravel:	13.6%
Silt & Clay (% Passing #200):	73.1%	Total Sand:	13.4%

Liquid Limit	29	Plastic Limit	20	Plastic Index	9
Coarse Sand:	3.8%	Medium Sand:	3.6%	Fine Sand:	5.9%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/27/18 — *Date*

This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

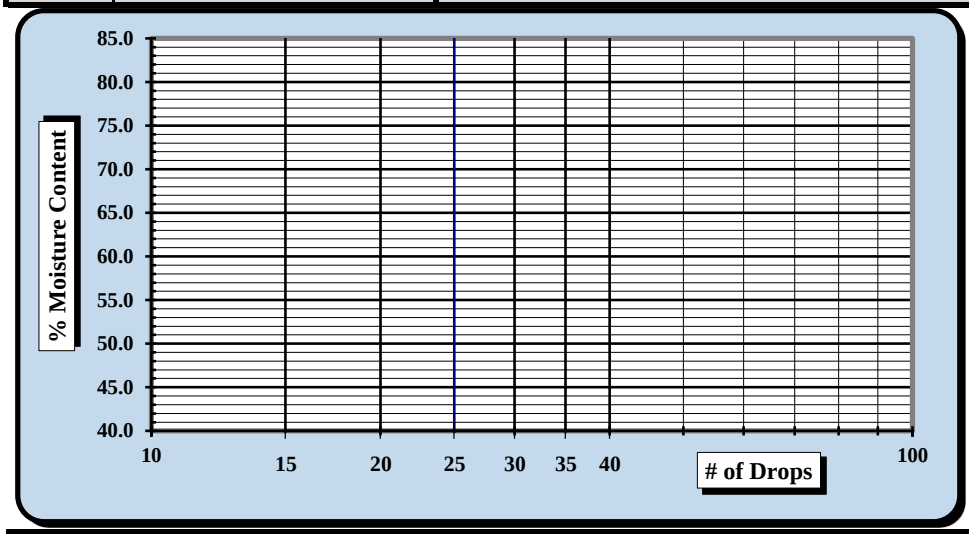
S&ME, Inc. - Atlanta: 4350 River Green Parkway, Suite 200, Duluth, GA 30096

Project #:	1461-16-047.2B	Report Date:	5-4-18
Project Name:	Carolina Crossroads Project	Test Date(s)	4/27-4/28/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-36	Sample #: SS-1		Sample Date: Various	
Location:	Bridge Boring	Offset: N/A		Depth: 0.0' - 2.0'	
Sample Description:	Clayey Sand (SC, A-2-4)				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	25128	3/17/2017	Grooving tool	26551	2/23/2018
LL Apparatus	31336	2/23/2018	Grooving tool		
Oven	31332	2/20/2018	Grooving tool		

Pan # 141		Liquid Limit						Plastic Limit		
	Tare #:	97						98	99	
A	Tare Weight	16.66						16.66	16.67	
B	Wet Soil Weight + A	29.29						25.07	25.00	
C	Dry Soil Weight + A	27.08						24.16	24.06	
D	Water Weight (B-C)	2.21						0.91	0.94	
E	Dry Soil Weight (C-A)	10.42						7.50	7.39	
F	% Moisture (D/E)*100	21.2%						12.1%	12.7%	
N	# OF DROPS	25						*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**12.4%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**21**
Plastic Limit	**12**
Plastic Index	**9**
Group Symbol	**CL**

Multipoint Method ☐
One-point Method ☑

Wet Preparation ☐ Dry Preparation ☐ Air Dried ☑

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

Jimmy Hanson	4/28/2018		5/4/2018
Technician Name	*Date*	*Technical Responsibility*	*Date*

This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Form No: TR-D7928-3
Revision No.: 0
Revision Date: 02/21/17

Particle Size Analysis of Soils

ASTM D6913/D7928

Quality Assurance

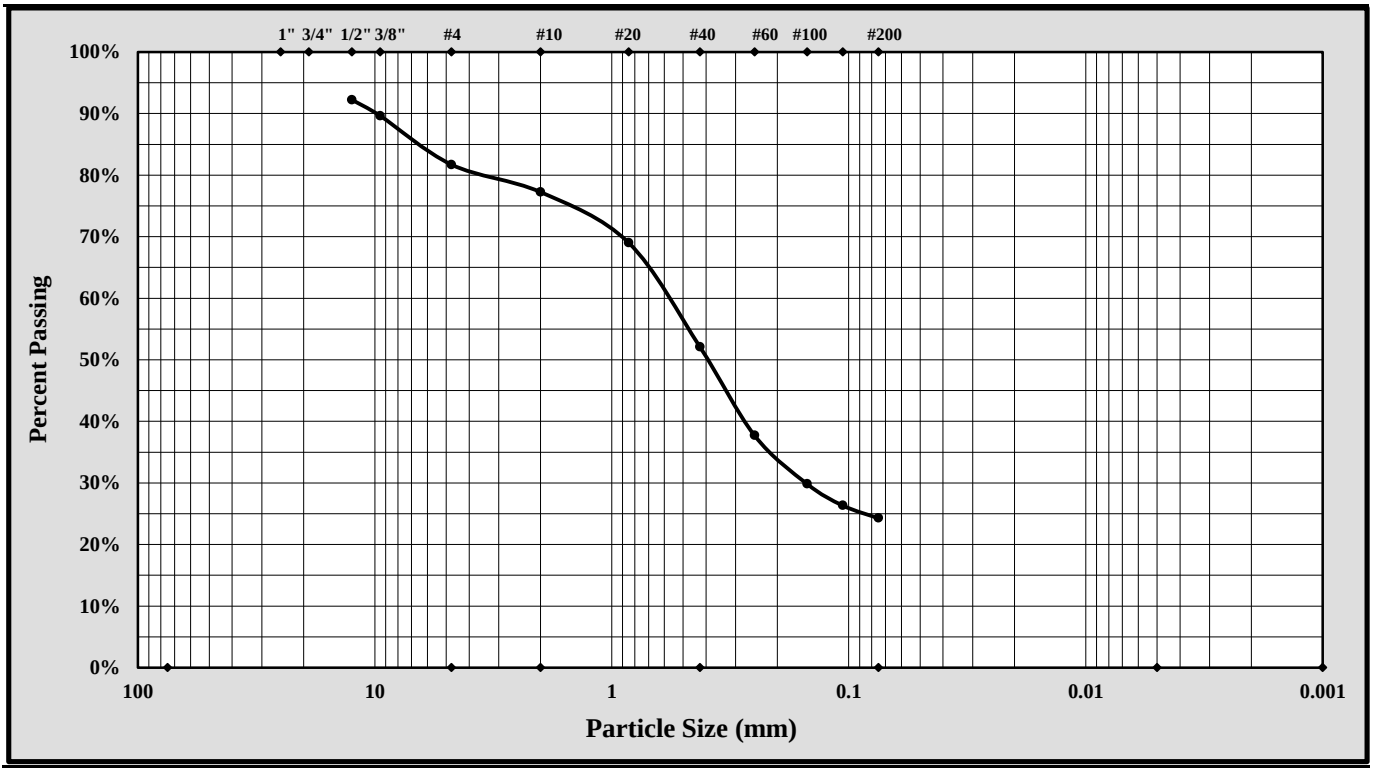
Sample Log No.:

S&ME, Inc., 4350 Rivergreen Parkway, Suite 200, Duluth, GA 30096

S&ME Project #:	1461-16-047.2B	Report Date:	4/23/18
Project Name:	Carolina Crossroads Project	Test Date(s):	4/19-4/20/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		

Sample ID:	B-36	Type:	Split Spoon	Sample Date:	Various
Location:	Bridge Boring	Sample No.:	SS-1	Depth:	0.0' - 2.0'

Sample Description: Clayey Sand (SC, A-2-4)



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:		Gravel:	18.3%
Silt & Clay (% Passing #200):	24.3%	Total Sand:	57.4%
Assumed Specific Gravity:	2.65		

Liquid Limit	21	Plastic Limit	12	Plastic Index	9

$Cc = D_{30}^2/(D_{10} \times D_{60})$ $Cu = D_{60}/D_{10}$

Description of Sand and Gravel	Rounded ☐	Angular ☐	Hard & Durable ☐	Soft ☐	Weathered & Friable ☐
Sample Prep Method: Moist Prep	Dispersion Period:	1 min.	Dispersing Agent:	Sodium Hexametaphosphate:	50 g./ Liter

References / Comments / Deviations:

Nathan Price		Laboratory Group Leader	5/7/2018
Technical Responsibility	*Signature*	*Position*	*Date*

This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

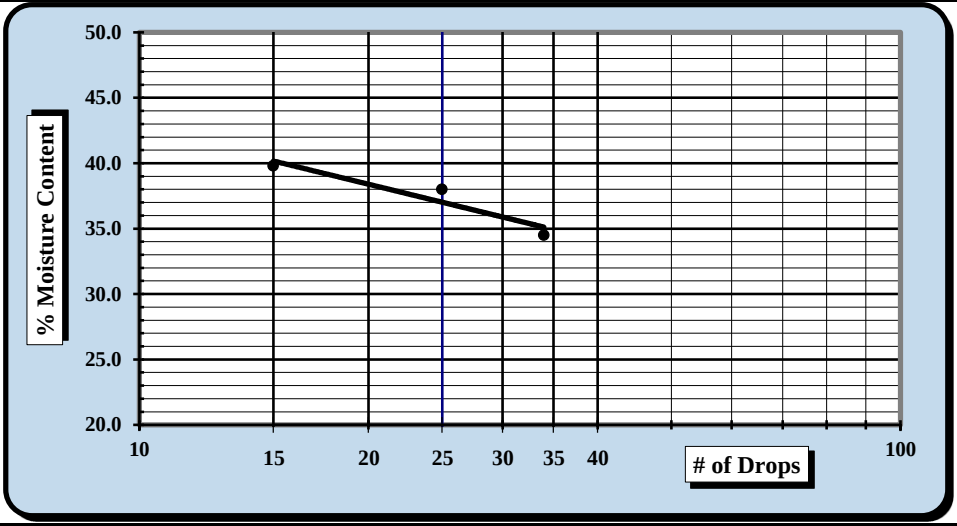
S&ME, Inc. - Atlanta: 4350 River Green Parkway, Suite 200, Duluth, GA 30096

Project #:	1461-16-047.2B	Report Date:	5-4-18
Project Name:	Carolina Crossroads Project	Test Date(s)	4/27-4/28/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-36	Sample #: SS-2		Sample Date: Various	
Location:	Bridge Boring	Offset: N/A		Depth: 2.0' - 4.0'	
Sample Description:	Clayey Sand (SC, A-2-6)				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	25128	3/17/2017	Grooving tool	26551	2/23/2018
LL Apparatus	31336	2/23/2018	Grooving tool		
Oven	31332	2/20/2018	Grooving tool		

		Liquid Limit						Plastic Limit		
Pan #	182									
	Tare #:	67	68	69				70	72	
A	Tare Weight	26.12	29.34	29.07				29.40	26.31	
B	Wet Soil Weight + A	39.31	42.56	42.97				36.64	35.68	
C	Dry Soil Weight + A	35.93	38.92	39.01				35.72	34.50	
D	Water Weight (B-C)	3.38	3.64	3.96				0.92	1.18	
E	Dry Soil Weight (C-A)	9.81	9.58	9.94				6.32	8.19	
F	% Moisture (D/E)*100	34.5%	38.0%	39.8%				14.6%	14.4%	
N	# OF DROPS	34	25	15				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**14.5%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**37**
Plastic Limit	**15**
Plastic Index	**22**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☐ Air Dried ☑

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

Jimmy Hanson	4/28/2018		5/4/2018
Technician Name	*Date*	*Technical Responsibility*	*Date*

This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Form No: TR-D7928-3
Revision No.: 0
Revision Date: 02/21/17

Particle Size Analysis of Soils

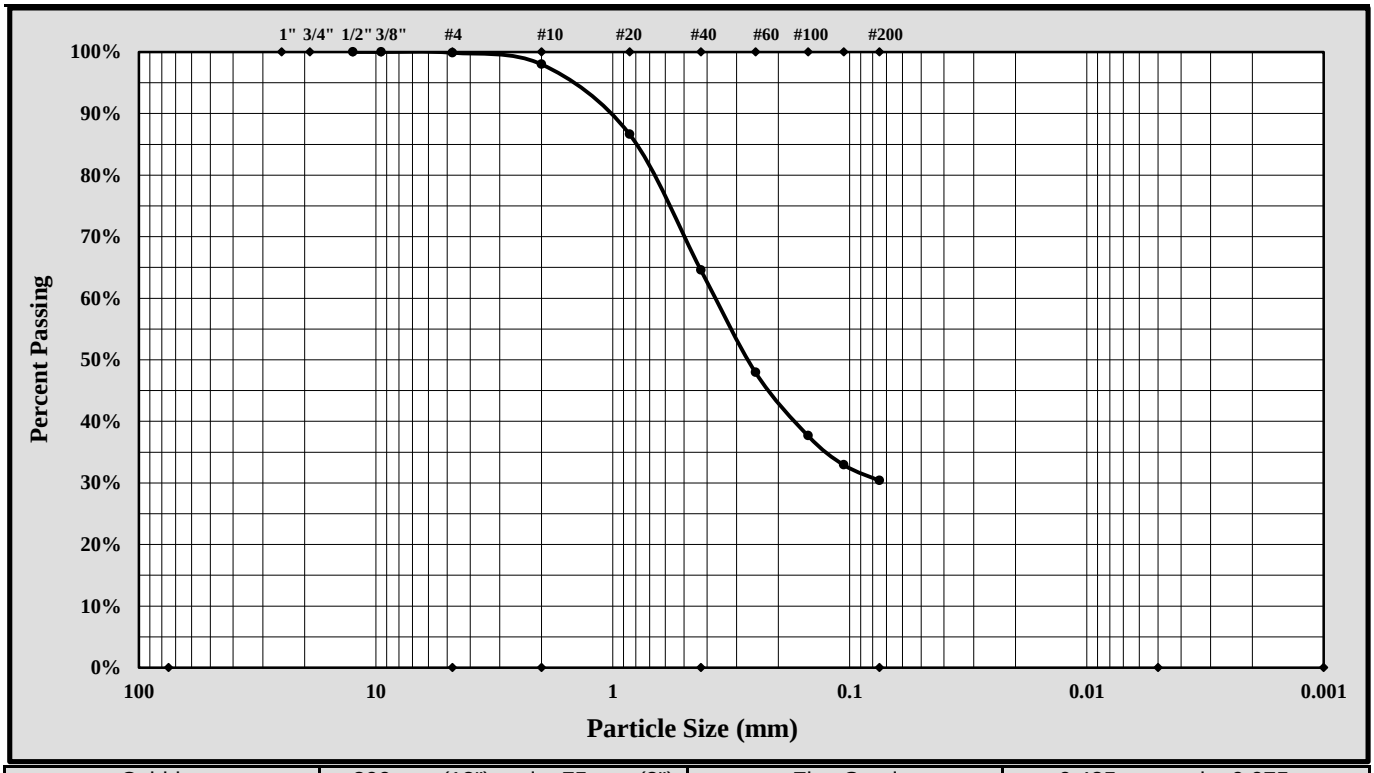
ASTM D6913/D7928

Quality Assurance

Sample Log No.:

S&ME, Inc., 4350 Rivergreen Parkway, Suite 200, Duluth, GA 30096

S&ME Project #:	1461-16-047.2B	Report Date:	4/23/18
Project Name:	Carolina Crossroads Project	Test Date(s):	4/19-4/20/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sample ID:	B-36 Type: Split Spoon	Sample Date:	Various
Location:	Bridge Boring Sample No.: SS-2	Depth:	2.0' - 4.0'
Sample Description:	Clayey Sand (SC, A-2-6)		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:		Gravel:	0.1%
Silt & Clay (% Passing #200):	30.4%	Total Sand:	69.5%
Assumed Specific Gravity:	2.65		
Liquid Limit	37	Plastic Limit	15
		Plastic Index	22

$Cc = D_{30}^2/(D_{10} \times D_{60})$ $Cu = D_{60}/D_{10}$

Description of Sand and Gravel	Rounded ☐	Angular ☐	Hard & Durable ☐	Soft ☐	Weathered & Friable ☐
Sample Prep Method: Moist Prep	Dispersion Period:	1 min.	Dispersing Agent:	Sodium Hexametaphosphate:	50 g./ Liter

References / Comments / Deviations:

Nathan Price		Laboratory Group Leader	5/7/2018
Technical Responsibility	*Signature*	*Position*	*Date*

This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

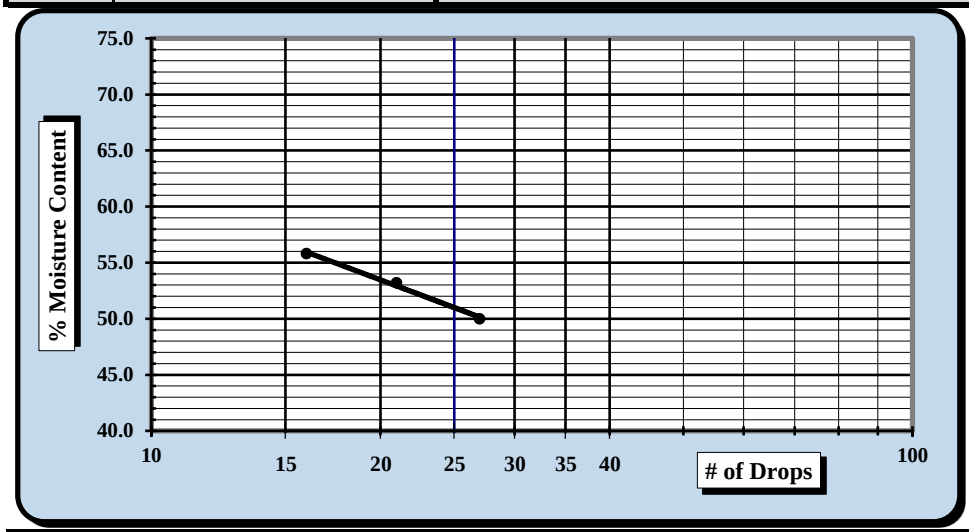
ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Atlanta: 4350 River Green Parkway, Suite 200, Duluth, GA 30096

Project #:	1461-16-047.2B	Report Date:	5-1-2018
Project Name:	Carolina Crossroads Project	Test Date(s)	4/27-4/28/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-36	Sample #: SS-5	Sample Date: Various
Location:	Bridge Boring	Offset: N/A	Depth: 8.0' - 10.0'
Sample Description:	Clayey Sand (SC, A-7-6 (8))		

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	25128	3/17/2017	Grooving tool	26551	2/23/2018
LL Apparatus	31336	2/23/2018	Grooving tool		
Oven	31332	2/20/2018	Grooving tool		

Pan # 372		Liquid Limit						Plastic Limit		
	Tare #:	55	56	57				58	78	
A	Tare Weight	15.74	15.22	15.38				15.14	15.05	
B	Wet Soil Weight + A	25.85	26.79	26.32				22.72	21.57	
C	Dry Soil Weight + A	22.48	22.77	22.40				21.31	20.37	
D	Water Weight (B-C)	3.37	4.02	3.92				1.41	1.20	
E	Dry Soil Weight (C-A)	6.74	7.55	7.02				6.17	5.32	
F	% Moisture (D/E)*100	50.0%	53.2%	55.8%				22.9%	22.6%	
N	# OF DROPS	27	21	16				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**22.8%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**52**
Plastic Limit	**23**
Plastic Index	**29**
Group Symbol	**CH**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☐ Air Dried ☑

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

Jimmy Hanson	4/28/2018		4/30/2018
Technician Name	*Date*	*Technical Responsibility*	*Date*

This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Form No: TR-D7928-3
Revision No.: 0
Revision Date: 02/21/17

Particle Size Analysis of Soils

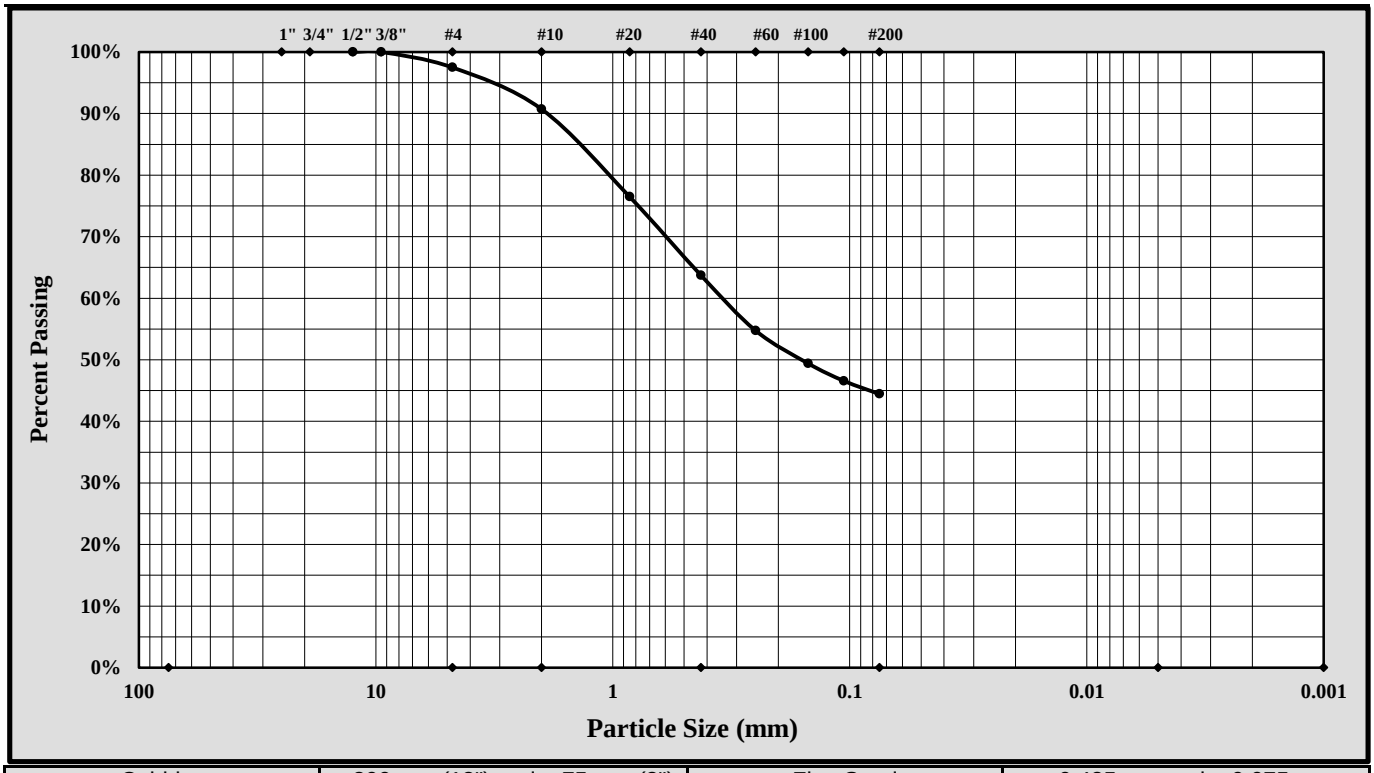
ASTM D6913/D7928

Quality Assurance

Sample Log No.:

S&ME, Inc., 4350 Rivergreen Parkway, Suite 200, Duluth, GA 30096

S&ME Project #:	1461-16-047.2B	Report Date:	4/23/18
Project Name:	Carolina Crossroads Project	Test Date(s):	4/19-4/20/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sample ID:	B-36 Type: Split Spoon	Sample Date:	Various
Location:	Bridge Boring Sample No.: SS-5	Depth:	8.0' - 10.0'
Sample Description:	Clayey Sand (SC, A-7-6 (8))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:		Gravel:	2.5%
Silt & Clay (% Passing #200):	44.5%	Total Sand:	53.0%
Assumed Specific Gravity:	2.65		
Liquid Limit	52	Plastic Limit	23
			Plastic Index 29

$Cc = D_{30}^2/(D_{10} \times D_{60})$ $Cu = D_{60}/D_{10}$

Description of Sand and Gravel: Rounded ☐ Angular ☐ Hard & Durable ☐ Soft ☐ Weathered & Friable ☐

Sample Prep Method: Moist Prep | Dispersion Period: 1 min. | Dispersing Agent: Sodium Hexametaphosphate: 50 g./ Liter

References / Comments / Deviations:

Nathan Price		Laboratory Group Leader	5/7/2018
Technical Responsibility	*Signature*	*Position*	*Date*

This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

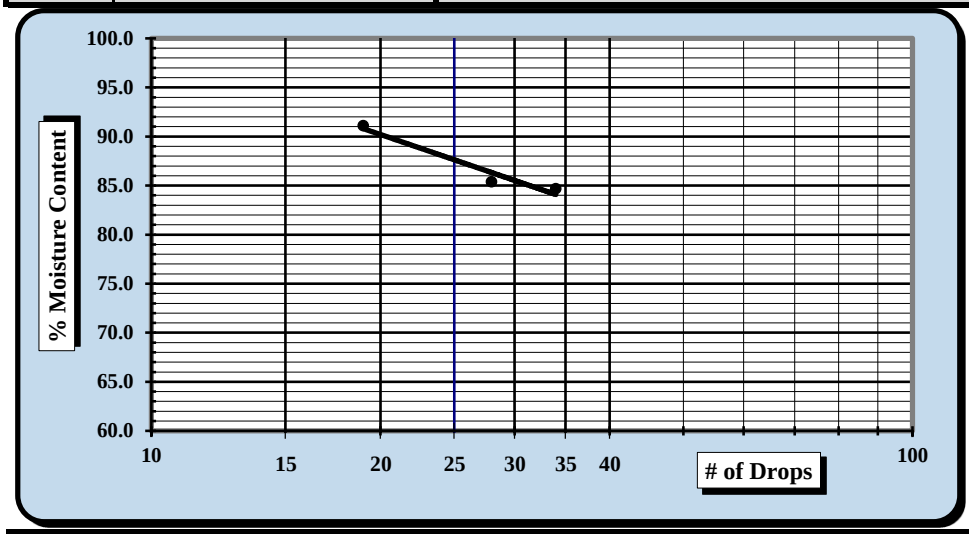
S&ME, Inc. - Atlanta: 4350 River Green Parkway, Suite 200, Duluth, GA 30096

Project #:	1461-16-047.2B	Report Date:	5-4-18
Project Name:	Carolina Crossroads Project	Test Date(s)	4/27-4/28/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-36	Sample #: SS-8		Sample Date: Various	
Location:	Bridge Boring	Offset: N/A		Depth: 23.5' - 25.0'	
Sample Description:	Fat Clay with Sand (CH, A-7-5 (53))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	25128	3/17/2017	Grooving tool	26551	2/23/2018
LL Apparatus	31336	2/23/2018	Grooving tool		
Oven	31332	2/20/2018	Grooving tool		

Pan # 487		Liquid Limit						Plastic Limit		
	Tare #:	20	21	22				23	24	
A	Tare Weight	15.44	15.33	15.43				14.91	15.22	
B	Wet Soil Weight + A	26.32	27.27	27.66				22.02	22.08	
C	Dry Soil Weight + A	21.33	21.77	21.83				20.38	20.52	
D	Water Weight (B-C)	4.99	5.50	5.83				1.64	1.56	
E	Dry Soil Weight (C-A)	5.89	6.44	6.40				5.47	5.30	
F	% Moisture (D/E)*100	84.7%	85.4%	91.1%				30.0%	29.4%	
N	# OF DROPS	34	28	19				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**29.7%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**87**
Plastic Limit	**30**
Plastic Index	**57**
Group Symbol	**CH**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☐ Air Dried ☑

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

Jimmy Hanson	4/28/2018		5/4/2018
Technician Name	*Date*	*Technical Responsibility*	*Date*

This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Form No: TR-D7928-3
Revision No.: 0
Revision Date: 02/21/17

Sample Log No.:

Particle Size Analysis of Soils

ASTM D6913/D7928

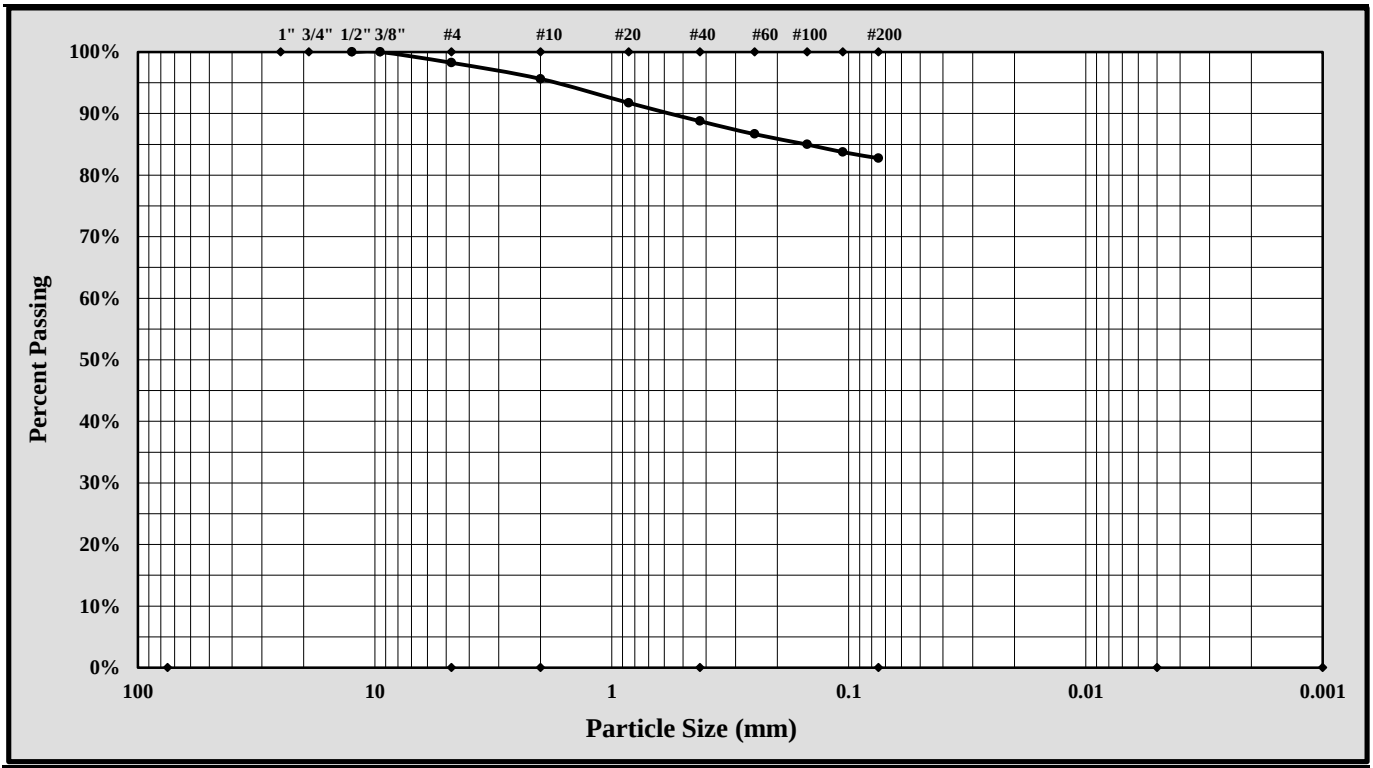
Quality Assurance

S&ME, Inc., 4350 Rivergreen Parkway, Suite 200, Duluth, GA 30096

S&ME Project #:	1461-16-047.2B	Report Date:	4/23/18
Project Name:	Carolina Crossroads Project	Test Date(s):	4/19-4/20/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		

Sample ID:	B-36	Type:	Split Spoon	Sample Date:	Various
Location:	Bridge Boring	Sample No.:	SS-8	Depth:	23.5' - 25.0'

Sample Description: Fat Clay with Sand (CH, A-7-5 (53))



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:		Gravel:	1.7%
Silt & Clay (% Passing #200):	82.8%	Total Sand:	15.5%
Assumed Specific Gravity:	2.65		

Liquid Limit	87	Plastic Limit	30	Plastic Index	57

$Cc = D_{30}^2/(D_{10} \times D_{60})$ $Cu = D_{60}/D_{10}$

Description of Sand and Gravel	Rounded ☐	Angular ☐	Hard & Durable ☐	Soft ☐	Weathered & Friable ☐
Sample Prep Method: Moist Prep	Dispersion Period:	1 min.	Dispersing Agent:	Sodium Hexametaphosphate:	50 g./ Liter

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*

Project Manager — *Position*

6/7/2018 — *Date*

This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

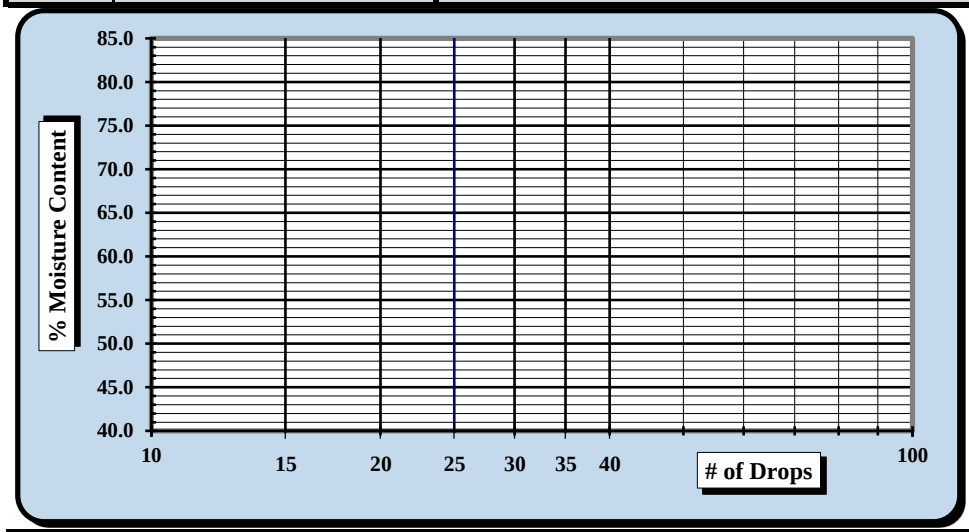
S&ME, Inc. - Atlanta: 4350 River Green Parkway, Suite 200, Duluth, GA 30096

Project #:	1461-16-047.2B	Report Date:	5-4-18
Project Name:	Carolina Crossroads Project	Test Date(s)	4/27-4/28/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-36	Sample #: SS-10		Sample Date: Various	
Location:	Bridge Boring	Offset: N/A		Depth: 33.5' - 35.0'	
Sample Description:	Silt with Sand (ML, A-4 (0))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	25128	3/17/2017	Grooving tool	26551	2/23/2018
LL Apparatus	31336	2/23/2018	Grooving tool		
Oven	31332	2/20/2018	Grooving tool		

Pan # 489		Liquid Limit						Plastic Limit		
	Tare #:	10	11	12				13	14	
A	Tare Weight									
B	Wet Soil Weight + A									
C	Dry Soil Weight + A									
D	Water Weight (B-C)									
E	Dry Soil Weight (C-A)									
F	% Moisture (D/E)*100									
N	# OF DROPS							*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*									



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**NP**
Plastic Limit	**NP**
Plastic Index	**NP**
Group Symbol	**ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☐ Air Dried ☑

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

Jimmy Hanson	4/28/2018		5/4/2018
Technician Name	*Date*	*Technical Responsibility*	*Date*

This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Form No: TR-D7928-3
Revision No.: 0
Revision Date: 02/21/17

Sample Log No.:

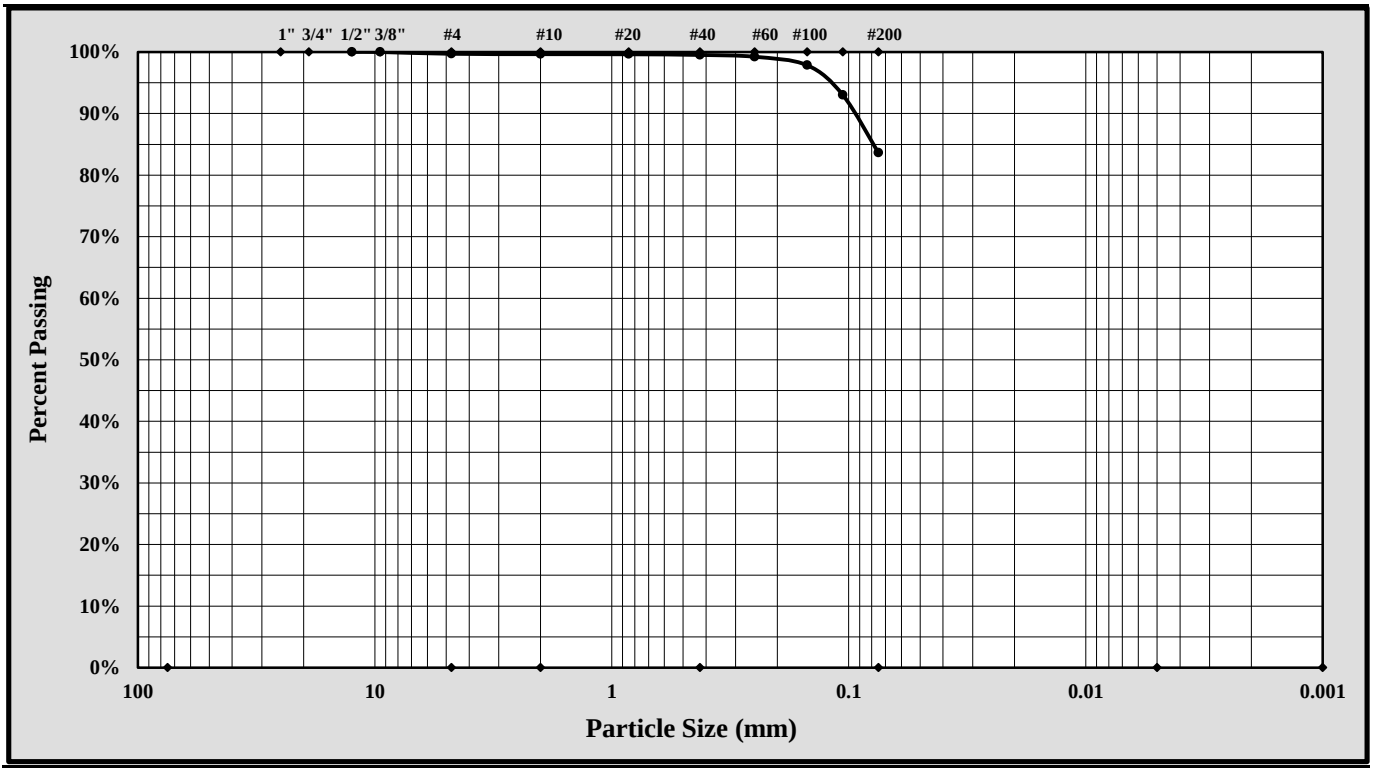
Particle Size Analysis of Soils

ASTM D6913/D7928

Quality Assurance

S&ME, Inc., 4350 Rivergreen Parkway, Suite 200, Duluth, GA 30096

S&ME Project #:	1461-16-047.2B	Report Date:	4/23/18
Project Name:	Carolina Crossroads Project	Test Date(s):	4/19-4/20/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sample ID:	B-36 Type: Split Spoon	Sample Date:	Various
Location:	Bridge Boring Sample No.: SS-10	Depth:	33.5' - 35.0'
Sample Description:	Silt with Sand (ML, A-4 (0))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:		Gravel:	0.3%
Silt & Clay (% Passing #200):	83.6%	Total Sand:	16.1%
Assumed Specific Gravity:	2.65		

Liquid Limit	NP	Plastic Limit	NP	Plastic Index	NP

$Cc = D_{30}^2/(D_{10} \times D_{60})$ $Cu = D_{60}/D_{10}$

Description of Sand and Gravel	Rounded ☐	Angular ☐	Hard & Durable ☐	Soft ☐	Weathered & Friable ☐
Sample Prep Method: Moist Prep	Dispersion Period:	1 min.	Dispersing Agent:	Sodium Hexametaphosphate:	50 g./ Liter

References / Comments / Deviations:

Nathan Price — *Technical Responsibility*

Laboratory Group Leader — *Position*

5/10/2018 — *Date*

This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

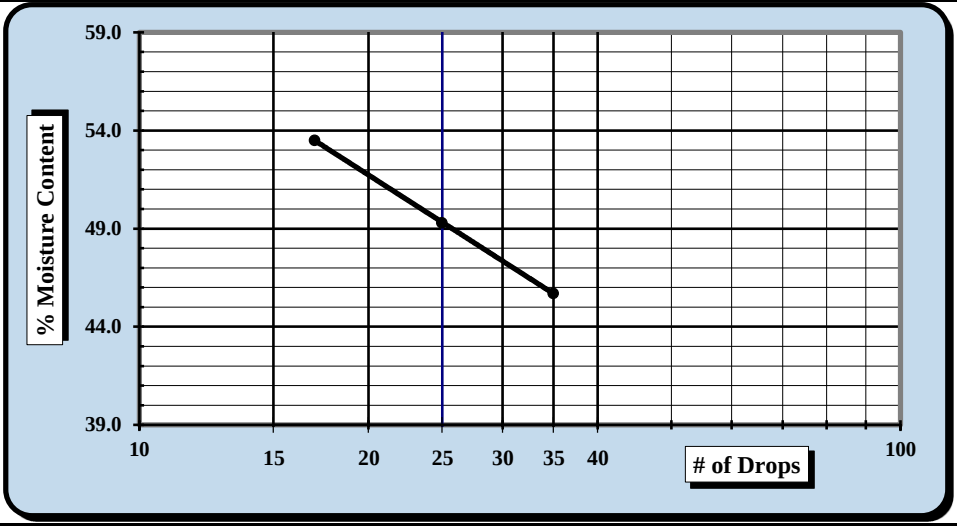
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	4/27/18
Project Name:	Carolina Crossroads Project	Test Date:	4/24/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-37	Sample #:	SS-1	Sample Date:	3/07/18
Location:	Bridge Boring	Type:	Split-spoon	Depth:	0.4' - 2.4'
Sample Description:	Sandy Lean Clay (CL, A-7-6(10))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	56	57	58				59	60	
A	Tare Weight	26.35	29.15	3.74				3.77	3.55	
B	Wet Soil Weight + A	38.88	44.51	19.23				10.95	9.92	
C	Dry Soil Weight + A	34.95	39.44	13.83				9.66	8.78	
D	Water Weight (B-C)	3.93	5.07	5.40				1.29	1.14	
E	Dry Soil Weight (C-A)	8.60	10.29	10.09				5.89	5.23	
F	% Moisture (D/E)*100	45.7%	49.3%	53.5%				21.9%	21.8%	
N	# OF DROPS	35	25	17				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**21.9%**		



One Point Liquid Limit

N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**49**
Plastic Limit	**22**
Plastic Index	**27**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	4/27/18	Matthew F. Cooke, P.G.	4/27/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

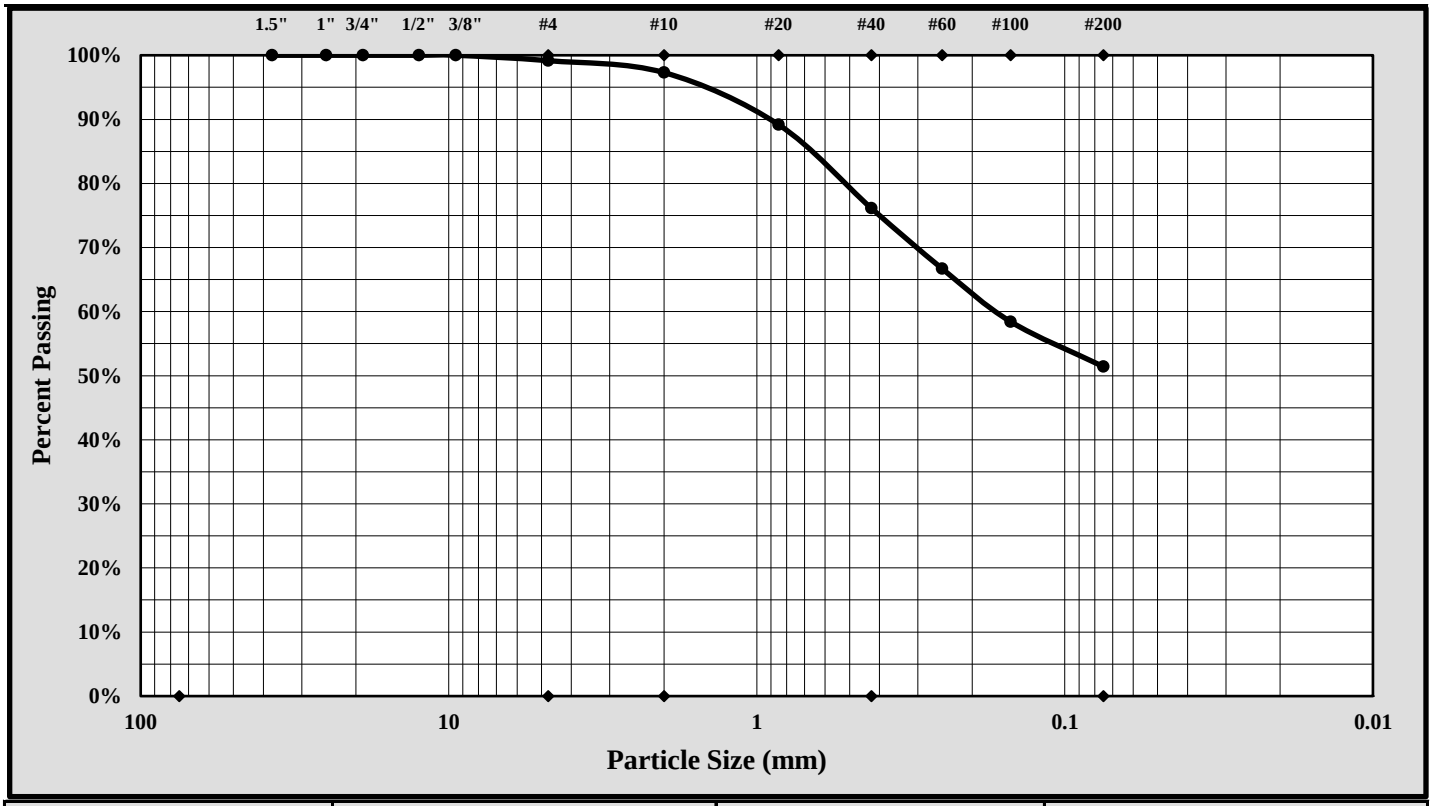
This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	4/27/18
Project Name:	Carolina Crossroads Project	Test Date(s):	4/15 - 4/27/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-37 Sample #: SS-1	Sample Date:	3/07/18
Location:	Bridge Boring Type: Split-spoon	Depth:	0.4' - 2.4'
Sample Description:	Sandy Lean Clay (CL, A-7-6(10))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	4.75 mm	Gravel:	0.8%
Silt & Clay (% Passing #200):	51.4%	Total Sand:	47.7%

Liquid Limit	49	Plastic Limit	22	Plastic Index	27
Coarse Sand:	1.9%	Medium Sand:	21.2%	Fine Sand:	24.7%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/27/18 — *Date*

This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	4/27/18
Project Name:	Carolina Crossroads Project	Test Date:	4/24/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-37	Sample #:	SS-3	Sample Date:	3/07/18
Location:	Bridge Boring	Type:	Split-spoon	Depth:	4.4' - 6.4'
Sample Description:	Fat Clay (CH, A-7-6(51))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	1	2	3				4	5	
A	Tare Weight	26.70	26.47	26.33				25.93	26.94	
B	Wet Soil Weight + A	41.71	40.46	39.84				34.42	34.60	
C	Dry Soil Weight + A	35.54	34.50	33.67				32.85	33.15	
D	Water Weight (B-C)	6.17	5.96	6.17				1.57	1.45	
E	Dry Soil Weight (C-A)	8.84	8.03	7.34				6.92	6.21	
F	% Moisture (D/E)*100	69.8%	74.2%	84.1%				22.7%	23.3%	
N	# OF DROPS	35	28	18				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**23.0%**		



One Point Liquid Limit

N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**77**
Plastic Limit	**23**
Plastic Index	**54**
Group Symbol	**CH**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	4/27/18	Matthew F. Cooke, P.G.	4/27/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

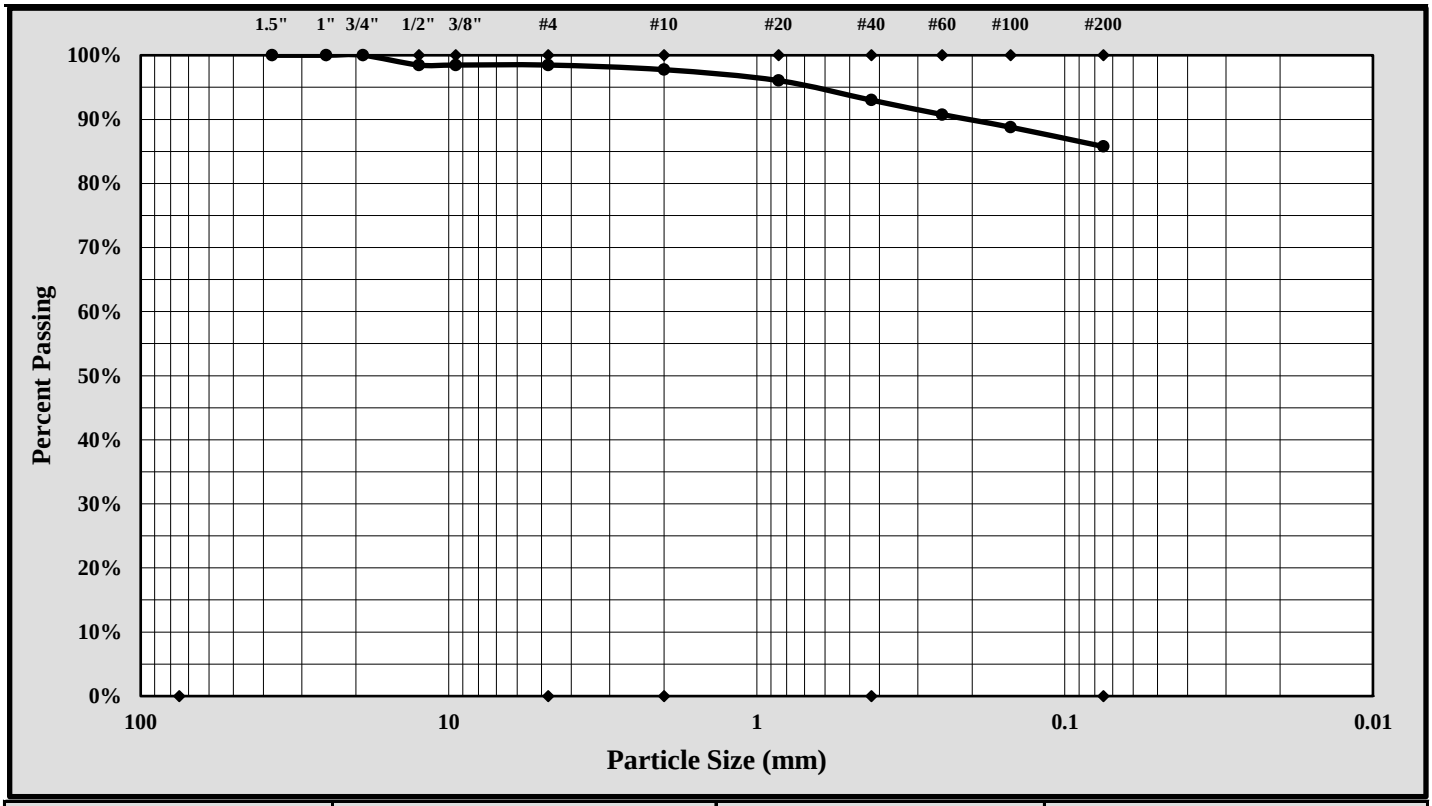
This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	4/27/18
Project Name:	Carolina Crossroads Project	Test Date(s):	4/15 - 4/27/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-37	Sample #: SS-3	Sample Date: 3/07/18
Location:	Bridge Boring	Type: Split-spoon	Depth: 4.4' - 6.4'
Sample Description:	Fat Clay (CH, A-7-6(51))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	19.0 mm	Gravel:	1.5%
Silt & Clay (% Passing #200):	85.8%	Total Sand:	12.7%

Liquid Limit	77	Plastic Limit	23	Plastic Index	54
Coarse Sand:	0.7%	Medium Sand:	4.8%	Fine Sand:	7.2%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/27/18 — *Date*

This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Form No: TR-D1140-1
Revision No. 1
Revision Date: 8/2/17

MATERIAL FINER THAN THE #200 SIEVE

ASTM D1140

S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	4/27/18
Project Name:	Carolina Crossroads Project	Test Date(s):	3/28 - 3/30/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sampled by:	S&ME	Sample Dates:	3/07/18
Sampling Method:	Split-spoon	Drill Rig:	CME 55
Method;	**A** ☐ **B** ☑	Soaked	☑ Soak Time 16 hrs.

Boring #	Sample #	Sample Depth	Tare #	Tare Weight	Tare Wt.+ Wet Wt	Tare Wt. + Dry Wt	Tare Wt. + Dry Wt. after Wash	% Passing #200
		ft.		grams	grams	grams	grams	%
B-37	SS-6	9.5 - 11.5	BK-2	0.00	149.05	116.43	13.85	**88.1%**

Balance ID.: *13942* *Calibration Date:* *8/18/17* *#200 Sieve:* *23239* *Calibration Date:* *2/19/17*

Notes / Deviations / References: ASTM D1140: Amount of Material in Soil Finer Than the No. 200 (75-um)) Sieve

Benjamin Kovaleski	Benjamin J. Kovaleski	NICET Lab Level III/117226	4/27/18
Technician Name	*Signature*	*Certification Type/No.*	*Date*
Matthew F. Cooke, P.G.		Project Manager	4/27/18
Technical Responsibility		*Position*	*Date*

This report shall not be reproduced, except in full without the written approval of S&ME, Inc.

Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

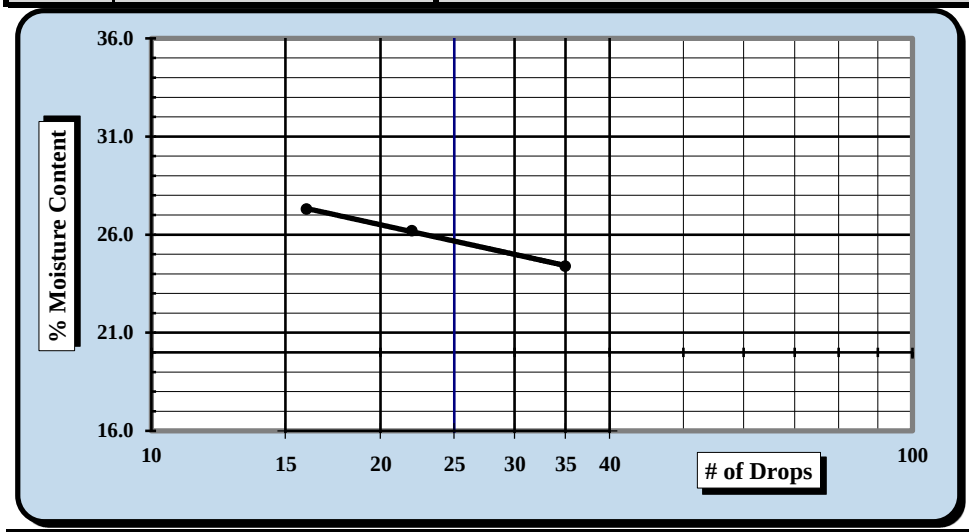
Project #:	1461-16-047.2B	Report Date:	4/27/18
Project Name:	Carolina Crossroads Project	Test Date:	4/25/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-37	Sample #:	SS-8	Sample Date:	3/07/18
Location:	Bridge Boring	Type:	Split-spoon	Depth:	18.5' - 20.0'

Sample Description: Silty Clayey Sand with Gravel (SC-SM, A-4(0))

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	6	7	8				9	10	
A	Tare Weight	27.76	26.31	27.31				26.85	26.75	
B	Wet Soil Weight + A	45.91	43.32	42.36				32.08	34.16	
C	Dry Soil Weight + A	42.35	39.79	39.13				31.25	33.02	
D	Water Weight (B-C)	3.56	3.53	3.23				0.83	1.14	
E	Dry Soil Weight (C-A)	14.59	13.48	11.82				4.40	6.27	
F	% Moisture (D/E)*100	24.4%	26.2%	27.3%				18.9%	18.2%	
N	# OF DROPS	35	22	16				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**18.6%**		



One Point Liquid Limit

N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**26**
Plastic Limit	**19**
Plastic Index	**7**
Group Symbol	**CL-ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	4/27/18	Matthew F. Cooke, P.G.	4/27/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

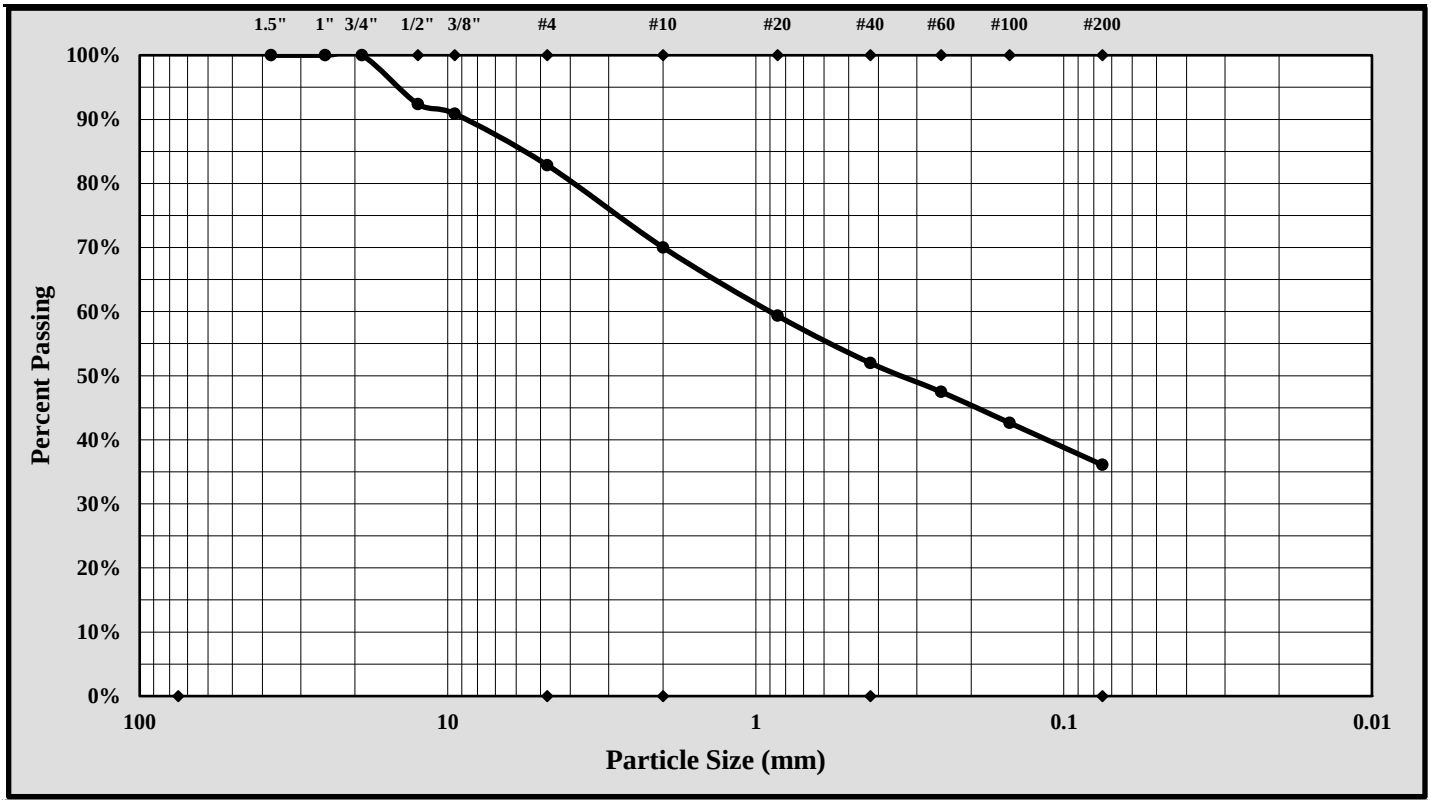
This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	4/27/18
Project Name:	Carolina Crossroads Project	Test Date(s):	4/15 - 4/27/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-37	Sample #: SS-8	Sample Date: 3/07/18
Location:	Bridge Boring	Type: Split-spoon	Depth: 18.5' - 20.0'
Sample Description:	Silty Clayey Sand with Gravel (SC-SM, A-4(0))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	19.0 mm	Gravel:	17.2%
Silt & Clay (% Passing #200):	36.1%	Total Sand:	46.8%

Liquid Limit	26	Plastic Limit	19	Plastic Index	7
Coarse Sand:	12.8%	Medium Sand:	18.0%	Fine Sand:	15.9%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/27/18 — *Date*

This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

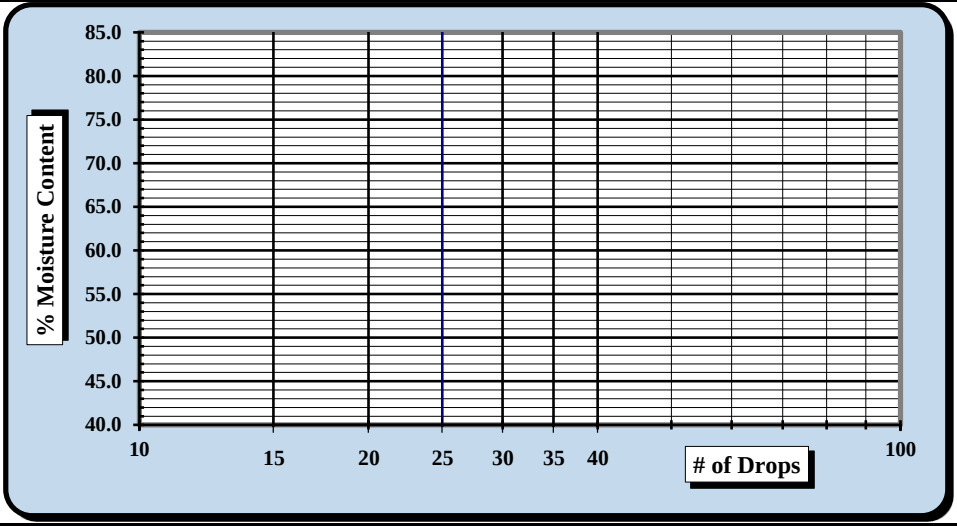
S&ME, Inc. - Atlanta: 4350 River Green Parkway, Suite 200, Duluth, GA 30096

Project #:	1461-16-047.2B	Report Date:	5-1-2018
Project Name:	Carolina Crossroads Project	Test Date(s)	4/27-4/28/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-43	Sample #: SS-1		Sample Date: Various	
Location:	Bridge Boring	Offset: N/A		Depth: 14.8' - 16.8'	
Sample Description:	Silty Sand (SM, A-2-4)				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	25128	3/17/2017	Grooving tool	26551	2/23/2018
LL Apparatus	31336	2/23/2018	Grooving tool		
Oven	31332	2/20/2018	Grooving tool		

		Liquid Limit						Plastic Limit		
Pan #	337									
	Tare #:									
A	Tare Weight									
B	Wet Soil Weight + A									
C	Dry Soil Weight + A									
D	Water Weight (B-C)									
E	Dry Soil Weight (C-A)									
F	% Moisture (D/E)*100									
N	# OF DROPS							*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*									



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☒

Liquid Limit	**NP**
Plastic Limit	**NP**
Plastic Index	**NP**
Group Symbol	**ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☐ Air Dried ☑

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

Jimmy Hanson	4/28/2018		5/1/2018
Technician Name	*Date*	*Technical Responsibility*	*Date*

This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Form No: TR-D7928-3
Revision No.: 0
Revision Date: 02/21/17

Particle Size Analysis of Soils

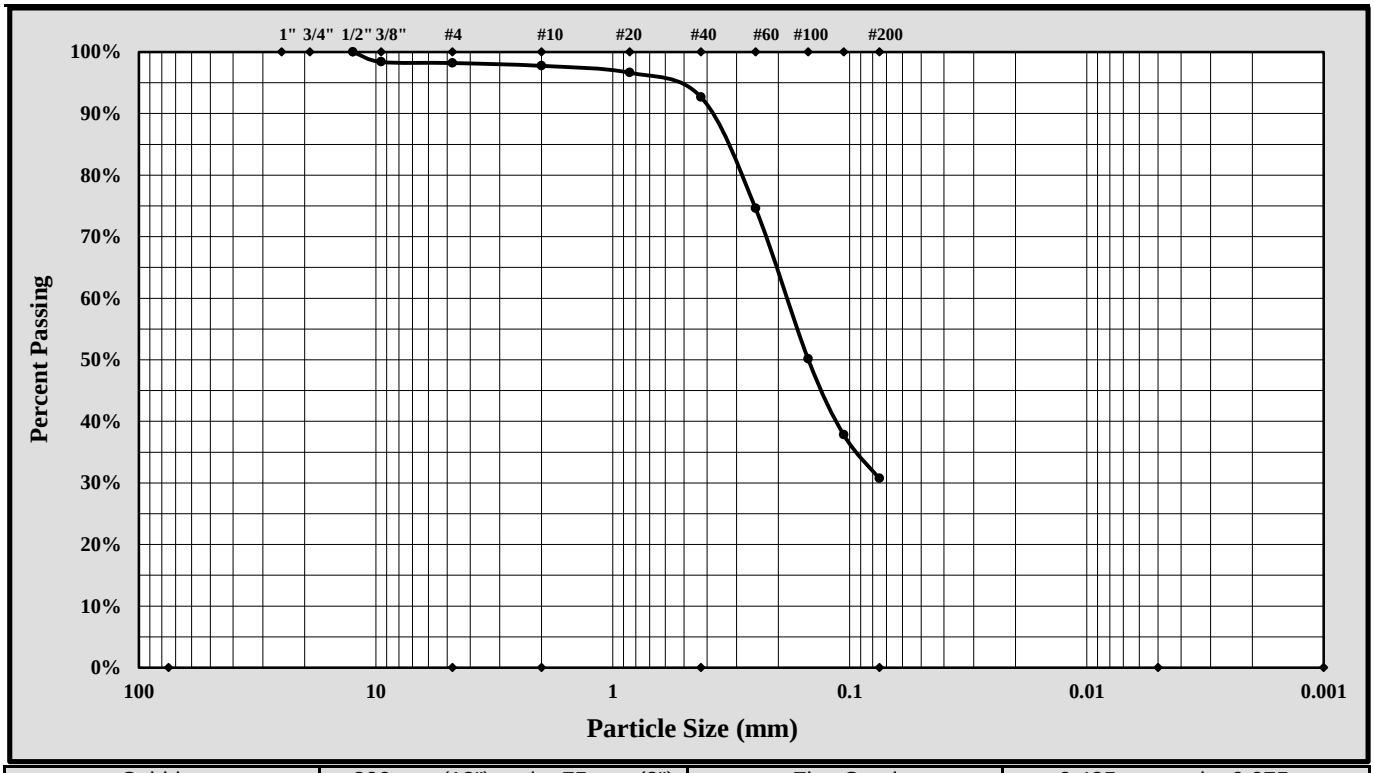
ASTM D6913/D7928

Quality Assurance

Sample Log No.:

S&ME, Inc., 4350 Rivergreen Parkway, Suite 200, Duluth, GA 30096

S&ME Project #:	1461-16-047.2B	Report Date:	4/23/18
Project Name:	Carolina Crossroads Project	Test Date(s):	4/19-4/20/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sample ID:	B-43 Type: Split Spoon	Sample Date:	Various
Location:	Bridge Boring Sample No.: SS-1	Depth:	14.8' - 16.8'
Sample Description:	Silty Sand (SM, A-2-4)		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:		Gravel:	1.8%
Silt & Clay (% Passing #200):	30.7%	Total Sand:	67.5%
Assumed Specific Gravity:	2.65		

Liquid Limit	NP	Plastic Limit	NP	Plastic Index	NP

$Cc = D_{30}^2/(D_{10} \times D_{60})$ $Cu = D_{60}/D_{10}$

Description of Sand and Gravel	Rounded ☐	Angular ☐	Hard & Durable ☐	Soft ☐	Weathered & Friable ☐
Sample Prep Method: Moist Prep	Dispersion Period:	1 min.	Dispersing Agent:	Sodium Hexametaphosphate:	50 g./ Liter

References / Comments / Deviations:

Nathan Price		Laboratory Group Leader	5/10/2018
Technical Responsibility	*Signature*	*Position*	*Date*

This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

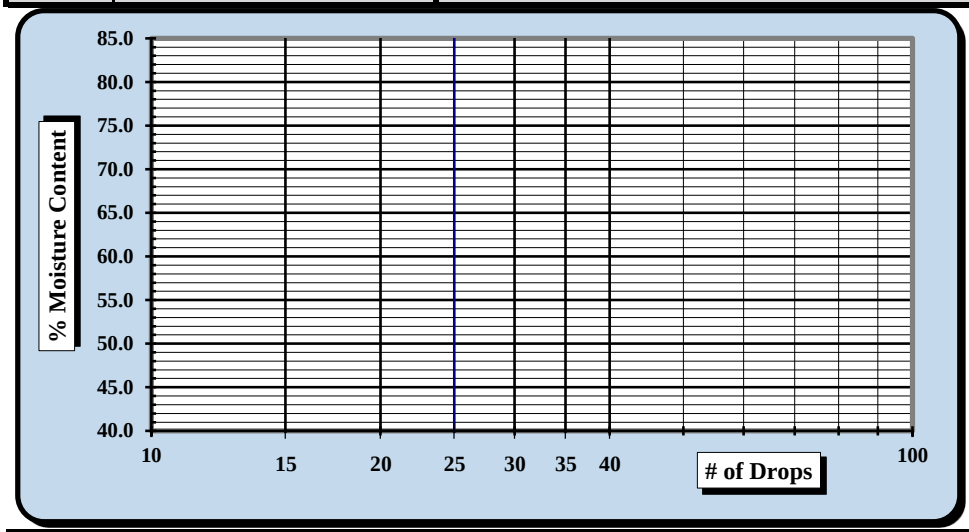
S&ME, Inc. - Atlanta: 4350 River Green Parkway, Suite 200, Duluth, GA 30096

Project #:	1461-16-047.2B	Report Date:	4/30/18
Project Name:	Carolina Crossroads Project	Test Date(s)	4/27-4/28/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-43	Sample #: SS-2		Sample Date: Various	
Location:	Bridge Boring	Offset: N/A		Depth: 16.8' - 18.8'	
Sample Description:	Sandy Lean Clay (CL, A-6 (8))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	25128	3/17/2017	Grooving tool	26551	2/23/2018
LL Apparatus	31336	2/23/2018	Grooving tool		
Oven	31332	2/20/2018	Grooving tool		

Pan # 423		Liquid Limit						Plastic Limit		
	Tare #:	60	61	62				63	64	
A	Tare Weight	16.00	15.05	15.54				15.09	15.86	
B	Wet Soil Weight + A	29.61	27.81	28.44				22.93	23.71	
C	Dry Soil Weight + A	26.25	24.61	25.14				21.69	22.46	
D	Water Weight (B-C)	3.36	3.20	3.30				1.24	1.25	
E	Dry Soil Weight (C-A)	10.25	9.56	9.60				6.60	6.60	
F	% Moisture (D/E)*100	32.8%	33.5%	34.4%				18.8%	18.9%	
N	# OF DROPS	30	25	16				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**18.9%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**34**
Plastic Limit	**19**
Plastic Index	**15**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☐ Air Dried ☑

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

Jimmy Hanson	4/28/2018		4/30/2018
Technician Name	*Date*	*Technical Responsibility*	*Date*

This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Form No: TR-D7928-3
Revision No.: 0
Revision Date: 02/21/17

Particle Size Analysis of Soils

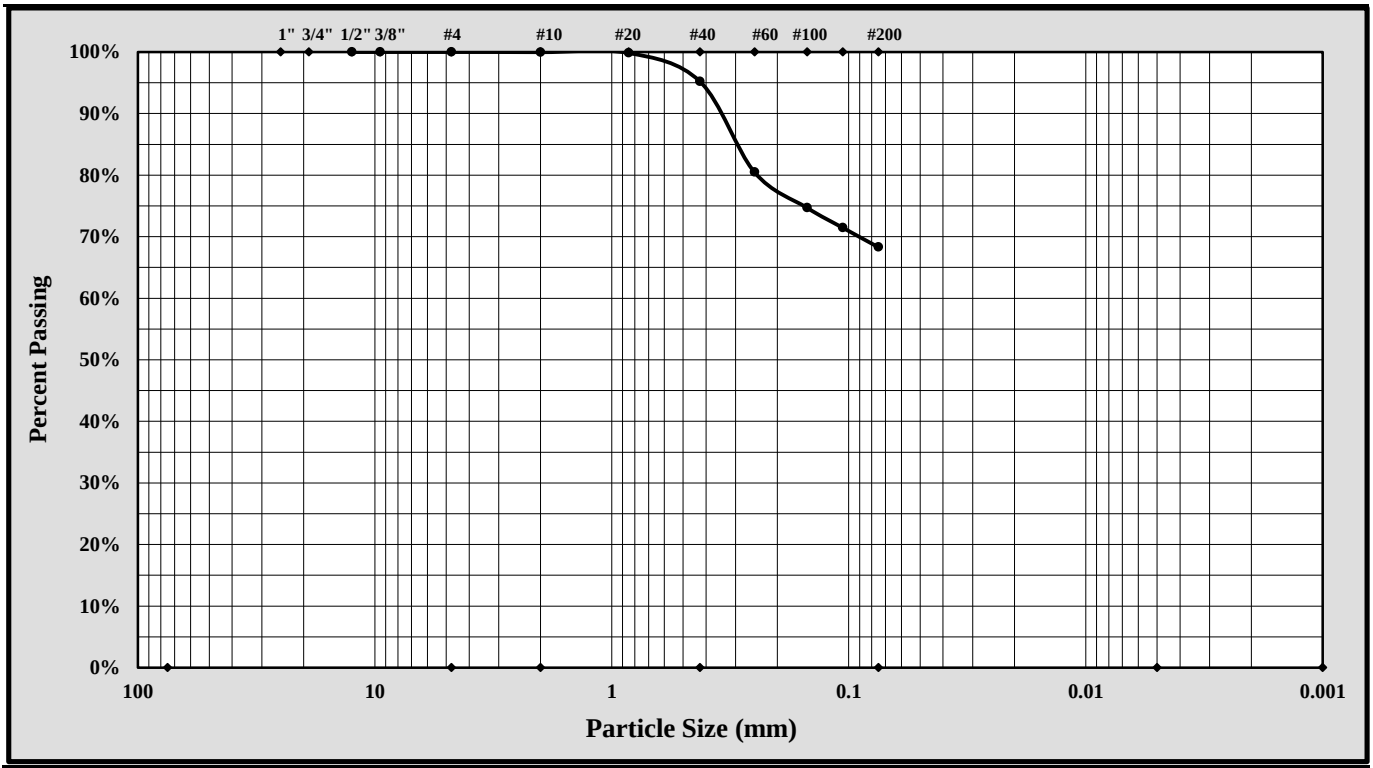
ASTM D6913/D7928

Quality Assurance

Sample Log No.:

S&ME, Inc., 4350 Rivergreen Parkway, Suite 200, Duluth, GA 30096

S&ME Project #:	1461-16-047.2B	Report Date:	4/23/18
Project Name:	Carolina Crossroads Project	Test Date(s):	4/19-4/20/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sample ID:	B-43 Type: Split Spoon	Sample Date:	Various
Location:	Bridge Boring Sample No.: SS-2	Depth:	16.8' - 18.8'
Sample Description:	Sandy Lean Clay (CL, A-6 (8))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:		Gravel:	0.0%
Silt & Clay (% Passing #200):	68.3%	Total Sand:	31.7%
Assumed Specific Gravity:	2.65		

Liquid Limit	34	Plastic Limit	19	Plastic Index	15

$Cc = D_{30}^2/(D_{10} \times D_{60})$ $Cu = D_{60}/D_{10}$

Description of Sand and Gravel	Rounded ☐	Angular ☐	Hard & Durable ☐	Soft ☐	Weathered & Friable ☐
Sample Prep Method: Moist Prep	Dispersion Period:	1 min.	Dispersing Agent:	Sodium Hexametaphosphate:	50 g./ Liter

References / Comments / Deviations:

Matthew F. Cooke, P.G.	Project Manager	6/7/2018
Technical Responsibility	*Position*	*Date*

This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

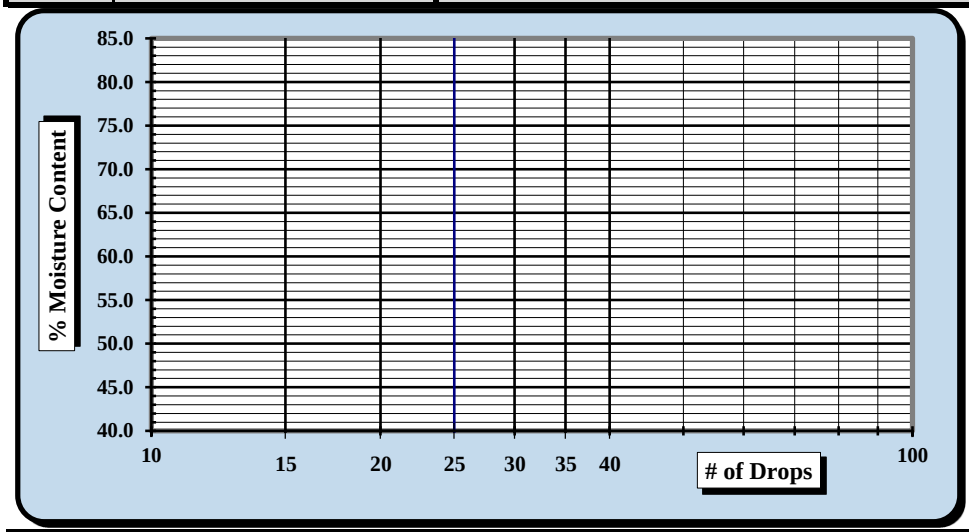
S&ME, Inc. - Atlanta: 4350 River Green Parkway, Suite 200, Duluth, GA 30096

Project #:	1461-16-047.2B	Report Date:	5-2-2018
Project Name:	Carolina Crossroads Project	Test Date(s)	4/27-4/28/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-43	Sample #: SS-6		Sample Date: Various	
Location:	Bridge Boring	Offset: N/A		Depth: 28.3' - 29.8'	
Sample Description:	Silty Sand with Gravel (SM, A-2-4)				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	25128	3/17/2017	Grooving tool	26551	2/23/2018
LL Apparatus	31336	2/23/2018	Grooving tool		
Oven	31332	2/20/2018	Grooving tool		

Pan # 407		Liquid Limit						Plastic Limit		
	Tare #:	1	4	5				6	7	
A	Tare Weight									
B	Wet Soil Weight + A									
C	Dry Soil Weight + A									
D	Water Weight (B-C)									
E	Dry Soil Weight (C-A)									
F	% Moisture (D/E)*100									
N	# OF DROPS							*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*									



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☒

Liquid Limit	**NP**
Plastic Limit	**NP**
Plastic Index	**NP**
Group Symbol	**ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☐ Air Dried ☑

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

Jimmy Hanson	4/28/2018		5/2/2018
Technician Name	*Date*	*Technical Responsibility*	*Date*

This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Form No: TR-D7928-3
Revision No.: 0
Revision Date: 02/21/17

Particle Size Analysis of Soils

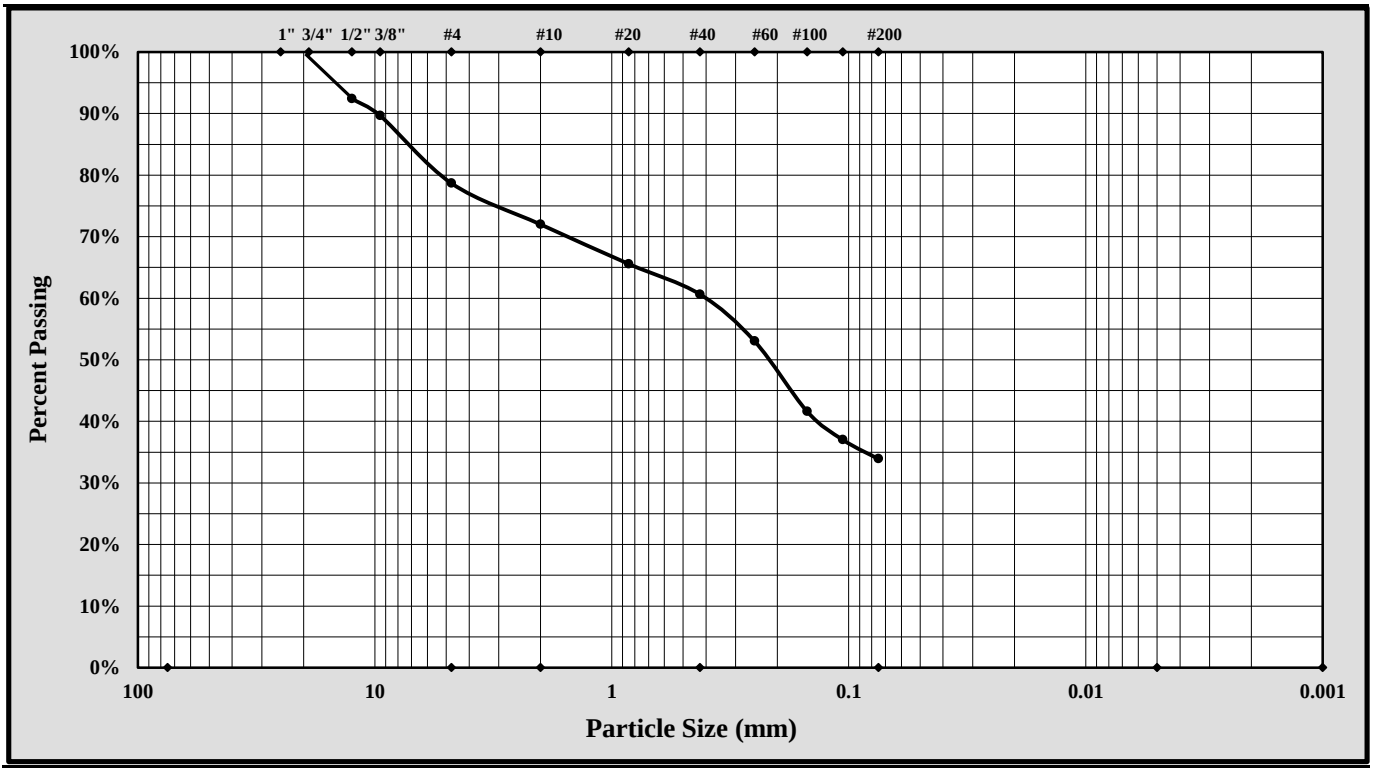
ASTM D6913/D7928

Quality Assurance

Sample Log No.:

S&ME, Inc., 4350 Rivergreen Parkway, Suite 200, Duluth, GA 30096

S&ME Project #:	1461-16-047.2B	Report Date:	4/23/18
Project Name:	Carolina Crossroads Project	Test Date(s):	4/19-4/20/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sample ID:	B-43 Type: Split Spoon	Sample Date:	Various
Location:	Bridge Boring Sample No.: SS-6	Depth:	28.3' - 29.8'
Sample Description:	Silty Sand with Gravel (SM, A-2-4)		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:		Gravel:	21.3%
Silt & Clay (% Passing #200):	33.9%	Total Sand:	44.8%
Assumed Specific Gravity:	2.65		

Liquid Limit	NP	Plastic Limit	NP	Plastic Index	NP

$Cc = D_{30}^2/(D_{10} \times D_{60})$ $Cu = D_{60}/D_{10}$

Description of Sand and Gravel	Rounded ☐	Angular ☐	Hard & Durable ☐	Soft ☐	Weathered & Friable ☐
Sample Prep Method: Moist Prep	Dispersion Period:	1 min.	Dispersing Agent:	Sodium Hexametaphosphate:	50 g./ Liter

References / Comments / Deviations:

Nathan Price		Laboratory Group Leader	5/2/2018
Technical Responsibility	*Signature*	*Position*	*Date*

This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

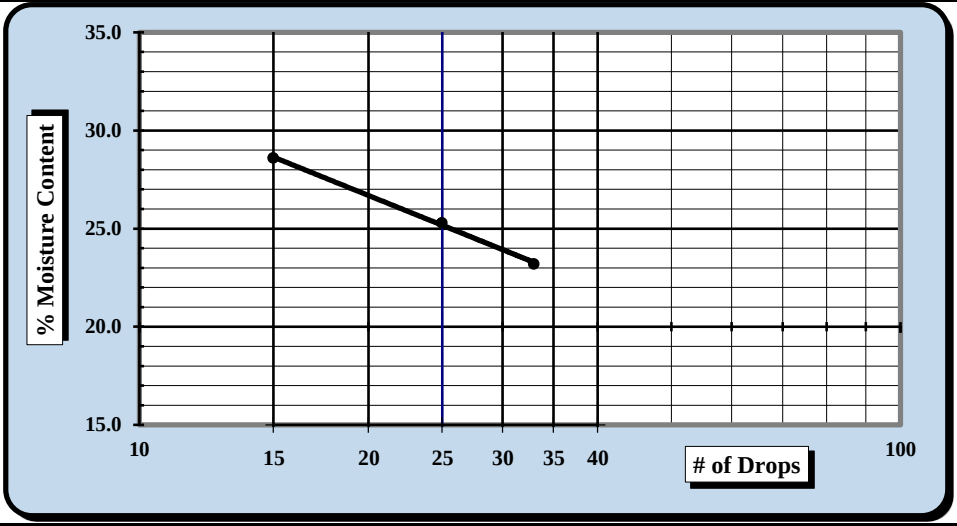
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	5/04/18
Project Name:	Carolina Crossroads Project	Test Date:	5/03/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-44	Sample #:	SS-1	Sample Date:	3/21/18
Location:	Bridge Boring	Type:	Split-spoon	Depth:	0.0' - 2.0'
Sample Description:	Sandy Silty Clay (CL-ML, A-4(1))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	16	17	18				19	20	
A	Tare Weight	26.61	26.64	26.77				26.66	26.82	
B	Wet Soil Weight + A	47.31	43.28	42.09				33.18	33.89	
C	Dry Soil Weight + A	43.41	39.92	38.68				32.15	32.77	
D	Water Weight (B-C)	3.90	3.36	3.41				1.03	1.12	
E	Dry Soil Weight (C-A)	16.80	13.28	11.91				5.49	5.95	
F	% Moisture (D/E)*100	23.2%	25.3%	28.6%				18.8%	18.8%	
N	# OF DROPS	33	25	15				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**18.8%**		



One Point Liquid Limit

N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**25**
Plastic Limit	**19**
Plastic Index	**6**
Group Symbol	**CL-ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	5/04/18	Matthew F. Cooke, P.G.	5/04/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

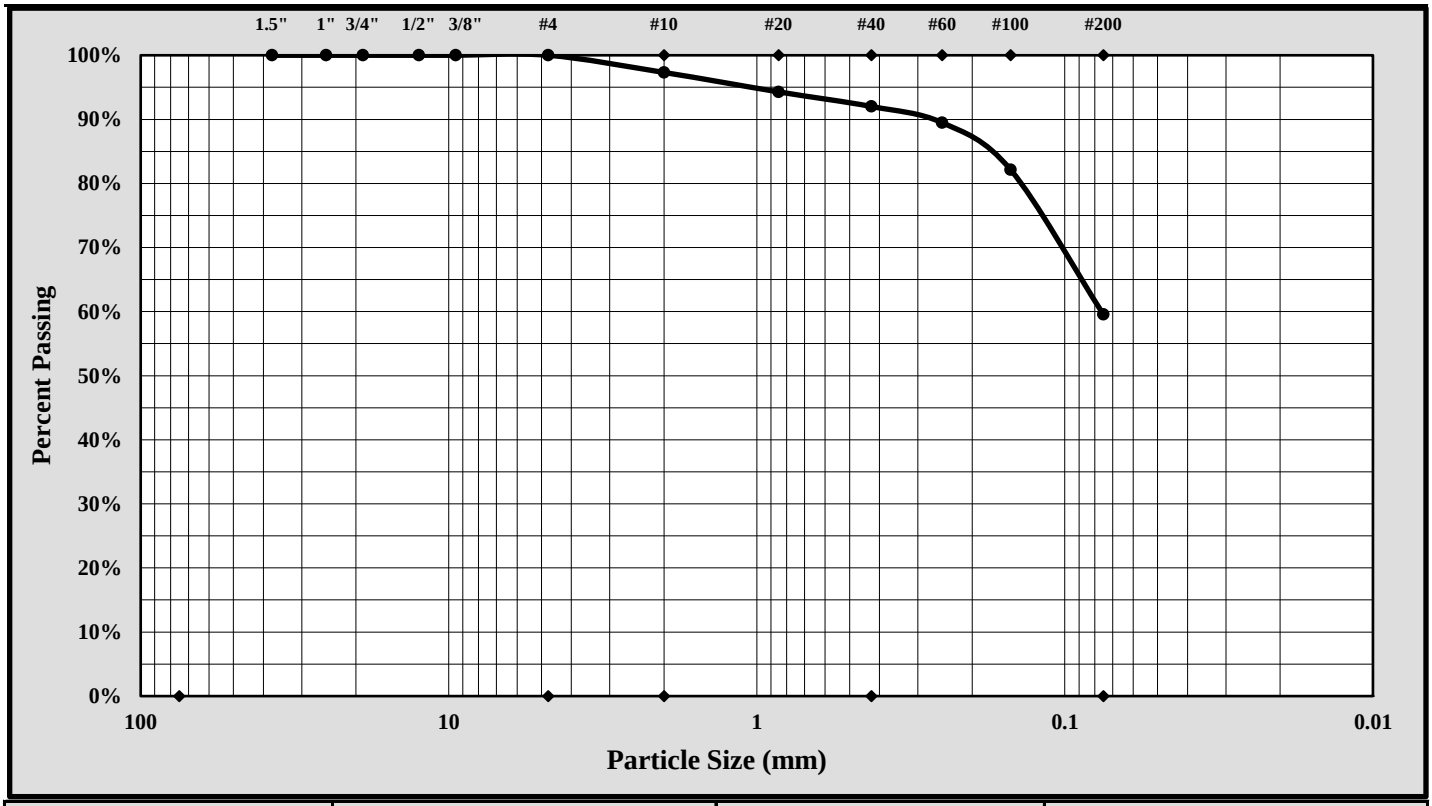
This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	5/04/18
Project Name:	Carolina Crossroads Project	Test Date(s):	5/02 - 5/04/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-44 Sample #: SS-1	Sample Date:	3/21/18
Location:	Bridge Boring Type: Split-spoon	Depth:	0.0' - 2.0'
Sample Description:	Sandy Silty Clay (CL-ML, A-4(1))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	4.75 mm	Gravel:	0.0%
Silt & Clay (% Passing #200):	59.6%	Total Sand:	40.4%

Liquid Limit	25	Plastic Limit	19	Plastic Index	6
Coarse Sand:	2.7%	Medium Sand:	5.3%	Fine Sand:	32.5%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
5/04/18 — *Date*

This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ *AASHTO T 89* ☐ *AASHTO T 90* ☐

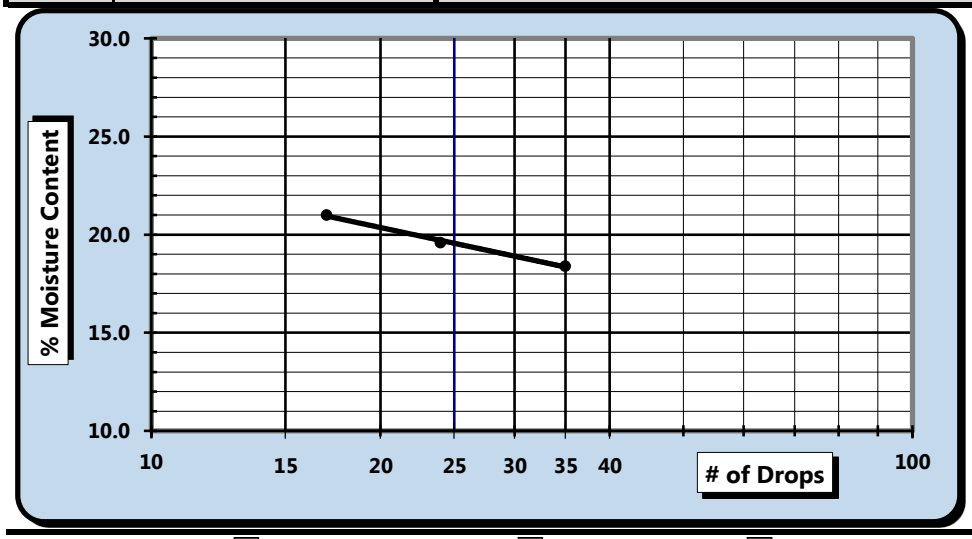
S&ME, Inc. - Spartanburg: 301 Zima Park Drive, Spartanburg, SC 29301

Project #:	1461-16-047.2B	Report Date:	5/11/18
Project Name:	Carolina Crossroads Project	Test Date:	5/10/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-45	Sample #:	SS-1	Sample Date:	2/8/18
Location:	Bridge Boring	Type:	Split-spoon	Depth:	0.8' - 2.8'
Sample Description:	Silty Clayey Sand (SC-SM, A-2-4)				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	7537	1/31/2018	Grooving tool	14185	9/12/2017
LL Apparatus	13859	9/12/2017			
Oven	7313	7/28/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	Q-1	Q-2	Q-3				3	4	
A	Tare Weight	16.69	16.63	15.72				11.59	12.27	
B	Wet Soil Weight + A	38.29	39.44	38.50				18.97	19.49	
C	Dry Soil Weight + A	34.94	35.70	34.55				17.94	18.51	
D	Water Weight (B-C)	3.35	3.74	3.95				1.03	0.98	
E	Dry Soil Weight (C-A)	18.25	19.07	18.83				6.35	6.24	
F	% Moisture (D/E)*100	18.4%	19.6%	21.0%				16.2%	15.7%	
N	# OF DROPS	35	24	17				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							16.0%		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**20**
Plastic Limit	**16**
Plastic Index	**4**
Group Symbol	**CL-ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Matt Jacobs	NICET 118202	Matthew F. Cooke, P.G.	5/11/18
Technician Name	*Certification#*	*Technical Responsibility*	*Date*

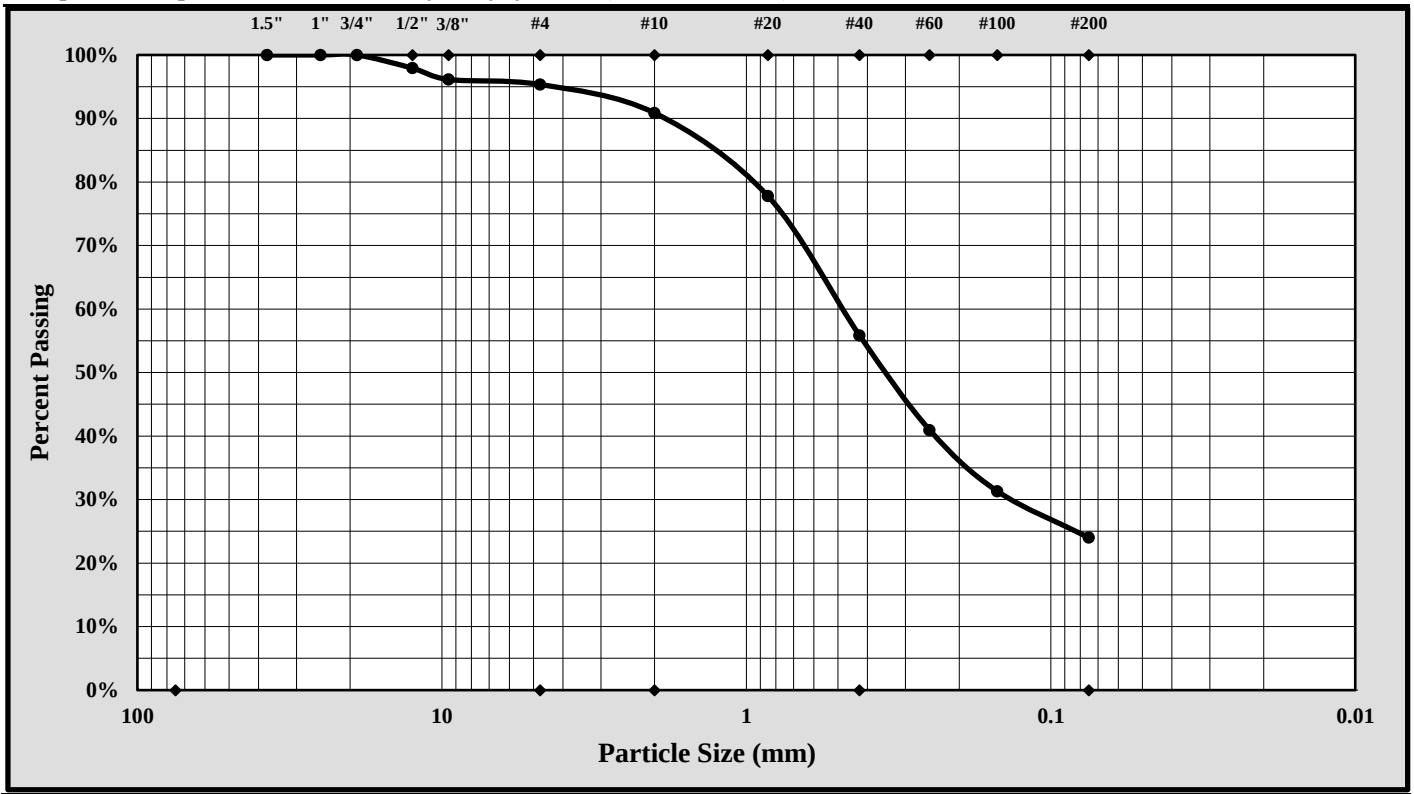
This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. - Spartanburg 301 Zima Park Dr. Spartanburg, SC 29301

S&ME Project #:	1461-16-047.2B	Report Date:	5/11/18
Project Name:	Carolina Crossroads Project	Test Date(s):	2/21 - 2/27/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-45	Sample #: SS-1	Sample Date: 2/8/18
Location:	Bridge Boring	Type: Split-spoon	Depth: 0.8' - 2.8'
Sample Description:	Silty Clayey Sand (SC-SM, A-2-4)		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	19.00 mm	Gravel:	4.7%
Silt & Clay (% Passing #200):	24.0%	Total Sand:	71.3%

Liquid Limit	20	Plastic Limit	16	Plastic Index	4
Coarse Sand:	4.5%	Medium Sand:	35.0%	Fine Sand:	31.8%

Description of Sand and Gravel — Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
5/11/18 — *Date*

This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

Quality Assurance ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Knoxville: 1413 Topside Road, Louisville, TN 37777

Project #:	1461-16-047.2B	Report Date:	5/23/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	4/30/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-46	Sample #: SS-1	Sample Date: Various
Log #:	43-2321		Depth: 0.0' - 2.0'
Sample Description:	Lean clay with sand (CL, A-6 (8))		

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	18435	4/10/2018	Grooving tool	32239	2/16/2018
LL Apparatus	18414	10/6/2017	No. 40 Sieve	31434	4/7/2018
Oven	12872	3/17/2018			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	17	12	10				14	19	
A	Tare Weight	15.49	15.57	15.41				15.46	15.42	
B	Wet Soil Weight + A	27.87	28.60	29.90				24.48	25.40	
C	Dry Soil Weight + A	24.76	25.42	26.44				22.91	23.66	
D	Water Weight (B-C)	3.11	3.18	3.46				1.57	1.74	
E	Dry Soil Weight (C-A)	9.27	9.85	11.03				7.45	8.24	
F	% Moisture (D/E)*100	33.5%	32.3%	31.4%				21.1%	21.1%	
N	# OF DROPS	18	25	35				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**21.1%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**32**
Plastic Limit	**21**
Plastic Index	**11**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑

Notes / Deviations / References: Group symbol is for minus No. 40 portion only.

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Derek Baker	4/30/2018	Michael D. Kelso, E.I.	5/23/2018
Technician Name	*Date*	*Technical Responsibility*	*Date*

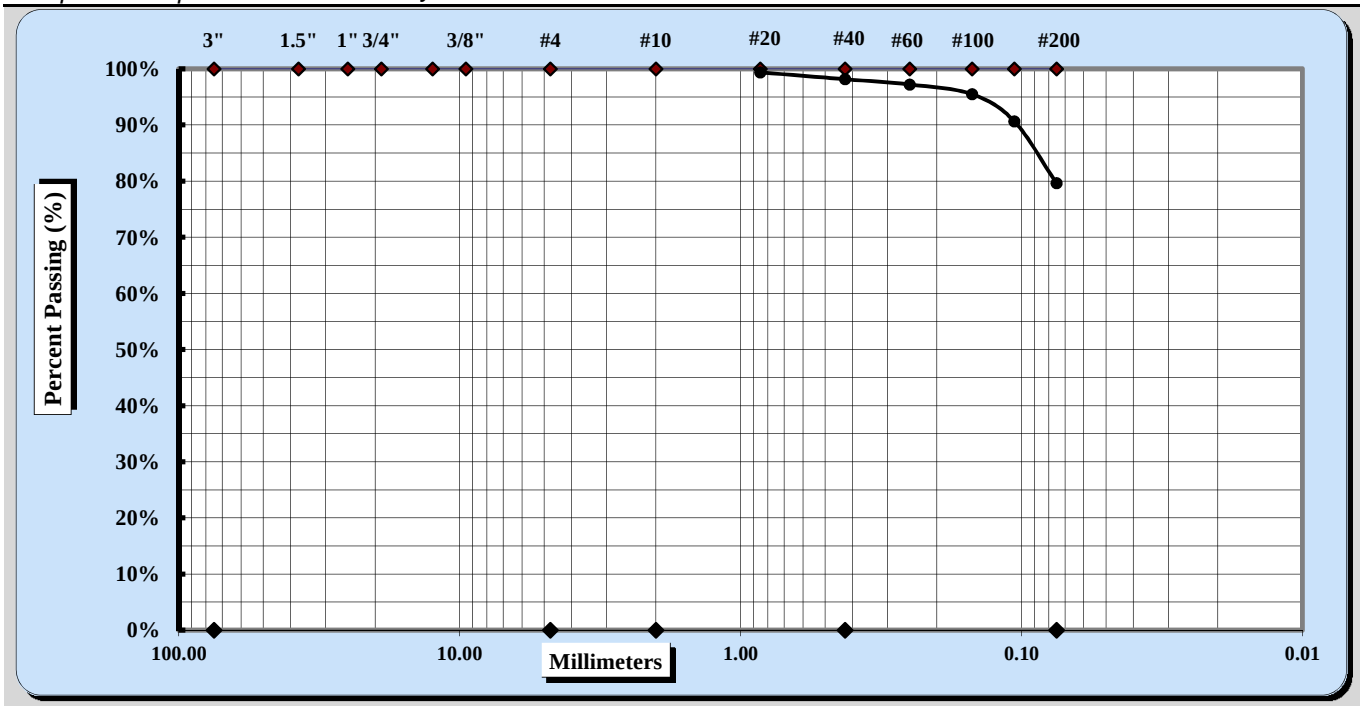
This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Sieve Analysis of Soils

Quality Assurance | *ASTM D6913 Method A*

S&ME, Inc. - Knoxville: 1413 Topside Road, Louisville, TN 37777

Project #:	**1461-16-047.2B**	Report Date:	5/23/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	5/5/18 - 5/22/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sample ID: B-46	Type: Split Spoon	Sample Date:	Various
Sample Log No.: 43-2321	Sample: 1	Depth:	0.0' - 2.0'
Sample Description:	Lean clay with sand (CL, A-6 (8))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size	No. 20	Coarse Sand	0%	Fine Sand	19%
Gravel	0%	Medium Sand	2%	Silt & Clay	80%
Liquid Limit	32	Plastic Limit	21	Plastic Index	11

Coarse Sand	0%	Medium Sand	2%	Fine Sand	19%

Description of Sand & Gravel Particles: Rounded ☒ Angular ☒
Hard & Durable ☒ Soft ☒ Weathered & Friable ☒

Notes / Deviations / References:

Michael D. Kelso, E.I.		Staff Professional	5/23/2018
Technical Responsibility	*Signature*	*Position*	*Date*

This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

Quality Assurance ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Knoxville: 1413 Topside Road, Louisville, TN 37777

Project #:	1461-16-047.2B	Report Date:	5/23/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	4/30/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-46	Sample #: SS-2	Sample Date: Various
Log #:	43-2321		Depth: 2.0' - 4.0'
Sample Description:	Lean clay with sand (CL, A-6 (8))		

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	18435	4/10/2018	Grooving tool	32239	2/16/2018
LL Apparatus	18414	10/6/2017	No. 40 Sieve	31434	4/7/2018
Oven	12872	3/17/2018			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	11	13	8				24	7	
A	Tare Weight	15.43	15.39	15.52				15.43	15.40	
B	Wet Soil Weight + A	27.62	28.38	29.88				24.67	24.81	
C	Dry Soil Weight + A	24.52	25.28	26.58				23.19	23.33	
D	Water Weight (B-C)	3.10	3.10	3.30				1.48	1.48	
E	Dry Soil Weight (C-A)	9.09	9.89	11.06				7.76	7.93	
F	% Moisture (D/E)*100	34.1%	31.3%	29.8%				19.1%	18.7%	
N	# OF DROPS	18	28	35				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**18.9%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**32**
Plastic Limit	**19**
Plastic Index	**13**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑

Notes / Deviations / References: Group symbol is for minus No. 40 portion only.

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Derek Baker	4/30/2018	Michael D. Kelso, E.I.	5/23/2018
Technician Name	*Date*	*Technical Responsibility*	*Date*

This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

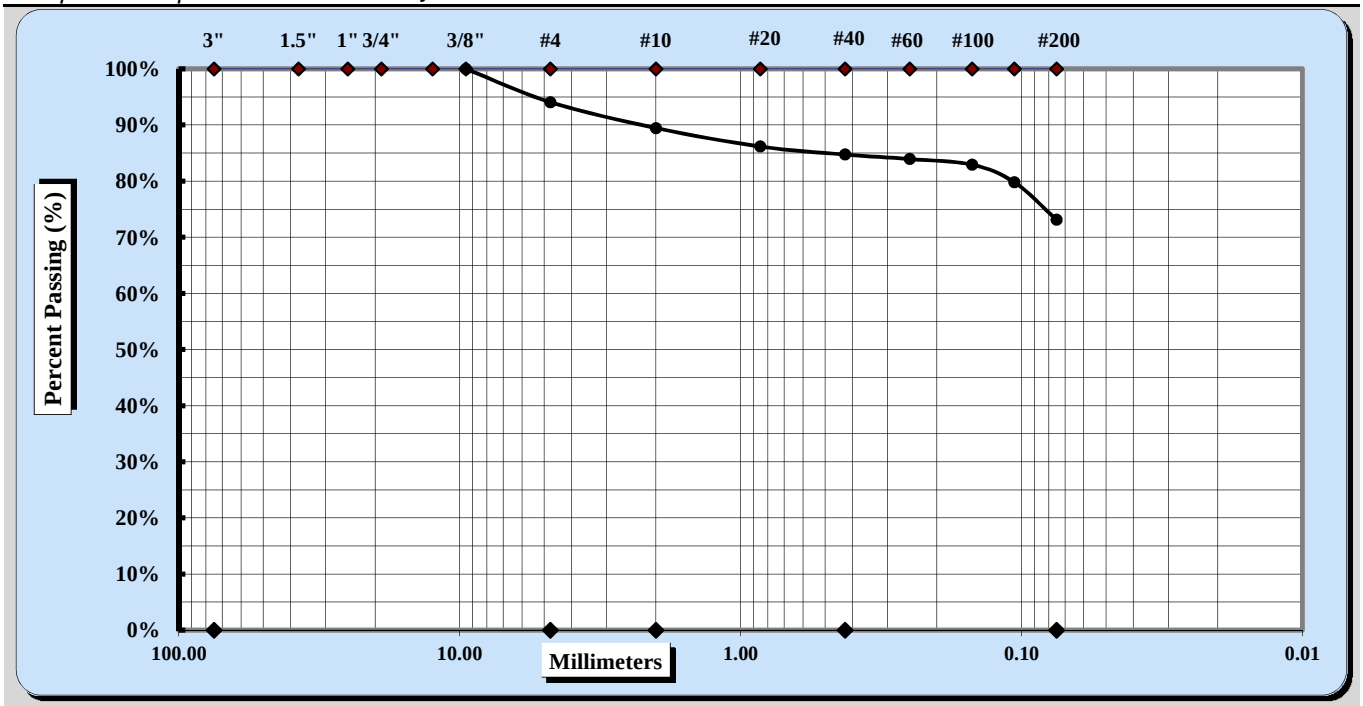
Sieve Analysis of Soils

Quality Assurance | *ASTM D6913 Method A*

S&ME, Inc. - Knoxville: 1413 Topside Road, Louisville, TN 37777

Project #:	**1461-16-047.2B**	Report Date:	5/23/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	5/5/18 - 5/22/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sample ID: B-46	Type: Split Spoon	Sample Date:	Various
Sample Log No.: 43-2321	Sample: 2	Depth:	2.0' - 4.0'

Sample Description: Lean clay with sand (CL, A-6 (8))



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size	3/8"	Coarse Sand	5%	Fine Sand	12%
Gravel	6%	Medium Sand	5%	Silt & Clay	73%
Liquid Limit	32	Plastic Limit	19	Plastic Index	13

Coarse Sand	5%	Medium Sand	5%	Fine Sand	12%

Description of Sand & Gravel Particles: Rounded ☒ Angular ☒
Hard & Durable ☒ Soft ☒ Weathered & Friable ☐

Notes / Deviations / References:

Michael D. Kelso, E.I. — *Technical Responsibility*
Signature
Staff Professional — *Position*
5/23/2018 — *Date*

This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

Quality Assurance ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Knoxville: 1413 Topside Road, Louisville, TN 37777

Project #:	1461-16-047.2B	Report Date:	5/23/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	5/19/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-62	Sample #: SS-1	Sample Date: Various
Log #:	43-2321		Elevation: 0.0' - 2.0'
Sample Description:	Sandy lean clay (CL, A-4 (2))		

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	18435	4/10/2018	Grooving tool	32239	2/16/2018
LL Apparatus	18414	10/6/2017	No. 40 Sieve	31434	4/7/2018
Oven	12872	3/17/2018			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	17	21	16				4	10	
A	Tare Weight	15.50	15.51	15.64				15.44	15.40	
B	Wet Soil Weight + A	25.46	26.47	27.05				24.47	25.07	
C	Dry Soil Weight + A	23.36	24.24	24.84				23.26	23.78	
D	Water Weight (B-C)	2.10	2.23	2.21				1.21	1.29	
E	Dry Soil Weight (C-A)	7.86	8.73	9.20				7.82	8.38	
F	% Moisture (D/E)*100	26.7%	25.5%	24.0%				15.5%	15.4%	
N	# OF DROPS	18	23	35				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**15.5%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**25**
Plastic Limit	**16**
Plastic Index	**9**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑

Notes / Deviations / References: Group symbol is for minus No. 40 portion only.

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Derek Baker	5/19/2018	Michael D. Kelso, E.I.	5/23/2018
Technician Name	*Date*	*Technical Responsibility*	*Date*

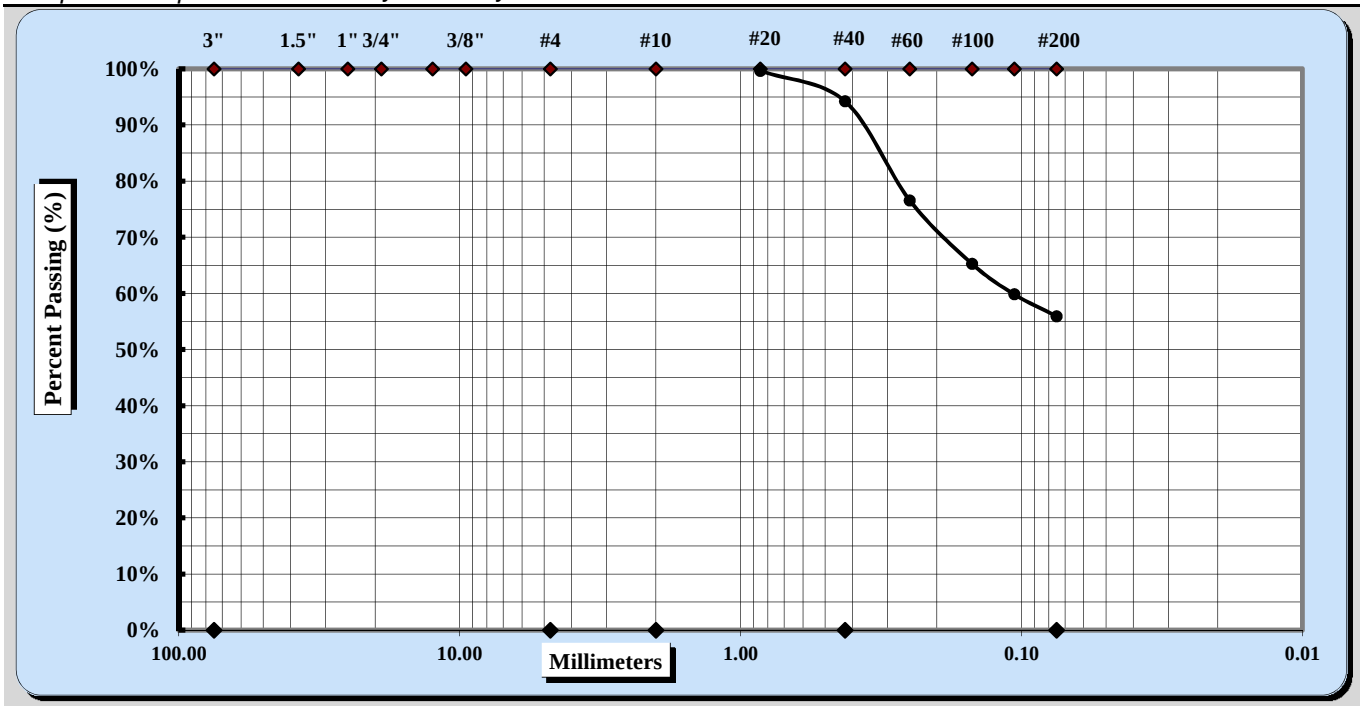
This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Sieve Analysis of Soils

Quality Assurance *ASTM D6913 Method A*

S&ME, Inc. - Knoxville: 1413 Topside Road, Louisville, TN 37777

Project #:	**1461-16-047.2B**	Report Date:	5/23/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	5/5/18 - 5/22/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sample ID: B-62	Type: Split Spoon	Sample Date:	Various
Sample Log No.: 43-2321	Sample: 1	Depth:	0.0' - 2.0'
Sample Description:	Sandy lean clay (CL, A-4 (2))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size	No. 20	Coarse Sand	0%	Fine Sand	38%
Gravel	0%	Medium Sand	6%	Silt & Clay	56%
Liquid Limit	25	Plastic Limit	16	Plastic Index	9

Coarse Sand	0%	Medium Sand	6%	Fine Sand	38%
Description of Sand & Gravel Particles:		Rounded	☒	Angular	☒
Hard & Durable	☒	Soft	☐	Weathered & Friable	☐

Notes / Deviations / References:

Michael D. Kelso, E.I.		Staff Professional	5/23/2018
Technical Responsibility	*Signature*	*Position*	*Date*

This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

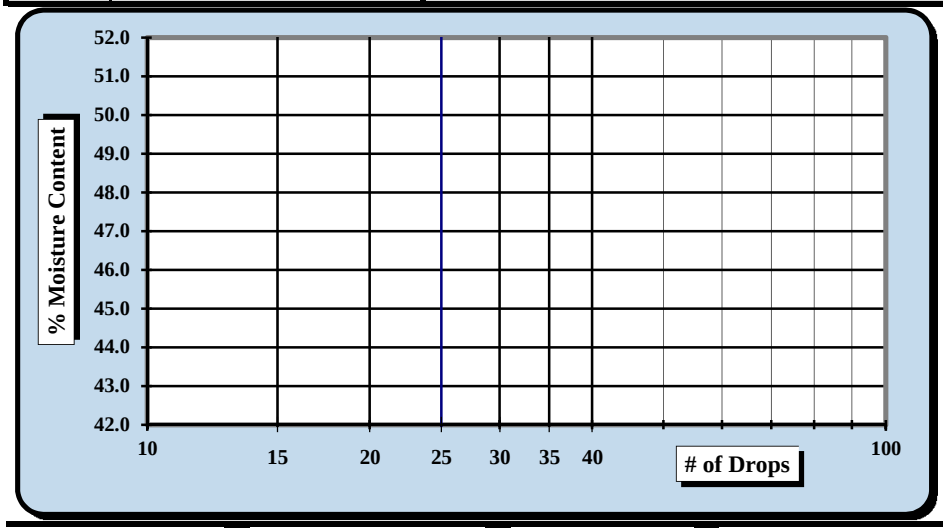
Quality Assurance ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Knoxville: 1413 Topside Road, Louisville, TN 37777

Project #:	1461-16-047.2B	Report Date:	5/23/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	5/19/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-62	Sample #: SS-2	Sample Date: Various
Log #:	43-2321		Depth: 2.0' - 4.0'
Sample Description:	Silty sand (SM, A-2-4)		

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	18435	4/10/2018	Grooving tool	32239	2/16/2018
LL Apparatus	18414	10/6/2017	No. 40 Sieve	31434	4/7/2018
Oven	12872	3/17/2018			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:									
A	Tare Weight									
B	Wet Soil Weight + A									
C	Dry Soil Weight + A									
D	Water Weight (B-C)									
E	Dry Soil Weight (C-A)									
F	% Moisture (D/E)*100									
N	# OF DROPS							*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*									



One Point Liquid Limit

N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☒

Liquid Limit	**NP**
Plastic Limit	**NP**
Plastic Index	**NP**
Group Symbol	**NP**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑

Notes / Deviations / References: Group symbol is for minus No. 40 portion only.

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Derek Baker	5/19/2018	Michael D. Kelso, E.I.	5/23/2018
Technician Name	*Date*	*Technical Responsibility*	*Date*

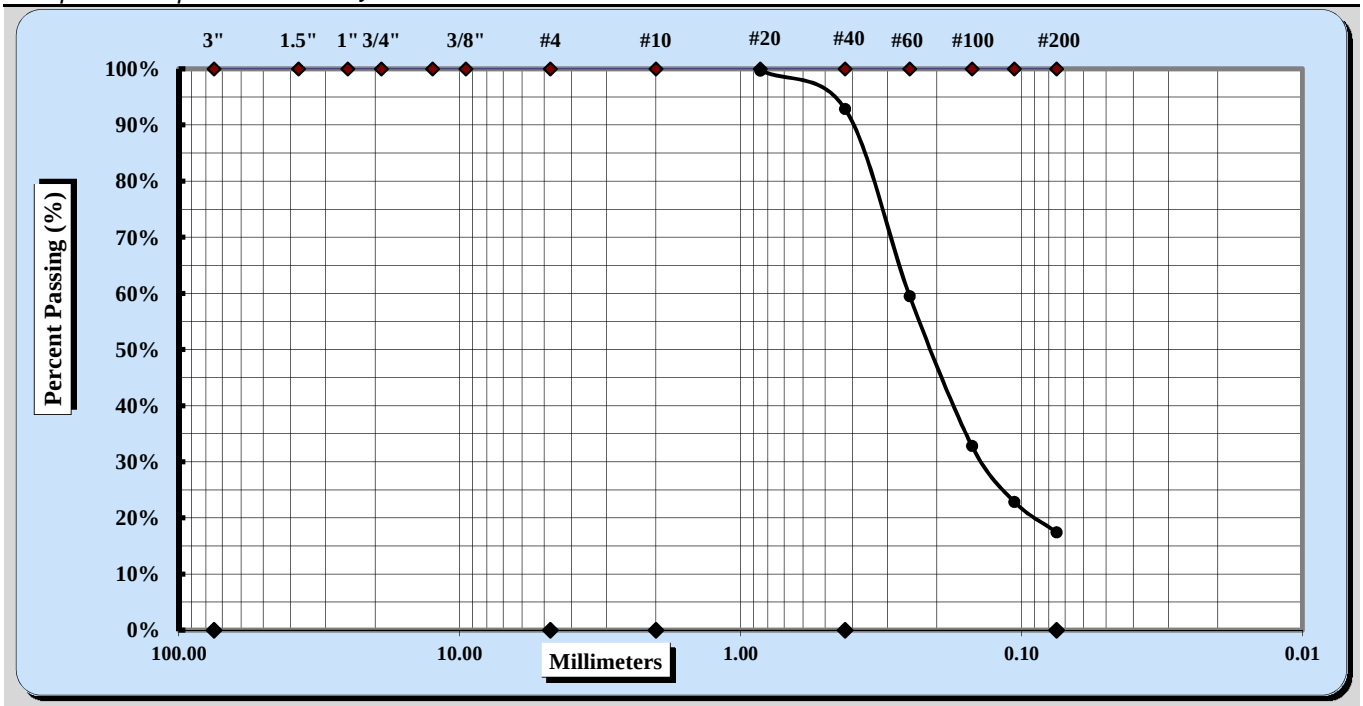
This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Sieve Analysis of Soils

Quality Assurance | *ASTM D6913 Method A*

S&ME, Inc. - Knoxville: 1413 Topside Road, Louisville, TN 37777

Project #:	**1461-16-047.2B**	Report Date:	5/23/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	5/5/18 - 5/22/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sample ID: B-62	Type: Split Spoon	Sample Date:	Various
Sample Log No.: 43-2321	Sample: 2	Depth:	2.0' - 4.0'
Sample Description:	Silty sand (SM, A-2-4)		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size	No. 20	Coarse Sand	0%	Fine Sand	75%
Gravel	0%	Medium Sand	7%	Silt & Clay	17%

Coarse Sand	0%	Medium Sand	7%	Fine Sand	75%
Description of Sand & Gravel Particles:		Rounded	☒	Angular	☐
Hard & Durable	☒	Soft	☒	Weathered & Friable	☐

Notes / Deviations / References:

Michael D. Kelso, E.I.		Staff Professional	5/23/2018
Technical Responsibility	*Signature*	*Position*	*Date*

This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

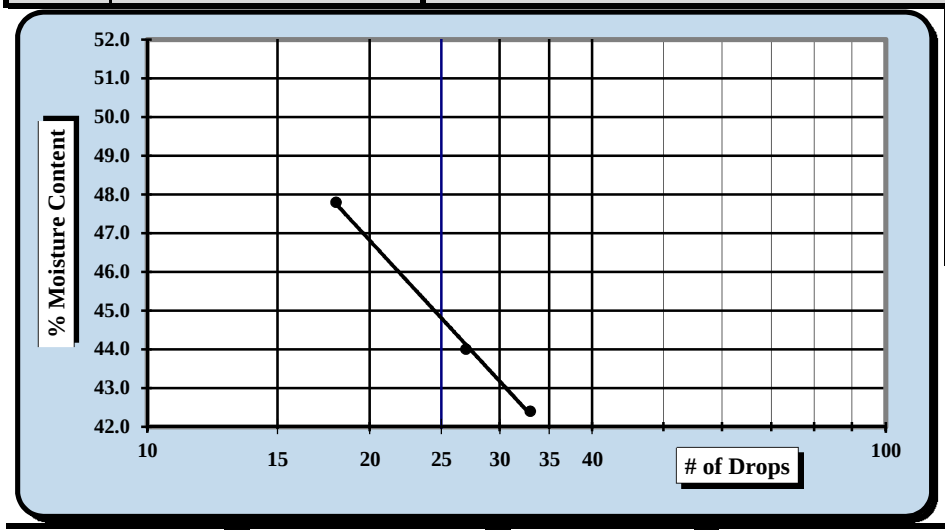
Quality Assurance ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Knoxville: 1413 Topside Road, Louisville, TN 37777

Project #:	1461-16-047.2B	Report Date:	5/23/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	5/19/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-62	Sample #: SS-5	Sample Date: Various
Log #:	43-2321		Depth: 8.0' - 10.0'
Sample Description:	Silt with sand (ML, A-7-5 (14))		

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	18435	4/10/2018	Grooving tool	32239	2/16/2018
LL Apparatus	18414	10/6/2017	No. 40 Sieve	31434	4/7/2018
Oven	12872	3/17/2018			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	8	15	6				18	11	
A	Tare Weight	15.52	15.32	15.45				15.42	15.43	
B	Wet Soil Weight + A	23.62	24.49	25.49				23.89	24.71	
C	Dry Soil Weight + A	21.00	21.69	22.50				21.96	22.58	
D	Water Weight (B-C)	2.62	2.80	2.99				1.93	2.13	
E	Dry Soil Weight (C-A)	5.48	6.37	7.05				6.54	7.15	
F	% Moisture (D/E)*100	47.8%	44.0%	42.4%				29.5%	29.8%	
N	# OF DROPS	18	27	33				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**29.7%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**45**
Plastic Limit	**30**
Plastic Index	**15**
Group Symbol	**ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑

Notes / Deviations / References: Group symbol is for minus No. 40 portion only.

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Derek Baker	5/19/2018	Michael D. Kelso, E.I.	5/23/2018
Technician Name	*Date*	*Technical Responsibility*	*Date*

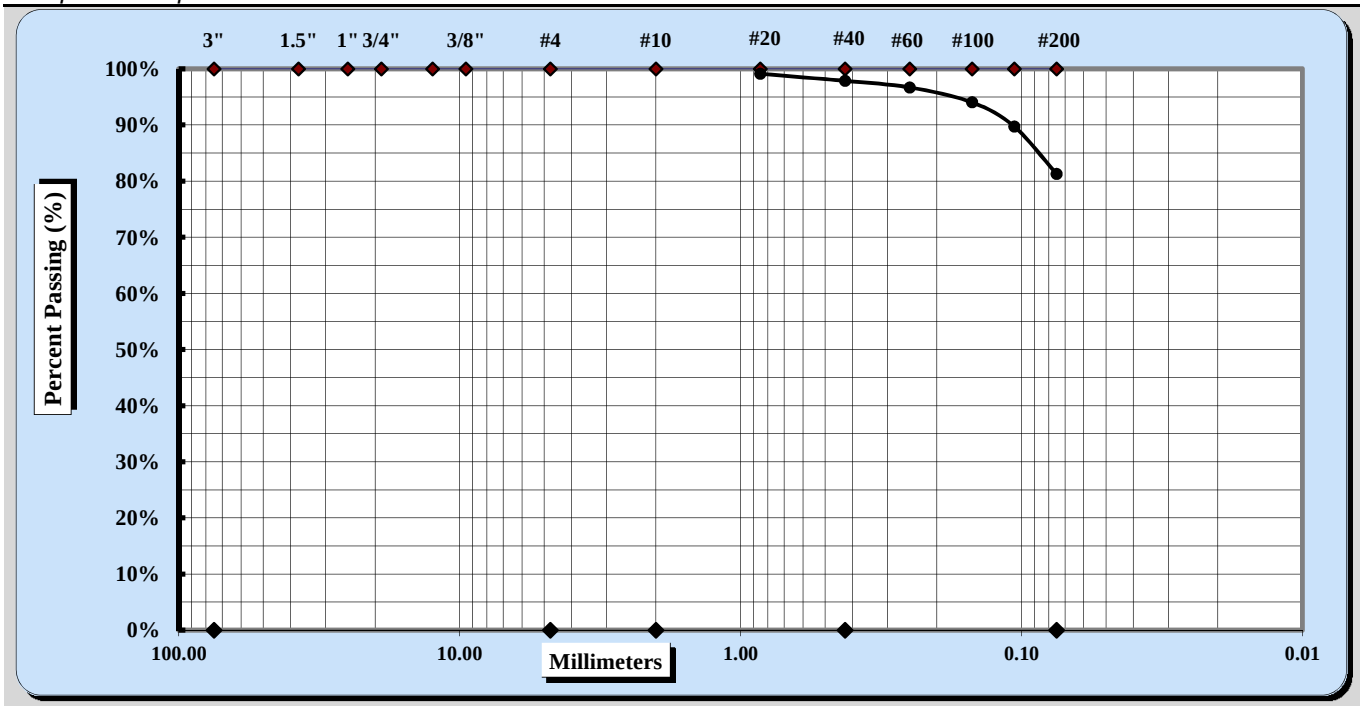
This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Sieve Analysis of Soils

Quality Assurance | *ASTM D6913 Method A*

S&ME, Inc. - Knoxville: 1413 Topside Road, Louisville, TN 37777

Project #:	**1461-16-047.2B**	Report Date:	5/23/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	5/5/18 - 5/22/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sample ID: B-62	Type: Split Spoon	Sample Date:	Various
Sample Log No.: 43-2321	Sample: 5	Depth:	8.0' - 10.0'
Sample Description:	Silt with sand (ML, A-7-5 (14))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size	No. 20	Coarse Sand	0%	Fine Sand	17%
Gravel	0%	Medium Sand	2%	Silt & Clay	81%
Liquid Limit	45	Plastic Limit	30	Plastic Index	15

Coarse Sand	0%	Medium Sand	2%	Fine Sand	17%
Description of Sand & Gravel Particles:			Rounded ☒	Angular ☒	
Hard & Durable ☒		Soft ☒		Weathered & Friable ☒	

Notes / Deviations / References:

Michael D. Kelso, E.I.		Staff Professional	5/23/2018
Technical Responsibility	*Signature*	*Position*	*Date*

This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

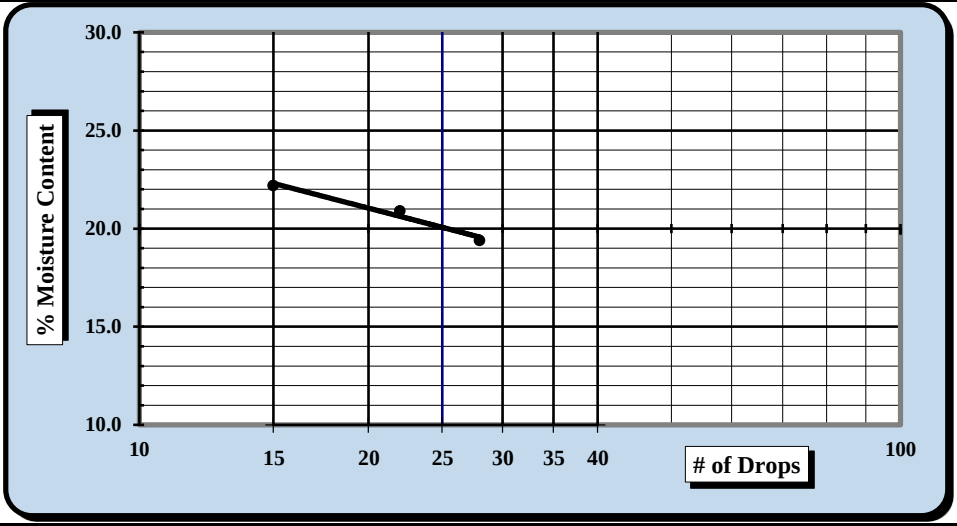
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	4/04/18
Project Name:	Carolina Crossroads Project	Test Date:	4/03/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	W-22	Sample #:	SS-1	Sample Date:	2/07/18
Location:	Wall Boring	Type:	Split-spoon	Depth:	0.0' - 2.0'
Sample Description:	Silty Clayey Sand (SC-SM, A-2-4)				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	1	2	3				4	5	
A	Tare Weight	26.69	26.46	26.32				25.93	26.94	
B	Wet Soil Weight + A	48.75	44.17	46.75				33.85	33.63	
C	Dry Soil Weight + A	45.16	41.11	43.04				32.89	32.82	
D	Water Weight (B-C)	3.59	3.06	3.71				0.96	0.81	
E	Dry Soil Weight (C-A)	18.47	14.65	16.72				6.96	5.88	
F	% Moisture (D/E)*100	19.4%	20.9%	22.2%				13.8%	13.8%	
N	# OF DROPS	28	22	15				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**13.8%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**20**
Plastic Limit	**14**
Plastic Index	**6**
Group Symbol	**CL-ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	4/04/18	Matthew F. Cooke, P.G.	4/04/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

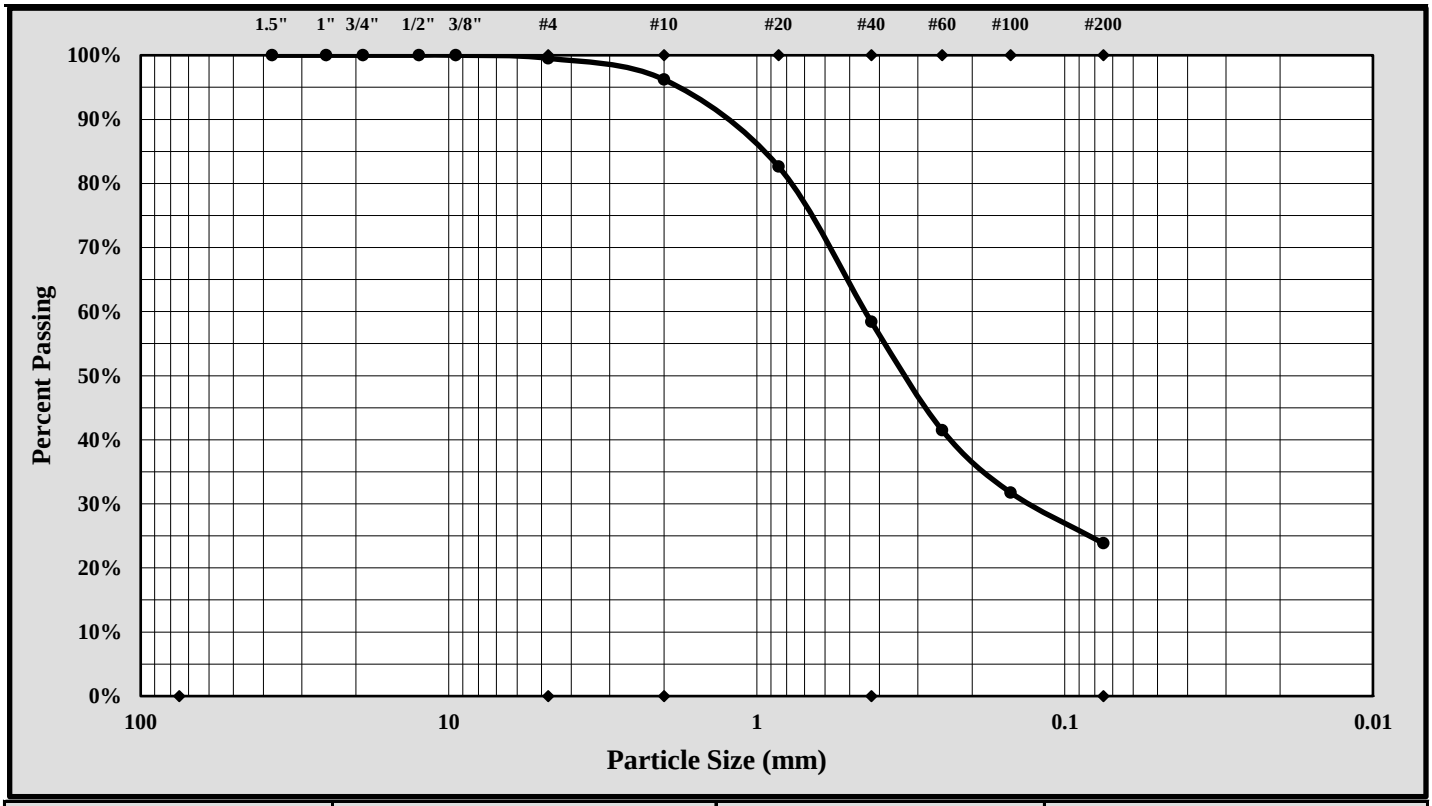
This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	4/04/18
Project Name:	Carolina Crossroads Project	Test Date(s):	3/26 - 4/04/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	W-22	Sample #: SS-1	Sample Date: 2/07/18
Location:	Wall Boring	Type: Split-spoon	Depth: 0.0' - 2.0'
Sample Description:	Silty Clayey Sand (SC-SM, A-2-4)		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	4.75 mm	Gravel:	0.5%
Silt & Clay (% Passing #200):	23.8%	Total Sand:	75.7%

Liquid Limit	20	Plastic Limit	14	Plastic Index	6
Coarse Sand:	3.3%	Medium Sand:	37.8%	Fine Sand:	34.6%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/04/18 — *Date*

This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

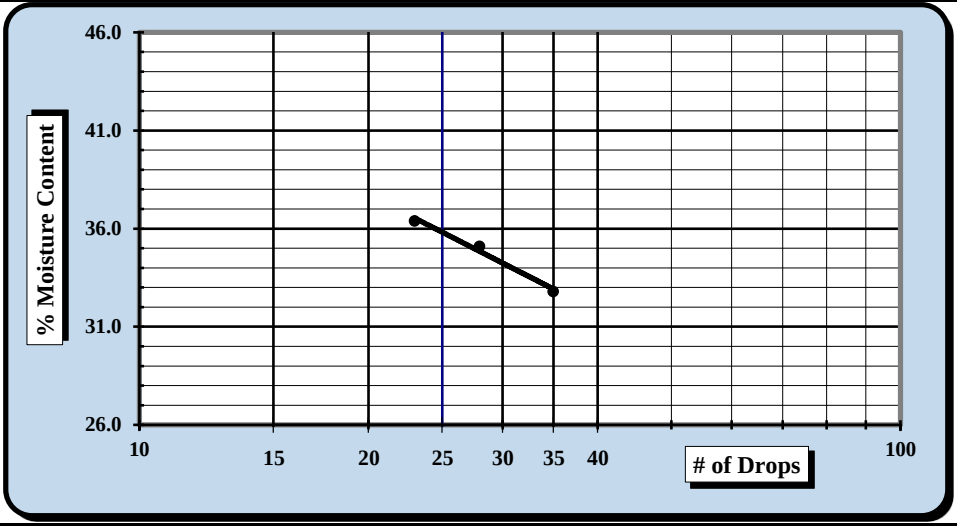
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	4/04/18
Project Name:	Carolina Crossroads Project	Test Date:	4/03/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	W-22	Sample #:	SS-4	Sample Date:	2/07/18
Location:	Wall Boring	Type:	Split-spoon	Depth:	6.0' - 8.0'
Sample Description:	Silty Sand (SM, A-6(2))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	6	7	8				9	10	
A	Tare Weight	27.76	26.29	27.33				26.84	26.75	
B	Wet Soil Weight + A	44.24	43.69	41.54				32.91	33.64	
C	Dry Soil Weight + A	40.17	39.17	37.75				31.71	32.26	
D	Water Weight (B-C)	4.07	4.52	3.79				1.20	1.38	
E	Dry Soil Weight (C-A)	12.41	12.88	10.42				4.87	5.51	
F	% Moisture (D/E)*100	32.8%	35.1%	36.4%				24.6%	25.0%	
N	# OF DROPS	35	28	23				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**24.8%**		



One Point Liquid Limit

N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**36**
Plastic Limit	**25**
Plastic Index	**11**
Group Symbol	**ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	4/04/18	Matthew F. Cooke, P.G.	4/04/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

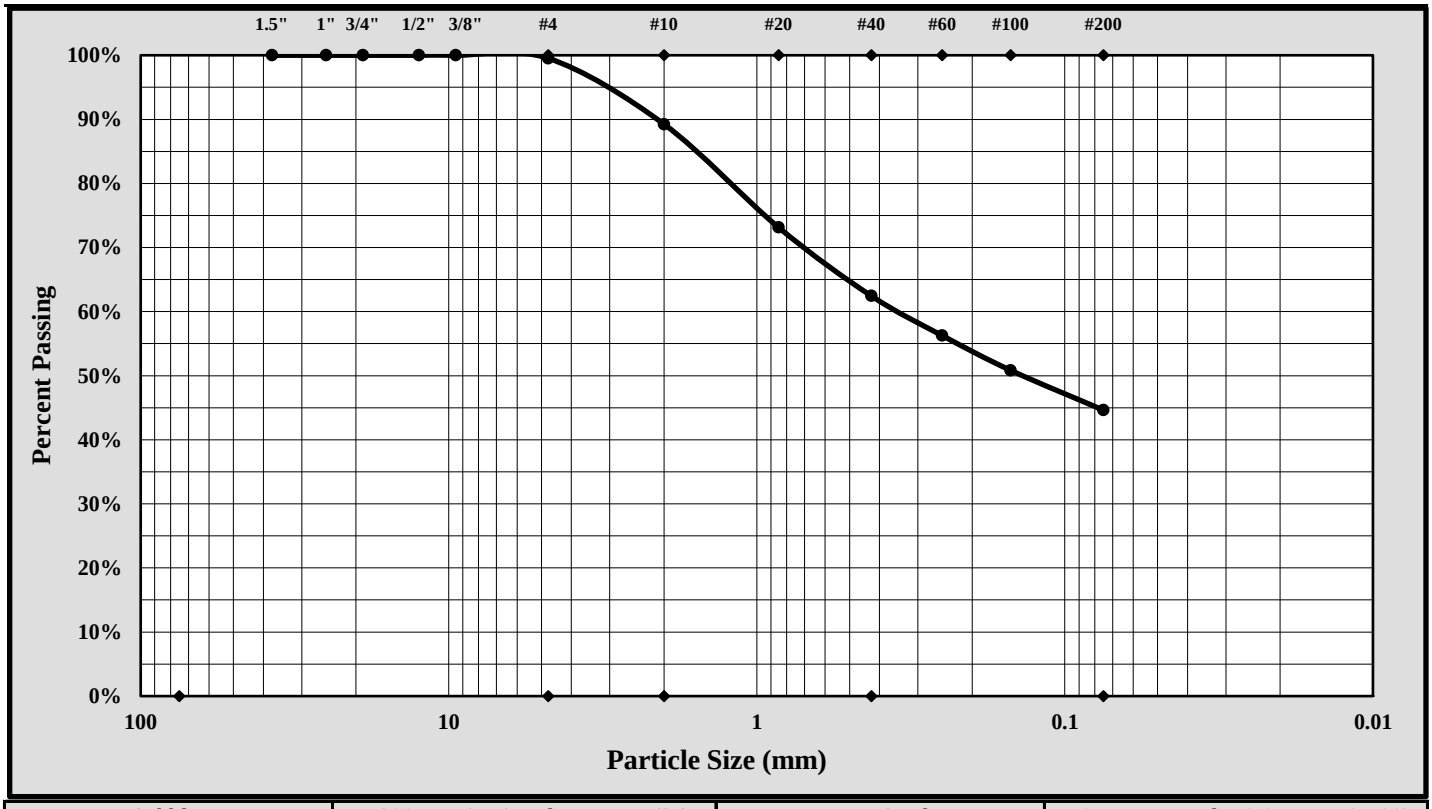
This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	4/04/18
Project Name:	Carolina Crossroads Project	Test Date(s):	3/26 - 4/04/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	W-22 Sample #: SS-4	Sample Date:	2/07/18
Location:	Wall Boring Type: Split-spoon	Depth:	6.0' - 8.0'
Sample Description:	Silty Sand (SM, A-6(2))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	4.75 mm	Gravel:	0.5%
Silt & Clay (% Passing #200):	44.6%	Total Sand:	54.9%

Liquid Limit	36	Plastic Limit	25	Plastic Index	11
Coarse Sand:	10.3%	Medium Sand:	26.8%	Fine Sand:	17.8%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/04/18 — *Date*

This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

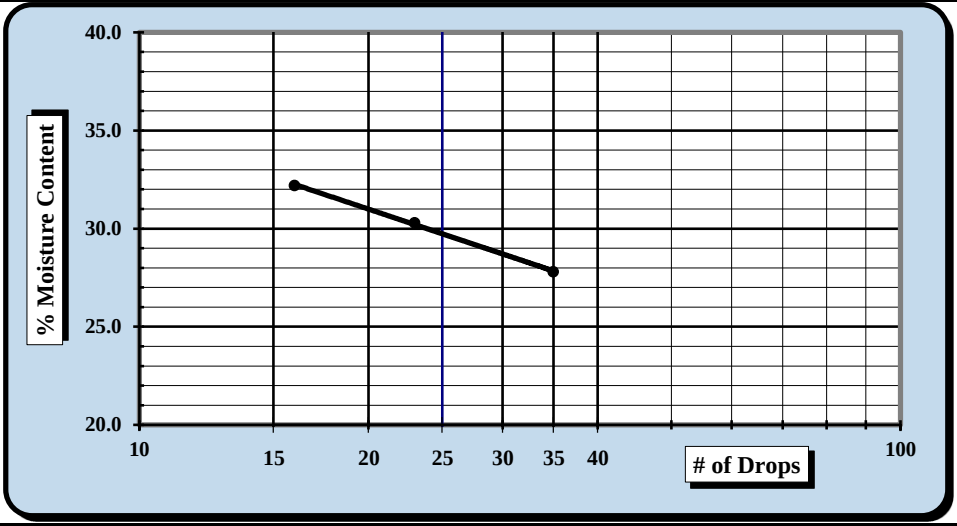
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	4/04/18
Project Name:	Carolina Crossroads Project	Test Date:	4/03/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	W-22	Sample #:	SS-6	Sample Date:	2/07/18
Location:	Wall Boring	Type:	Split-spoon	Depth:	13.5' - 15.0'
Sample Description:	Silty Clayey Sand (SC-SM, A-2-4)				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	11	12	13				14	15	
A	Tare Weight	26.68	26.63	26.75				26.65	27.60	
B	Wet Soil Weight + A	43.88	43.99	46.09				33.04	34.00	
C	Dry Soil Weight + A	40.14	39.95	41.38				31.84	32.80	
D	Water Weight (B-C)	3.74	4.04	4.71				1.20	1.20	
E	Dry Soil Weight (C-A)	13.46	13.32	14.63				5.19	5.20	
F	% Moisture (D/E)*100	27.8%	30.3%	32.2%				23.1%	23.1%	
N	# OF DROPS	35	23	16				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**23.1%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**30**
Plastic Limit	**23**
Plastic Index	**7**
Group Symbol	**CL-ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	4/04/18	Matthew F. Cooke, P.G.	4/04/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

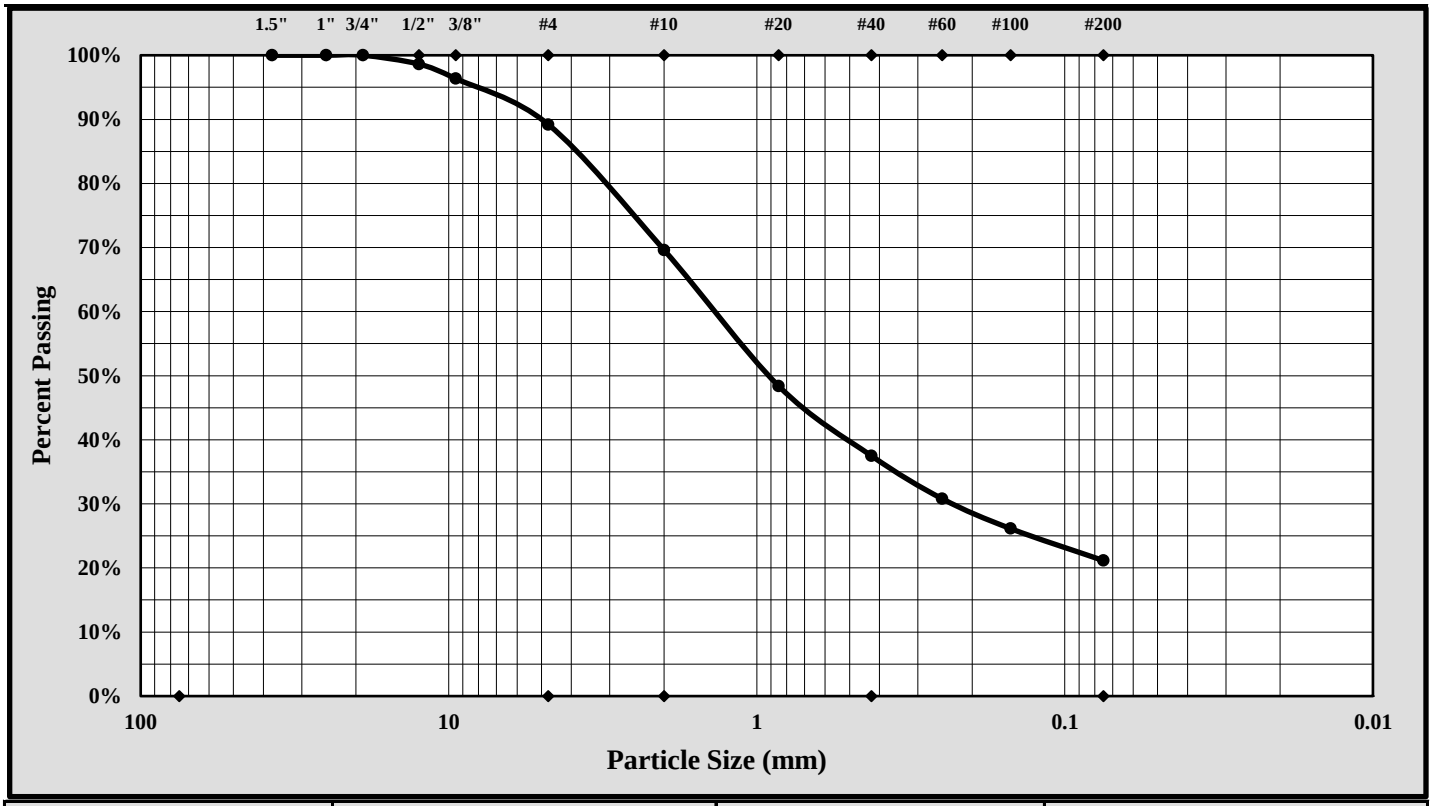
This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	4/04/18
Project Name:	Carolina Crossroads Project	Test Date(s):	3/26 - 4/04/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	W-22	Sample #: SS-6	Sample Date: 2/07/18
Location:	Wall Boring	Type: Split-spoon	Depth: 13.5' - 15.0'
Sample Description:	Silty Clayey Sand (SC-SM, A-2-4)		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	19.0 mm	Gravel:	10.8%
Silt & Clay (% Passing #200):	21.2%	Total Sand:	68.0%

Liquid Limit	30	Plastic Limit	23	Plastic Index	7
Coarse Sand:	19.6%	Medium Sand:	32.1%	Fine Sand:	16.4%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/04/18 — *Date*

This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

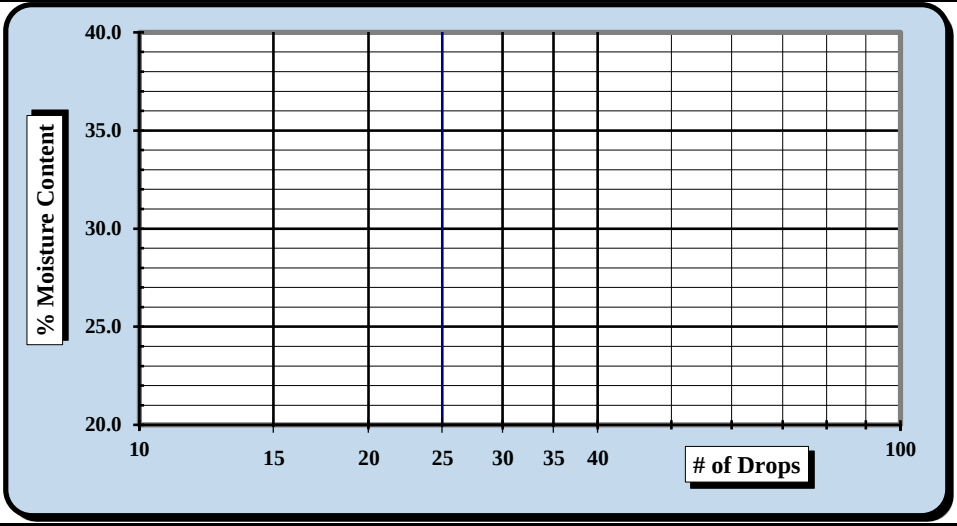
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	4/04/18
Project Name:	Carolina Crossroads Project	Test Date:	4/03/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	W-22	Sample #:	SS-8	Sample Date:	2/07/18
Location:	Wall Boring	Type:	Split-spoon	Depth:	23.5' - 25.0'
Sample Description:	Silty Sand (SM, A-2-4)				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

	Pan # / Tare #:	Liquid Limit						Plastic Limit		
A	Tare Weight									
B	Wet Soil Weight + A									
C	Dry Soil Weight + A									
D	Water Weight (B-C)									
E	Dry Soil Weight (C-A)									
F	% Moisture (D/E)*100									
N	# OF DROPS							*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*									



One Point Liquid Limit

N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☒

Liquid Limit	---
Plastic Limit	**NP**
Plastic Index	**NP**
Group Symbol	**ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	4/04/18	Matthew F. Cooke, P.G.	4/04/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

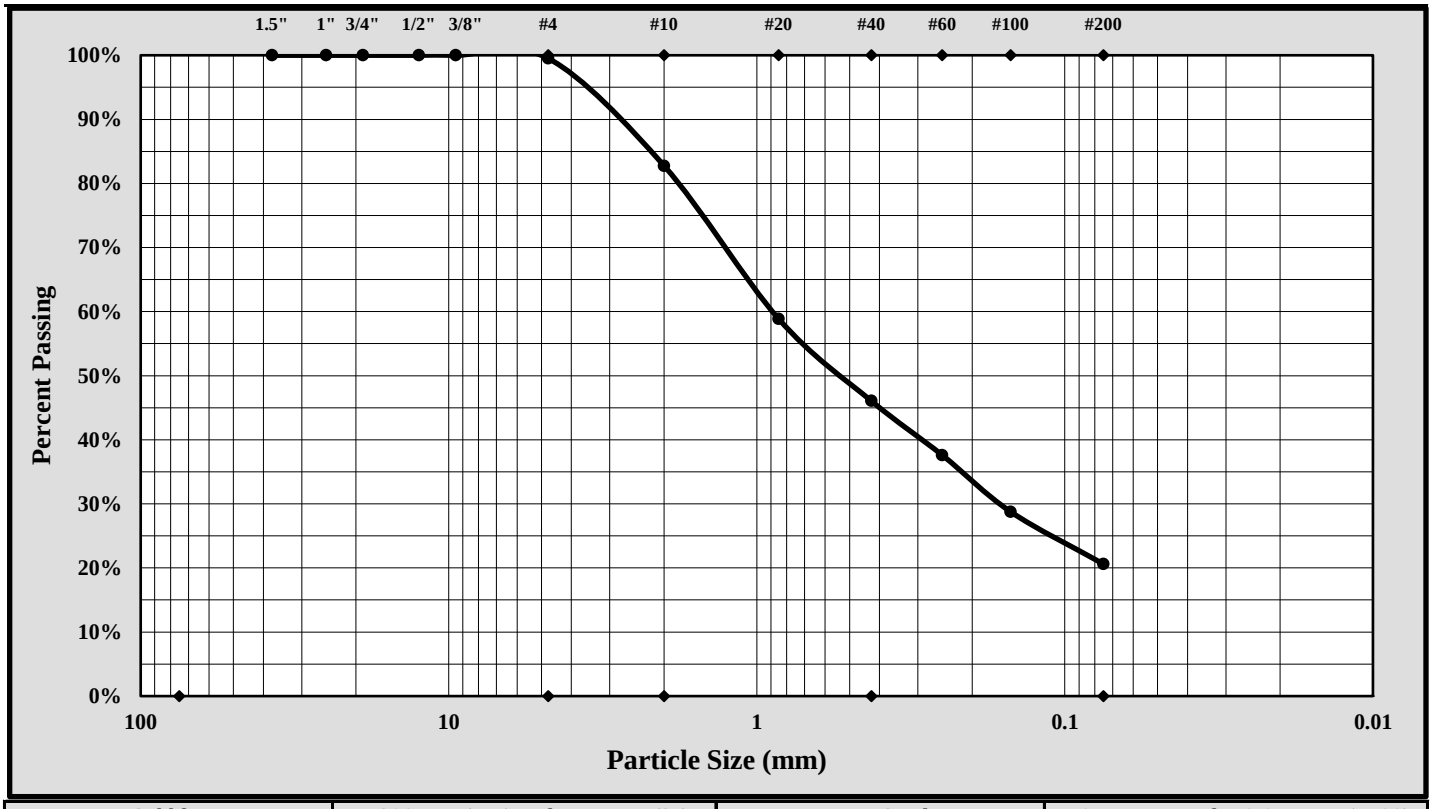
This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	4/04/18
Project Name:	Carolina Crossroads Project	Test Date(s):	3/26 - 4/04/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	W-22	Sample #: SS-8	Sample Date: 2/07/18
Location:	Wall Boring	Type: Split-spoon	Depth: 23.5' - 25.0'
Sample Description:	Silty Sand (SM, A-2-4)		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	4.75 mm	Gravel:	0.5%
Silt & Clay (% Passing #200):	20.6%	Total Sand:	78.9%

Liquid Limit	---	Plastic Limit	NP	Plastic Index	NP
Coarse Sand:	16.7%	Medium Sand:	36.7%	Fine Sand:	25.4%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/04/18 — *Date*

This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

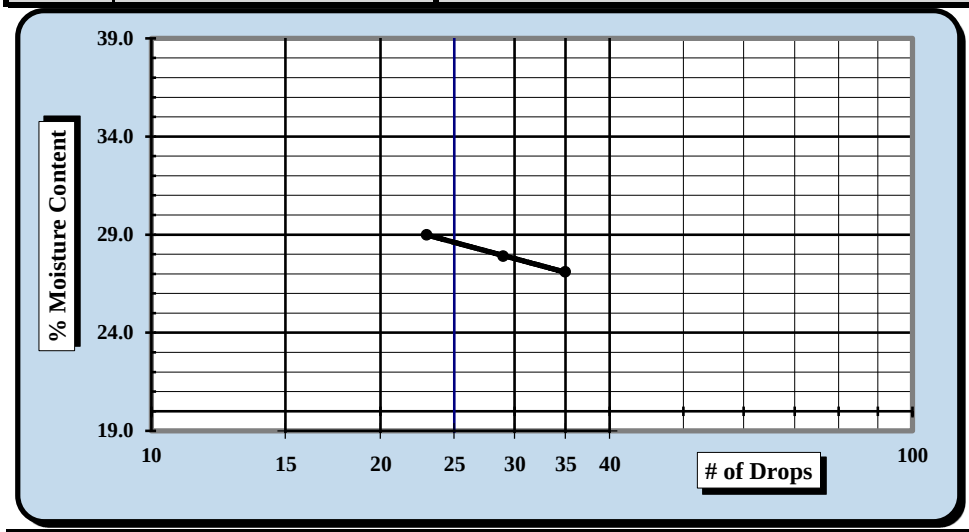
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	4/26/18
Project Name:	Carolina Crossroads Project	Test Date:	4/23/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	W-23	Sample #:	SS-1	Sample Date:	3/05/18
Location:	Wall Boring	Type:	Split-spoon	Depth:	0.2' - 2.2'
Sample Description:	Clayey Sand with Gravel (SC, A-2-6(1))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	46	47	48				49	50	
A	Tare Weight	27.57	25.83	26.38				28.66	28.90	
B	Wet Soil Weight + A	42.07	37.23	38.53				35.48	36.41	
C	Dry Soil Weight + A	38.98	34.74	35.80				34.63	35.46	
D	Water Weight (B-C)	3.09	2.49	2.73				0.85	0.95	
E	Dry Soil Weight (C-A)	11.41	8.91	9.42				5.97	6.56	
F	% Moisture (D/E)*100	27.1%	27.9%	29.0%				14.2%	14.5%	
N	# OF DROPS	35	29	23				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**14.4%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐
Liquid Limit **29**
Plastic Limit **14**
Plastic Index **15**
Group Symbol **CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	4/26/18	Matthew F. Cooke, P.G.	4/26/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

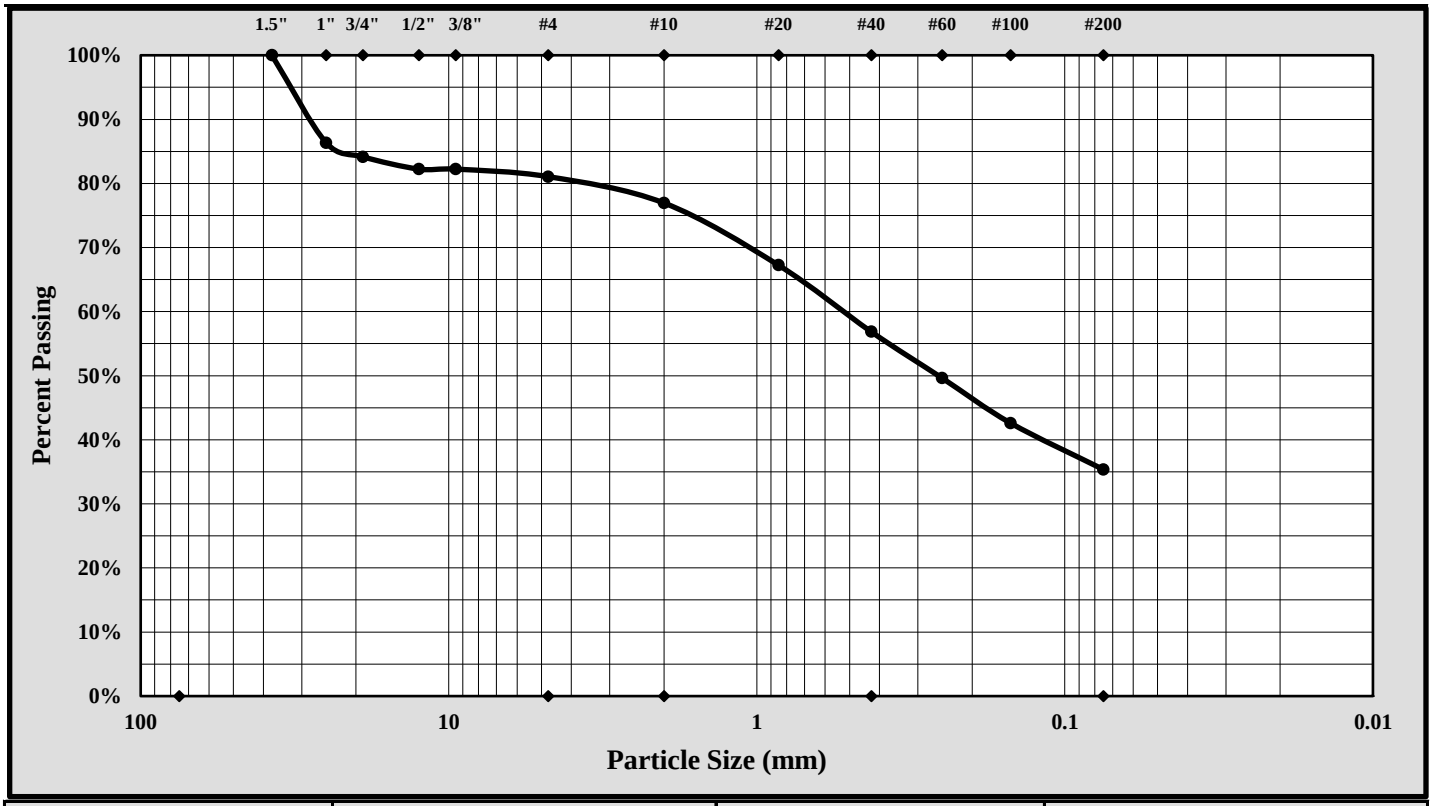
This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	4/26/18
Project Name:	Carolina Crossroads Project	Test Date(s):	4/12 - 4/26/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	W-23	Sample #: SS-1	Sample Date: 3/05/18
Location:	Wall Boring	Type: Split-spoon	Depth: 0.2' - 2.2'
Sample Description:	Clayey Sand with Gravel (SC, A-2-6(1))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	37.5 mm	Gravel:	18.9%
Silt & Clay (% Passing #200):	35.4%	Total Sand:	45.7%

Liquid Limit	29	Plastic Limit	14	Plastic Index	15
Coarse Sand:	4.1%	Medium Sand:	20.1%	Fine Sand:	21.5%

Description of Sand and Gravel — Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/26/18 — *Date*

This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	4/26/18
Project Name:	Carolina Crossroads Project	Test Date:	4/23/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	W-23	Sample #:	SS-4	Sample Date:	3/05/18
Location:	Wall Boring	Type:	Split-spoon	Depth:	6.2' - 8.2'

Sample Description: Fat Clay with Sand (CH, A-7-6(32))

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	51	52	53				54	55	
A	Tare Weight	28.45	24.98	28.39				27.60	26.01	
B	Wet Soil Weight + A	43.65	41.21	44.58				35.10	32.14	
C	Dry Soil Weight + A	38.19	35.12	38.13				33.80	31.08	
D	Water Weight (B-C)	5.46	6.09	6.45				1.30	1.06	
E	Dry Soil Weight (C-A)	9.74	10.14	9.74				6.20	5.07	
F	% Moisture (D/E)*100	56.1%	60.1%	66.2%				21.0%	20.9%	
N	# OF DROPS	35	25	15				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**21.0%**		



One Point Liquid Limit

N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**60**
Plastic Limit	**21**
Plastic Index	**39**
Group Symbol	**CH**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	4/26/18	Matthew F. Cooke, P.G.	4/26/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

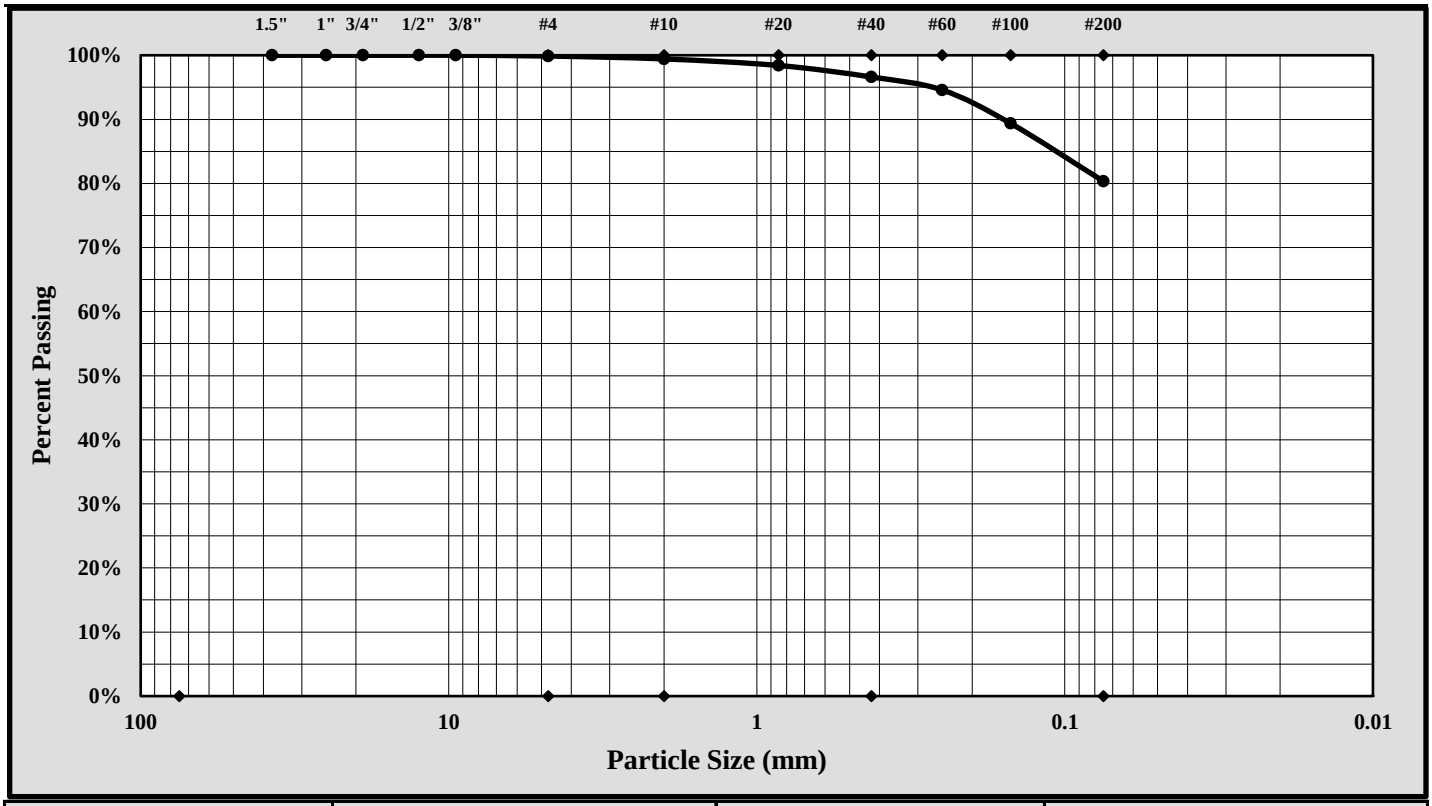
This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	4/26/18
Project Name:	Carolina Crossroads Project	Test Date(s):	4/12 - 4/26/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	W-23	Sample #: SS-4	Sample Date: 3/05/18
Location:	Wall Boring	Type: Split-spoon	Depth: 6.2' - 8.2'
Sample Description:	Fat Clay with Sand (CH, A-7-6(32))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	2.00 mm	Gravel:	0.1%
Silt & Clay (% Passing #200):	80.3%	Total Sand:	19.5%

Liquid Limit	60	Plastic Limit	21	Plastic Index	39
Coarse Sand:	0.4%	Medium Sand:	2.8%	Fine Sand:	16.3%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/26/18 — *Date*

This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	3/09/18
Project Name:	Carolina Crossroads Project	Test Date:	3/08/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	RW-35	Sample #:	SS-3	Sample Date:	1/24/18
Location:	Embankment Boring	Type:	Split-spoon	Depth:	4.0' - 6.0'
Sample Description:	Sandy Silt (ML, A-7-5 (11))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	11	12	13				14	15	
A	Tare Weight	26.67	26.66	26.78				26.66	27.61	
B	Wet Soil Weight + A	44.06	41.88	42.03				34.26	34.53	
C	Dry Soil Weight + A	38.59	36.98	36.89				32.46	32.88	
D	Water Weight (B-C)	5.47	4.90	5.14				1.80	1.65	
E	Dry Soil Weight (C-A)	11.92	10.32	10.11				5.80	5.27	
F	% Moisture (D/E)*100	45.9%	47.5%	50.8%				31.0%	31.3%	
N	# OF DROPS	35	28	20				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**31.2%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐
Liquid Limit **49**
Plastic Limit **31**
Plastic Index **18**
Group Symbol **ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ % Passing the #200 Sieve: 64.2%

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	3/09/18		3/09/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

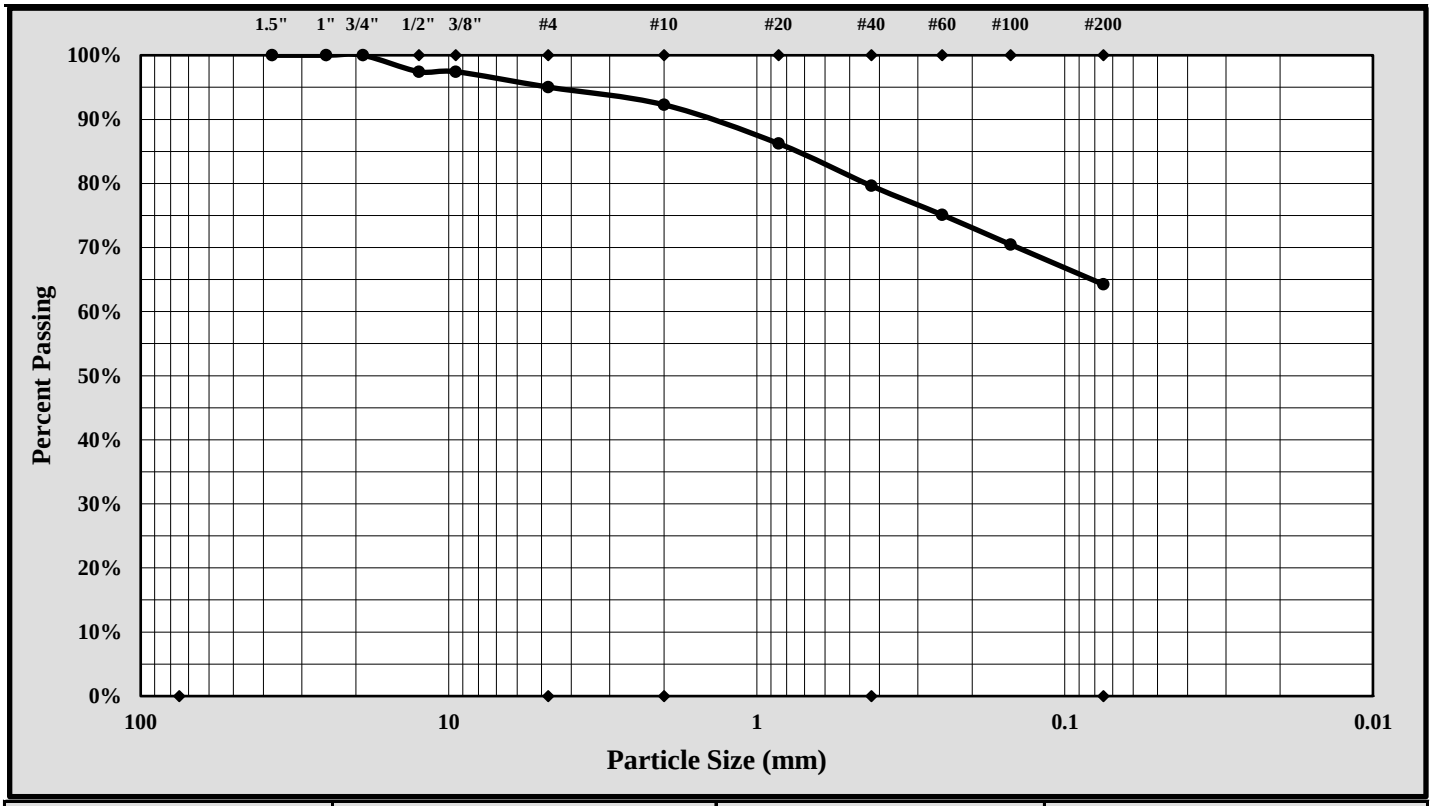
This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	3/09/18
Project Name:	Carolina Crossroads Project	Test Date(s):	2/28 - 3/09/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	RW-35 Sample #: SS-3	Sample Date:	1/24/18
Location:	Embankment Boring Type: Split-spoon	Depth:	4.0' - 6.0'
Sample Description:	Sandy Silt (ML, A-7-5 (11))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	19.0 mm	Gravel:	5.0%
Silt & Clay (% Passing #200):	64.2%	Total Sand:	30.8%

Liquid Limit	49	Plastic Limit	31	Plastic Index	18
Coarse Sand:	2.8%	Medium Sand:	12.6%	Fine Sand:	15.4%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Brian Vaughan, P.E.	Brian Vaughan	Group Leader	3/09/18
Technical Responsibility	*Signature*	*Position*	*Date*

This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	3/09/18
Project Name:	Carolina Crossroads Project	Test Date:	3/08/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	RW-35	Sample #:	SS-5	Sample Date:	1/24/18
Location:	Embankment Boring	Type:	Split-spoon	Depth:	8.0' - 10.0'
Sample Description:	Lean Clay (CL, A-4(7))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	16	17	18				19	20	
A	Tare Weight	26.57	26.63	26.77				26.68	26.83	
B	Wet Soil Weight + A	47.62	48.50	46.73				33.75	33.63	
C	Dry Soil Weight + A	43.07	43.55	42.02				32.45	32.39	
D	Water Weight (B-C)	4.55	4.95	4.71				1.30	1.24	
E	Dry Soil Weight (C-A)	16.50	16.92	15.25				5.77	5.56	
F	% Moisture (D/E)*100	27.6%	29.3%	30.9%				22.5%	22.3%	
N	# OF DROPS	35	27	20				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**22.4%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐
Liquid Limit **30**
Plastic Limit **22**
Plastic Index **8**
Group Symbol **CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ % Passing the #200 Sieve: 92.8%

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski — *Technician Name*
3/09/18 — *Date*
Brian Vaughn — *Technical Responsibility*
3/09/18 — *Date*

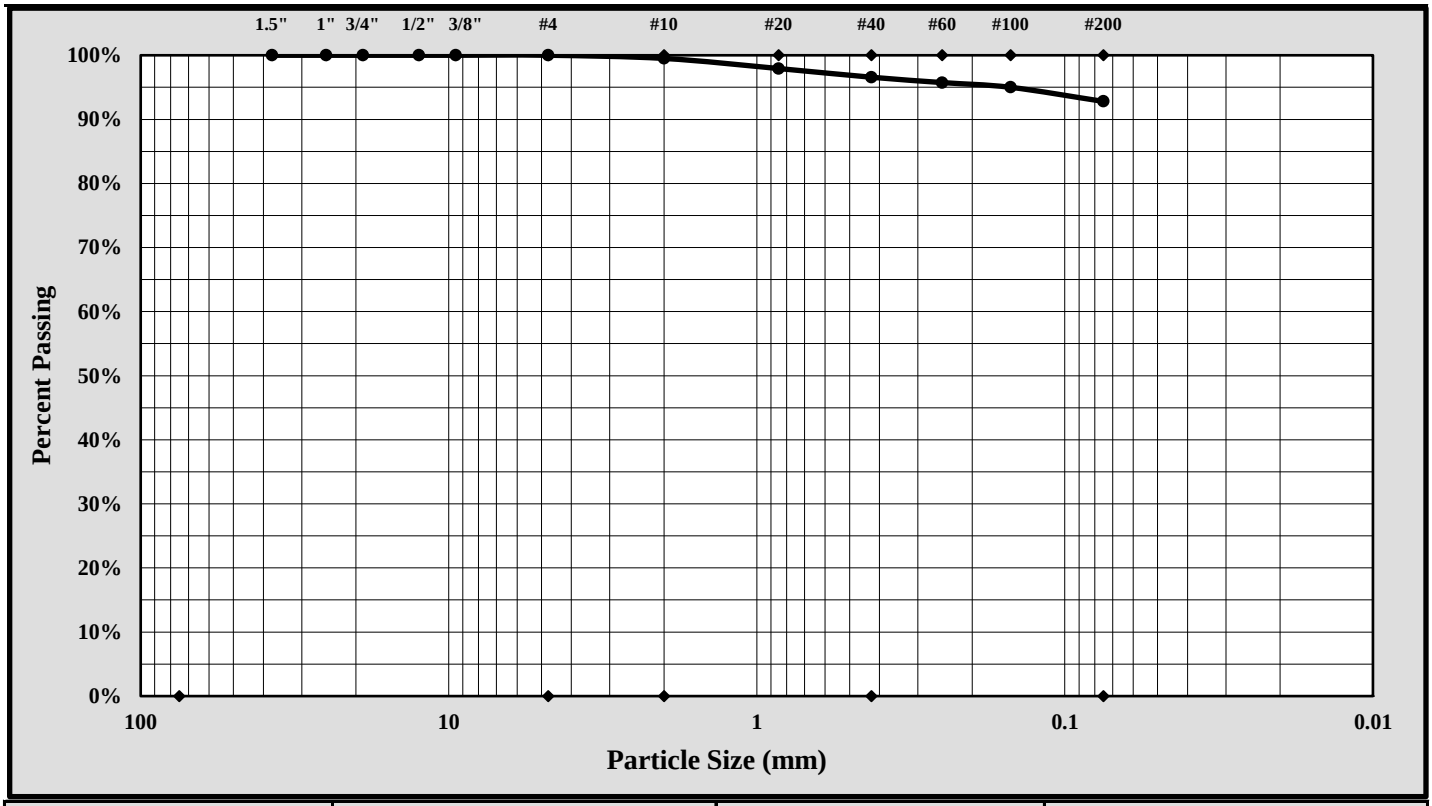
This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	3/09/18
Project Name:	Carolina Crossroads Project	Test Date(s):	2/28 - 3/09/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	RW-35 Sample #: SS-5	Sample Date:	1/24/18
Location:	Embankment Boring Type: Split-spoon	Depth:	8.0' - 10.0'
Sample Description:	Lean Clay (CL, A-4(7))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	2.00 mm	Gravel:	0.0%
Silt & Clay (% Passing #200):	92.8%	Total Sand:	7.2%

Liquid Limit	30	Plastic Limit	22	Plastic Index	8
Coarse Sand:	0.5%	Medium Sand:	2.9%	Fine Sand:	3.8%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Brian Vaughan, P.E.	Brian Vaughan	Group Leader	3/09/18
Technical Responsibility	*Signature*	*Position*	*Date*

This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

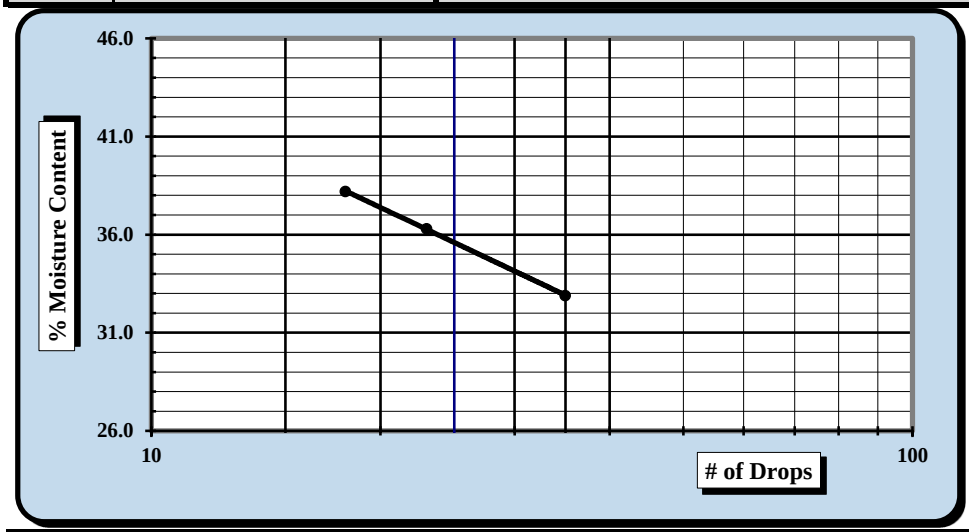
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	3/09/18
Project Name:	Carolina Crossroads Project	Test Date:	3/08/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	RW-35	Sample #:	SS-8	Sample Date:	1/24/18
Location:	Embankment Boring	Type:	Split-spoon	Depth:	23.5' - 25.0'
Sample Description:	Silt with Sand (ML, A-4(6))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	21	22	23				24	25	
A	Tare Weight	28.09	25.69	27.22				26.00	26.83	
B	Wet Soil Weight + A	45.65	43.50	47.62				32.83	33.29	
C	Dry Soil Weight + A	41.30	38.76	41.98				31.42	31.94	
D	Water Weight (B-C)	4.35	4.74	5.64				1.41	1.35	
E	Dry Soil Weight (C-A)	13.21	13.07	14.76				5.42	5.11	
F	% Moisture (D/E)*100	32.9%	36.3%	38.2%				26.0%	26.4%	
N	# OF DROPS	35	23	18				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**26.2%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**36**
Plastic Limit	**26**
Plastic Index	**10**
Group Symbol	**ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ % Passing the #200 Sieve: 70.3%

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	3/09/18	Brian Vaughn	3/09/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

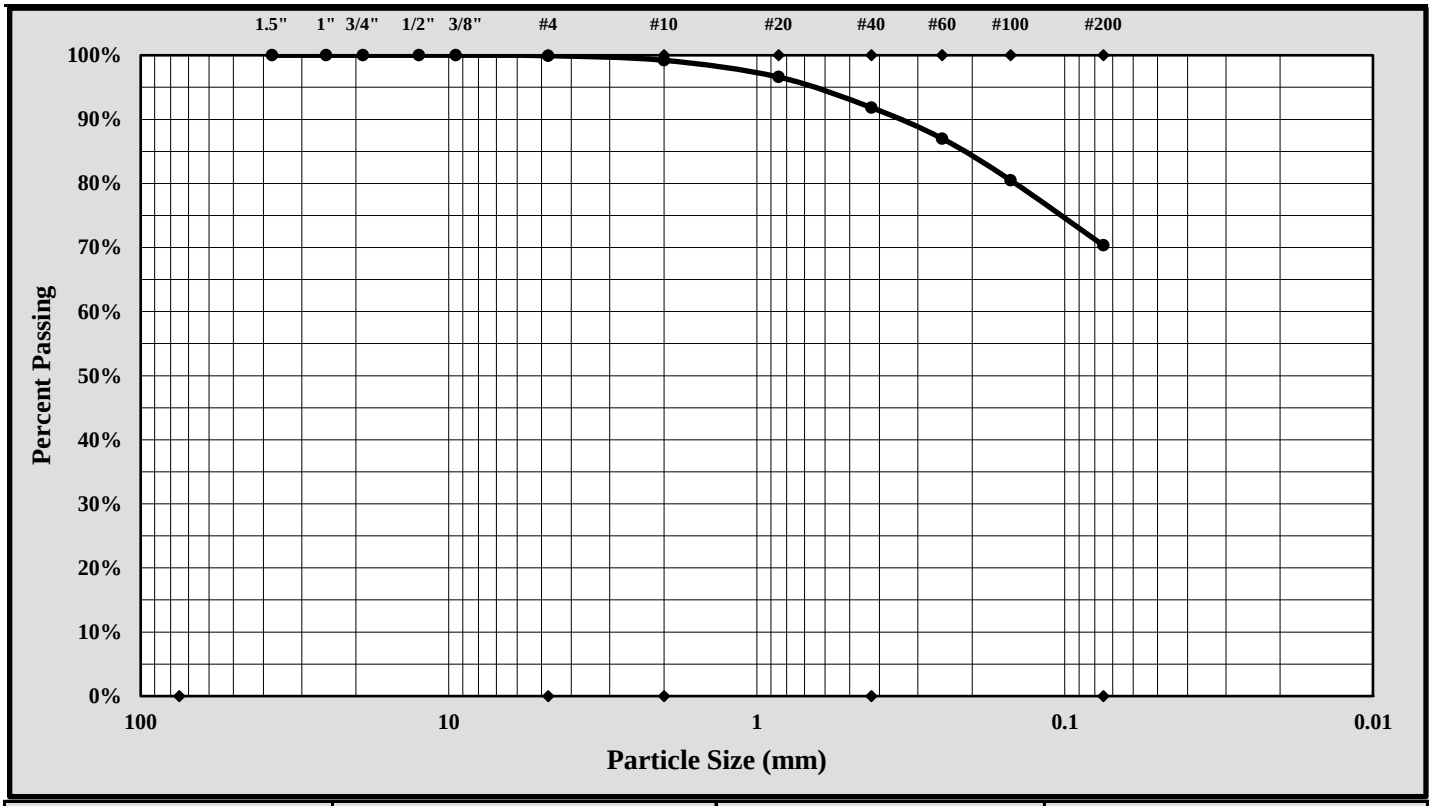
This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	3/09/18
Project Name:	Carolina Crossroads Project	Test Date(s):	2/28 - 3/09/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	RW-35 Sample #: SS-8	Sample Date:	1/24/18
Location:	Embankment Boring Type: Split-spoon	Depth:	23.5' - 25.0'
Sample Description:	Silt with Sand (ML, A-4(6))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	2.00 mm	Gravel:	0.1%
Silt & Clay (% Passing #200):	70.3%	Total Sand:	29.6%

Liquid Limit	36	Plastic Limit	26	Plastic Index	10
Coarse Sand:	0.7%	Medium Sand:	7.4%	Fine Sand:	21.5%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Brian Vaughan, P.E.	Brian Vaughan	Group Leader	3/09/18
Technical Responsibility	*Signature*	*Position*	*Date*

This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

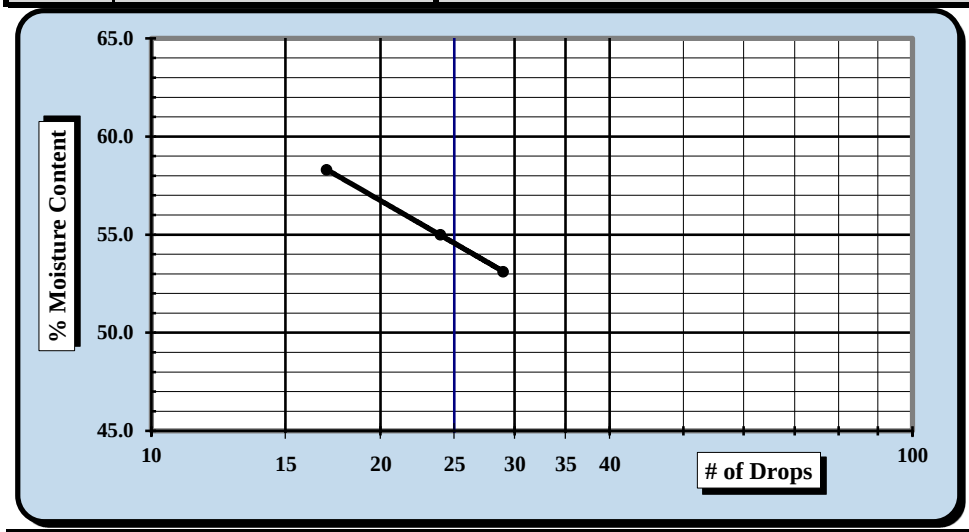
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	4/26/18
Project Name:	Carolina Crossroads Project	Test Date:	4/21/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	RW-36	Sample #:	SS-1	Sample Date:	3/01/18
Location:	Embankment Boring	Type:	Split-spoon	Depth:	0.0' - 2.0'
Sample Description:	Fat Clay with Sand (CH, A-7-6(23))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	11	12	13				14	15	
A	Tare Weight	26.68	26.66	26.78				26.65	27.61	
B	Wet Soil Weight + A	43.69	39.73	41.72				33.48	34.88	
C	Dry Soil Weight + A	37.79	35.09	36.22				32.12	33.43	
D	Water Weight (B-C)	5.90	4.64	5.50				1.36	1.45	
E	Dry Soil Weight (C-A)	11.11	8.43	9.44				5.47	5.82	
F	% Moisture (D/E)*100	53.1%	55.0%	58.3%				24.9%	24.9%	
N	# OF DROPS	29	24	17				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**24.9%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**55**
Plastic Limit	**25**
Plastic Index	**30**
Group Symbol	**CH**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	4/26/18	Matthew F. Cooke, P.G.	4/26/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

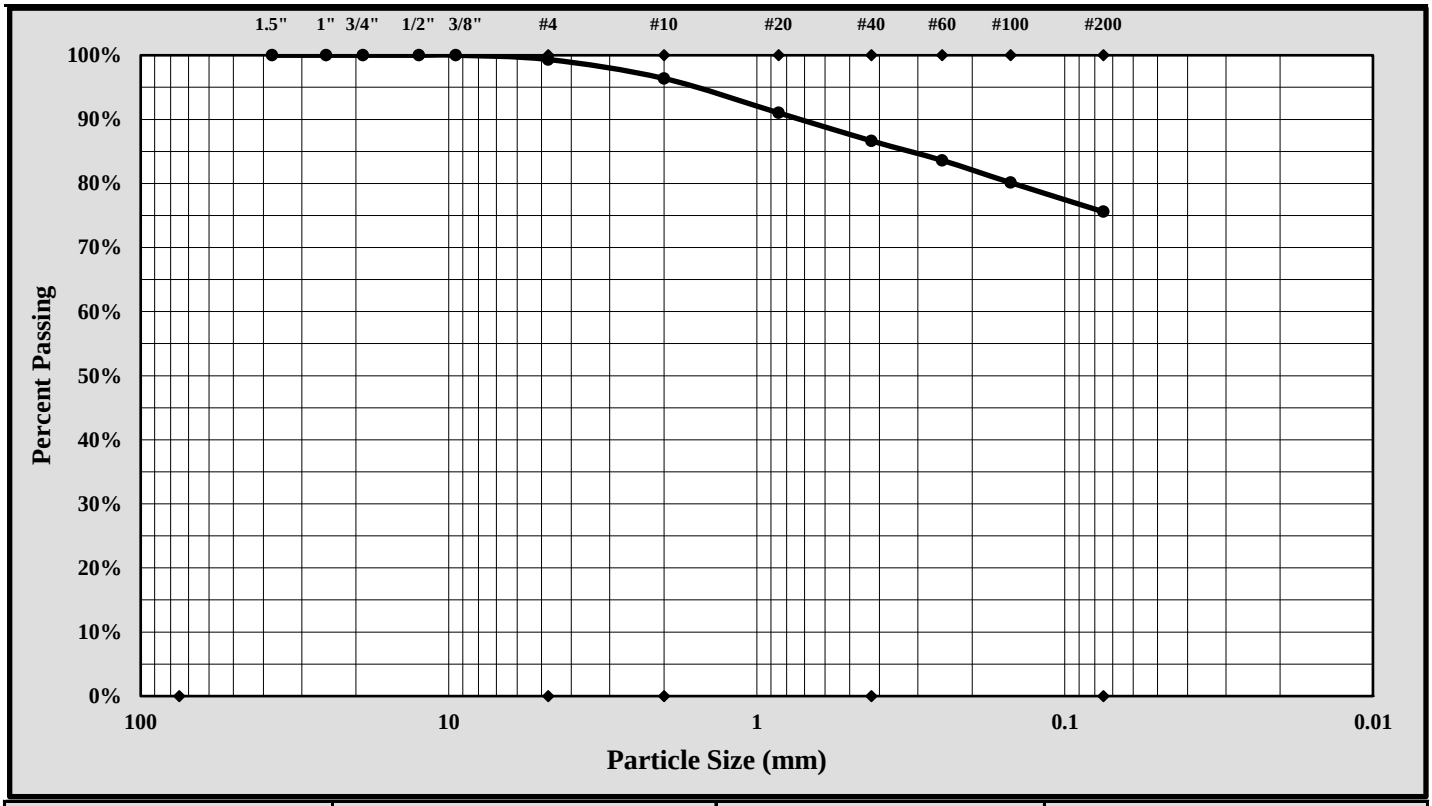
This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	4/26/18
Project Name:	Carolina Crossroads Project	Test Date(s):	4/11 - 4/25/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	RW-36 Sample #: SS-1	Sample Date:	3/01/18
Location:	Embankment Boring Type: Split-spoon	Depth:	0.0' - 2.0'
Sample Description:	Fat Clay with Sand (CH, A-7-6(23))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	4.75 mm	Gravel:	0.7%
Silt & Clay (% Passing #200):	75.6%	Total Sand:	23.8%

Liquid Limit	55	Plastic Limit	25	Plastic Index	30
Coarse Sand:	3.0%	Medium Sand:	9.7%	Fine Sand:	11.1%

Description of Sand and Gravel	Rounded ☐	Angular ☒	Hard & Durable ☒	Soft ☐	Weathered & Friable ☐		

References / Comments / Deviations:

Matthew F. Cooke, P.G.	Project Manager	4/26/18
Technical Responsibility	*Position*	*Date*

This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

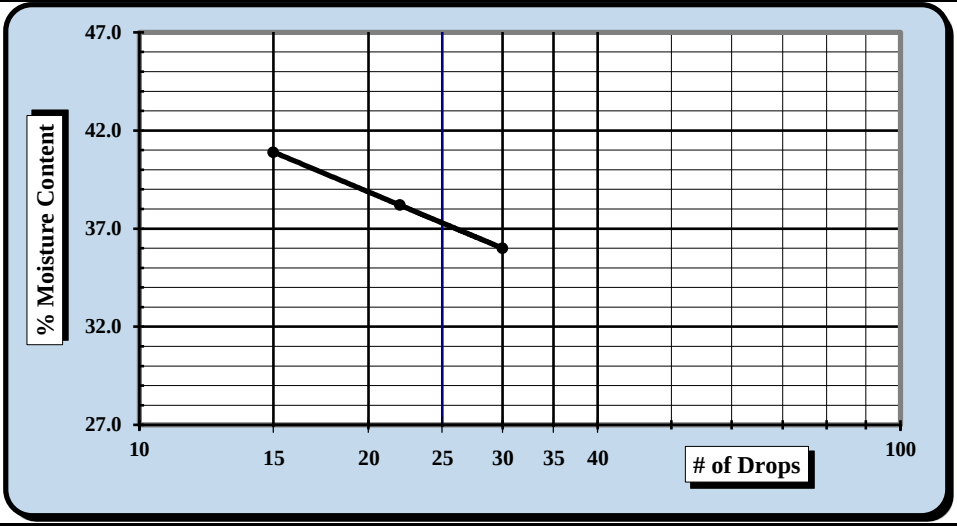
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	4/26/18
Project Name:	Carolina Crossroads Project	Test Date:	4/21/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	RW-36	Sample #:	SS-4	Sample Date:	3/01/18
Location:	Embankment Boring	Type:	Split-spoon	Depth:	6.0' - 8.0'
Sample Description:	Lean Clay with Sand (CL, A-6(11))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	16	17	18				19	20	
A	Tare Weight	26.57	26.63	26.84				26.66	26.85	
B	Wet Soil Weight + A	44.50	43.95	42.65				33.19	34.88	
C	Dry Soil Weight + A	39.75	39.16	38.06				31.97	33.35	
D	Water Weight (B-C)	4.75	4.79	4.59				1.22	1.53	
E	Dry Soil Weight (C-A)	13.18	12.53	11.22				5.31	6.50	
F	% Moisture (D/E)*100	36.0%	38.2%	40.9%				23.0%	23.5%	
N	# OF DROPS	30	22	15				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**23.3%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐
Liquid Limit **37**
Plastic Limit **23**
Plastic Index **14**
Group Symbol **CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	4/26/18	Matthew F. Cooke, P.G.	4/26/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

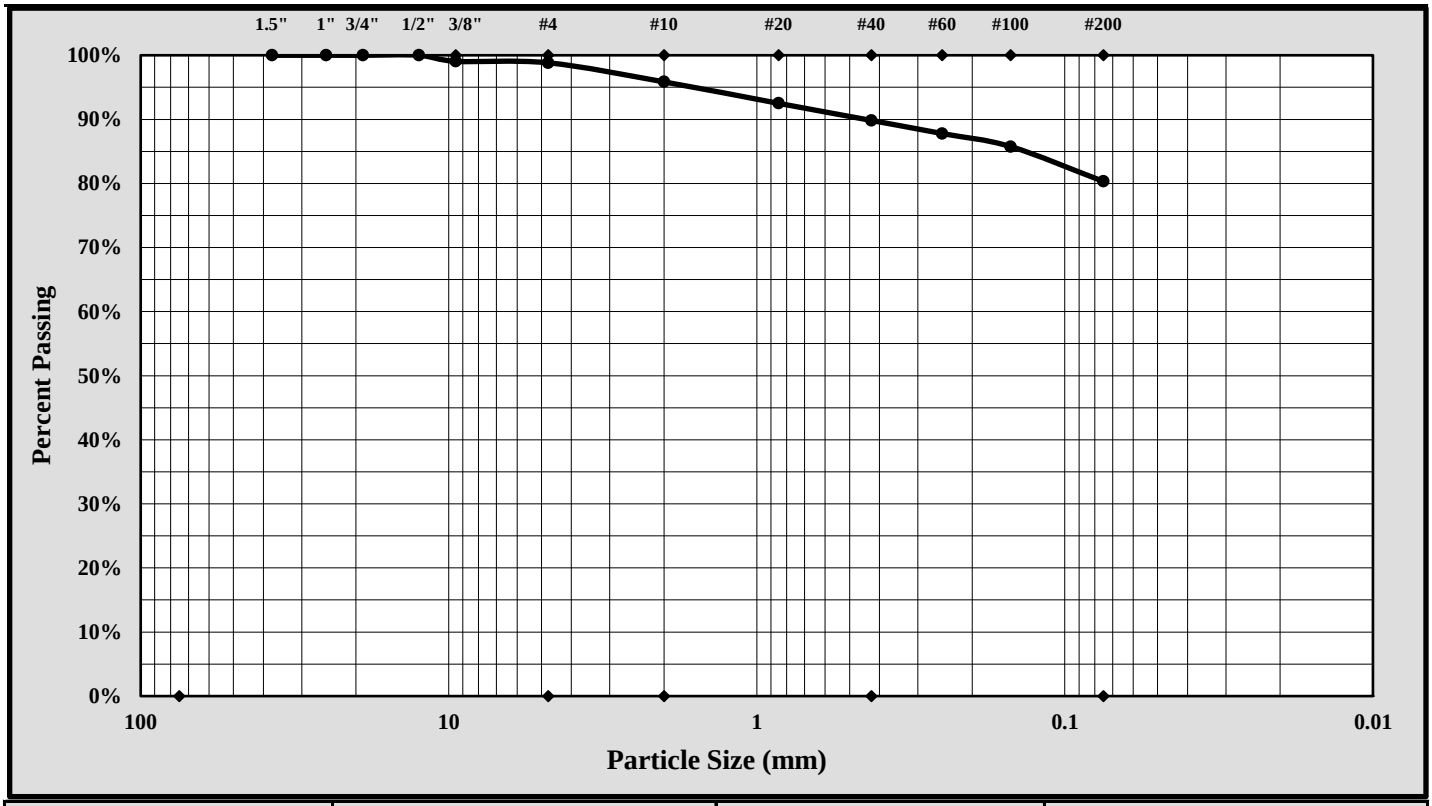
This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	4/26/18
Project Name:	Carolina Crossroads Project	Test Date(s):	4/11 - 4/25/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	RW-36 Sample #: SS-4	Sample Date:	3/01/18
Location:	Embankment Boring Type: Split-spoon	Depth:	6.0' - 8.0'
Sample Description:	Lean Clay with Sand (CL, A-6(11))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	9.50 mm	Gravel:	1.2%
Silt & Clay (% Passing #200):	80.3%	Total Sand:	18.5%

Liquid Limit	37	Plastic Limit	23	Plastic Index	14
Coarse Sand:	3.0%	Medium Sand:	6.0%	Fine Sand:	9.5%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/26/18 — *Date*

This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

Quality Assurance ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

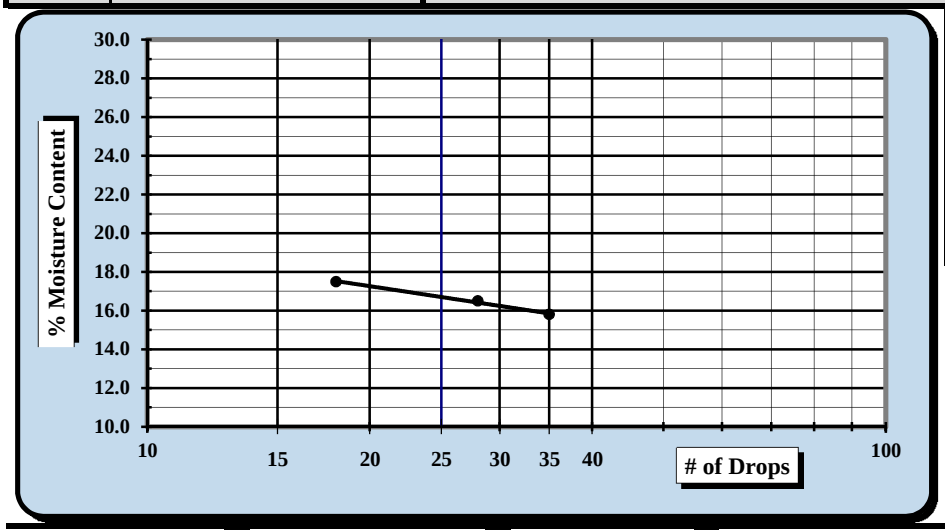
S&ME, Inc. - Knoxville: 1413 Topside Road, Louisville, TN 37777

Project #:	1461-16-047.2B	Report Date:	5/31/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	5/30/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	RW-38	Sample #: SS-1A	Sample Date: Various
Log #:	43-2321		Depth: 0.0' - 1.0'
Sample Description:	Silty, clayey sand (SC-SM, A-2-4)		

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	18435	4/10/2018	Grooving tool	32239	2/16/2018
LL Apparatus	18414	10/6/2017	No. 40 Sieve	31434	4/7/2018
Oven	12872	3/17/2018			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	14	17	1				18	16	
A	Tare Weight	15.47	15.49	15.34				15.41	15.64	
B	Wet Soil Weight + A	24.69	25.71	26.77				25.58	24.47	
C	Dry Soil Weight + A	23.32	24.26	25.21				24.50	23.54	
D	Water Weight (B-C)	1.37	1.45	1.56				1.08	0.93	
E	Dry Soil Weight (C-A)	7.85	8.77	9.87				9.09	7.90	
F	% Moisture (D/E)*100	17.5%	16.5%	15.8%				11.9%	11.8%	
N	# OF DROPS	18	28	35				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**11.9%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**17**
Plastic Limit	**12**
Plastic Index	**5**
Group Symbol	**CL-ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑

Notes / Deviations / References: Group symbol is for minus No. 40 portion only.

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Derek Baker	5/30/2018	Michael D. Kelso, E.I.	5/31/2018
Technician Name	*Date*	*Technical Responsibility*	*Date*

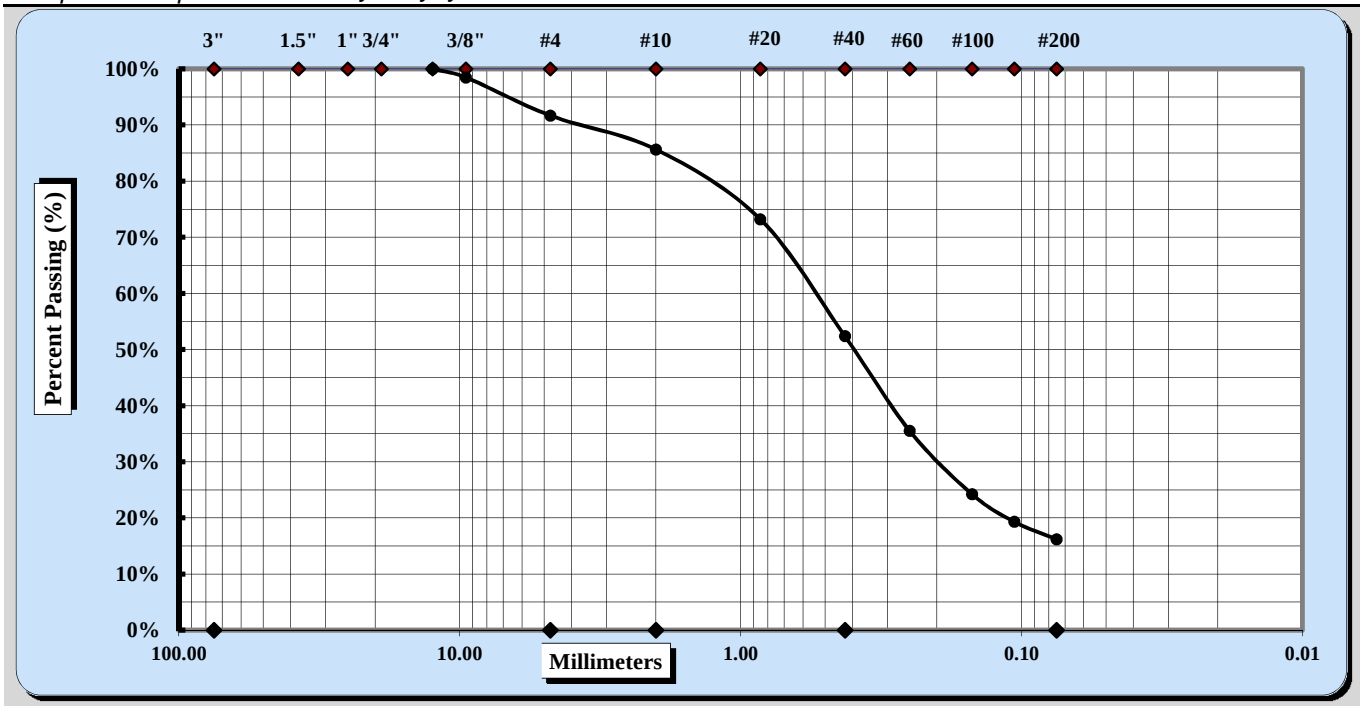
This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Sieve Analysis of Soils

Quality Assurance *ASTM D6913 Method A*

S&ME, Inc. - Knoxville: 1413 Topside Road, Louisville, TN 37777

Project #:	**1461-16-047.2B**	Report Date:	5/31/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	5/25/18 - 5/29/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sample ID:	RW-38	Type: Split Spoon	Sample Date: Various
Sample Log No.:	43-2321	Sample: 1A	Depth: 0.0' - 1.0'
Sample Description:	Silty, clayey sand (SC-SM, A-2-4)		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size	1/2"	Coarse Sand	6%	Fine Sand	36%
Gravel	8%	Medium Sand	33%	Silt & Clay	16%
Liquid Limit	17	Plastic Limit	12	Plastic Index	5

Coarse Sand	6%	Medium Sand	33%	Fine Sand	36%

Description of Sand & Gravel Particles: Rounded ☐ Angular ☒
Hard & Durable ☒ Soft ☒ Weathered & Friable ☒

Notes / Deviations / References:

Michael D. Kelso, E.I. — *Technical Responsibility*
Signature
Staff Professional — *Position*
5/31/2018 — *Date*

This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

Quality Assurance ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

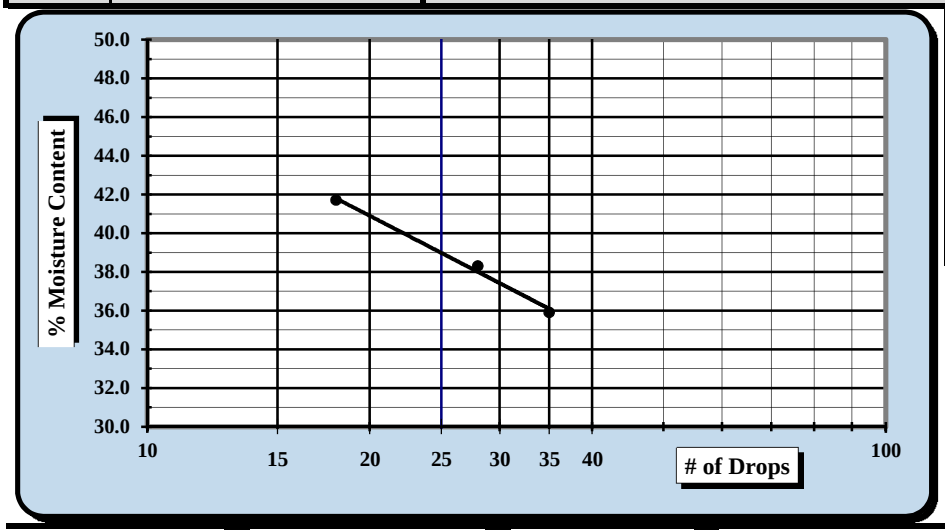
S&ME, Inc. - Knoxville: 1413 Topside Road, Louisville, TN 37777

Project #:	1461-16-047.2B	Report Date:	5/31/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	5/30/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	RW-38	Sample #: SS-2	Sample Date: Various
Log #:	43-2321		Depth: 2.0' - 4.0'
Sample Description:	Lean clay with sand (CL, A-6 (13))		

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	18435	4/10/2018	Grooving tool	32239	2/16/2018
LL Apparatus	18414	10/6/2017	No. 40 Sieve	31434	4/7/2018
Oven	12872	3/17/2018			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	23	8	6				21	20	
A	Tare Weight	15.44	15.51	15.45				15.51	15.46	
B	Wet Soil Weight + A	28.52	29.56	30.34				23.97	24.75	
C	Dry Soil Weight + A	24.67	25.67	26.41				22.53	23.17	
D	Water Weight (B-C)	3.85	3.89	3.93				1.44	1.58	
E	Dry Soil Weight (C-A)	9.23	10.16	10.96				7.02	7.71	
F	% Moisture (D/E)*100	41.7%	38.3%	35.9%				20.5%	20.5%	
N	# OF DROPS	18	28	35				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**20.5%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**39**
Plastic Limit	**21**
Plastic Index	**18**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑

Notes / Deviations / References: Group symbol is for minus No. 40 portion only.

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Derek Baker	5/30/2018	Michael D. Kelso, E.I.	5/31/2018
Technician Name	*Date*	*Technical Responsibility*	*Date*

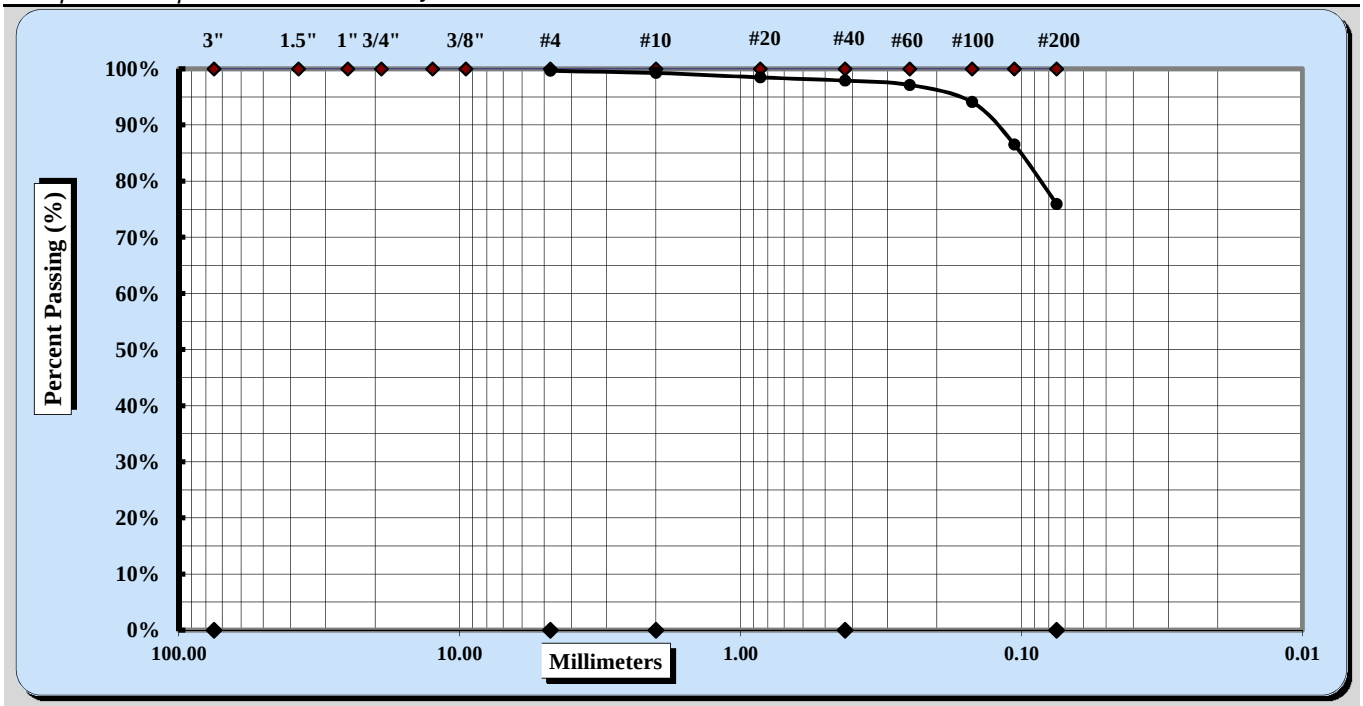
This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Sieve Analysis of Soils

Quality Assurance *ASTM D6913 Method A*

S&ME, Inc. - Knoxville: 1413 Topside Road, Louisville, TN 37777

Project #:	**1461-16-047.2B**	Report Date:	5/31/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	5/25/18 - 5/29/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sample ID:	RW-38	Type: Split Spoon	Sample Date: Various
Sample Log No.:	43-2321	Sample: 2	Depth: 2.0' - 4.0'
Sample Description:	Lean clay with sand (CL, A-6 (13))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size	No. 4	Coarse Sand	0%	Fine Sand	22%
Gravel	0%	Medium Sand	1%	Silt & Clay	76%
Liquid Limit	39	Plastic Limit	21	Plastic Index	18

Coarse Sand	0%	Medium Sand	1%	Fine Sand	22%
Description of Sand & Gravel Particles:		Rounded	☐	Angular	☒
Hard & Durable	☒	Soft	☒	Weathered & Friable	☒

Notes / Deviations / References:

Michael D. Kelso, E.I.		Staff Professional	5/31/2018
Technical Responsibility	*Signature*	*Position*	*Date*

This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

Quality Assurance ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

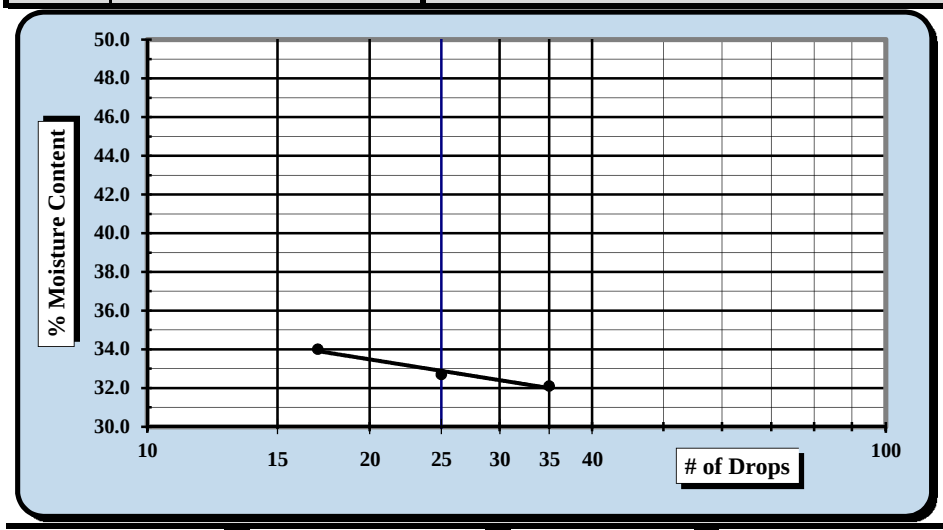
S&ME, Inc. - Knoxville: 1413 Topside Road, Louisville, TN 37777

Project #:	1461-16-047.2B	Report Date:	5/31/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	5/29/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	RW-38	Sample #: SS-4	Sample Date: Various
Log #:	43-2321		Depth: 6.0' - 8.0'
Sample Description:	Lean clay with sand (CL, A-6 (11))		

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	18435	4/10/2018	Grooving tool	32239	2/16/2018
LL Apparatus	18414	10/6/2017	No. 40 Sieve	31434	4/7/2018
Oven	12872	3/17/2018			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	19	15	16				22	7	
A	Tare Weight	15.42	15.32	15.64				15.38	15.41	
B	Wet Soil Weight + A	27.27	28.43	29.15				24.17	24.86	
C	Dry Soil Weight + A	24.26	25.20	25.87				22.75	23.33	
D	Water Weight (B-C)	3.01	3.23	3.28				1.42	1.53	
E	Dry Soil Weight (C-A)	8.84	9.88	10.23				7.37	7.92	
F	% Moisture (D/E)*100	34.0%	32.7%	32.1%				19.3%	19.3%	
N	# OF DROPS	17	25	35				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**19.3%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**33**
Plastic Limit	**19**
Plastic Index	**14**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑

Notes / Deviations / References: Group symbol is for minus No. 40 portion only.

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Derek Baker	5/29/2018	Michael D. Kelso, E.I.	5/31/2018
Technician Name	*Date*	*Technical Responsibility*	*Date*

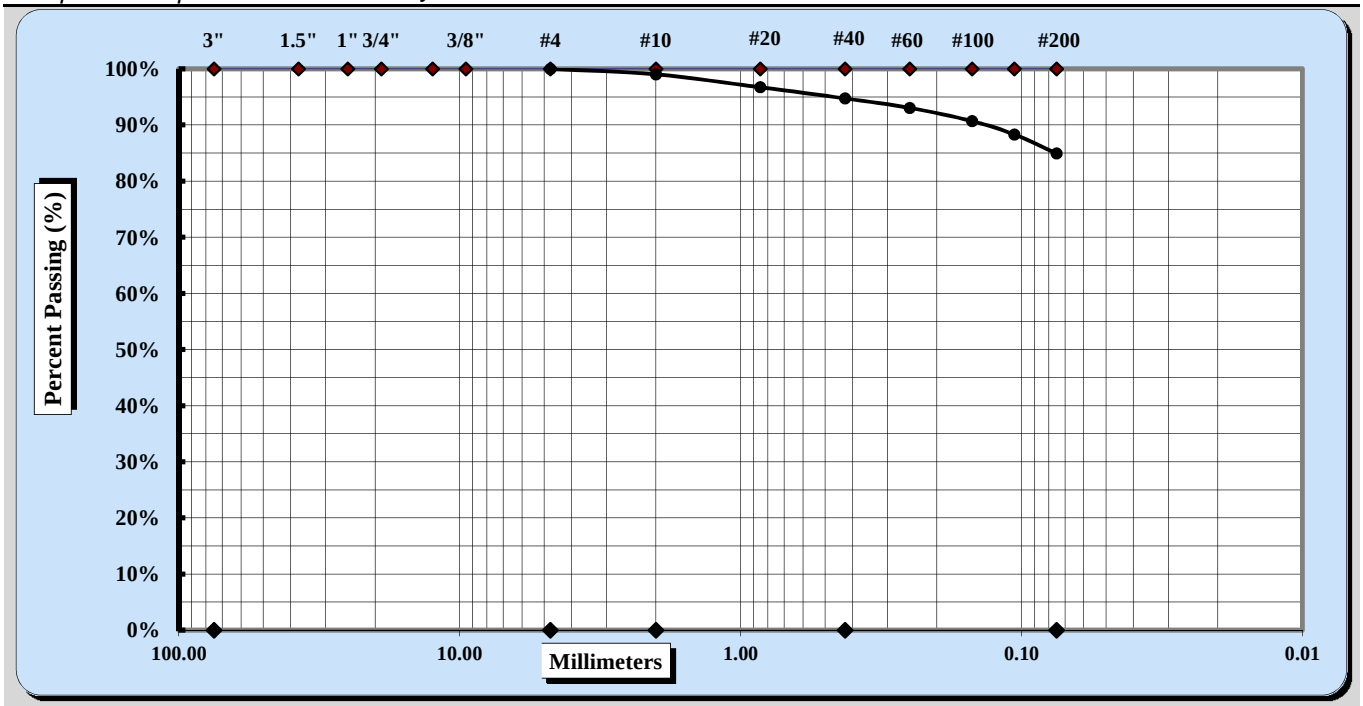
This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Sieve Analysis of Soils

Quality Assurance *ASTM D6913 Method A*

S&ME, Inc. - Knoxville: 1413 Topside Road, Louisville, TN 37777

Project #:	**1461-16-047.2B**	Report Date:	5/31/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	5/25/18 - 5/29/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sample ID:	RW-38	Type: Split Spoon	Sample Date: Various
Sample Log No.:	43-2321	Sample: 4	Depth: 6.0' - 8.0'
Sample Description:	Lean clay with sand (CL, A-6 (11))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size	No. 4	Coarse Sand	1%	Fine Sand	10%
Gravel	0%	Medium Sand	4%	Silt & Clay	85%
Liquid Limit	33	Plastic Limit	19	Plastic Index	14

Coarse Sand	1%	Medium Sand	4%	Fine Sand	10%

Description of Sand & Gravel Particles: Rounded ☐ Angular ☒
Hard & Durable ☒ Soft ☒ Weathered & Friable ☒

Notes / Deviations / References:

Michael D. Kelso, E.I. — *Technical Responsibility*
Signature
Staff Professional — *Position*
5/31/2018 — *Date*

This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

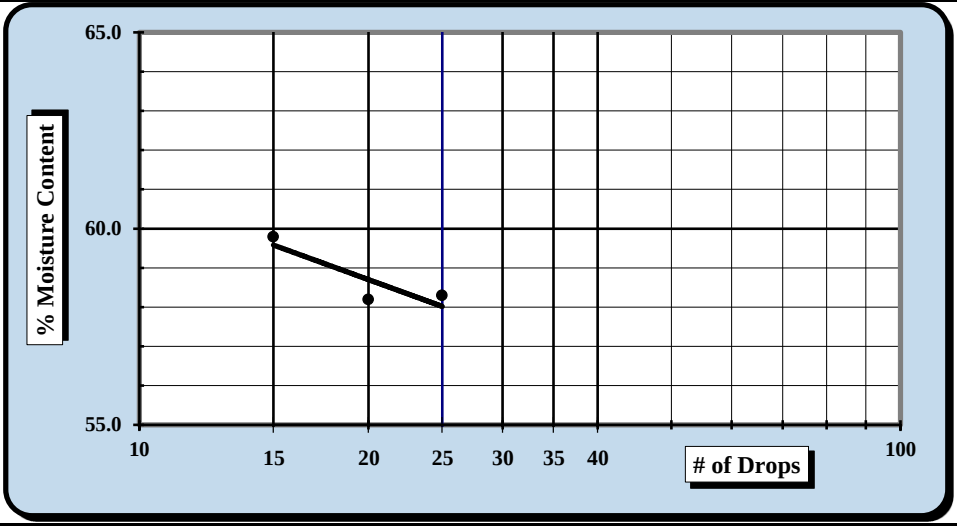
S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	2/21/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	2/15-2/20/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	P-37	Sample #: SS-1	Sample Date: 1/24/2018
Location:	Pavement Boring	Offset: N/A	Depth: 1.7' - 3.7'
Sample Description:	Sandy Elastic Silt (MH, A-7-5(14))		

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	15425	8/30/2017	Flat Grooving tool	28573	11/10/2017
LL Apparatus	28562	5/12/2017			
Oven	25722	8/18/2017	No. 40 Sieve	21775	1/8/2018

	Pan # 604	Liquid Limit						Plastic Limit		
	Tare #:	214	6	217				9	19	
A	Tare Weight	20.84	20.57	20.91				20.82	20.53	
B	Wet Soil Weight + A	28.50	27.83	28.87				28.61	27.42	
C	Dry Soil Weight + A	25.68	25.16	25.89				26.43	25.47	
D	Water Weight (B-C)	2.82	2.67	2.98				2.18	1.95	
E	Dry Soil Weight (C-A)	4.84	4.59	4.98				5.61	4.94	
F	% Moisture (D/E)*100	58.3%	58.2%	59.8%				38.9%	39.5%	
N	# OF DROPS	25	20	15				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**39.2%**		



One Point Liquid Limit

N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**58**
Plastic Limit	**39**
Plastic Index	**19**
Group Symbol	**MH**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Matthew Wolfe	NICET 123218	Matthew F. Cooke, P.G.	3/8/2018
Technician Name	*Certification*	*Technical Responsibility*	*Date*

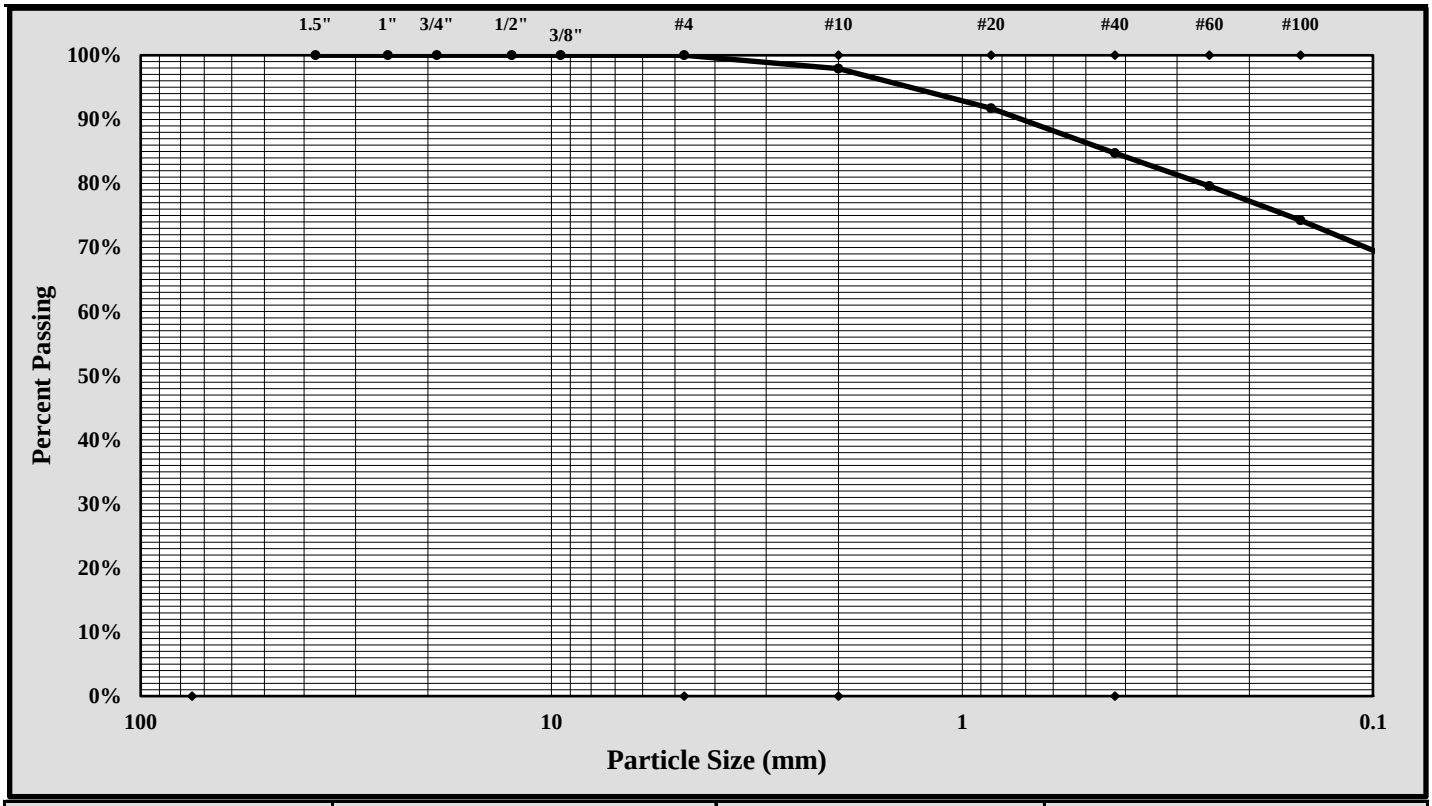
This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Columbia Office, 134 Suber Road Columbia SC 29210

S&ME Project #:	1461-16-047.2B	Report Date:	2/21/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	2/5-2/19/2018
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-37 Sample #: SS-1	Sample Date:	1/24/2018
Location:	Pavement Boring Offset: N/A	Depth:	1.7' - 3.7'
Sample Description:	Sandy Elastic Silt (MH, A-7-5(14))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	#10	Gravel:	0%
Silt & Clay (% Passing #200):	66%	Total Sand:	34%

Liquid Limit	58	Plastic Limit	39	Plastic Index	19
Coarse Sand:	2%	Medium Sand:	13%	Fine Sand:	18%

Description of Sand and Gravel	Rounded ☐	Angular ☒	Hard & Durable ☒	Soft ☐	Weathered & Friable ☒		

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
3/8/2018 — *Date*

This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

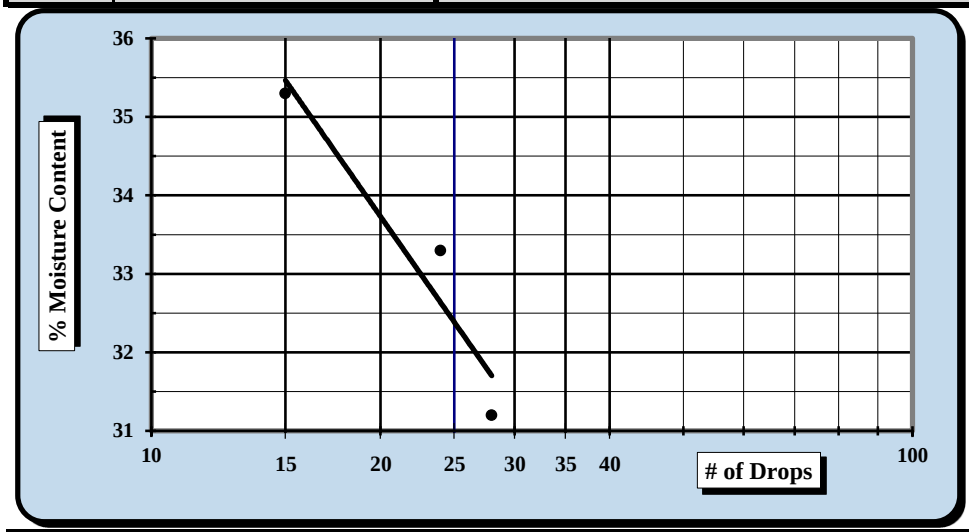
S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	4/25/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	3/7-4/2/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	P-38	Sample #: SS-1		Sample Date: 1/29/18	
Location:	Pavement Boring	Offset: N/A		Depth: 0.8' - 2.8'	
Sample Description:	Clayey Sand (SC, A-2-6)				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	15425	8/30/2017	Flat Grooving tool	28574	11/10/2017
LL Apparatus	28562	5/12/2017			
Oven	25722	8/18/2017	No. 40 Sieve	21775	1/8/2018

Pan # 601		Liquid Limit						Plastic Limit		
	Tare #:	36	214	227				123	19	
A	Tare Weight	20.95	20.83	20.81				20.56	20.52	
B	Wet Soil Weight + A	29.37	28.04	27.37				27.10	26.54	
C	Dry Soil Weight + A	27.37	26.24	25.66				26.28	25.80	
D	Water Weight (B-C)	2.00	1.80	1.71				0.82	0.74	
E	Dry Soil Weight (C-A)	6.42	5.41	4.85				5.72	5.28	
F	% Moisture (D/E)*100	31.2%	33.3%	35.3%				14.3%	14.0%	
N	# OF DROPS	28	24	15				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**14.2%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**32**
Plastic Limit	**14**
Plastic Index	**18**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group Symbol for minus No. 40 sieve portion only.

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Matthew Wolfe	NICET 123218	Matthew F. Cooke, P.G.	5/3/2018
Technician Name	*Certification*	*Technical Responsibility*	*Date*

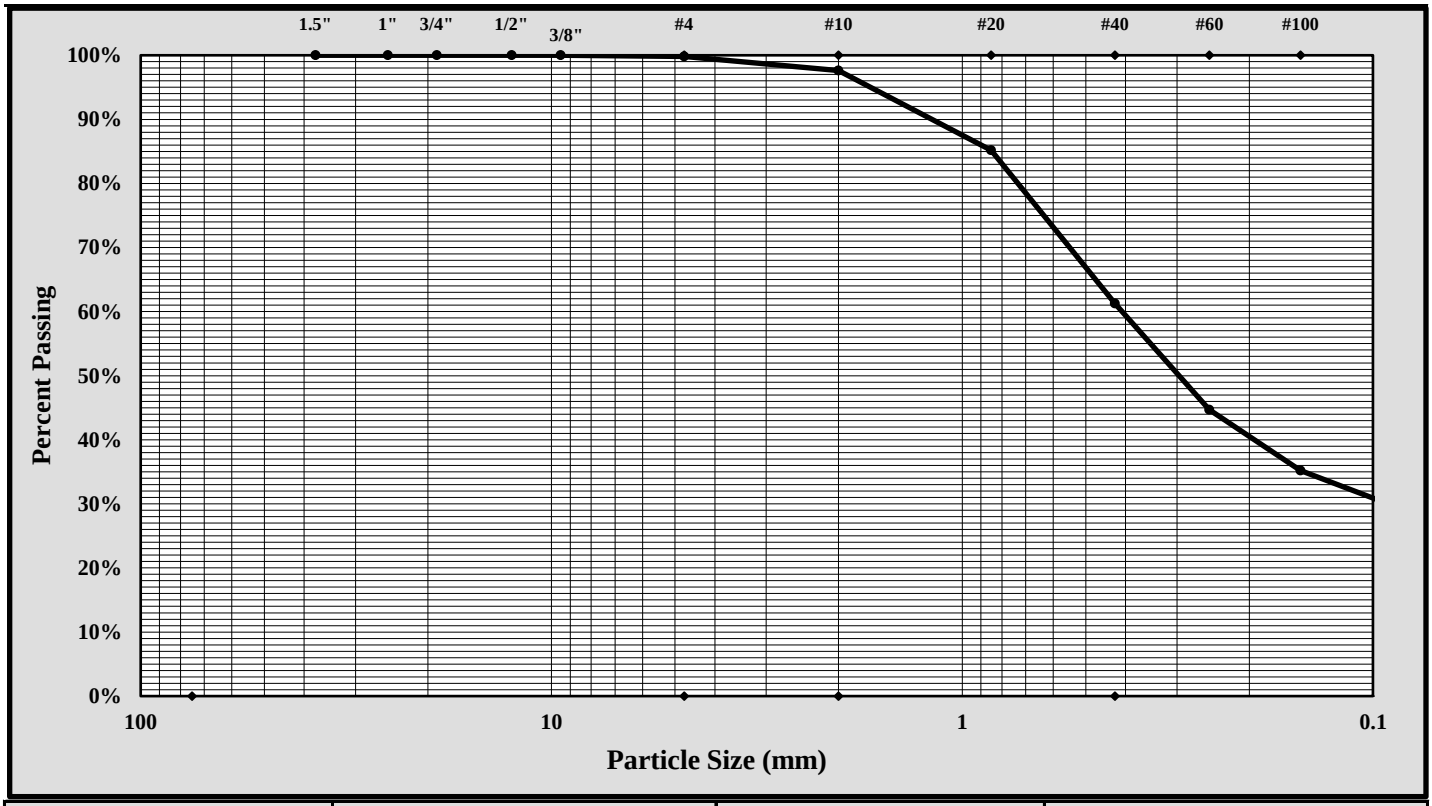
This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Columbia Office, 134 Suber Road Columbia SC 29210

S&ME Project #:	1461-16-047.2B	Report Date:	4/25/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	3/1-3/7/2018
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-38 Sample #: SS-1	Sample Date:	1/29/18
Location:	Pavement Boring Offset: N/A	Depth:	0.8' - 2.8'
Sample Description:	Clayey Sand (SC, A-2-6)		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	#4	Gravel:	0.2%
Silt & Clay (% Passing #200):	27.9%	Total Sand:	71.9%

Liquid Limit	32	Plastic Limit	14	Plastic Index	18		
Coarse Sand:	2.2%	Medium Sand:	36.3%	Fine Sand:	33.4%		
Description of Sand and Gravel	Rounded ☐	Angular ☒	Hard & Durable ☒	Soft ☐	Weathered & Friable ☒		

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
5/3/2018 — *Date*

This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	2/21/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	2/15-2/20/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-39	Sample #: SS-1	Sample Date: 1/24/2018
Location:	Pavement Boring	Offset: N/A	Depth: 0.8' - 2.8'
Sample Description:	Clayey Sand (SC, A-6(2))		

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	15425	8/30/2017	Flat Grooving tool	28573	11/10/2017
LL Apparatus	28562	5/12/2017			
Oven	25722	8/18/2017	No. 40 Sieve	21775	1/8/2018

	Pan # 606	Liquid Limit						Plastic Limit		
	Tare #:	240	32	123				206	245	
A	Tare Weight	20.78	20.41	20.57				20.92	20.77	
B	Wet Soil Weight + A	30.72	29.69	29.53				29.88	27.47	
C	Dry Soil Weight + A	28.37	27.43	27.29				28.68	26.59	
D	Water Weight (B-C)	2.35	2.26	2.24				1.20	0.88	
E	Dry Soil Weight (C-A)	7.59	7.02	6.72				7.76	5.82	
F	% Moisture (D/E)*100	31.0%	32.2%	33.3%				15.5%	15.1%	
N	# OF DROPS	35	24	16				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**15.3%**		



One Point Liquid Limit

N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**32**
Plastic Limit	**15**
Plastic Index	**17**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Matthew Wolfe	NICET 123218	Matthew F. Cooke, P.G.	3/8/2018
Technician Name	*Certification*	*Technical Responsibility*	*Date*

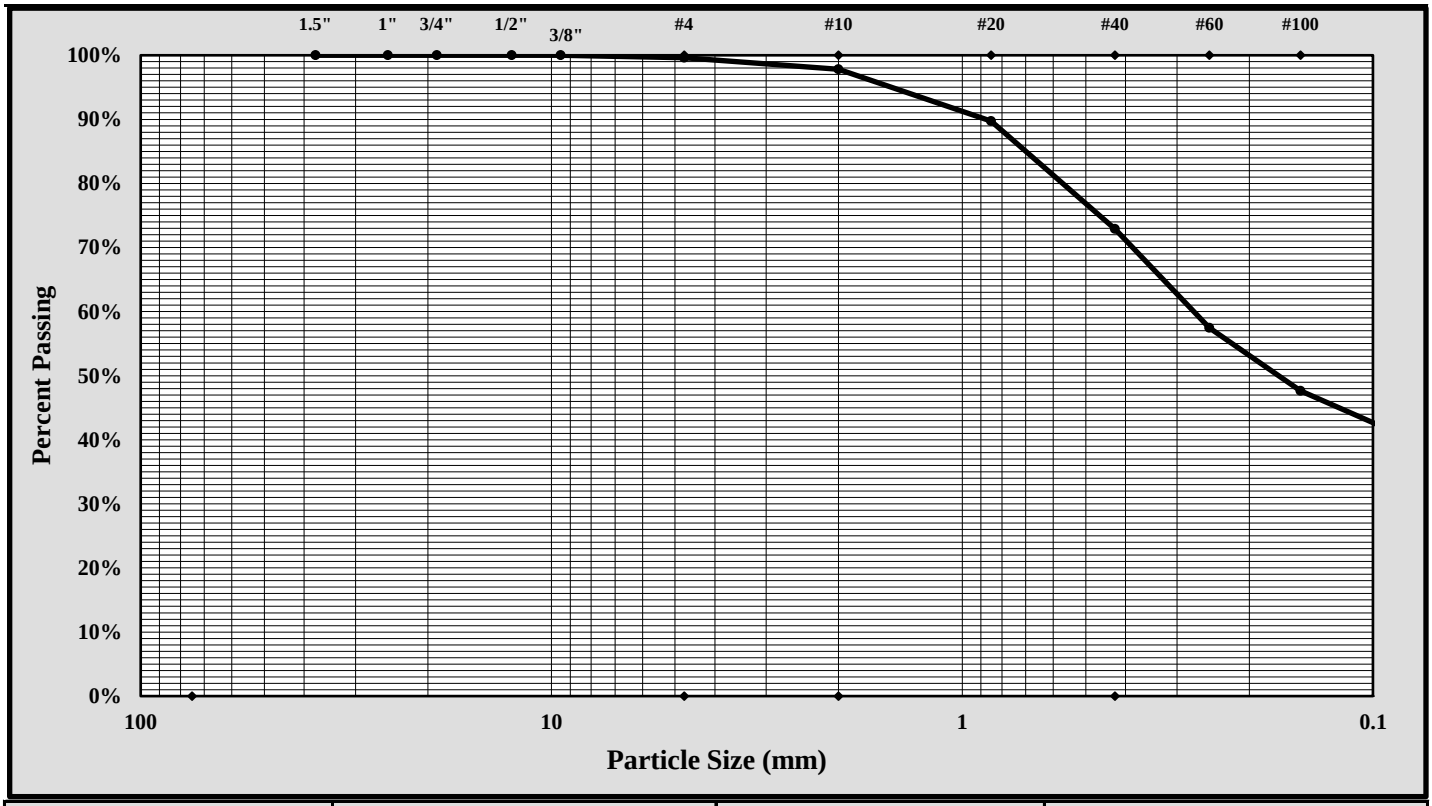
This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Columbia Office, 134 Suber Road Columbia SC 29210

S&ME Project #:	1461-16-047.2B	Report Date:	2/21/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	2/5-2/19/2018
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-39 Sample #: SS-1	Sample Date:	1/24/2018
Location:	Pavement Boring Offset: N/A	Depth:	0.8' - 2.8'
Sample Description:	Clayey Sand (SC, A-6(2))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	#4	Gravel:	0%
Silt & Clay (% Passing #200):	39%	Total Sand:	60%

Liquid Limit	32	Plastic Limit	15	Plastic Index	17
Coarse Sand:	2%	Medium Sand:	25%	Fine Sand:	34%

Description of Sand and Gravel — Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☒

References / Comments / Deviations:

Matthew F. Cooke, P.G.	Project Manager	3/8/2018
Technical Responsibility	*Position*	*Date*

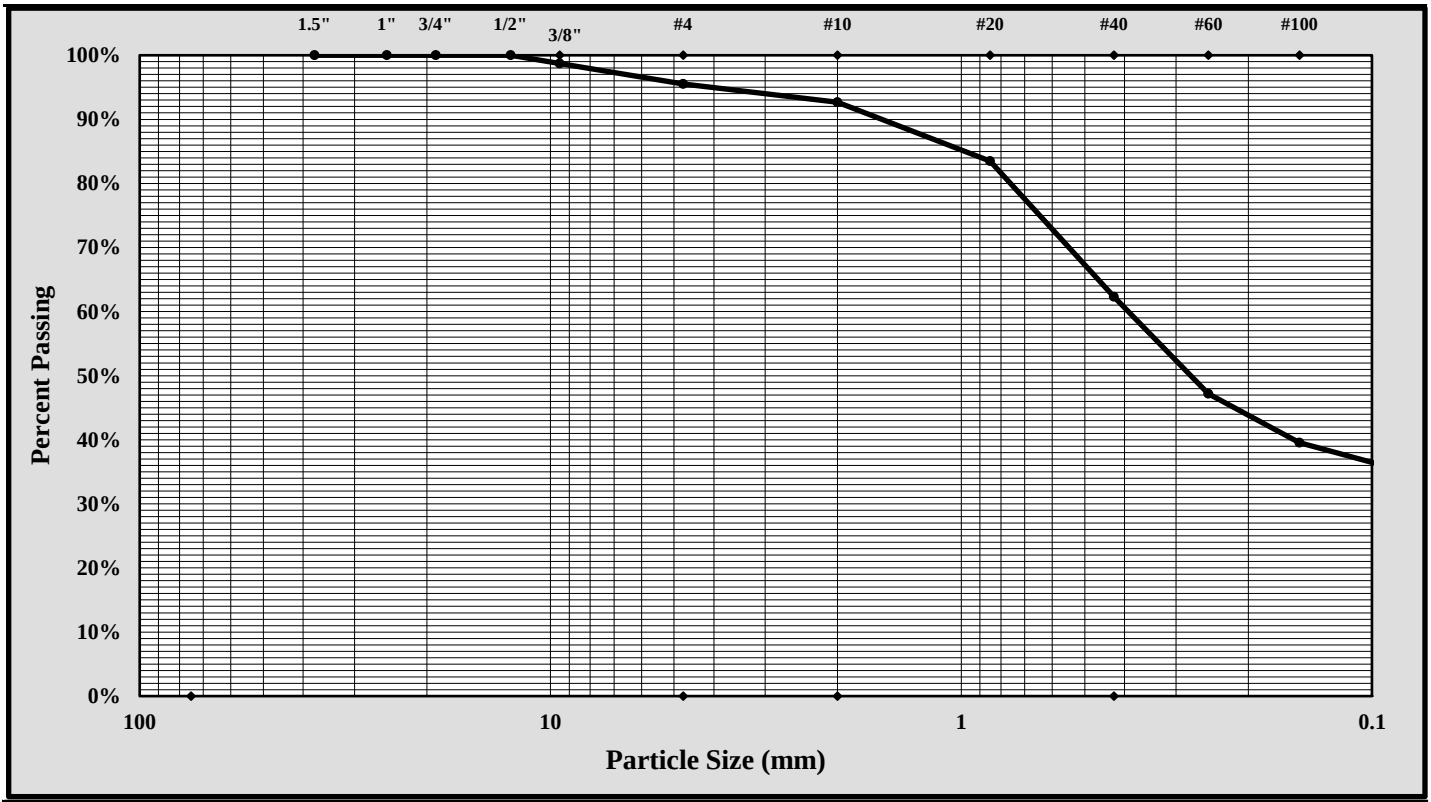
This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Columbia Office, 134 Suber Road Columbia SC 29210

S&ME Project #:	1461-16-047.2B	Report Date:	2/21/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	2/5-2/19/2018
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-65 Sample #: SS-1	Sample Date:	1/24/2018
Location:	Pavement Boring Offset: N/A	Depth:	0.8' - 2.8'
Sample Description:	Silty Sand (SM, A-2-4)		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	3/8-inch	Gravel:	5%
Silt & Clay (% Passing #200):	34%	Total Sand:	61%

Liquid Limit	*	Plastic Limit	*	Plastic Index	*
Coarse Sand:	3%	Medium Sand:	30%	Fine Sand:	28%

Description of Sand and Gravel	Rounded ☐	Angular ☒	Hard & Durable ☒	Soft ☐	Weathered & Friable ☒		

References / Comments / Deviations:

*Not enough fine material available for testing. Material assumed to be non-plastic.

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
3/8/2018 — *Date*

This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

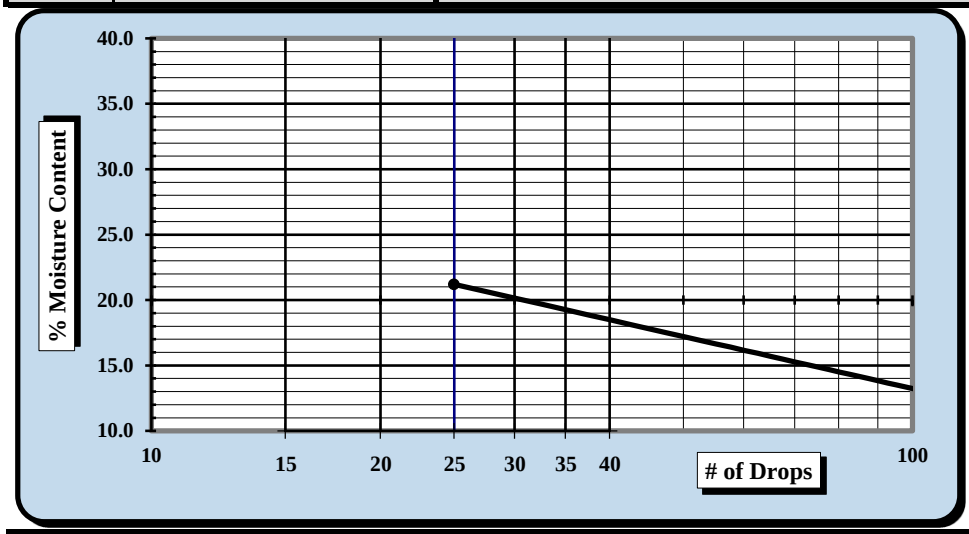
ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Atlanta: 4350 River Green Parkway, Suite 200, Duluth, GA 30096

Project #:	1461-16-047.2B	Report Date:	5-2-18
Project Name:	Carolina Crossroads Project	Test Date(s)	4/27-4/28/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-66	Sample #: SS-1	Sample Date: Various
Location:	Pavement Boring	Offset: N/A	Depth: 0.8' - 2.8'
Sample Description:	Clayey Sand (SC, A-2-4))		

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	25128	3/17/2017	Grooving tool	26551	2/23/2018
LL Apparatus	31336	2/23/2018	Grooving tool		
Oven	31332	2/20/2018	Grooving tool		

	Pan # 328	Liquid Limit						Plastic Limit		
	Tare #:	74						75	76	
A	Tare Weight	27.24						29.34	29.09	
B	Wet Soil Weight + A	43.41						38.34	37.41	
C	Dry Soil Weight + A	40.58						37.35	36.50	
D	Water Weight (B-C)	2.83						0.99	0.91	
E	Dry Soil Weight (C-A)	13.34						8.01	7.41	
F	% Moisture (D/E)*100	21.2%						12.4%	12.3%	
N	# OF DROPS	25						*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**12.4%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**21**
Plastic Limit	**12**
Plastic Index	**9**
Group Symbol	**CL**

Multipoint Method ☐
One-point Method ☑

Wet Preparation ☐ Dry Preparation ☐ Air Dried ☑

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

Jimmy Hanson	4/28/2018		5/2/2018
Technician Name	*Date*	*Technical Responsibility*	*Date*

This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Form No: TR-D7928-3
Revision No.: 0
Revision Date: 02/21/17

Particle Size Analysis of Soils

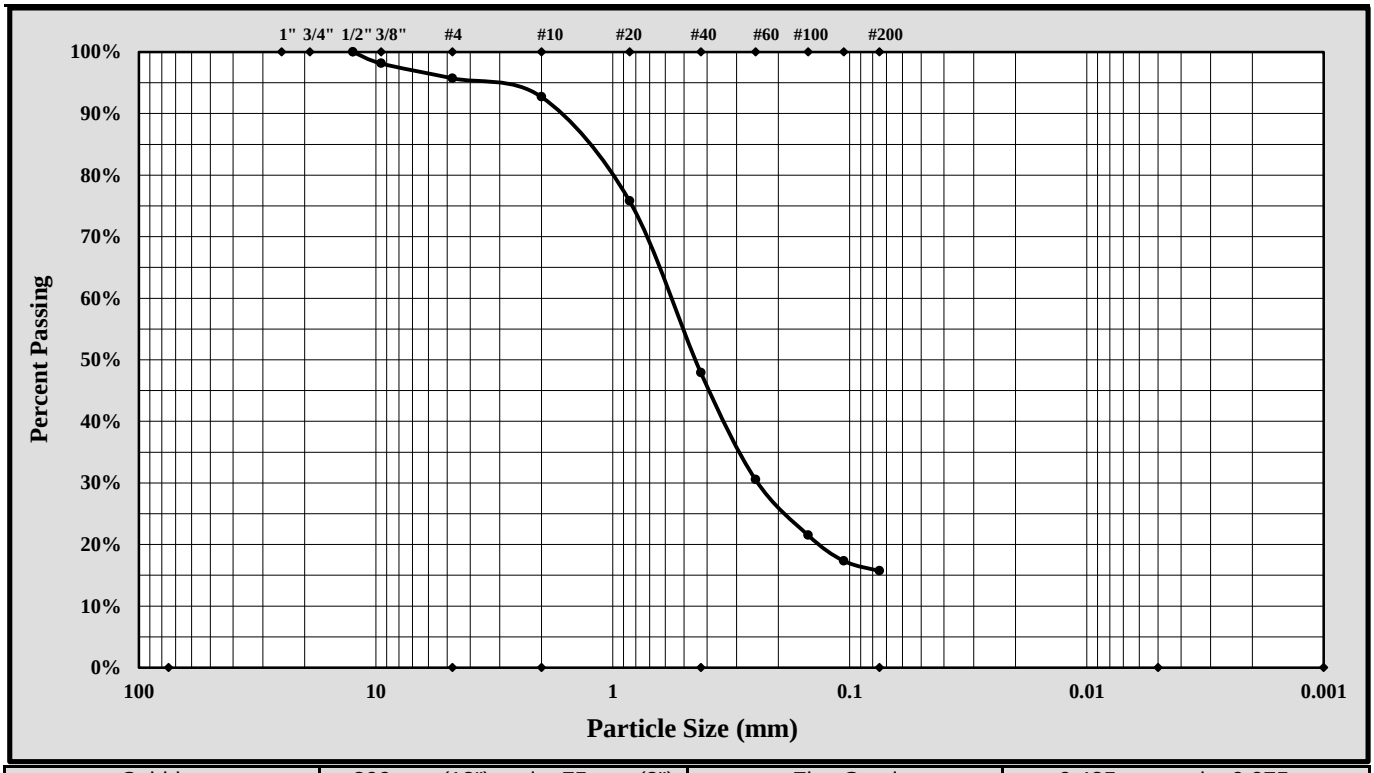
ASTM D6913/D7928

Quality Assurance

Sample Log No.:

S&ME, Inc., 4350 Rivergreen Parkway, Suite 200, Duluth, GA 30096

S&ME Project #:	1461-16-047.2B	Report Date:	4/23/18
Project Name:	Carolina Crossroads Project	Test Date(s):	4/19-4/20/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sample ID:	P-66 Type: Split Spoon	Sample Date:	Various
Location:	Pavement Boring Sample No.: SS-1	Depth:	0.8' - 2.8'
Sample Description:	Clayey Sand (SC, A-2-4))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:		Gravel:	4.3%
Silt & Clay (% Passing #200):	15.7%	Total Sand:	80.0%
Assumed Specific Gravity:	2.65		
Liquid Limit	21	Plastic Limit	12
		Plastic Index	9

$Cc = D_{30}^2/(D_{10} \times D_{60})$ $Cu = D_{60}/D_{10}$

Description of Sand and Gravel	Rounded ☐	Angular ☐	Hard & Durable ☐	Soft ☐	Weathered & Friable ☐
Sample Prep Method: Moist Prep	Dispersion Period:	1 min.	Dispersing Agent:	Sodium Hexametaphosphate:	50 g./ Liter

References / Comments / Deviations:

Nathan Price		Labortory Group Leader	5/2/2018
Technical Responsibility	*Signature*	*Position*	*Date*

This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

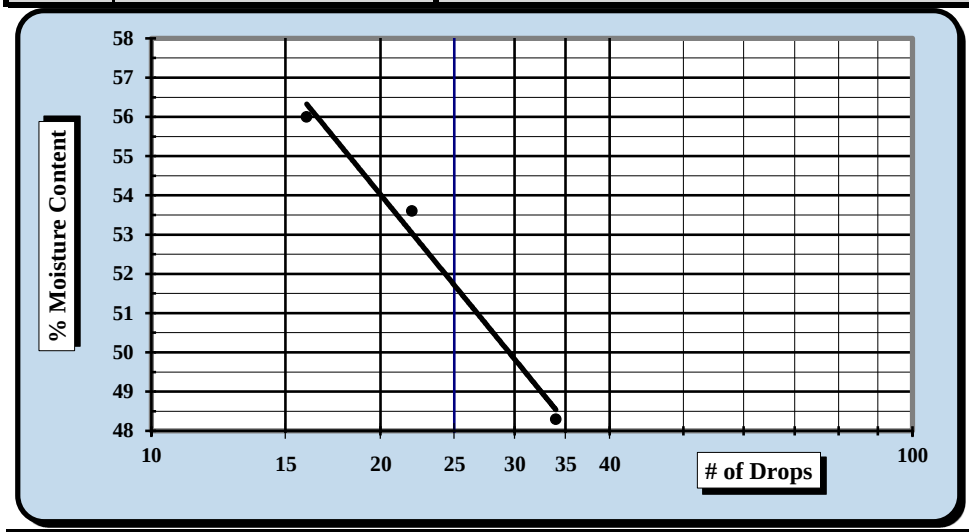
S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	4/25/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	4/2-4/24/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	P-67	Sample #: SS-1		Sample Date: 1/31/18	
Location:	Pavement Boring	Offset: N/A		Depth: 0.6' - 2.6'	
Sample Description:	Sandy Fat Clay (CH, A-7-6(16))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	15425	8/30/2017	Flat Grooving tool	28574	11/10/2017
LL Apparatus	28562	5/12/2017			
Oven	25722	8/18/2017	No. 40 Sieve	21775	1/8/2018

	Pan # 608	Liquid Limit						Plastic Limit		
	Tare #:	39	24	25				7	195	
A	Tare Weight	20.81	20.77	20.61				20.80	20.54	
B	Wet Soil Weight + A	28.49	27.65	27.35				26.94	27.74	
C	Dry Soil Weight + A	25.99	25.25	24.93				25.81	26.41	
D	Water Weight (B-C)	2.50	2.40	2.42				1.13	1.33	
E	Dry Soil Weight (C-A)	5.18	4.48	4.32				5.01	5.87	
F	% Moisture (D/E)*100	48.3%	53.6%	56.0%				22.6%	22.7%	
N	# OF DROPS	34	22	16				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**22.7%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**52**
Plastic Limit	**23**
Plastic Index	**29**
Group Symbol	**CH**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group Symbol for minus No. 40 sieve portion only.

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Matthew Wolfe	NICET 123218	Matthew F. Cooke, P.G.	5/3/2018
Technician Name	*Certification*	*Technical Responsibility*	*Date*

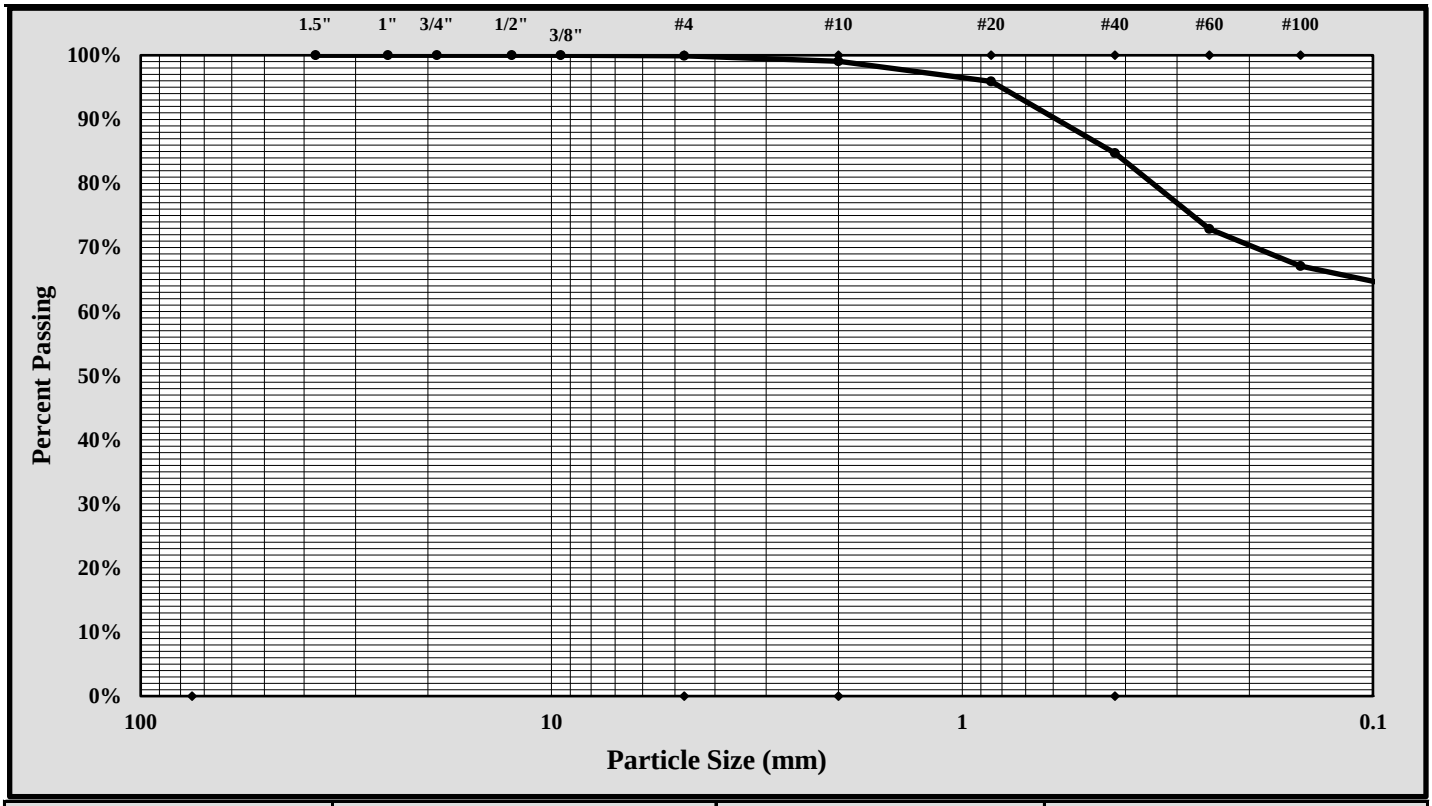
This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Columbia Office, 134 Suber Road Columbia SC 29210

S&ME Project #:	1461-16-047.2B	Report Date:	4/25/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	4/2-4/25/2018
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-67 Sample #: SS-1	Sample Date:	1/31/18
Location:	Pavement Boring Offset: N/A	Depth:	0.6' - 2.6'
Sample Description:	Sandy Fat Clay (CH, A-7-6(16))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	#4	Gravel:	0.1%
Silt & Clay (% Passing #200):	63.1%	Total Sand:	36.9%

Liquid Limit	52	Plastic Limit	23	Plastic Index	29
Coarse Sand:	0.9%	Medium Sand:	14.3%	Fine Sand:	21.7%

Description of Sand and Gravel	Rounded ☐	Angular ☒	Hard & Durable ☒	Soft ☐	Weathered & Friable ☒		

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
5/3/2018 — *Date*

This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Soil Analysis Lab Results

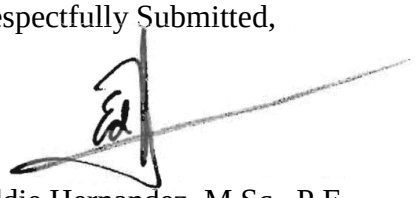
Client: S&ME, Inc
Job Name: Carolina Crossroads Project
Client Job Number: 1461-16-047
Project X Job Number: S180308B
March 13, 2018

	Method	ASTM G187		ASTM D516		ASTM D512B		ASTM G51
Bore# / Description	**Depth**	**Resistivity** As Rec'd | Minimum		**Sulfates**		**Chlorides**		**pH**
	(ft)	(Ohm-cm)	(Ohm-cm)	(mg/kg)	(wt%)	(mg/kg)	(wt%)	
SS-3, SS-5 - DH-4	4.0-10.0	60,300	17,420	21	0.0021	9	0.0009	7.68
SS-5, SS-6, SS-7 - DH-5	8.2-20.0	4,154	3,953	60	0.0060	75	0.0075	7.34
SS-5, SS-6 - DH-6	8.3-15.0	30,820	8,710	30	0.0030	33	0.0033	7.12
SS-6, SS-7 - B-29	14.5-21.0	7,370	7,370	9	0.0009	12	0.0012	7.83
SS-11, SS-12 - B-30	38.5-45.0	1,943	1,943	120	0.0120	120	0.0120	7.87
SS-8, SS-9 - B-34	23.5-30.0	8,040	8,040	3	0.0003	9	0.0009	7.15
SS-11, SS-13 - B-36	38.5-50.0	3,752	3,484	18	0.0018	24	0.0024	7.18
SS-5, SS-6 - B-41	8.8-15.0	19,430	16,750	9	0.0009	24	0.0024	7.25
SS-3, SS-4 - B-43	18.8-22.8	3,417	3,283	90	0.0090	300	0.0300	6.75
SS-9, SS-10 - B-47	29.5-36.0	12,730	10,050	60	0.0060	138	0.0138	7.15
SS-11, SS-12 - B-50	38.5-45.0	54,270	50,920	15	0.0015	3	0.0003	7.18
SS-3, SS-4 - B-51	4.0-8.0	61,640	46,230	6	0.0006	12	0.0012	6.81
SS-10, SS-11 - B-52	33.5-40.0	50,920	36,180	21	0.0021	6	0.0006	6.57
SS-10, SS-11 - B-53	33.5-40.0	63,650	47,570	3	0.0003	6	0.0006	6.55
SS-7, SS-8 - B-55	18.5-25.0	33,500	30,150	12	0.0012	9	0.0009	6.31
SS-4, SS-5 - B-57	6.1-10.1	16,080	15,410	18	0.0018	6	0.0006	5.68
SS-5, SS-6 - B-59	8.3-15.0	120,600	87,100	15	0.0015	9	0.0009	5.86

Unk = Unknown
NT = Not Tested
mg/kg = milligrams per kilogram (parts per million) of dry soil weight
Chemical Analysis performed on 1:3 Soil-To-Water extract

Please call if you have any questions.

Respectfully Submitted,





Eddie Hernandez, M.Sc., P.E.
Sr. Corrosion Consultant
NACE Corrosion Technologist #16592
Professional Engineer
California No. M37102
ehernandez@projectxcorrosion.com

Soil Analysis Lab Results

Client: S&ME, Inc
Job Name: Carolina Crossroads Project
Client Job Number: 1461-16-047
Project X Job Number: S180420G
April 27, 2018

	Method	ASTM G187		ASTM D516		ASTM D512B		ASTM G51
Bore# / Description	**Depth**	**Resistivity** As Rec'd | Minimum		**Sulfates**		**Chlorides**		**pH**
	(ft)	(Ohm-cm)	(Ohm-cm)	(mg/kg)	(wt%)	(mg/kg)	(wt%)	
SS-7 , SS-8 - B-31	18.5-25.0	3,752	3,752	30	0.0030	63	0.0063	6.43
SS-5 , SS-6 - B-32	8.0-15.0	7,370	7,370	12	0.0012	174	0.0174	7.09
SS-6 , SS-7 - B-33	13.5-20.0	17,420	12,060	18	0.0018	57	0.0057	6.82
SS-6 , SS-7 - B-35	13.5-20.1	14,070	8,710	30	0.0030	72	0.0072	6.99
SS-6 , SS-7 - B-37	13.5-20.2	8,040	6,700	90	0.0090	168	0.0168	7.00
SS-1 , SS-3 - B-38	0.0-6.0	67,670	41,540	12	0.0012	6	0.0006	5.02
SS-8 , SS-9 - B-42	23.5-30.0	50,920	50,920	30	0.0030	3	0.0003	5.97
SS-2 , SS-3 - B-44	2.0-6.0	9,380	9,380	300	0.0300	390	0.0390	6.11
SS-4 , SS-5 - B-46	6.0-10.0	1,608	1,474	270	0.0270	642	0.0642	6.88
SS-6 , SS-7- B-54	13.9-20.4	63,650	60,300	15	0.0015	6	0.0006	4.96
SS-7 , SS-9 - B-56	18.5-30.0	18,090	17,420	24	0.0024	33	0.0033	4.84
SS-11 , SS-12 - B-58	38.5-45.0	100,500	100,500	30	0.0030	3	0.0003	5.10
SS-4 , SS-5 - B-61	6.0-10.0	14,070	1,407	6	0.0006	3	0.0003	7.90
SS-3 , SS-4 - B-62	4.0-8.0	36,850	36,850	9	0.0009	3	0.0003	6.12
SS-4 , SS-5 - B-39	6.0-10.0	4,355	4,355	420	0.0420	765	0.0765	6.84

Unk = Unknown
NT = Not Tested
mg/kg = milligrams per kilogram (parts per million) of dry soil weight
Chemical Analysis performed on 1:3 Soil-To-Water extract

APPENDIX

SECTION 4 LABORATORY TEST RESULTS

SECTION 4B ROCK SAMPLES

CAROLINA CROSSROADS PHASE 3D
RICHLAND/LEXINGTON COUNTY, SOUTH CAROLINA
F&ME PROJECT NO.: G5662.03; SCDOT PROJECT NO.: P0443326

ROCK LABORATORY RESULTS SUMMARY

Boring Number	Investigation ID	Core Run Number	Rock Type	Sample Depth (ft)	Unit Weight (pcf)	Elasric Modulus (ksi)	Poissons Ratio	REC	RQD	GSI	Unconfined Compressive Strength (psi)
P3D-B2	2025 FME	NQ-4	Amphibolite	51.3 - 51.7	177.4	5,680	0.17	93	47	35-45	35,110
P3D-B3	2025 FME	NQ-1	Phyllite & Amphibolite	44.9 - 45.3	179.2	8,690	0.12	100	84	55-65	36,950
P3D-B3	2025 FME	NQ-2	Phyllite & Amphibolite	46.9 - 47.3	174.9	5,800	0.14	100	90	55-75	18,600
P3D-B4	2025 FME	NQ-2	Amphibolite	27.3 - 27.7	181.8	N/A	N/A	33	20	15-20	15,870
P3D-B5	2025 FME	NQ-1	Amphibolite	17.0 - 17.4	168.6	3,630	0.10	96	52	30-45	14,740
P3D-B11	2025 FME	NQ-1	Amphibolite	44.1 - 44.5	179.6	2,690	0.14	85	48	35-50	17,780
P3D-B16	2025 FME	NQ-2	Amphibolite	37.3 - 37.7	181.0	8,140	0.19	38	33	45-55	31,670
P3D-B17	2025 FME	NQ-1	Amphibolite	33.2 - 33.6	192.1	10,900	0.17	88	65	40-50	52,480
P3D-B17	2025 FME	NQ-2	Amphibolite	38.0 - 38.4	187.7	8,870	0.24	70	40	35-45	8,870
P3D-B18A	2025 FME	NQ-2	Amphibolite	15.9 - 16.3	184.5	10,900	0.22	98	77	45-60	36,900
P3D-B18A	2025 FME	NQ-3	Amphibolite	23.3 - 23.7	178.5	4,570	0.11	72	52	45-55	20,720
P3D-B19	2025 FME	NQ-1	Amphibolite	40.7 - 41.1	172.1	1,980	0.17	94	64	35-45	12,460
P3D-B19	2025 FME	NQ-2	Amphibolite	41.9 - 42.3	169.8	1,300	0.22	96	31	15-20	14400
P3D-B20	2025 FME	NQ-1	Phyllite	49.0 - 49.4	175.4	5,100	0.23	90	85	65-75	10680
P3D-B20	2025 FME	NQ-2	Phyllite	53.2 - 53.6	176.1	5,110	0.16	98	96	70-80	11700
P3D-B21	2025 FME	NQ-3	Amphibolite	61.4 - 61.8	175.8	6,140	0.15	34	28	35-55	14420
P3D-B23	2025 FME	NQ-2	Amphibolite	61.8 - 62.2	180.8	6,080	0.25	100	100	50-65	29950
P3D-B23	2025 FME	NQ-3	Amphibolite	68.6 - 69.0	176.7	5,980	0.24	99	96	65-80	35640
P3D-B24	2025 FME	NQ-2	Granite	27.1 - 27.5	162.8	5,870	0.15	83	61	50-60	36100
P3D-B25	2025 FME	NQ-1	Granite	26.0 - 26.4	162.0	2,880	0.10	87	87	90-95	18970
P3D-B25	2025 FME	NQ-2	Granite	31.0 - 31.4	162.0	3,310	0.10	87	73	70-85	22110
P3D-B26	2025 FME	NQ-2	Granite	59.0 - 59.4	174.7	886	0.02	87	73	70-85	8040
DH-3A	2018 FME & SME	NQ-1	Hornfels	2.9-3.2	194.7	N/A	N/A	53	38	53-58	69510
DH-3A	2018 FME & SME	NQ-4	Hornfels	21.1-21.4	184.1	N/A	N/A	50	23	30-35	36670
DH-3A	2018 FME & SME	NQ-9	Hornfels	72.3-72.6	183.2	N/A	N/A	87	62	30-35	22610
DH-3A	2018 FME & SME	NQ-10	Hornfels	76.5-76.8	193.0	N/A	N/A	99	95	30-40	13710
DH-3A	2018 FME & SME	NQ-10	Hornfels	80.6-80.9	184.0	N/A	N/A	99	95	30-40	16760
DH-3A	2018 FME & SME	NQ-11	Hornfels	84.6-84.9	184.7	N/A	N/A	93	85	30-40	28600
DH-3A	2018 FME & SME	NQ-12	Hornfels	89.6-89.9	183.5	N/A	N/A	98	98	30-40	37260
DH-3A	2018 FME & SME	NQ-15	Hornfels	103.3-103.6	183.0	N/A	N/A	98	98	40-45	29090
B-31	2018 FME & SME	RC-1	Schist	26.7-27.4	186.6	13770	N/A	94	52	45-55	52272
B-31	2018 FME & SME	RC-4	Schist	41.3-42.0	187.0	6570	N/A	80	43	30-40	30261
B-32	2018 FME & SME	RC-3	Schist	67.2-68.1	178.7	6340	N/A	60	20	10-20	30222
B-33	2018 FME & SME	RC-6	Schist	72.2-73.0	176.0	6120	N/A	100	19	30-40	30472
B-36	2018 FME & SME	RC-3	Schist	69.3-69.9	198.6	16490	N/A	100	34	10-20	69199
B-37	2018 FME & SME	RC-4	Schist	52.6-53.3	183.6	3890	N/A	100	30	20-30	14914
B-37	2018 FME & SME	RC-5	Schist	57.2-58.0	176.9	12660	N/A	96	32	20-30	21778
B-37	2018 FME & SME	RC-6	Schist	63.2-63.8	176.9	7330	N/A	100	80	50-60	10352
B-44	2018 FME & SME	RC-1	Granite	9.2-9.9	163.5	8430	N/A	100	30	45-55	32832
B-44	2018 FME & SME	RC-3	Granite	16.2-17.1	162.7	5810	N/A	100	40	45-55	9831
B-44	2018 FME & SME	RC-4	Granite	23.2-23.9	162.4	2770	N/A	94	25	45-55	3328
B-45	2018 FME & SME	RC-3	Granite	37.9-38.5	163.9	8010	N/A	100	78	70-80	30585
B-45	2018 FME & SME	RC-6	Granite	42.8-43.4	163.3	6320	N/A	100	90	70-80	22213
W-22	2018 FME & SME	RC-3	Granite	16.5-17.0	164.2	6090	N/A	90	67	75-85	26378
W-23	2018 FME & SME	RC-2	Granite	20.7-21.5	164.2	7870	N/A	96	97	60-70	29167

FME 2025 INVESTIGATION

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

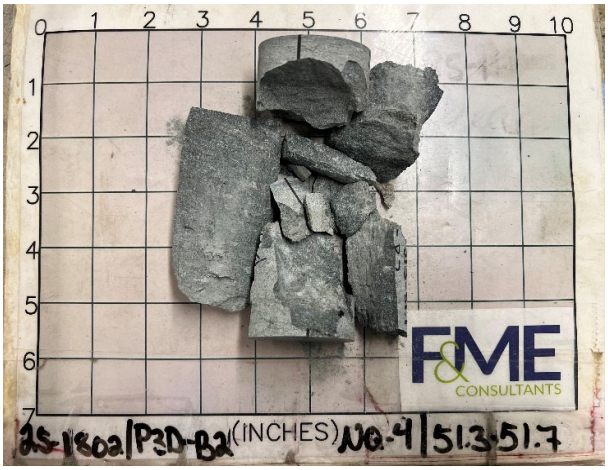
Project	Carolina Crossroads I-20/26/126 Corridor Improvements			Date	8/4/2025
Project No.	G5662.030	Sample Diameter (in.)	1.867	Tested By	TP
SCDOT ID	P039721 & P039722	Sample Length (in.)	4.508	Reviewed By	WJG
Boring	P3D-B2	Unit Weight (pcf)	177.4	Core Size	NQ
Sample No.	NQ-4 / 25-1802	L/D Ratio	2.41	Recovery	93%
Depth	51.3' - 51.7'	Load Rate (psi/sec)	20	RQD	47%
Description	Dark Gray/Dark Brown Amphibolite				

Test Data

Percent of Failure Load	Strain (10^{-6}) Axial	Strain (10^{-6}) Radial	Load (lbs)	Compressive Stress (psi)	Secant Modulus x10^6 (psi)	Poisson's Ratio
10%	-1316	174	9,617	3,513	5.34	0.13
20%	-2558	395	19,226	7,023	5.49	0.15
30%	-3695	648	28,842	10,535	5.70	0.18
40%	-4780	928	38,446	14,043	5.88	0.19
50%	-5831	1233	48,064	17,557	6.02	0.21
60%	-6886	1579	57,675	21,067	6.12	0.23
70%	-7954	1981	67,286	24,578	6.18	0.25
80%	-9064	2485	76,897	28,089	6.20	0.27
90%	-10251	3162	86,504	31,598	6.16	0.31
100%	-12661	4582	96,120	35,110		

Sample Photos



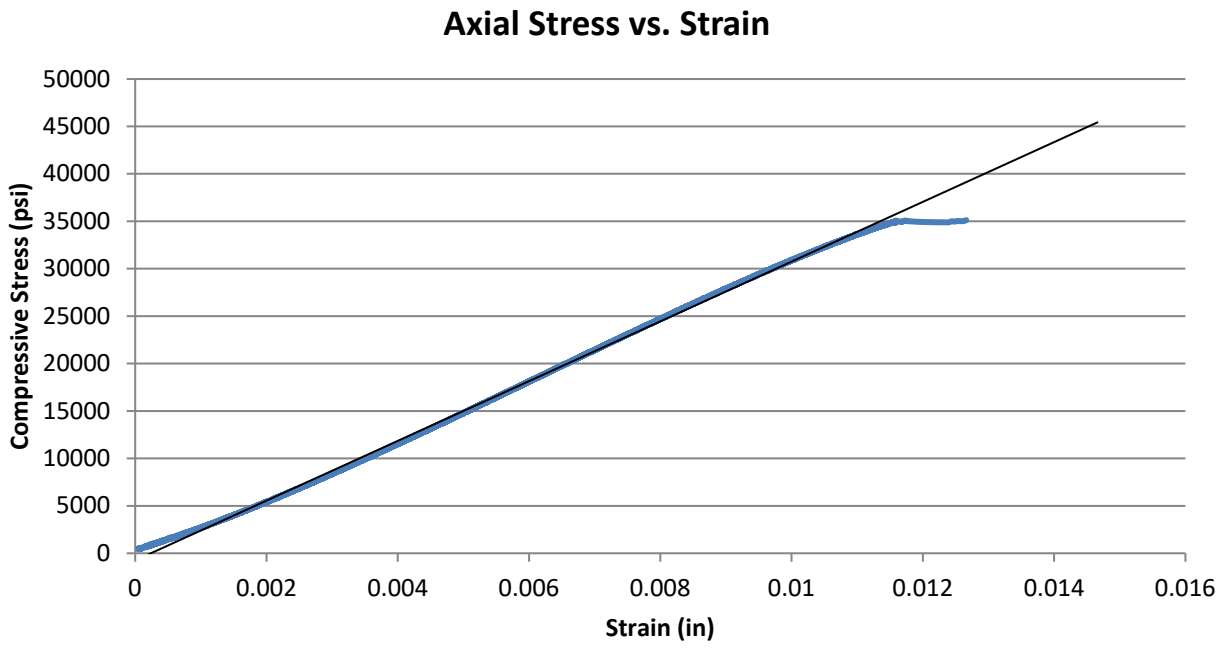


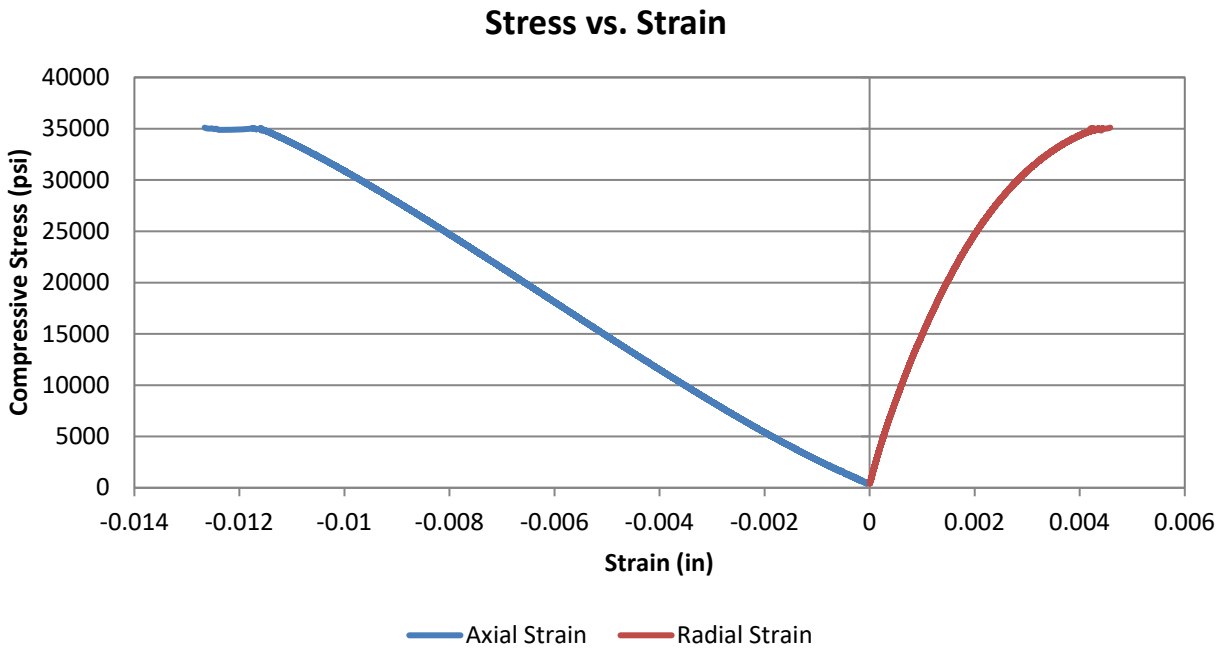
Test Results

Unconfined Compressive Strength (psi)	**35,110**	Elastic Modulus (psi)	5.68E+06
		Poisson's Ratio in Elastic Range	0.17
Comments	Elastic range was taken as between 0.002 and 0.005 inches of axial strain. This range was chosen to avoid any non-linear behavior from the initial loading and the inflection point at the end of the elastic range.		

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

Project	Carolina Crossroads I-20/26/126 Corridor Improvements			Date	8/4/2025
Project No.	G5662.030	Sample Diameter (in.)	1.867	Tested By	TP
SCDOT ID	P039721 & P039722	Sample Length (in.)	4.508	Reviewed By	WJG
Boring	P3D-B2	Unit Weight (pcf)	177.4	Core Size	NQ
Sample No.	NQ-4 / 25-1802	L/D Ratio	2.41	Recovery	93%
Depth	51.3' - 51.7'	Load Rate (psi/sec)	20	RQD	47%
Description	Dark Gray/Dark Brown Amphibolite				





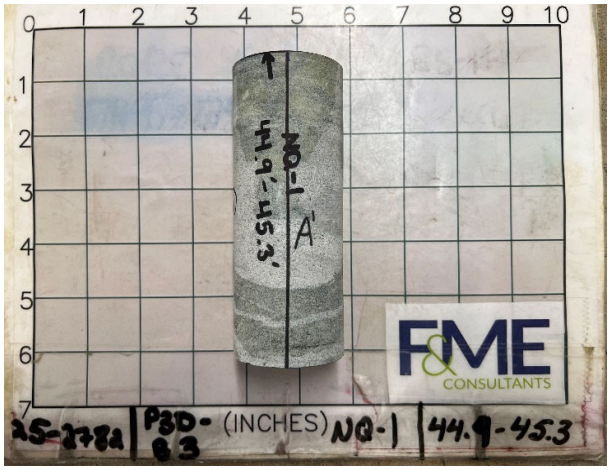
Compressive Strength and Elastic Moduli of Intact Rock Core Specimens
ASTM D7012 - Method D / SC-T-39

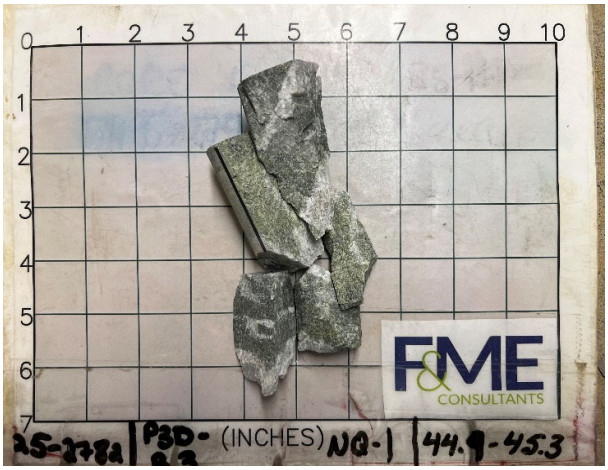
Project	Carolina Crossroads I-20/26/126 Corridor Improvements			Date	9/18/2025
Project No.	G5662.030	Sample Diameter (in.)	1.862	Tested By	TP
SCDOT ID	P039721 & P039722	Sample Length (in.)	4.622	Reviewed By	WJG
Boring	P3D-B3	Unit Weight (pcf)	179.2	Core Size	NQ
Sample No.	NQ-1 / 25-2782	L/D Ratio	2.48	Recovery	100%
Depth	44.9' - 45.3'	Load Rate (psi/sec)	25	RQD	84%
Description	Black/Green Phyllite & Amphibolite				

Test Data

Percent of Failure Load	Strain (10^{-6}) Axial	Strain (10^{-6}) Radial	Load (lbs)	Compressive Stress (psi)	Secant Modulus x10^6 (psi)	Poisson's Ratio
10%	-862	96	10,021	3,680	8.53	0.11
20%	-1714	194	20,112	7,386	8.62	0.11
30%	-2529	306	30,187	11,086	8.77	0.12
40%	-3335	424	40,242	14,779	8.86	0.13
50%	-4148	551	50,303	18,473	8.91	0.13
60%	-4976	686	60,362	22,167	8.91	0.14
70%	-5808	1935	70,424	25,863	8.91	0.33
80%	-7106	7185	80,482	29,556	8.32	1.01
90%	-7873	7988	90,541	33,250	8.45	1.01
100%	-9096	7987	100,603	36,946		

Sample Photos





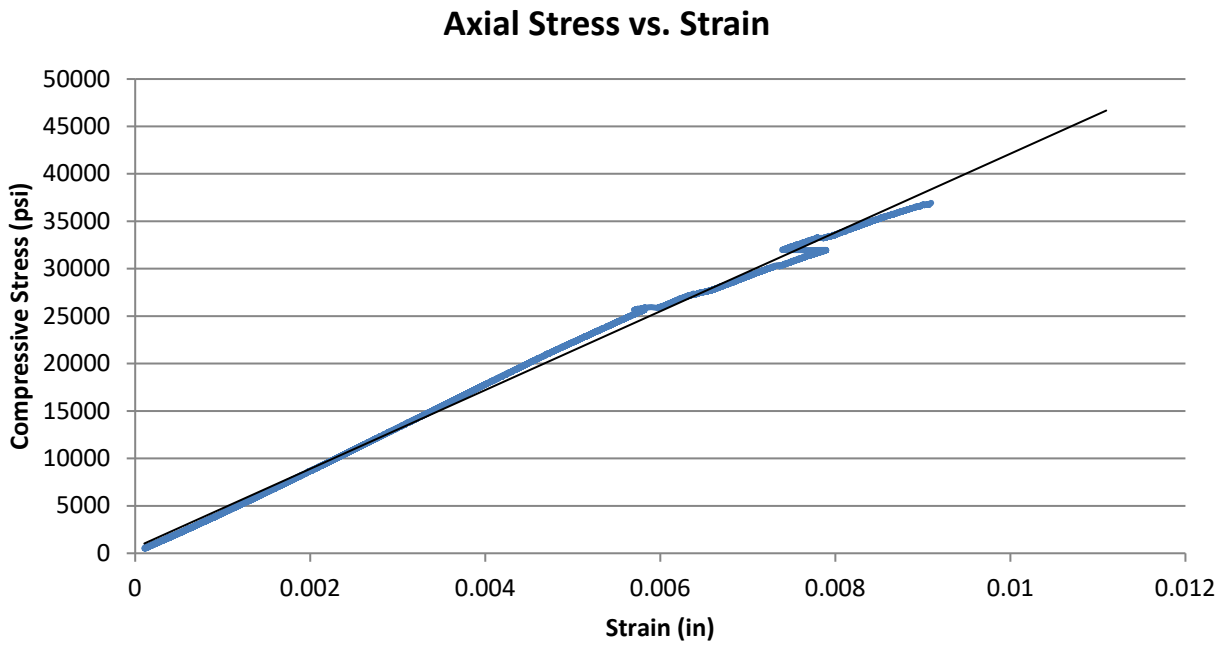
Test Results

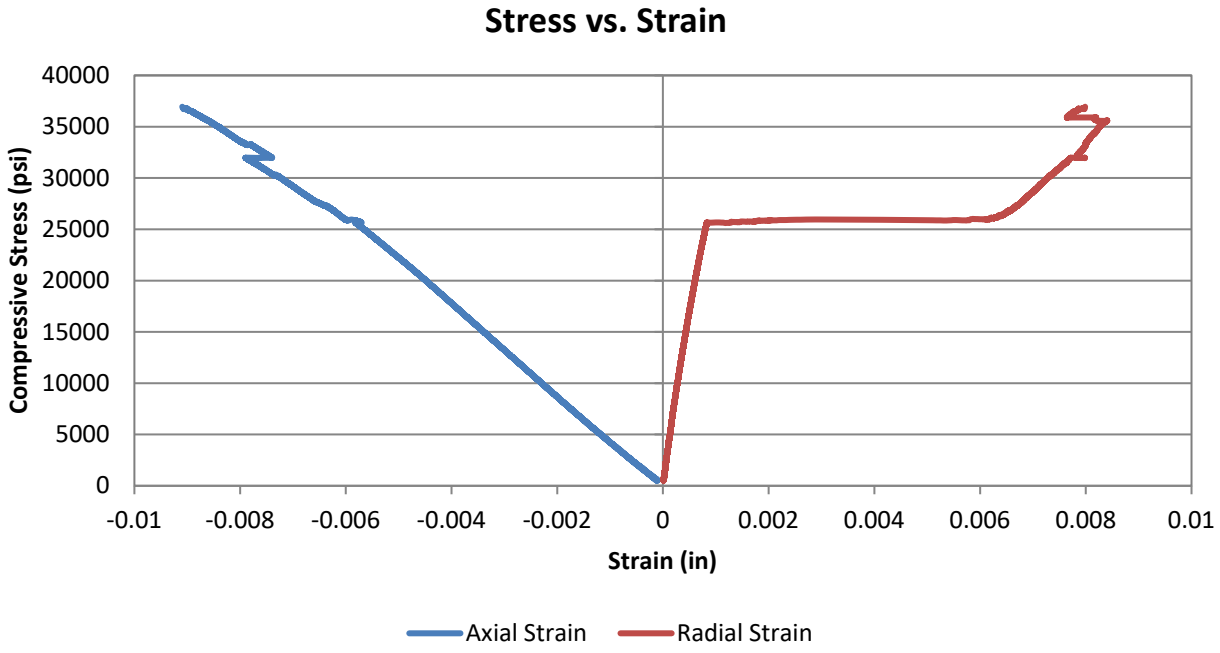
Unconfined Compressive Strength (psi)	**36,950**	Elastic Modulus (psi)	8.69E+06
		Poisson's Ratio in Elastic Range	0.12
Comments	Elastic range was taken as between 0.001 and 0.0035 inches of axial strain. This range was chosen to avoid any non-linear behavior from the initial loading and the inflection point at the end of the elastic range.		

F&ME CONSULTANTS

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

Project	Carolina Crossroads I-20/26/126 Corridor Improvements			Date	9/18/2025
Project No.	G5662.030	Sample Diameter (in.)	1.862	Tested By	TP
SCDOT ID	P039721 & P039722	Sample Length (in.)	4.622	Reviewed By	WJG
Boring	P3D-B3	Unit Weight (pcf)	179.2	Core Size	NQ
Sample No.	NQ-1 / 25-2782	L/D Ratio	2.48	Recovery	100%
Depth	44.9' - 45.3'	Load Rate (psi/sec)	25	RQD	84%
Description	Black/Green Phyllite & Amphibolite				





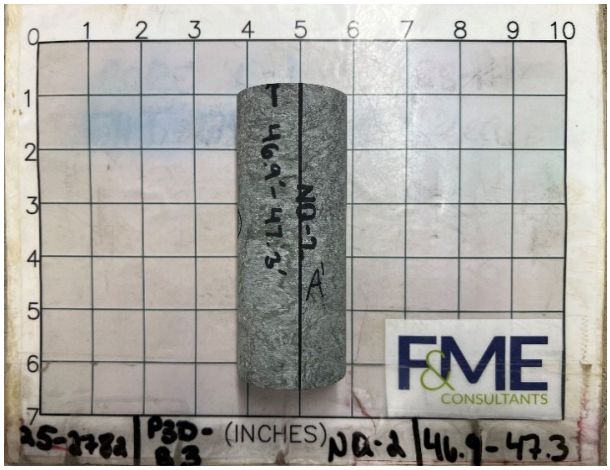
Compressive Strength and Elastic Moduli of Intact Rock Core Specimens
ASTM D7012 - Method D / SC-T-39

Project	Carolina Crossroads I-20/26/126 Corridor Improvements			Date	9/18/2025
Project No.	G5662.030	Sample Diameter (in.)	1.864	Tested By	TP
SCDOT ID	P039721 & P039722	Sample Length (in.)	4.552	Reviewed By	WJG
Boring	P3D-B3	Unit Weight (pcf)	174.9	Core Size	NQ
Sample No.	NQ-2 / 25-2782	L/D Ratio	2.44	Recovery	100%
Depth	46.9' - 47.3'	Load Rate (psi/sec)	35	RQD	90%
Description	Black/Green Phyllite & Amphibolite				

Test Data

Percent of Failure Load	Strain (10^{-6}) Axial	Strain (10^{-6}) Radial	Load (lbs)	Compressive Stress (psi)	Secant Modulus x10^6 (psi)	Poisson's Ratio
10%	-652	82	5,077	1,860	5.70	0.13
20%	-1293	173	10,157	3,722	5.76	0.13
30%	-1926	268	15,241	5,585	5.80	0.14
40%	-2555	367	20,306	7,441	5.83	0.14
50%	-3208	477	25,386	9,303	5.80	0.15
60%	-3862	598	30,478	11,169	5.78	0.15
70%	-4572	745	35,530	13,020	5.70	0.16
80%	-5396	952	40,607	14,881	5.52	0.18
90%	-6297	1226	45,699	16,747	5.32	0.19
100%	-8003	1920	50,763	18,602		

Sample Photos



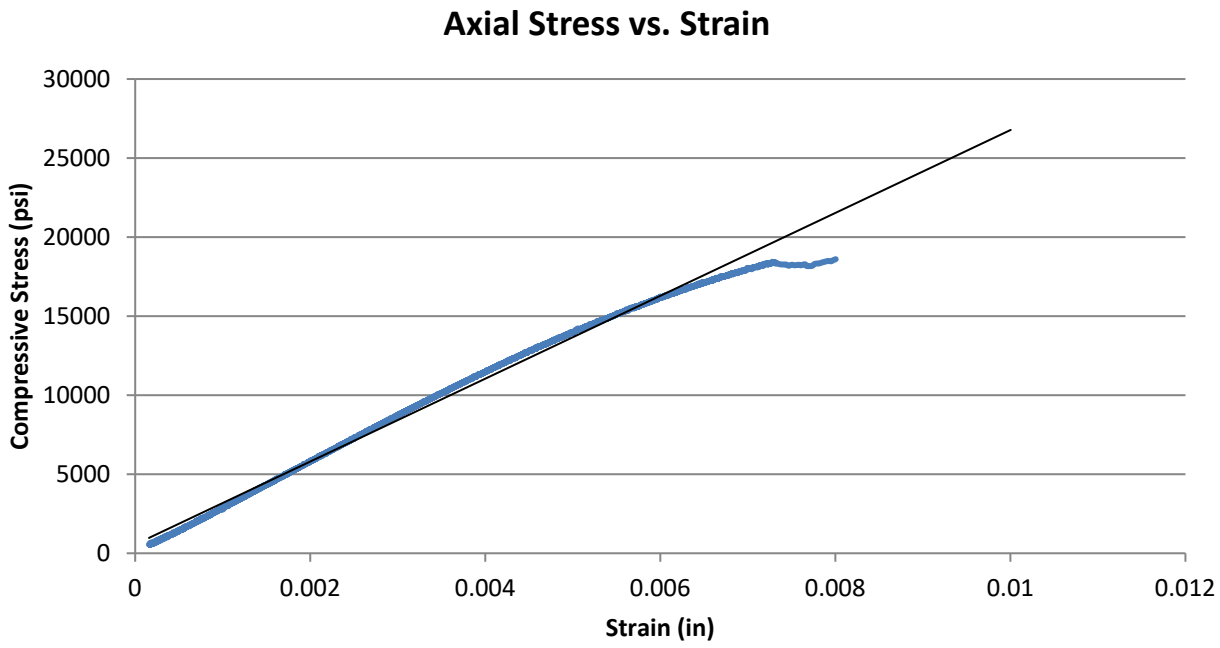


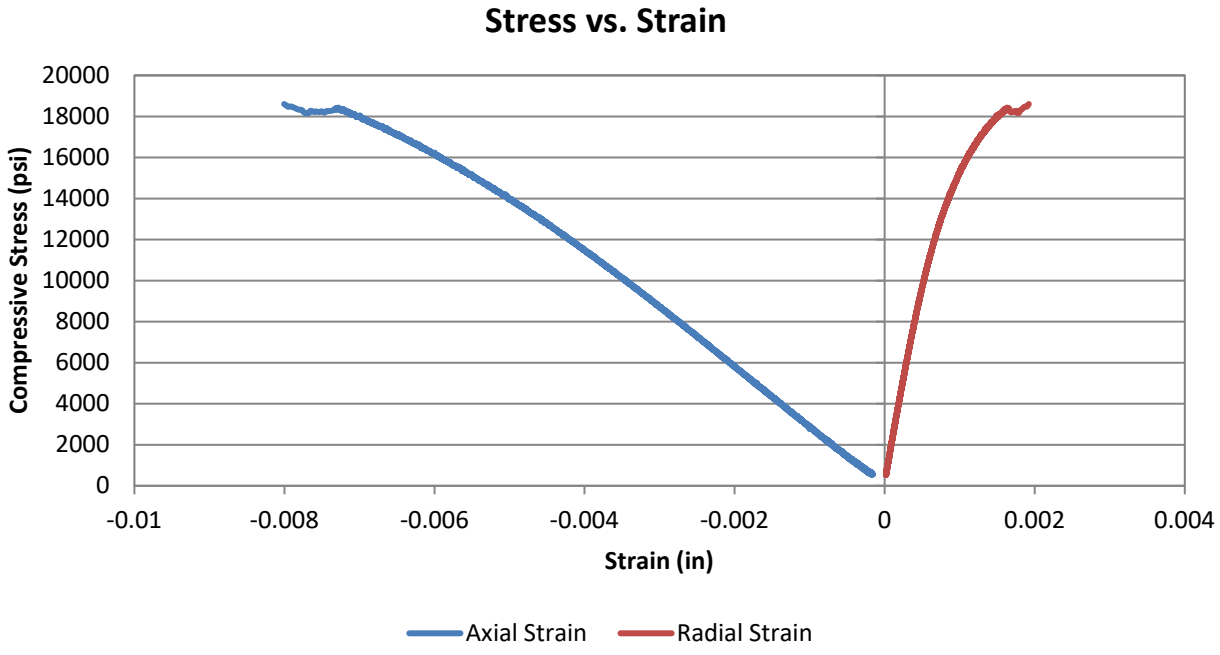
Test Results

Unconfined Compressive Strength (psi)	**18,600**	Elastic Modulus (psi)	5.80E+06
		Poisson's Ratio in Elastic Range	0.14
Comments	Elastic range was taken as between 0.001 and 0.0035 inches of axial strain. This range was chosen to avoid any non-linear behavior from the initial loading and the inflection point at the end of the elastic range.		

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

Project	Carolina Crossroads I-20/26/126 Corridor Improvements			Date	9/18/2025
Project No.	G5662.030	Sample Diameter (in.)	1.864	Tested By	TP
SCDOT ID	P039721 & P039722	Sample Length (in.)	4.552	Reviewed By	WJG
Boring	P3D-B3	Unit Weight (pcf)	174.9	Core Size	NQ
Sample No.	NQ-2 / 25-2782	L/D Ratio	2.44	Recovery	100%
Depth	46.9' - 47.3'	Load Rate (psi/sec)	35	RQD	90%
Description	Black/Green Phyllite & Amphibolite				





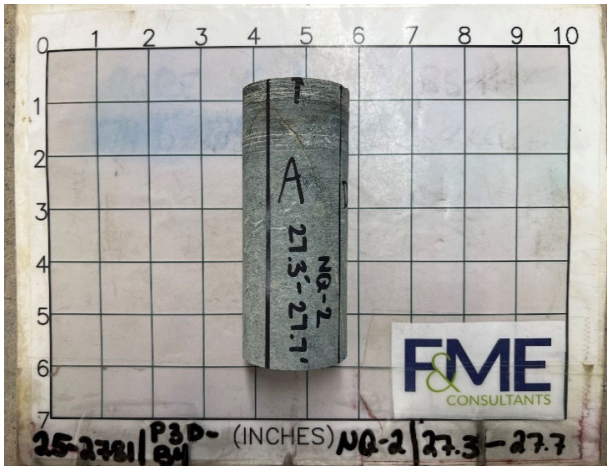
Compressive Strength and Elastic Moduli of Intact Rock Core Specimens
ASTM D7012 - Method D / SC-T-39

Project	Carolina Crossroads I-20/26/126 Corridor Improvements			Date	9/18/2025
Project No.	G5662.030	Sample Diameter (in.)	1.814	Tested By	TP
SCDOT ID	P039721 & P039722	Sample Length (in.)	4.405	Reviewed By	WJG
Boring	P3D-B4	Unit Weight (pcf)	181.8	Core Size	NQ
Sample No.	NQ-2 / 25-2781	L/D Ratio	2.43	Recovery	33%
Depth	27.3' - 27.7'	Load Rate (psi/sec)	35	RQD	20%
Description	Black/Green Amphibolite				

Test Data

Percent of Failure Load	Strain (10^{-6}) Axial	Strain (10^{-6}) Radial	Load (lbs)	Compressive Stress (psi)	Secant Modulus x10^6 (psi)	Poisson's Ratio
10%	-108	98	4,105	1,588	29.48	0.91
20%	-298	197	8,249	3,192	21.43	0.66
30%	-286	251	12,305	4,761	33.28	0.88
40%	-97	298	16,399	6,345	130.96	3.08
50%	-461	391	20,502	7,933	34.40	0.85
60%	-768	469	24,613	9,524	24.81	0.61
70%	-1399	552	28,716	11,111	15.88	0.39
80%	-24969	1886	32,816	12,698	1.02	0.08
90%	-24658	1951	36,921	14,286	1.16	0.08
100%	-25697	1947	41,019	15,872		

Sample Photos



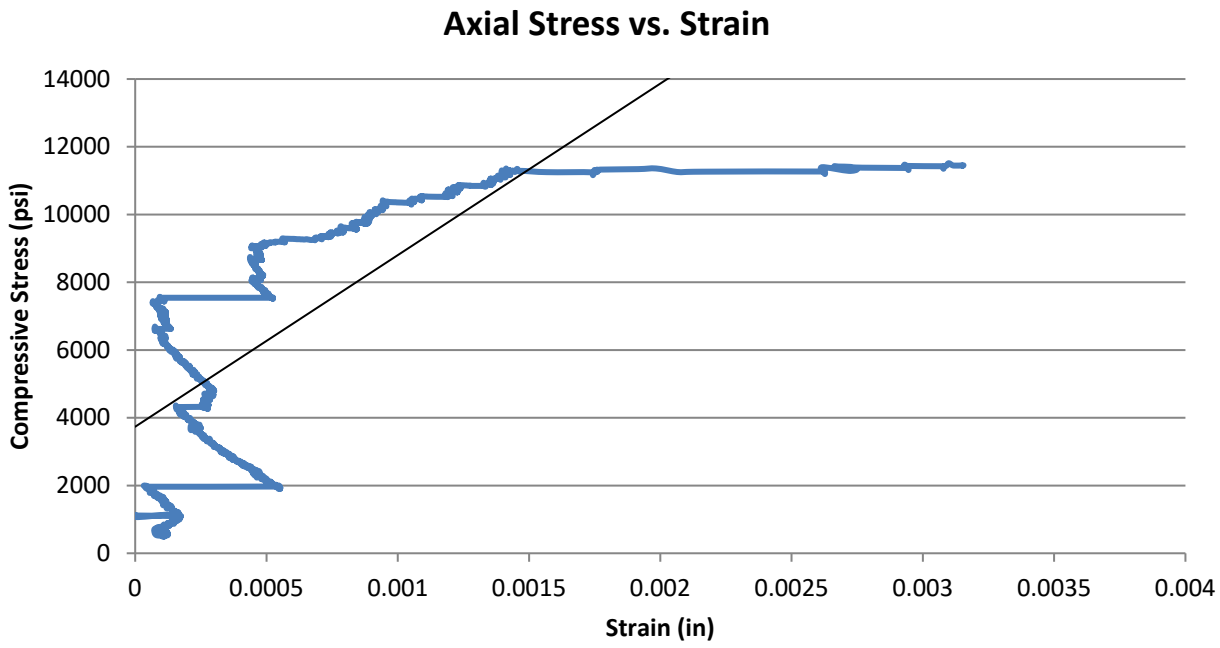


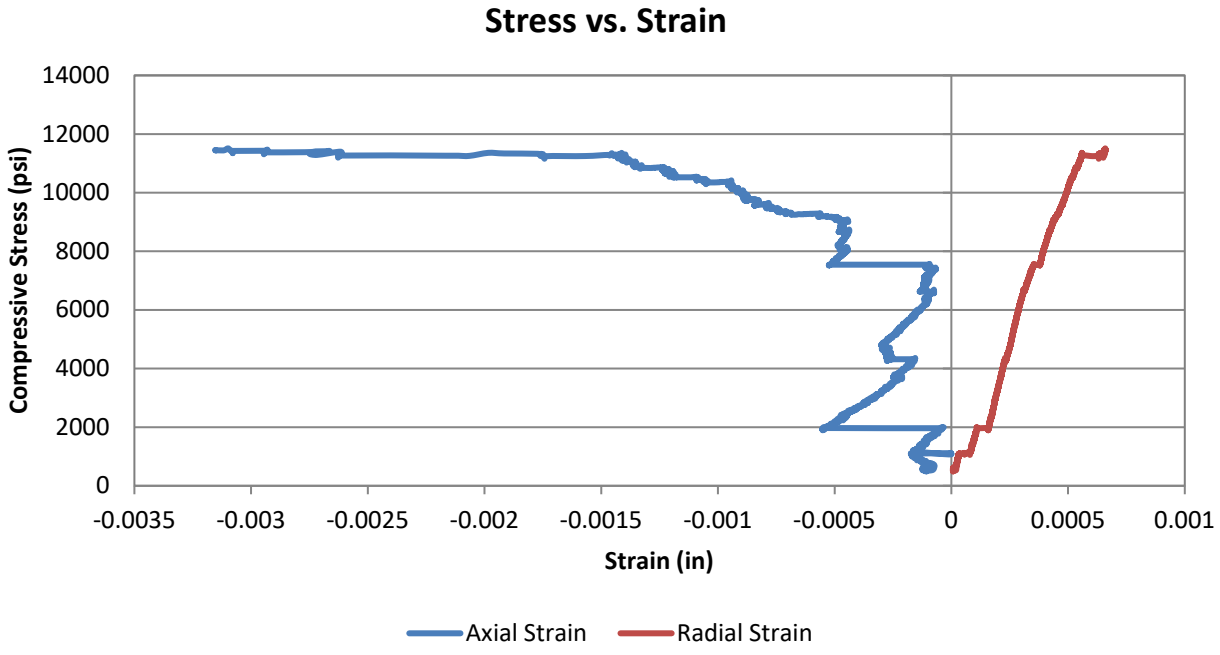
Test Results

Unconfined Compressive Strength (psi)	**15,870**	Elastic Modulus (psi)	N/A
		Poisson's Ratio in Elastic Range	N/A
Comments	Elastic range could not be determined due to gauge movement during testing. Unreliable strain data was collected during testing. Calculation of the Elastic Modulus and Poisson's Ratio in the Elastic Range could not be determined.		

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

Project	Carolina Crossroads I-20/26/126 Corridor Improvements			Date	9/18/2025
Project No.	G5662.030	Sample Diameter (in.)	1.814	Tested By	TP
SCDOT ID	P039721 & P039722	Sample Length (in.)	4.405	Reviewed By	WJG
Boring	P3D-B4	Unit Weight (pcf)	181.8	Core Size	NQ
Sample No.	NQ-2 / 25-2781	L/D Ratio	2.43	Recovery	33%
Depth	27.3' - 27.7'	Load Rate (psi/sec)	35	RQD	20%
Description	Black/Green Amphibolite				





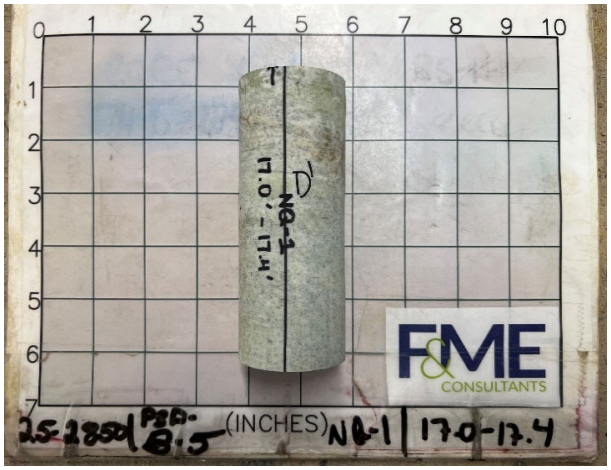
Compressive Strength and Elastic Moduli of Intact Rock Core Specimens
ASTM D7012 - Method D / SC-T-39

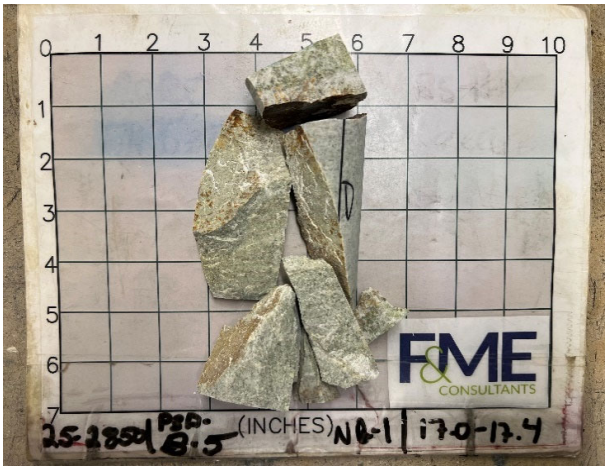
Project	Carolina Crossroads I-20/26/126 Corridor Improvements			Date	9/18/2025
Project No.	G5662.030	Sample Diameter (in.)	1.851	Tested By	TP
SCDOT ID	P039721 & P039722	Sample Length (in.)	4.612	Reviewed By	WJG
Boring	P3D-B5	Unit Weight (pcf)	168.6	Core Size	NQ
Sample No.	NQ-1 / 25-2850	L/D Ratio	2.49	Recovery	96%
Depth	17.0' - 17.4'	Load Rate (psi/sec)	35	RQD	52%
Description	Green/White Amphibolite				

Test Data

Percent of Failure Load	Strain (10^{-6}) Axial	Strain (10^{-6}) Radial	Load (lbs)	Compressive Stress (psi)	Secant Modulus x10^6 (psi)	Poisson's Ratio
10%	-790	67	3,965	1,473	3.73	0.08
20%	-1612	150	7,927	2,946	3.66	0.09
30%	-2448	254	11,925	4,431	3.62	0.10
40%	-3171	366	15,876	5,900	3.72	0.12
50%	-3823	479	19,820	7,365	3.85	0.13
60%	-4457	585	23,807	8,847	3.97	0.13
70%	-5073	697	27,797	10,330	4.07	0.14
80%	-5660	809	31,741	11,796	4.17	0.14
90%	-22671	7005	35,732	13,279	1.17	0.31
100%	-22897	7807	39,674	14,744		

Sample Photos



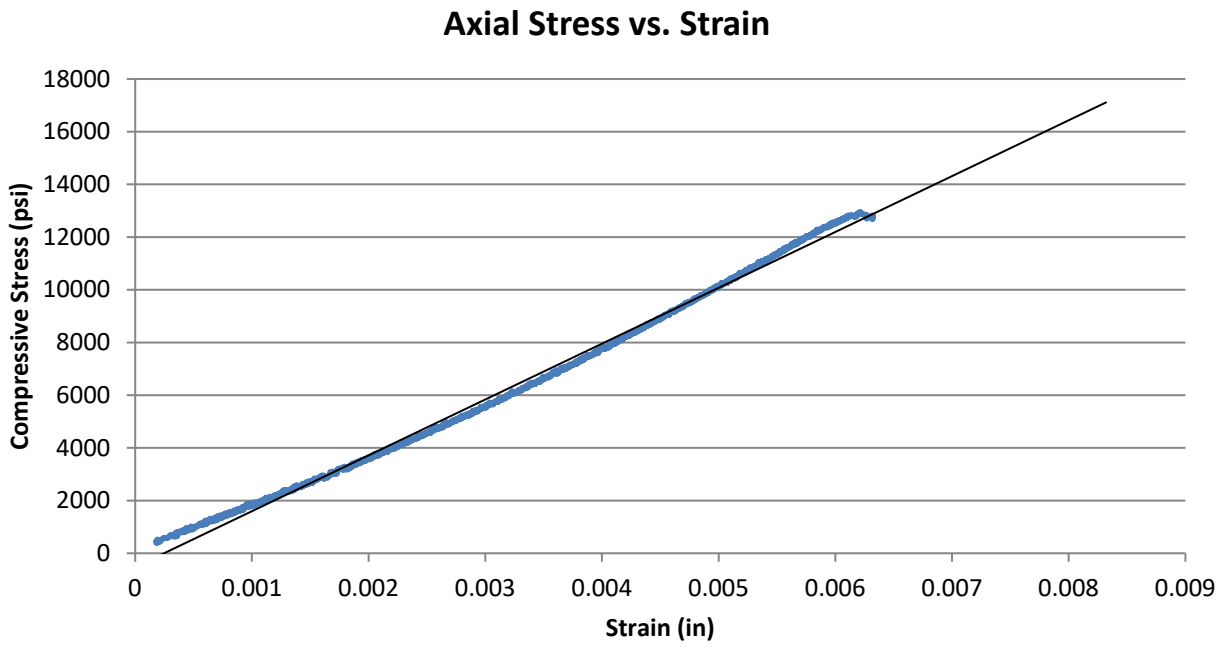


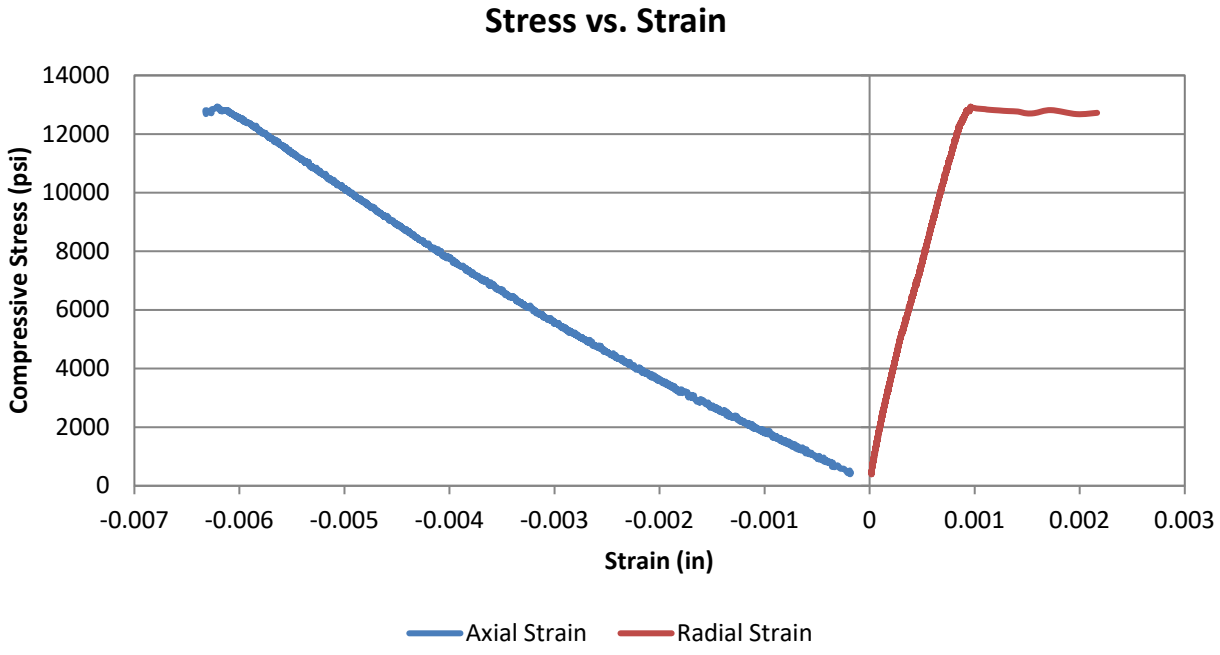
Test Results

Unconfined Compressive Strength (psi)	**14,740**	Elastic Modulus (psi)	3.63E+06
		Poisson's Ratio in Elastic Range	0.10
Comments	Elastic range was taken as between 0.001 and 0.003 inches of axial strain. This range was chosen to avoid any non-linear behavior from the initial loading and the inflection point at the end of the elastic range.		

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

Project	Carolina Crossroads I-20/26/126 Corridor Improvements			Date	9/18/2025
Project No.	G5662.030	Sample Diameter (in.)	1.851	Tested By	TP
SCDOT ID	P039721 & P039722	Sample Length (in.)	4.612	Reviewed By	WJG
Boring	P3D-B5	Unit Weight (pcf)	168.6	Core Size	NQ
Sample No.	NQ-1 / 25-2850	L/D Ratio	2.49	Recovery	96%
Depth	17.0' - 17.4'	Load Rate (psi/sec)	35	RQD	52%
Description	Green/White Amphibolite				





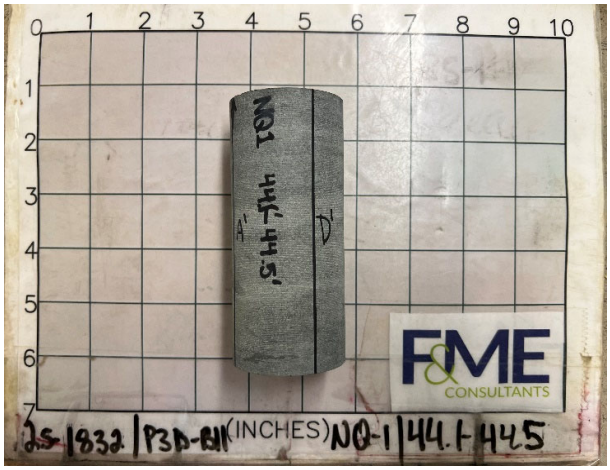
Compressive Strength and Elastic Moduli of Intact Rock Core Specimens
ASTM D7012 - Method D / SC-T-39

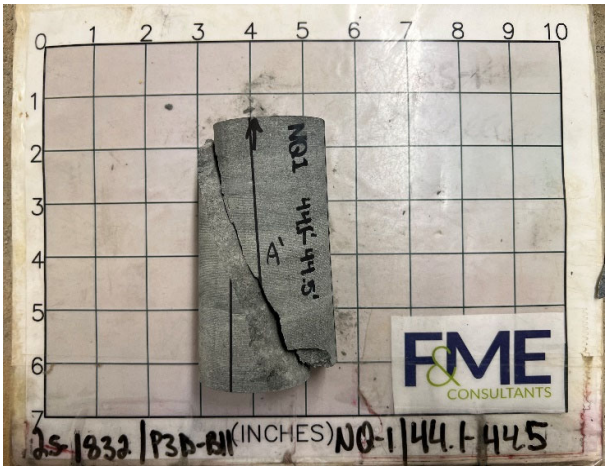
Project	Carolina Crossroads I-20/26/126 Corridor Improvements			Date	8/4/2025
Project No.	G5662.030	Sample Diameter (in.)	1.875	Tested By	TP
SCDOT ID	P039721 & P039722	Sample Length (in.)	4.154	Reviewed By	WJG
Boring	P3D-B11	Unit Weight (pcf)	179.6	Core Size	NQ
Sample No.	NQ-1 / 25-1832	L/D Ratio	2.22	Recovery	85%
Depth	44.1' - 44.5'	Load Rate (psi/sec)	25	RQD	48%
Description	Dark Gray Amphibolite				

Test Data

Percent of Failure Load	Strain (10^{-6}) Axial	Strain (10^{-6}) Radial	Load (lbs)	Compressive Stress (psi)	Secant Modulus x10^6 (psi)	Poisson's Ratio
10%	-1223	116	4,926	1,785	2.92	0.09
20%	-2644	338	9,813	3,556	2.69	0.13
30%	-3995	610	14,723	5,335	2.67	0.15
40%	-5279	942	19,634	7,114	2.69	0.18
50%	-6533	1363	24,530	8,889	2.72	0.21
60%	-7772	1881	29,440	10,668	2.74	0.24
70%	-9037	2561	34,351	12,448	2.75	0.28
80%	-10386	3534	39,262	14,227	2.74	0.34
90%	-11881	5050	44,170	16,005	2.69	0.43
100%	-14473	8377	49,077	17,783		

Sample Photos



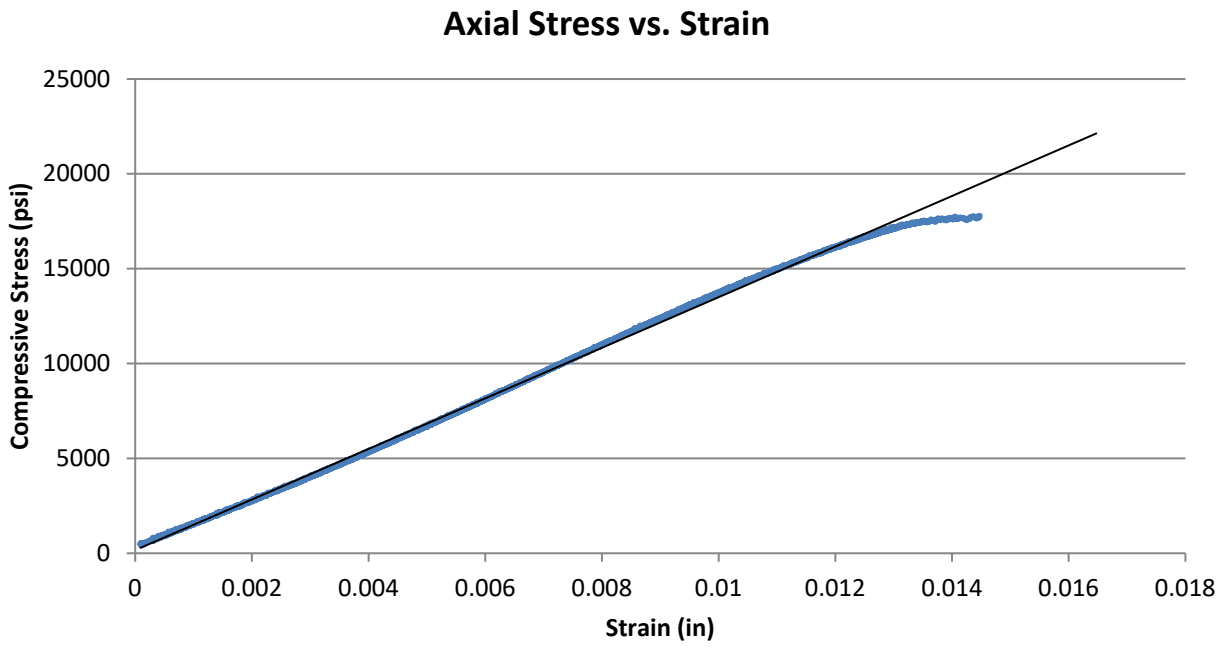


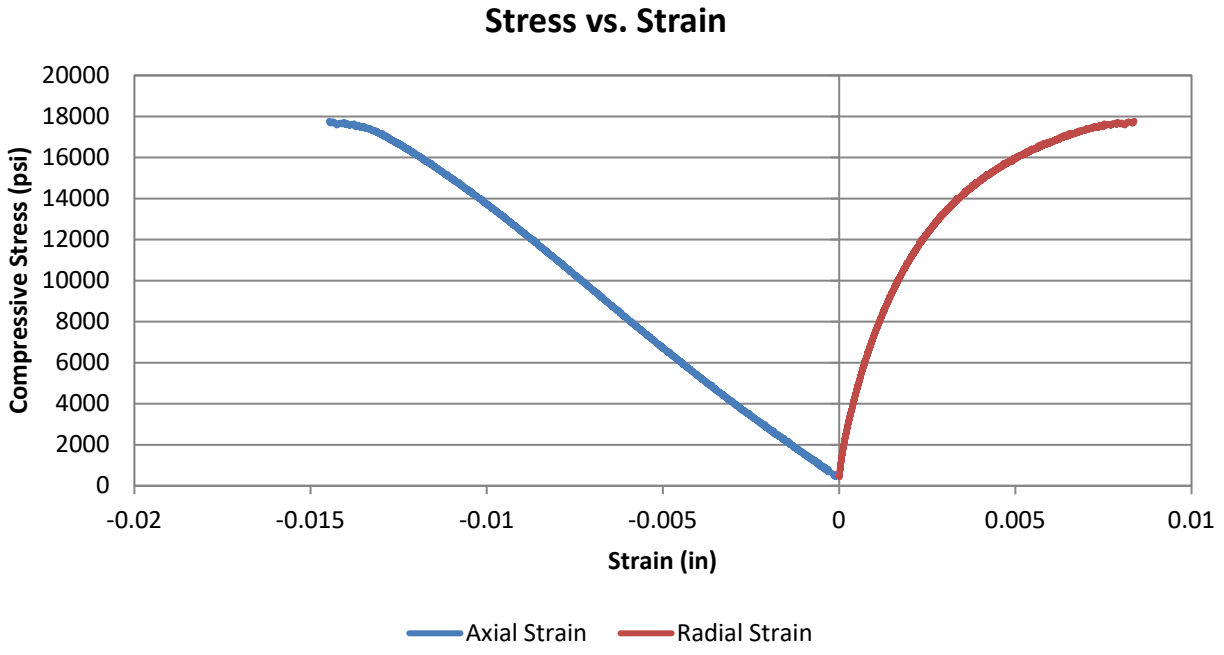
Test Results

Unconfined Compressive Strength (psi)	**17,780**	Elastic Modulus (psi)	2.69E+06
		Poisson's Ratio in Elastic Range	0.14
Comments	Elastic range was taken as between 0.002 and 0.005 inches of axial strain. This range was chosen to avoid any non-linear behavior from the initial loading and the inflection point at the end of the elastic range.		

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

Project	Carolina Crossroads I-20/26/126 Corridor Improvements			Date	8/4/2025
Project No.	G5662.030	Sample Diameter (in.)	1.875	Tested By	TP
SCDOT ID	P039721 & P039722	Sample Length (in.)	4.154	Reviewed By	WJG
Boring	P3D-B11	Unit Weight (pcf)	179.6	Core Size	NQ
Sample No.	NQ-1 / 25-1832	L/D Ratio	2.22	Recovery	85%
Depth	44.1' - 44.5'	Load Rate (psi/sec)	25	RQD	48%
Description	Dark Gray Amphibolite				





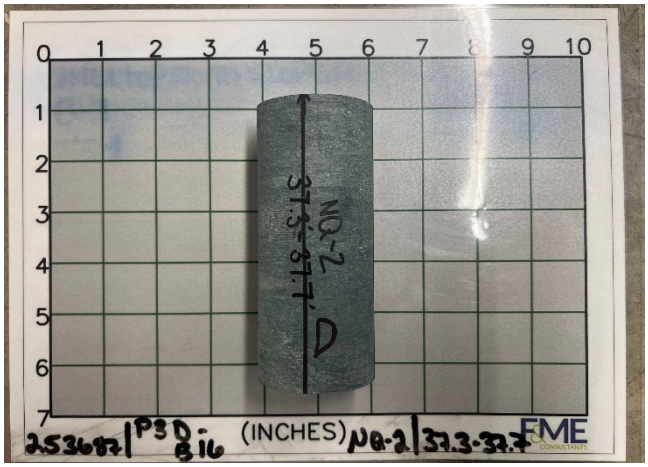
Compressive Strength and Elastic Moduli of Intact Rock Core Specimens
ASTM D7012 - Method D / SC-T-39

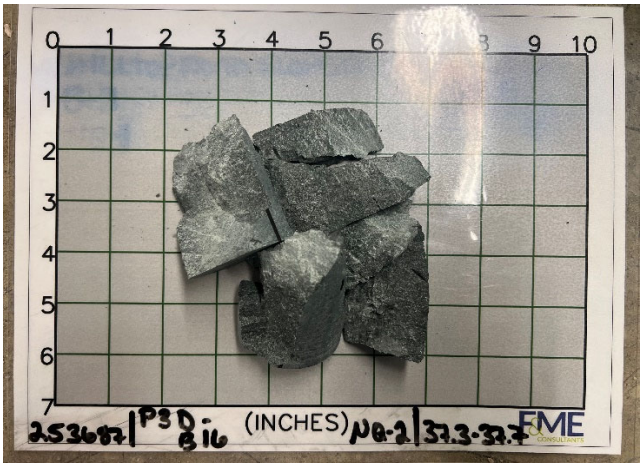
Project	Carolina Crossroads I-20/26/126 Corridor Improvements			Date	10/21/2025
Project No.	G5662.030	Sample Diameter (in.)	1.883	Tested By	TP
SCDOT ID	P039721 & P039722	Sample Length (in.)	4.5	Reviewed By	WJG
Boring	P3D-B16	Unit Weight (pcf)	181.0	Core Size	NQ
Sample No.	NQ-2 / 25-3687	L/D Ratio	2.39	Recovery	38%
Depth	37.3' - 37.7'	Load Rate (psi/sec)	50	RQD	33%
Description	Dark Gray Amphibolite				

Test Data

Percent of Failure Load	Strain (10^{-6}) Axial	Strain (10^{-6}) Radial	Load (lbs)	Compressive Stress (psi)	Secant Modulus x10^6 (psi)	Poisson's Ratio
10%	-282	105	8,821	3,168	22.45	0.37
20%	-1346	258	17,675	6,347	9.43	0.19
30%	-2384	436	26,472	9,506	7.97	0.18
40%	-3412	640	35,276	12,668	7.42	0.19
50%	-4411	872	44,099	15,836	7.18	0.20
60%	-5384	1125	52,933	19,008	7.06	0.21
70%	-6326	1394	61,736	22,169	7.01	0.22
80%	-7272	1697	70,555	25,336	6.97	0.23
90%	-8352	2053	79,372	28,502	6.83	0.25
100%	-9503	2959	88,193	31,670		

Sample Photos



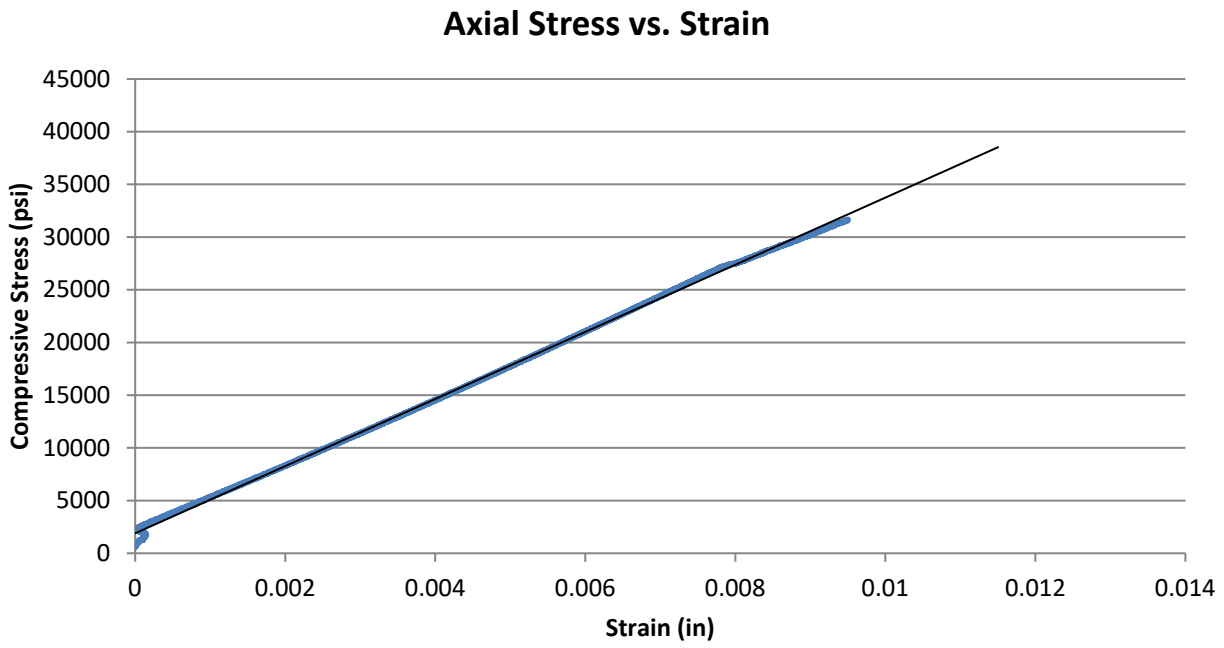


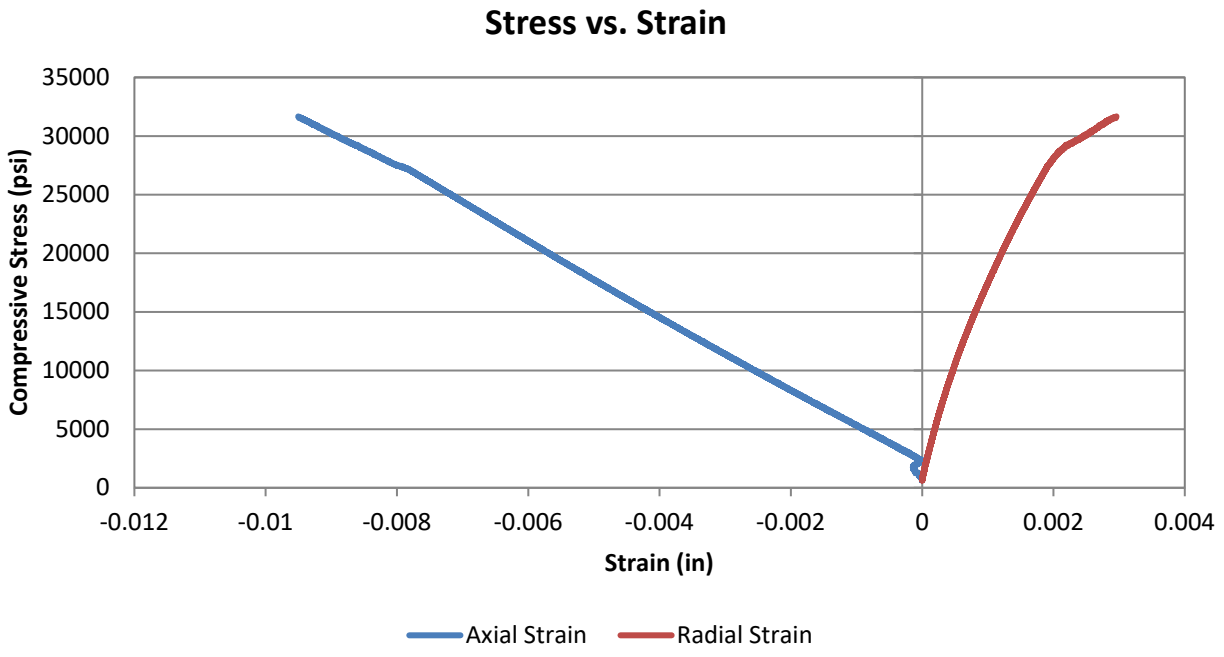
Test Results

Unconfined Compressive Strength (psi)	**31,670**	Elastic Modulus (psi)	8.14E+06
		Poisson's Ratio in Elastic Range	0.19
Comments	Elastic range was taken as between 0.001 and 0.004 inches of axial strain. This range was chosen to avoid any non-linear behavior from the initial loading and the inflection point at the end of the elastic range.		

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

Project	Carolina Crossroads I-20/26/126 Corridor Improvements			Date	10/21/2025
Project No.	G5662.030	Sample Diameter (in.)	1.883	Tested By	TP
SCDOT ID	P039721 & P039722	Sample Length (in.)	4.5	Reviewed By	WJG
Boring	P3D-B16	Unit Weight (pcf)	181.0	Core Size	NQ
Sample No.	NQ-2 / 25-3687	L/D Ratio	2.39	Recovery	38%
Depth	37.3' - 37.7'	Load Rate (psi/sec)	50	RQD	33%
Description	Dark Gray Amphibolite				





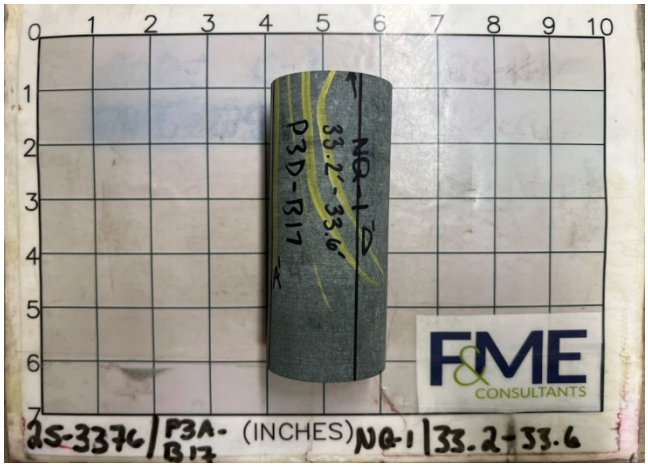
Compressive Strength and Elastic Moduli of Intact Rock Core Specimens
ASTM D7012 - Method D / SC-T-39

Project	Carolina Crossroads I-20/26/126 Corridor Improvements			Date	10/10/2025
Project No.	G5662.030	Sample Diameter (in.)	1.865	Tested By	TP
SCDOT ID	P039721 & P039722	Sample Length (in.)	4.503	Reviewed By	WJG
Boring	P3D-B17	Unit Weight (pcf)	192.1	Core Size	NQ
Sample No.	NQ-1 / 25-3376	L/D Ratio	2.41	Recovery	88%
Depth	33.2' - 33.6'	Load Rate (psi/sec)	35	RQD	65%
Description	Dark/Light Gray Amphibolite				

Test Data

Percent of Failure Load	Strain (10^{-6}) Axial	Strain (10^{-6}) Radial	Load (lbs)	Compressive Stress (psi)	Secant Modulus $x10^6$ (psi)	Poisson's Ratio
10%	-975	161	14,340	5,249	10.77	0.16
20%	-1936	332	28,677	10,498	10.85	0.17
30%	-2893	508	43,032	15,752	10.89	0.18
40%	-3837	688	57,348	20,993	10.94	0.18
50%	-4781	873	71,701	26,247	10.98	0.18
60%	-5741	1073	86,036	31,494	10.97	0.19
70%	-6693	1274	100,380	36,745	10.98	0.19
80%	-7671	1492	114,700	41,987	10.95	0.19
90%	-25159	2330	129,036	47,235	3.75	0.09
100%	-21741	3377	143,373	52,483		

Sample Photos





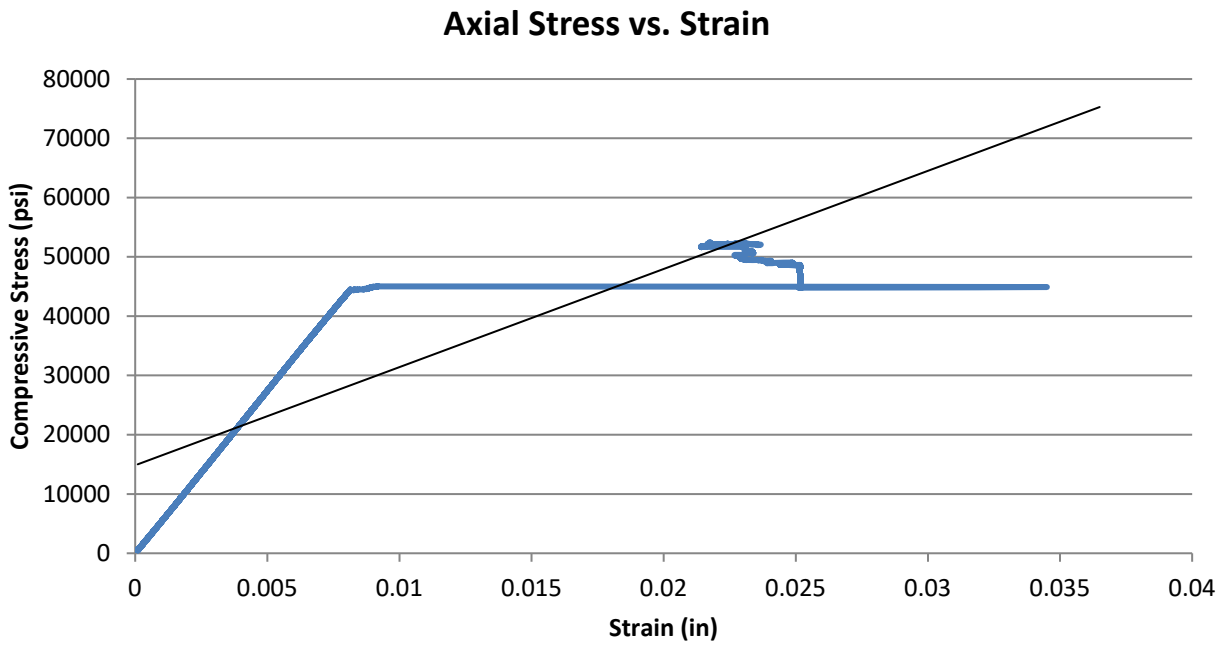
Test Results

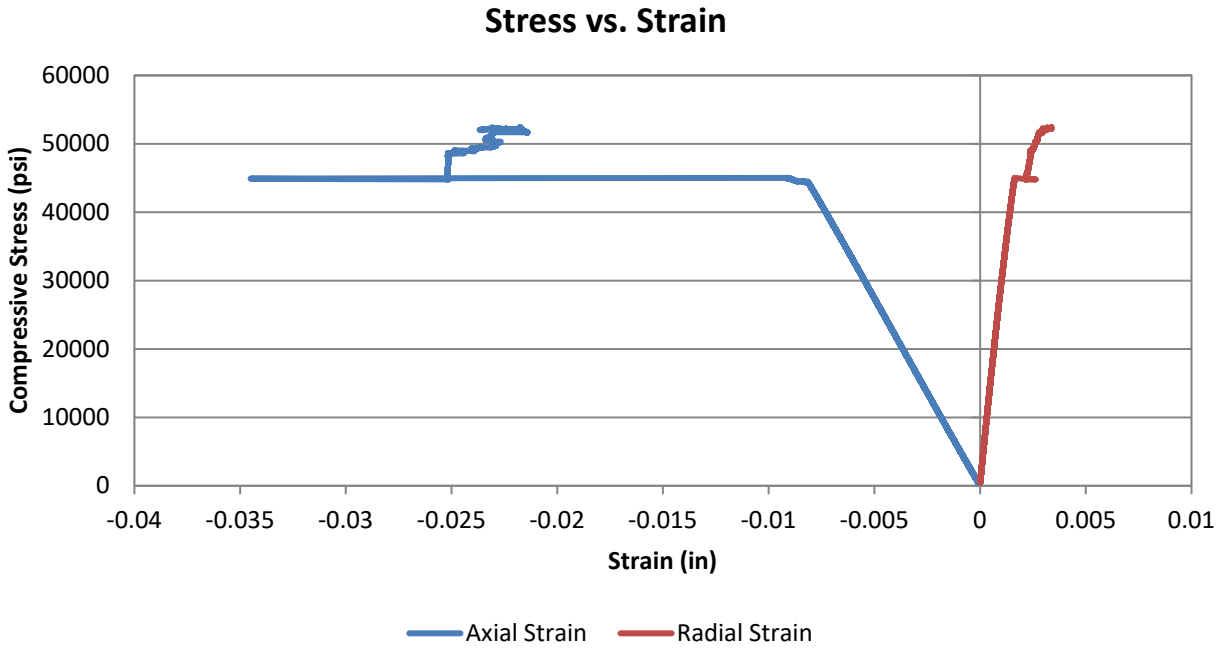
Unconfined Compressive Strength (psi)	**52,480**	Elastic Modulus (psi)	1.09E+07
		Poisson's Ratio in Elastic Range	0.17

Comments: Elastic range was taken as between 0.001 and 0.004 inches of axial strain. This range was chosen to avoid any non-linear behavior from the initial loading and the inflection point at the end of the elastic range. Please note that sample experienced a partial failure at approximately 45,000 psi compressive stress

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

Project	Carolina Crossroads I-20/26/126 Corridor Improvements			Date	10/10/2025
Project No.	G5662.030	Sample Diameter (in.)	1.865	Tested By	TP
SCDOT ID	P039721 & P039722	Sample Length (in.)	4.503	Reviewed By	WJG
Boring	P3D-B17	Unit Weight (pcf)	192.1	Core Size	NQ
Sample No.	NQ-1 / 25-3376	L/D Ratio	2.41	Recovery	88%
Depth	33.2' - 33.6'	Load Rate (psi/sec)	35	RQD	65%
Description	Dark/Light Gray Amphibolite				





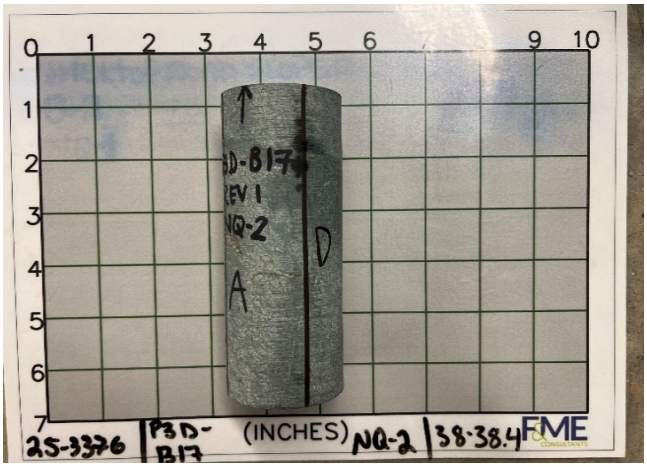
Compressive Strength and Elastic Moduli of Intact Rock Core Specimens
ASTM D7012 - Method D / SC-T-39

Project	Carolina Crossroads I-20/26/126 Corridor Improvements			Date	10/21/2025
Project No.	G5662.030	Sample Diameter (in.)	1.864	Tested By	TP
SCDOT ID	P039721 & P039722	Sample Length (in.)	4.789	Reviewed By	WJG
Boring	P3D-B17	Unit Weight (pcf)	187.7	Core Size	NQ
Sample No.	NQ-2 / 25-3376	L/D Ratio	2.57	Recovery	70%
Depth	38.0' - 38.4'	Load Rate (psi/sec)	20	RQD	40%
Description	Dark/Light Gray Amphibolite				

Test Data

Percent of Failure Load	Strain (10^{-6}) Axial	Strain (10^{-6}) Radial	Load (lbs)	Compressive Stress (psi)	Secant Modulus $x10^6$ (psi)	Poisson's Ratio
10%	-185	41	2,412	884	9.54	0.22
20%	-393	90	4,840	1,774	9.03	0.23
30%	-599	142	7,255	2,659	8.88	0.24
40%	-805	196	9,686	3,550	8.82	0.24
50%	-1005	257	12,105	4,436	8.83	0.26
60%	-1207	324	14,528	5,324	8.82	0.27
70%	-1416	414	16,948	6,211	8.77	0.29
80%	-1630	543	19,394	7,107	8.72	0.33
90%	-1858	866	21,790	7,985	8.60	0.47
100%	-185990	18957	24,214	8,873		

Sample Photos



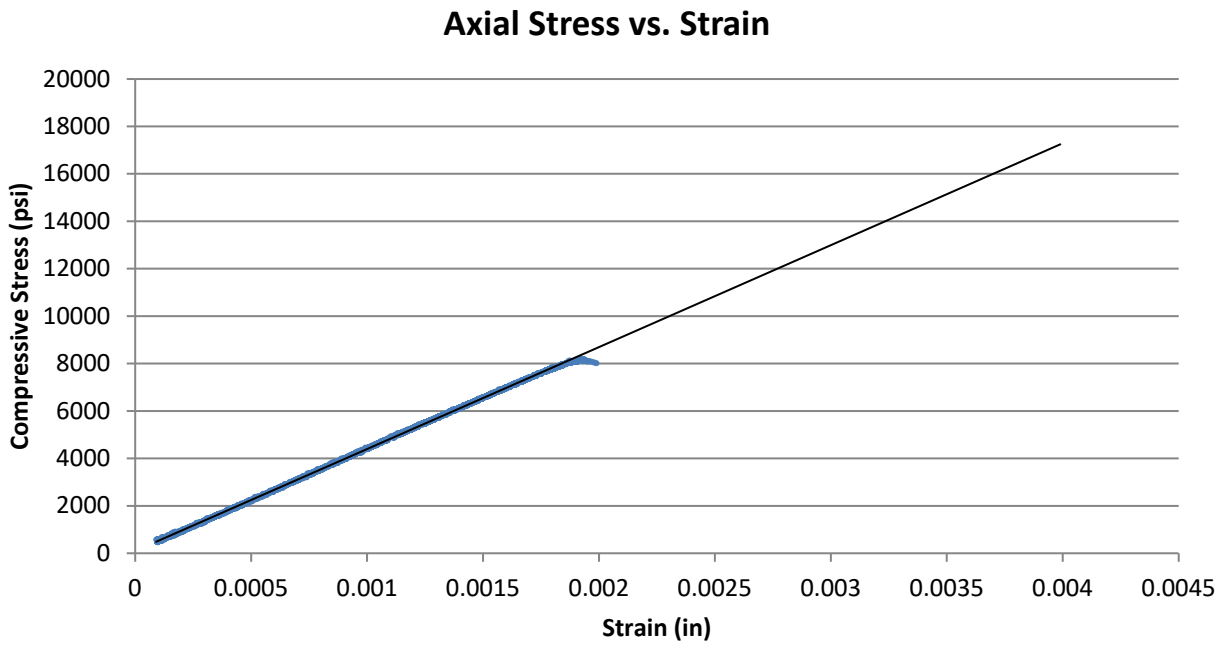


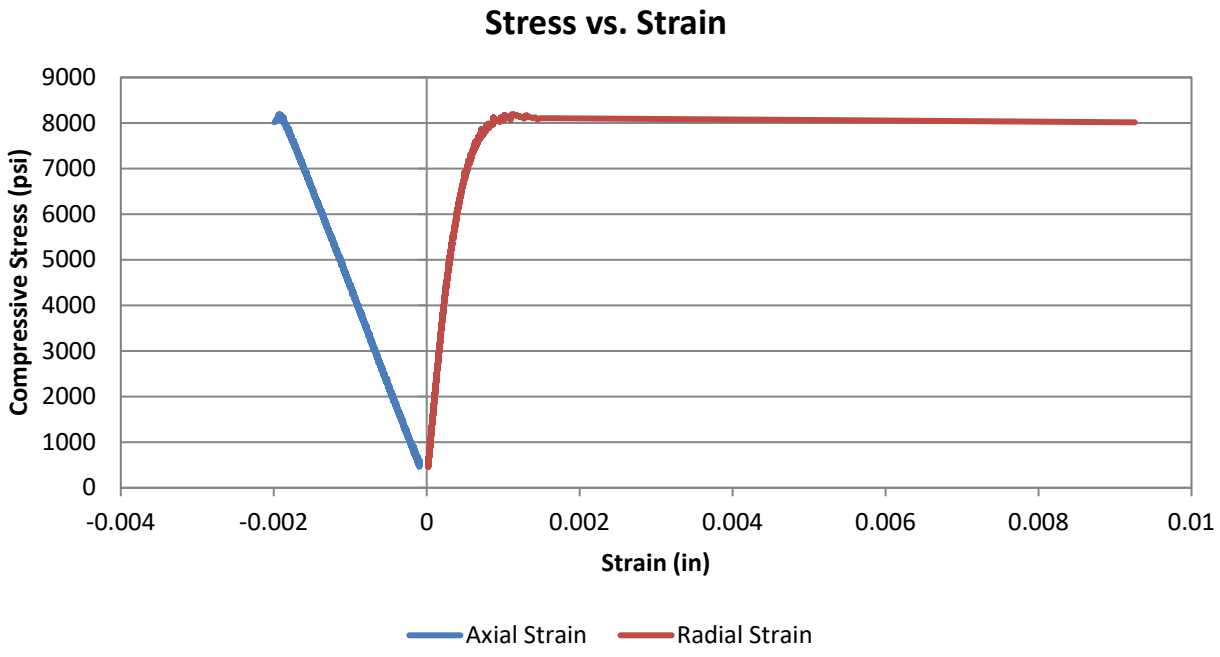
Test Results

Unconfined Compressive Strength (psi)	**8,870**	Elastic Modulus (psi)	8.87E+06
		Poisson's Ratio in Elastic Range	0.24
Comments	Elastic range was taken as between 0.0005 and 0.001 inches of axial strain. This range was chosen to avoid any non-linear behavior from the initial loading and the inflection point at the end of the elastic range.		

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

Project	Carolina Crossroads I-20/26/126 Corridor Improvements			Date	10/21/2025
Project No.	G5662.030	Sample Diameter (in.)	1.864	Tested By	TP
SCDOT ID	P039721 & P039722	Sample Length (in.)	4.789	Reviewed By	WJG
Boring	P3D-B17	Unit Weight (pcf)	187.7	Core Size	NQ
Sample No.	NQ-2 / 25-3376	L/D Ratio	2.57	Recovery	70%
Depth	38.0' - 38.4'	Load Rate (psi/sec)	20	RQD	40%
Description	Dark/Light Gray Amphibolite				





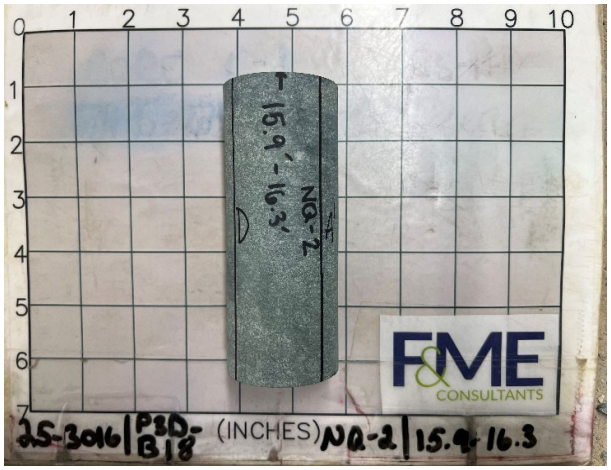
Compressive Strength and Elastic Moduli of Intact Rock Core Specimens
ASTM D7012 - Method D / SC-T-39

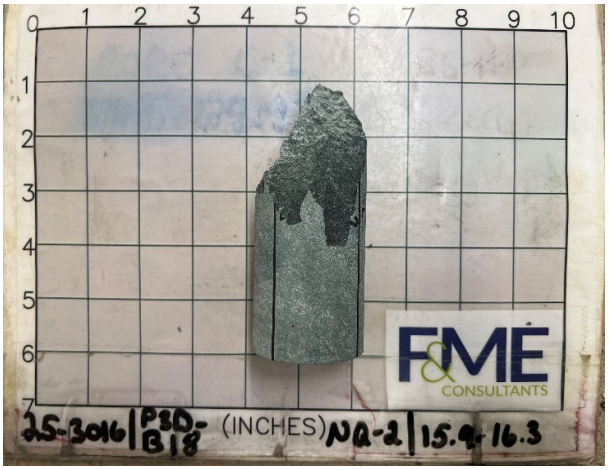
Project	Carolina Crossroads I-20/26/126 Corridor Improvements			Date	9/18/2025
Project No.	G5662.030	Sample Diameter (in.)	1.858	Tested By	TP
SCDOT ID	P039721 & P039722	Sample Length (in.)	4.531	Reviewed By	WJG
Boring	P3D-B18A	Unit Weight (pcf)	184.5	Core Size	NQ
Sample No.	NQ-2 / 25-3016	L/D Ratio	2.44	Recovery	98%
Depth	15.9' - 16.3'	Load Rate (psi/sec)	35	RQD	77%
Description	Black/Gray Amphibolite				

Test Data

Percent of Failure Load	Strain (10^{-6}) Axial	Strain (10^{-6}) Radial	Load (lbs)	Compressive Stress (psi)	Secant Modulus x10^6 (psi)	Poisson's Ratio
10%	-645	143	10,048	3,706	11.49	0.22
20%	-1328	287	20,015	7,382	11.12	0.22
30%	-2044	439	30,018	11,072	10.83	0.21
40%	-2769	594	40,006	14,755	10.66	0.21
50%	-3533	766	50,026	18,451	10.45	0.22
60%	-4323	953	60,035	22,142	10.24	0.22
70%	-5171	1173	70,043	25,833	9.99	0.23
80%	-6061	1432	80,036	29,519	9.74	0.24
90%	-7038	1772	90,044	33,210	9.44	0.25
100%	-36179	18714	100,059	36,904		

Sample Photos





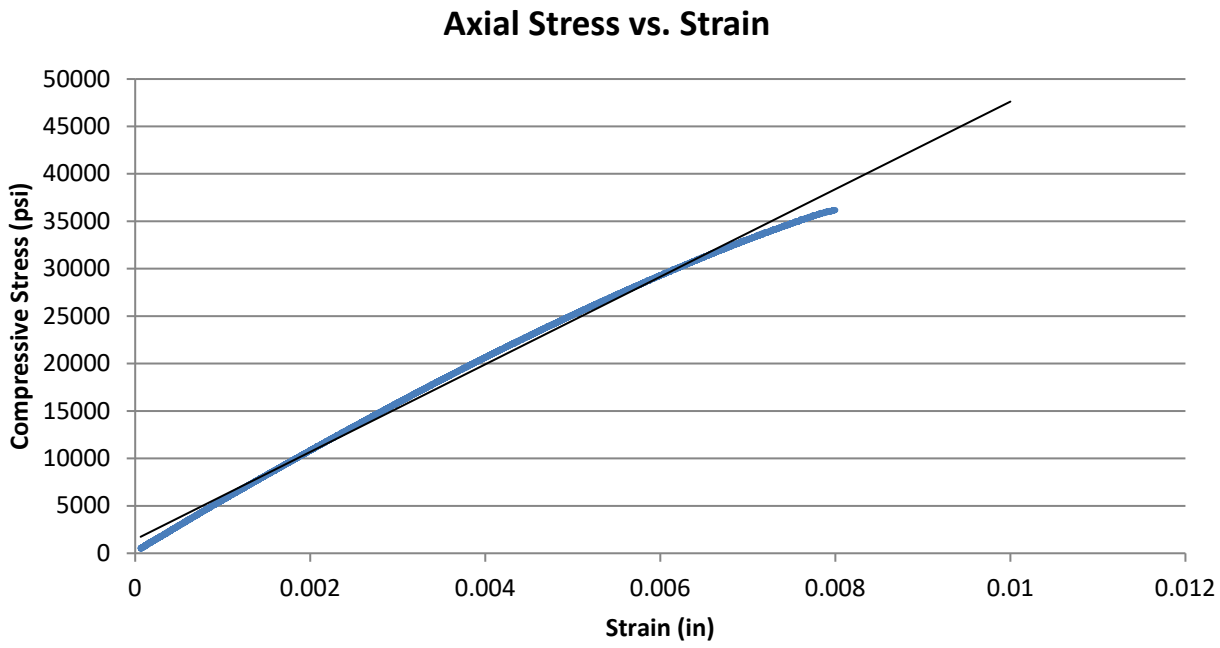
Test Results

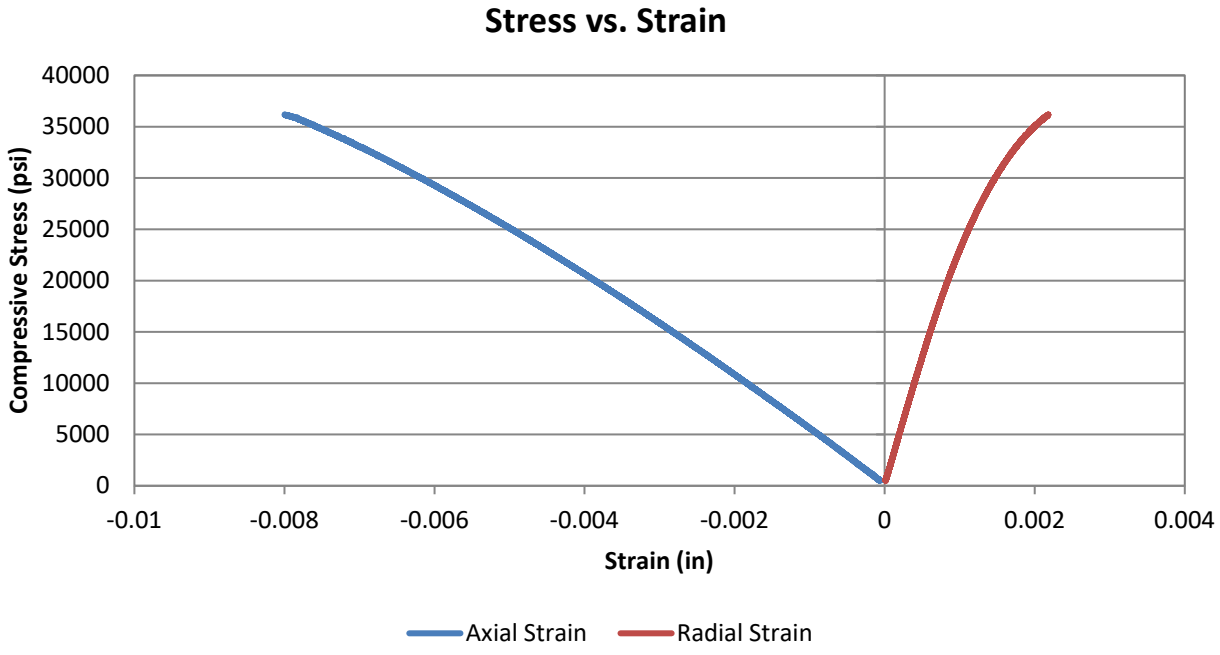
Unconfined Compressive Strength (psi)	**36,900**	Elastic Modulus (psi)	1.09E+07
		Poisson's Ratio in Elastic Range	0.22
Comments	Elastic range was taken as between 0.001 and 0.003 inches of axial strain. This range was chosen to avoid any non-linear behavior from the initial loading and the inflection point at the end of the elastic range.		

F&ME CONSULTANTS

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

Project	Carolina Crossroads I-20/26/126 Corridor Improvements			Date	9/18/2025
Project No.	G5662.030	Sample Diameter (in.)	1.858	Tested By	TP
SCDOT ID	P039721 & P039722	Sample Length (in.)	4.531	Reviewed By	WJG
Boring	P3D-B18	Unit Weight (pcf)	184.5	Core Size	NQ
Sample No.	NQ-2 / 25-3016	L/D Ratio	2.44	Recovery	98%
Depth	15.9' - 16.3'	Load Rate (psi/sec)	35	RQD	77%
Description	Black/Gray Amphibolite				





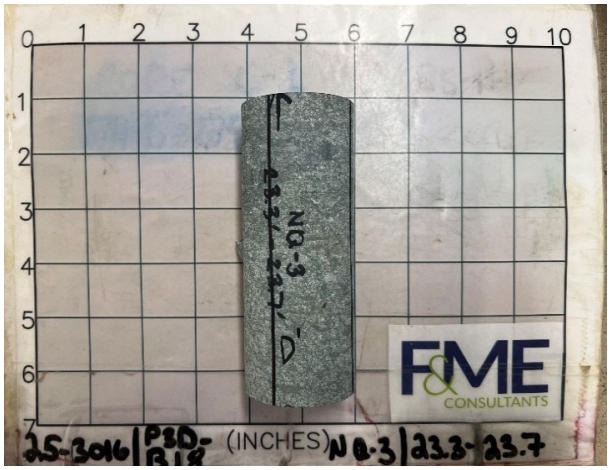
Compressive Strength and Elastic Moduli of Intact Rock Core Specimens
ASTM D7012 - Method D / SC-T-39

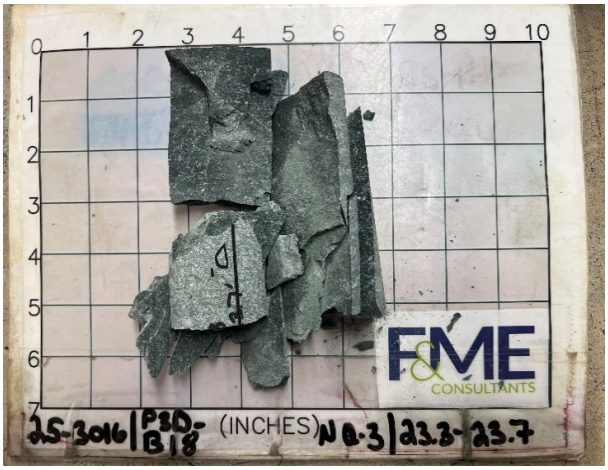
Project	Carolina Crossroads I-20/26/126 Corridor Improvements			Date	9/18/2025
Project No.	G5662.030	Sample Diameter (in.)	1.873	Tested By	TP
SCDOT ID	P039721 & P039722	Sample Length (in.)	4.593	Reviewed By	WJG
Boring	P3D-B18A	Unit Weight (pcf)	178.5	Core Size	NQ
Sample No.	NQ-3 / 25-3016	L/D Ratio	2.45	Recovery	72%
Depth	23.3' - 23.7'	Load Rate (psi/sec)	35	RQD	52%
Description	Black/Gray Amphibolite				

Test Data

Percent of Failure Load	Strain (10^{-6}) Axial	Strain (10^{-6}) Radial	Load (lbs)	Compressive Stress (psi)	Secant Modulus x10^6 (psi)	Poisson's Ratio
10%	-829	88	5,709	2,072	5.00	0.11
20%	-1798	192	11,417	4,144	4.61	0.11
30%	-2847	325	17,127	6,216	4.37	0.11
40%	-3876	492	22,836	8,288	4.28	0.13
50%	-4843	680	28,544	10,360	4.28	0.14
60%	-5778	889	34,248	12,430	4.30	0.15
70%	-6682	1113	39,954	14,501	4.34	0.17
80%	-7535	1347	45,664	16,573	4.40	0.18
90%	-8385	1604	51,372	18,645	4.45	0.19
100%	-9279	2125	57,087	20,719		

Sample Photos





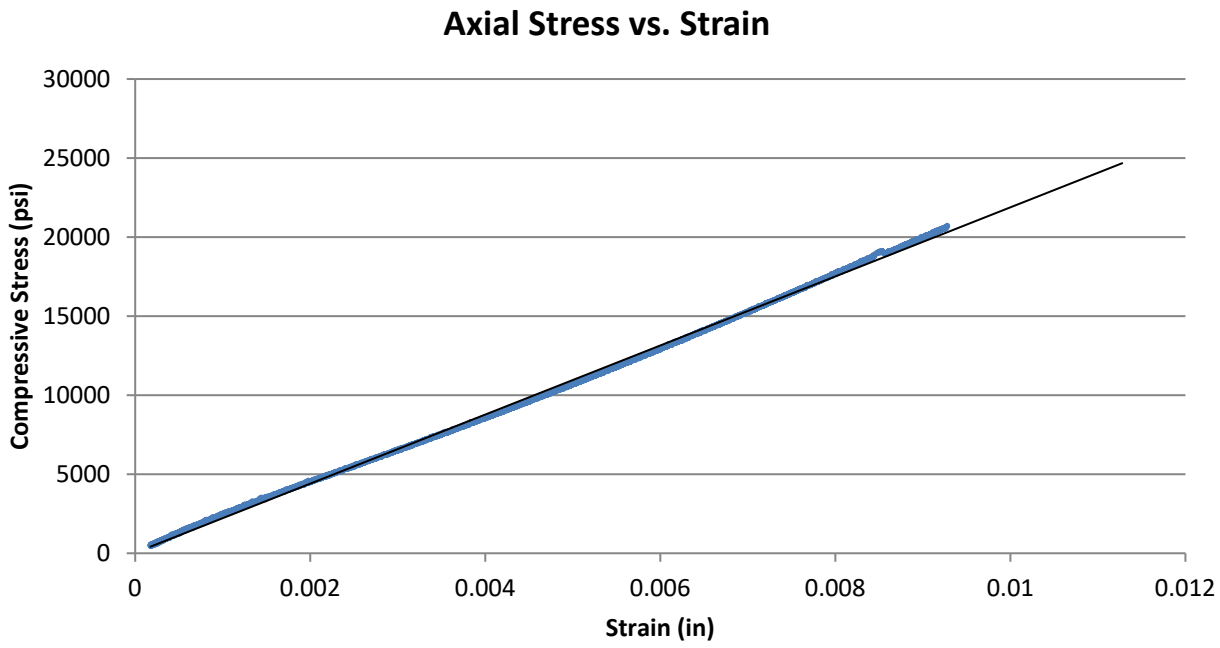
Test Results

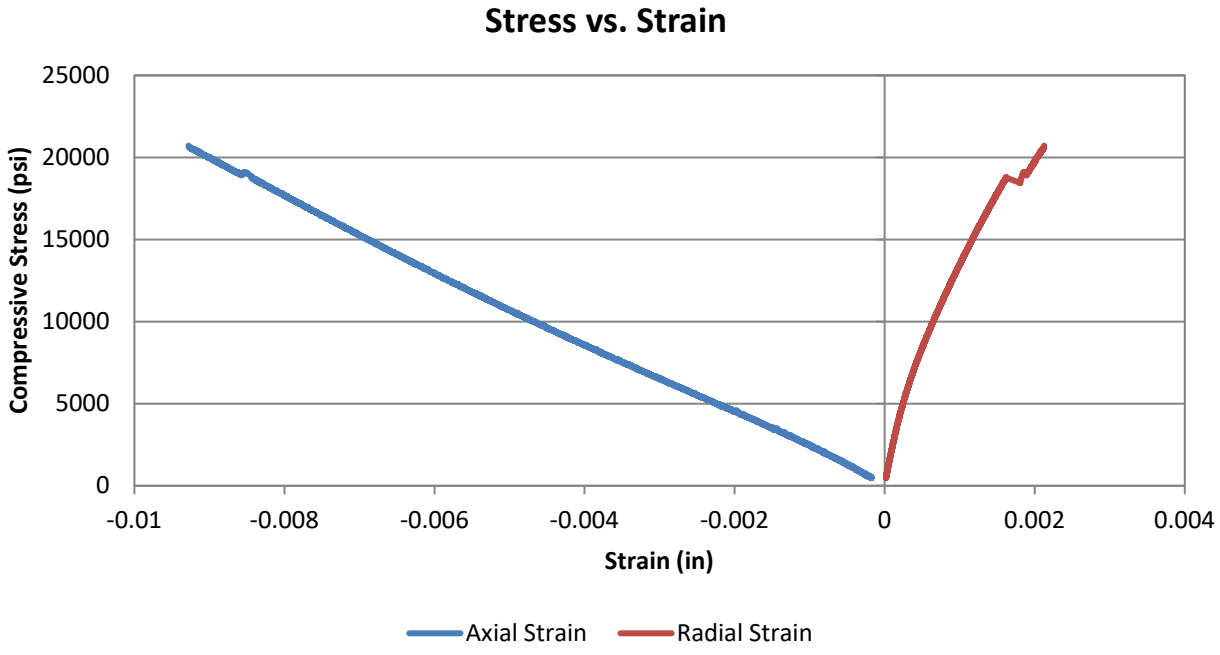
Unconfined Compressive Strength (psi)	**20,720**	Elastic Modulus (psi)	4.57E+06
		Poisson's Ratio in Elastic Range	0.11
Comments	Elastic range was taken as between 0.001 and 0.003 inches of axial strain. This range was chosen to avoid any non-linear behavior from the initial loading and the inflection point at the end of the elastic range.		

F&ME CONSULTANTS

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

Project	Carolina Crossroads I-20/26/126 Corridor Improvements			Date	9/18/2025
Project No.	G5662.030	Sample Diameter (in.)	1.873	Tested By	TP
SCDOT ID	P039721 & P039722	Sample Length (in.)	4.593	Reviewed By	WJG
Boring	P3D-B18A	Unit Weight (pcf)	178.5	Core Size	NQ
Sample No.	NQ-3 / 25-3016	L/D Ratio	2.45	Recovery	72%
Depth	23.3' - 23.7'	Load Rate (psi/sec)	35	RQD	52%
Description	Black/Gray Amphibolite				





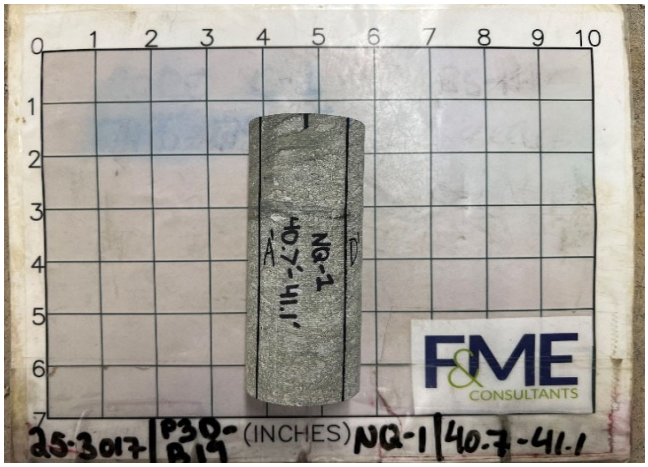
Compressive Strength and Elastic Moduli of Intact Rock Core Specimens
ASTM D7012 - Method D / SC-T-39

Project	Carolina Crossroads I-20/26/126 Corridor Improvements			Date	9/18/2025
Project No.	G5662.030	Sample Diameter (in.)	1.858	Tested By	TP
SCDOT ID	P039721 & P039722	Sample Length (in.)	4.433	Reviewed By	WJG
Boring	P3D-B19	Unit Weight (pcf)	172.1	Core Size	NQ
Sample No.	NQ-1 / 25-3017	L/D Ratio	2.39	Recovery	94%
Depth	40.7' - 41.1'	Load Rate (psi/sec)	35	RQD	64%
Description	Gray Amphibolite				

Test Data

Percent of Failure Load	Strain (10^{-6}) Axial	Strain (10^{-6}) Radial	Load (lbs)	Compressive Stress (psi)	Secant Modulus x10^6 (psi)	Poisson's Ratio
10%	-1168	135	3,380	1,247	2.14	0.12
20%	-2457	383	6,761	2,493	2.03	0.16
30%	-3972	816	10,128	3,735	1.88	0.21
40%	-5589	1495	13,510	4,983	1.78	0.27
50%	-7282	2536	16,880	6,226	1.71	0.35
60%	-9132	4187	20,269	7,476	1.64	0.46
70%	-10916	6408	23,635	8,717	1.60	0.59
80%	-12380	9744	27,018	9,965	1.61	0.79
90%	-14381	15569	30,393	11,210	1.56	1.08
100%	-16689	32447	33,771	12,456		

Sample Photos



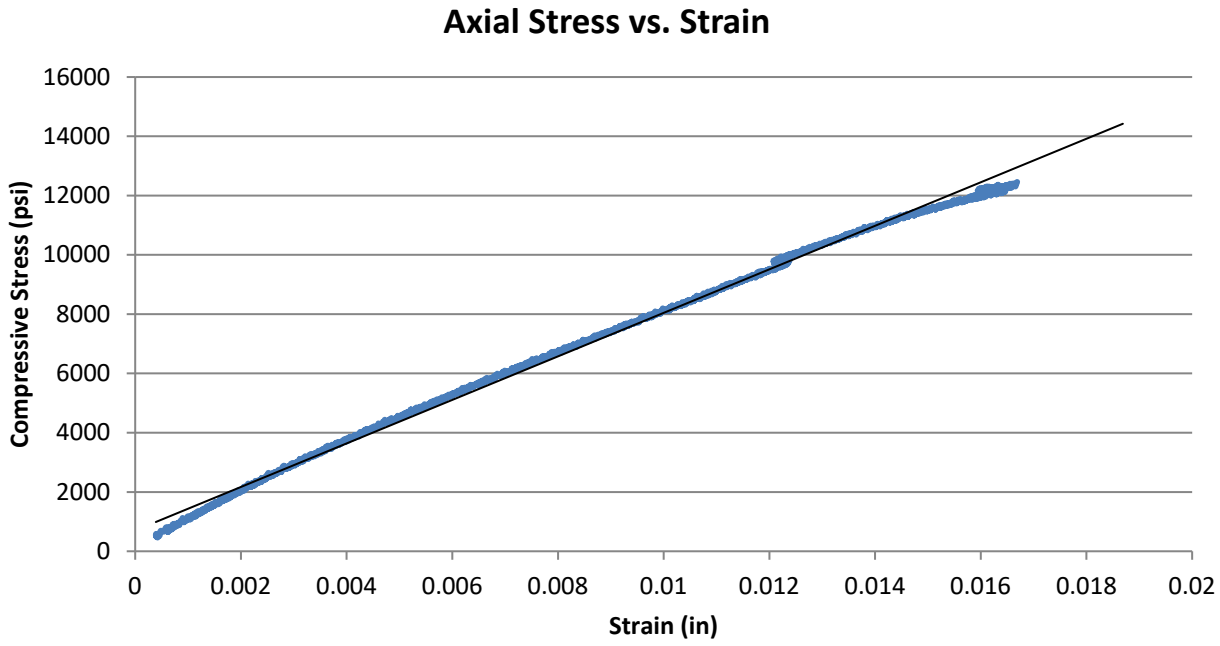


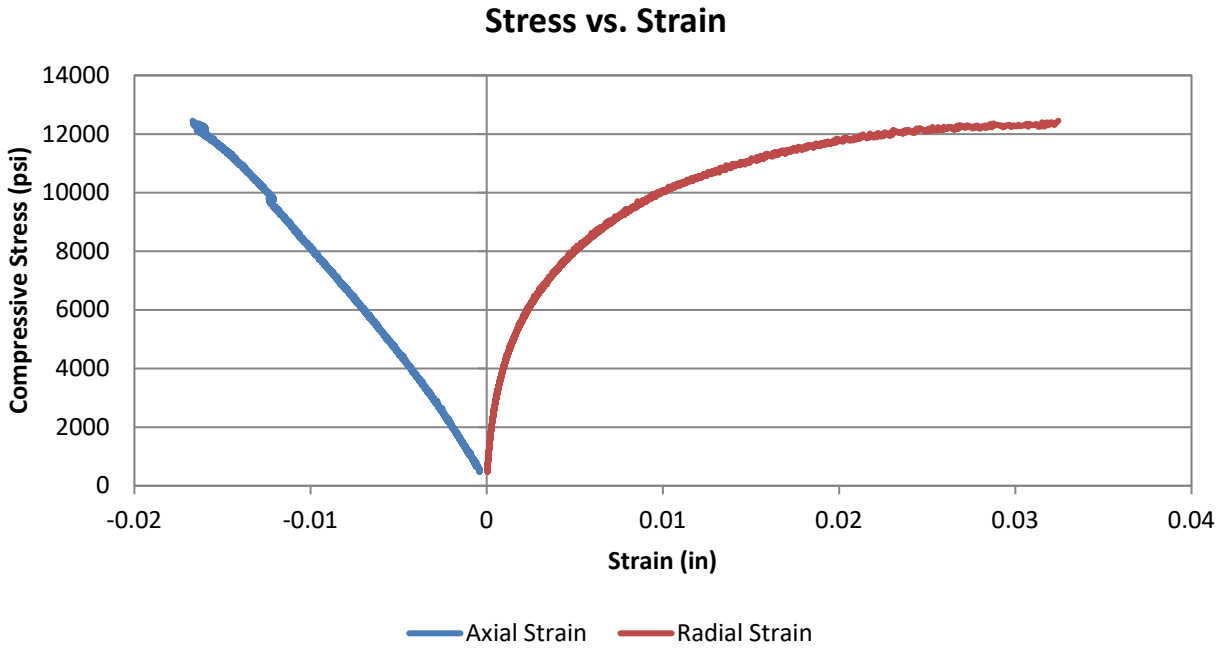
Test Results

Unconfined Compressive Strength (psi)	**12,460**	Elastic Modulus (psi)	1.98E+06
		Poisson's Ratio in Elastic Range	0.17
Comments	Elastic range was taken as between 0.001 and 0.005 inches of axial strain. This range was chosen to avoid any non-linear behavior from the initial loading and the inflection point at the end of the elastic range.		

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

Project	Carolina Crossroads I-20/26/126 Corridor Improvements			Date	9/18/2025
Project No.	G5662.030	Sample Diameter (in.)	1.858	Tested By	TP
SCDOT ID	P039721 & P039722	Sample Length (in.)	4.433	Reviewed By	WJG
Boring	P3D-B19	Unit Weight (pcf)	172.1	Core Size	NQ
Sample No.	NQ-1 / 25-3017	L/D Ratio	2.39	Recovery	94%
Depth	40.7' - 41.1'	Load Rate (psi/sec)	35	RQD	64%
Description	Gray Amphibolite				





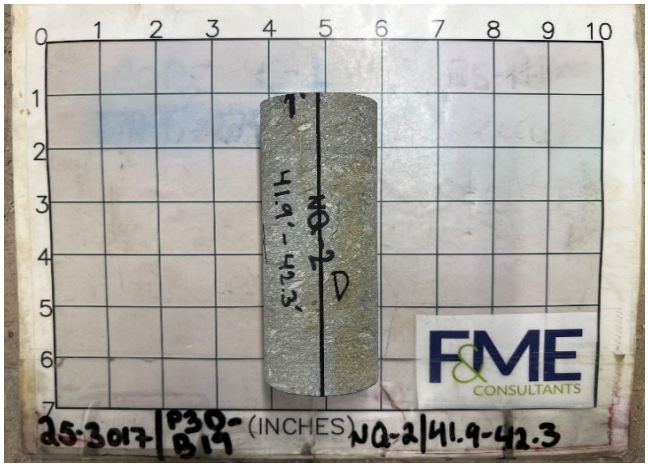
Compressive Strength and Elastic Moduli of Intact Rock Core Specimens
ASTM D7012 - Method D / SC-T-39

Project	Carolina Crossroads I-20/26/126 Corridor Improvements			Date	9/18/2025
Project No.	G5662.030	Sample Diameter (in.)	1.859	Tested By	TP
SCDOT ID	P039721 & P039722	Sample Length (in.)	4.574	Reviewed By	WJG
Boring	P3D-B19	Unit Weight (pcf)	169.8	Core Size	NQ
Sample No.	NQ-2 / 25-3017	L/D Ratio	2.46	Recovery	96%
Depth	41.9' - 42.3'	Load Rate (psi/sec)	35	RQD	31%
Description	Gray Amphibolite				

Test Data

Percent of Failure Load	Strain (10^{-6}) Axial	Strain (10^{-6}) Radial	Load (lbs)	Compressive Stress (psi)	Secant Modulus x10^{6} (psi)	Poisson's Ratio
10%	-2472	355	3,902	1,438	1.16	0.14
20%	-4505	931	7,815	2,879	1.28	0.21
30%	-6131	1645	11,727	4,320	1.41	0.27
40%	-7626	2550	15,634	5,760	1.51	0.33
50%	-9061	3711	19,535	7,197	1.59	0.41
60%	-10359	5082	23,442	8,637	1.67	0.49
70%	-12057	7499	27,355	10,078	1.67	0.62
80%	-13576	9634	31,257	11,516	1.70	0.71
90%	-15431	13405	35,171	12,958	1.68	0.87
100%	-20553	28437	39,076	14,396		

Sample Photos



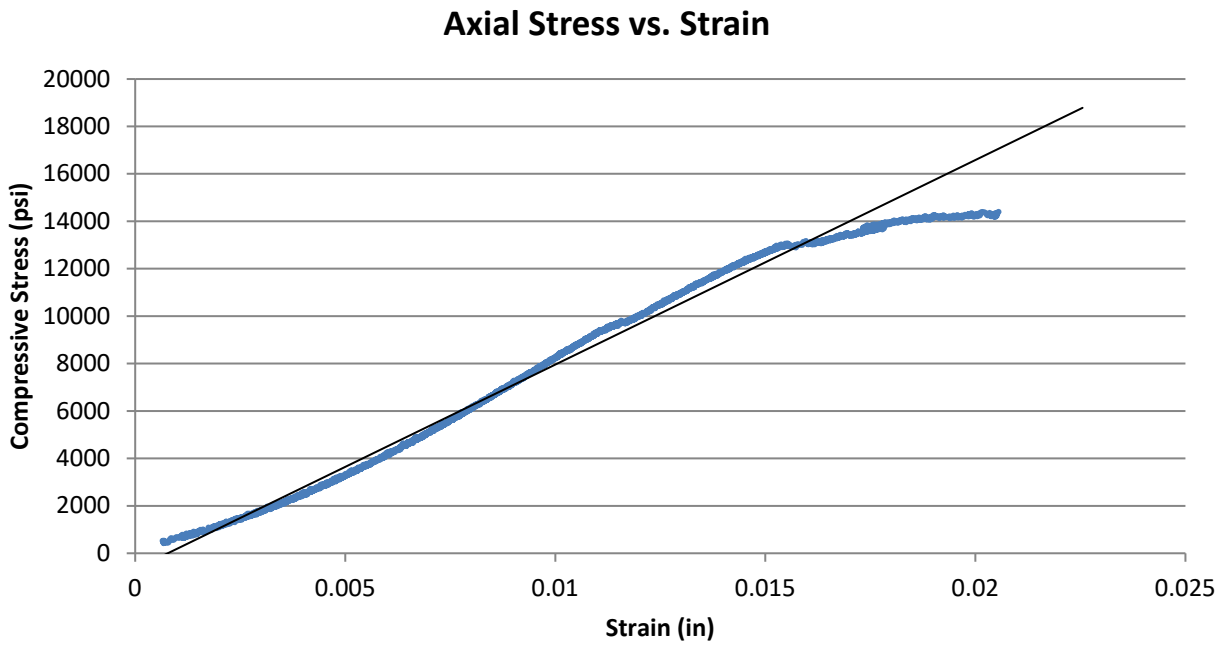


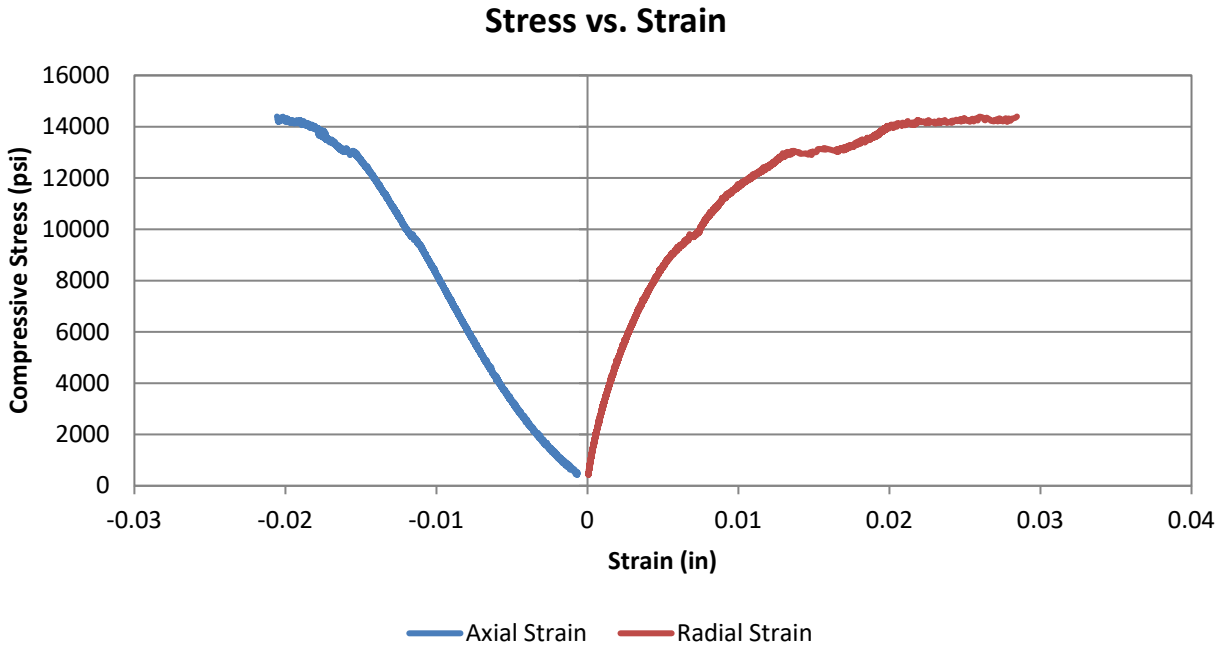
Test Results

Unconfined Compressive Strength (psi)	**14,400**	Elastic Modulus (psi)	1.30E+06
		Poisson's Ratio in Elastic Range	0.22
Comments	Elastic range was taken as between 0.002 and 0.007 inches of axial strain. This range was chosen to avoid any non-linear behavior from the initial loading and the inflection point at the end of the elastic range.		

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

Project	Carolina Crossroads I-20/26/126 Corridor Improvements			Date	9/18/2025
Project No.	G5662.030	Sample Diameter (in.)	1.859	Tested By	TP
SCDOT ID	P039721 & P039722	Sample Length (in.)	4.574	Reviewed By	WJG
Boring	P3D-B19	Unit Weight (pcf)	169.8	Core Size	NQ
Sample No.	NQ-2 / 25-3017	L/D Ratio	2.46	Recovery	96%
Depth	41.9' - 42.3'	Load Rate (psi/sec)	35	RQD	31%
Description	Gray Amphibolite				





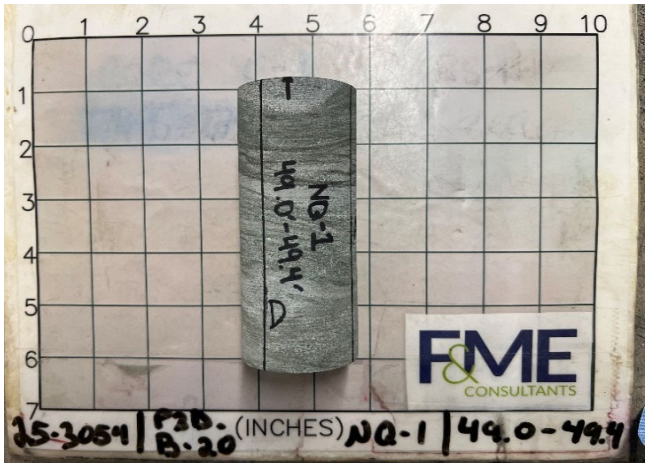
Compressive Strength and Elastic Moduli of Intact Rock Core Specimens
ASTM D7012 - Method D / SC-T-39

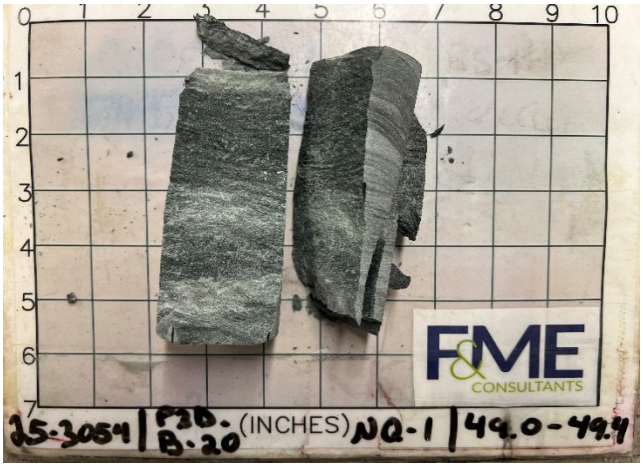
Project	Carolina Crossroads I-20/26/126 Corridor Improvements			Date	9/18/2025
Project No.	G5662.030	Sample Diameter (in.)	1.86	Tested By	TP
SCDOT ID	P039721 & P039722	Sample Length (in.)	4.362	Reviewed By	WJG
Boring	P3D-B20	Unit Weight (pcf)	175.4	Core Size	NQ
Sample No.	NQ-1 / 25-3054	L/D Ratio	2.35	Recovery	90%
Depth	49.0' - 49.4'	Load Rate (psi/sec)	35	RQD	85%
Description	Dark Gray Phyllite				

Test Data

Percent of Failure Load	Strain (10^{-6}) Axial	Strain (10^{-6}) Radial	Load (lbs)	Compressive Stress (psi)	Secant Modulus x10^{6} (psi)	Poisson's Ratio
10%	-352	44	2,907	1,070	6.08	0.12
20%	-656	131	5,809	2,138	6.52	0.20
30%	-1098	237	8,707	3,204	5.84	0.22
40%	-1622	366	11,614	4,274	5.27	0.23
50%	-2209	521	14,515	5,342	4.84	0.24
60%	-2837	708	17,429	6,414	4.52	0.25
70%	-3434	932	20,316	7,477	4.35	0.27
80%	-4079	1226	23,219	8,545	4.19	0.30
90%	-4722	1560	26,118	9,612	4.07	0.33
100%	-1962	2416	29,020	10,680		

Sample Photos





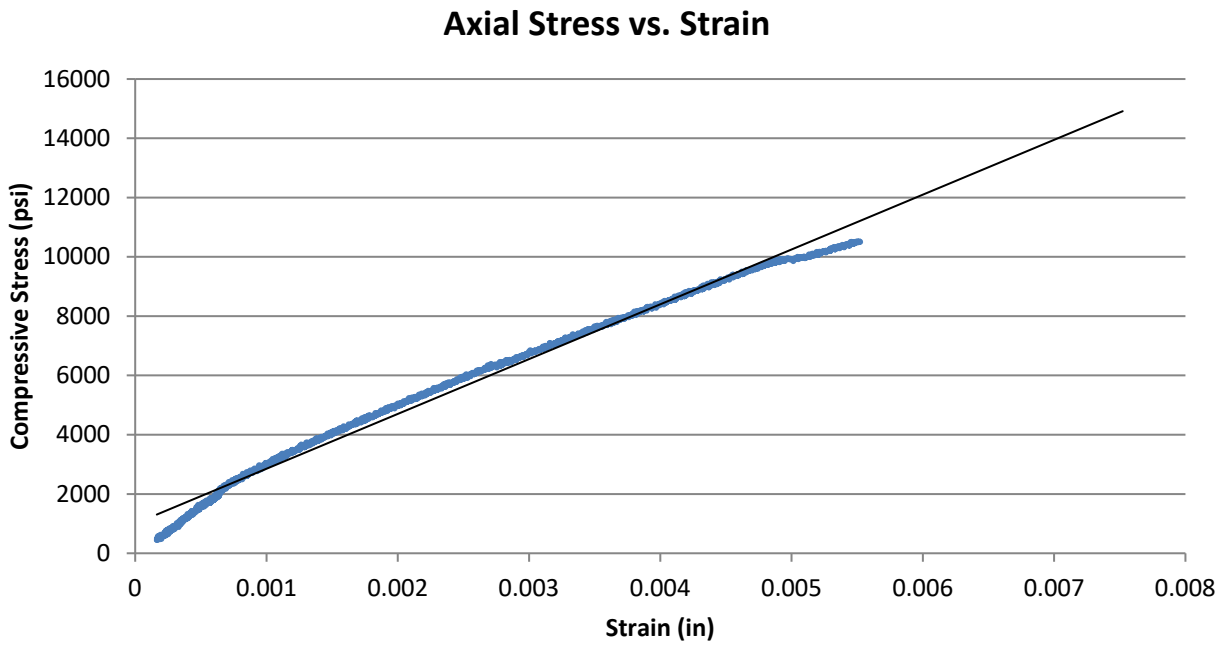
Test Results

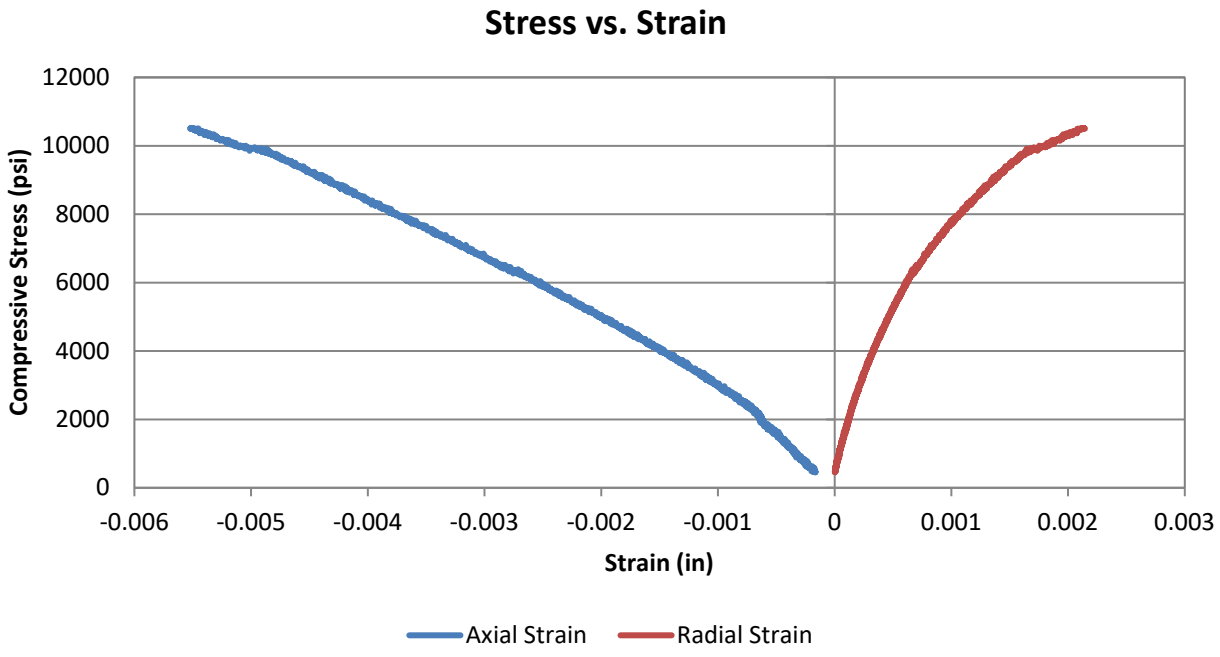
Unconfined Compressive Strength (psi)	**10,680**	Elastic Modulus (psi)	5.10E+06
		Poisson's Ratio in Elastic Range	0.23
Comments	Elastic range was taken as between 0.001 and 0.003 inches of axial strain. This range was chosen to avoid any non-linear behavior from the initial loading and the inflection point at the end of the elastic range.		

F&ME CONSULTANTS

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

Project	Carolina Crossroads I-20/26/126 Corridor Improvements			Date	9/18/2025
Project No.	G5662.030	Sample Diameter (in.)	1.86	Tested By	TP
SCDOT ID	P039721 & P039722	Sample Length (in.)	4.362	Reviewed By	WJG
Boring	P3D-B20	Unit Weight (pcf)	175.4	Core Size	NQ
Sample No.	NQ-1 / 25-3054	L/D Ratio	2.35	Recovery	90%
Depth	49.0' - 49.4'	Load Rate (psi/sec)	35	RQD	85%
Description	Dark Gray Phyllite				





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

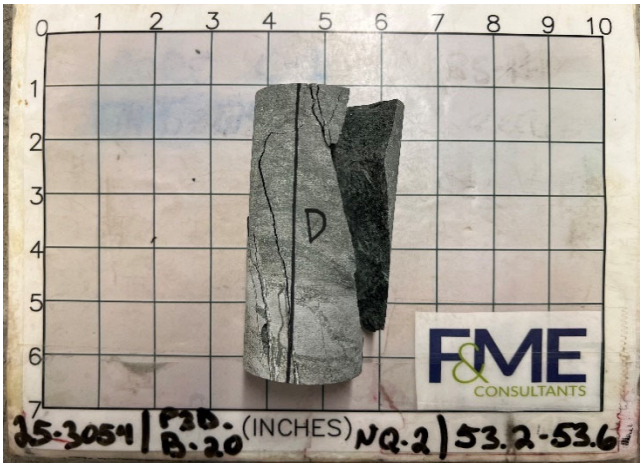
Project	Carolina Crossroads I-20/26/126 Corridor Improvements			Date	9/18/2025
Project No.	G5662.030	Sample Diameter (in.)	1.865	Tested By	TP
SCDOT ID	P039721 & P039722	Sample Length (in.)	4.398	Reviewed By	WJG
Boring	P3D-B20	Unit Weight (pcf)	176.1	Core Size	NQ
Sample No.	NQ-2 / 25-3054	L/D Ratio	2.36	Recovery	98%
Depth	53.2' - 53.6'	Load Rate (psi/sec)	35	RQD	96%
Description	Dark Gray Phyllite				

Test Data

Percent of Failure Load	Strain (10^{-6}) Axial	Strain (10^{-6}) Radial	Load (lbs)	Compressive Stress (psi)	Secant Modulus x10^{6} (psi)	Poisson's Ratio
10%	-447	63	3,235	1,184	5.30	0.14
20%	-849	125	6,391	2,339	5.51	0.15
30%	-1289	195	9,592	3,511	5.45	0.15
40%	-1815	284	12,791	4,682	5.16	0.16
50%	-2370	385	15,987	5,852	4.94	0.16
60%	-2924	497	19,187	7,024	4.80	0.17
70%	-3526	636	22,388	8,195	4.65	0.18
80%	-4167	807	25,579	9,363	4.49	0.19
90%	-4893	1045	28,774	10,533	4.31	0.21
100%	-5746	1361	31,974	11,704		

Sample Photos



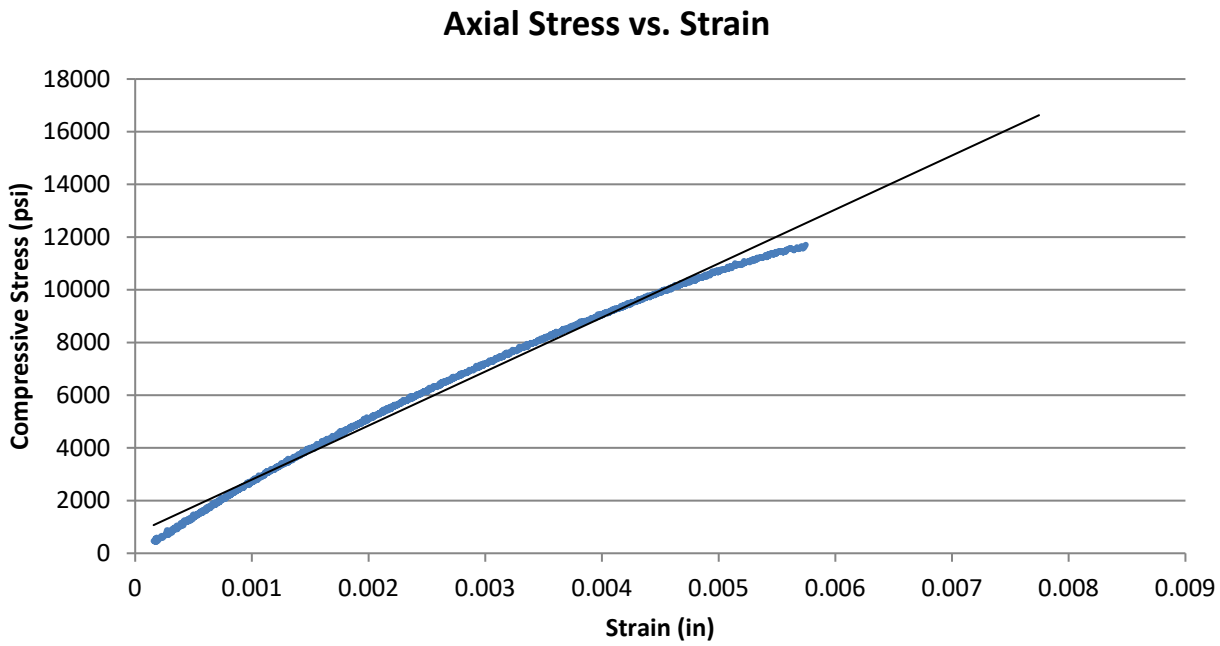


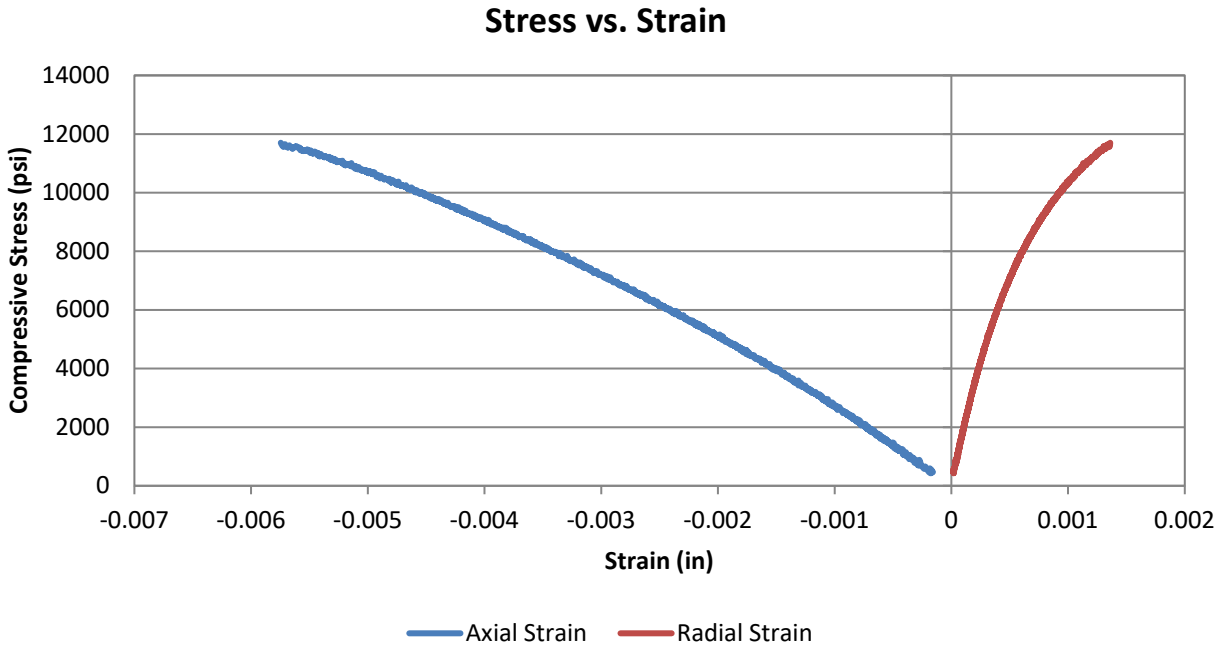
Test Results

Unconfined Compressive Strength (psi)	**11,700**	Elastic Modulus (psi)	5.11E+06
		Poisson's Ratio in Elastic Range	0.16
Comments	Elastic range was taken as between 0.001 and 0.003 inches of axial strain. This range was chosen to avoid any non-linear behavior from the initial loading and the inflection point at the end of the elastic range.		

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

Project	Carolina Crossroads I-20/26/126 Corridor Improvements			Date	9/18/2025
Project No.	G5662.030	Sample Diameter (in.)	1.865	Tested By	TP
SCDOT ID	P039721 & P039722	Sample Length (in.)	4.398	Reviewed By	WJG
Boring	P3D-B20	Unit Weight (pcf)	176.1	Core Size	NQ
Sample No.	NQ-2 / 25-3054	L/D Ratio	2.36	Recovery	98%
Depth	53.2' - 53.6'	Load Rate (psi/sec)	35	RQD	96%
Description	Dark Gray Phyllite				





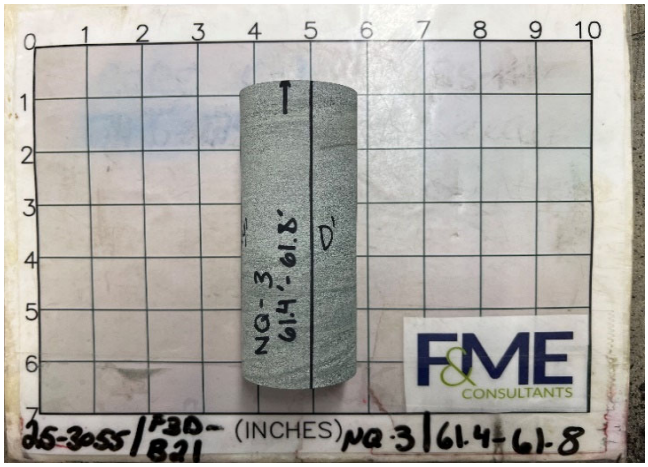
Compressive Strength and Elastic Moduli of Intact Rock Core Specimens
ASTM D7012 - Method D / SC-T-39

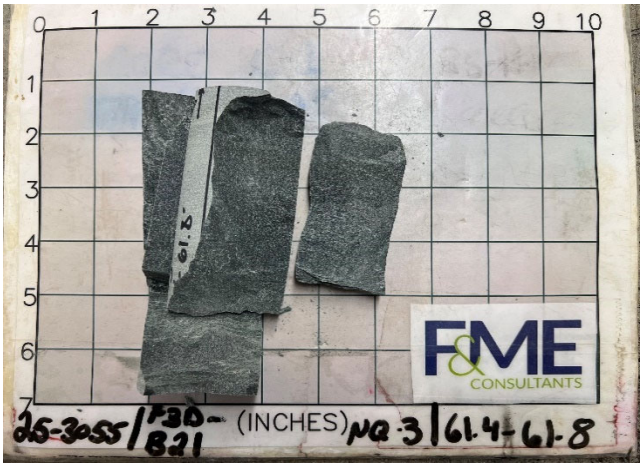
Project	Carolina Crossroads I-20/26/126 Corridor Improvements			Date	9/18/2025
Project No.	G5662.030	Sample Diameter (in.)	1.859	Tested By	TP
SCDOT ID	P039721 & P039722	Sample Length (in.)	4.612	Reviewed By	WJG
Boring	P3D-B21	Unit Weight (pcf)	175.8	Core Size	NQ
Sample No.	NQ-3 / 25-3055	L/D Ratio	2.48	Recovery	34%
Depth	61.4' - 61.8'	Load Rate (psi/sec)	35	RQD	28%
Description	Dark/Light Gray Phyllite				

Test Data

Percent of Failure Load	Strain (10^{-6}) Axial	Strain (10^{-6}) Radial	Load (lbs)	Compressive Stress (psi)	Secant Modulus x10^6 (psi)	Poisson's Ratio
10%	-431	64	3,918	1,443	6.69	0.15
20%	-898	128	7,831	2,885	6.42	0.14
30%	-1389	199	11,740	4,325	6.23	0.14
40%	-1883	273	15,656	5,768	6.13	0.14
50%	-2387	354	19,552	7,203	6.03	0.15
60%	-2850	432	23,479	8,650	6.07	0.15
70%	-3365	527	27,390	10,091	6.00	0.16
80%	-3843	620	31,313	11,537	6.00	0.16
90%	-4348	740	35,227	12,978	5.97	0.17
100%	-4411	1122	39,141	14,420		

Sample Photos





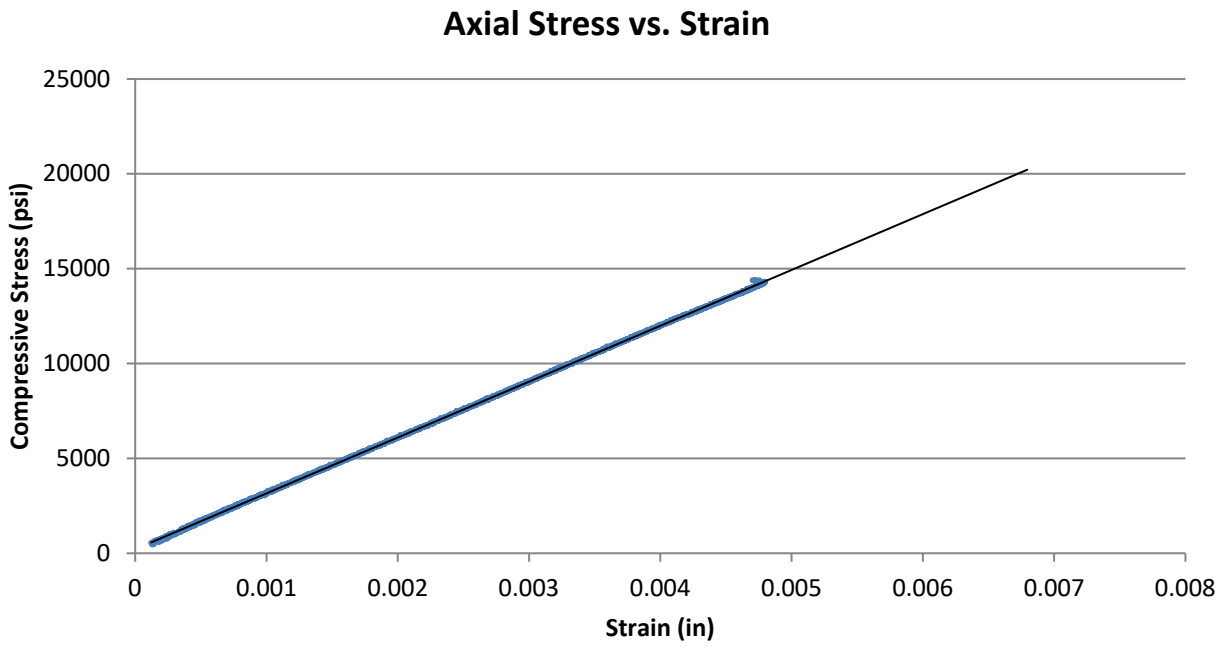
Test Results

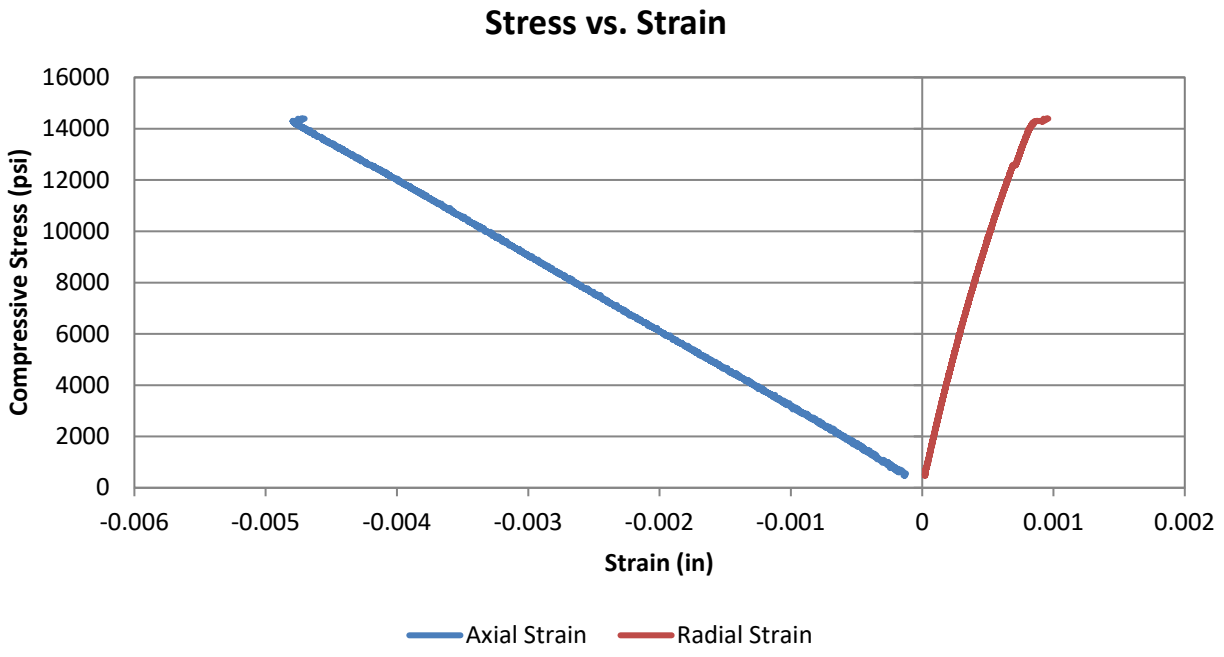
Unconfined Compressive Strength (psi)	**14,420**	Elastic Modulus (psi)	6.14E+06
		Poisson's Ratio in Elastic Range	0.15
Comments	Elastic range was taken as between 0.001 and 0.003 inches of axial strain. This range was chosen to avoid any non-linear behavior from the initial loading and the inflection point at the end of the elastic range.		

F&ME CONSULTANTS

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

Project	Carolina Crossroads I-20/26/126 Corridor Improvements			Date	9/18/2025
Project No.	G5662.030	Sample Diameter (in.)	1.859	Tested By	TP
SCDOT ID	P039721 & P039722	Sample Length (in.)	4.612	Reviewed By	WJG
Boring	P3D-B21	Unit Weight (pcf)	175.8	Core Size	NQ
Sample No.	NQ-3 / 25-3055	L/D Ratio	2.48	Recovery	34%
Depth	61.4' - 61.8'	Load Rate (psi/sec)	35	RQD	28%
Description	Dark/Light Gray Phyllite				





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

Project	Carolina Crossroads I-20/26/126 Corridor Improvements			Date	8/4/2025
Project No.	G5662.030	Sample Diameter (in.)	1.858	Tested By	TP
SCDOT ID	P039721 & P039722	Sample Length (in.)	4.414	Reviewed By	WJG
Boring	P3D-B23	Unit Weight (pcf)	180.8	Core Size	NQ
Sample No.	NQ-2 / 25-2231	L/D Ratio	2.38	Recovery	100%
Depth	61.8' - 62.2'	Load Rate (psi/sec)	20	RQD	100%
Description	Black/Gray Amphibolite				

Test Data

Percent of Failure Load	Strain (10^{-6}) Axial	Strain (10^{-6}) Radial	Load (lbs)	Compressive Stress (psi)	Secant Modulus x10^{6} (psi)	Poisson's Ratio
10%	-925	181	8,119	2,995	6.48	0.20
20%	-1947	420	16,233	5,987	6.15	0.22
30%	-2963	708	24,358	8,984	6.06	0.24
40%	-3951	1019	32,482	11,980	6.06	0.26
50%	-4925	1353	40,596	14,973	6.08	0.27
60%	-5904	1732	48,716	17,968	6.09	0.29
70%	-6901	2197	56,836	20,962	6.08	0.32
80%	-7990	2871	64,960	23,959	6.00	0.36
90%	-9260	3988	73,075	26,952	5.82	0.43
100%	-14307	8475	81,195	29,947		

Sample Photos



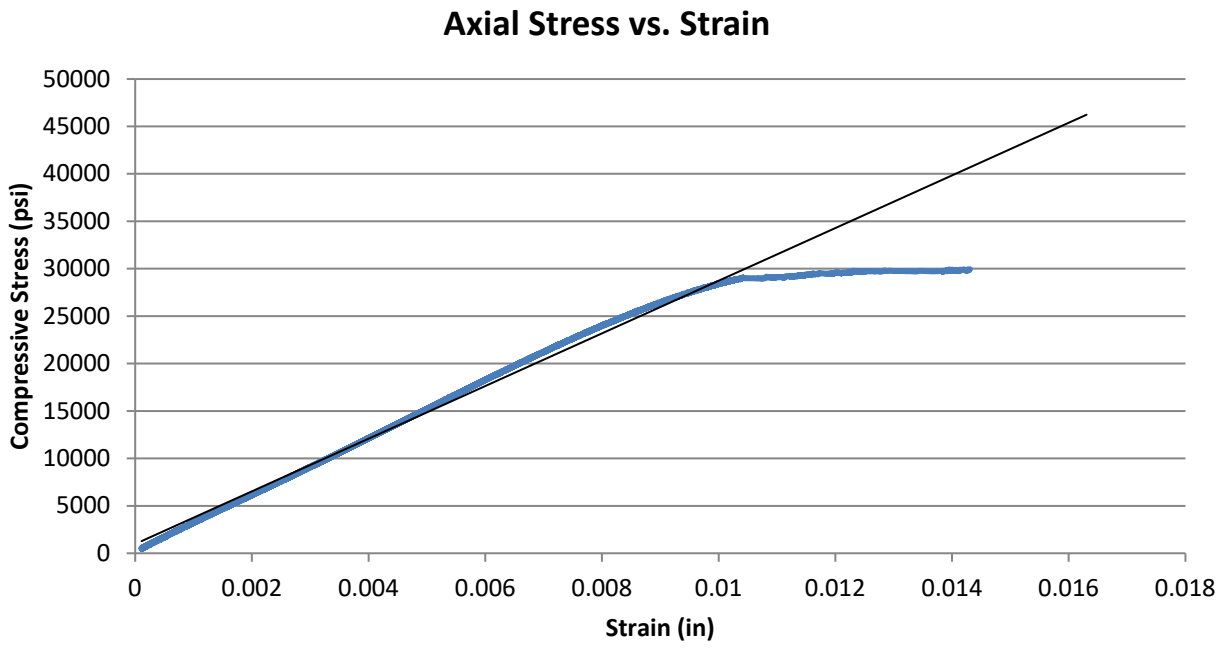


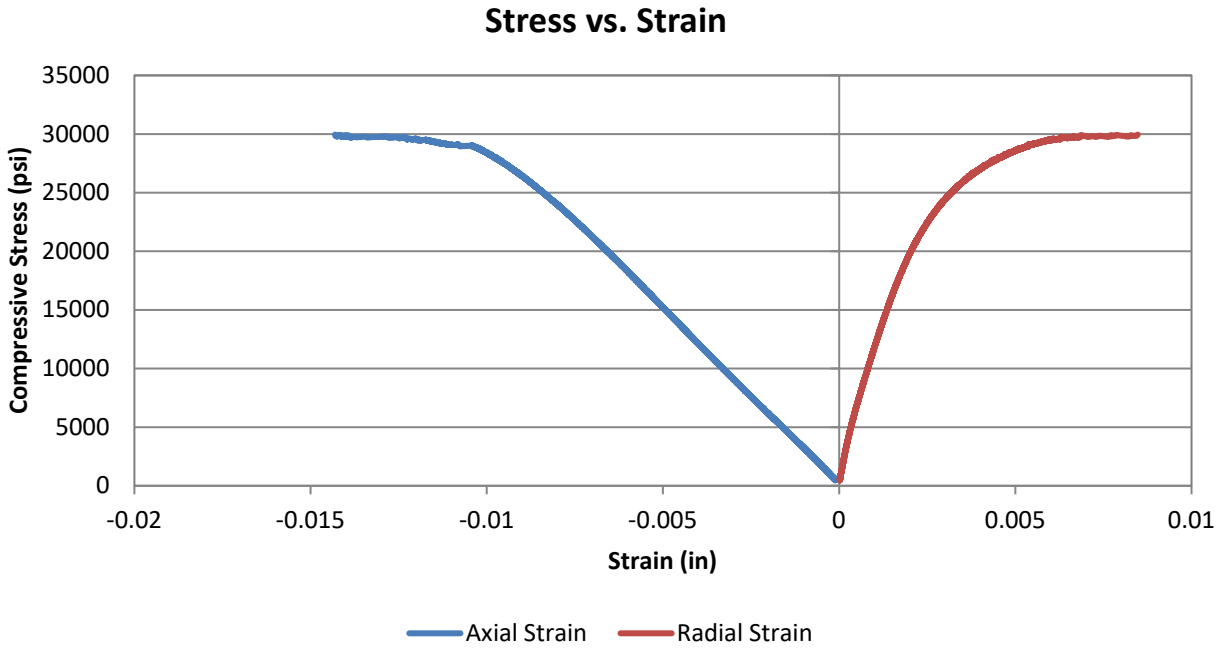
Test Results

Unconfined Compressive Strength (psi)	**29,950**	Elastic Modulus (psi)	6.08E+06
		Poisson's Ratio in Elastic Range	0.25
Comments	Elastic range was taken as between 0.002 and 0.005 inches of axial strain. This range was chosen to avoid any non-linear behavior from the initial loading and the inflection point at the end of the elastic range.		

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

Project	Carolina Crossroads I-20/26/126 Corridor Improvements			Date	8/4/2025
Project No.	G5662.030	Sample Diameter (in.)	1.858	Tested By	TP
SCDOT ID	P039721 & P039722	Sample Length (in.)	4.414	Reviewed By	WJG
Boring	P3D-B23	Unit Weight (pcf)	180.8	Core Size	NQ
Sample No.	NQ-2 / 25-2231	L/D Ratio	2.38	Recovery	100%
Depth	61.8' - 62.2'	Load Rate (psi/sec)	20	RQD	100%
Description	Black/Gray Amphibolite				





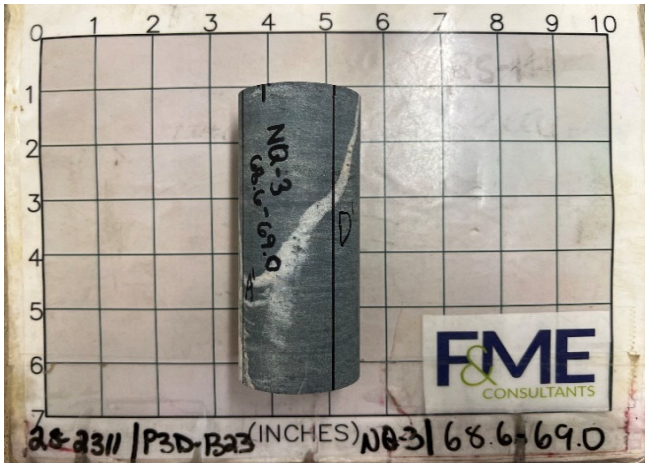
Compressive Strength and Elastic Moduli of Intact Rock Core Specimens
ASTM D7012 - Method D / SC-T-39

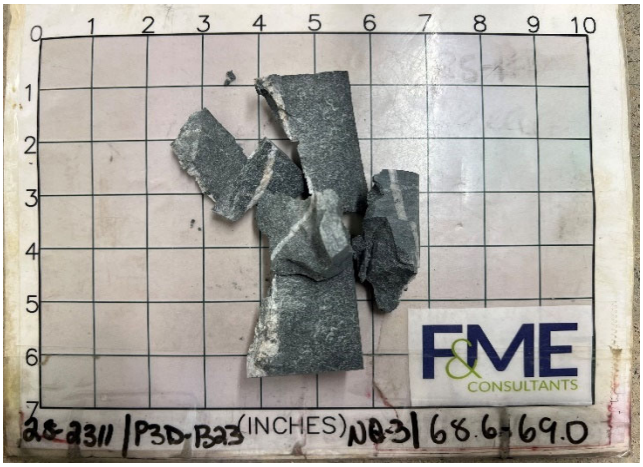
Project	Carolina Crossroads I-20/26/126 Corridor Improvements			Date	8/4/2025
Project No.	G5662.030	Sample Diameter (in.)	1.859	Tested By	TP
SCDOT ID	P039721 & P039722	Sample Length (in.)	4.436	Reviewed By	WJG
Boring	P3D-B23	Unit Weight (pcf)	176.7	Core Size	NQ
Sample No.	NQ-3 / 25-2231	L/D Ratio	2.39	Recovery	99%
Depth	68.6' - 69.0'	Load Rate (psi/sec)	25	RQD	96%
Description	Black/Gray Amphibolite				

Test Data

Percent of Failure Load	Strain (10^{-6}) Axial	Strain (10^{-6}) Radial	Load (lbs)	Compressive Stress (psi)	Secant Modulus x10^{6} (psi)	Poisson's Ratio
10%	-1138	234	9,674	3,564	6.26	0.21
20%	-2413	616	19,351	7,129	5.91	0.26
30%	-3613	902	29,044	10,700	5.92	0.25
40%	-4729	1209	38,699	14,258	6.03	0.26
50%	-5808	1549	48,374	17,822	6.14	0.27
60%	-6909	1961	58,051	21,387	6.19	0.28
70%	-8031	2422	67,723	24,951	6.21	0.30
80%	-9498	3191	77,392	28,513	6.00	0.34
90%	-12190	7930	87,065	32,077	5.26	0.65
100%	-9087	9595	96,743	35,643		

Sample Photos



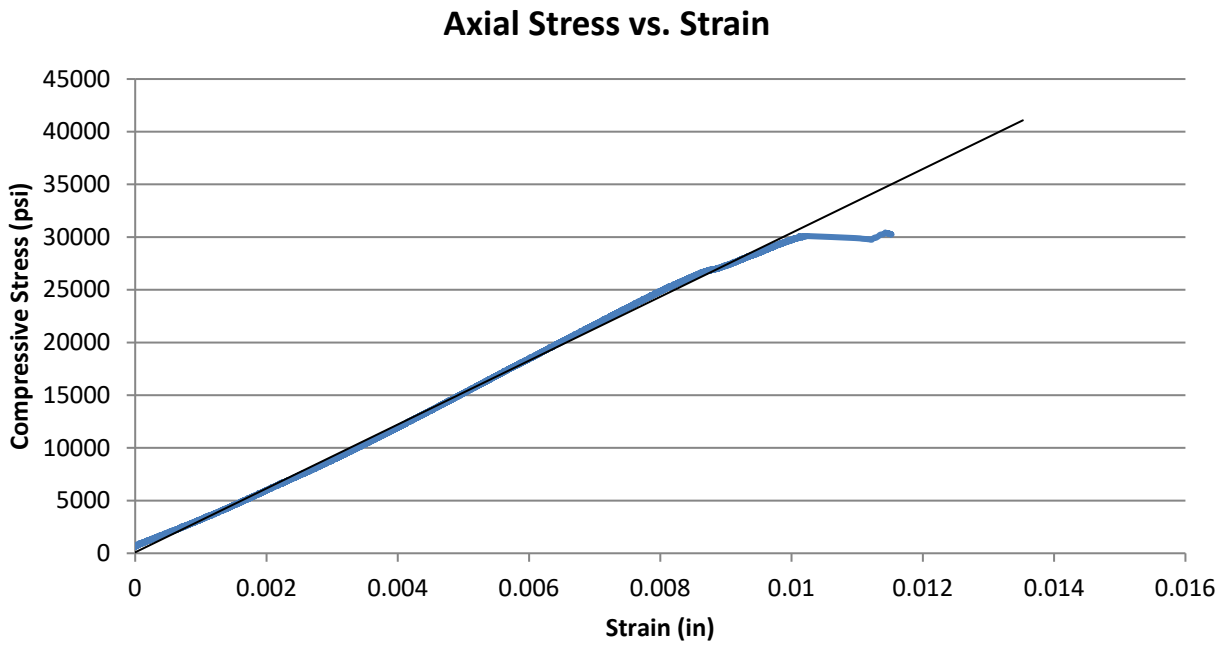


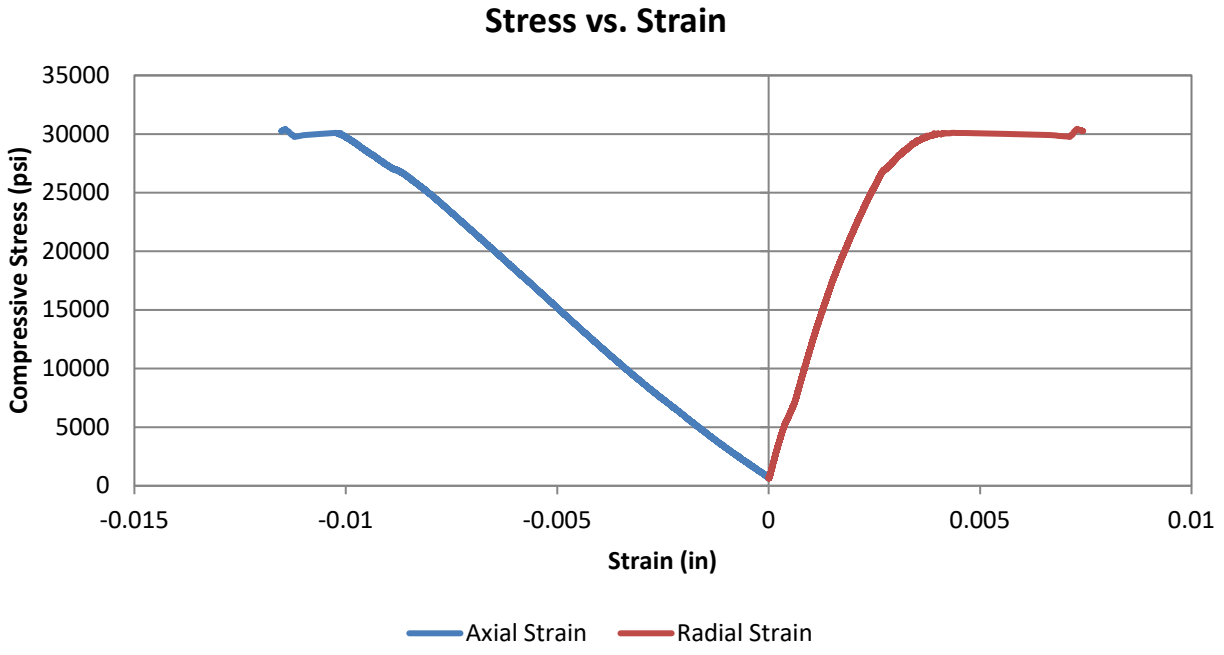
Test Results

Unconfined Compressive Strength (psi)	**35,640**	Elastic Modulus (psi)	5.98E+06
		Poisson's Ratio in Elastic Range	0.24
Comments	Elastic range was taken as between 0.001 and 0.004 inches of axial strain. This range was chosen to avoid any non-linear behavior from the initial loading and the inflection point at the end of the elastic range.		

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

Project	Carolina Crossroads I-20/26/126 Corridor Improvements			Date	8/4/2025
Project No.	G5662.030	Sample Diameter (in.)	1.859	Tested By	TP
SCDOT ID	P039721 & P039722	Sample Length (in.)	4.436	Reviewed By	WJG
Boring	P3D-B23	Unit Weight (pcf)	176.7	Core Size	NQ
Sample No.	NQ-3 / 25-2231	L/D Ratio	2.39	Recovery	99%
Depth	68.6' - 69.0'	Load Rate (psi/sec)	25	RQD	96%
Description	Black/Gray Amphibolite				





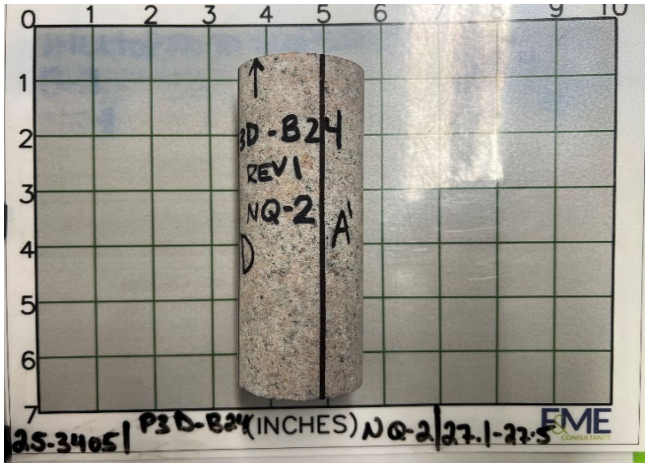
Compressive Strength and Elastic Moduli of Intact Rock Core Specimens
ASTM D7012 - Method D / SC-T-39

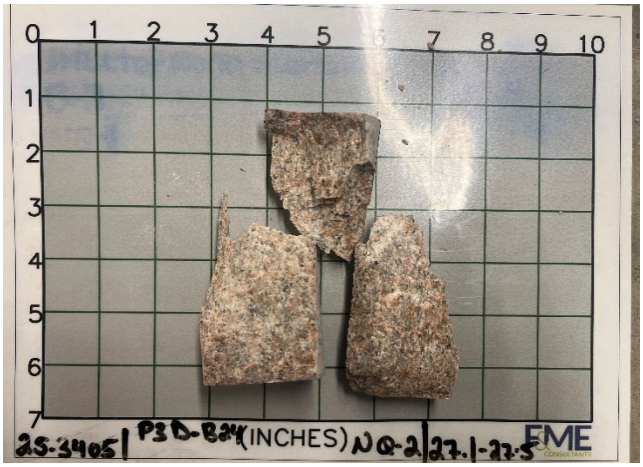
Project	Carolina Crossroads I-20/26/126 Corridor Improvements			Date	10/21/2025
Project No.	G5662.030	Sample Diameter (in.)	1.868	Tested By	TP
SCDOT ID	P039721 & P039722	Sample Length (in.)	4.773	Reviewed By	WJG
Boring	P3D-B24	Unit Weight (pcf)	162.8	Core Size	NQ
Sample No.	NQ-2 / 25-3405	L/D Ratio	2.56	Recovery	83%
Depth	27.1' - 27.5'	Load Rate (psi/sec)	30	RQD	60%
Description	Pink/Gray Columbia Metagranite				

Test Data

Percent of Failure Load	Strain (10^{-6}) Axial	Strain (10^{-6}) Radial	Load (lbs)	Compressive Stress (psi)	Secant Modulus x10^{6} (psi)	Poisson's Ratio
10%	-1260	163	9,854	3,595	5.71	0.13
20%	-2479	363	19,788	7,220	5.83	0.15
30%	-3579	554	29,680	10,830	6.05	0.15
40%	-4629	747	39,577	14,441	6.24	0.16
50%	-5652	958	49,472	18,051	6.39	0.17
60%	-6687	1195	59,368	21,662	6.48	0.18
70%	-7708	1461	69,257	25,271	6.56	0.19
80%	-8769	1788	79,147	28,880	6.59	0.20
90%	-9872	2238	88,944	32,454	6.58	0.23
100%	-11193	3626	98,934	36,100		

Sample Photos



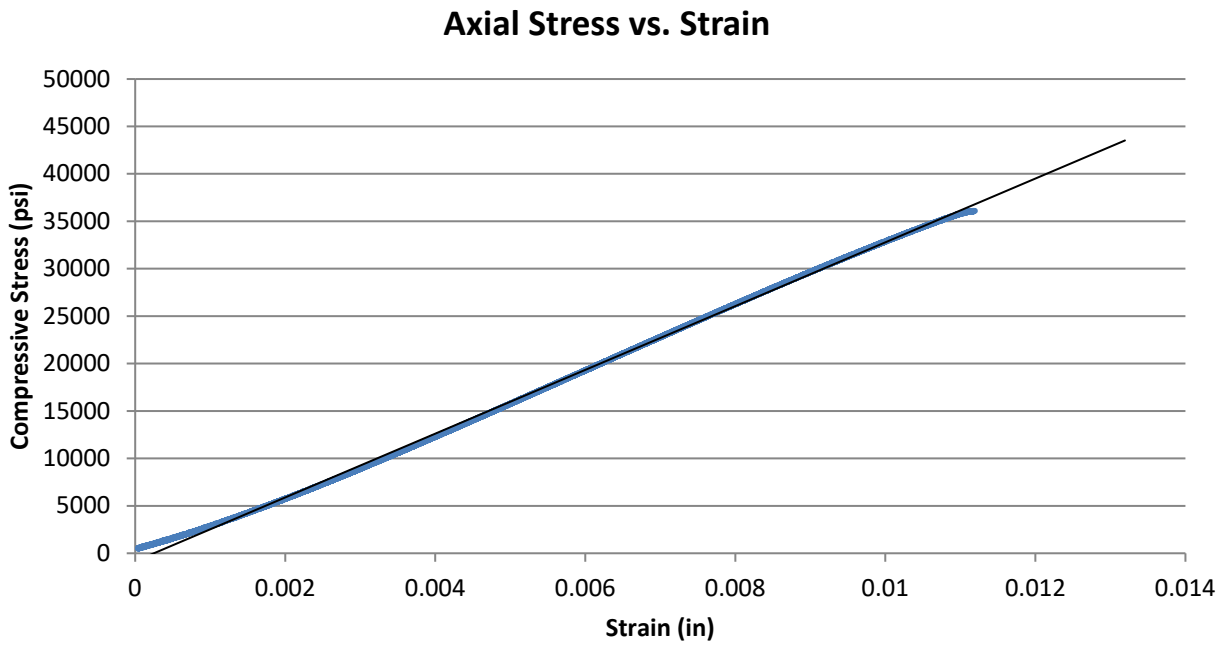


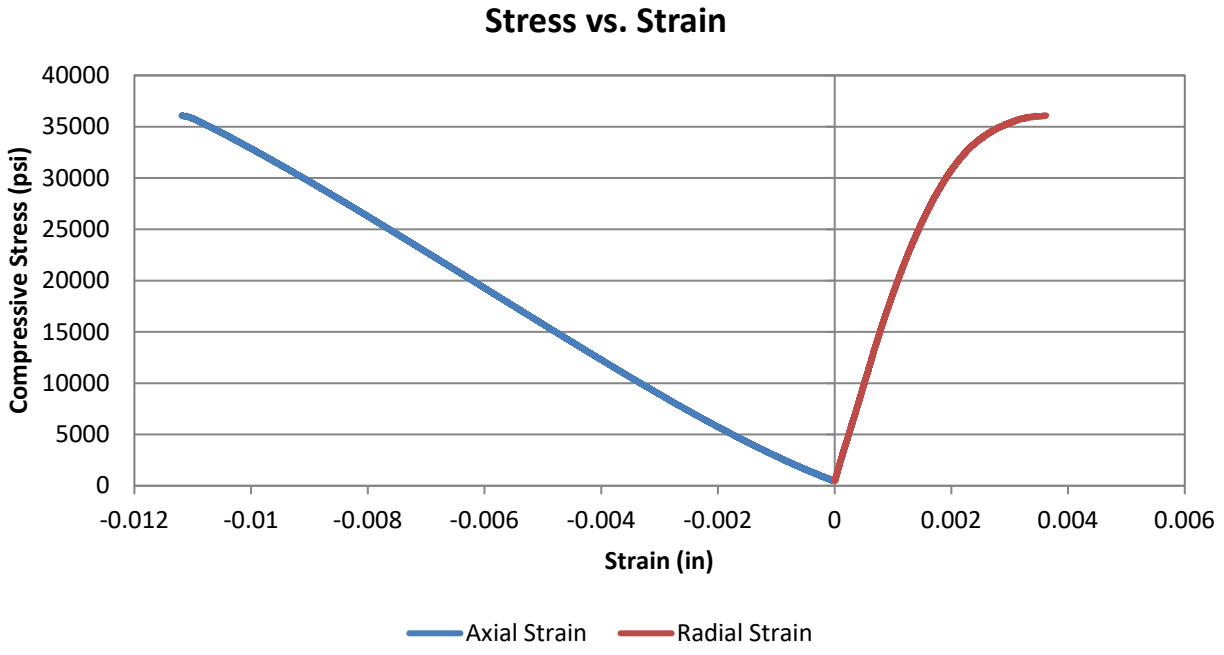
Test Results

Unconfined Compressive Strength (psi)	**36,100**	Elastic Modulus (psi)	5.87E+06
		Poisson's Ratio in Elastic Range	0.15
Comments	Elastic range was taken as between 0.001 and 0.004 inches of axial strain. This range was chosen to avoid any non-linear behavior from the initial loading and the inflection point at the end of the elastic range.		

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

Project	Carolina Crossroads I-20/26/126 Corridor Improvements			Date	10/21/2025
Project No.	G5662.030	Sample Diameter (in.)	1.868	Tested By	TP
SCDOT ID	P039721 & P039722	Sample Length (in.)	4.773	Reviewed By	WJG
Boring	P3D-B24	Unit Weight (pcf)	162.8	Core Size	NQ
Sample No.	NQ-2 / 25-3405	L/D Ratio	2.56	Recovery	83%
Depth	27.1' - 27.5'	Load Rate (psi/sec)	30	RQD	60%
Description	Pink/Gray Columbia Metagranite				





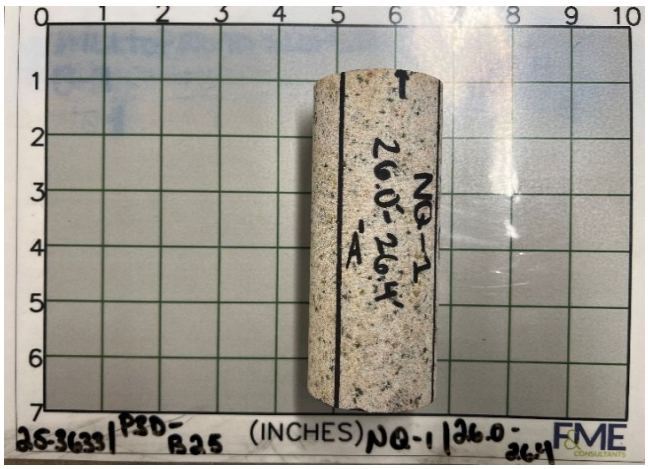
Compressive Strength and Elastic Moduli of Intact Rock Core Specimens
ASTM D7012 - Method D / SC-T-39

Project	Carolina Crossroads I-20/26/126 Corridor Improvements			Date	10/21/2025
Project No.	G5662.030	Sample Diameter (in.)	1.871	Tested By	TP
SCDOT ID	P039721 & P039722	Sample Length (in.)	4.628	Reviewed By	WJG
Boring	P3D-B25	Unit Weight (pcf)	162.0	Core Size	NQ
Sample No.	NQ-1 / 25-3633	L/D Ratio	2.47	Recovery	87%
Depth	26.0' - 26.4'	Load Rate (psi/sec)	50	RQD	87%
Description	Pink Granite				

Test Data

Percent of Failure Load	Strain (10^{-6}) Axial	Strain (10^{-6}) Radial	Load (lbs)	Compressive Stress (psi)	Secant Modulus x10^{6} (psi)	Poisson's Ratio
10%	-1449	96	5,200	1,891	2.61	0.07
20%	-2728	241	10,440	3,797	2.78	0.09
30%	-3778	414	15,675	5,701	3.02	0.11
40%	-4686	603	20,867	7,590	3.24	0.13
50%	-5534	811	26,072	9,483	3.43	0.15
60%	-6326	1045	31,303	11,386	3.60	0.17
70%	-7100	1317	36,523	13,284	3.74	0.19
80%	-7874	1655	41,722	15,175	3.85	0.21
90%	-8706	2164	46,982	17,088	3.93	0.25
100%	-11272	10819	52,167	18,974		

Sample Photos



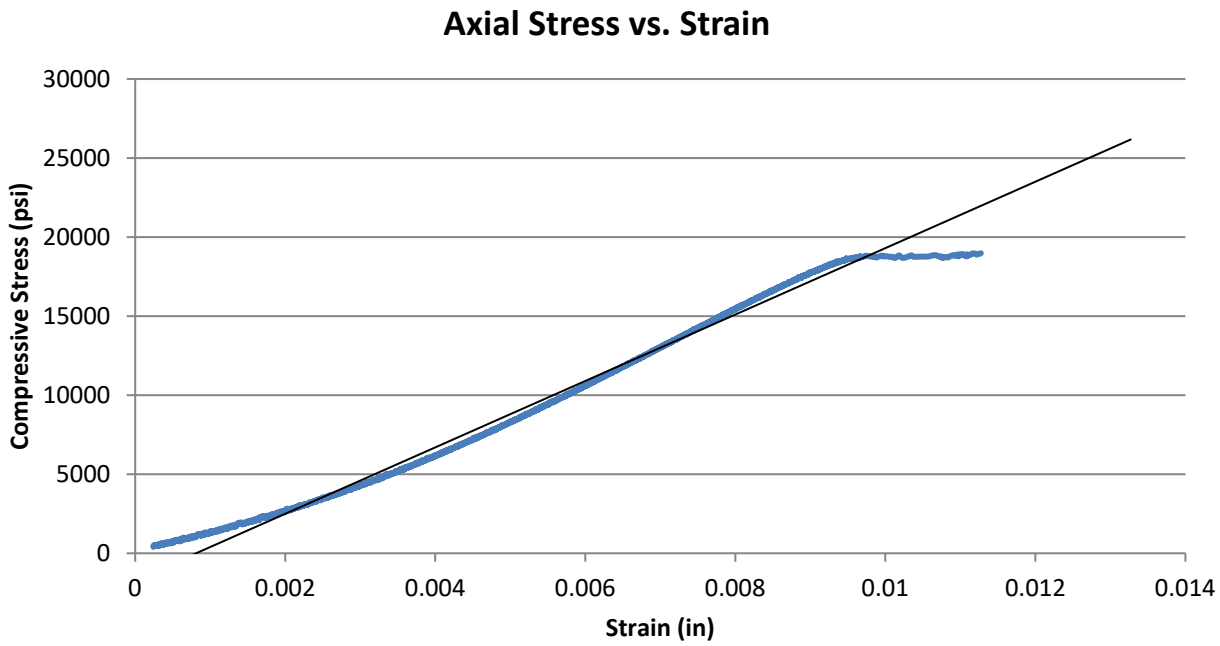


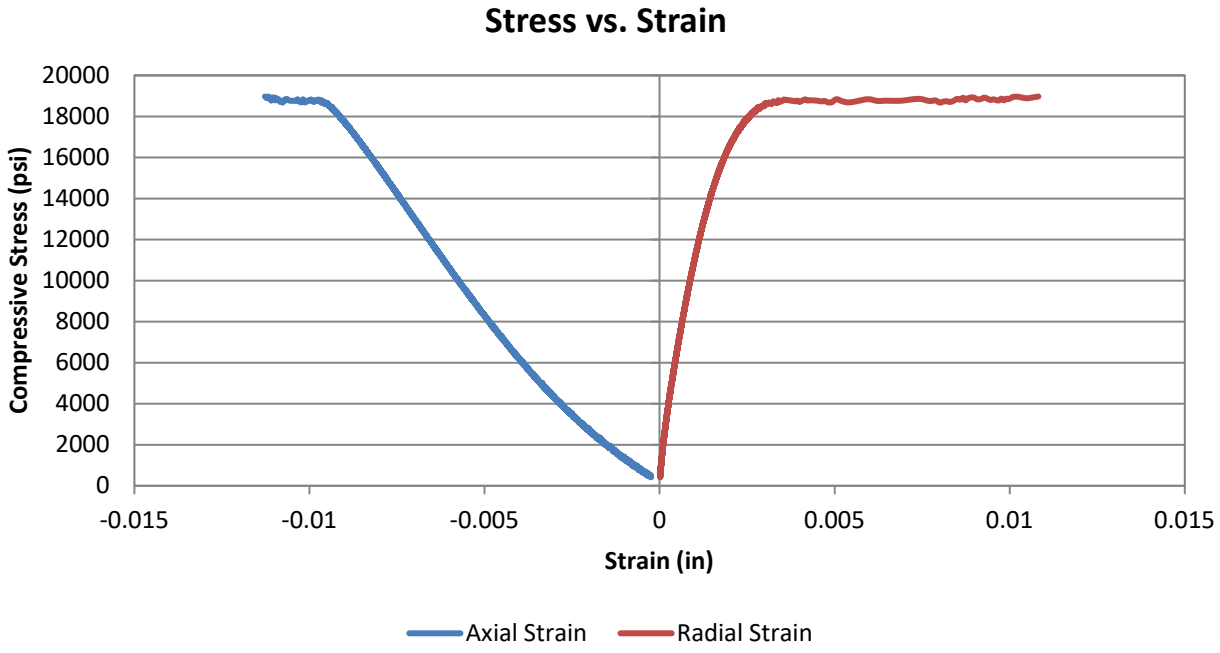
Test Results

Unconfined Compressive Strength (psi)	**18,970**	Elastic Modulus (psi)	2.88E+06
		Poisson's Ratio in Elastic Range	0.10
Comments	Elastic range was taken as between 0.002 and 0.004 inches of axial strain. This range was chosen to avoid any non-linear behavior from the initial loading and the inflection point at the end of the elastic range.		

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

Project	Carolina Crossroads I-20/26/126 Corridor Improvements			Date	10/21/2025
Project No.	G5662.030	Sample Diameter (in.)	1.871	Tested By	TP
SCDOT ID	P039721 & P039722	Sample Length (in.)	4.628	Reviewed By	WJG
Boring	P3D-B25	Unit Weight (pcf)	162.0	Core Size	NQ
Sample No.	NQ-1 / 25-3633	L/D Ratio	2.47	Recovery	87%
Depth	26.0' - 26.4'	Load Rate (psi/sec)	50	RQD	87%
Description	Pink Granite				





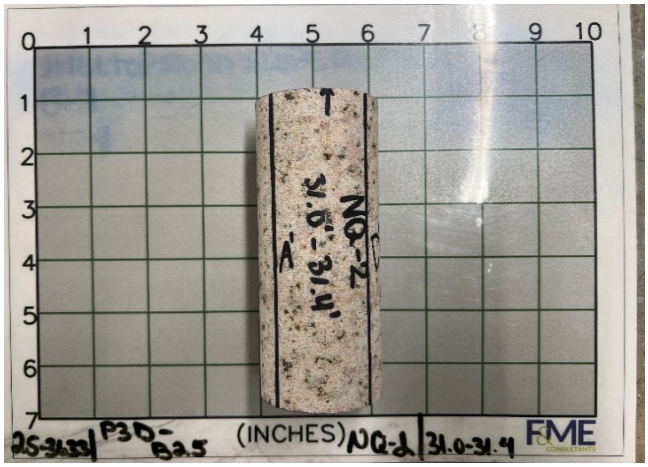
Compressive Strength and Elastic Moduli of Intact Rock Core Specimens
ASTM D7012 - Method D / SC-T-39

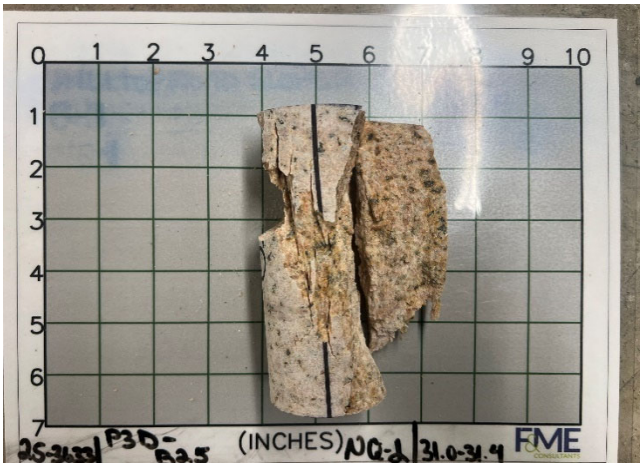
Project	Carolina Crossroads I-20/26/126 Corridor Improvements			Date	10/21/2025
Project No.	G5662.030	Sample Diameter (in.)	1.871	Tested By	TP
SCDOT ID	P039721 & P039722	Sample Length (in.)	4.636	Reviewed By	WJG
Boring	P3D-B25	Unit Weight (pcf)	162.0	Core Size	NQ
Sample No.	NQ-2 / 25-3633	L/D Ratio	2.48	Recovery	87%
Depth	31.0' - 31.4'	Load Rate (psi/sec)	30	RQD	73%
Description	Pink Granite				

Test Data

Percent of Failure Load	Strain (10^{-6}) Axial	Strain (10^{-6}) Radial	Load (lbs)	Compressive Stress (psi)	Secant Modulus x10^{6} (psi)	Poisson's Ratio
10%	-1413	107	6,080	2,212	3.13	0.08
20%	-2730	248	12,150	4,419	3.24	0.09
30%	-3835	409	18,236	6,633	3.46	0.11
40%	-4825	598	24,314	8,843	3.67	0.12
50%	-5725	800	30,389	11,053	3.86	0.14
60%	-6587	1031	36,466	13,263	4.03	0.16
70%	-7415	1303	42,550	15,476	4.17	0.18
80%	-8241	1671	48,620	17,684	4.29	0.20
90%	-9115	2268	54,699	19,895	4.37	0.25
100%	-10399	6859	60,781	22,107		

Sample Photos



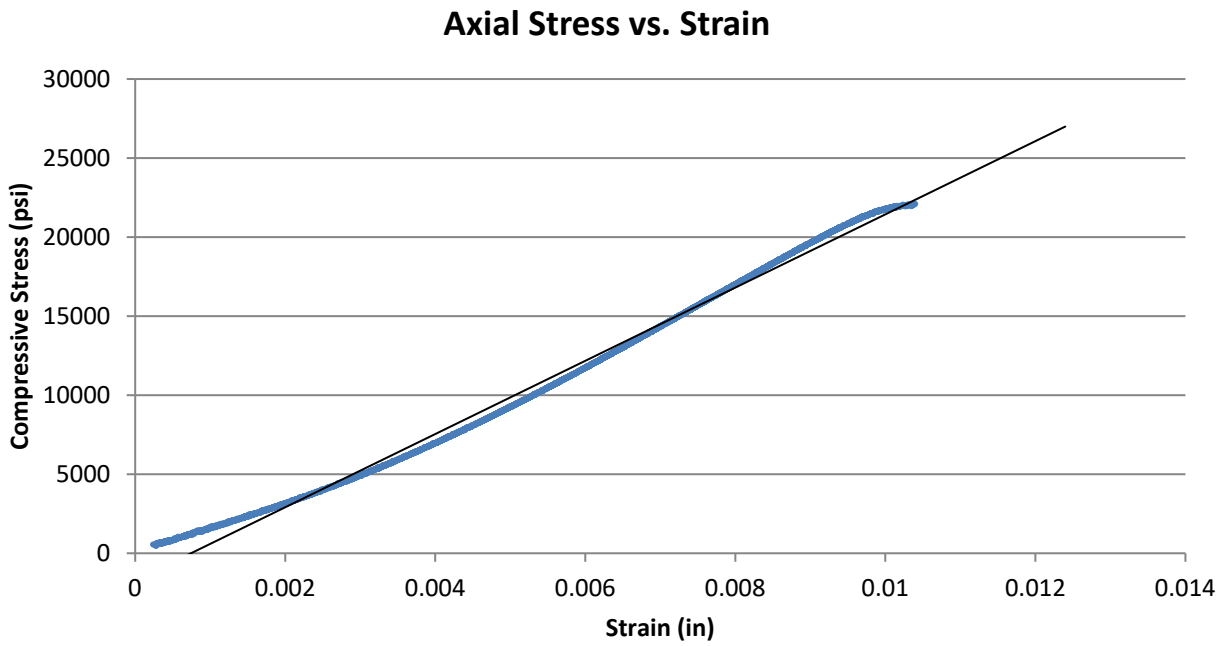


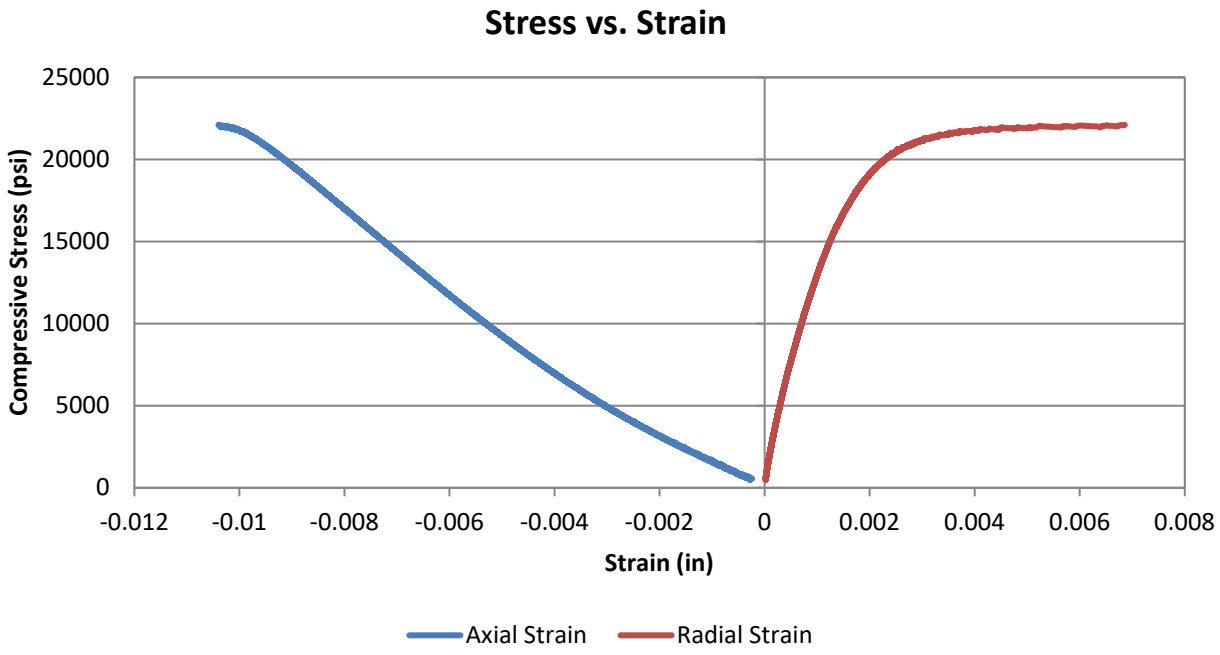
Test Results

Unconfined Compressive Strength (psi)	**22,110**	Elastic Modulus (psi)	3.31E+06
		Poisson's Ratio in Elastic Range	0.10
Comments	Elastic range was taken as between 0.002 and 0.004 inches of axial strain. This range was chosen to avoid any non-linear behavior from the initial loading and the inflection point at the end of the elastic range.		

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

Project	Carolina Crossroads I-20/26/126 Corridor Improvements			Date	10/21/2025
Project No.	G5662.030	Sample Diameter (in.)	1.871	Tested By	TP
SCDOT ID	P039721 & P039722	Sample Length (in.)	4.636	Reviewed By	WJG
Boring	P3D-B25	Unit Weight (pcf)	162.0	Core Size	NQ
Sample No.	NQ-2 / 25-3633	L/D Ratio	2.48	Recovery	87%
Depth	31.0' - 31.4'	Load Rate (psi/sec)	30	RQD	73%
Description	Pink Granite				





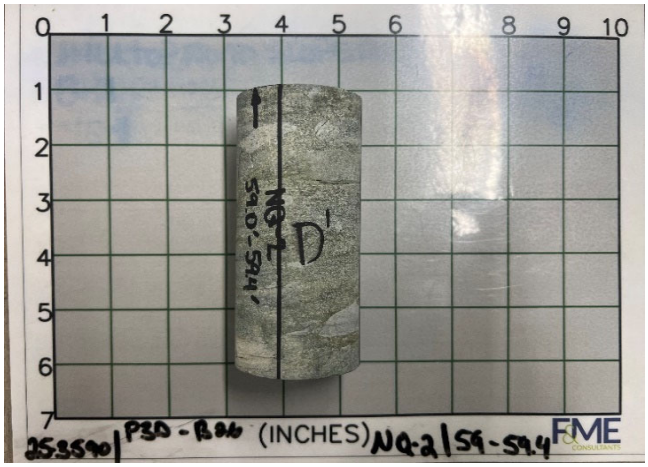
Compressive Strength and Elastic Moduli of Intact Rock Core Specimens
ASTM D7012 - Method D / SC-T-39

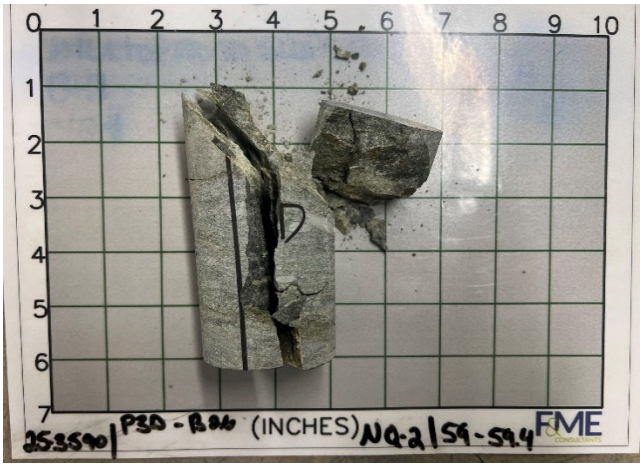
Project	Carolina Crossroads I-20/26/126 Corridor Improvements			Date	10/21/2025
Project No.	G5662.030	Sample Diameter (in.)	1.868	Tested By	TP
SCDOT ID	P039721 & P039722	Sample Length (in.)	4.098	Reviewed By	WJG
Boring	P3D-B26	Unit Weight (pcf)	174.7	Core Size	NQ
Sample No.	NQ-2 / 25-3590	L/D Ratio	2.19	Recovery	98%
Depth	59.0' - 59.4'	Load Rate (psi/sec)	20	RQD	16%
Description	Black/Green Amphibolite				

Test Data

Percent of Failure Load	Strain (10^{-6}) Axial	Strain (10^{-6}) Radial	Load (lbs)	Compressive Stress (psi)	Secant Modulus x10^{6} (psi)	Poisson's Ratio
10%	-1988	39	2,204	804	0.81	0.02
20%	-3679	83	4,403	1,607	0.87	0.02
30%	-5082	129	6,610	2,412	0.95	0.03
40%	-6425	187	8,803	3,212	1.00	0.03
50%	-7520	253	11,020	4,021	1.07	0.03
60%	-8609	351	13,225	4,826	1.12	0.04
70%	-9476	613	15,431	5,630	1.19	0.06
80%	-10326	899	17,631	6,433	1.25	0.09
90%	-11360	1282	19,837	7,238	1.27	0.11
100%	-12562	2332	22,042	8,043		

Sample Photos



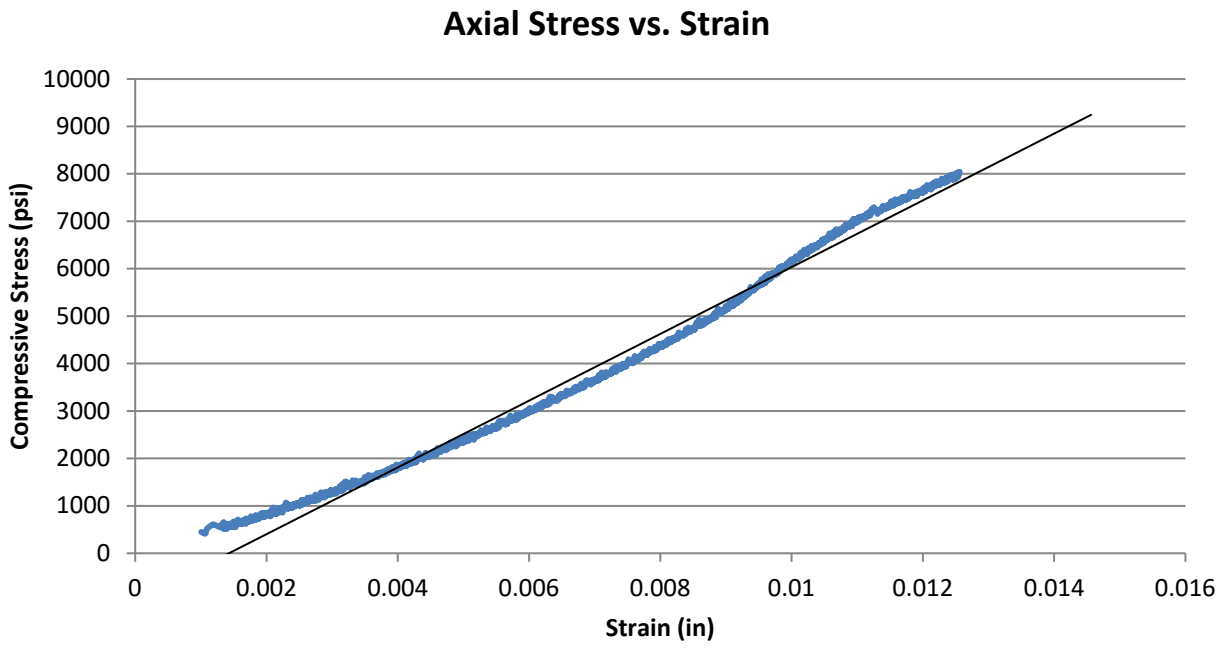


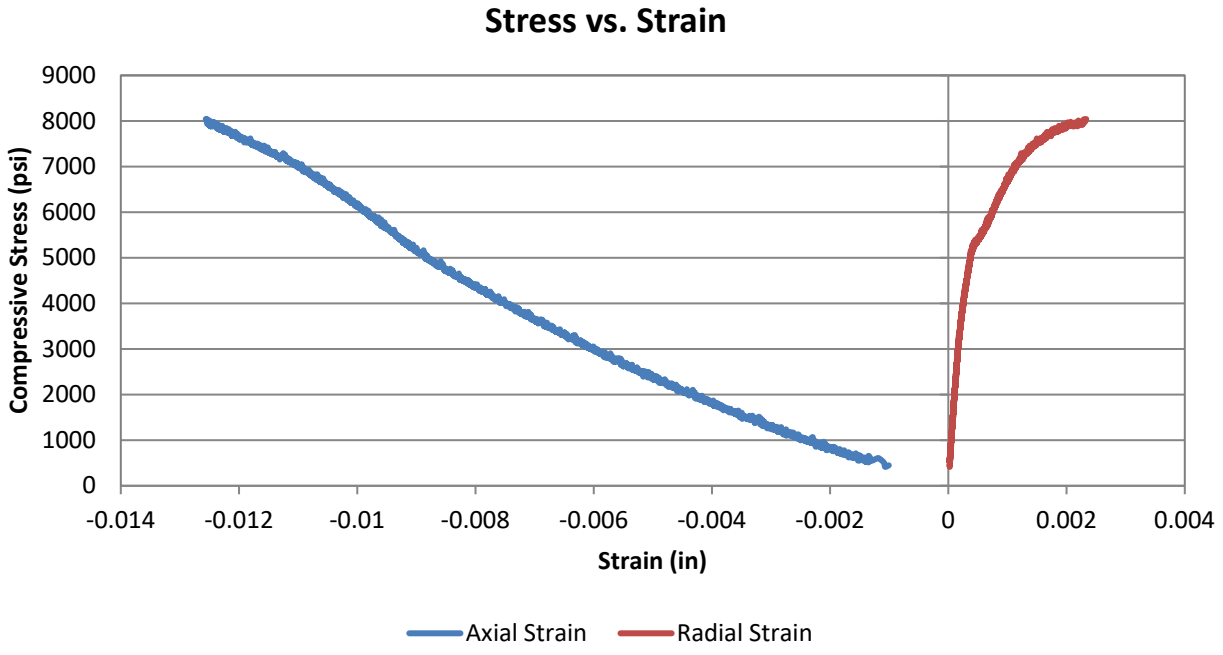
Test Results

Unconfined Compressive Strength (psi)	**8,040**	Elastic Modulus (psi)	8.86E+05
		Poisson's Ratio in Elastic Range	0.02
Comments	Elastic range was taken as between 0.002 and 0.005 inches of axial strain. This range was chosen to avoid any non-linear behavior from the initial loading and the inflection point at the end of the elastic range.		

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

Project	Carolina Crossroads I-20/26/126 Corridor Improvements			Date	10/21/2025
Project No.	G5662.030	Sample Diameter (in.)	1.868	Tested By	TP
SCDOT ID	P039721 & P039722	Sample Length (in.)	4.098	Reviewed By	WJG
Boring	P3D-B26	Unit Weight (pcf)	174.7	Core Size	NQ
Sample No.	NQ-2 / 25-3590	L/D Ratio	2.19	Recovery	98%
Depth	59.0' - 59.4'	Load Rate (psi/sec)	20	RQD	16%
Description	Black/Green Amphibolite				





FME & SME 2018 INVESTIGATION

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

ROCK CORE COMPRESSION TEST

PROJECT: I-20/26/126 Corridor Improvements **PROJECT NO:** G5662.01

SAMPLED BY: RW **DATE SAMPLED:** 1/22/2018

TESTED BY: BF **DATE TESTED:** 2/2/2018

Lab No.	18-0156A	18-0156B	18-0156C	18-0156D	18-0156E
Boring No.	DH-3A	DH-3A	DH-3A	DH-3A	DH-3A
Sample No.	NQ-1	NQ-4	NQ-9	NQ-10	NQ-10
Depth	2.9-3.2	21.1-21.4	72.3-72.6	76.5-76.8	80.6-80.9
Length (in)	4.08	3.86	3.94	4.02	3.97
Diameter (in)	1.86	1.85	1.85	1.85	1.86
Mass (g)	566.99	498.97	510.35	549.26	519.50
Cross Sectional Area (in^2)	2.72	2.68	2.70	2.70	2.71
Load (lb)	189270	98135	60965	37020	45430
Compressive Strength (psi)	69510	36670	22610	13710	16760
Corrected Compressive Strength (psi)					
Unit Weight (lb/ft^3)	194.66	184.14	183.17	192.95	183.95

Signature: _____

Remarks: _____

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

ROCK CORE COMPRESSION TEST

PROJECT: I-20/26/126 Corridor Improvements **PROJECT NO:** G5662.01

SAMPLED BY: RW **DATE SAMPLED:** 1/22/2018

TESTED BY: BF **DATE TESTED:** 2/2/2018

Lab No.	18-0156F	18-0156G	18-0156H		
Boring No.	DH-3A	DH-3A	DH-3A		
Sample No.	NQ-11	NQ-12	NQ-15		
Depth	84.6-84.9	89.6-89.9	103.3-103.6		
Length (in)	3.99	4.00	3.97		
Diameter (in)	1.86	1.86	1.86		
Mass (g)	524.43	522.69	518.34		
Cross Sectional Area (in^2)	2.71	2.71	2.72		
Load (lb)	77635	101135	79100		
Compressive Strength (psi)	28600	37260	29080		
Corrected Compressive Strength (psi)					
Unit Weight (lb/ft^3)	184.71	183.45	182.95		

Signature: _____

Remarks: _____

UNCONFINED COMPRESSION
(ASTM D7012 Method C)

S&ME, Inc. - Knoxville 1413 Topside Road, Louisville, TN 37777

Project Name: Carolina Crossroads Project
Project Number: 1461-16-047 Phase 2B

Report Date: March 6, 2018
Reviewed By: Jason B. Burgess

Boring No.	Sample No.	Depth (ft)	Dimensions, in.		Shape (See Key)	Area (in^2)	Unit Weight (lbs/ft^3)	Loading Rate (psi/sec)	Maximum Load (lbs)	Strength (psi)	Moisture (%)
			Length	Diameter							
B-29	RC-3	65.4 - 66.1	4.35	1.98	A	3.08	183.1	88	132,108	42,892	0.0
B-29	RC-4	70.3 - 70.9	4.38	1.98	A	3.08	180.9	82	60,645	19,690	0.1
B-29	RC-5	75.6 - 76.4	4.39	1.98	A	3.08	182.3	91	69,013	22,407	0.1
B-36	RC-3	69.3 - 69.9	4.36	1.98	A	3.08	198.6	77	69,199	22,467	0.1
B-45	RC-2	30.6 - 31.4	4.37	1.98	A	3.08	163.5	86	74,649	24,237	0.4

NOTES: Effective (as received) unit weight as determined by RTH 109-93.
Loading rates were selected to target reaching failure between 2 and 15 minutes.
Test results for specimens not meeting the requirements of ASTM D4543 may differ from a test specimen that meets the requirements of ASTM D4543.

SHAPE KEY

ASTM D4543-08$^{\epsilon 1}$ *Standard Practice for Preparing Rock Core as Cylindrical Test Specimens and Verifying Conformance to Dimensional and Shape Tolerance* Section 1.2 - "Rock is a complex engineering material that can vary greatly as a function of lithology, stress history, weathering, moisture content and chemistry, and other natural geologic processes. As such, it is not always possible to obtain or prepare rock core specimens that satisfy the desirable tolerances given in this practice. Most commonly, this situation presents itself with weaker, more porous, and poorly cemented rock types and rock types containing significant or weak (or both) structural features. For these and other rock types which are difficult to prepare, all reasonable efforts shall be made to prepare a specimen in accordance with this practice and for the intended test procedure. However, when it has been determined by trial that this is not possible, prepare the rock specimen to the closest tolerances practicable and consider this to be the best effort and report it as such and if allowable or necessary for the intended test, capping the ends of the specimen as discussed in this practice is permitted."

A Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ (side straightness, end flatness & parallelism, and end perpendicularity to axis)

B Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness & parallelism, and end perpendicularity to axis. Specimen did not meet the desired tolerance for side straightness. Specimen prepared to closest tolerances practicable.

C Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness & parallelism. Specimen did not meet the desired tolerances for side straightness and end perpendicularity to axis. Specimen prepared to closest tolerances practicable.

D Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness. Specimen did not meet the desired tolerances for side straightness, parallelism and end perpendicularity to axis. Specimen prepared to closest tolerances practicable.

E Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness and end perpendicularity to axis. Specimen did not meet the desired tolerance for side straightness and parallelism. Specimen prepared to closest tolerances practicable.

UNCONFINED COMPRESSION
(ASTM D7012 Method C)

S&ME, Inc. - Knoxville 1413 Topside Road, Louisville, TN 37777

Project Name: Carolina Crossroads Project
Project Number: 1461-16-047 Phase 2B

Report Date: March 6, 2018
Reviewed By: Jason B. Burgess

Boring No.	Sample No.	Depth (ft)	Dimensions, in.		Shape (See Key)	Area (in^2)	Unit Weight (lbs/ft^3)	Loading Rate (psi/sec)	Maximum Load (lbs)	Strength (psi)	Moisture (%)
			Length	Diameter							
B-45	RC-3	37.9 - 38.5	4.48	1.98	A	3.08	163.9	89	94,201	30,585	0.3
B-45	RC-6	42.8 - 43.4	4.37	1.98	A	3.08	163.3	82	68,417	22,213	0.4
B-47	RC-1	47.2 - 47.8	4.40	1.99	A	3.11	166.4	48	19,469	6,260	0.4
B-47	RC-3	55.4 - 56.2	4.47	1.98	A	3.08	170.6	42	14,859	4,824	0.4
B-47	RC-4	64.0 - 65.0	4.45	1.98	A	3.08	169.3	44	10,041	3,260	0.4

NOTES: Effective (as received) unit weight as determined by RTH 109-93.
Loading rates were selected to target reaching failure between 2 and 15 minutes.
Test results for specimens not meeting the requirements of ASTM D4543 may differ from a test specimen that meets the requirements of ASTM D4543.

SHAPE KEY

ASTM D4543-08$^{\epsilon 1}$ *Standard Practice for Preparing Rock Core as Cylindrical Test Specimens and Verifying Conformance to Dimensional and Shape Tolerance* Section 1.2 - "Rock is a complex engineering material that can vary greatly as a function of lithology, stress history, weathering, moisture content and chemistry, and other natural geologic processes. As such, it is not always possible to obtain or prepare rock core specimens that satisfy the desirable tolerances given in this practice. Most commonly, this situation presents itself with weaker, more porous, and poorly cemented rock types and rock types containing significant or weak (or both) structural features. For these and other rock types which are difficult to prepare, all reasonable efforts shall be made to prepare a specimen in accordance with this practice and for the intended test procedure. However, when it has been determined by trial that this is not possible, prepare the rock specimen to the closest tolerances practicable and consider this to be the best effort and report it as such and if allowable or necessary for the intended test, capping the ends of the specimen as discussed in this practice is permitted."

A Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ (side straightness, end flatness & parallelism, and end perpendicularity to axis)

B Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness & parallelism, and end perpendicularity to axis. Specimen did not meet the desired tolerance for side straightness. Specimen prepared to closest tolerances practicable.

C Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness & parallelism. Specimen did not meet the desired tolerances for side straightness and end perpendicularity to axis. Specimen prepared to closest tolerances practicable.

D Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness. Specimen did not meet the desired tolerances for side straightness, parallelism and end perpendicularity to axis. Specimen prepared to closest tolerances practicable.

E Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness and end perpendicularity to axis. Specimen did not meet the desired tolerance for side straightness and parallelism. Specimen prepared to closest tolerances practicable.

UNCONFINED COMPRESSION
(ASTM D7012 Method C)

S&ME, Inc. - Knoxville 1413 Topside Road, Louisville, TN 37777

Project Name: Carolina Crossroads Project
Project Number: 1461-16-047 Phase 2B

Report Date: March 6, 2018
Reviewed By: Jason B. Burgess

Boring No.	Sample No.	Depth (ft)	Dimensions, in.		Shape (See Key)	Area (in^2)	Unit Weight (lbs/ft^3)	Loading Rate (psi/sec)	Maximum Load (lbs)	Strength (psi)	Moisture (%)
			Length	Diameter							
B-50	RC-1	73.7 - 74.3	4.32	1.96	A	3.02	170.8	22	5,945	1,969	0.3
B-50	RC-4	87.7 - 88.5	4.34	1.95	A	2.99	167.6	22	2,590	866	0.3
W-22	RC-3	16.5 - 17.0	4.39	1.98	A	3.08	164.2	85	81,245	26,378	0.3
W-25	RC-2	30.5 - 31.3	4.38	1.98	A	3.08	165.3	89	98,111	31,854	0.3
W-32	RC-1	48.0 - 48.7	4.39	1.98	A	3.08	179.9	95	61,645	20,015	0.2

NOTES: Effective (as received) unit weight as determined by RTH 109-93.
Loading rates were selected to target reaching failure between 2 and 15 minutes.
Test results for specimens not meeting the requirements of ASTM D4543 may differ from a test specimen that meets the requirements of ASTM D4543.

SHAPE KEY

ASTM D4543-08$^{\epsilon 1}$ *Standard Practice for Preparing Rock Core as Cylindrical Test Specimens and Verifying Conformance to Dimensional and Shape Tolerance* Section 1.2 - "Rock is a complex engineering material that can vary greatly as a function of lithology, stress history, weathering, moisture content and chemistry, and other natural geologic processes. As such, it is not always possible to obtain or prepare rock core specimens that satisfy the desirable tolerances given in this practice. Most commonly, this situation presents itself with weaker, more porous, and poorly cemented rock types and rock types containing significant or weak (or both) structural features. For these and other rock types which are difficult to prepare, all reasonable efforts shall be made to prepare a specimen in accordance with this practice and for the intended test procedure. However, when it has been determined by trial that this is not possible, prepare the rock specimen to the closest tolerances practicable and consider this to be the best effort and report it as such and if allowable or necessary for the intended test, capping the ends of the specimen as discussed in this practice is permitted."

A Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ (side straightness, end flatness & parallelism, and end perpendicularity to axis)

B Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness & parallelism, and end perpendicularity to axis. Specimen did not meet the desired tolerance for side straightness. Specimen prepared to closest tolerances practicable.

C Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness & parallelism. Specimen did not meet the desired tolerances for side straightness and end perpendicularity to axis. Specimen prepared to closest tolerances practicable.

D Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness. Specimen did not meet the desired tolerances for side straightness, parallelism and end perpendicularity to axis. Specimen prepared to closest tolerances practicable.

E Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness and end perpendicularity to axis. Specimen did not meet the desired tolerance for side straightness and parallelism. Specimen prepared to closest tolerances practicable.

UNCONFINED COMPRESSION WITH YOUNG'S MODULUS
(ASTM D7012 Method C and D)

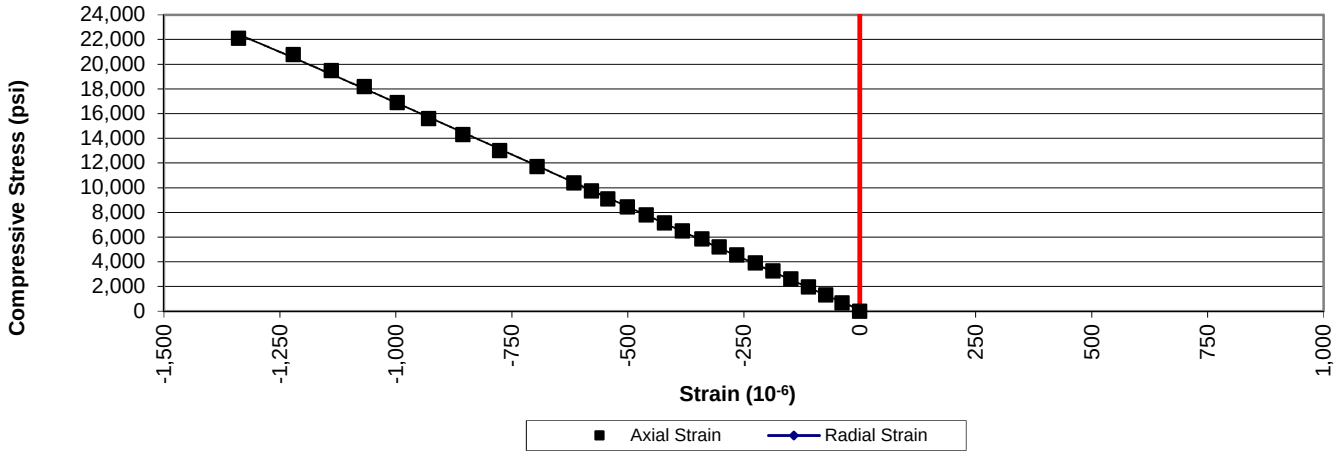
1413 Topside Road, Louisville, TN 37777

Project:	Carolina Crossroads Project	**Diameter, in.:**	1.98	**Date:**	3/1/2018
Project No.:	1461-16-047 Phase 2B	**Length, in.:**	4.36	**Tested by:**	BKP / MG
Boring Id:	B-36	**Unit Weight, pcf:**	198.6	**Reviewed by:**	JBB
Sample No:	RC-3	**Moisture Content, %:**	0.1		
Depth (ft):	69.3 - 69.9	**Load Rate, psi/sec:**	77		

Data Point	Strain (10^{-6})		Load (lb)	Compressive Stress (psi)	Secant Modulus x 10^6 (psi)	Poisson's Ratio	Remarks Failure
	axial	radial					
1	0		0	0	0.00		
2	-38		2,000	649	17.08		
3	-73		4,000	1,299	17.79		
4	-110		6,000	1,948	17.71		
5	-148		8,000	2,597	17.55		
6	-187		10,000	3,247	17.36		
7	-225		12,000	3,896	17.32		
8	-265		14,000	4,545	17.15		
9	-303		16,000	5,195	17.15		
10	-340		18,000	5,844	17.19		
11	-382		20,000	6,494	17.00		
12	-421		22,000	7,143	16.97		
13	-460		24,000	7,792	16.94		
14	-501		26,000	8,442	16.85		
15	-543		28,000	9,091	16.74		
16	-578		30,000	9,740	16.85		
17	-616		32,000	10,390	16.87		
18	-695		36,000	11,688	16.82		
19	-776		40,000	12,987	16.74		
20	-855		44,000	14,286	16.71		
21	-929		48,000	15,584	16.78		
22	-997		52,000	16,883	16.93		
23	-1,068		56,000	18,182	17.02		
24	-1,139		60,000	19,481	17.10		
25	-1,221		64,000	20,779	17.02		
26	-1,339		68,000	22,078	16.49		
27			69,199	22,467			Failure

Comments: Loading rate was selected to target reaching failure between 2 and 15 minutes.
Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ (side straightness, end flatness & parallelism, and end perpendicularity to axis)

Stress vs. Strain



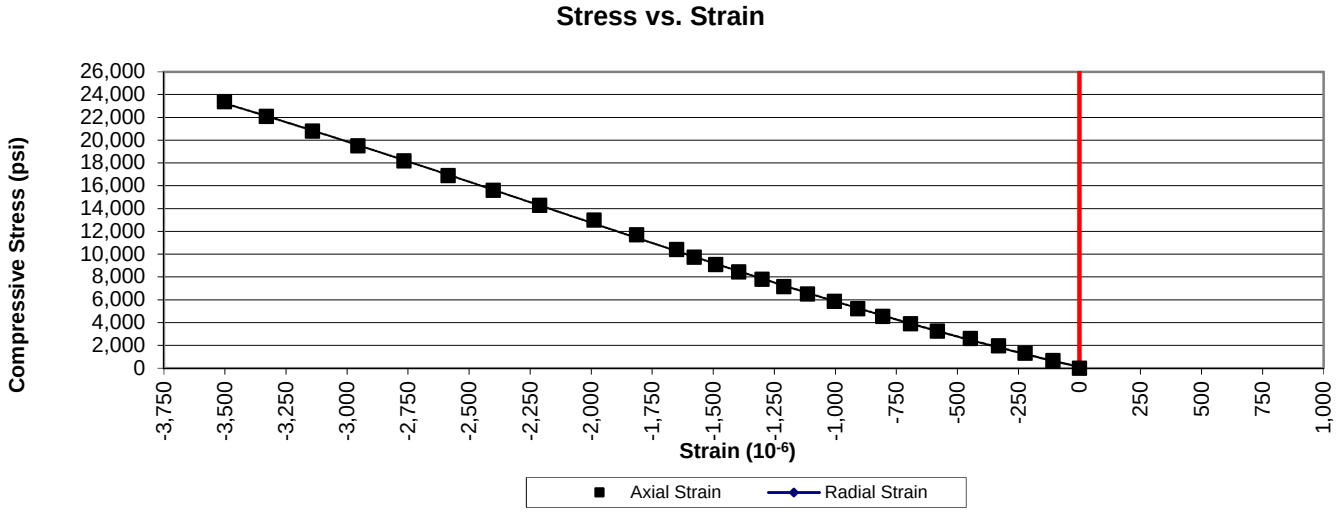
UNCONFINED COMPRESSION WITH YOUNG'S MODULUS
(ASTM D7012 Method C and D)

1413 Topside Road, Louisville, TN 37777

Project:	Carolina Crossroads Project	**Diameter, in.:**	1.98	**Date:**	3/1/2018
Project No.:	1461-16-047 Phase 2B	**Length, in.:**	4.37	**Tested by:**	BKP / MG
Boring Id:	B-45	**Unit Weight, pcf:**	163.5	**Reviewed by:**	JBB
Sample No:	RC-2	**Moisture Content, %:**	0.4		
Depth (ft):	30.6 - 31.4	**Load Rate, psi/sec:**	86		

Data Point	Strain (10^{-6})		Load (lb)	Compressive Stress (psi)	Secant Modulus x 10^6 (psi)	Poisson's Ratio	Remarks Failure
	axial	radial					
1	0		0	0	0.00		
2	-108		2,000	649	6.01		
3	-222		4,000	1,299	5.85		
4	-331		6,000	1,948	5.89		
5	-447		8,000	2,597	5.81		
6	-581		10,000	3,247	5.59		
7	-691		12,000	3,896	5.64		
8	-805		14,000	4,545	5.65		
9	-908		16,000	5,195	5.72		
10	-1,003		18,000	5,844	5.83		
11	-1,114		20,000	6,494	5.83		
12	-1,211		22,000	7,143	5.90		
13	-1,300		24,000	7,792	5.99		
14	-1,395		26,000	8,442	6.05		
15	-1,490		28,000	9,091	6.10		
16	-1,578		30,000	9,740	6.17		
17	-1,650		32,000	10,390	6.30		
18	-1,814		36,000	11,688	6.44		
19	-1,988		40,000	12,987	6.53		
20	-2,210		44,000	14,286	6.46		
21	-2,401		48,000	15,584	6.49		
22	-2,586		52,000	16,883	6.53		
23	-2,766		56,000	18,182	6.57		
24	-2,955		60,000	19,481	6.59		
25	-3,141		64,000	20,779	6.62		
26	-3,330		68,000	22,078	6.63		
27	-3,502		72,000	23,377	6.68		
28			74,649	24,237			Failure

Comments: Loading rate was selected to target reaching failure between 2 and 15 minutes.
Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ (side straightness, end flatness & parallelism, and end perpendicularity to axis)



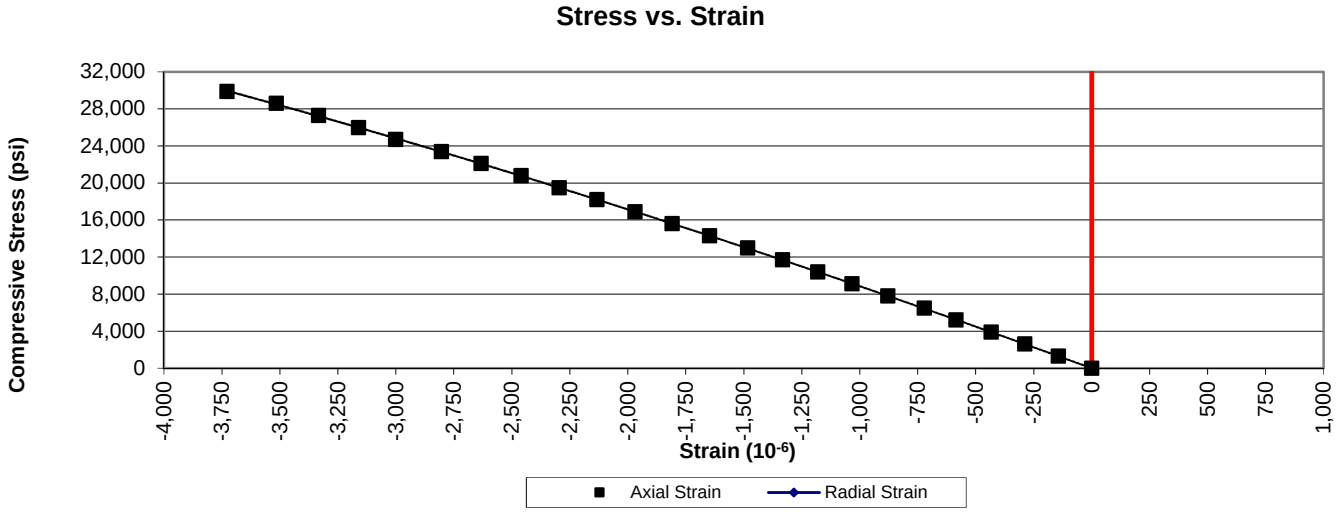
UNCONFINED COMPRESSION WITH YOUNG'S MODULUS
(ASTM D7012 Method C and D)

1413 Topside Road, Louisville, TN 37777

Project:	Carolina Crossroads Project	**Diameter, in.:**	1.98	**Date:**	3/1/2018
Project No.:	1461-16-047 Phase 2B	**Length, in.:**	4.48	**Tested by:**	BKP / MG
Boring Id:	B-45	**Unit Weight, pcf:**	163.9	**Reviewed by:**	JBB
Sample No:	RC-3	**Moisture Content, %:**	0.3		
Depth (ft):	37.9 - 38.5	**Load Rate, psi/sec:**	89		

Data Point	Strain (10^{-6})		Load (lb)	Compressive Stress (psi)	Secant Modulus x 10^6 (psi)	Poisson's Ratio	Remarks Failure
	axial	radial					
1	0		0	0	0.00		
2	-143		4,000	1,299	9.08		
3	-288		8,000	2,597	9.02		
4	-433		12,000	3,896	9.00		
5	-585		16,000	5,195	8.88		
6	-721		20,000	6,494	9.01		
7	-879		24,000	7,792	8.86		
8	-1,033		28,000	9,091	8.80		
9	-1,180		32,000	10,390	8.81		
10	-1,332		36,000	11,688	8.77		
11	-1,483		40,000	12,987	8.76		
12	-1,647		44,000	14,286	8.67		
13	-1,808		48,000	15,584	8.62		
14	-1,968		52,000	16,883	8.58		
15	-2,132		56,000	18,182	8.53		
16	-2,296		60,000	19,481	8.48		
17	-2,459		64,000	20,779	8.45		
18	-2,632		68,000	22,078	8.39		
19	-2,803		72,000	23,377	8.34		
20	-3,000		76,000	24,675	8.23		
21	-3,160		80,000	25,974	8.22		
22	-3,333		84,000	27,273	8.18		
23	-3,515		88,000	28,571	8.13		
24	-3,728		92,000	29,870	8.01		
25			94,201	30,585			Failure

Comments: Loading rate was selected to target reaching failure between 2 and 15 minutes.
Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ (side straightness, end flatness & parallelism, and end perpendicularity to axis)



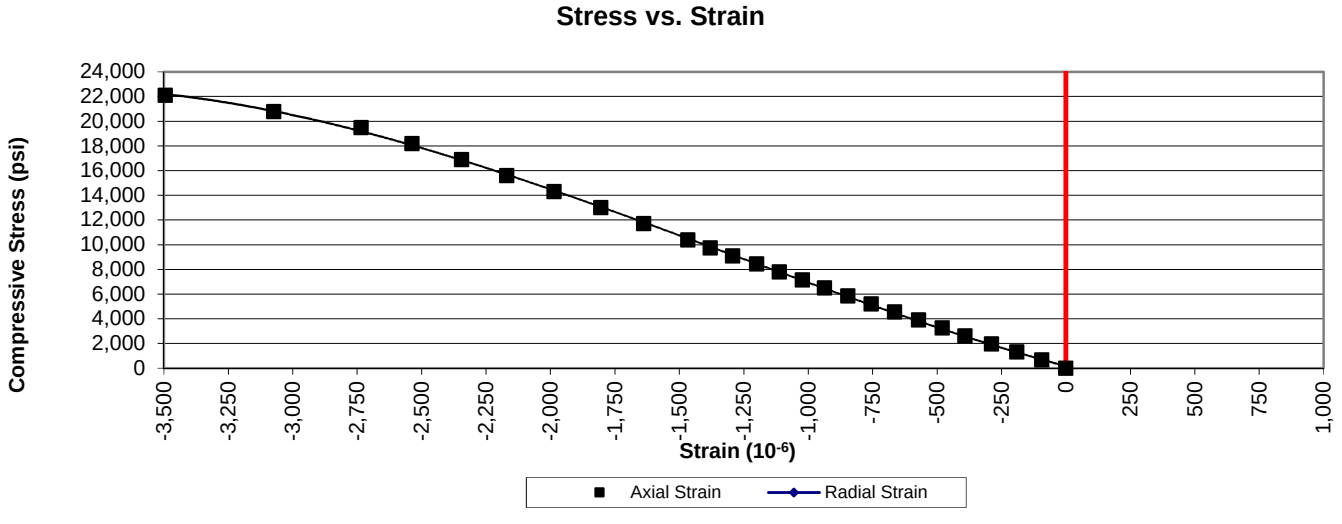
UNCONFINED COMPRESSION WITH YOUNG'S MODULUS
(ASTM D7012 Method C and D)

1413 Topside Road, Louisville, TN 37777

Project:	Carolina Crossroads Project	**Diameter, in.:**	1.98	**Date:**	3/1/2018
Project No.:	1461-16-047 Phase 2B	**Length, in.:**	4.37	**Tested by:**	BKP / MG
Boring Id:	B-45	**Unit Weight, pcf:**	163.3	**Reviewed by:**	JBB
Sample No:	RC-6	**Moisture Content, %:**	0.4		
Depth (ft):	42.8 - 43.4	**Load Rate, psi/sec:**	82		

Data Point	Strain (10^{-6})		Load (lb)	Compressive Stress (psi)	Secant Modulus x 10^6 (psi)	Poisson's Ratio	Remarks Failure
	axial	radial					
1	0		0	0	0.00		
2	-93		2,000	649	6.98		
3	-190		4,000	1,299	6.84		
4	-288		6,000	1,948	6.76		
5	-391		8,000	2,597	6.64		
6	-479		10,000	3,247	6.78		
7	-572		12,000	3,896	6.81		
8	-664		14,000	4,545	6.84		
9	-755		16,000	5,195	6.88		
10	-846		18,000	5,844	6.91		
11	-936		20,000	6,494	6.94		
12	-1,022		22,000	7,143	6.99		
13	-1,111		24,000	7,792	7.01		
14	-1,200		26,000	8,442	7.04		
15	-1,293		28,000	9,091	7.03		
16	-1,380		30,000	9,740	7.06		
17	-1,467		32,000	10,390	7.08		
18	-1,638		36,000	11,688	7.14		
19	-1,805		40,000	12,987	7.20		
20	-1,986		44,000	14,286	7.19		
21	-2,169		48,000	15,584	7.18		
22	-2,344		52,000	16,883	7.20		
23	-2,537		56,000	18,182	7.17		
24	-2,734		60,000	19,481	7.13		
25	-3,073		64,000	20,779	6.76		
26	-3,494		68,000	22,078	6.32		
27			68,417	22,213			Failure

Comments: Loading rate was selected to target reaching failure between 2 and 15 minutes.
Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ (side straightness, end flatness & parallelism, and end perpendicularity to axis)



UNCONFINED COMPRESSION WITH YOUNG'S MODULUS
(ASTM D7012 Method C and D)

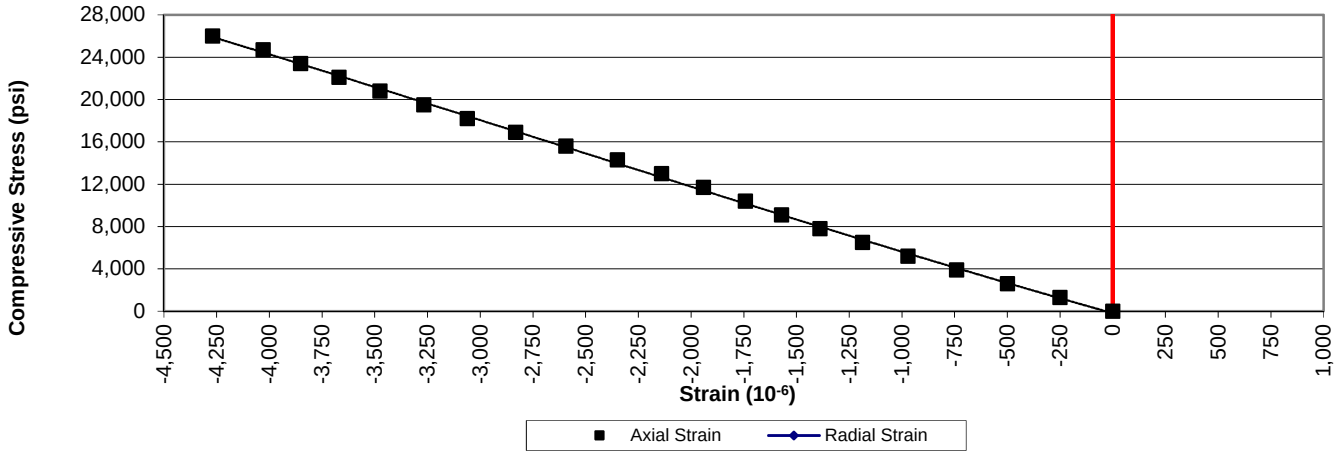
1413 Topside Road, Louisville, TN 37777

Project:	Carolina Crossroads Project	**Diameter, in.:**	1.98	**Date:**	3/1/2018
Project No.:	1461-16-047 Phase 2B	**Length, in.:**	4.39	**Tested by:**	BKP / MG
Boring Id:	W-22	**Unit Weight, pcf:**	164.2	**Reviewed by:**	JBB
Sample No:	RC-3	**Moisture Content, %:**	0.3		
Depth (ft):	16.5 - 17.0	**Load Rate, psi/sec:**	85		

Data Point	Strain (10^{-6})		Load (lb)	Compressive Stress (psi)	Secant Modulus x 10^6 (psi)	Poisson's Ratio	Remarks Failure
	axial	radial					
1	0		0	0	0.00		
2	-250		4,000	1,299	5.20		
3	-499		8,000	2,597	5.20		
4	-740		12,000	3,896	5.26		
5	-970		16,000	5,195	5.36		
6	-1,186		20,000	6,494	5.48		
7	-1,388		24,000	7,792	5.61		
8	-1,570		28,000	9,091	5.79		
9	-1,741		32,000	10,390	5.97		
10	-1,941		36,000	11,688	6.02		
11	-2,139		40,000	12,987	6.07		
12	-2,348		44,000	14,286	6.08		
13	-2,593		48,000	15,584	6.01		
14	-2,831		52,000	16,883	5.96		
15	-3,061		56,000	18,182	5.94		
16	-3,267		60,000	19,481	5.96		
17	-3,475		64,000	20,779	5.98		
18	-3,669		68,000	22,078	6.02		
19	-3,851		72,000	23,377	6.07		
20	-4,029		76,000	24,675	6.12		
21	-4,268		80,000	25,974	6.09		
22			81,245	26,378			Failure

Comments: Loading rate was selected to target reaching failure between 2 and 15 minutes.
Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ (side straightness, end flatness & parallelism, and end perpendicularity to axis)

Stress vs. Strain



PREPARING ROCK CORES AS CYLINDRICAL TEST SPECIMENS AND VERIFY CONFORMANCE OF DIMENSIONAL AND SHAPE TOLERANCES (ASTM D4543)

1413 Topside Road, Louisville, TN 37777

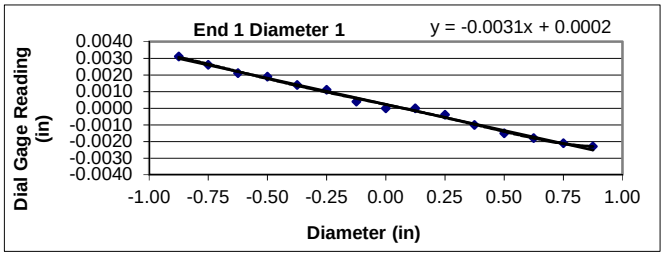
Project:	Carolina Crossroads Project	**Diameter (in):**	1.98	**Date:**	2/27/2018
Project No.:	1461-16-047 Phase B	**Length (in):**	4.36	**Tested by:**	BKP
Boring Id:	B-36	**Unit Weight (pcf):**	198.6	**Reviewed by:**	JBB
Sample No.:	RC-3	**Moisture Content (%):**	0.1		
Depth (ft):	69.3 - 69.9				

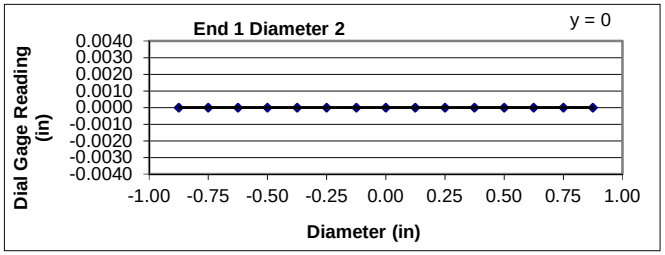
Deviation From Straightness (Procedure S1)

Is the maximum gap ≤ 0.02 in.? **YES** Straightness Tolerance Met? **YES**

End Flatness and Parallelism Readings (Procedure FP1)

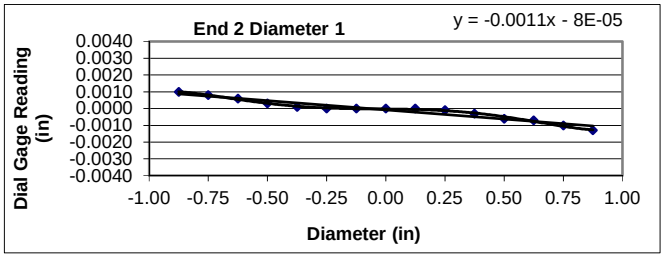
Position	End 1	End 1(90)	End 2	End 2(90)
- 7/8	0.0031	0.0000	0.0010	0.0000
- 6/8	0.0026	0.0000	0.0008	0.0000
- 5/8	0.0021	0.0000	0.0006	0.0000
- 4/8	0.0019	0.0000	0.0003	0.0000
- 3/8	0.0014	0.0000	0.0001	0.0000
- 2/8	0.0011	0.0000	0.0000	0.0000
- 1/8	0.0004	0.0000	0.0000	0.0000
0	0.0000	0.0000	0.0000	0.0000
1/8	0.0000	0.0000	0.0000	0.0000
2/8	-0.0004	0.0000	-0.0001	0.0000
3/8	-0.0010	0.0000	-0.0003	0.0000
4/8	-0.0015	0.0000	-0.0006	0.0000
5/8	-0.0018	0.0000	-0.0007	0.0000
6/8	-0.0021	0.0000	-0.0010	0.0000
7/8	-0.0023	0.0000	-0.0013	0.0000

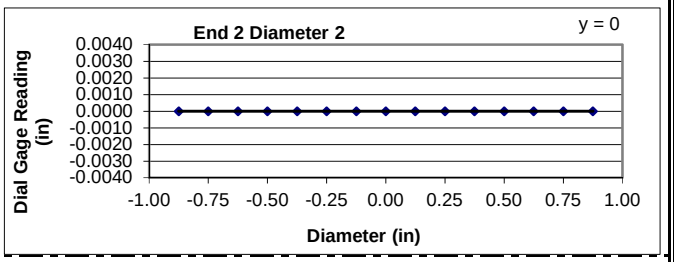




Flatness is met when the difference at any point between a smooth curve drawn through points and a visual best fit line is ≤ 0.001 in.

Flatness Tolerance Met? **YES**





Parallelism is met when the angular difference between best fit lines on opposing ends is ≤ 0.25°.

Parrallelism Diameter 1

End 1:	Slope of Best Fit Line:	-0.00313
	Angle of Best Fit Line:	-0.17958
End 2:	Slope of Best Fit Line:	-0.00110
	Angle of Best Fit Line:	-0.06286
	Max Angular Difference:	**-0.12**

Parrallelism Diameter 2

End 1:	Slope of Best Fit Line:	0.00000
	Angle of Best Fit Line:	0.00000
End 2:	Slope of Best Fit Line:	0.00000
	Angle of Best Fit Line:	0.00000
	Max Angular Difference:	**0.00**

Parallelism Tolerance Met? **YES**

Perpendicularity (Procedure P1) is met when the difference between max and min readings along each line divided by the diameter is ≤ 0.0043.

	Difference b/w max & min	Divide by Diameter	Meets Tolerance
End 1 Diam 1	0.0054	0.0027	**YES**
End 1 Diam 2	0.0000	0.0000	**YES**
End 2 Diam 1	0.0023	0.0012	**YES**
End 2 Diam 2	0.0000	0.0000	**YES**

Perpendicularity Tolerance Met? **YES**

PREPARING ROCK CORES AS CYLINDRICAL TEST SPECIMENS AND VERIFY CONFORMANCE OF DIMENSIONAL AND SHAPE TOLERANCES (ASTM D4543)

1413 Topside Road, Louisville, TN 37777

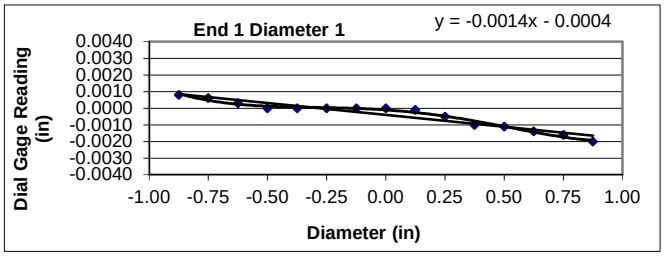
Project:	Carolina Crossroads Project	**Diameter (in):**	1.98	**Date:**	2/27/2018
Project No.:	1461-16-047 Phase B	**Length (in):**	4.37	**Tested by:**	BKP
Boring Id:	B-45	**Unit Weight (pcf):**	163.5	**Reviewed by:**	JBB
Sample No.:	RC-2	**Moisture Content (%):**	0.4		
Depth (ft):	30.6 - 31.4				

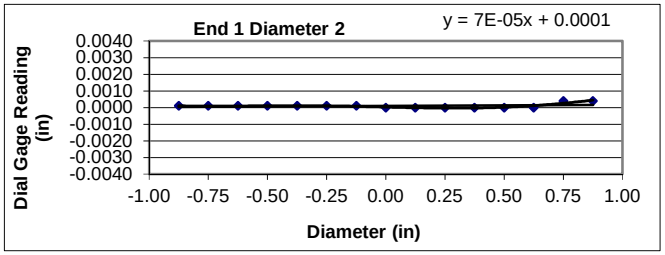
Deviation From Straightness (Procedure S1)

Is the maximum gap ≤ 0.02 in.? **YES** Straightness Tolerance Met? **YES**

End Flatness and Parallelism Readings (Procedure FP1)

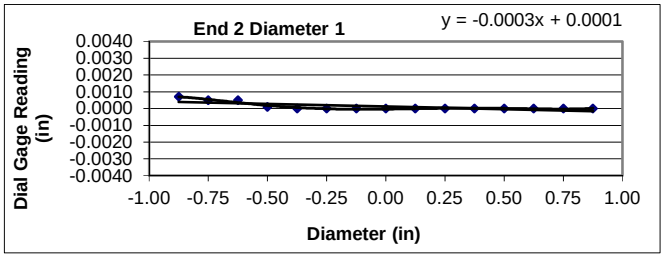
Position	End 1	End 1(90)	End 2	End 2(90)
- 7/8	0.0008	0.0001	0.0007	0.0000
- 6/8	0.0006	0.0001	0.0005	0.0000
- 5/8	0.0003	0.0001	0.0005	0.0000
- 4/8	0.0000	0.0001	0.0001	0.0000
- 3/8	0.0000	0.0001	0.0000	0.0000
- 2/8	0.0000	0.0001	0.0000	0.0000
- 1/8	0.0000	0.0001	0.0000	0.0000
0	0.0000	0.0000	0.0000	0.0000
1/8	-0.0001	0.0000	0.0000	0.0000
2/8	-0.0005	0.0000	0.0000	0.0000
3/8	-0.0010	0.0000	0.0000	0.0000
4/8	-0.0011	0.0000	0.0000	0.0000
5/8	-0.0014	0.0000	0.0000	0.0000
6/8	-0.0016	0.0004	0.0000	0.0005
7/8	-0.0020	0.0004	0.0000	0.0005

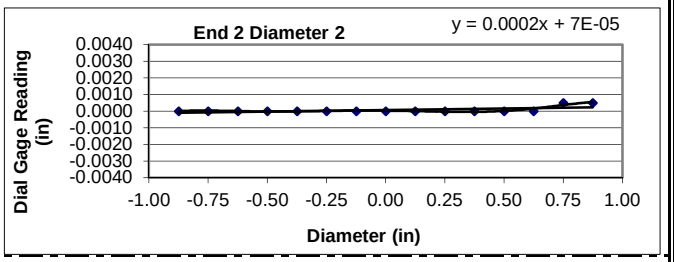




Flatness is met when the difference at any point between a smooth curve drawn through points and a visual best fit line is ≤ 0.001 in.

Flatness Tolerance Met? **YES**





Parallelism is met when the angular difference between best fit lines on opposing ends is ≤ 0.25°.

Parrallelism Diameter 1

End 1:	Slope of Best Fit Line:	-0.00142
	Angle of Best Fit Line:	-0.08152
End 2:	Slope of Best Fit Line:	-0.00031
	Angle of Best Fit Line:	-0.01768
	Max Angular Difference:	**-0.06**

Parrallelism Diameter 2

End 1:	Slope of Best Fit Line:	0.00007
	Angle of Best Fit Line:	0.00393
End 2:	Slope of Best Fit Line:	0.00019
	Angle of Best Fit Line:	0.01064
	Max Angular Difference:	**-0.01**

Parallelism Tolerance Met? **YES**

Perpendicularity (Procedure P1) is met when the difference between max and min readings along each line divided by the diameter is ≤ 0.0043.

	Difference b/w max & min	Divide by Diameter	Meets Tolerance
End 1 Diam 1	0.0028	0.0014	**YES**
End 1 Diam 2	0.0004	0.0002	**YES**
End 2 Diam 1	0.0007	0.0004	**YES**
End 2 Diam 2	0.0005	0.0003	**YES**

Perpendicularity Tolerance Met? **YES**

PREPARING ROCK CORES AS CYLINDRICAL TEST SPECIMENS AND VERIFY CONFORMANCE OF DIMENSIONAL AND SHAPE TOLERANCES (ASTM D4543)

1413 Topside Road, Louisville, TN 37777

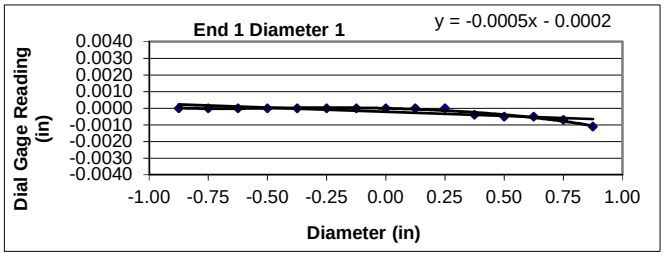
Project:	Carolina Crossroads Project	**Diameter (in):**	1.98	**Date:**	2/27/2018
Project No.:	1461-16-047 Phase B	**Length (in):**	4.48	**Tested by:**	BKP
Boring Id:	B-45	**Unit Weight (pcf):**	163.9	**Reviewed by:**	JBB
Sample No.:	RC-3	**Moisture Content (%):**	0.3		
Depth (ft):	37.9 - 38.5				

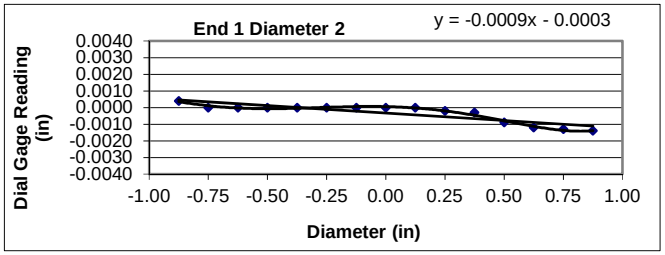
Deviation From Straightness (Procedure S1)

Is the maximum gap ≤ 0.02 in.? **YES** Straightness Tolerance Met? **YES**

End Flatness and Parallelism Readings (Procedure FP1)

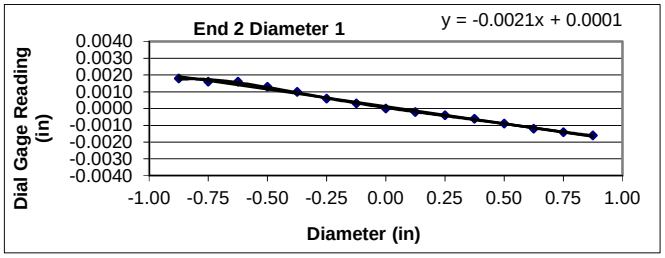
Position	End 1	End 1(90)	End 2	End 2(90)
- 7/8	0.0000	0.0004	0.0018	0.0014
- 6/8	0.0000	0.0000	0.0016	0.0010
- 5/8	0.0000	0.0000	0.0016	0.0006
- 4/8	0.0000	0.0000	0.0013	0.0006
- 3/8	0.0000	0.0000	0.0010	0.0003
- 2/8	0.0000	0.0000	0.0006	0.0001
- 1/8	0.0000	0.0000	0.0003	0.0001
0	0.0000	0.0000	0.0000	0.0000
1/8	0.0000	0.0000	-0.0002	-0.0001
2/8	0.0000	-0.0002	-0.0004	-0.0004
3/8	-0.0004	-0.0003	-0.0006	-0.0005
4/8	-0.0005	-0.0009	-0.0009	-0.0007
5/8	-0.0005	-0.0012	-0.0012	-0.0010
6/8	-0.0007	-0.0013	-0.0014	-0.0013
7/8	-0.0011	-0.0014	-0.0016	-0.0014

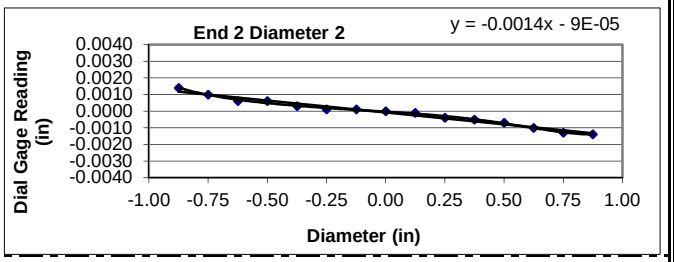




Flatness is met when the difference at any point between a smooth curve drawn through points and a visual best fit line is ≤ 0.001 in.

Flatness Tolerance Met? **YES**





Parallelism is met when the angular difference between best fit lines on opposing ends is ≤ 0.25°.

Parrallelism Diameter 1

End 1:	Slope of Best Fit Line:	-0.00050
	Angle of Best Fit Line:	-0.02881
End 2:	Slope of Best Fit Line:	-0.00205
	Angle of Best Fit Line:	-0.11770
	Max Angular Difference:	**0.09**

Parrallelism Diameter 2

End 1:	Slope of Best Fit Line:	-0.00089
	Angle of Best Fit Line:	-0.05124
End 2:	Slope of Best Fit Line:	-0.00143
	Angle of Best Fit Line:	-0.08218
	Max Angular Difference:	**0.03**

Parallelism Tolerance Met? **YES**

Perpendicularity (Procedure P1) is met when the difference between max and min readings along each line divided by the diameter is ≤ 0.0043.

	Difference b/w max & min	Divide by Diameter	Meets Tolerance
End 1 Diam 1	0.0011	0.0006	**YES**
End 1 Diam 2	0.0018	0.0009	**YES**
End 2 Diam 1	0.0034	0.0017	**YES**
End 2 Diam 2	0.0028	0.0014	**YES**

Perpendicularity Tolerance Met? **YES**

PREPARING ROCK CORES AS CYLINDRICAL TEST SPECIMENS AND VERIFY CONFORMANCE OF DIMENSIONAL AND SHAPE TOLERANCES (ASTM D4543)

1413 Topside Road, Louisville, TN 37777

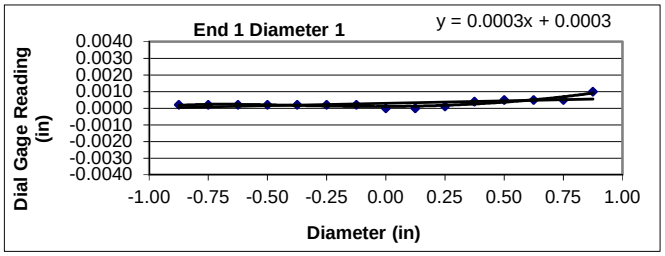
Project:	Carolina Crossroads Project	**Diameter (in):**	1.98	**Date:**	2/27/2018
Project No.:	1461-16-047 Phase B	**Length (in):**	4.37	**Tested by:**	BKP
Boring Id:	B-45	**Unit Weight (pcf):**	163.3	**Reviewed by:**	JBB
Sample No.:	RC-6	**Moisture Content (%):**	0.4		
Depth (ft):	42.8 - 43.4				

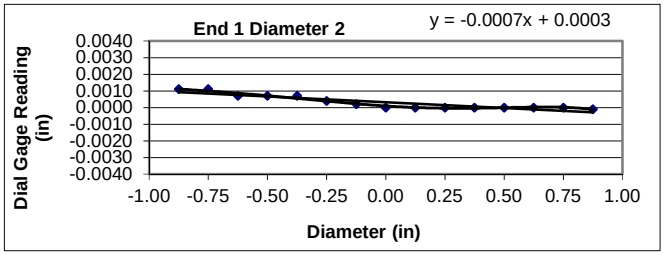
Deviation From Straightness (Procedure S1)

Is the maximum gap ≤ 0.02 in.? **YES** Straightness Tolerance Met? **YES**

End Flatness and Parallelism Readings (Procedure FP1)

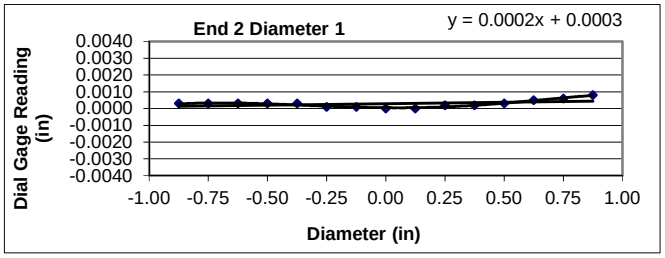
Position	End 1	End 1(90)	End 2	End 2(90)
- 7/8	0.0002	0.0011	0.0003	0.0003
- 6/8	0.0002	0.0011	0.0003	0.0003
- 5/8	0.0002	0.0007	0.0003	0.0003
- 4/8	0.0002	0.0007	0.0003	0.0003
- 3/8	0.0002	0.0007	0.0003	0.0003
- 2/8	0.0002	0.0004	0.0001	0.0002
- 1/8	0.0002	0.0002	0.0001	0.0002
0	0.0000	0.0000	0.0000	0.0000
1/8	0.0000	0.0000	0.0000	0.0000
2/8	0.0001	0.0000	0.0002	-0.0003
3/8	0.0004	0.0000	0.0002	-0.0004
4/8	0.0005	0.0000	0.0003	-0.0007
5/8	0.0005	0.0000	0.0005	-0.0008
6/8	0.0005	0.0000	0.0006	-0.0008
7/8	0.0010	-0.0001	0.0008	-0.0008

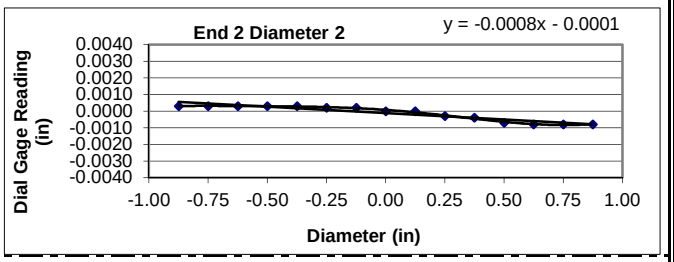




Flatness is met when the difference at any point between a smooth curve drawn through points and a visual best fit line is ≤ 0.001 in.

Flatness Tolerance Met? **YES**





Parallelism is met when the angular difference between best fit lines on opposing ends is ≤ 0.25°.

Parrallelism Diameter 1

End 1:	Slope of Best Fit Line:	0.00029
	Angle of Best Fit Line:	0.01686
End 2:	Slope of Best Fit Line:	0.00017
	Angle of Best Fit Line:	0.00999
	Max Angular Difference:	**0.01**

Parrallelism Diameter 2

End 1:	Slope of Best Fit Line:	-0.00070
	Angle of Best Fit Line:	-0.03994
End 2:	Slope of Best Fit Line:	-0.00077
	Angle of Best Fit Line:	-0.04436
	Max Angular Difference:	**0.00**

Parallelism Tolerance Met? **YES**

Perpendicularity (Procedure P1) is met when the difference between max and min readings along each line divided by the diameter is ≤ 0.0043.

	Difference b/w max & min	Divide by Diameter	Meets Tolerance
End 1 Diam 1	0.0010	0.0005	**YES**
End 1 Diam 2	0.0012	0.0006	**YES**
End 2 Diam 1	0.0008	0.0004	**YES**
End 2 Diam 2	0.0011	0.0006	**YES**

Perpendicularity Tolerance Met? **YES**

PREPARING ROCK CORES AS CYLINDRICAL TEST SPECIMENS AND VERIFY CONFORMANCE OF DIMENSIONAL AND SHAPE TOLERANCES (ASTM D4543)

1413 Topside Road, Louisville, TN 37777

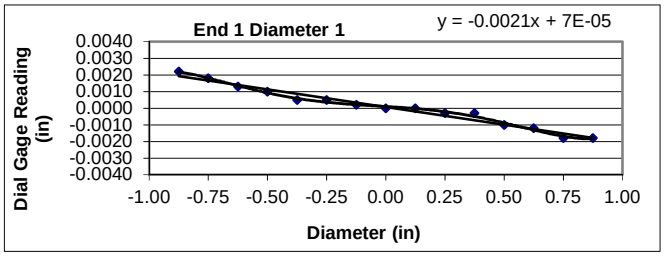
Project:	Carolina Crossroads Project	**Diameter (in):**	1.98	**Date:**	2/27/2018
Project No.:	1461-16-047 Phase B	**Length (in):**	4.39	**Tested by:**	BKP
Boring Id:	W-22	**Unit Weight (pcf):**	164.2	**Reviewed by:**	JBB
Sample No.:	RC-3	**Moisture Content (%):**	0.3		
Depth (ft):	16.5 - 17.0				

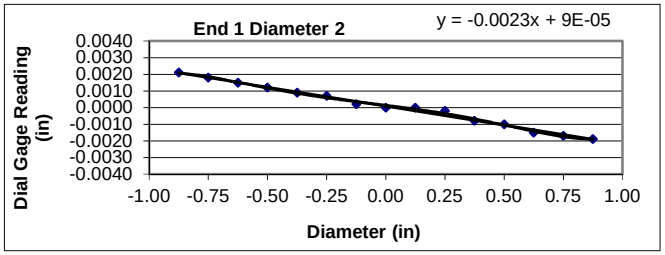
Deviation From Straightness (Procedure S1)

Is the maximum gap ≤ 0.02 in.? **YES** Straightness Tolerance Met? **YES**

End Flatness and Parallelism Readings (Procedure FP1)

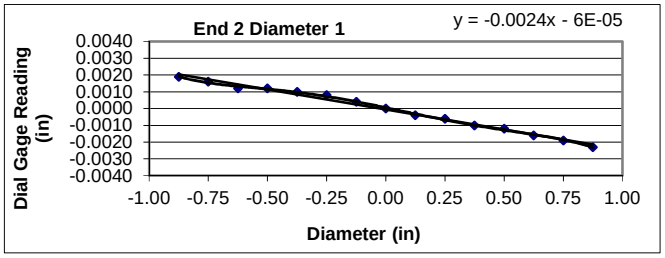
Position	End 1	End 1(90)	End 2	End 2(90)
- 7/8	0.0022	0.0021	0.0019	0.0003
- 6/8	0.0018	0.0018	0.0016	0.0003
- 5/8	0.0013	0.0015	0.0012	0.0000
- 4/8	0.0010	0.0012	0.0012	0.0000
- 3/8	0.0005	0.0009	0.0010	0.0000
- 2/8	0.0005	0.0007	0.0008	0.0000
- 1/8	0.0002	0.0002	0.0004	0.0000
0	0.0000	0.0000	0.0000	0.0000
1/8	0.0000	0.0000	-0.0004	0.0000
2/8	-0.0003	-0.0002	-0.0006	-0.0001
3/8	-0.0003	-0.0008	-0.0010	-0.0001
4/8	-0.0010	-0.0010	-0.0012	-0.0001
5/8	-0.0012	-0.0015	-0.0016	-0.0001
6/8	-0.0018	-0.0017	-0.0019	-0.0001
7/8	-0.0018	-0.0019	-0.0023	-0.0001

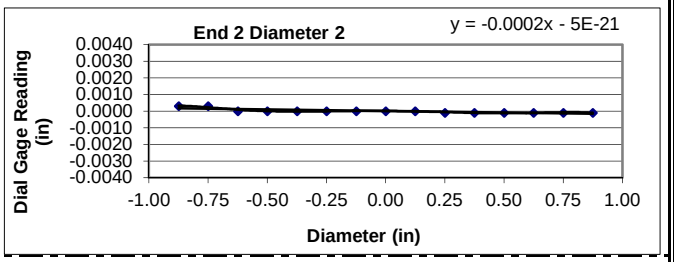




Flatness is met when the difference at any point between a smooth curve drawn through points and a visual best fit line is ≤ 0.001 in.

Flatness Tolerance Met? **YES**





Parallelism is met when the angular difference between best fit lines on opposing ends is ≤ 0.25°.

Parrallelism Diameter 1

End 1:	Slope of Best Fit Line:	-0.00212
	Angle of Best Fit Line:	-0.12163
End 2:	Slope of Best Fit Line:	-0.00239
	Angle of Best Fit Line:	-0.13686
	Max Angular Difference:	**0.02**

Parrallelism Diameter 2

End 1:	Slope of Best Fit Line:	-0.00228
	Angle of Best Fit Line:	-0.13080
End 2:	Slope of Best Fit Line:	-0.00019
	Angle of Best Fit Line:	-0.01080
	Max Angular Difference:	**-0.12**

Parallelism Tolerance Met? **YES**

Perpendicularity (Procedure P1) is met when the difference between max and min readings along each line divided by the diameter is ≤ 0.0043.

	Difference b/w max & min	Divide by Diameter	Meets Tolerance
End 1 Diam 1	0.0040	0.0020	**YES**
End 1 Diam 2	0.0040	0.0020	**YES**
End 2 Diam 1	0.0042	0.0021	**YES**
End 2 Diam 2	0.0004	0.0002	**YES**

Perpendicularity Tolerance Met? **YES**





Date: 3/1/2018

Photographer: Ben Painter

3	**Location / Orientation**	B-29, RC-5 (75.6' – 76.4')
	Remarks	Unconfined Compressive Strength of Rock Core Specimen Before/After (ASTM D7012)





Date: 3/1/2018

Photographer: Ben Painter

4	**Location / Orientation**	B-36, RC-3 (69.3' – 69.9')
	Remarks	Unconfined Compressive Strength of Rock Core Specimen Before/After (ASTM D7012)



Date: 3/1/2018

Photographer: Ben Painter

5	**Location / Orientation**	B-45, RC-2 (30.6' – 31.4')
	Remarks	Unconfined Compressive Strength of Rock Core Specimen Before/After (ASTM D7012)



Date: 3/1/2018

Photographer: Ben Painter

6	**Location / Orientation**	B-45, RC-3 (37.9' – 38.5')
	Remarks	Unconfined Compressive Strength of Rock Core Specimen Before/After (ASTM D7012)



Date: 3/1/2018

Photographer: Ben Painter

7	**Location / Orientation**	B-45, RC-6 (42.8' – 43.4')
	Remarks	Unconfined Compressive Strength of Rock Core Specimen Before/After (ASTM D7012)



Date: 3/1/2018

Photographer: Ben Painter

8	**Location / Orientation**	B-47, RC-1 (47.2' – 47.8')
	Remarks	Unconfined Compressive Strength of Rock Core Specimen Before/After (ASTM D7012)





Date: 3/1/2018

Photographer: Ben Painter

13	**Location / Orientation**	W-22, RC-3 (16.5' – 17.0')
	Remarks	Unconfined Compressive Strength of Rock Core Specimen Before/After (ASTM D7012)





Date: 3/1/2018

Photographer: Ben Painter

14	**Location / Orientation**	W-25, RC-2 (30.5' – 31.3')
	Remarks	Unconfined Compressive Strength of Rock Core Specimen Before/After (ASTM D7012)

UNCONFINED COMPRESSION
(ASTM D7012 Method C)

S&ME, Inc. - Knoxville 1413 Topside Road, Louisville, TN 37777

Project Name: Carolina Crossroads Project
Project Number: 1461-16-047 Phase 2B

Report Date: March 14, 2018
Reviewed By: Jason B. Burgess

Boring No.	Sample No.	Depth (ft)	Dimensions, in.		Shape (See Key)	Area (in^2)	Unit Weight (lbs/ft^3)	Loading Rate (psi/sec)	Maximum Load (lbs)	Strength (psi)	Moisture (%)
			Length	Diameter							
B-42	RC-2	70.8 - 71.7	4.44	1.98	A	3.08	166.0	85	98,530	31,990	0.2
B-42	RC-4	79.5 - 80.4	4.46	1.98	A	3.08	165.9	85	78,260	25,409	0.2
W-23	RC-2	20.7 - 21.5	4.42	1.98	A	3.08	164.2	88	89,833	29,167	0.3

NOTES: Effective (as received) unit weight as determined by RTH 109-93.
Loading rates were selected to target reaching failure between 2 and 15 minutes.
Test results for specimens not meeting the requirements of ASTM D4543 may differ from a test specimen that meets the requirements of ASTM D4543.

SHAPE KEY

ASTM D4543-08$^{\epsilon 1}$ *Standard Practice for Preparing Rock Core as Cylindrical Test Specimens and Verifying Conformance to Dimensional and Shape Tolerance* Section 1.2 - "Rock is a complex engineering material that can vary greatly as a function of lithology, stress history, weathering, moisture content and chemistry, and other natural geologic processes. As such, it is not always possible to obtain or prepare rock core specimens that satisfy the desirable tolerances given in this practice. Most commonly, this situation presents itself with weaker, more porous, and poorly cemented rock types and rock types containing significant or weak (or both) structural features. For these and other rock types which are difficult to prepare, all reasonable efforts shall be made to prepare a specimen in accordance with this practice and for the intended test procedure. However, when it has been determined by trial that this is not possible, prepare the rock specimen to the closest tolerances practicable and consider this to be the best effort and report it as such and if allowable or necessary for the intended test, capping the ends of the specimen as discussed in this practice is permitted."

A Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ (side straightness, end flatness & parallelism, and end perpendicularity to axis)

B Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness & parallelism, and end perpendicularity to axis. Specimen did not meet the desired tolerance for side straightness. Specimen prepared to closest tolerances practicable.

C Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness & parallelism. Specimen did not meet the desired tolerances for side straightness and end perpendicularity to axis. Specimen prepared to closest tolerances practicable.

D Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness. Specimen did not meet the desired tolerances for side straightness, parallelism and end perpendicularity to axis. Specimen prepared to closest tolerances practicable.

E Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness and end perpendicularity to axis. Specimen did not meet the desired tolerance for side straightness and parallelism. Specimen prepared to closest tolerances practicable.

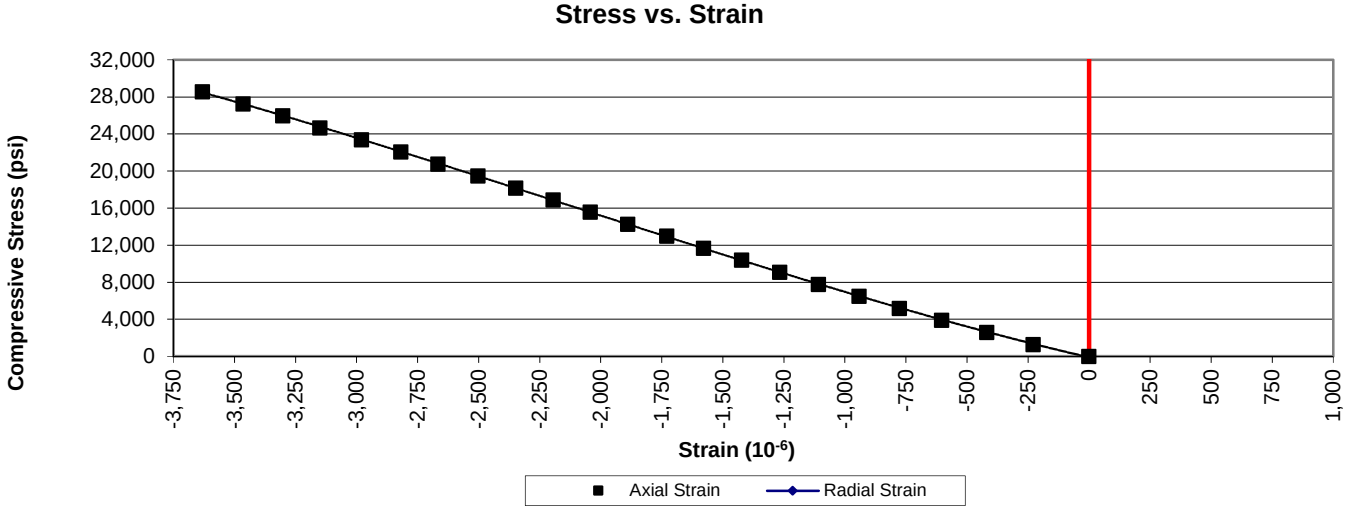
UNCONFINED COMPRESSION WITH YOUNG'S MODULUS
(ASTM D7012 Method C and D)

1413 Topside Road, Louisville, TN 37777

Project:	Carolina Crossroads Project	**Diameter, in.:**	1.98	**Date:**	3/12/2018
Project No.:	1461-16-047 Phase 2B	**Length, in.:**	4.42	**Tested by:**	BKP / MG
Boring Id:	W-23	**Unit Weight, pcf:**	164.2	**Reviewed by:**	JBB
Sample No:	RC-2	**Moisture Content, %:**	0.3		
Depth (ft):	20.7 - 21.5	**Load Rate, psi/sec:**	88		

Data Point	Strain (10^{-6})		Load (lb)	Compressive Stress (psi)	Secant Modulus x 10^6 (psi)	Poisson's Ratio	Remarks Failure
	axial	radial					
1	0		0	0	0.00		
2	-228		4,000	1,299	5.70		
3	-419		8,000	2,597	6.20		
4	-604		12,000	3,896	6.45		
5	-777		16,000	5,195	6.69		
6	-941		20,000	6,494	6.90		
7	-1,108		24,000	7,792	7.03		
8	-1,266		28,000	9,091	7.18		
9	-1,423		32,000	10,390	7.30		
10	-1,579		36,000	11,688	7.40		
11	-1,729		40,000	12,987	7.51		
12	-1,889		44,000	14,286	7.56		
13	-2,043		48,000	15,584	7.63		
14	-2,195		52,000	16,883	7.69		
15	-2,348		56,000	18,182	7.74		
16	-2,503		60,000	19,481	7.78		
17	-2,667		64,000	20,779	7.79		
18	-2,819		68,000	22,078	7.83		
19	-2,979		72,000	23,377	7.85		
20	-3,150		76,000	24,675	7.83		
21	-3,302		80,000	25,974	7.87		
22	-3,465		84,000	27,273	7.87		
23	-3,631		88,000	28,571	7.87		
24			89,833	29,167			Failure

Comments: Loading rate was selected to target reaching failure between 2 and 15 minutes.
Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ (side straightness, end flatness & parallelism, and end perpendicularity to axis)



PREPARING ROCK CORES AS CYLINDRICAL TEST SPECIMENS AND VERIFY CONFORMANCE OF DIMENSIONAL AND SHAPE TOLERANCES (ASTM D4543)

1413 Topside Road, Louisville, TN 37777

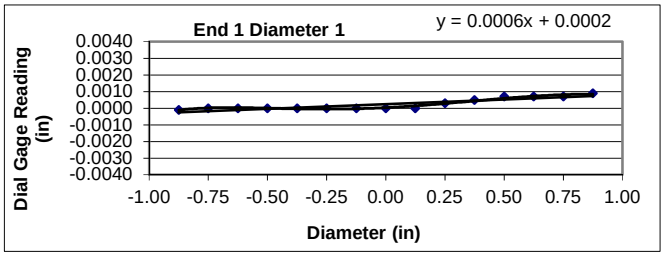
Project:	Carolina Crossroads Project	**Diameter (in):**	1.98	**Date:**	3/8/2018
Project No.:	1461-16-047 Phase B	**Length (in):**	4.42	**Tested by:**	BKP
Boring Id:	W-23	**Unit Weight (pcf):**	164.2	**Reviewed by:**	JBB
Sample No.:	RC-2	**Moisture Content (%):**	0.3		
Depth (ft):	20.7 - 21.5				

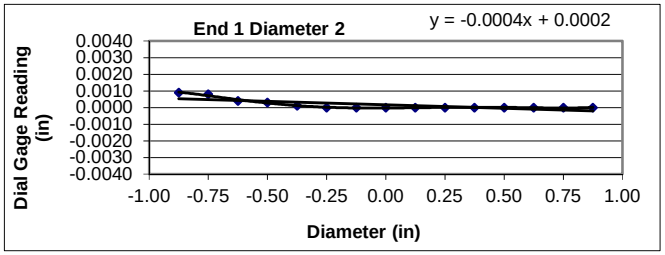
Deviation From Straightness (Procedure S1)

Is the maximum gap ≤ 0.02 in.? **YES** Straightness Tolerance Met? **YES**

End Flatness and Parallelism Readings (Procedure FP1)

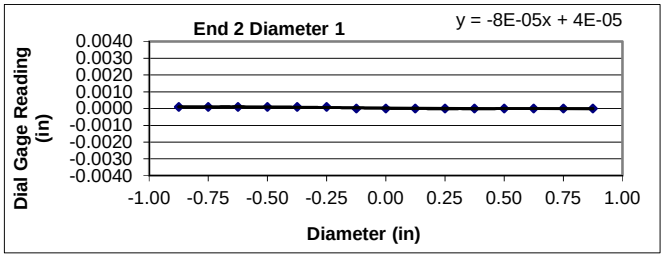
Position	End 1	End 1(90)	End 2	End 2(90)
- 7/8	-0.0001	0.0009	0.0001	-0.0030
- 6/8	0.0000	0.0008	0.0001	-0.0022
- 5/8	0.0000	0.0004	0.0001	-0.0016
- 4/8	0.0000	0.0003	0.0001	-0.0012
- 3/8	0.0000	0.0001	0.0001	-0.0009
- 2/8	0.0000	0.0000	0.0001	-0.0004
- 1/8	0.0000	0.0000	0.0000	0.0000
0	0.0000	0.0000	0.0000	0.0000
1/8	0.0000	0.0000	0.0000	0.0003
2/8	0.0003	0.0000	0.0000	0.0009
3/8	0.0005	0.0000	0.0000	0.0011
4/8	0.0007	0.0000	0.0000	0.0016
5/8	0.0007	0.0000	0.0000	0.0021
6/8	0.0007	0.0000	0.0000	0.0026
7/8	0.0009	0.0000	0.0000	0.0029

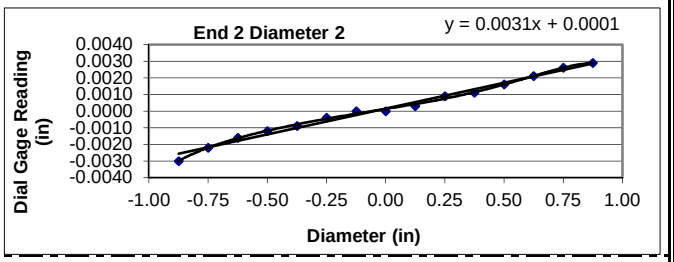




Flatness is met when the difference at any point between a smooth curve drawn through points and a visual best fit line is ≤ 0.001 in.

Flatness Tolerance Met? **YES**





Parallelism is met when the angular difference between best fit lines on opposing ends is ≤ 0.25°.

Parrallelism Diameter 1

End 1:	Slope of Best Fit Line:	0.00056
	Angle of Best Fit Line:	0.03209
End 2:	Slope of Best Fit Line:	-0.00008
	Angle of Best Fit Line:	-0.00442
	Max Angular Difference:	**0.04**

Parrallelism Diameter 2

End 1:	Slope of Best Fit Line:	-0.00042
	Angle of Best Fit Line:	-0.02390
End 2:	Slope of Best Fit Line:	0.00311
	Angle of Best Fit Line:	0.17794
	Max Angular Difference:	**-0.20**

Parallelism Tolerance Met? **YES**

Perpendicularity (Procedure P1) is met when the difference between max and min readings along each line divided by the diameter is ≤ 0.0043.

	Difference b/w max & min	Divide by Diameter	Meets Tolerance
End 1 Diam 1	0.0010	0.0005	**YES**
End 1 Diam 2	0.0009	0.0005	**YES**
End 2 Diam 1	0.0001	0.0001	**YES**
End 2 Diam 2	0.0059	0.0030	**YES**

Perpendicularity Tolerance Met? **YES**





Date: 3/12/2018

Photographer: Ben Painter

13	**Location / Orientation**	W-23, RC-2 (20.7' – 21.5')
	Remarks	Unconfined Compressive Strength of Rock Core Specimen Before/After (ASTM D7012)

UNCONFINED COMPRESSION
(ASTM D7012 Method C)

S&ME, Inc. - Knoxville 1413 Topside Road, Louisville, TN 37777

Project Name: Carolina Crossroads Project
Project Number: 1461-16-047 Phase 2B

Report Date: March 22, 2018
Reviewed By: Jason B. Burgess

Boring No.	Sample No.	Depth (ft)	Dimensions, in.		Shape (See Key)	Area (in^2)	Unit Weight (lbs/ft^3)	Loading Rate (psi/sec)	Maximum Load (lbs)	Strength (psi)	Moisture (%)
			Length	Diameter							
W-24	RC-1	27.2 - 28.2	4.47	1.99	A	3.11	165.0	73	67,834	21,812	0.4
B-31	RC-1	26.7 - 27.4	4.44	1.97	A	3.05	186.6	83	159,430	52,272	0.0
B-31	RC-4	41.3 - 42.0	4.42	1.97	B	3.05	187.0	80	92,296	30,261	0.1
B-33	RC-6	72.2 - 73.0	4.44	1.98	A	3.08	166.7	79	93,854	30,472	0.1
B-37	RC-4	52.6 - 53.3	4.44	1.99	A	3.11	176.0	76	46,382	14,914	0.1

NOTES: Effective (as received) unit weight as determined by RTH 109-93.
Loading rates were selected to target reaching failure between 2 and 15 minutes.
Test results for specimens not meeting the requirements of ASTM D4543 may differ from a test specimen that meets the requirements of ASTM D4543.

SHAPE KEY

ASTM D4543-08$^{\epsilon 1}$ *Standard Practice for Preparing Rock Core as Cylindrical Test Specimens and Verifying Conformance to Dimensional and Shape Tolerance* Section 1.2 - "Rock is a complex engineering material that can vary greatly as a function of lithology, stress history, weathering, moisture content and chemistry, and other natural geologic processes. As such, it is not always possible to obtain or prepare rock core specimens that satisfy the desirable tolerances given in this practice. Most commonly, this situation presents itself with weaker, more porous, and poorly cemented rock types and rock types containing significant or weak (or both) structural features. For these and other rock types which are difficult to prepare, all reasonable efforts shall be made to prepare a specimen in accordance with this practice and for the intended test procedure. However, when it has been determined by trial that this is not possible, prepare the rock specimen to the closest tolerances practicable and consider this to be the best effort and report it as such and if allowable or necessary for the intended test, capping the ends of the specimen as discussed in this practice is permitted."

A Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ (side straightness, end flatness & parallelism, and end perpendicularity to axis)

B Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness & parallelism, and end perpendicularity to axis. Specimen did not meet the desired tolerance for side straightness. Specimen prepared to closest tolerances practicable.

C Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness & parallelism. Specimen did not meet the desired tolerances for side straightness and end perpendicularity to axis. Specimen prepared to closest tolerances practicable.

D Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness. Specimen did not meet the desired tolerances for side straightness, parallelism and end perpendicularity to axis. Specimen prepared to closest tolerances practicable.

E Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness and end perpendicularity to axis. Specimen did not meet the desired tolerance for side straightness and parallelism. Specimen prepared to closest tolerances practicable.

UNCONFINED COMPRESSION
(ASTM D7012 Method C)

S&ME, Inc. - Knoxville 1413 Topside Road, Louisville, TN 37777

Project Name: Carolina Crossroads Project
Project Number: 1461-16-047 Phase 2B

Report Date: March 22, 2018
Reviewed By: Jason B. Burgess

Boring No.	Sample No.	Depth (ft)	Dimensions, in.		Shape (See Key)	Area (in^2)	Unit Weight (lbs/ft^3)	Loading Rate (psi/sec)	Maximum Load (lbs)	Strength (psi)	Moisture (%)
			Length	Diameter							
B-37	RC-5	57.2 - 58.0	4.49	1.99	A	3.11	183.6	73	67,731	21,778	0.1
B-37	RC-6	63.2 - 63.8	4.47	1.99	A	3.11	176.9	72	32,195	10,352	0.2

NOTES: Effective (as received) unit weight as determined by RTH 109-93.
Loading rates were selected to target reaching failure between 2 and 15 minutes.
Test results for specimens not meeting the requirements of ASTM D4543 may differ from a test specimen that meets the requirements of ASTM D4543.

SHAPE KEY

ASTM D4543-08$^{\epsilon 1}$ *Standard Practice for Preparing Rock Core as Cylindrical Test Specimens and Verifying Conformance to Dimensional and Shape Tolerance* Section 1.2 - "Rock is a complex engineering material that can vary greatly as a function of lithology, stress history, weathering, moisture content and chemistry, and other natural geologic processes. As such, it is not always possible to obtain or prepare rock core specimens that satisfy the desirable tolerances given in this practice. Most commonly, this situation presents itself with weaker, more porous, and poorly cemented rock types and rock types containing significant or weak (or both) structural features. For these and other rock types which are difficult to prepare, all reasonable efforts shall be made to prepare a specimen in accordance with this practice and for the intended test procedure. However, when it has been determined by trial that this is not possible, prepare the rock specimen to the closest tolerances practicable and consider this to be the best effort and report it as such and if allowable or necessary for the intended test, capping the ends of the specimen as discussed in this practice is permitted."

A Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ (side straightness, end flatness & parallelism, and end perpendicularity to axis)

B Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness & parallelism, and end perpendicularity to axis. Specimen did not meet the desired tolerance for side straightness. Specimen prepared to closest tolerances practicable.

C Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness & parallelism. Specimen did not meet the desired tolerances for side straightness and end perpendicularity to axis. Specimen prepared to closest tolerances practicable.

D Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness. Specimen did not meet the desired tolerances for side straightness, parallelism and end perpendicularity to axis. Specimen prepared to closest tolerances practicable.

E Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness and end perpendicularity to axis. Specimen did not meet the desired tolerance for side straightness and parallelism. Specimen prepared to closest tolerances practicable.

UNCONFINED COMPRESSION WITH YOUNG'S MODULUS
(ASTM D7012 Method C and D)

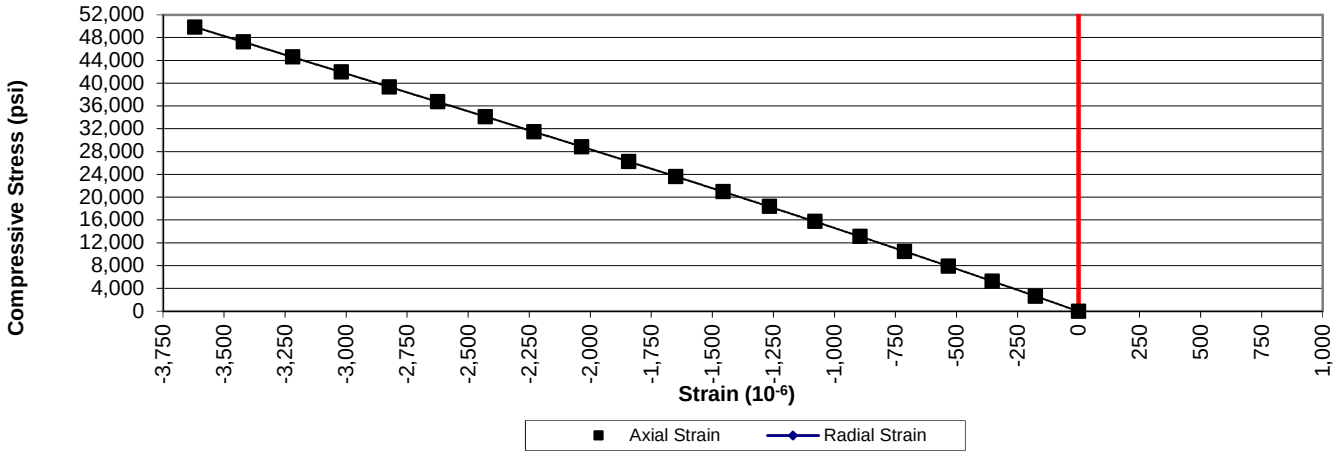
1413 Topside Road, Louisville, TN 37777

Project:	Carolina Crossroads Project	**Diameter, in.:**	1.97	**Date:**	3/20/2018
Project No.:	1461-16-047 Phase 2B	**Length, in.:**	4.44	**Tested by:**	BKP / MG
Boring Id:	B-31	**Unit Weight, pcf:**	186.6	**Reviewed by:**	JBB
Sample No:	RC-1	**Moisture Content, %:**	0.0		
Depth (ft):	26.7 - 27.4	**Load Rate, psi/sec:**	83		

Data Point	Strain (10^{-6}) axial	Strain (10^{-6}) radial	Load (lb)	Compressive Stress (psi)	Secant Modulus x 10^6 (psi)	Poisson's Ratio	Remarks Failure
1	0		0	0	0.00		
2	-177		8,000	2,623	14.82		
3	-354		16,000	5,246	14.82		
4	-533		24,000	7,869	14.76		
5	-712		32,000	10,492	14.74		
6	-895		40,000	13,115	14.65		
7	-1,080		48,000	15,738	14.57		
8	-1,266		56,000	18,361	14.50		
9	-1,456		64,000	20,984	14.41		
10	-1,649		72,000	23,607	14.32		
11	-1,842		80,000	26,230	14.24		
12	-2,035		88,000	28,852	14.18		
13	-2,230		96,000	31,475	14.11		
14	-2,430		104,000	34,098	14.03		
15	-2,625		112,000	36,721	13.99		
16	-2,822		120,000	39,344	13.94		
17	-3,019		128,000	41,967	13.90		
18	-3,219		136,000	44,590	13.85		
19	-3,420		144,000	47,213	13.80		
20	-3,619		152,000	49,836	13.77		
21			159,430	52,272			Failure

Comments: Loading rate was selected to target reaching failure between 2 and 15 minutes.
Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ (side straightness, end flatness & parallelism, and end perpendicularity to axis)

Stress vs. Strain



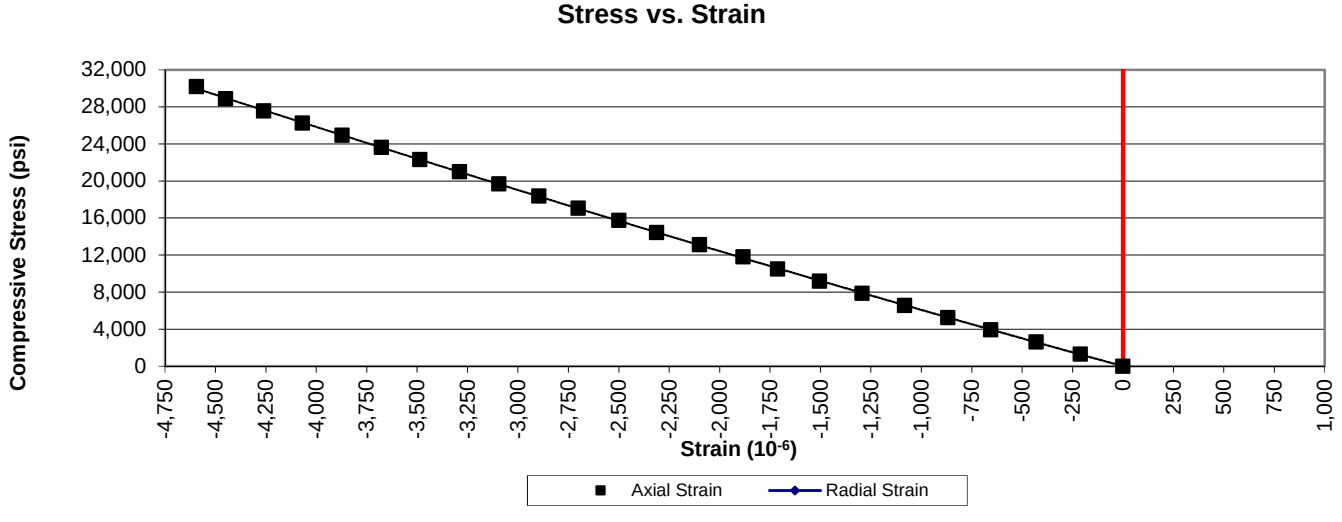
UNCONFINED COMPRESSION WITH YOUNG'S MODULUS
(ASTM D7012 Method C and D)

1413 Topside Road, Louisville, TN 37777

Project:	Carolina Crossroads Project	**Diameter, in.:**	1.97	**Date:**	3/20/2018
Project No.:	1461-16-047 Phase 2B	**Length, in.:**	4.42	**Tested by:**	BKP / MG
Boring Id:	B-31	**Unit Weight, pcf:**	187.0	**Reviewed by:**	JBB
Sample No:	RC-4	**Moisture Content, %:**	0.1		
Depth (ft):	41.3 - 42.0	**Load Rate, psi/sec:**	80		

Data Point	Strain (10^{-6})		Load (lb)	Compressive Stress (psi)	Secant Modulus x 10^6 (psi)	Poisson's Ratio	Remarks Failure
	axial	radial					
1	0		0	0	0.00		
2	-211		4,000	1,311	6.21		
3	-430		8,000	2,623	6.10		
4	-655		12,000	3,934	6.01		
5	-869		16,000	5,246	6.04		
6	-1,083		20,000	6,557	6.05		
7	-1,293		24,000	7,869	6.09		
8	-1,504		28,000	9,180	6.10		
9	-1,712		32,000	10,492	6.13		
10	-1,884		36,000	11,803	6.26		
11	-2,100		40,000	13,115	6.25		
12	-2,312		44,000	14,426	6.24		
13	-2,499		48,000	15,738	6.30		
14	-2,701		52,000	17,049	6.31		
15	-2,896		56,000	18,361	6.34		
16	-3,094		60,000	19,672	6.36		
17	-3,290		64,000	20,984	6.38		
18	-3,486		68,000	22,295	6.40		
19	-3,677		72,000	23,607	6.42		
20	-3,871		76,000	24,918	6.44		
21	-4,069		80,000	26,230	6.45		
22	-4,261		84,000	27,541	6.46		
23	-4,449		88,000	28,852	6.49		
24	-4,594		92,000	30,164	6.57		
25			92,296	30,261			Failure

Comments: Loading rate was selected to target reaching failure between 2 and 15 minutes.
Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness & parallelism, and end perpendicularity to axis. Specimen did not meet the desired tolerance for side straightness. Specimen prepared to closest tolerances practicable.



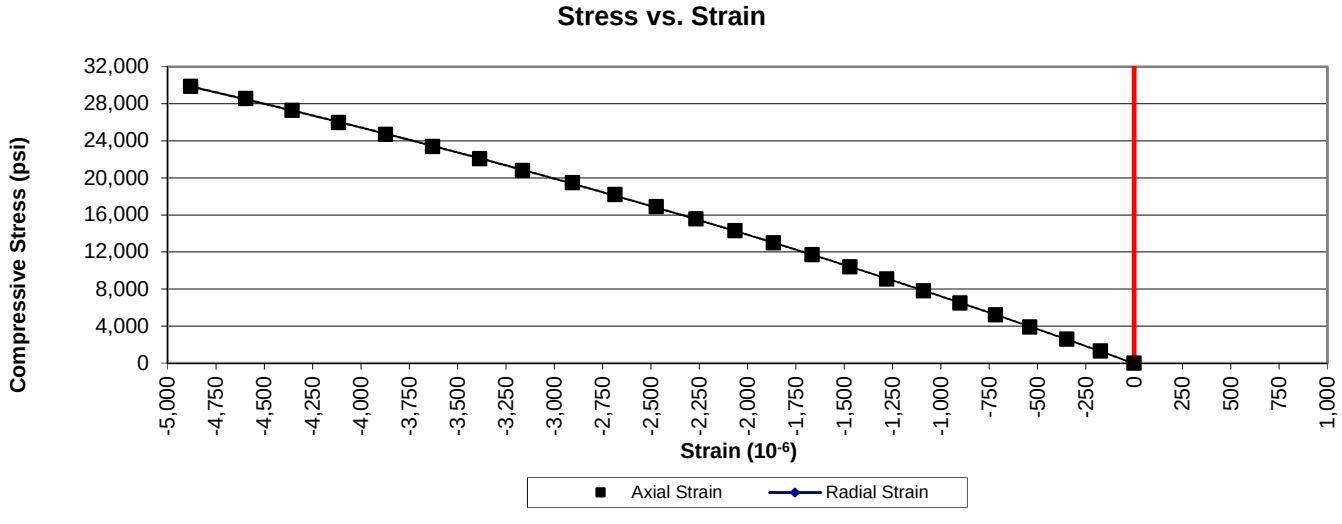
UNCONFINED COMPRESSION WITH YOUNG'S MODULUS
(ASTM D7012 Method C and D)

1413 Topside Road, Louisville, TN 37777

Project:	Carolina Crossroads Project	**Diameter, in.:**	1.98	**Date:**	3/20/2018
Project No.:	1461-16-047 Phase 2B	**Length, in.:**	4.44	**Tested by:**	BKP / MG
Boring Id:	B-33	**Unit Weight, pcf:**	166.7	**Reviewed by:**	JBB
Sample No:	RC-6	**Moisture Content, %:**	0.1		
Depth (ft):	72.2 - 73.0	**Load Rate, psi/sec:**	79		

Data Point	Strain (10^{-6})		Load (lb)	Compressive Stress (psi)	Secant Modulus x 10^6 (psi)	Poisson's Ratio	Remarks Failure
	axial	radial					
1	0		0	0	0.00		
2	-173		4,000	1,299	7.51		
3	-348		8,000	2,597	7.46		
4	-540		12,000	3,896	7.21		
5	-716		16,000	5,195	7.26		
6	-900		20,000	6,494	7.22		
7	-1,089		24,000	7,792	7.16		
8	-1,279		28,000	9,091	7.11		
9	-1,470		32,000	10,390	7.07		
10	-1,665		36,000	11,688	7.02		
11	-1,866		40,000	12,987	6.96		
12	-2,064		44,000	14,286	6.92		
13	-2,266		48,000	15,584	6.88		
14	-2,472		52,000	16,883	6.83		
15	-2,685		56,000	18,182	6.77		
16	-2,905		60,000	19,481	6.71		
17	-3,164		64,000	20,779	6.57		
18	-3,386		68,000	22,078	6.52		
19	-3,628		72,000	23,377	6.44		
20	-3,872		76,000	24,675	6.37		
21	-4,116		80,000	25,974	6.31		
22	-4,356		84,000	27,273	6.26		
23	-4,595		88,000	28,571	6.22		
24	-4,880		92,000	29,870	6.12		
25			93,854	30,472			Failure

Comments: Loading rate was selected to target reaching failure between 2 and 15 minutes.
Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ (side straightness, end flatness & parallelism, and end perpendicularity to axis)



UNCONFINED COMPRESSION WITH YOUNG'S MODULUS
(ASTM D7012 Method C and D)

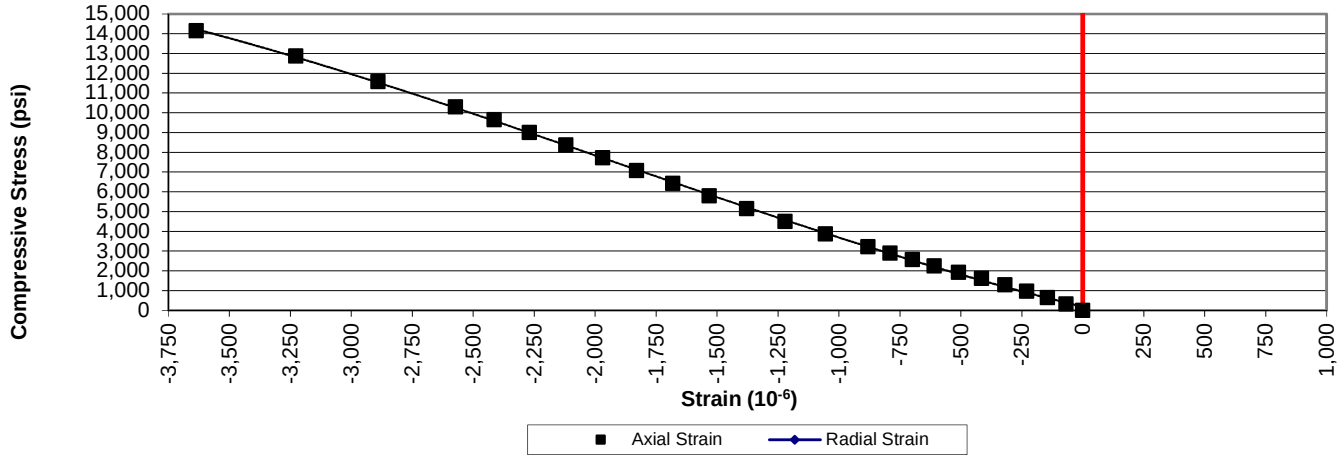
1413 Topside Road, Louisville, TN 37777

Project:	Carolina Crossroads Project	**Diameter, in.:**	1.99	**Date:**	3/20/2018
Project No.:	1461-16-047 Phase 2B	**Length, in.:**	4.44	**Tested by:**	BKP / MG
Boring Id:	B-37	**Unit Weight, pcf:**	176.0	**Reviewed by:**	JBB
Sample No:	RC-4	**Moisture Content, %:**	0.1		
Depth (ft):	52.6 - 53.3	**Load Rate, psi/sec:**	76		

Data Point	Strain (10^{-6})		Load (lb)	Compressive Stress (psi)	Secant Modulus x 10^6 (psi)	Poisson's Ratio	Remarks Failure
	axial	radial					
1	0		0	0	0.00		
2	-69		1,000	322	4.67		
3	-144		2,000	643	4.47		
4	-230		3,000	965	4.20		
5	-319		4,000	1,286	4.03		
6	-415		5,000	1,608	3.87		
7	-510		6,000	1,929	3.78		
8	-609		7,000	2,251	3.70		
9	-699		8,000	2,572	3.68		
10	-790		9,000	2,894	3.66		
11	-881		10,000	3,215	3.65		
12	-1,055		12,000	3,859	3.66		
13	-1,221		14,000	4,502	3.69		
14	-1,378		16,000	5,145	3.73		
15	-1,532		18,000	5,788	3.78		
16	-1,681		20,000	6,431	3.83		
17	-1,830		22,000	7,074	3.87		
18	-1,969		24,000	7,717	3.92		
19	-2,120		26,000	8,360	3.94		
20	-2,270		28,000	9,003	3.97		
21	-2,414		30,000	9,646	4.00		
22	-2,572		32,000	10,289	4.00		
23	-2,890		36,000	11,576	4.01		
24	-3,227		40,000	12,862	3.99		
25	-3,635		44,000	14,148	3.89		
26			46,382	14,914			Failure

Comments: Loading rate was selected to target reaching failure between 2 and 15 minutes.
Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ (side straightness, end flatness & parallelism, and end perpendicularity to axis)

Stress vs. Strain



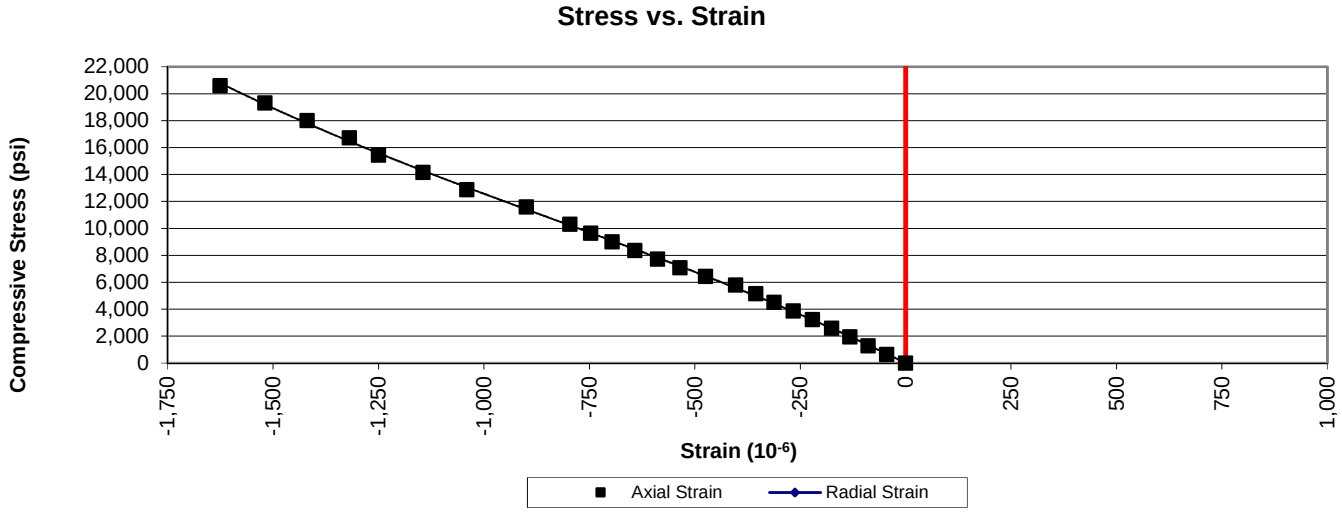
UNCONFINED COMPRESSION WITH YOUNG'S MODULUS
(ASTM D7012 Method C and D)

1413 Topside Road, Louisville, TN 37777

Project:	Carolina Crossroads Project	**Diameter, in.:**	1.99	**Date:**	3/20/2018
Project No.:	1461-16-047 Phase 2B	**Length, in.:**	4.49	**Tested by:**	BKP / MG
Boring Id:	B-37	**Unit Weight, pcf:**	183.6	**Reviewed by:**	JBB
Sample No:	RC-5	**Moisture Content, %:**	0.1		
Depth (ft):	57.2 - 58.0	**Load Rate, psi/sec:**	73		

Data Point	Strain (10^{-6})		Load (lb)	Compressive Stress (psi)	Secant Modulus x 10^6 (psi)	Poisson's Ratio	Remarks Failure
	axial	radial					
1	0		0	0	0.00		
2	-45		2,000	643	14.29		
3	-89		4,000	1,286	14.45		
4	-132		6,000	1,929	14.61		
5	-175		8,000	2,572	14.70		
6	-221		10,000	3,215	14.55		
7	-266		12,000	3,859	14.51		
8	-312		14,000	4,502	14.43		
9	-355		16,000	5,145	14.49		
10	-403		18,000	5,788	14.36		
11	-474		20,000	6,431	13.57		
12	-535		22,000	7,074	13.22		
13	-588		24,000	7,717	13.12		
14	-642		26,000	8,360	13.02		
15	-696		28,000	9,003	12.94		
16	-747		30,000	9,646	12.91		
17	-796		32,000	10,289	12.93		
18	-899		36,000	11,576	12.88		
19	-1,040		40,000	12,862	12.37		
20	-1,144		44,000	14,148	12.37		
21	-1,250		48,000	15,434	12.35		
22	-1,319		52,000	16,720	12.68		
23	-1,419		56,000	18,006	12.69		
24	-1,519		60,000	19,293	12.70		
25	-1,625		64,000	20,579	12.66		
26			67,731	21,778			Failure

Comments: Loading rate was selected to target reaching failure between 2 and 15 minutes.
Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ (side straightness, end flatness & parallelism, and end perpendicularity to axis)



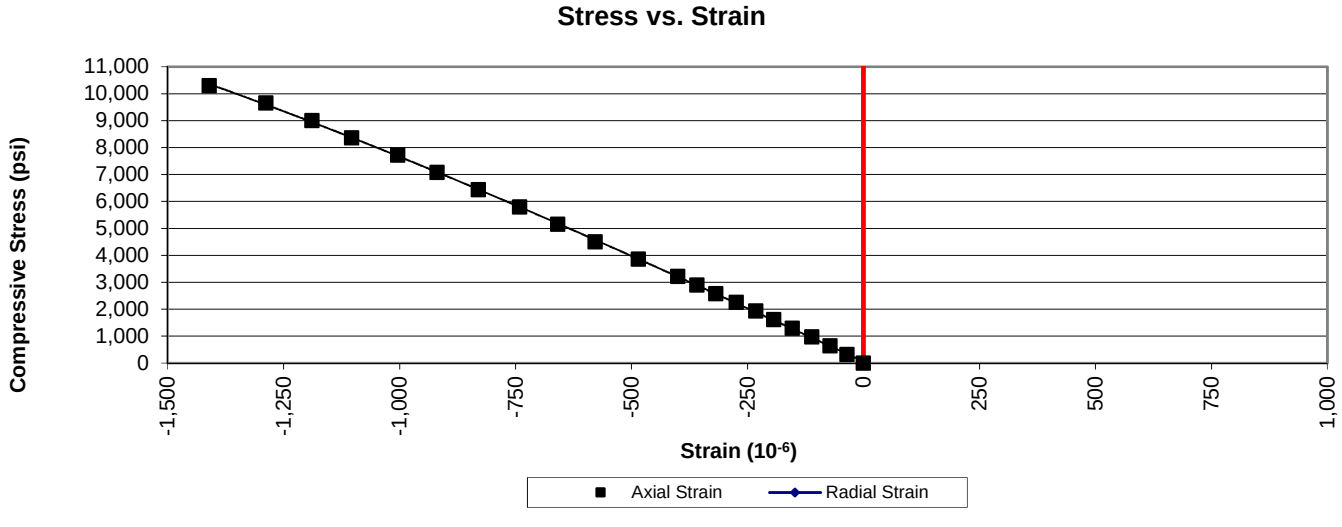
UNCONFINED COMPRESSION WITH YOUNG'S MODULUS
(ASTM D7012 Method C and D)

1413 Topside Road, Louisville, TN 37777

Project:	Carolina Crossroads Project	**Diameter, in.:**	1.99	**Date:**	3/20/2018
Project No.:	1461-16-047 Phase 2B	**Length, in.:**	4.47	**Tested by:**	BKP / MG
Boring Id:	B-37	**Unit Weight, pcf:**	176.9	**Reviewed by:**	JBB
Sample No:	RC-6	**Moisture Content, %:**	0.2		
Depth (ft):	63.2 - 63.8	**Load Rate, psi/sec:**	72		

Data Point	Strain (10^{-6})		Load (lb)	Compressive Stress (psi)	Secant Modulus x 10^6 (psi)	Poisson's Ratio	Remarks Failure
	axial	radial					
1	0		0	0	0.00		
2	-35		1,000	322	9.20		
3	-72		2,000	643	8.93		
4	-111		3,000	965	8.69		
5	-153		4,000	1,286	8.41		
6	-193		5,000	1,608	8.33		
7	-232		6,000	1,929	8.31		
8	-274		7,000	2,251	8.22		
9	-318		8,000	2,572	8.09		
10	-359		9,000	2,894	8.06		
11	-400		10,000	3,215	8.04		
12	-485		12,000	3,859	7.96		
13	-578		14,000	4,502	7.79		
14	-659		16,000	5,145	7.81		
15	-741		18,000	5,788	7.81		
16	-830		20,000	6,431	7.75		
17	-919		22,000	7,074	7.70		
18	-1,004		24,000	7,717	7.69		
19	-1,103		26,000	8,360	7.58		
20	-1,189		28,000	9,003	7.57		
21	-1,288		30,000	9,646	7.49		
22	-1,410		32,000	10,289	7.30		
23			32,195	10,352			Failure

Comments: Loading rate was selected to target reaching failure between 2 and 15 minutes.
Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ (side straightness, end flatness & parallelism, and end perpendicularity to axis)



PREPARING ROCK CORES AS CYLINDRICAL TEST SPECIMENS AND VERIFY CONFORMANCE OF DIMENSIONAL AND SHAPE TOLERANCES (ASTM D4543)

1413 Topside Road, Louisville, TN 37777

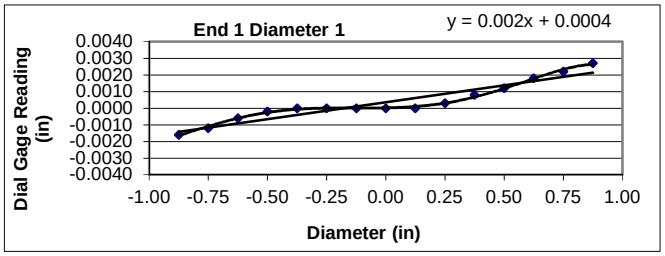
Project:	Carolina Crossroads Project	**Diameter (in):**	1.97	**Date:**	3/19/2018
Project No.:	1461-16-047 Phase B	**Length (in):**	4.44	**Tested by:**	BKP
Boring Id:	B-31	**Unit Weight (pcf):**	186.6	**Reviewed by:**	JBB
Sample No.:	RC-1	**Moisture Content (%):**	0.0		
Depth (ft):	26.7 - 27.4				

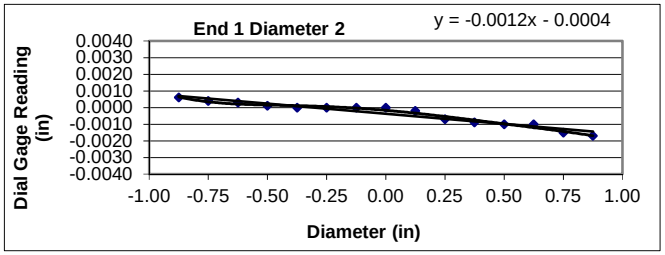
Deviation From Straightness (Procedure S1)

Is the maximum gap ≤ 0.02 in.? **YES** Straightness Tolerance Met? **YES**

End Flatness and Parallelism Readings (Procedure FP1)

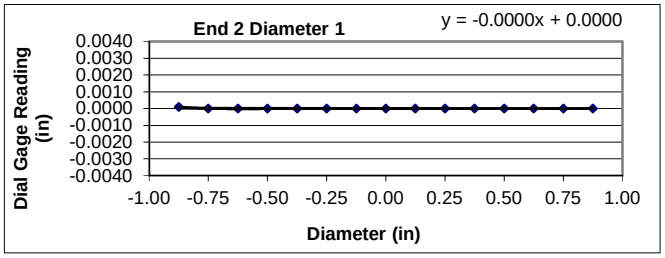
Position	End 1	End 1(90)	End 2	End 2(90)
- 7/8	-0.0016	0.0006	0.0001	0.0011
- 6/8	-0.0012	0.0004	0.0000	0.0010
- 5/8	-0.0006	0.0003	0.0000	0.0009
- 4/8	-0.0002	0.0001	0.0000	0.0008
- 3/8	0.0000	0.0000	0.0000	0.0006
- 2/8	0.0000	0.0000	0.0000	0.0006
- 1/8	0.0000	0.0000	0.0000	0.0004
0	0.0000	0.0000	0.0000	0.0000
1/8	0.0000	-0.0002	0.0000	0.0000
2/8	0.0003	-0.0007	0.0000	0.0000
3/8	0.0008	-0.0009	0.0000	0.0000
4/8	0.0012	-0.0010	0.0000	0.0000
5/8	0.0018	-0.0010	0.0000	-0.0004
6/8	0.0022	-0.0015	0.0000	-0.0005
7/8	0.0027	-0.0017	0.0000	-0.0006

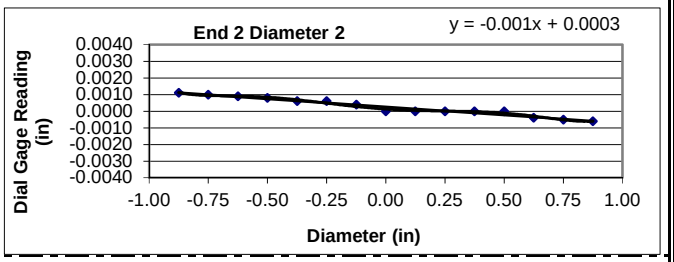




Flatness is met when the difference at any point between a smooth curve drawn through points and a visual best fit line is ≤ 0.001 in.

Flatness Tolerance Met? **YES**





Parallelism is met when the angular difference between best fit lines on opposing ends is ≤ 0.25°.

Parrallelism Diameter 1

End 1:	Slope of Best Fit Line:	0.00203
	Angle of Best Fit Line:	0.11639
End 2:	Slope of Best Fit Line:	-0.00002
	Angle of Best Fit Line:	-0.00115
	Max Angular Difference:	**0.12**

Parrallelism Diameter 2

End 1:	Slope of Best Fit Line:	-0.00122
	Angle of Best Fit Line:	-0.06990
End 2:	Slope of Best Fit Line:	-0.00097
	Angle of Best Fit Line:	-0.05566
	Max Angular Difference:	**-0.01**

Parallelism Tolerance Met? **YES**

Perpendicularity (Procedure P1) is met when the difference between max and min readings along each line divided by the diameter is ≤ 0.0043.

	Difference b/w max & min	Divide by Diameter	Meets Tolerance
End 1 Diam 1	0.0043	0.0022	**YES**
End 1 Diam 2	0.0023	0.0012	**YES**
End 2 Diam 1	0.0001	0.0001	**YES**
End 2 Diam 2	0.0017	0.0009	**YES**

Perpendicularity Tolerance Met? **YES**

PREPARING ROCK CORES AS CYLINDRICAL TEST SPECIMENS AND VERIFY CONFORMANCE OF DIMENSIONAL AND SHAPE TOLERANCES (ASTM D4543)

1413 Topside Road, Louisville, TN 37777

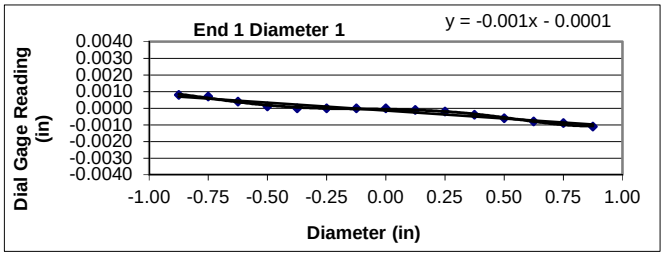
Project:	Carolina Crossroads Project	**Diameter (in):**	1.97	**Date:**	3/19/2018
Project No.:	1461-16-047 Phase B	**Length (in):**	4.42	**Tested by:**	BKP
Boring Id:	B-31	**Unit Weight (pcf):**	187.0	**Reviewed by:**	JBB
Sample No.:	RC-4	**Moisture Content (%):**	0.1		
Depth (ft):	41.3 - 42.0				

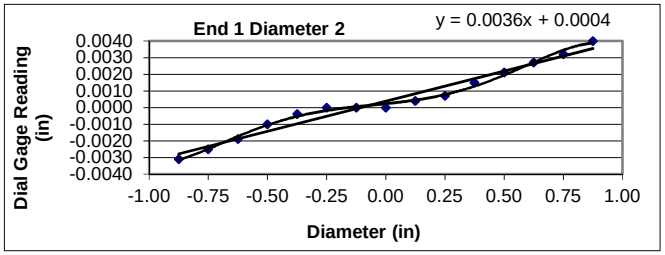
Deviation From Straightness (Procedure S1)

Is the maximum gap ≤ 0.02 in.? **NO** Straightness Tolerance Met? **NO**

End Flatness and Parallelism Readings (Procedure FP1)

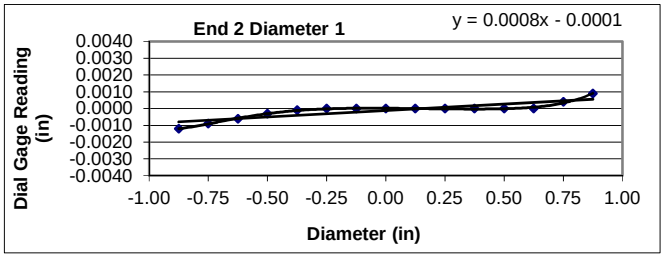
Position	End 1	End 1(90)	End 2	End 2(90)
- 7/8	0.0008	-0.0031	-0.0012	-0.0020
- 6/8	0.0007	-0.0025	-0.0009	-0.0016
- 5/8	0.0004	-0.0019	-0.0006	-0.0012
- 4/8	0.0001	-0.0010	-0.0003	-0.0008
- 3/8	0.0000	-0.0004	-0.0001	-0.0006
- 2/8	0.0000	0.0000	0.0000	-0.0002
- 1/8	0.0000	0.0000	0.0000	0.0000
0	0.0000	0.0000	0.0000	0.0000
1/8	-0.0001	0.0004	0.0000	0.0000
2/8	-0.0002	0.0007	0.0000	0.0000
3/8	-0.0004	0.0015	0.0000	0.0000
4/8	-0.0006	0.0021	0.0000	0.0000
5/8	-0.0008	0.0027	0.0000	0.0002
6/8	-0.0009	0.0032	0.0004	0.0003
7/8	-0.0011	0.0040	0.0009	0.0008

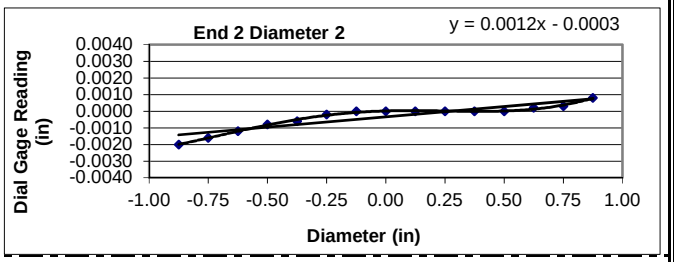




Flatness is met when the difference at any point between a smooth curve drawn through points and a visual best fit line is ≤ 0.001 in.

Flatness Tolerance Met? **YES**





Parallelism is met when the angular difference between best fit lines on opposing ends is ≤ 0.25°.

Parrallelism Diameter 1

End 1:	Slope of Best Fit Line:	-0.00095
	Angle of Best Fit Line:	-0.05468
End 2:	Slope of Best Fit Line:	0.00077
	Angle of Best Fit Line:	0.04420
	Max Angular Difference:	**-0.10**

Parrallelism Diameter 2

End 1:	Slope of Best Fit Line:	0.00362
	Angle of Best Fit Line:	0.20757
End 2:	Slope of Best Fit Line:	0.00124
	Angle of Best Fit Line:	0.07105
	Max Angular Difference:	**0.14**

Parallelism Tolerance Met? **YES**

Perpendicularity (Procedure P1) is met when the difference between max and min readings along each line divided by the diameter is ≤ 0.0043.

	Difference b/w max & min	Divide by Diameter	Meets Tolerance
End 1 Diam 1	0.0019	0.0010	**YES**
End 1 Diam 2	0.0071	0.0036	**YES**
End 2 Diam 1	0.0021	0.0011	**YES**
End 2 Diam 2	0.0028	0.0014	**YES**

Perpendicularity Tolerance Met? **YES**

PREPARING ROCK CORES AS CYLINDRICAL TEST SPECIMENS AND VERIFY CONFORMANCE OF DIMENSIONAL AND SHAPE TOLERANCES (ASTM D4543)

1413 Topside Road, Louisville, TN 37777

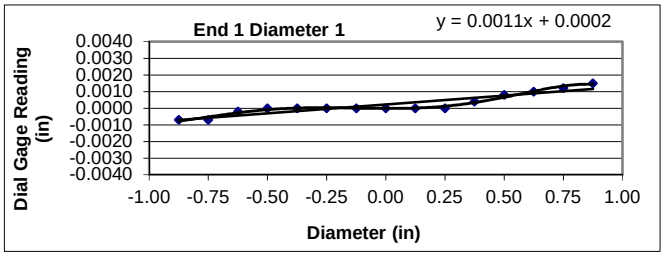
Project:	Carolina Crossroads Project	**Diameter (in):**	1.98	**Date:**	3/19/2018
Project No.:	1461-16-047 Phase B	**Length (in):**	4.44	**Tested by:**	BKP
Boring Id:	B-33	**Unit Weight (pcf):**	166.7	**Reviewed by:**	JBB
Sample No.:	RC-6	**Moisture Content (%):**	0.1		
Depth (ft):	72.2 - 73.0				

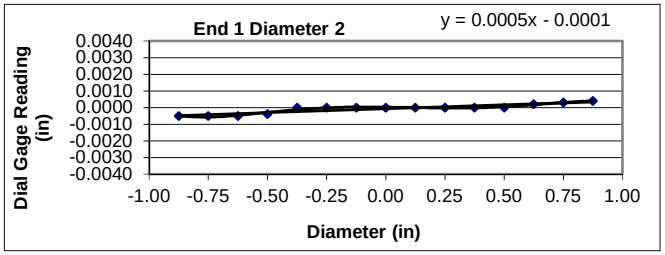
Deviation From Straightness (Procedure S1)

Is the maximum gap ≤ 0.02 in.? **YES** Straightness Tolerance Met? **YES**

End Flatness and Parallelism Readings (Procedure FP1)

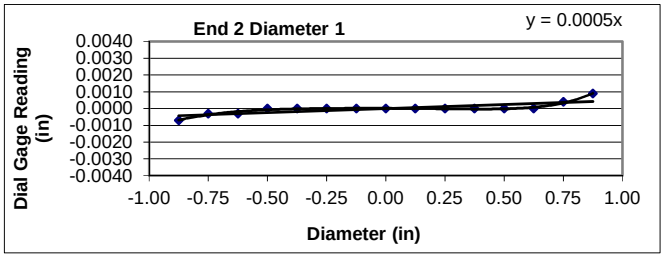
Position	End 1	End 1(90)	End 2	End 2(90)
- 7/8	-0.0007	-0.0005	-0.0007	0.0002
- 6/8	-0.0007	-0.0005	-0.0003	0.0001
- 5/8	-0.0002	-0.0005	-0.0003	0.0000
- 4/8	0.0000	-0.0004	0.0000	0.0000
- 3/8	0.0000	0.0000	0.0000	0.0000
- 2/8	0.0000	0.0000	0.0000	0.0000
- 1/8	0.0000	0.0000	0.0000	0.0000
0	0.0000	0.0000	0.0000	0.0000
1/8	0.0000	0.0000	0.0000	0.0000
2/8	0.0000	0.0000	0.0000	0.0000
3/8	0.0004	0.0000	0.0000	0.0000
4/8	0.0008	0.0000	0.0000	0.0000
5/8	0.0010	0.0002	0.0000	-0.0001
6/8	0.0012	0.0003	0.0004	-0.0002
7/8	0.0015	0.0004	0.0009	-0.0002

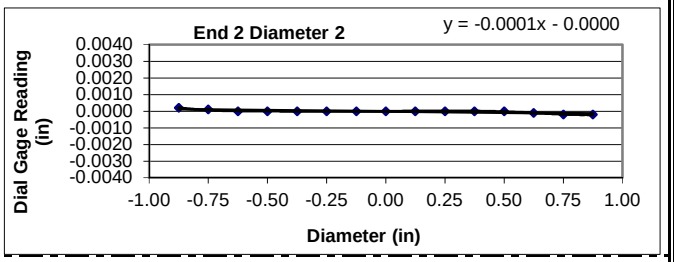




Flatness is met when the difference at any point between a smooth curve drawn through points and a visual best fit line is ≤ 0.001 in.

Flatness Tolerance Met? **YES**





Parallelism is met when the angular difference between best fit lines on opposing ends is ≤ 0.25°.

Parrallelism Diameter 1

End 1:	Slope of Best Fit Line:	0.00106
	Angle of Best Fit Line:	0.06090
End 2:	Slope of Best Fit Line:	0.00048
	Angle of Best Fit Line:	0.02767
	Max Angular Difference:	**0.03**

Parrallelism Diameter 2

End 1:	Slope of Best Fit Line:	0.00046
	Angle of Best Fit Line:	0.02652
End 2:	Slope of Best Fit Line:	-0.00015
	Angle of Best Fit Line:	-0.00835
	Max Angular Difference:	**0.03**

Parallelism Tolerance Met? **YES**

Perpendicularity (Procedure P1) is met when the difference between max and min readings along each line divided by the diameter is ≤ 0.0043.

	Difference b/w max & min	Divide by Diameter	Meets Tolerance
End 1 Diam 1	0.0022	0.0011	**YES**
End 1 Diam 2	0.0009	0.0005	**YES**
End 2 Diam 1	0.0016	0.0008	**YES**
End 2 Diam 2	0.0004	0.0002	**YES**

Perpendicularity Tolerance Met? **YES**

PREPARING ROCK CORES AS CYLINDRICAL TEST SPECIMENS AND VERIFY CONFORMANCE OF DIMENSIONAL AND SHAPE TOLERANCES (ASTM D4543)

1413 Topside Road, Louisville, TN 37777

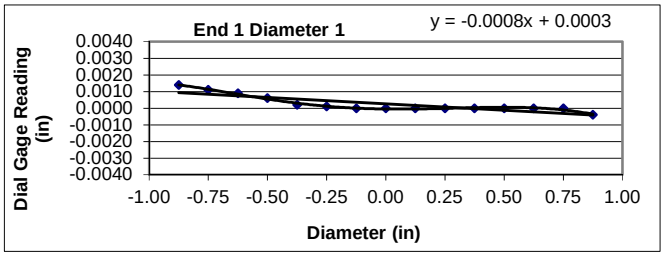
Project:	Carolina Crossroads Project	**Diameter (in):**	1.99	**Date:**	3/19/2018
Project No.:	1461-16-047 Phase B	**Length (in):**	4.44	**Tested by:**	BKP
Boring Id:	B-37	**Unit Weight (pcf):**	176.0	**Reviewed by:**	JBB
Sample No.:	RC-4	**Moisture Content (%):**	0.1		
Depth (ft):	52.6 - 53.3				

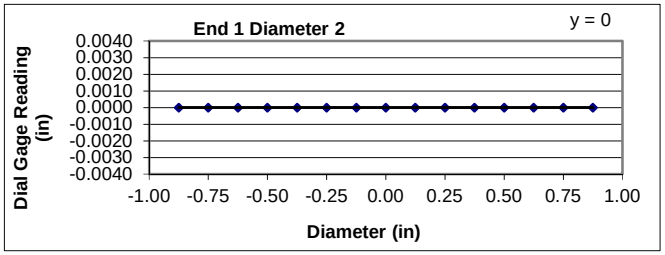
Deviation From Straightness (Procedure S1)

Is the maximum gap ≤ 0.02 in.? **YES** Straightness Tolerance Met? **YES**

End Flatness and Parallelism Readings (Procedure FP1)

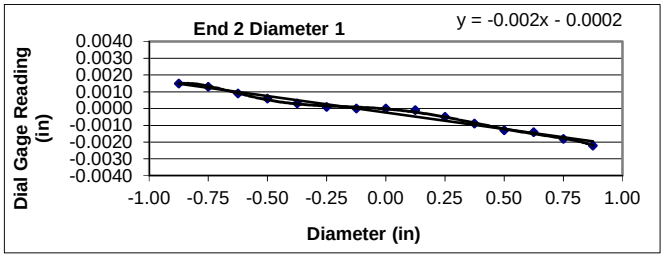
Position	End 1	End 1(90)	End 2	End 2(90)
- 7/8	0.0014	0.0000	0.0015	-0.0008
- 6/8	0.0011	0.0000	0.0013	-0.0006
- 5/8	0.0009	0.0000	0.0009	-0.0006
- 4/8	0.0006	0.0000	0.0006	-0.0001
- 3/8	0.0002	0.0000	0.0003	0.0000
- 2/8	0.0001	0.0000	0.0001	0.0000
- 1/8	0.0000	0.0000	0.0000	0.0000
0	0.0000	0.0000	0.0000	0.0000
1/8	0.0000	0.0000	-0.0001	0.0000
2/8	0.0000	0.0000	-0.0005	0.0000
3/8	0.0000	0.0000	-0.0009	0.0000
4/8	0.0000	0.0000	-0.0013	0.0000
5/8	0.0000	0.0000	-0.0014	0.0004
6/8	0.0000	0.0000	-0.0018	0.0008
7/8	-0.0004	0.0000	-0.0022	0.0012

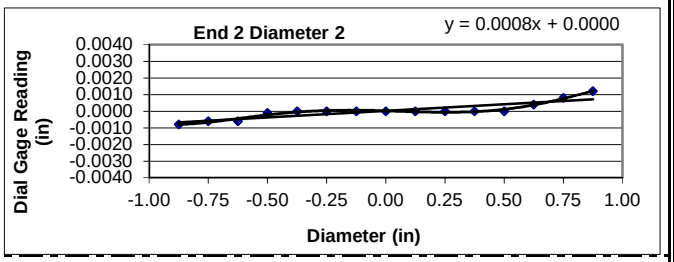




Flatness is met when the difference at any point between a smooth curve drawn through points and a visual best fit line is ≤ 0.001 in.

Flatness Tolerance Met? **YES**





Parallelism is met when the angular difference between best fit lines on opposing ends is ≤ 0.25°.

Parrallelism Diameter 1

End 1:	Slope of Best Fit Line:	-0.00077
	Angle of Best Fit Line:	-0.04404
End 2:	Slope of Best Fit Line:	-0.00196
	Angle of Best Fit Line:	-0.11214
	Max Angular Difference:	**0.07**

Parrallelism Diameter 2

End 1:	Slope of Best Fit Line:	0.00000
	Angle of Best Fit Line:	0.00000
End 2:	Slope of Best Fit Line:	0.00079
	Angle of Best Fit Line:	0.04551
	Max Angular Difference:	**-0.05**

Parallelism Tolerance Met? **YES**

Perpendicularity (Procedure P1) is met when the difference between max and min readings along each line divided by the diameter is ≤ 0.0043.

	Difference b/w max & min	Divide by Diameter	Meets Tolerance
End 1 Diam 1	0.0018	0.0009	**YES**
End 1 Diam 2	0.0000	0.0000	**YES**
End 2 Diam 1	0.0037	0.0019	**YES**
End 2 Diam 2	0.0020	0.0010	**YES**

Perpendicularity Tolerance Met? **YES**

PREPARING ROCK CORES AS CYLINDRICAL TEST SPECIMENS AND VERIFY CONFORMANCE OF DIMENSIONAL AND SHAPE TOLERANCES (ASTM D4543)

1413 Topside Road, Louisville, TN 37777

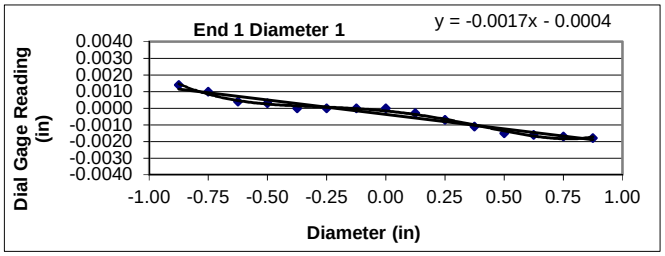
Project:	Carolina Crossroads Project	**Diameter (in):**	1.99	**Date:**	3/19/2018
Project No.:	1461-16-047 Phase B	**Length (in):**	4.49	**Tested by:**	BKP
Boring Id:	B-37	**Unit Weight (pcf):**	183.6	**Reviewed by:**	JBB
Sample No.:	RC-5	**Moisture Content (%):**	0.1		
Depth (ft):	57.2 - 58.0				

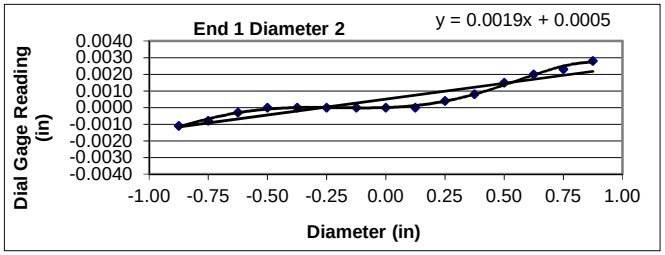
Deviation From Straightness (Procedure S1)

Is the maximum gap ≤ 0.02 in.? **YES** Straightness Tolerance Met? **YES**

End Flatness and Parallelism Readings (Procedure FP1)

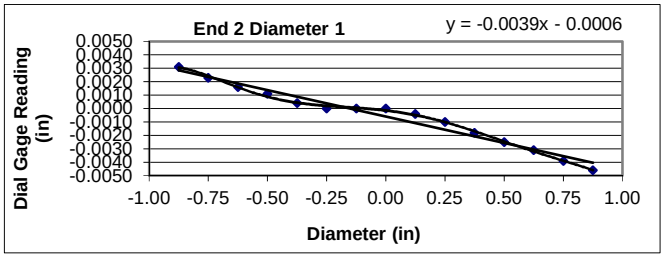
Position	End 1	End 1(90)	End 2	End 2(90)
- 7/8	0.0014	-0.0011	0.0031	0.0000
- 6/8	0.0010	-0.0008	0.0023	0.0000
- 5/8	0.0004	-0.0003	0.0016	0.0000
- 4/8	0.0003	0.0000	0.0011	0.0000
- 3/8	0.0000	0.0000	0.0004	0.0000
- 2/8	0.0000	0.0000	0.0000	0.0000
- 1/8	0.0000	0.0000	0.0000	0.0000
0	0.0000	0.0000	0.0000	0.0000
1/8	-0.0003	0.0000	-0.0004	-0.0001
2/8	-0.0007	0.0004	-0.0010	-0.0006
3/8	-0.0011	0.0008	-0.0018	-0.0010
4/8	-0.0015	0.0015	-0.0025	-0.0010
5/8	-0.0016	0.0020	-0.0031	-0.0010
6/8	-0.0017	0.0023	-0.0039	-0.0012
7/8	-0.0018	0.0028	-0.0046	-0.0017

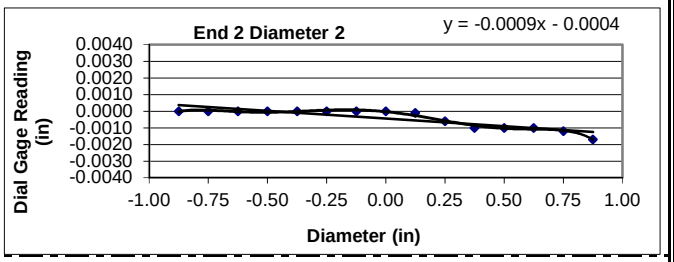




Flatness is met when the difference at any point between a smooth curve drawn through points and a visual best fit line is ≤ 0.001 in.

Flatness Tolerance Met? **YES**





Parallelism is met when the angular difference between best fit lines on opposing ends is ≤ 0.25°.

Parrallelism Diameter 1

End 1:	Slope of Best Fit Line:	-0.00174
	Angle of Best Fit Line:	-0.09953
End 2:	Slope of Best Fit Line:	-0.00394
	Angle of Best Fit Line:	-0.22591
	Max Angular Difference:	**0.13**

Parrallelism Diameter 2

End 1:	Slope of Best Fit Line:	0.00190
	Angle of Best Fit Line:	0.10903
End 2:	Slope of Best Fit Line:	-0.00093
	Angle of Best Fit Line:	-0.05304
	Max Angular Difference:	**0.16**

Parallelism Tolerance Met? **YES**

Perpendicularity (Procedure P1) is met when the difference between max and min readings along each line divided by the diameter is ≤ 0.0043.

	Difference b/w max & min	Divide by Diameter	Meets Tolerance
End 1 Diam 1	0.0032	0.0016	**YES**
End 1 Diam 2	0.0039	0.0020	**YES**
End 2 Diam 1	0.0077	0.0039	**YES**
End 2 Diam 2	0.0017	0.0009	**YES**

Perpendicularity Tolerance Met? **YES**

PREPARING ROCK CORES AS CYLINDRICAL TEST SPECIMENS AND VERIFY CONFORMANCE OF DIMENSIONAL AND SHAPE TOLERANCES (ASTM D4543)

1413 Topside Road, Louisville, TN 37777

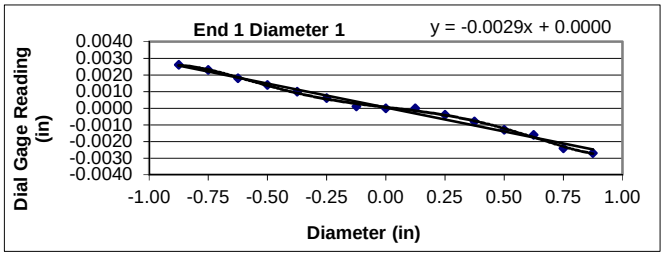
Project:	Carolina Crossroads Project	**Diameter (in):**	1.99	**Date:**	3/19/2018
Project No.:	1461-16-047 Phase B	**Length (in):**	4.47	**Tested by:**	BKP
Boring Id:	B-37	**Unit Weight (pcf):**	176.9	**Reviewed by:**	JBB
Sample No.:	RC-6	**Moisture Content (%):**	0.2		
Depth (ft):	63.2 - 63.8				

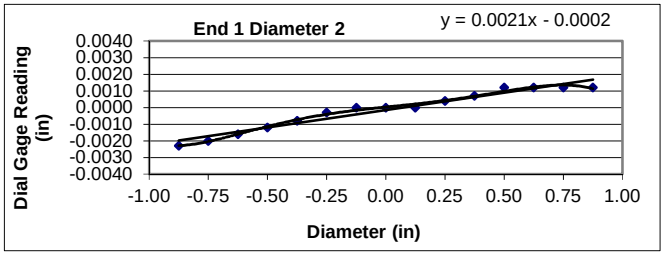
Deviation From Straightness (Procedure S1)

Is the maximum gap ≤ 0.02 in.? **YES** Straightness Tolerance Met? **YES**

End Flatness and Parallelism Readings (Procedure FP1)

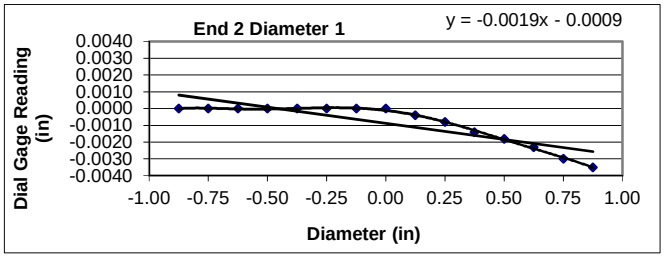
Position	End 1	End 1(90)	End 2	End 2(90)
- 7/8	0.0026	-0.0023	0.0000	-0.0002
- 6/8	0.0023	-0.0020	0.0000	0.0000
- 5/8	0.0018	-0.0016	0.0000	0.0000
- 4/8	0.0014	-0.0012	0.0000	0.0000
- 3/8	0.0010	-0.0008	0.0000	0.0000
- 2/8	0.0006	-0.0003	0.0000	0.0000
- 1/8	0.0001	0.0000	0.0000	0.0000
0	0.0000	0.0000	0.0000	0.0000
1/8	0.0000	0.0000	-0.0004	0.0000
2/8	-0.0004	0.0004	-0.0008	0.0000
3/8	-0.0008	0.0007	-0.0014	0.0000
4/8	-0.0013	0.0012	-0.0018	0.0000
5/8	-0.0016	0.0012	-0.0023	0.0000
6/8	-0.0024	0.0012	-0.0030	0.0000
7/8	-0.0027	0.0012	-0.0035	0.0000

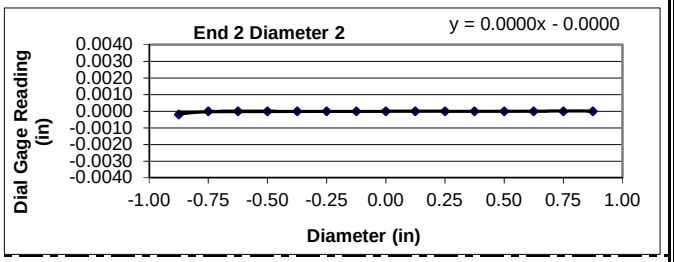




Flatness is met when the difference at any point between a smooth curve drawn through points and a visual best fit line is ≤ 0.001 in.

Flatness Tolerance Met? **YES**





Parallelism is met when the angular difference between best fit lines on opposing ends is ≤ 0.25°.

Parrallelism Diameter 1

End 1:	Slope of Best Fit Line:	-0.00287
	Angle of Best Fit Line:	-0.16468
End 2:	Slope of Best Fit Line:	-0.00193
	Angle of Best Fit Line:	-0.11034
	Max Angular Difference:	**-0.05**

Parrallelism Diameter 2

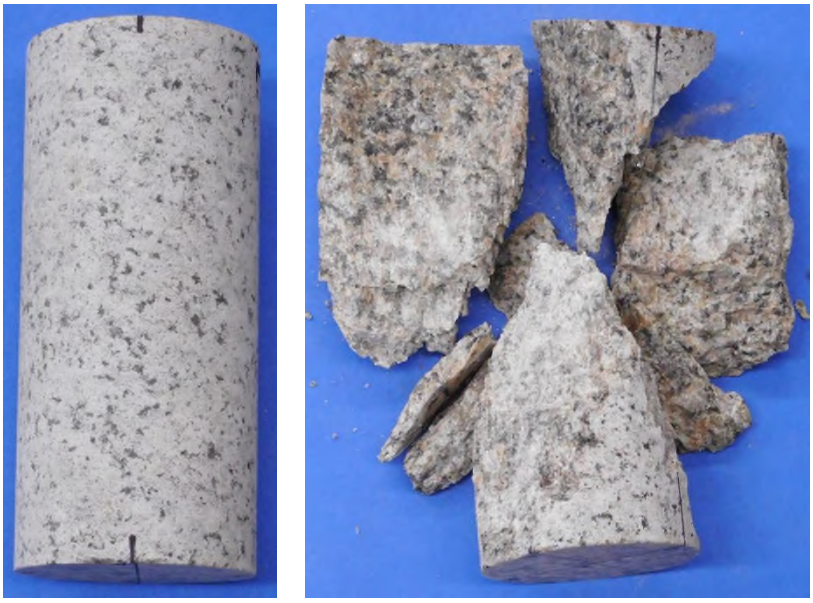
End 1:	Slope of Best Fit Line:	0.00209
	Angle of Best Fit Line:	0.11983
End 2:	Slope of Best Fit Line:	0.00004
	Angle of Best Fit Line:	0.00229
	Max Angular Difference:	**0.12**

Parallelism Tolerance Met? **YES**

Perpendicularity (Procedure P1) is met when the difference between max and min readings along each line divided by the diameter is ≤ 0.0043.

	Difference b/w max & min	Divide by Diameter	Meets Tolerance
End 1 Diam 1	0.0053	0.0027	**YES**
End 1 Diam 2	0.0035	0.0018	**YES**
End 2 Diam 1	0.0035	0.0018	**YES**
End 2 Diam 2	0.0002	0.0001	**YES**

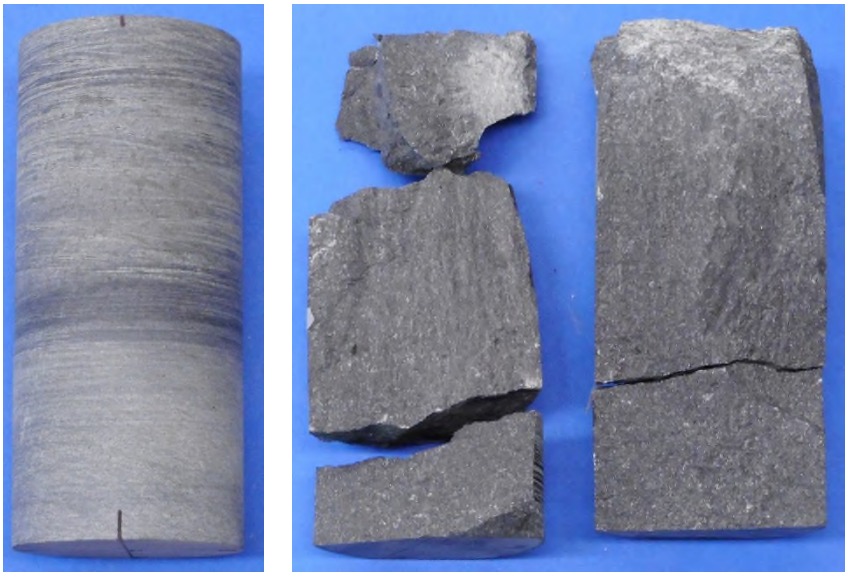
Perpendicularity Tolerance Met? **YES**



Date: 3/20/2018

Photographer: Ben Painter

1	**Location / Orientation**	W-24, RC-1 (27.2' – 28.2')
	Remarks	Unconfined Compressive Strength of Rock Core Specimen Before/After (ASTM D7012)



Date: 3/20/2018

Photographer: Ben Painter

2	**Location / Orientation**	B-31, RC-1 (26.7' – 27.4')
	Remarks	Unconfined Compressive Strength of Rock Core Specimen Before/After (ASTM D7012)




Date: 3/20/2018

Photographer: Ben Painter

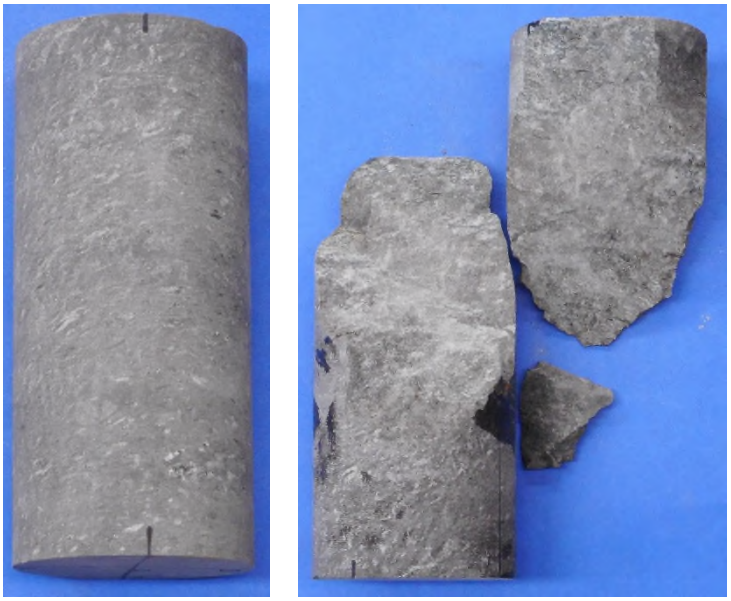
3	**Location / Orientation**	B-31, RC-4 (41.3' – 42.0')
	Remarks	Unconfined Compressive Strength of Rock Core Specimen Before/After (ASTM D7012)




Date: 3/20/2018

Photographer: Ben Painter

4	**Location / Orientation**	B-33, RC-6 (72.2' – 73.0')
	Remarks	Unconfined Compressive Strength of Rock Core Specimen Before/After (ASTM D7012)



Date: 3/20/2018

Photographer: Ben Painter

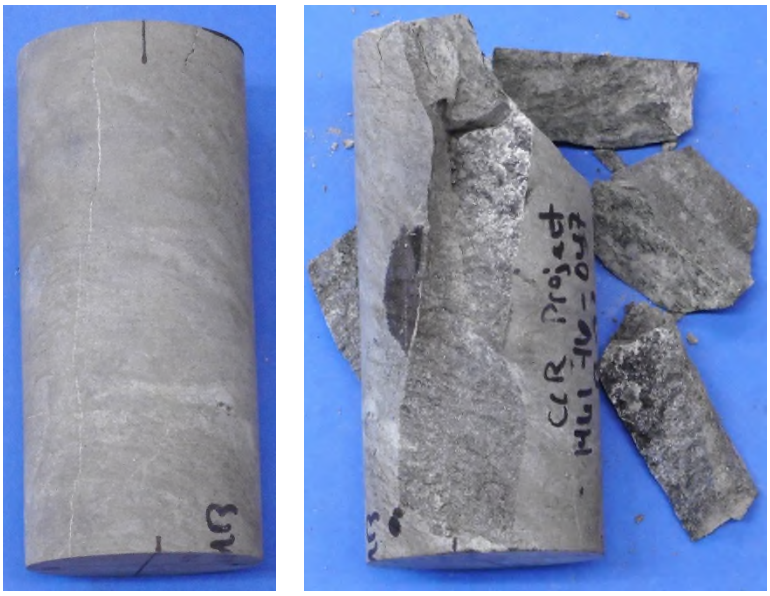
5	**Location / Orientation**	B-37, RC-4 (52.6' – 53.3')
	Remarks	Unconfined Compressive Strength of Rock Core Specimen Before/After (ASTM D7012)



Date: 3/20/2018

Photographer: Ben Painter

6	**Location / Orientation**	B-37, RC-5 (57.2' – 58.0')
	Remarks	Unconfined Compressive Strength of Rock Core Specimen Before/After (ASTM D7012)



Date: 3/20/2018

Photographer: Ben Painter

7	**Location / Orientation**	B-37, RC-6 (63.2' – 63.8')
	Remarks	Unconfined Compressive Strength of Rock Core Specimen Before/After (ASTM D7012)

UNCONFINED COMPRESSION
(ASTM D7012 Method C)

S&ME, Inc. - Knoxville 1413 Topside Road, Louisville, TN 37777

Project Name: Carolina Crossroads Project
Project Number: 1461-16-047 Phase 2B

Report Date: March 30, 2018
Reviewed By: Jason B. Burgess

Boring No.	Sample No.	Depth (ft)	Dimensions, in.		Shape (See Key)	Area (in^2)	Unit Weight (lbs/ft^3)	Loading Rate (psi/sec)	Maximum Load (lbs)	Strength (psi)	Moisture (%)
			Length	Diameter							
W-19	RC-3	53.5 - 54.1	4.26	1.97	A	3.05	151.6	21	3,166	1,038	0.8
B-32	RC-2	67.2 - 68.1	4.42	1.98	D	3.08	178.7	81	93,085	30,222	0.3
B-44	RC-1	9.2 - 9.9	4.50	1.98	A	3.08	163.5	83	101,124	32,832	0.2
B-44	RC-3	16.2 - 17.1	4.45	1.98	A	3.08	162.7	84	30,278	9,831	0.3
B-44	RC-4	23.2 - 23.9	4.46	1.98	A	3.08	162.4	37	10,251	3,328	0.4

NOTES: Effective (as received) unit weight as determined by RTH 109-93.
Loading rates were selected to target reaching failure between 2 and 15 minutes.
Test results for specimens not meeting the requirements of ASTM D4543 may differ from a test specimen that meets the requirements of ASTM D4543.

SHAPE KEY

ASTM D4543-08$^{\epsilon 1}$ *Standard Practice for Preparing Rock Core as Cylindrical Test Specimens and Verifying Conformance to Dimensional and Shape Tolerance* Section 1.2 - "Rock is a complex engineering material that can vary greatly as a function of lithology, stress history, weathering, moisture content and chemistry, and other natural geologic processes. As such, it is not always possible to obtain or prepare rock core specimens that satisfy the desirable tolerances given in this practice. Most commonly, this situation presents itself with weaker, more porous, and poorly cemented rock types and rock types containing significant or weak (or both) structural features. For these and other rock types which are difficult to prepare, all reasonable efforts shall be made to prepare a specimen in accordance with this practice and for the intended test procedure. However, when it has been determined by trial that this is not possible, prepare the rock specimen to the closest tolerances practicable and consider this to be the best effort and report it as such and if allowable or necessary for the intended test, capping the ends of the specimen as discussed in this practice is permitted."

A Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ (side straightness, end flatness & parallelism, and end perpendicularity to axis)

B Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness & parallelism, and end perpendicularity to axis. Specimen did not meet the desired tolerance for side straightness. Specimen prepared to closest tolerances practicable.

C Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness & parallelism. Specimen did not meet the desired tolerances for side straightness and end perpendicularity to axis. Specimen prepared to closest tolerances practicable.

D Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness. Specimen did not meet the desired tolerances for side straightness, parallelism and end perpendicularity to axis. Specimen prepared to closest tolerances practicable.

E Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness and end perpendicularity to axis. Specimen did not meet the desired tolerance for side straightness and parallelism. Specimen prepared to closest tolerances practicable.

UNCONFINED COMPRESSION WITH YOUNG'S MODULUS
(ASTM D7012 Method C and D)

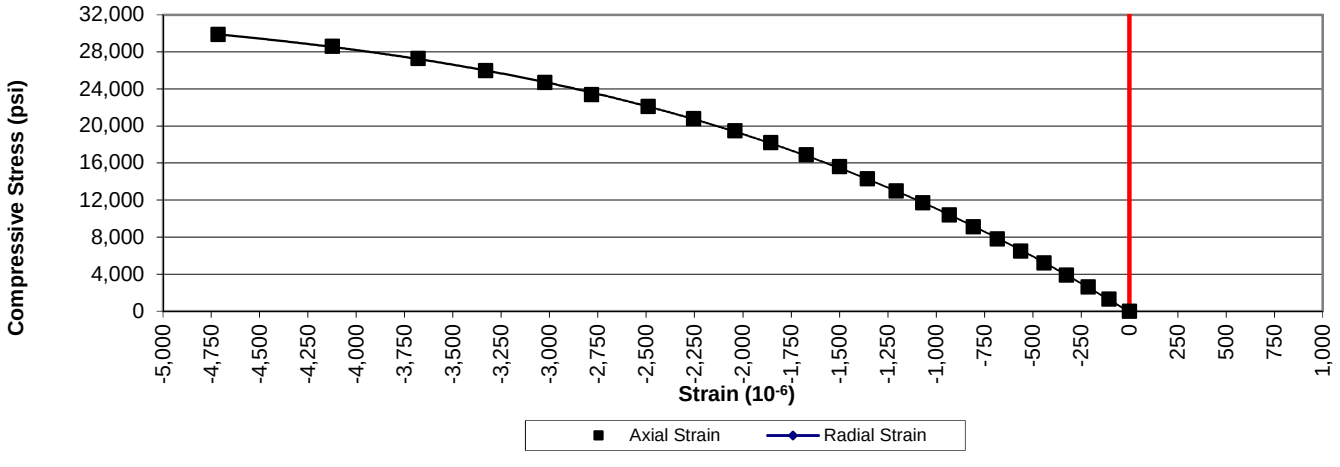
1413 Topside Road, Louisville, TN 37777

Project:	Carolina Crossroads Project	**Diameter, in.:**	1.98	**Date:**	3/28/2018
Project No.:	1461-16-047 Phase 2B	**Length, in.:**	4.42	**Tested by:**	BKP / MG
Boring Id:	B-32	**Unit Weight, pcf:**	178.7	**Reviewed by:**	JBB
Sample No:	RC-2	**Moisture Content, %:**	0.3		
Depth (ft):	67.2 - 68.1	**Load Rate, psi/sec:**	81		

Data Point	Strain (10^{-6})		Load (lb)	Compressive Stress (psi)	Secant Modulus x 10^6 (psi)	Poisson's Ratio	Remarks Failure
	axial	radial					
1	0		0	0	0.00		
2	-106		4,000	1,299	12.25		
3	-213		8,000	2,597	12.19		
4	-326		12,000	3,896	11.95		
5	-442		16,000	5,195	11.75		
6	-562		20,000	6,494	11.56		
7	-683		24,000	7,792	11.41		
8	-808		28,000	9,091	11.25		
9	-932		32,000	10,390	11.15		
10	-1,069		36,000	11,688	10.93		
11	-1,207		40,000	12,987	10.76		
12	-1,356		44,000	14,286	10.54		
13	-1,500		48,000	15,584	10.39		
14	-1,672		52,000	16,883	10.10		
15	-1,855		56,000	18,182	9.80		
16	-2,041		60,000	19,481	9.54		
17	-2,254		64,000	20,779	9.22		
18	-2,490		68,000	22,078	8.87		
19	-2,782		72,000	23,377	8.40		
20	-3,024		76,000	24,675	8.16		
21	-3,331		80,000	25,974	7.80		
22	-3,679		84,000	27,273	7.41		
23	-4,124		88,000	28,571	6.93		
24	-4,714		92,000	29,870	6.34		
25			93,085	30,222			Failure

Comments: Loading rate was selected to target reaching failure between 2 and 15 minutes.
Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness. Specimen did not meet the desired tolerances for side straightness, parallelism and end perpendicularity to axis. Specimen prepared to closest tolerances practicable.

Stress vs. Strain



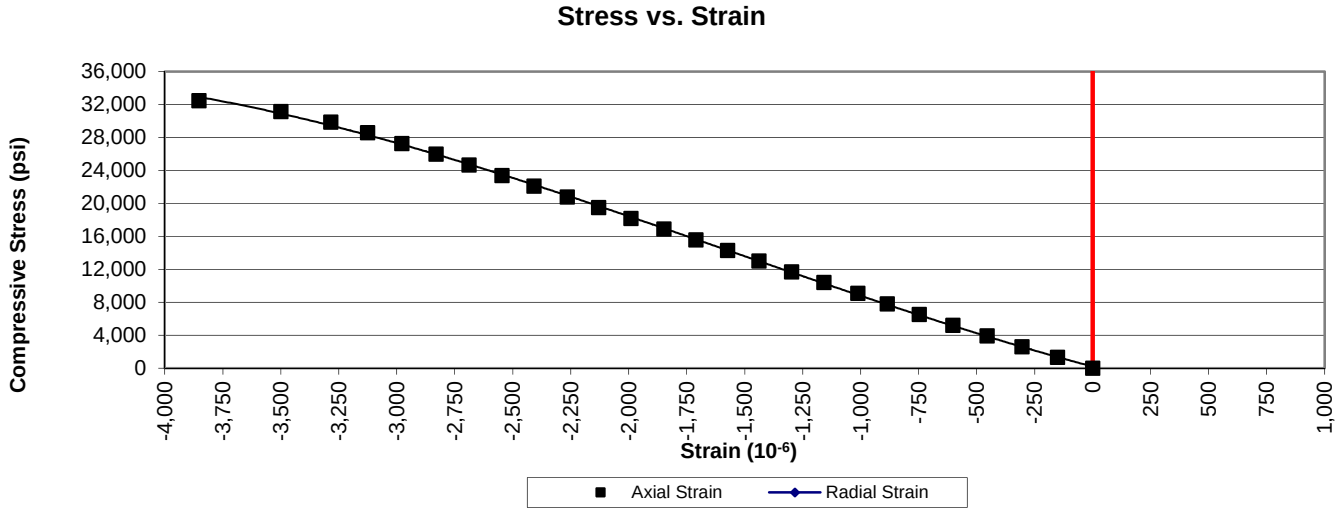
UNCONFINED COMPRESSION WITH YOUNG'S MODULUS
(ASTM D7012 Method C and D)

1413 Topside Road, Louisville, TN 37777

Project:	Carolina Crossroads Project	**Diameter, in.:**	1.98	**Date:**	3/28/2018
Project No.:	1461-16-047 Phase 2B	**Length, in.:**	4.50	**Tested by:**	BKP / MG
Boring Id:	B-44	**Unit Weight, pcf:**	163.5	**Reviewed by:**	JBB
Sample No:	RC-1	**Moisture Content, %:**	0.2		
Depth (ft):	9.2 - 9.9	**Load Rate, psi/sec:**	83		

Data Point	Strain (10^{-6})		Load (lb)	Compressive Stress (psi)	Secant Modulus x 10^6 (psi)	Poisson's Ratio	Remarks Failure
	axial	radial					
1	0		0	0	0.00		
2	-152		4,000	1,299	8.55		
3	-304		8,000	2,597	8.54		
4	-455		12,000	3,896	8.56		
5	-603		16,000	5,195	8.62		
6	-747		20,000	6,494	8.69		
7	-886		24,000	7,792	8.79		
8	-1,013		28,000	9,091	8.97		
9	-1,158		32,000	10,390	8.97		
10	-1,298		36,000	11,688	9.00		
11	-1,438		40,000	12,987	9.03		
12	-1,574		44,000	14,286	9.08		
13	-1,710		48,000	15,584	9.11		
14	-1,848		52,000	16,883	9.14		
15	-1,990		56,000	18,182	9.14		
16	-2,130		60,000	19,481	9.15		
17	-2,265		64,000	20,779	9.17		
18	-2,408		68,000	22,078	9.17		
19	-2,547		72,000	23,377	9.18		
20	-2,689		76,000	24,675	9.18		
21	-2,831		80,000	25,974	9.17		
22	-2,978		84,000	27,273	9.16		
23	-3,126		88,000	28,571	9.14		
24	-3,285		92,000	29,870	9.09		
25	-3,500		96,000	31,169	8.91		
26	-3,853		100,000	32,468	8.43		
27			101,124	32,832			Failure

Comments: Loading rate was selected to target reaching failure between 2 and 15 minutes.
Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ (side straightness, end flatness & parallelism, and end perpendicularity to axis)



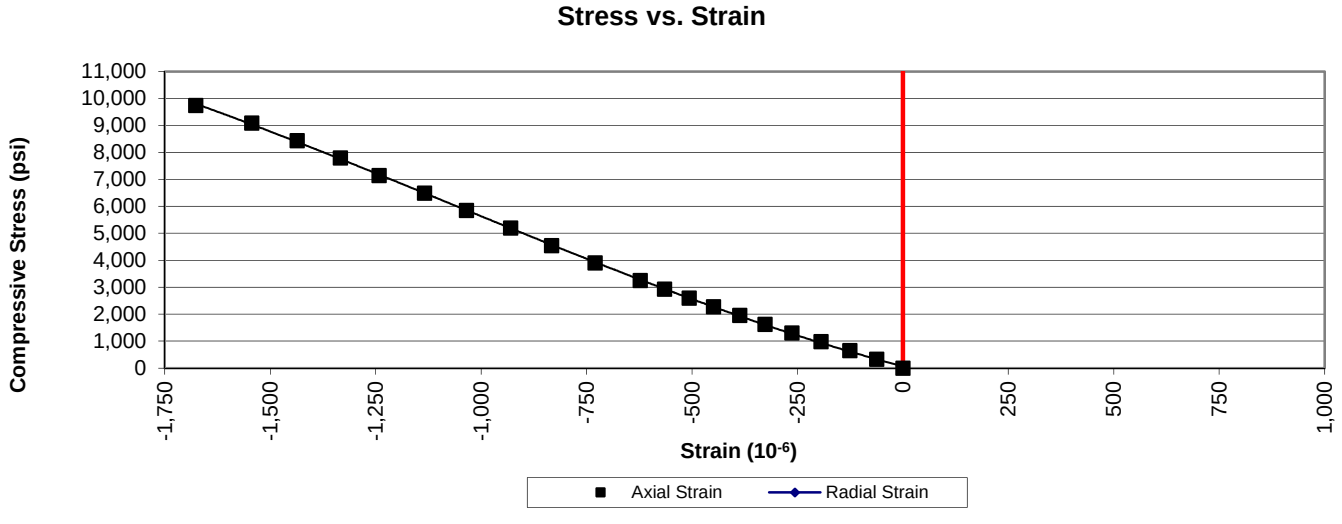
UNCONFINED COMPRESSION WITH YOUNG'S MODULUS
(ASTM D7012 Method C and D)

1413 Topside Road, Louisville, TN 37777

Project:	Carolina Crossroads Project	**Diameter, in.:**	1.98	**Date:**	3/28/2018
Project No.:	1461-16-047 Phase 2B	**Length, in.:**	4.45	**Tested by:**	BKP / MG
Boring Id:	B-44	**Unit Weight, pcf:**	162.7	**Reviewed by:**	JBB
Sample No:	RC-3	**Moisture Content, %:**	0.3		
Depth (ft):	16.2 - 17.1	**Load Rate, psi/sec:**	84		

Data Point	Strain (10^{-6})		Load (lb)	Compressive Stress (psi)	Secant Modulus x 10^6 (psi)	Poisson's Ratio	Remarks Failure
	axial	radial					
1	0		0	0	0.00		
2	-62		1,000	325	5.24		
3	-126		2,000	649	5.15		
4	-194		3,000	974	5.02		
5	-263		4,000	1,299	4.94		
6	-327		5,000	1,623	4.96		
7	-387		6,000	1,948	5.03		
8	-449		7,000	2,273	5.06		
9	-507		8,000	2,597	5.12		
10	-565		9,000	2,922	5.17		
11	-623		10,000	3,247	5.21		
12	-730		12,000	3,896	5.34		
13	-833		14,000	4,545	5.46		
14	-930		16,000	5,195	5.59		
15	-1,035		18,000	5,844	5.65		
16	-1,134		20,000	6,494	5.73		
17	-1,242		22,000	7,143	5.75		
18	-1,334		24,000	7,792	5.84		
19	-1,436		26,000	8,442	5.88		
20	-1,544		28,000	9,091	5.89		
21	-1,677		30,000	9,740	5.81		
22			30,278	9,831			Failure

Comments: Loading rate was selected to target reaching failure between 2 and 15 minutes.
Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ (side straightness, end flatness & parallelism, and end perpendicularity to axis)



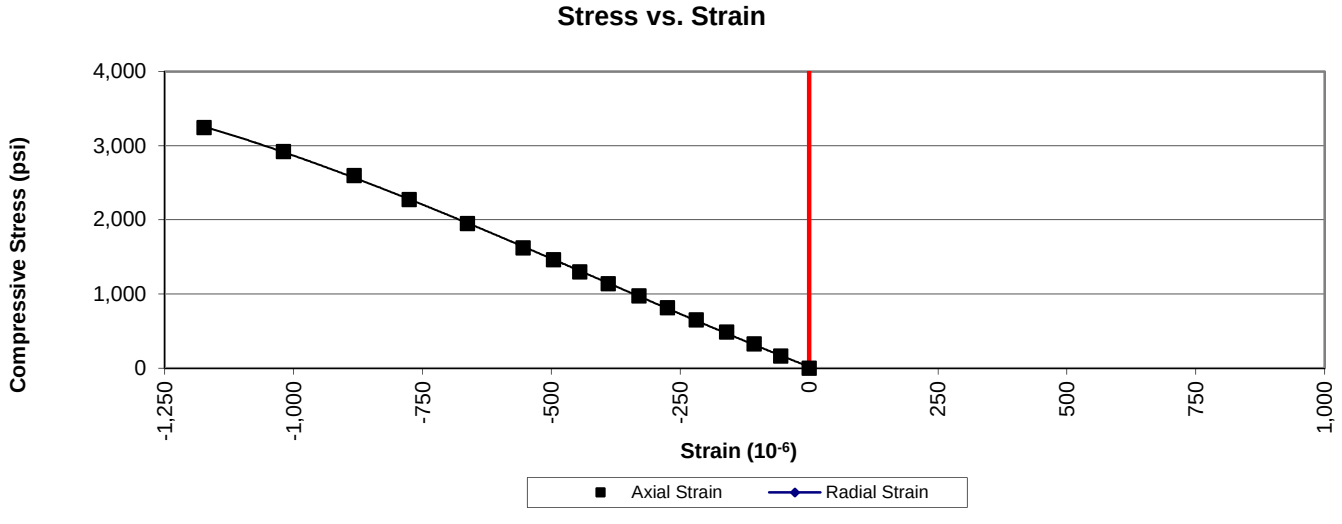
UNCONFINED COMPRESSION WITH YOUNG'S MODULUS
(ASTM D7012 Method C and D)

1413 Topside Road, Louisville, TN 37777

Project:	Carolina Crossroads Project	**Diameter, in.:**	1.98	**Date:**	3/28/2018
Project No.:	1461-16-047 Phase 2B	**Length, in.:**	4.46	**Tested by:**	BKP / MG
Boring Id:	B-44	**Unit Weight, pcf:**	162.4	**Reviewed by:**	JBB
Sample No:	RC-4	**Moisture Content, %:**	0.4		
Depth (ft):	23.2 - 23.9	**Load Rate, psi/sec:**	37		

Data Point	Strain (10^{-6})		Load (lb)	Compressive Stress (psi)	Secant Modulus x 10^6 (psi)	Poisson's Ratio	Remarks Failure
	axial	radial					
1	0		0	0	0.00		
2	-55		500	162	2.95		
3	-107		1,000	325	3.04		
4	-160		1,500	487	3.04		
5	-219		2,000	649	2.96		
6	-275		2,500	812	2.95		
7	-330		3,000	974	2.95		
8	-390		3,500	1,136	2.91		
9	-445		4,000	1,299	2.92		
10	-496		4,500	1,461	2.95		
11	-555		5,000	1,623	2.92		
12	-663		6,000	1,948	2.94		
13	-776		7,000	2,273	2.93		
14	-883		8,000	2,597	2.94		
15	-1,020		9,000	2,922	2.86		
16	-1,174		10,000	3,247	2.77		
17			10,251	3,328			Failure

Comments: Loading rate was selected to target reaching failure between 2 and 15 minutes.
Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ (side straightness, end flatness & parallelism, and end perpendicularity to axis)



PREPARING ROCK CORES AS CYLINDRICAL TEST SPECIMENS AND VERIFY CONFORMANCE OF DIMENSIONAL AND SHAPE TOLERANCES (ASTM D4543)

1413 Topside Road, Louisville, TN 37777

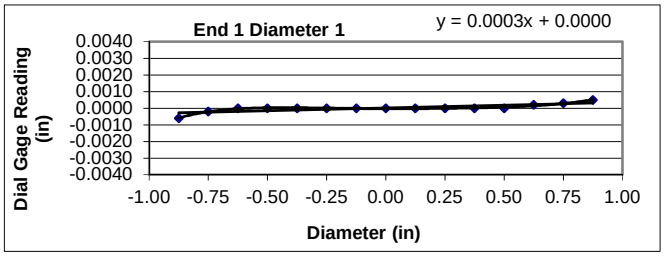
Project:	Carolina Crossroads Project	**Diameter (in):**	1.98	**Date:**	3/27/2018
Project No.:	1461-16-047 Phase B	**Length (in):**	4.42	**Tested by:**	BKP
Boring Id:	B-32	**Unit Weight (pcf):**	178.7	**Reviewed by:**	JBB
Sample No.:	RC-2	**Moisture Content (%):**	0.3		
Depth (ft):	67.2 - 68.1				

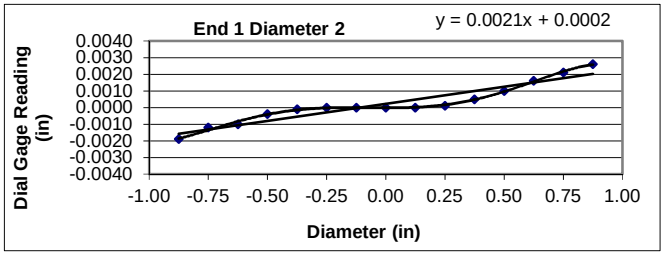
Deviation From Straightness (Procedure S1)

Is the maximum gap ≤ 0.02 in.? **NO** Straightness Tolerance Met? **NO**

End Flatness and Parallelism Readings (Procedure FP1)

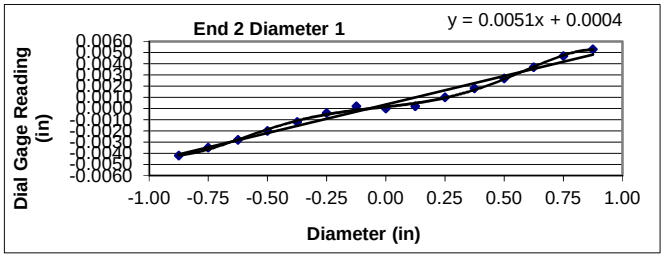
Position	End 1	End 1(90)	End 2	End 2(90)
- 7/8	-0.0006	-0.0019	-0.0042	0.0024
- 6/8	-0.0002	-0.0012	-0.0035	0.0021
- 5/8	0.0000	-0.0010	-0.0028	0.0018
- 4/8	0.0000	-0.0004	-0.0020	0.0014
- 3/8	0.0000	-0.0001	-0.0012	0.0011
- 2/8	0.0000	0.0000	-0.0004	0.0006
- 1/8	0.0000	0.0000	0.0002	0.0003
0	0.0000	0.0000	0.0000	0.0000
1/8	0.0000	0.0000	0.0002	0.0000
2/8	0.0000	0.0001	0.0010	-0.0004
3/8	0.0000	0.0005	0.0018	-0.0007
4/8	0.0000	0.0010	0.0027	-0.0011
5/8	0.0002	0.0016	0.0037	-0.0011
6/8	0.0003	0.0021	0.0047	-0.0016
7/8	0.0005	0.0026	0.0053	-0.0016

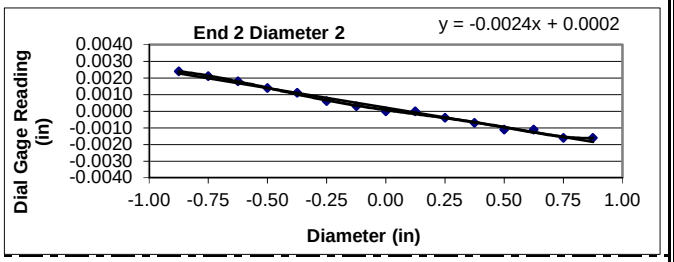




Flatness is met when the difference at any point between a smooth curve drawn through points and a visual best fit line is ≤ 0.001 in.

Flatness Tolerance Met? **YES**





Parallelism is met when the angular difference between best fit lines on opposing ends is ≤ 0.25°.

Parrallelism Diameter 1

End 1:	Slope of Best Fit Line:	0.00033
	Angle of Best Fit Line:	0.01915
End 2:	Slope of Best Fit Line:	0.00511
	Angle of Best Fit Line:	0.29270
	Max Angular Difference:	**-0.27**

Parrallelism Diameter 2

End 1:	Slope of Best Fit Line:	0.00205
	Angle of Best Fit Line:	0.11770
End 2:	Slope of Best Fit Line:	-0.00235
	Angle of Best Fit Line:	-0.13489
	Max Angular Difference:	**0.25**

Parallelism Tolerance Met? **NO**

Perpendicularity (Procedure P1) is met when the difference between max and min readings along each line divided by the diameter is ≤ 0.0043.

	Difference b/w max & min	Divide by Diameter	Meets Tolerance
End 1 Diam 1	0.0011	0.0006	**YES**
End 1 Diam 2	0.0045	0.0023	**YES**
End 2 Diam 1	0.0095	0.0048	**NO**
End 2 Diam 2	0.0040	0.0020	**YES**

Perpendicularity Tolerance Met? **NO**

PREPARING ROCK CORES AS CYLINDRICAL TEST SPECIMENS AND VERIFY CONFORMANCE OF DIMENSIONAL AND SHAPE TOLERANCES (ASTM D4543)

1413 Topside Road, Louisville, TN 37777

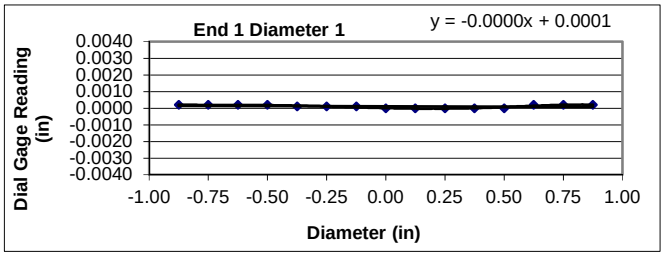
Project:	Carolina Crossroads Project	**Diameter (in):**	1.98	**Date:**	3/27/2018
Project No.:	1461-16-047 Phase B	**Length (in):**	4.50	**Tested by:**	BKP
Boring Id:	B-44	**Unit Weight (pcf):**	163.5	**Reviewed by:**	JBB
Sample No.:	RC-1	**Moisture Content (%):**	0.2		
Depth (ft):	9.2 - 9.9				

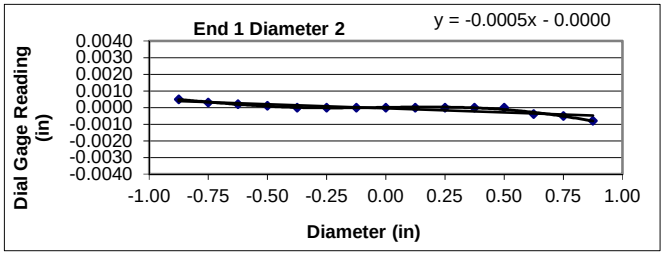
Deviation From Straightness (Procedure S1)

Is the maximum gap ≤ 0.02 in.? **YES** Straightness Tolerance Met? **YES**

End Flatness and Parallelism Readings (Procedure FP1)

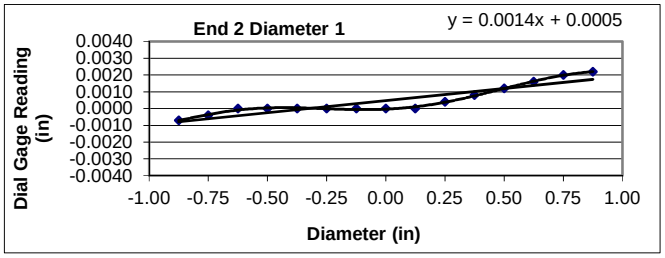
Position	End 1	End 1(90)	End 2	End 2(90)
- 7/8	0.0002	0.0005	-0.0007	0.0010
- 6/8	0.0002	0.0003	-0.0004	0.0009
- 5/8	0.0002	0.0002	0.0000	0.0004
- 4/8	0.0002	0.0001	0.0000	0.0003
- 3/8	0.0001	0.0000	0.0000	0.0003
- 2/8	0.0001	0.0000	0.0000	0.0001
- 1/8	0.0001	0.0000	0.0000	0.0001
0	0.0000	0.0000	0.0000	0.0000
1/8	0.0000	0.0000	0.0000	0.0000
2/8	0.0000	0.0000	0.0004	0.0000
3/8	0.0000	0.0000	0.0008	0.0000
4/8	0.0000	0.0000	0.0012	0.0000
5/8	0.0002	-0.0004	0.0016	0.0000
6/8	0.0002	-0.0005	0.0020	0.0000
7/8	0.0002	-0.0008	0.0022	0.0000

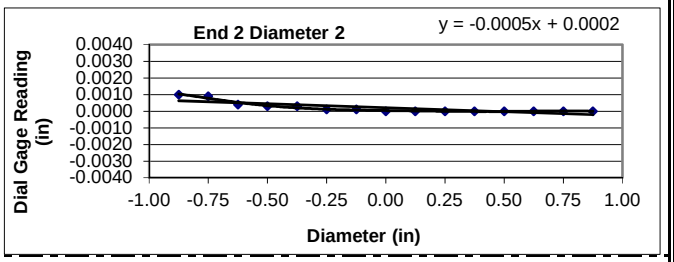




Flatness is met when the difference at any point between a smooth curve drawn through points and a visual best fit line is ≤ 0.001 in.

Flatness Tolerance Met? **YES**





Parallelism is met when the angular difference between best fit lines on opposing ends is ≤ 0.25°.

Parrallelism Diameter 1

End 1:	Slope of Best Fit Line:	-0.00004
	Angle of Best Fit Line:	-0.00229
End 2:	Slope of Best Fit Line:	0.00145
	Angle of Best Fit Line:	0.08300
	Max Angular Difference:	**-0.09**

Parrallelism Diameter 2

End 1:	Slope of Best Fit Line:	-0.00049
	Angle of Best Fit Line:	-0.02832
End 2:	Slope of Best Fit Line:	-0.00048
	Angle of Best Fit Line:	-0.02750
	Max Angular Difference:	**0.00**

Parallelism Tolerance Met? **YES**

Perpendicularity (Procedure P1) is met when the difference between max and min readings along each line divided by the diameter is ≤ 0.0043.

	Difference b/w max & min	Divide by Diameter	Meets Tolerance
End 1 Diam 1	0.0002	0.0001	**YES**
End 1 Diam 2	0.0013	0.0007	**YES**
End 2 Diam 1	0.0029	0.0015	**YES**
End 2 Diam 2	0.0010	0.0005	**YES**

Perpendicularity Tolerance Met? **YES**

PREPARING ROCK CORES AS CYLINDRICAL TEST SPECIMENS AND VERIFY CONFORMANCE OF DIMENSIONAL AND SHAPE TOLERANCES (ASTM D4543)

1413 Topside Road, Louisville, TN 37777

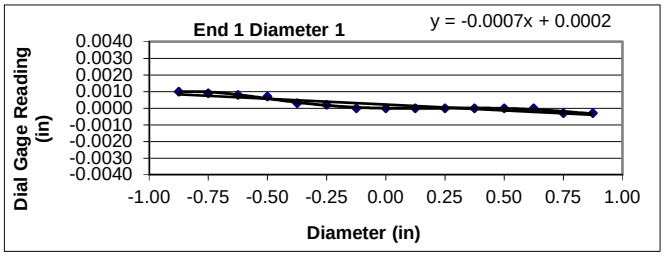
Project:	Carolina Crossroads Project	**Diameter (in):**	1.98	**Date:**	3/27/2018
Project No.:	1461-16-047 Phase B	**Length (in):**	4.45	**Tested by:**	BKP
Boring Id:	B-44	**Unit Weight (pcf):**	162.7	**Reviewed by:**	JBB
Sample No.:	RC-3	**Moisture Content (%):**	0.3		
Depth (ft):	16.2 - 17.1				

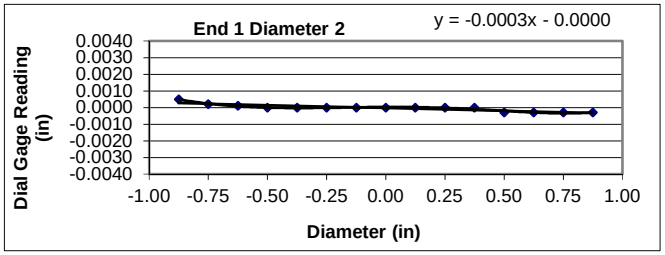
Deviation From Straightness (Procedure S1)

Is the maximum gap ≤ 0.02 in.? **YES** Straightness Tolerance Met? **YES**

End Flatness and Parallelism Readings (Procedure FP1)

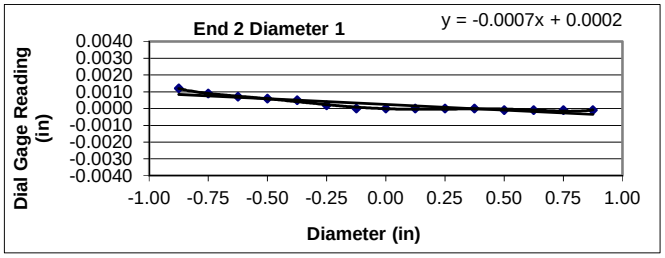
Position	End 1	End 1(90)	End 2	End 2(90)
- 7/8	0.0010	0.0005	0.0012	0.0009
- 6/8	0.0009	0.0002	0.0009	0.0009
- 5/8	0.0008	0.0001	0.0007	0.0009
- 4/8	0.0007	0.0000	0.0006	0.0006
- 3/8	0.0003	0.0000	0.0005	0.0005
- 2/8	0.0002	0.0000	0.0002	0.0004
- 1/8	0.0000	0.0000	0.0000	0.0003
0	0.0000	0.0000	0.0000	0.0000
1/8	0.0000	0.0000	0.0000	0.0000
2/8	0.0000	0.0000	0.0000	0.0000
3/8	0.0000	0.0000	0.0000	0.0000
4/8	0.0000	-0.0003	-0.0001	0.0000
5/8	0.0000	-0.0003	-0.0001	0.0000
6/8	-0.0003	-0.0003	-0.0001	0.0001
7/8	-0.0003	-0.0003	-0.0001	0.0001

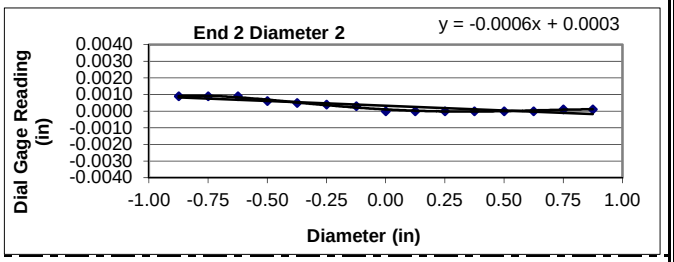




Flatness is met when the difference at any point between a smooth curve drawn through points and a visual best fit line is ≤ 0.001 in.

Flatness Tolerance Met? **YES**





Parallelism is met when the angular difference between best fit lines on opposing ends is ≤ 0.25°.

Parrallelism Diameter 1

End 1:	Slope of Best Fit Line:	-0.00070
	Angle of Best Fit Line:	-0.03994
End 2:	Slope of Best Fit Line:	-0.00068
	Angle of Best Fit Line:	-0.03896
	Max Angular Difference:	**0.00**

Parrallelism Diameter 2

End 1:	Slope of Best Fit Line:	-0.00034
	Angle of Best Fit Line:	-0.01932
End 2:	Slope of Best Fit Line:	-0.00057
	Angle of Best Fit Line:	-0.03258
	Max Angular Difference:	**0.01**

Parallelism Tolerance Met? **YES**

Perpendicularity (Procedure P1) is met when the difference between max and min readings along each line divided by the diameter is ≤ 0.0043.

	Difference b/w max & min	Divide by Diameter	Meets Tolerance
End 1 Diam 1	0.0013	0.0007	**YES**
End 1 Diam 2	0.0008	0.0004	**YES**
End 2 Diam 1	0.0013	0.0007	**YES**
End 2 Diam 2	0.0009	0.0005	**YES**

Perpendicularity Tolerance Met? **YES**

PREPARING ROCK CORES AS CYLINDRICAL TEST SPECIMENS AND VERIFY CONFORMANCE OF DIMENSIONAL AND SHAPE TOLERANCES (ASTM D4543)

1413 Topside Road, Louisville, TN 37777

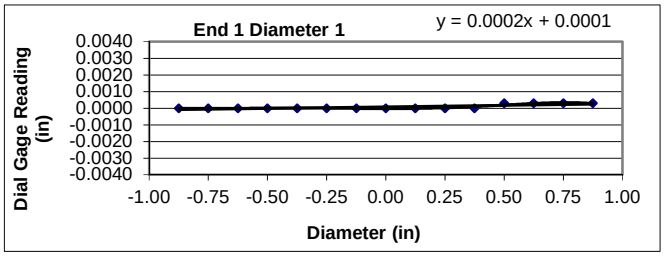
Project:	Carolina Crossroads Project	**Diameter (in):**	1.98	**Date:**	3/27/2018
Project No.:	1461-16-047 Phase B	**Length (in):**	4.46	**Tested by:**	BKP
Boring Id:	B-44	**Unit Weight (pcf):**	162.4	**Reviewed by:**	JBB
Sample No.:	RC-4	**Moisture Content (%):**	0.4		
Depth (ft):	23.2 - 23.9				

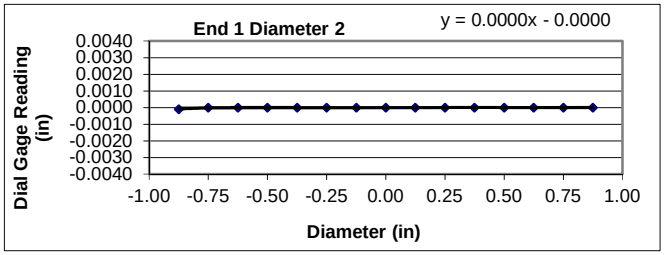
Deviation From Straightness (Procedure S1)

Is the maximum gap ≤ 0.02 in.? **YES** Straightness Tolerance Met? **YES**

End Flatness and Parallelism Readings (Procedure FP1)

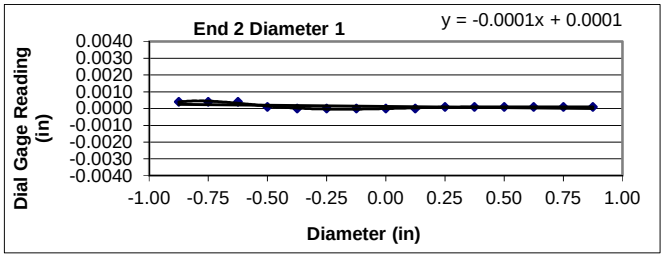
Position	End 1	End 1(90)	End 2	End 2(90)
- 7/8	0.0000	-0.0001	0.0004	0.0006
- 6/8	0.0000	0.0000	0.0004	0.0005
- 5/8	0.0000	0.0000	0.0004	0.0005
- 4/8	0.0000	0.0000	0.0001	0.0004
- 3/8	0.0000	0.0000	0.0000	0.0003
- 2/8	0.0000	0.0000	0.0000	0.0002
- 1/8	0.0000	0.0000	0.0000	0.0000
0	0.0000	0.0000	0.0000	0.0000
1/8	0.0000	0.0000	0.0000	0.0000
2/8	0.0000	0.0000	0.0001	0.0000
3/8	0.0000	0.0000	0.0001	0.0000
4/8	0.0003	0.0000	0.0001	0.0000
5/8	0.0003	0.0000	0.0001	0.0000
6/8	0.0003	0.0000	0.0001	0.0000
7/8	0.0003	0.0000	0.0001	0.0000

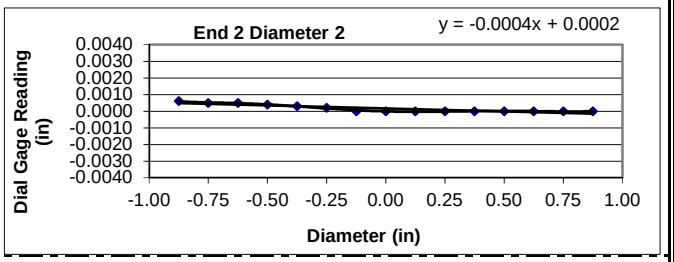




Flatness is met when the difference at any point between a smooth curve drawn through points and a visual best fit line is ≤ 0.001 in.

Flatness Tolerance Met? **YES**





Parallelism is met when the angular difference between best fit lines on opposing ends is ≤ 0.25°.

Parrallelism Diameter 1

End 1:	Slope of Best Fit Line:	0.00019
	Angle of Best Fit Line:	0.01080
End 2:	Slope of Best Fit Line:	-0.00014
	Angle of Best Fit Line:	-0.00802
	Max Angular Difference:	**0.02**

Parrallelism Diameter 2

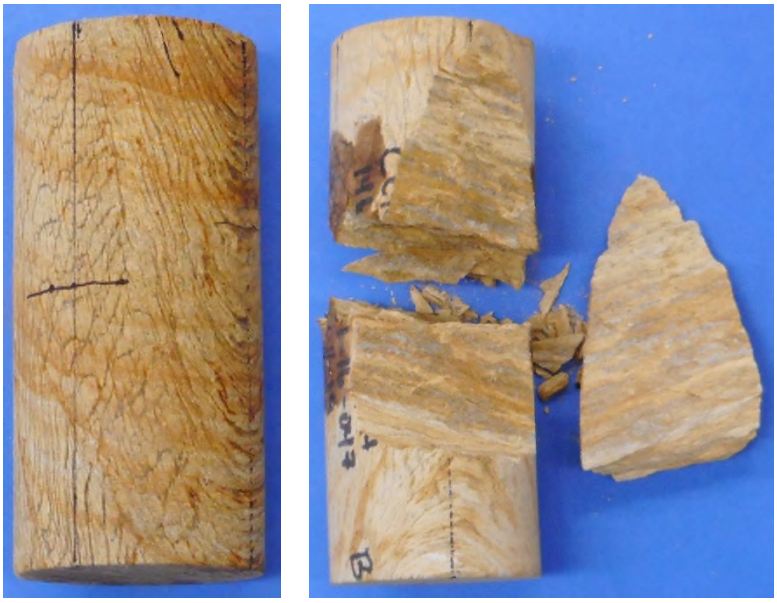
End 1:	Slope of Best Fit Line:	0.00002
	Angle of Best Fit Line:	0.00115
End 2:	Slope of Best Fit Line:	-0.00036
	Angle of Best Fit Line:	-0.02063
	Max Angular Difference:	**0.02**

Parallelism Tolerance Met? **YES**

Perpendicularity (Procedure P1) is met when the difference between max and min readings along each line divided by the diameter is ≤ 0.0043.

	Difference b/w max & min	Divide by Diameter	Meets Tolerance
End 1 Diam 1	0.0003	0.0002	**YES**
End 1 Diam 2	0.0001	0.0001	**YES**
End 2 Diam 1	0.0004	0.0002	**YES**
End 2 Diam 2	0.0006	0.0003	**YES**

Perpendicularity Tolerance Met? **YES**



Date: 3/28/2018

Photographer: Ben Painter

1	**Location / Orientation**	W-19, RC-3 (53.5' – 54.1')
	Remarks	Unconfined Compressive Strength of Rock Core Specimen Before/After (ASTM D7012)



Date: 3/28/2018

Photographer: Ben Painter

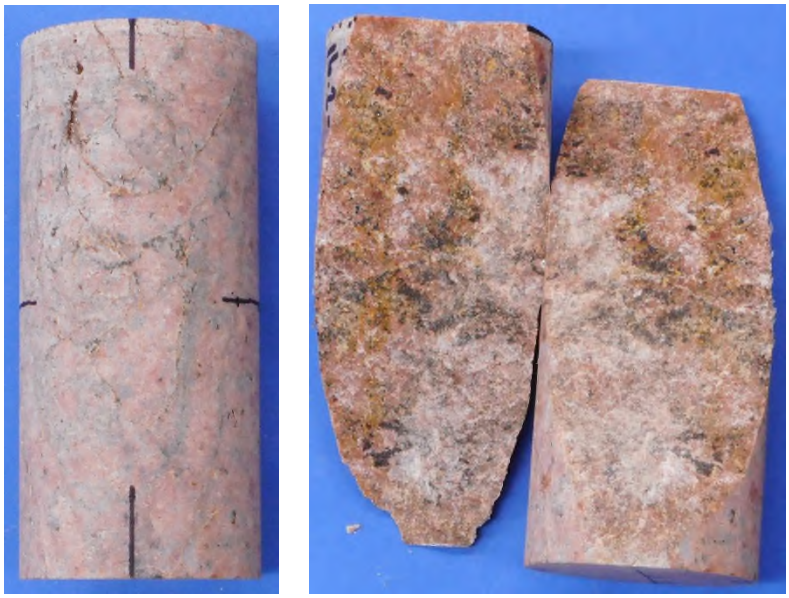
2	**Location / Orientation**	B-32, RC-2 (67.1' – 68.1')
	Remarks	Unconfined Compressive Strength of Rock Core Specimen Before/After (ASTM D7012)



Date: 3/28/2018

Photographer: Ben Painter

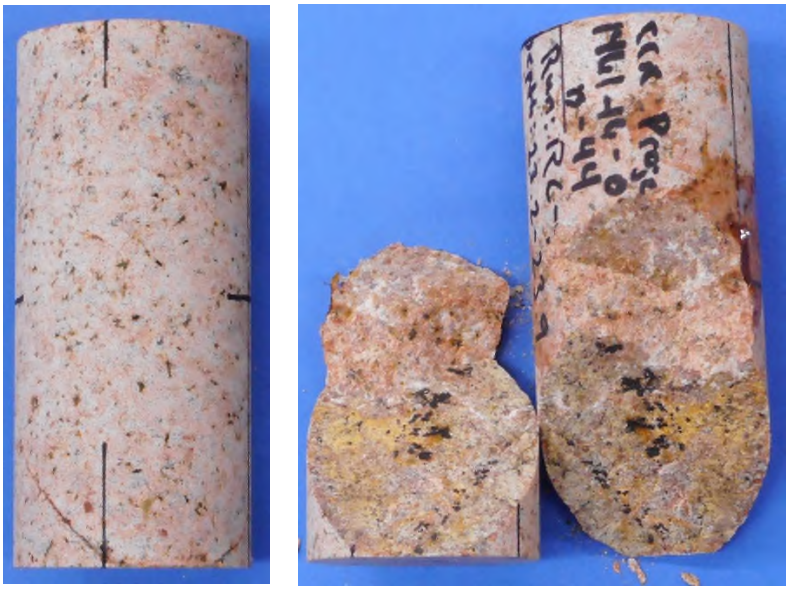
3	**Location / Orientation**	B-44, RC-1 (9.2' – 9.9')
	Remarks	Unconfined Compressive Strength of Rock Core Specimen Before/After (ASTM D7012)



Date: 3/28/2018

Photographer: Ben Painter

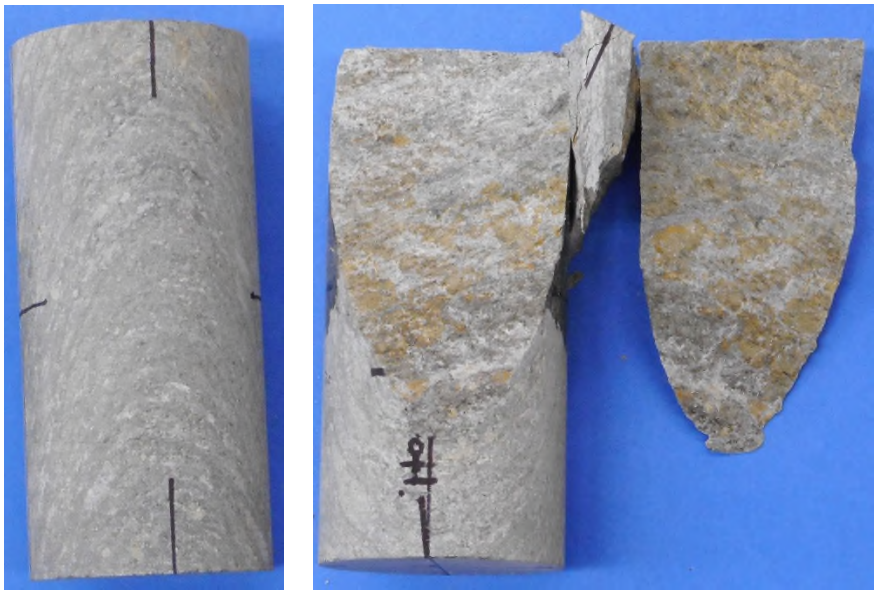
4	**Location / Orientation**	B-44, RC-3 (16.2' – 17.1')
	Remarks	Unconfined Compressive Strength of Rock Core Specimen Before/After (ASTM D7012)



Date: 3/28/2018

Photographer: Ben Painter

5	**Location / Orientation**	B-44, RC-4 (23.2' – 23.9')
	Remarks	Unconfined Compressive Strength of Rock Core Specimen Before/After (ASTM D7012)



Date: 3/28/2018

Photographer: Ben Painter

6	**Location / Orientation**	B-56, RC-1 (84.7' – 85.4')
	Remarks	Unconfined Compressive Strength of Rock Core Specimen Before/After (ASTM D7012)

APPENDIX

SECTION 4 LABORATORY TEST RESULTS

SECTION 4C UD SAMPLES

FME 2025 INVESTIGATION

REV 12/2023

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	CCR Ph. 3D	**PROJECT NO.:**	G5662.030
SAMPLE NUMBER:	25-1801	**DATE REQUESTED:**	6/10/2025
DESCRIPTION OF SOIL:	Various		
TESTED BY:	BW/MW	**DATE OF TESTING:**	6/16/2025
WEIGHED BY:	MW	**DATE OF WEIGHING:**	6/17/2025

BORING NO.	P3D-B1U	P3D-B1U			
SAMPLE NO.	SS-1	SS-2			
SAMPLE DEPTH	2.5 - 2.8	4.5 - 4.7			
WATER CONTENT, W%	15.4	12.0			

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

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

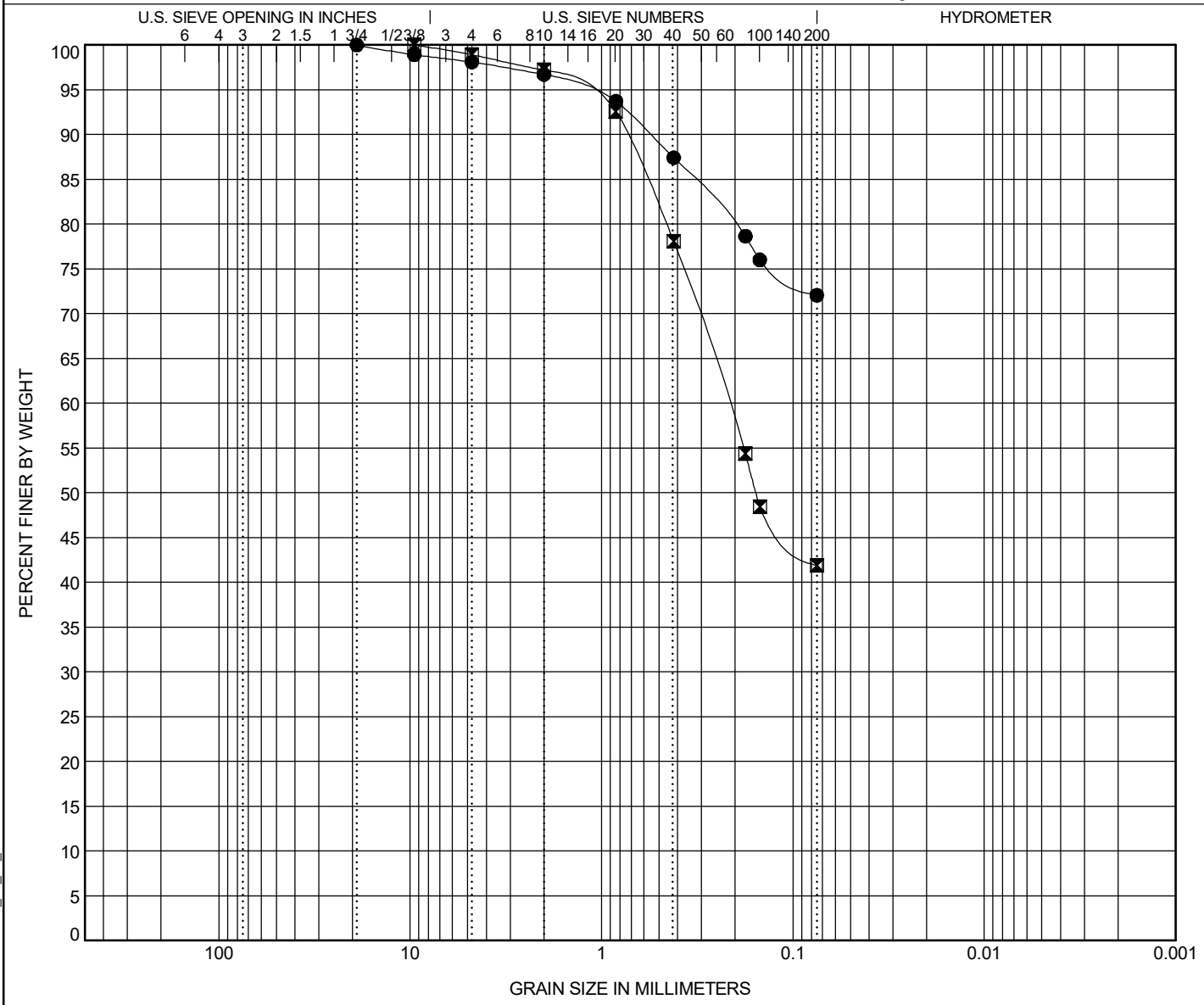
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

This report shall not be reproduced, except in full, without the written approval of F&ME Consultants, Inc.
211 Business Park Boulevard, Columbia SC 29203

GRAIN SIZE DISTRIBUTION

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**P3D-B1U**	**3.3**	**LEAN CLAY with SAND (CL/A-6)**	**37**	**13**	**24**		
⊠	**P3D-B1U**	**4.5**	**CLAYEY SAND (SC/A-6)**	**26**	**8**	**18**		

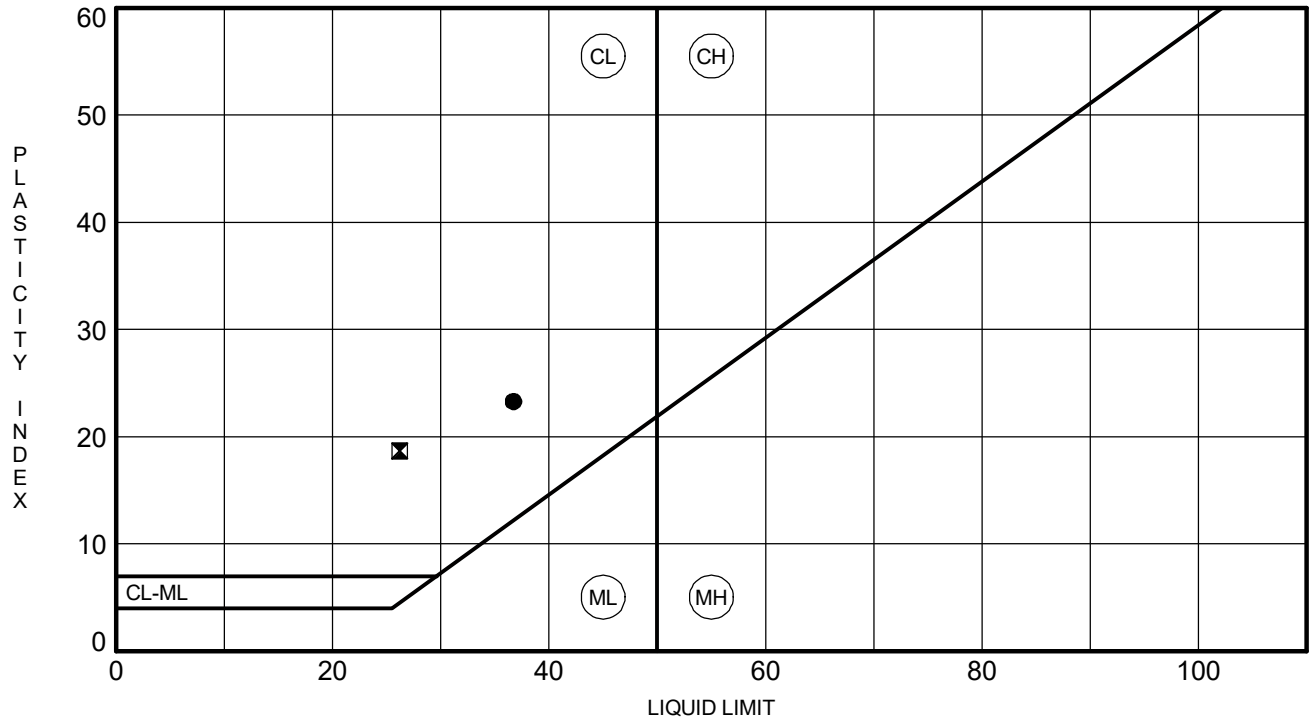
	BOREHOLE	DEPTH	D90	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**P3D-B1U**	**3.3**	**0.558**				**1.9**	**26.0**	**72.1**	
⊠	**P3D-B1U**	**4.5**	**0.744**	**0.217**			**1.1**	**57.0**	**41.9**	

GRAIN SIZE G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 6/27/25

ATTERBERG LIMITS' RESULTS

PROJECT ID P039721 & P039722 **PROJECT NAME** Carolina Crossroads I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**P3D-B1U**	**3.3**	**37**	**13**	**24**	**72.1**	**LEAN CLAY with SAND (CL/A-6)**
⊠	**P3D-B1U**	**4.5**	**26**	**8**	**18**	**41.9**	**CLAYEY SAND (SC/A-6)**

ATTERBERG LIMITS G5662.03- CAROLINA CROSSROADS PH 3D.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 6/27/25

F&ME CONSULTANTS, Inc.
211 Business Park Blvd.
Columbia, South Carolina 29203

SPECIFIC GRAVITY OF SOILS
(ASTM D854 / AASHTO T100)

Project Name:	**CCR Ph. 3D**	**Project No.:**	**G5662.03**
Sample Location:		**Sample/Boring No.:**	**P3D-B1U**
Soil Description	**ST-1.E 18.0" - 20.0"**	**Elevation/Depth of Sample:**	**2.0 - 6.0**
% of Soils Passing #4 Sieve:		**Date Received:**	
Material Excluded:	**Yes**	**X**	**No**
Description of Excluded Material:			
Method:	**A**	**X**	**B**
Tested By:	**L. Johnson**	**Date Tested:**	**6/27/2025**

Boring No.	**P3D-B1U**			
Sample Depth	2.0 - 6.0			
Volume of Flask at 20° C	500 mL			
Method of Air Removal	Boiling			
Mass Flask + Water + Soil (Wb)	754.89			
Test Temperature ° C (Tx)	24			
Mass Flask + Water (Wa)	693.06			
Container No.	D			
Mass of Container + Oven Dry Soil	294.86			
Mass of Container	194.86			
Mass of Oven Dry Soil (Wo)	100.00			
Specific Gravity @ Test Temperature **Wo/[Wo+(Wa-Wb)]**	2.620			
Specific Gravity (SG) **K x Specific Gravity @ Test Temperature**	2.618			

K = **Related Density of Water @ Test Temperature** / **Relative Density of Water @ 20° C**

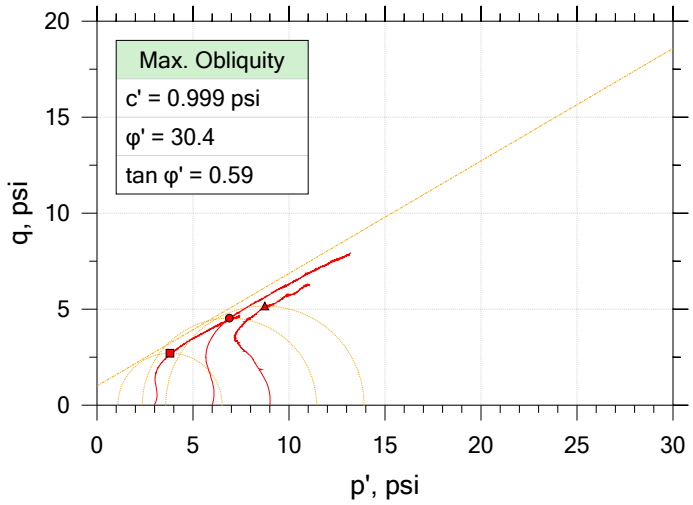
Average Specific Gravity of Soils =

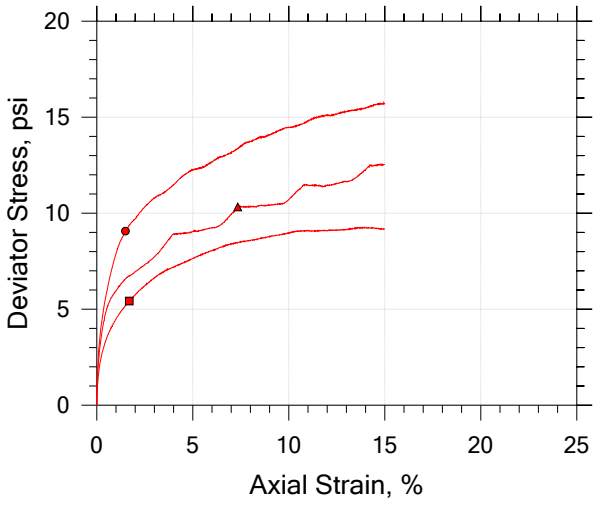
Remarks:

SIGNATURE:

This report shall not be reproduced, except in full,
without the written approval of F&ME Consultants, Inc.
211 Business Park Blvd., Columbia, SC 29203

Consolidated Undrained by AASHTO T297





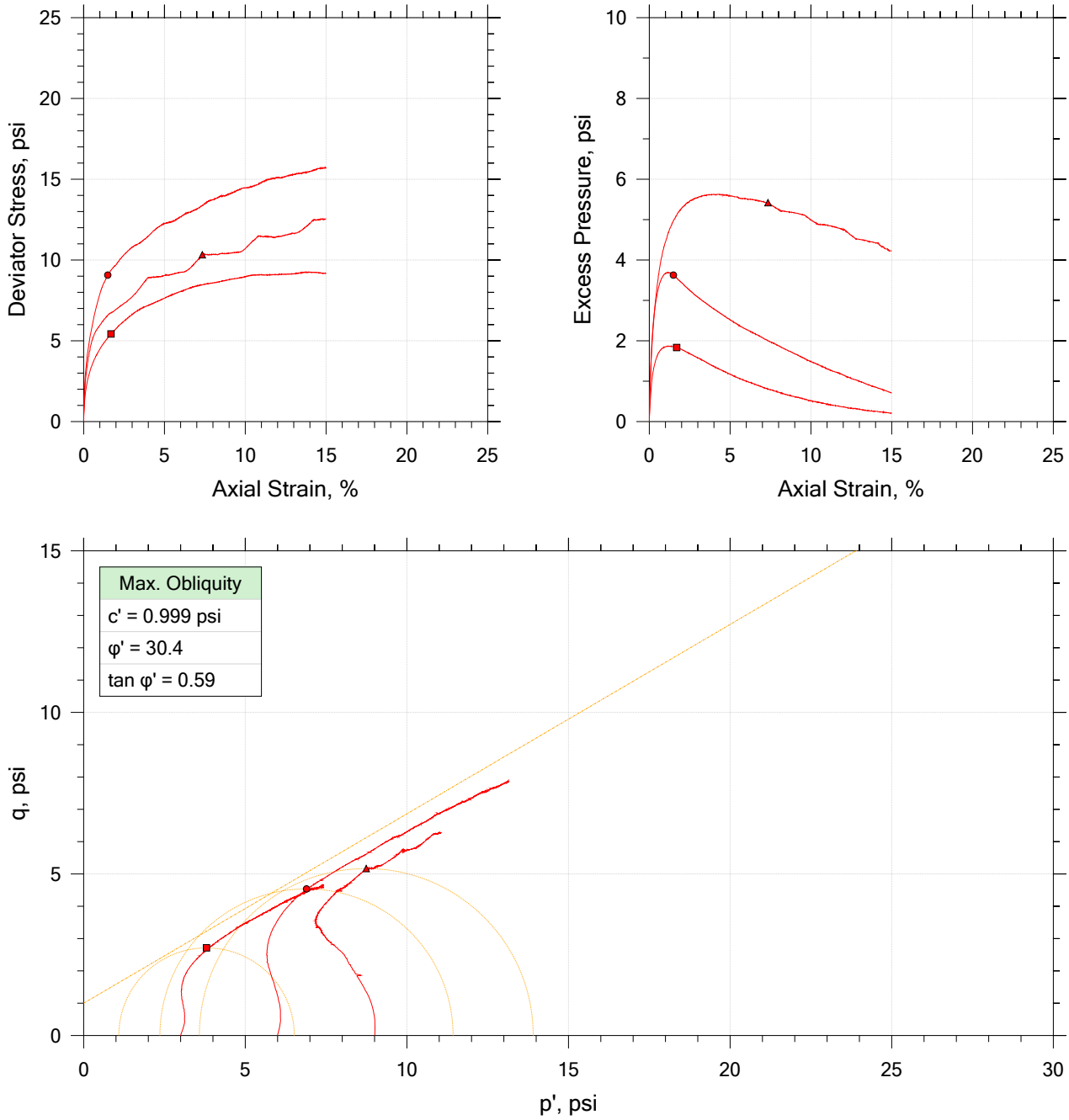
		■	●	▲
Symbol				
Sample ID		25-1801	25-1810	25-1810
Depth		4.0' - 6.0'	2.0' - 6.0'	2.0' - 6.0'
Test Number		ST-1.B	ST-1.C	ST-1.C
Initial	Height, in	5.879	6.057	5.987
	Diameter, in	2.834	2.855	2.837
	Moisture Content (from Cuttings), %	15.3	15.3	12.0
	Dry Density, pcf	110.	113.	113.
	Saturation (Wet Method), %	79.7	84.9	66.8
	Void Ratio	0.516	0.485	0.481
Final	Moisture Content, %	18.8	16.8	14.8
	Dry Density, pcf	111.	115.	120.
	Cross-Sectional Area (Method A), in²	6.271	6.296	6.079
	Saturation, %	100.0	100.0	100.0
	Void Ratio	0.505	0.450	0.396
	Back Pressure, psi	62.00	67.99	59.00
Vertical Effective Consolidation Stress, psi		2.986	5.965	8.928
Horizontal Effective Consolidation Stress, psi		2.997	6.001	9.006
Vertical Strain after Consolidation, %		0.06810	0.4126	1.435
Volumetric Strain after Consolidation, %		0.5227	1.454	4.080
Time to 50% Consolidation, min		3.000	0.6000	4.000
Shear Strength, psi		2.713	4.536	5.165
Strain at Failure, %		1.69	1.49	7.34
Strain Rate, %/min		0.0005000	0.0001000	0.0001000
Deviator Stress at Failure, psi		5.427	9.072	10.33
Effective Minor Principal Stress at Failure, psi		1.088	2.358	3.578
Effective Major Principal Stress at Failure, psi		6.515	11.43	13.91
B-Value		0.95	0.95	0.95

Notes:
- Before Shear Saturation set to 100% for phase calculation.
- Moisture Content determined by ASTM D2216.
- Atterberg Limits determined by ASTM D4318.
- Deviator Stress includes membrane correction.
- Values for c and φ determined from best-fit straight line for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site conditions.

F&ME CONSULTANTS

Project Name: CCR Ph. 3D	Location: Richland/Lexington County	Project Number: P027662
Boring Number: P3D-B1U	Tester: RMC	Checker: WAP/ WJG
Sample Number: 25-1801	Test Date: 6/16/2025	Depth: 4.0' - 6.0'
Test Number: ABC	Preparation: Undisturbed	Elevation:
Description: Various, See Shelby Tube Logs		
Remarks:		

Consolidated Undrained by AASHTO T297

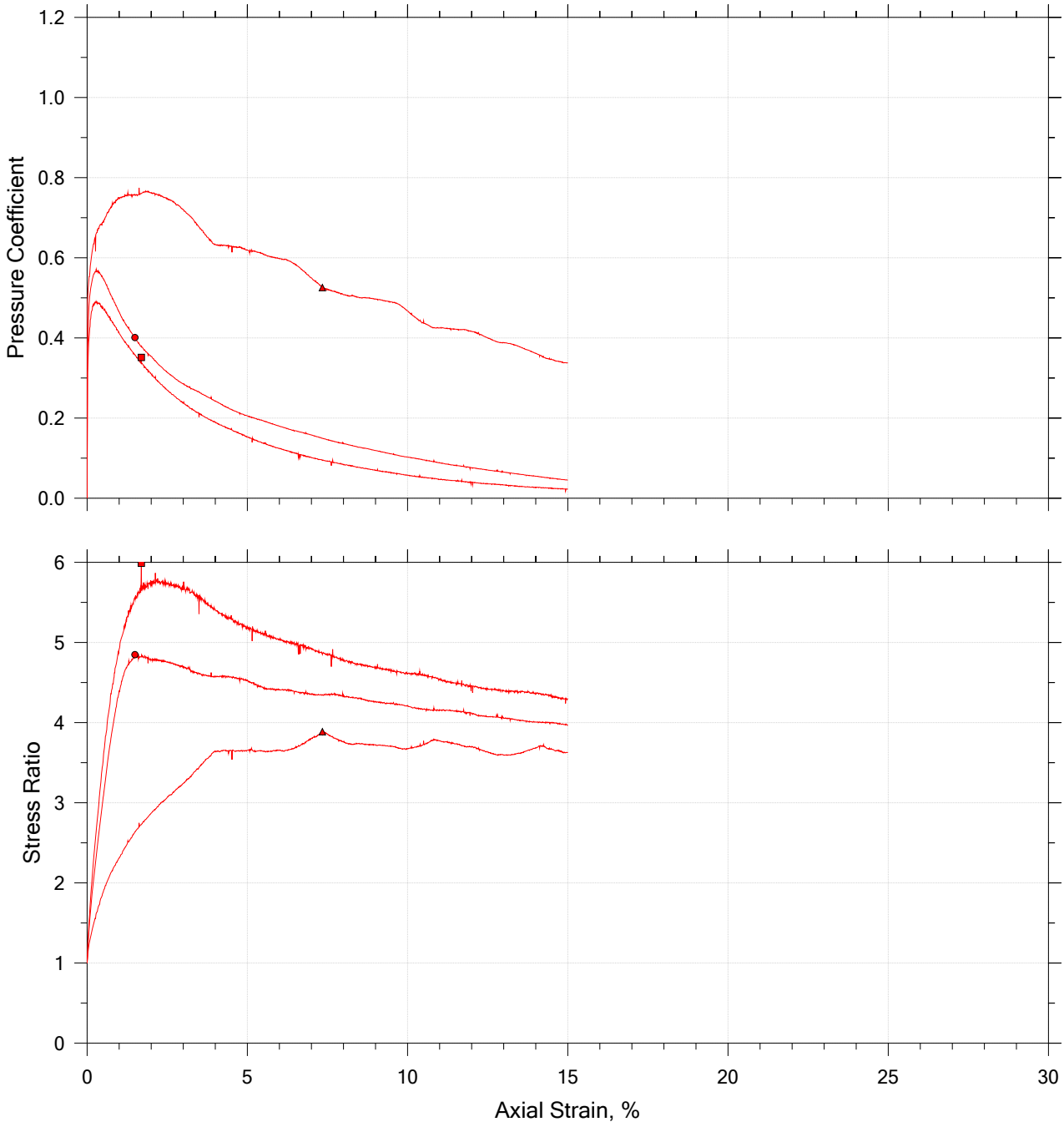


	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
■	25-1801	ST-1.B	4.0' - 6.0'	RMC	6/16/2025	WAP/ WJG	6/27/2025	G5662.03_P3D-B1U_ST-1.B_testA.dat
●	25-1810	ST-1.C	2.0' - 6.0'	RMC	6/16/2025	WAP/ WJG	6/27/2025	G5662.030_P3D-B1U_ST-1.C_TestB.da
▲	25-1810	ST-1.C	2.0' - 6.0'	RMC	6/16/2025	WAP/ WJG	6/27/2025	G5662.030_P3D-B1U_ST-2.A_TestC.da

F&ME CONSULTANTS

Project Name: CCR Ph. 3D	Location: Richland/Lexington County	Project Number: P027662
Boring Number: P3D-B1U	Tester: RMC	Checker: WAP/ WJG
Sample Number: 25-1801	Test Date: 6/16/2025	Depth: 4.0' - 6.0'
Test Number: ABC	Preparation: Undisturbed	Elevation:
Description: Various, See Shelby Tube Logs		
Remarks:		

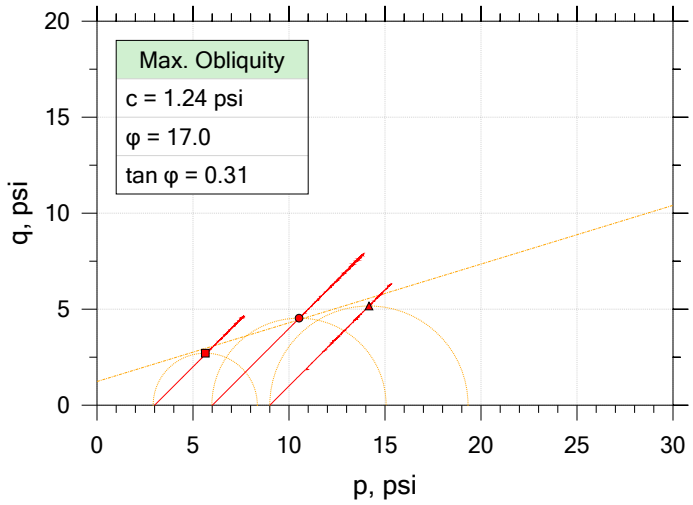
Consolidated Undrained by AASHTO T297

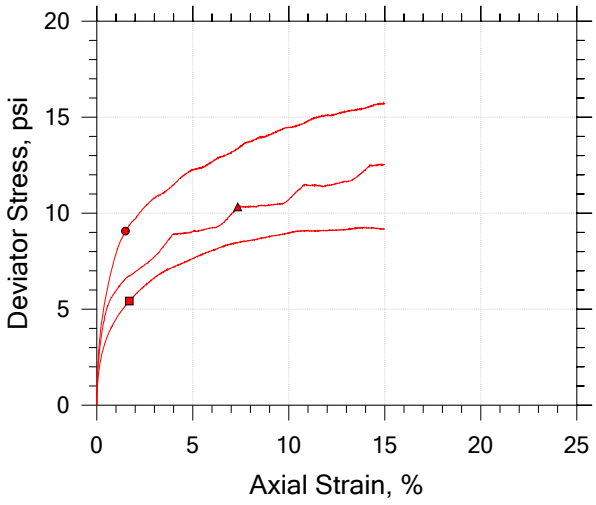


	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
■	25-1801	ST-1.B	4.0' - 6.0'	RMC	6/16/2025	WAP/ WJG	6/27/2025	G5662.03_P3D-B1U_ST-1.B_testA.dat
●	25-1810	ST-1.C	2.0' - 6.0'	RMC	6/16/2025	WAP/ WJG	6/27/2025	G5662.030_P3D-B1U_ST-1.C_TestB.da
▲	25-1810	ST-1.C	2.0' - 6.0'	RMC	6/16/2025	WAP/ WJG	6/27/2025	G5662.030_P3D-B1U_ST-2.A_TestC.da

F&ME CONSULTANTS	Project Name: CCR Ph. 3D	Location: Richland/Lexington County	Project Number: P027662
	Boring Number: P3D-B1U	Tester: RMC	Checker: WAP/ WJG
	Sample Number: 25-1801	Test Date: 6/16/2025	Depth: 4.0' - 6.0'
	Test Number: ABC	Preparation: Undisturbed	Elevation:
	Description: Various, See Shelby Tube Logs		
	Remarks:		

Consolidated Undrained by AASHTO T297





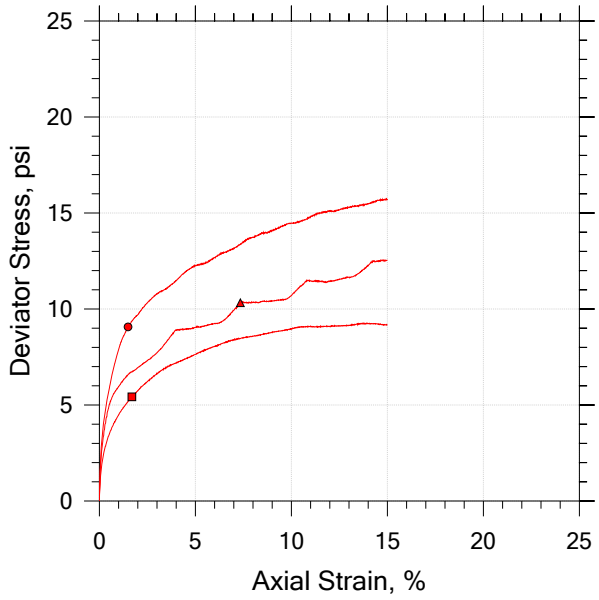
Symbol		■	●	▲	
Sample ID		25-1801	25-1810	25-1810	
Depth		4.0' - 6.0'	2.0' - 6.0'	2.0' - 6.0'	
Test Number		ST-1.B	ST-1.C	ST-1.C	
Initial	Height, in	5.879	6.057	5.987	
	Diameter, in	2.834	2.855	2.837	
	Moisture Content (from Cuttings), %	15.3	15.3	12.0	
	Dry Density, pcf	110.	113.	113.	
	Saturation (Wet Method), %	79.7	84.9	66.8	
	Void Ratio	0.516	0.485	0.481	
Final	Moisture Content, %	18.8	16.8	14.8	
	Dry Density, pcf	111.	115.	120.	
	Cross-Sectional Area (Method A), in²	6.271	6.296	6.079	
	Saturation, %	100.0	100.0	100.0	
	Void Ratio	0.505	0.450	0.396	
	Back Pressure, psi	62.00	67.99	59.00	
Vertical Effective Consolidation Stress, psi		2.986	5.965	8.928	
Horizontal Effective Consolidation Stress, psi		2.997	6.001	9.006	
Vertical Strain after Consolidation, %		0.06810	0.4126	1.435	
Volumetric Strain after Consolidation, %		0.5227	1.454	4.080	
Time to 50% Consolidation, min		3.000	0.6000	4.000	
Shear Strength, psi		2.713	4.536	5.165	
Strain at Failure, %		1.69	1.49	7.34	
Strain Rate, %/min		0.0005000	0.0001000	0.0001000	
Deviator Stress at Failure, psi		5.427	9.072	10.33	
Effective Minor Principal Stress at Failure, psi		1.088	2.358	3.578	
Effective Major Principal Stress at Failure, psi		6.515	11.43	13.91	
B-Value		0.95	0.95	0.95	

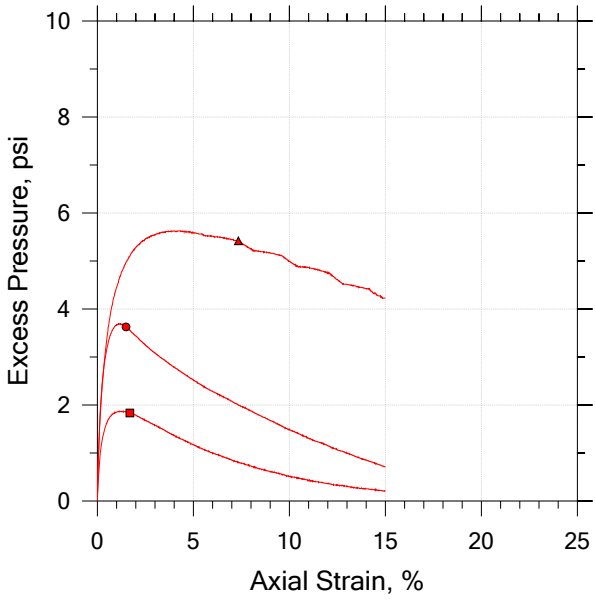
Notes:
- Before Shear Saturation set to 100% for phase calculation.
- Moisture Content determined by ASTM D2216.
- Atterberg Limits determined by ASTM D4318.
- Deviator Stress includes membrane correction.
- Values for c and φ determined from best-fit straight line for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site conditions.

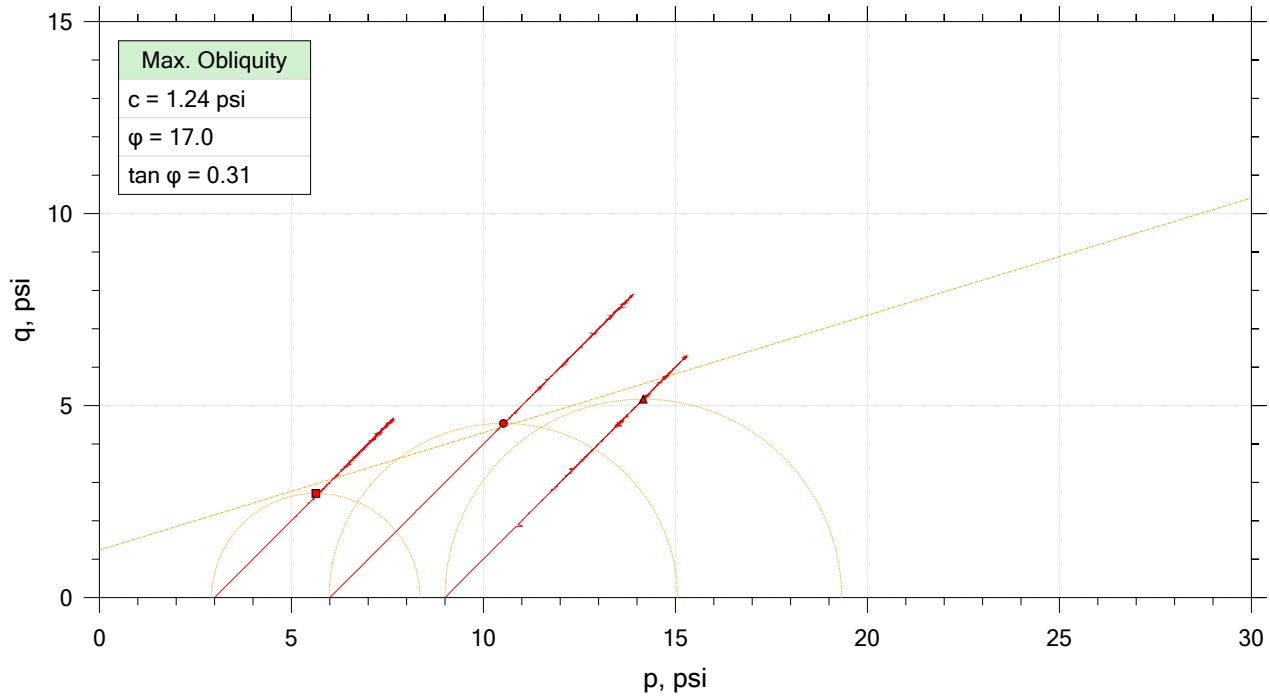
F&ME CONSULTANTS

Project Name: CCR Ph. 3D	Location: Richland/Lexington County	Project Number: P027662
Boring Number: P3D-B1U	Tester: RMC	Checker: WAP/ WJG
Sample Number: 25-1801	Test Date: 6/16/2025	Depth: 4.0' - 6.0'
Test Number: ABC	Preparation: Undisturbed	Elevation:
Description: Various, See Shelby Tube Logs		
Remarks:		

Consolidated Undrained by AASHTO T297



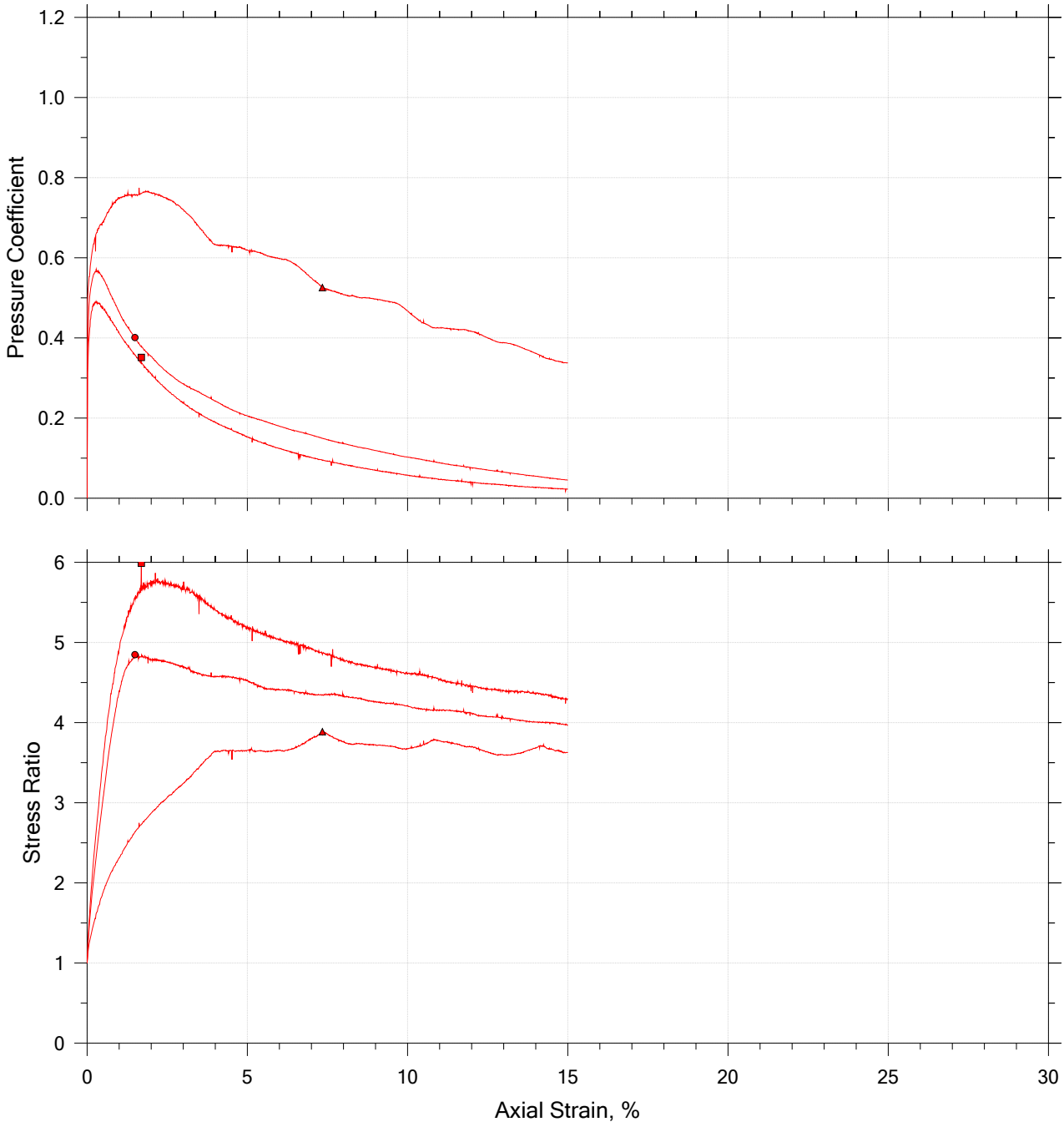




	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
■	25-1801	ST-1.B	4.0' - 6.0'	RMC	6/16/2025	WAP/ WJG	6/27/2025	G5662.03_P3D-B1U_ST-1.B_testA.dat
●	25-1810	ST-1.C	2.0' - 6.0'	RMC	6/16/2025	WAP/ WJG	6/27/2025	G5662.030_P3D-B1U_ST-1.C_TestB.da
▲	25-1810	ST-1.C	2.0' - 6.0'	RMC	6/16/2025	WAP/ WJG	6/27/2025	G5662.030_P3D-B1U_ST-2.A_TestC.da

Project Name: CCR Ph. 3D	Location: Richland/Lexington County	Project Number: P027662
Boring Number: P3D-B1U	Tester: RMC	Checker: WAP/ WJG
Sample Number: 25-1801	Test Date: 6/16/2025	Depth: 4.0' - 6.0'
Test Number: ABC	Preparation: Undisturbed	Elevation:
Description: Various, See Shelby Tube Logs		
Remarks:		

Consolidated Undrained by AASHTO T297

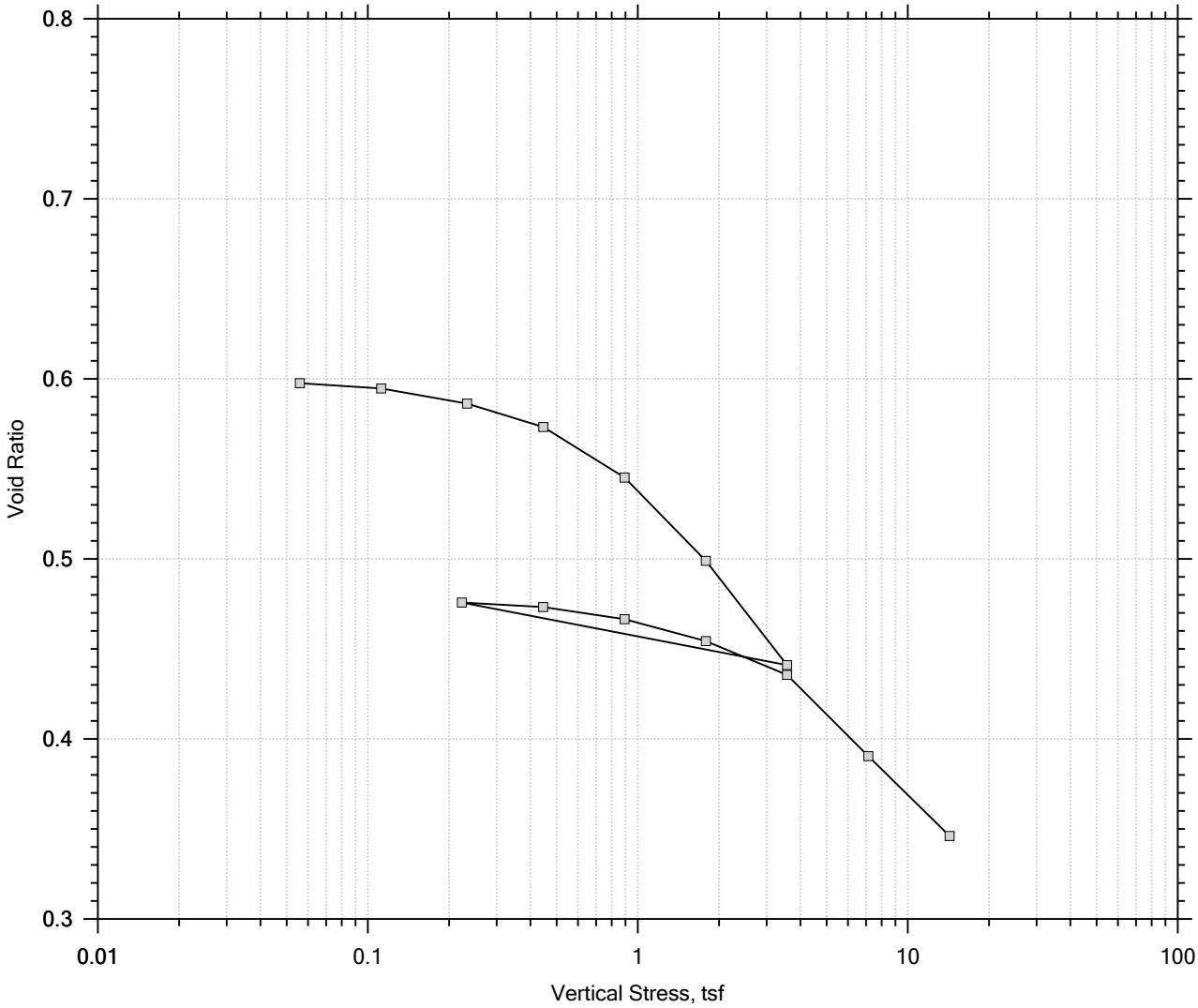


	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
■	25-1801	ST-1.B	4.0' - 6.0'	RMC	6/16/2025	WAP/ WJG	6/27/2025	G5662.03_P3D-B1U_ST-1.B_testA.dat
●	25-1810	ST-1.C	2.0' - 6.0'	RMC	6/16/2025	WAP/ WJG	6/27/2025	G5662.030_P3D-B1U_ST-1.C_TestB.da
▲	25-1810	ST-1.C	2.0' - 6.0'	RMC	6/16/2025	WAP/ WJG	6/27/2025	G5662.030_P3D-B1U_ST-2.A_TestC.da

F&ME CONSULTANTS	Project Name: CCR Ph. 3D	Location: Richland/Lexington County	Project Number: P027662
	Boring Number: P3D-B1U	Tester: RMC	Checker: WAP/ WJG
	Sample Number: 25-1801	Test Date: 6/16/2025	Depth: 4.0' - 6.0'
	Test Number: ABC	Preparation: Undisturbed	Elevation:
	Description: Various, See Shelby Tube Logs		
	Remarks:		

One-Dimensional Consolidation by ASTM D2435 - Method B

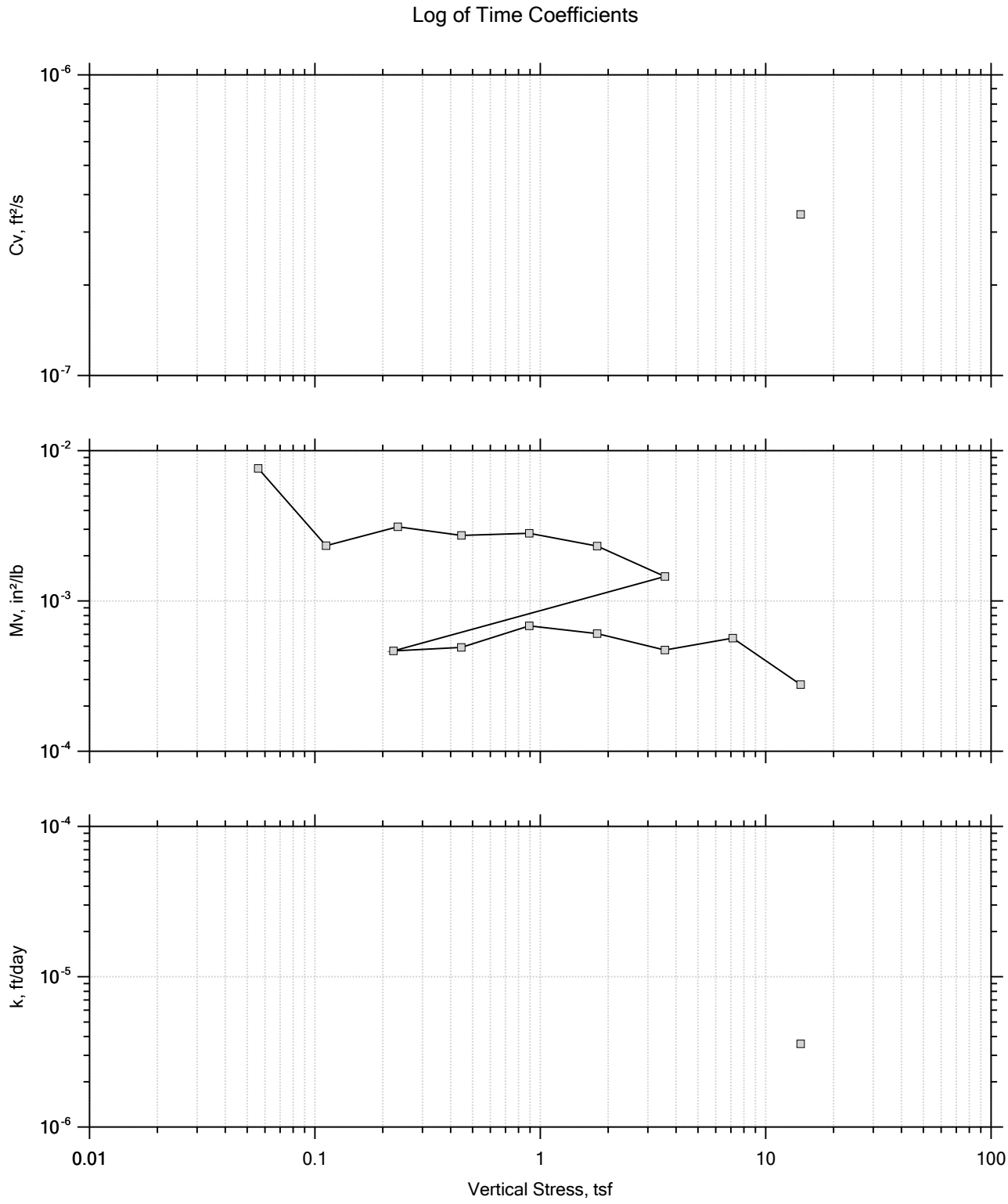
Summary Report



					Before Test	After Test
Current Vertical Effective Stress: 0.12 tsf				Water Content, %	19.24	15.91
Preconsolidation Stress: 1 tsf				Dry Unit Weight, pcf	104.49	121.22
Compression Ratio: 0.65				Saturation, %	85.24	111.07
Diameter: 2.5 in		Height: 1 in		Void Ratio	0.61	0.39
LL: 37	PL: 13	PI: 24	GS: 2.69			

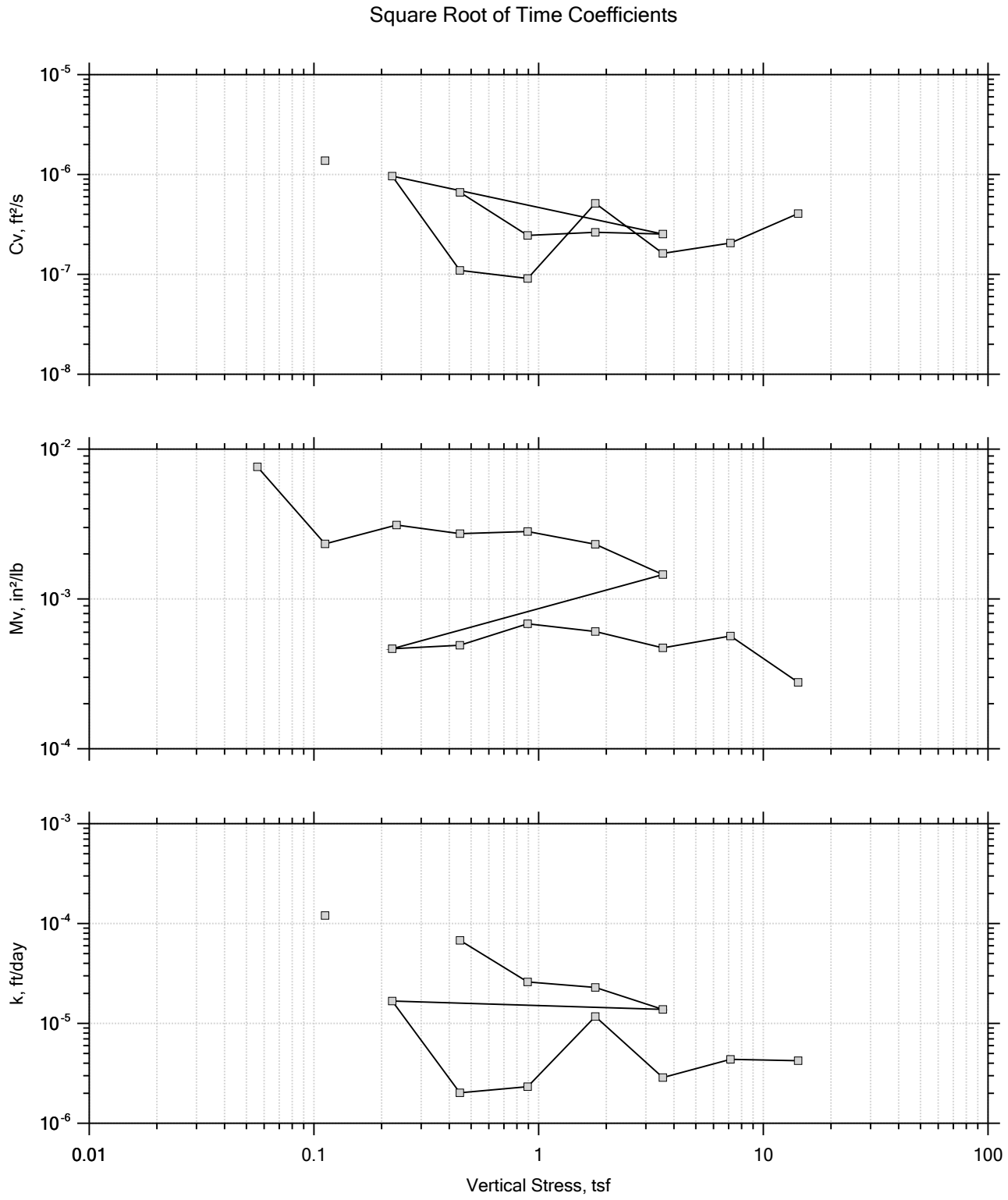
F&ME CONSULTANTS	Project: CCR Ph. 3D	Location: Richland/Lexington County	Project No.: G5662.030
	Boring No.: P3D-B1U	Tested By: RMC/WAP	Checked By: WAP/WJG
	Sample No.: 25-1630	Test Date: 6/20/2025	Depth: 2.0' - 6.0'
	Test No.: ST-2.D	Sample Type: Undisturbed	Elevation:
	Description: Lean CLAY (CL/A-6) with Sand, LL=37, PL=13, PI=24, %200=72.1		
	Remarks:		
	Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B



Project: CCR Ph. 3D	Location: Richland/Lexington County	Project No.: G5662.030
Boring No.: P3D-B1U	Tested By: RMC/WAP	Checked By: WAP/WJG
Sample No.: 25-1630	Test Date: 6/20/2025	Depth: 2.0' - 6.0'
Test No.: ST-2.D	Sample Type: Undisturbed	Elevation:
Description: Lean CLAY (CL/A-6) with Sand, LL=37, PL=13, PI=24, %200=72.1		
Remarks:		

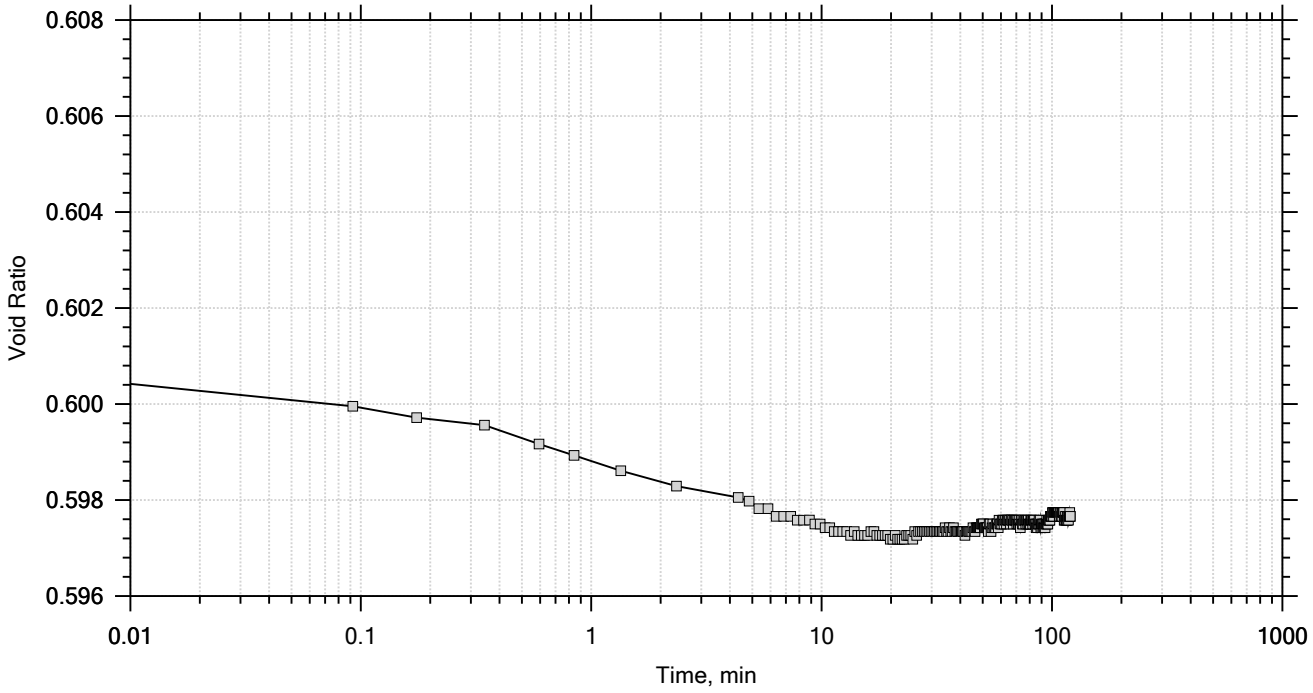
One-Dimensional Consolidation by ASTM D2435 - Method B

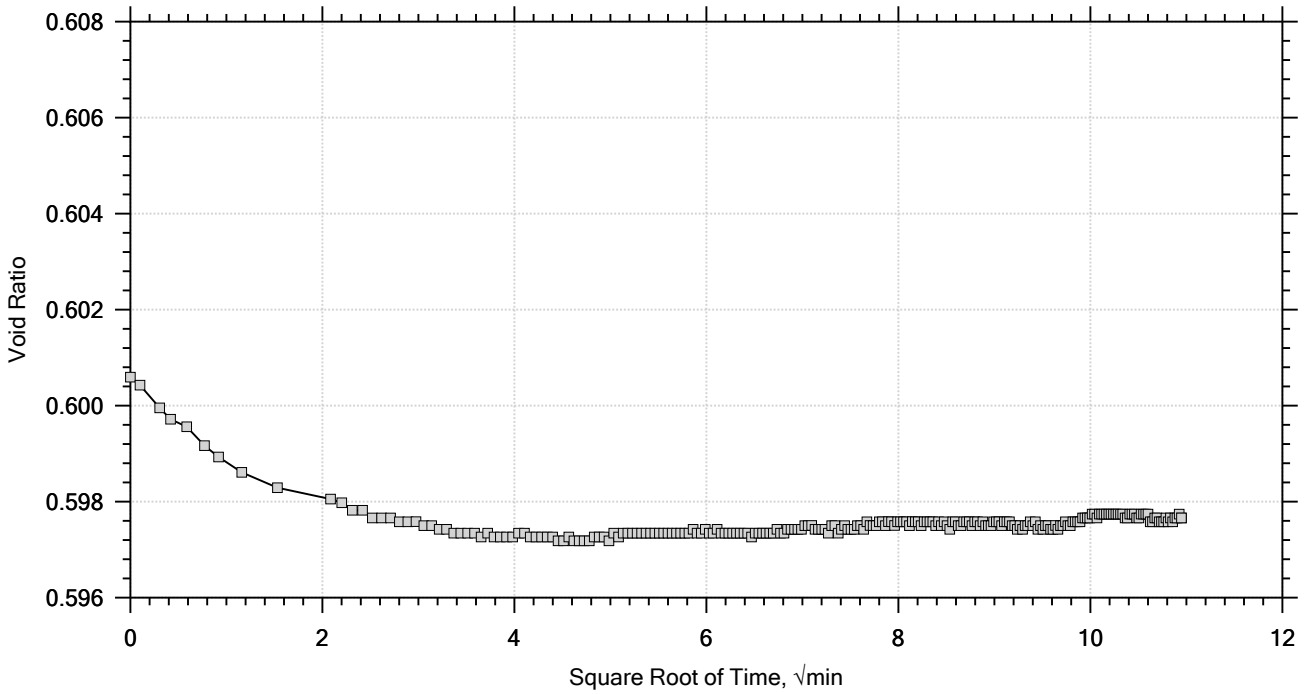


F&ME CONSULTANTS	Project: CCR Ph. 3D	Location: Richland/Lexington County	Project No.: G5662.030
	Boring No.: P3D-B1U	Tested By: RMC/WAP	Checked By: WAP/WJG
	Sample No.: 25-1630	Test Date: 6/20/2025	Depth: 2.0' - 6.0'
	Test No.: ST-2.D	Sample Type: Undisturbed	Elevation:
	Description: Lean CLAY (CL/A-6) with Sand, LL=37, PL=13, PI=24, %200=72.1		
	Remarks:		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 1 of 14
Constant Load Step
Stress: 0.056 tsf

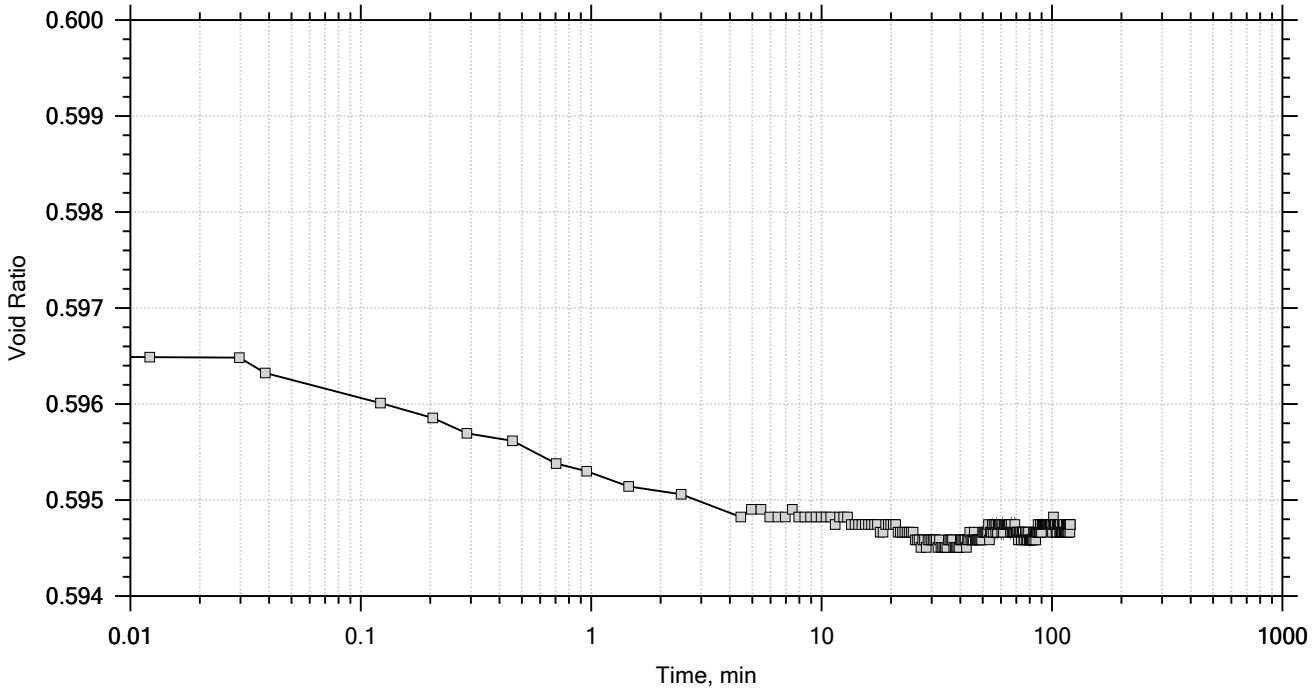


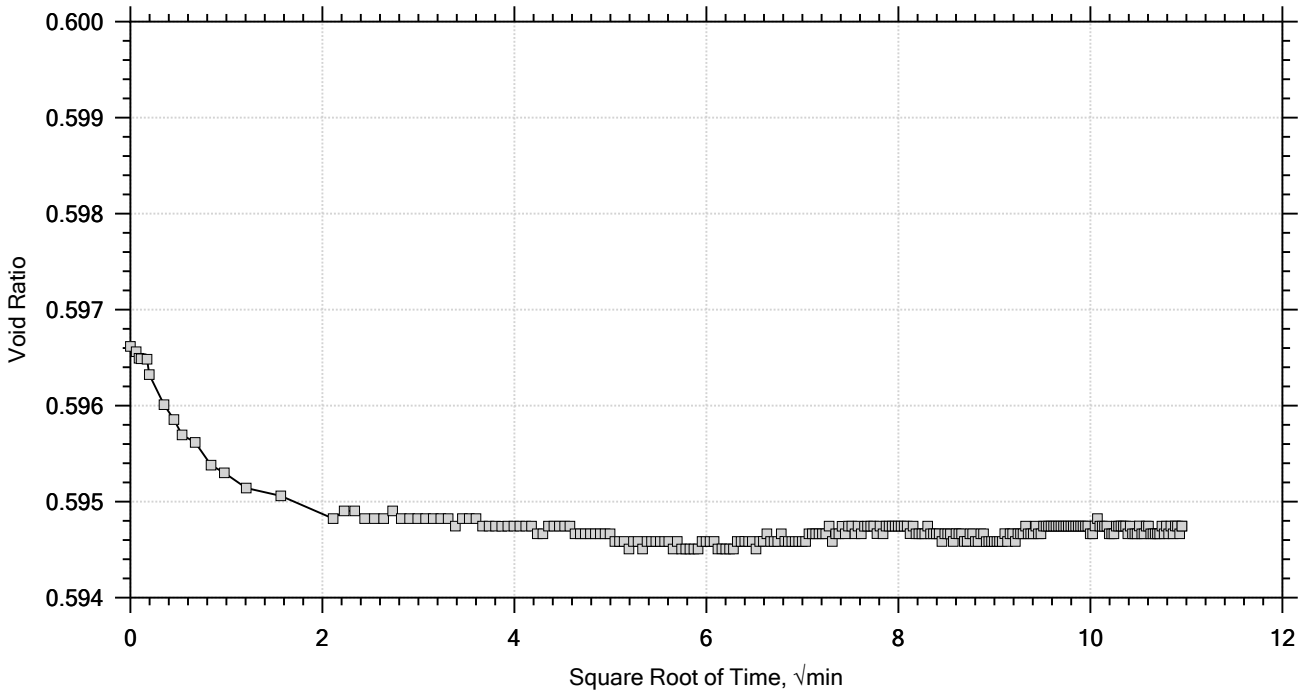


Project: CCR Ph. 3D	Location: Richland/Lexington County	Project No.: G5662.030
Boring No.: P3D-B1U	Tested By: RMC/WAP	Checked By: WAP/WJG
Sample No.: 25-1630	Test Date: 6/20/2025	Depth: 2.0' - 6.0'
Test No.: ST-2.D	Sample Type: Undisturbed	Elevation:
Description: Lean CLAY (CL/A-6) with Sand, LL=37, PL=13, PI=24, %200=72.1		
Remarks:		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 2 of 14
Constant Load Step
Stress: 0.112 tsf

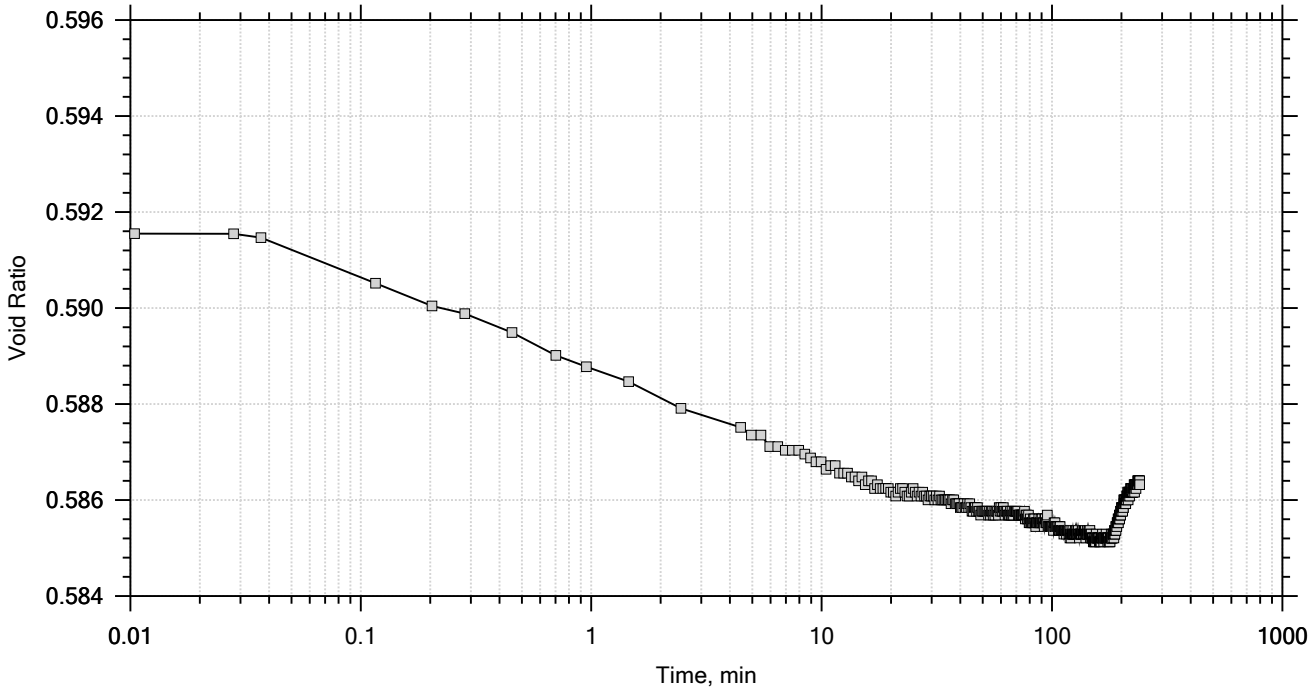


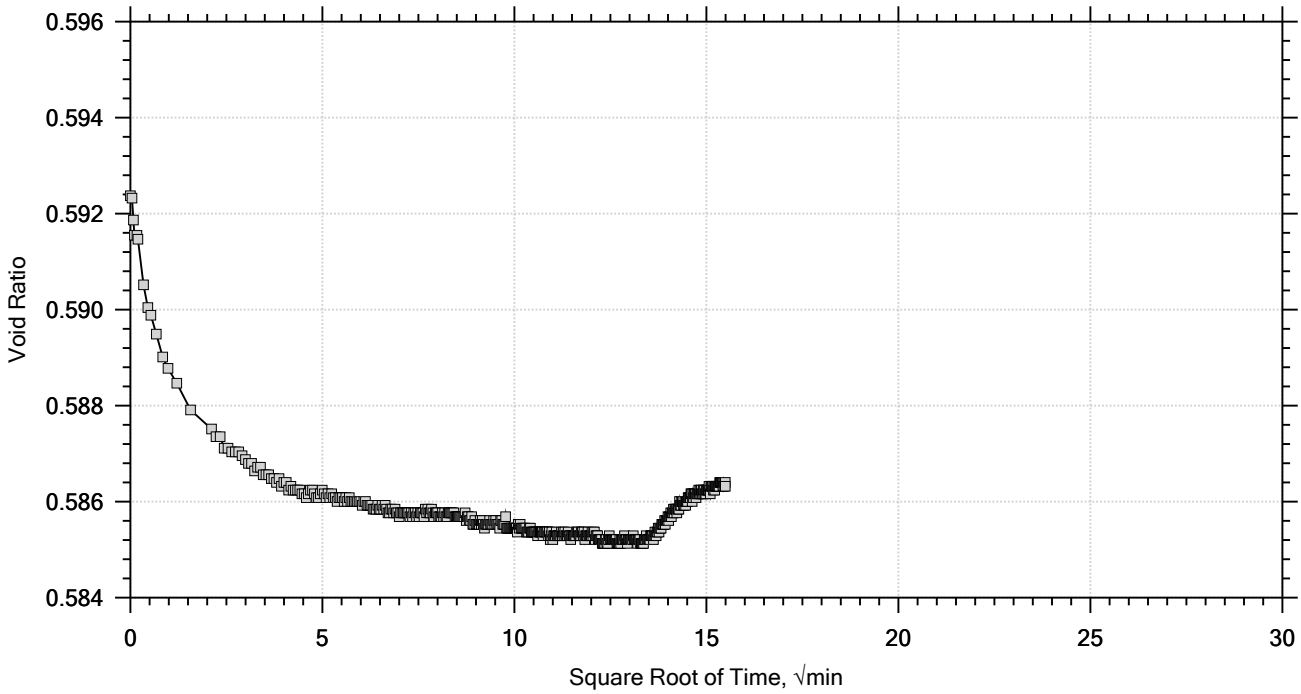


Project: CCR Ph. 3D	Location: Richland/Lexington County	Project No.: G5662.030
Boring No.: P3D-B1U	Tested By: RMC/WAP	Checked By: WAP/WJG
Sample No.: 25-1630	Test Date: 6/20/2025	Depth: 2.0' - 6.0'
Test No.: ST-2.D	Sample Type: Undisturbed	Elevation:
Description: Lean CLAY (CL/A-6) with Sand, LL=37, PL=13, PI=24, %200=72.1		
Remarks:		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 3 of 14
Constant Load Step
Stress: 0.233 tsf

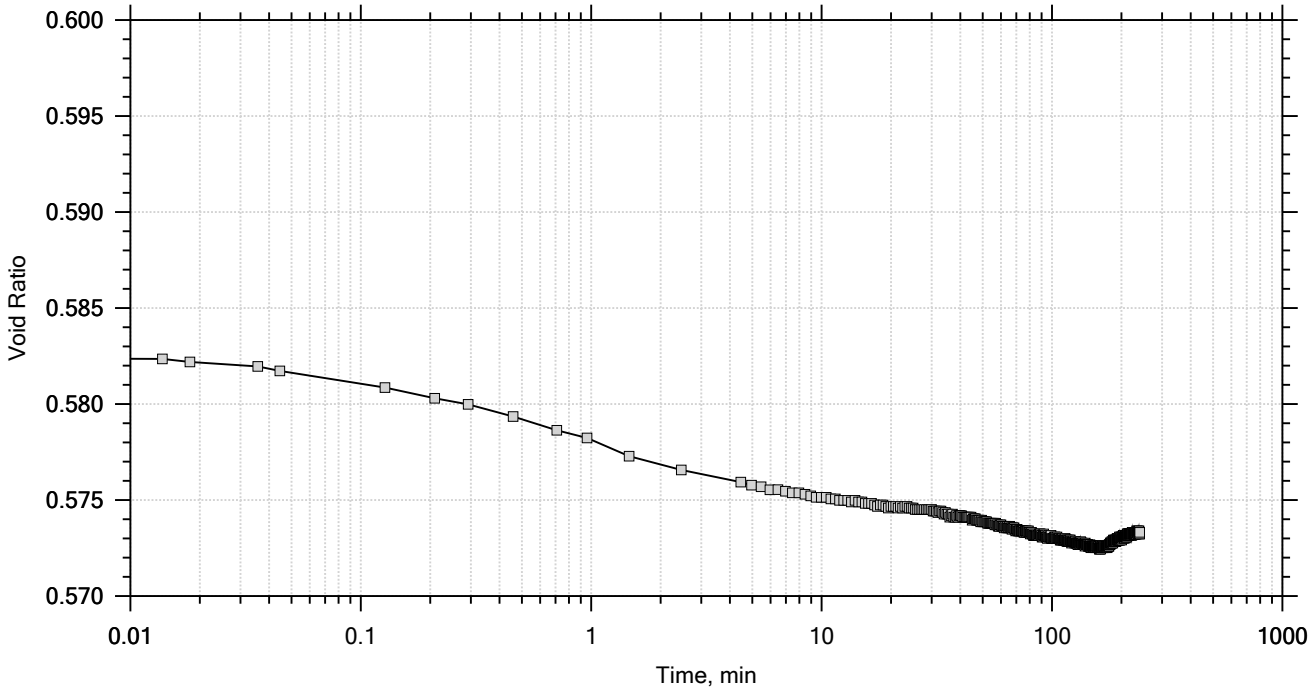


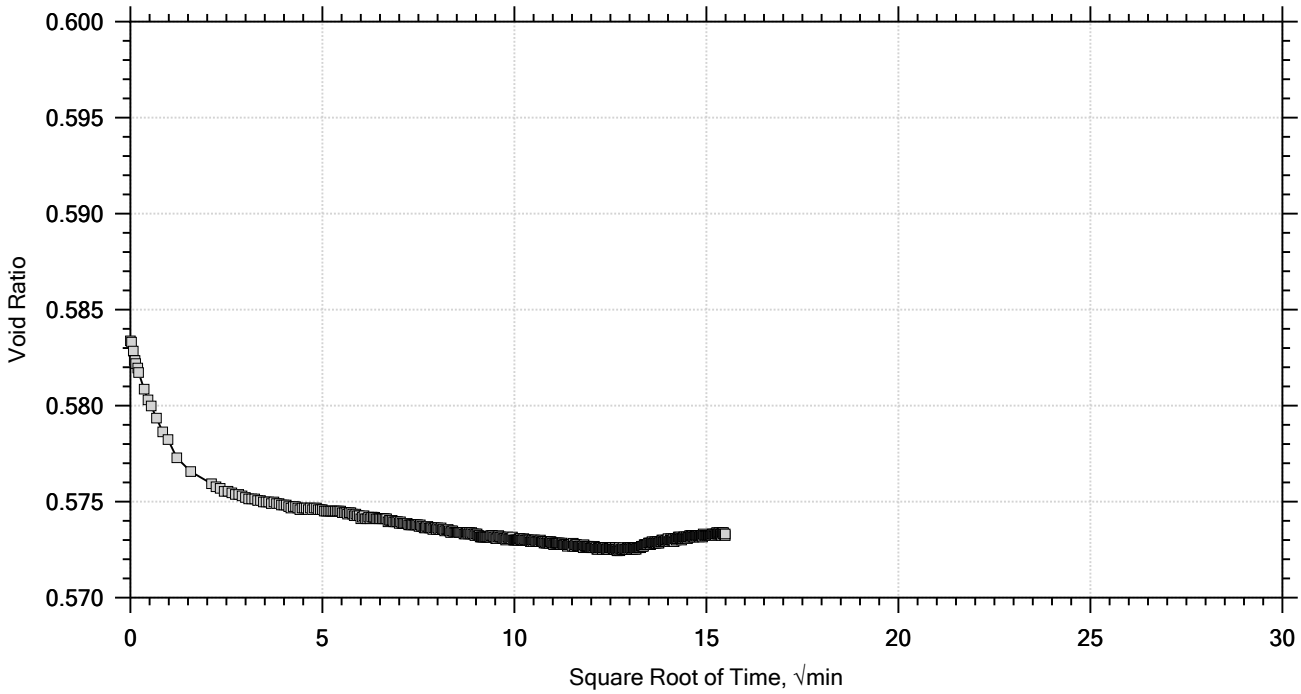


Project: CCR Ph. 3D	Location: Richland/Lexington County	Project No.: G5662.030
Boring No.: P3D-B1U	Tested By: RMC/WAP	Checked By: WAP/WJG
Sample No.: 25-1630	Test Date: 6/20/2025	Depth: 2.0' - 6.0'
Test No.: ST-2.D	Sample Type: Undisturbed	Elevation:
Description: Lean CLAY (CL/A-6) with Sand, LL=37, PL=13, PI=24, %200=72.1		
Remarks:		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 4 of 14
Constant Load Step
Stress: 0.446 tsf

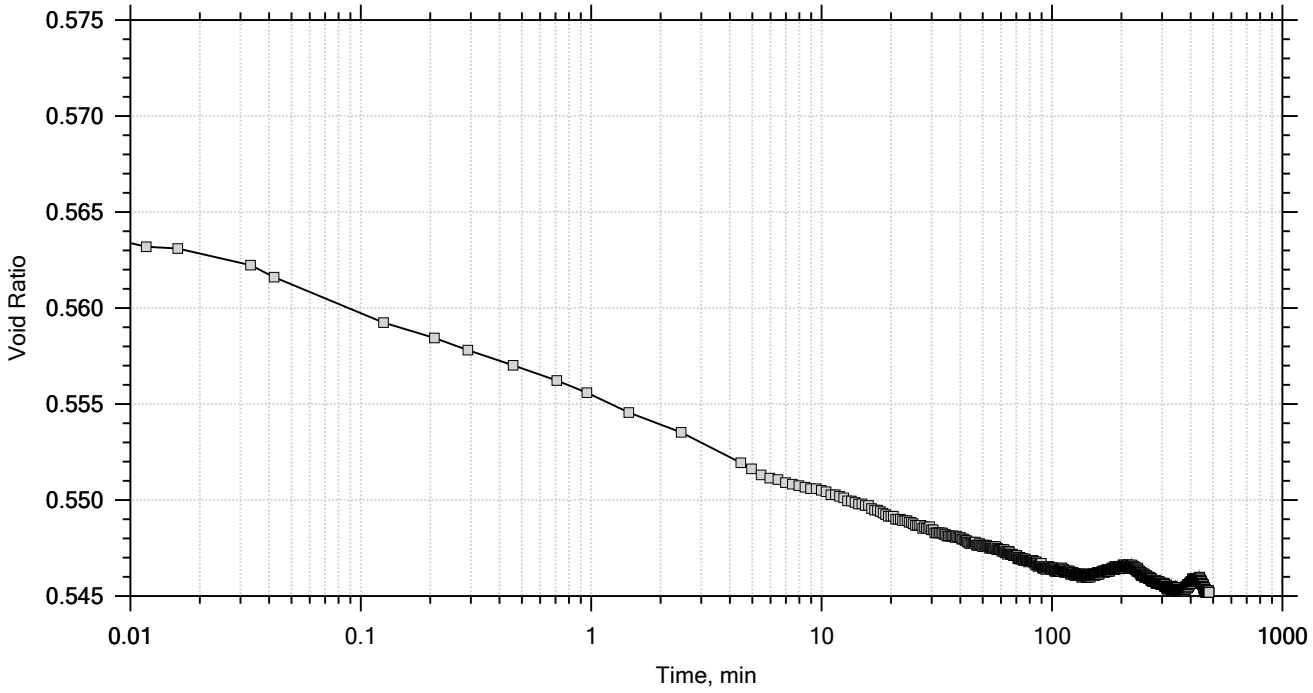


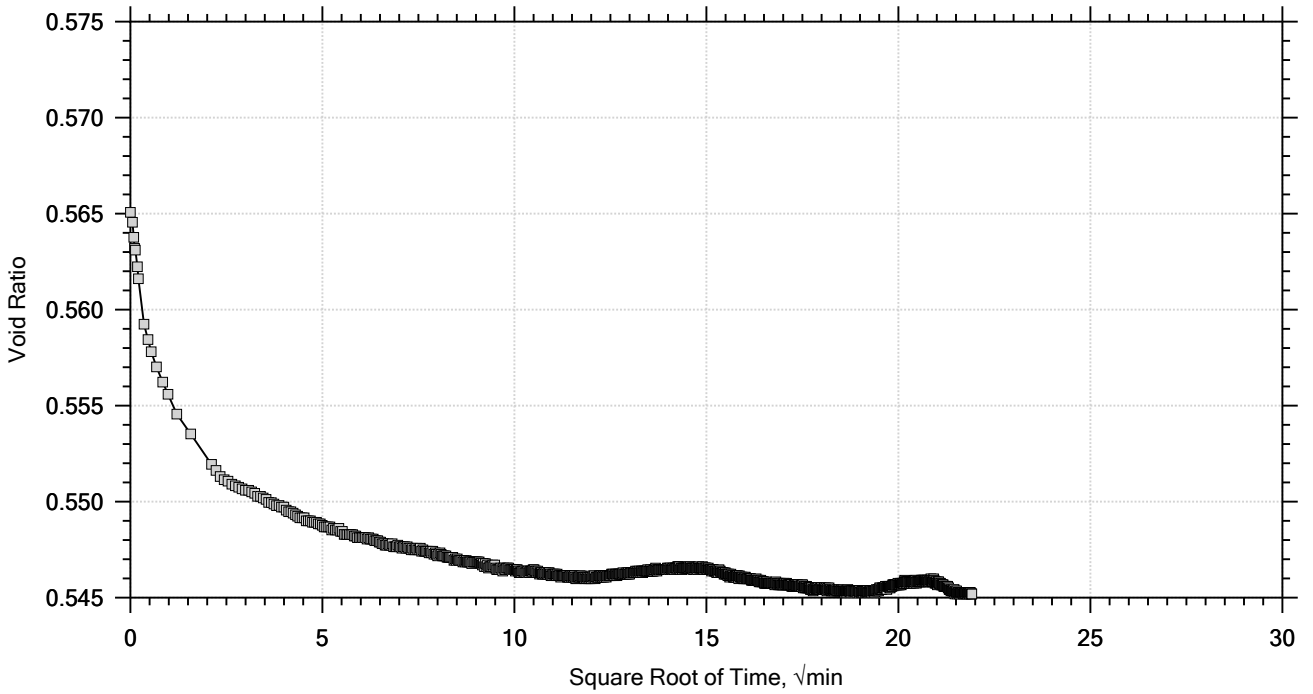


Project: CCR Ph. 3D	Location: Richland/Lexington County	Project No.: G5662.030
Boring No.: P3D-B1U	Tested By: RMC/WAP	Checked By: WAP/WJG
Sample No.: 25-1630	Test Date: 6/20/2025	Depth: 2.0' - 6.0'
Test No.: ST-2.D	Sample Type: Undisturbed	Elevation:
Description: Lean CLAY (CL/A-6) with Sand, LL=37, PL=13, PI=24, %200=72.1		
Remarks:		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 5 of 14
Constant Load Step
Stress: 0.893 tsf

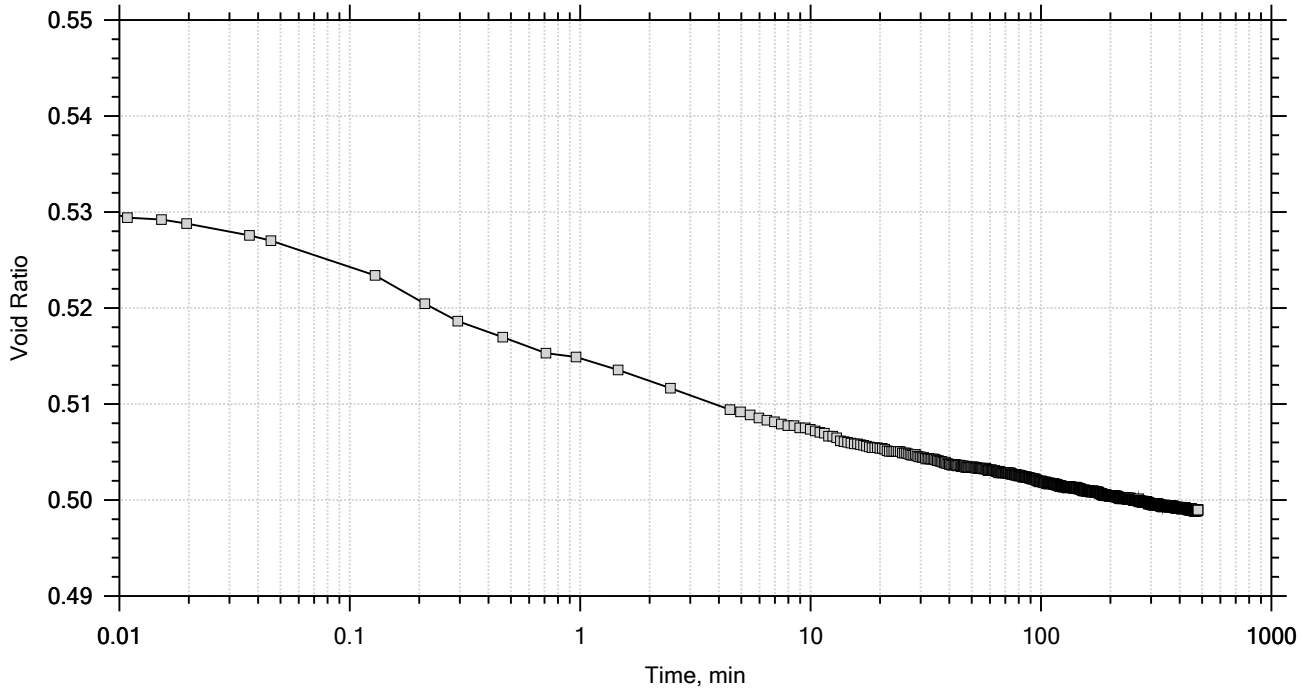


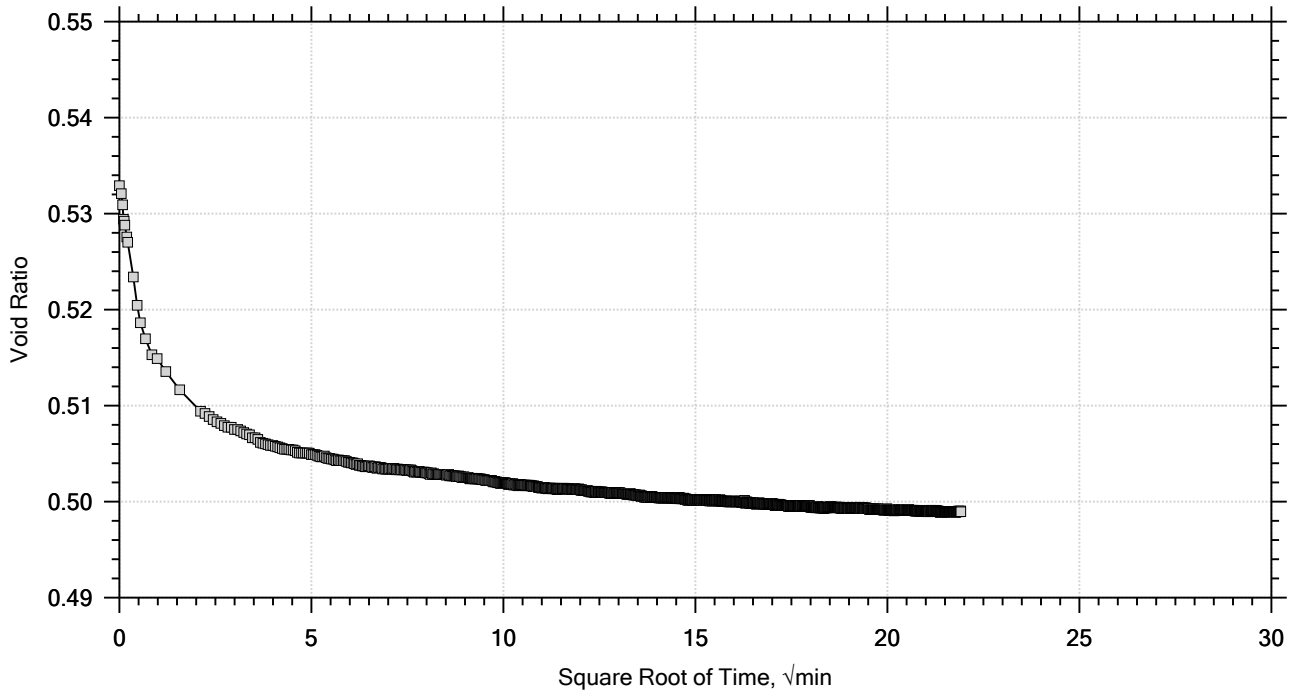


Project: CCR Ph. 3D	Location: Richland/Lexington County	Project No.: G5662.030
Boring No.: P3D-B1U	Tested By: RMC/WAP	Checked By: WAP/WJG
Sample No.: 25-1630	Test Date: 6/20/2025	Depth: 2.0' - 6.0'
Test No.: ST-2.D	Sample Type: Undisturbed	Elevation:
Description: Lean CLAY (CL/A-6) with Sand, LL=37, PL=13, PI=24, %200=72.1		
Remarks:		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 6 of 14
Constant Load Step
Stress: 1.79 tsf

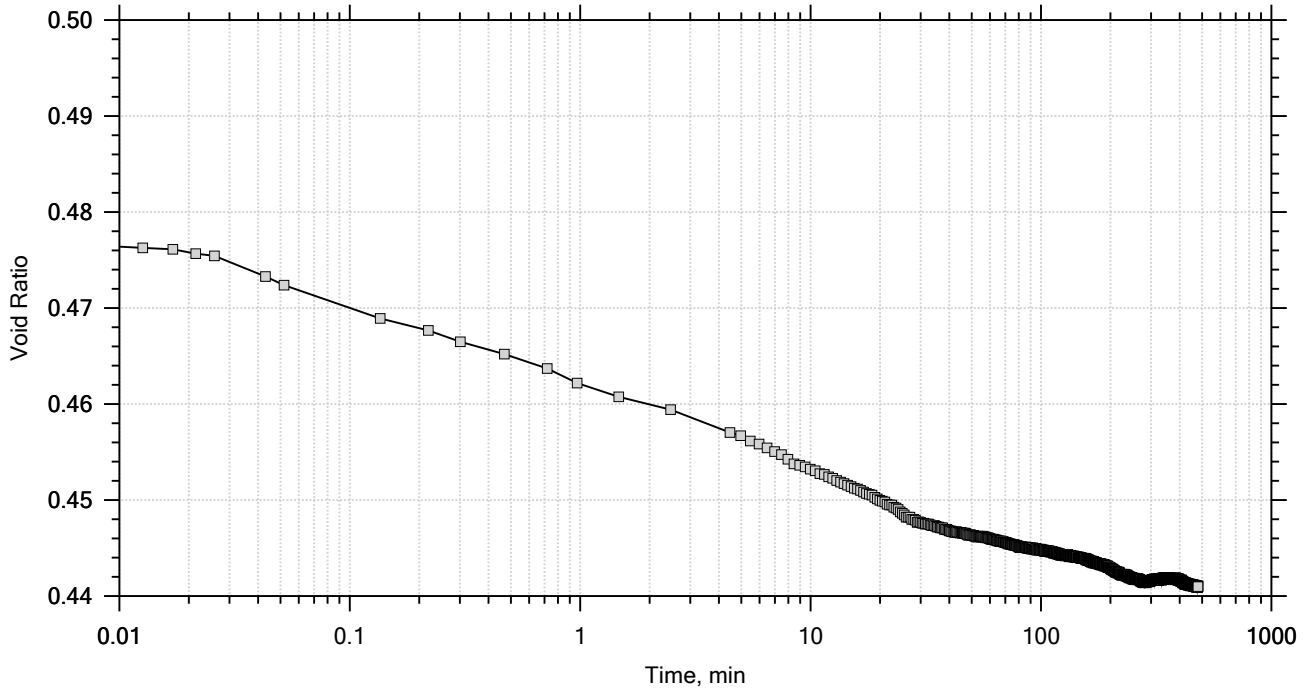


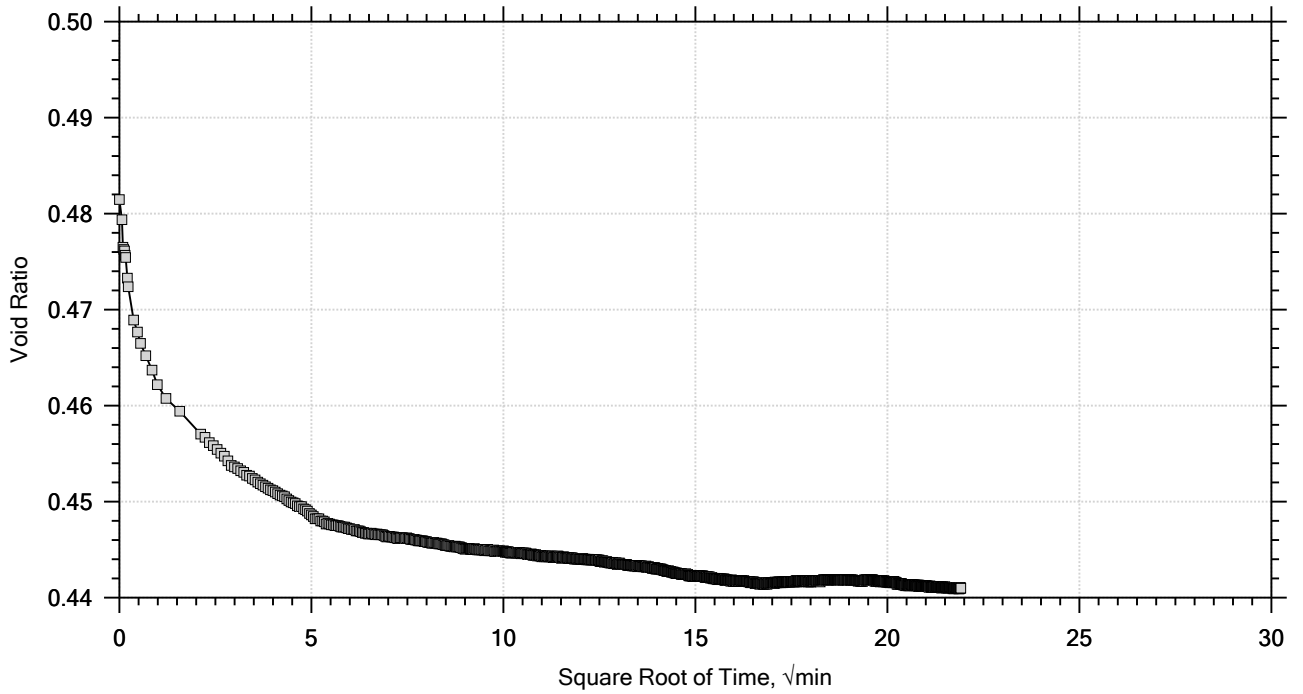


Project: CCR Ph. 3D	Location: Richland/Lexington County	Project No.: G5662.030
Boring No.: P3D-B1U	Tested By: RMC/WAP	Checked By: WAP/WJG
Sample No.: 25-1630	Test Date: 6/20/2025	Depth: 2.0' - 6.0'
Test No.: ST-2.D	Sample Type: Undisturbed	Elevation:
Description: Lean CLAY (CL/A-6) with Sand, LL=37, PL=13, PI=24, %200=72.1		
Remarks:		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 7 of 14
Constant Load Step
Stress: 3.57 tsf

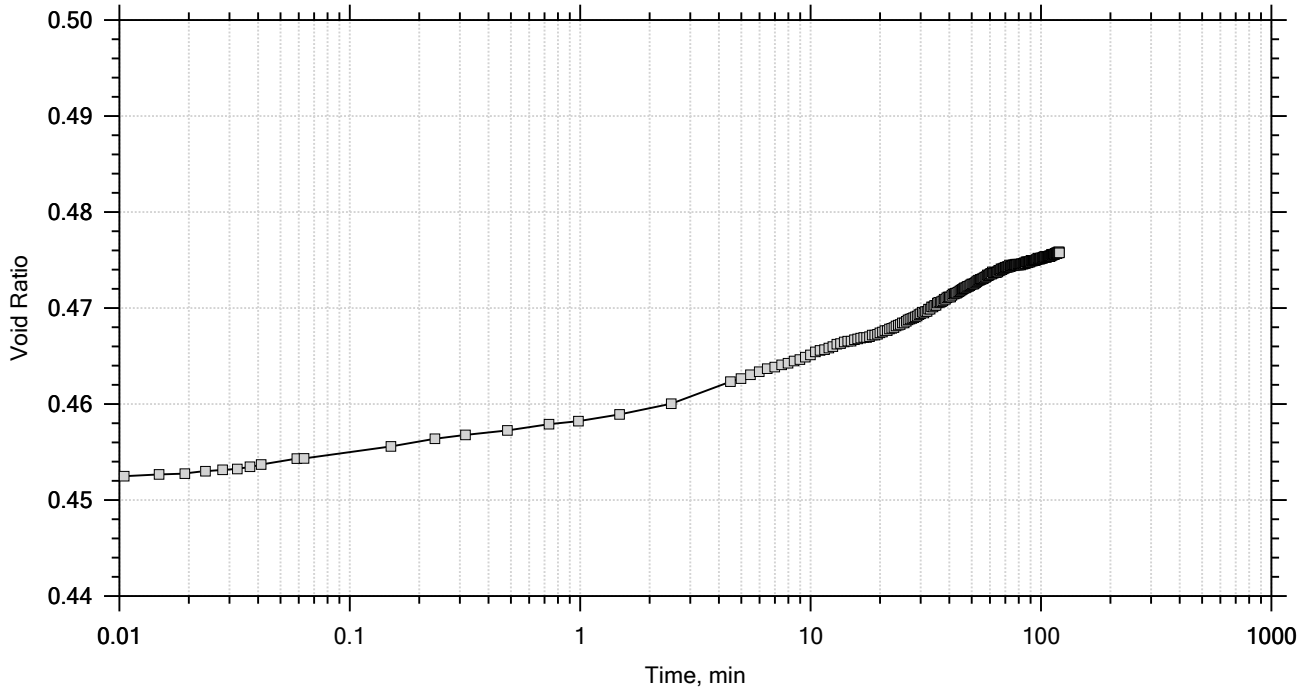


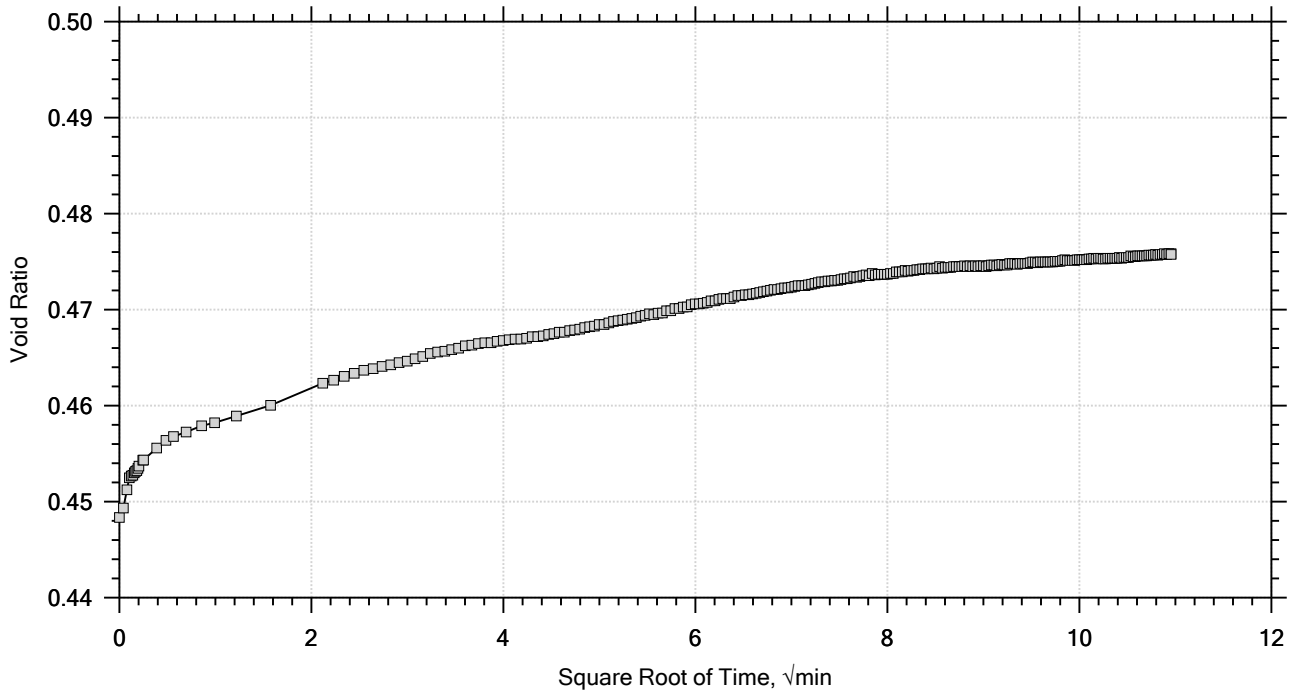


Project: CCR Ph. 3D	Location: Richland/Lexington County	Project No.: G5662.030
Boring No.: P3D-B1U	Tested By: RMC/WAP	Checked By: WAP/WJG
Sample No.: 25-1630	Test Date: 6/20/2025	Depth: 2.0' - 6.0'
Test No.: ST-2.D	Sample Type: Undisturbed	Elevation:
Description: Lean CLAY (CL/A-6) with Sand, LL=37, PL=13, PI=24, %200=72.1		
Remarks:		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 8 of 14
Constant Load Step
Stress: 0.223 tsf

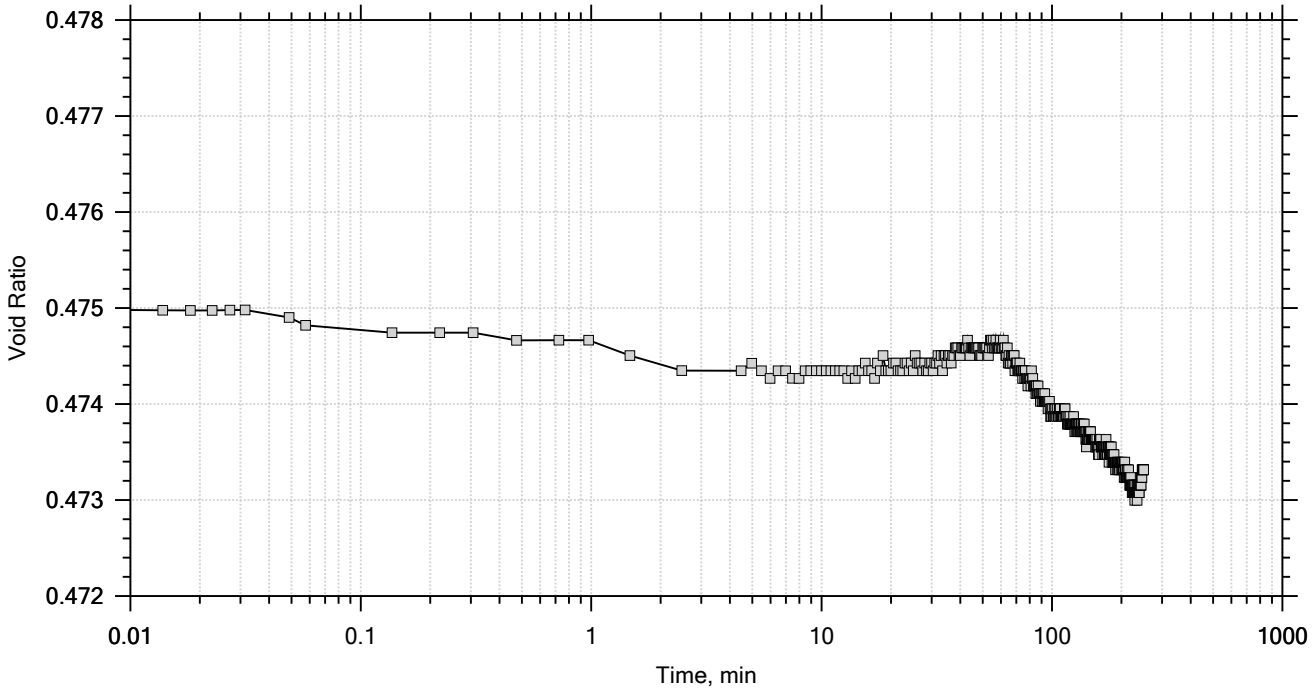


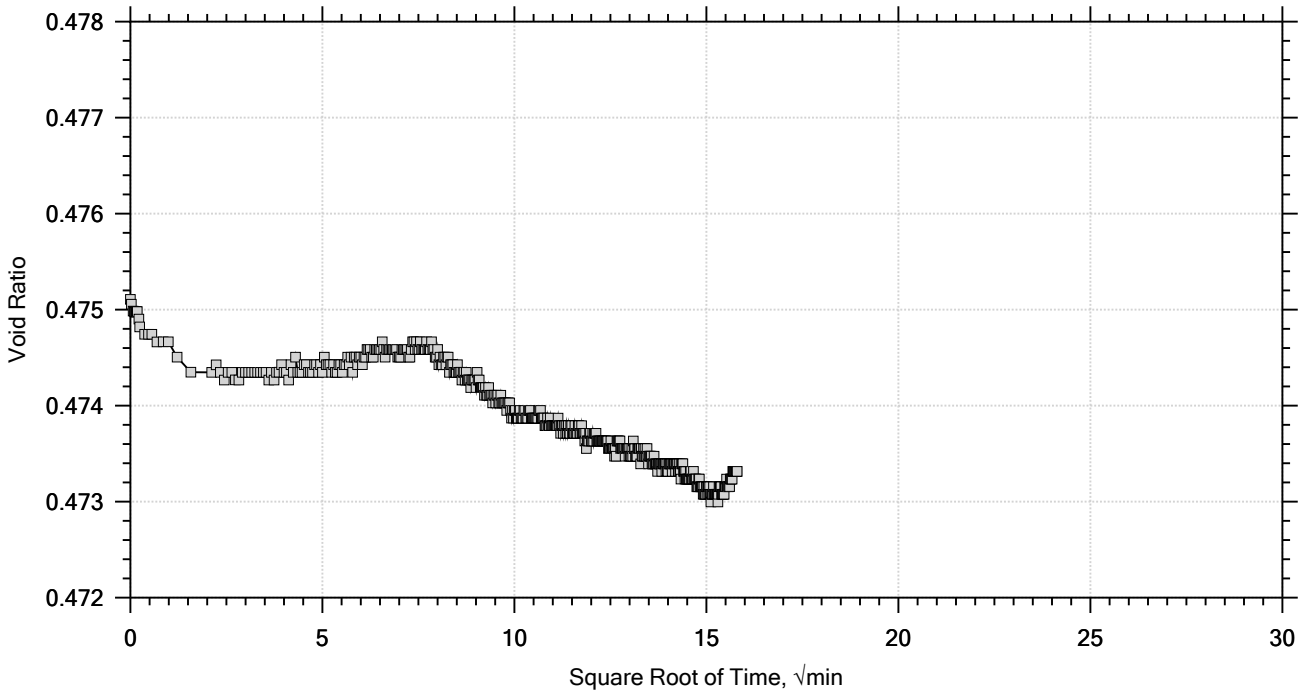


Project: CCR Ph. 3D	Location: Richland/Lexington County	Project No.: G5662.030
Boring No.: P3D-B1U	Tested By: RMC/WAP	Checked By: WAP/WJG
Sample No.: 25-1630	Test Date: 6/20/2025	Depth: 2.0' - 6.0'
Test No.: ST-2.D	Sample Type: Undisturbed	Elevation:
Description: Lean CLAY (CL/A-6) with Sand, LL=37, PL=13, PI=24, %200=72.1		
Remarks:		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 9 of 14
Constant Load Step
Stress: 0.446 tsf

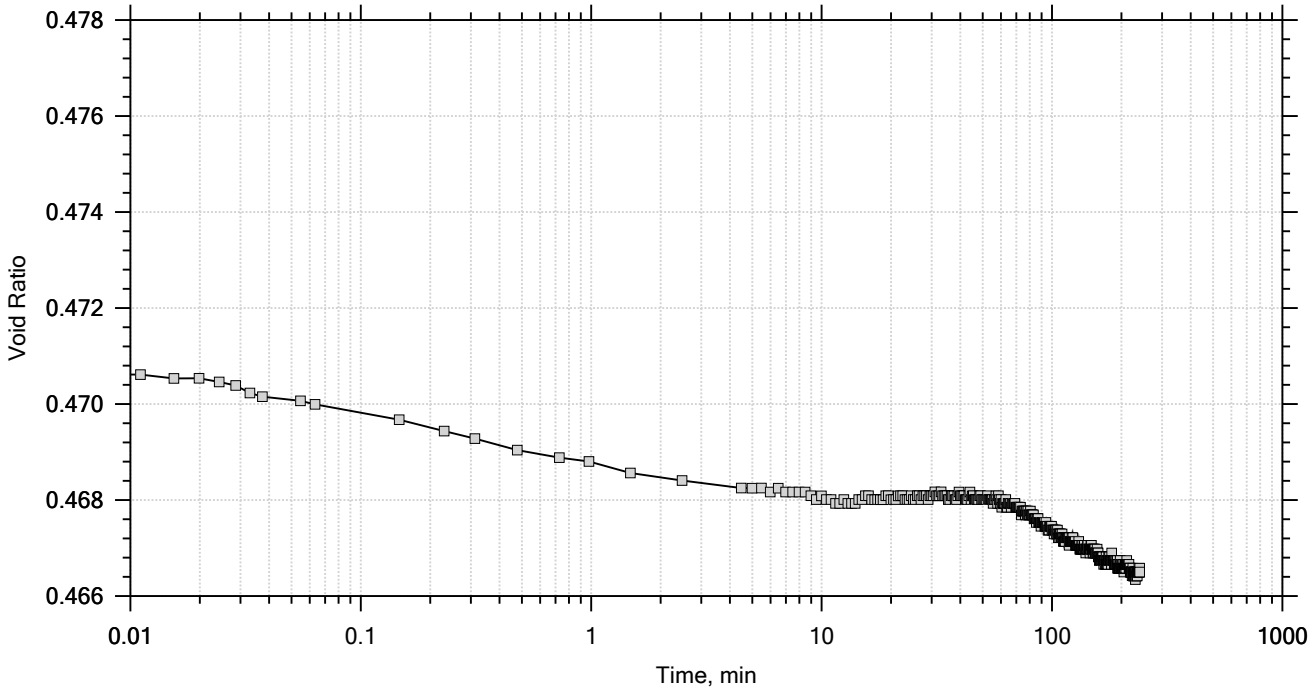


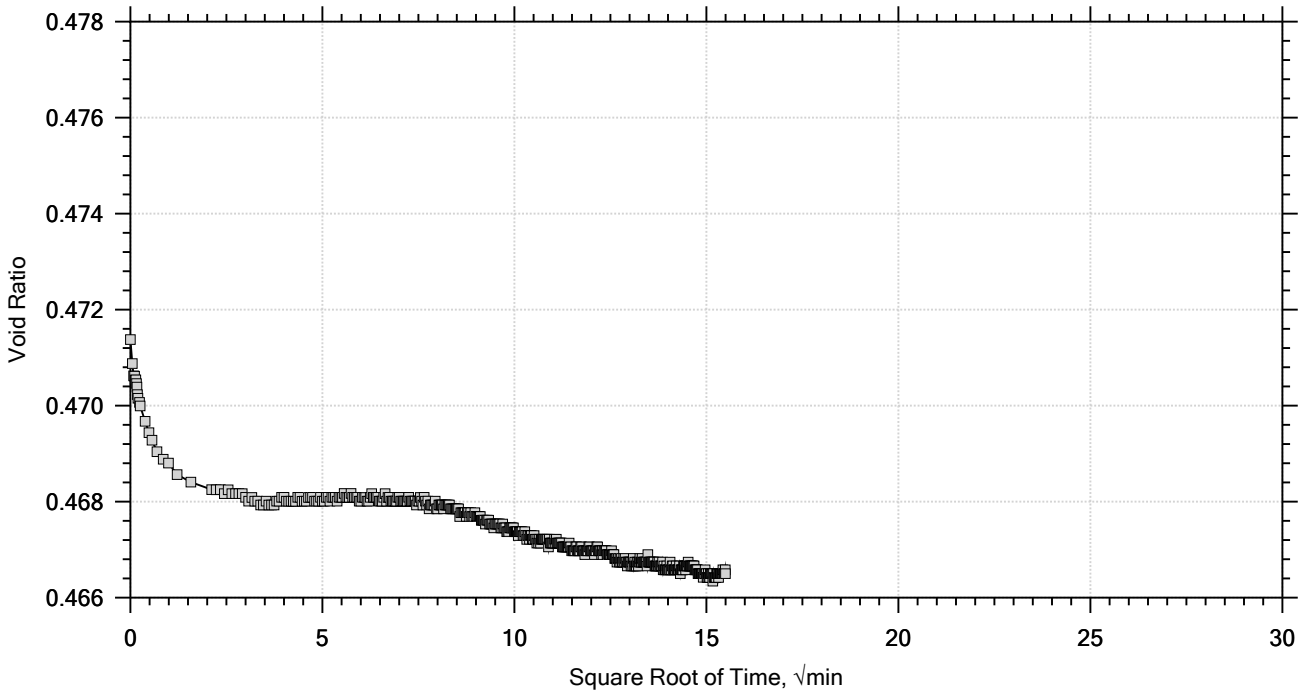


Project: CCR Ph. 3D	Location: Richland/Lexington County	Project No.: G5662.030
Boring No.: P3D-B1U	Tested By: RMC/WAP	Checked By: WAP/WJG
Sample No.: 25-1630	Test Date: 6/20/2025	Depth: 2.0' - 6.0'
Test No.: ST-2.D	Sample Type: Undisturbed	Elevation:
Description: Lean CLAY (CL/A-6) with Sand, LL=37, PL=13, PI=24, %200=72.1		
Remarks:		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 10 of 14
Constant Load Step
Stress: 0.893 tsf

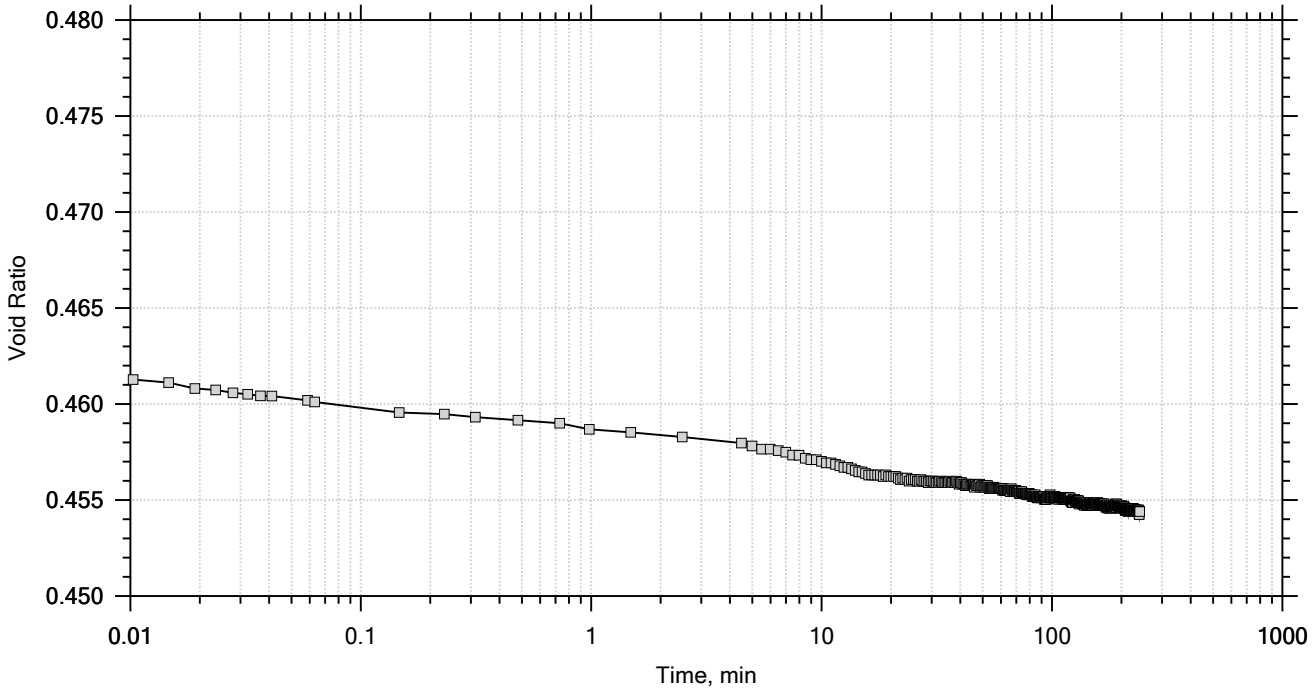


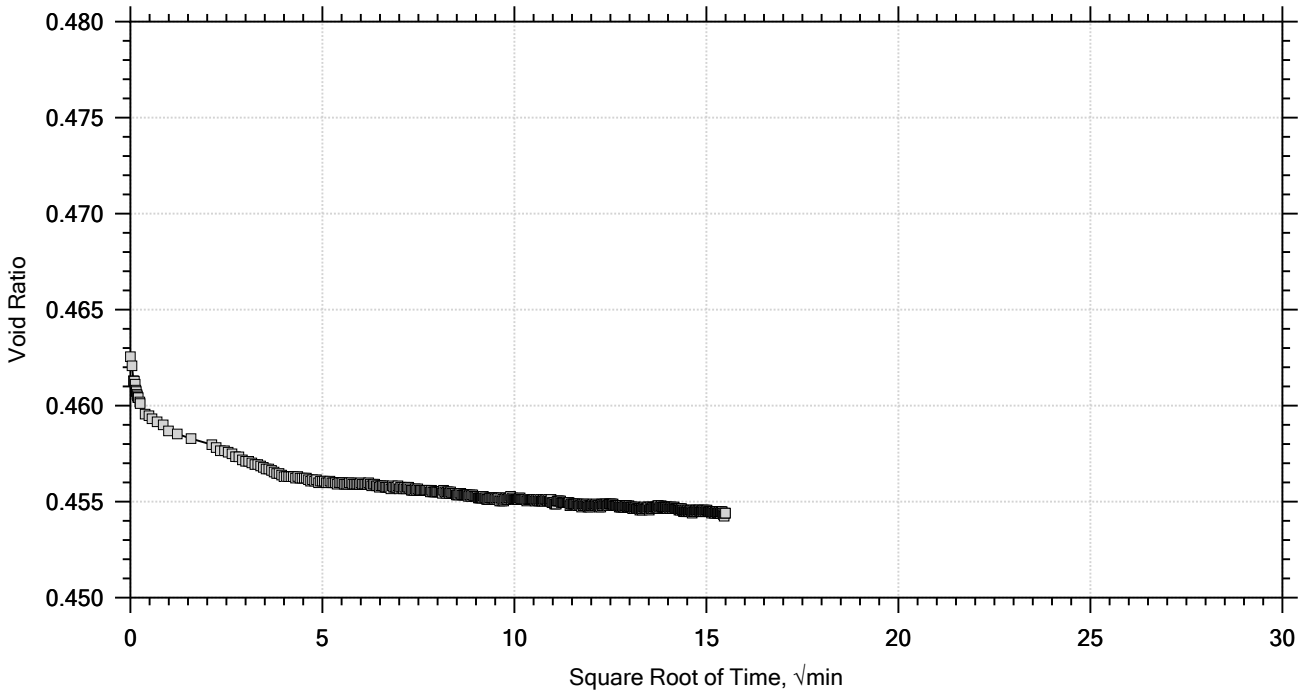


Project: CCR Ph. 3D	Location: Richland/Lexington County	Project No.: G5662.030
Boring No.: P3D-B1U	Tested By: RMC/WAP	Checked By: WAP/WJG
Sample No.: 25-1630	Test Date: 6/20/2025	Depth: 2.0' - 6.0'
Test No.: ST-2.D	Sample Type: Undisturbed	Elevation:
Description: Lean CLAY (CL/A-6) with Sand, LL=37, PL=13, PI=24, %200=72.1		
Remarks:		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 11 of 14
Constant Load Step
Stress: 1.79 tsf

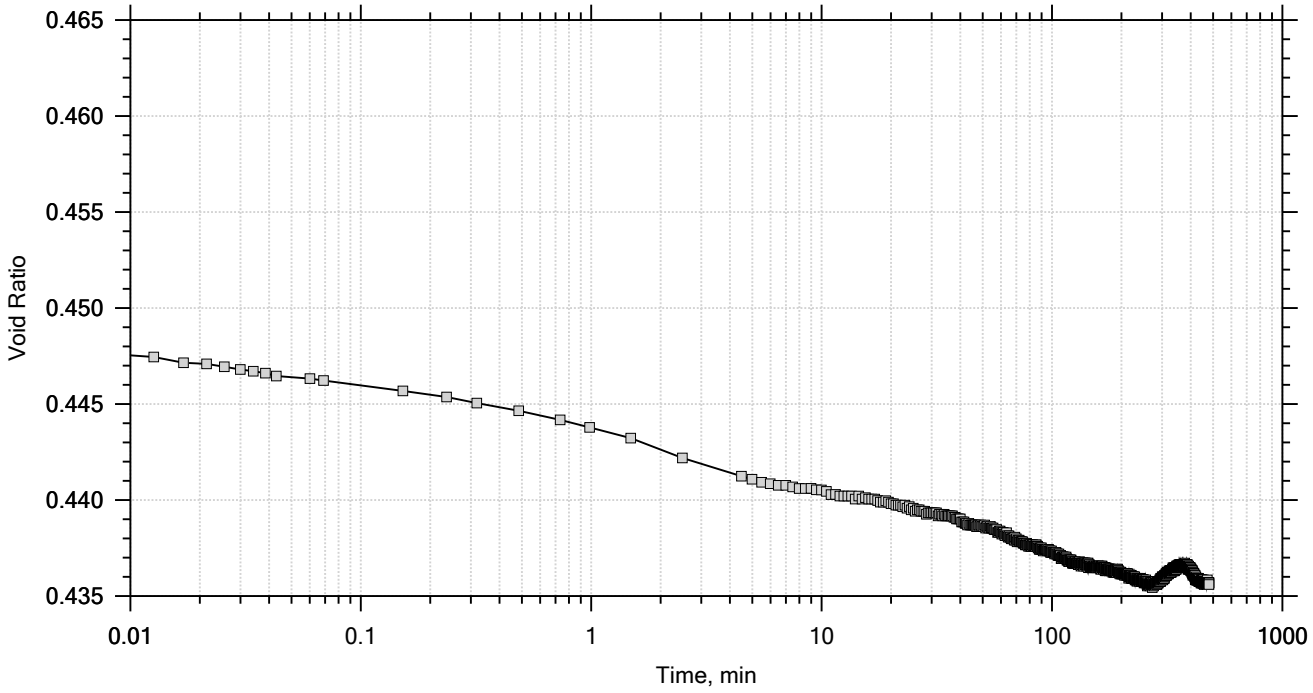


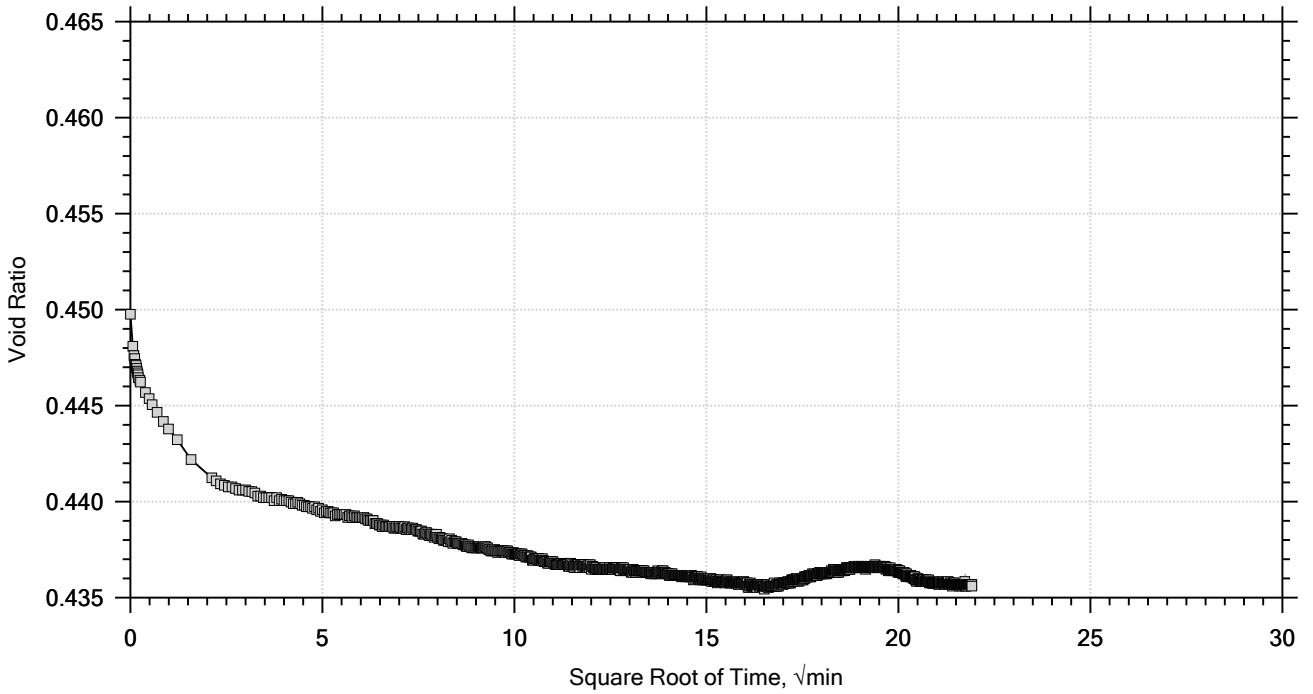


Project: CCR Ph. 3D	Location: Richland/Lexington County	Project No.: G5662.030
Boring No.: P3D-B1U	Tested By: RMC/WAP	Checked By: WAP/WJG
Sample No.: 25-1630	Test Date: 6/20/2025	Depth: 2.0' - 6.0'
Test No.: ST-2.D	Sample Type: Undisturbed	Elevation:
Description: Lean CLAY (CL/A-6) with Sand, LL=37, PL=13, PI=24, %200=72.1		
Remarks:		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 12 of 14
Constant Load Step
Stress: 3.57 tsf

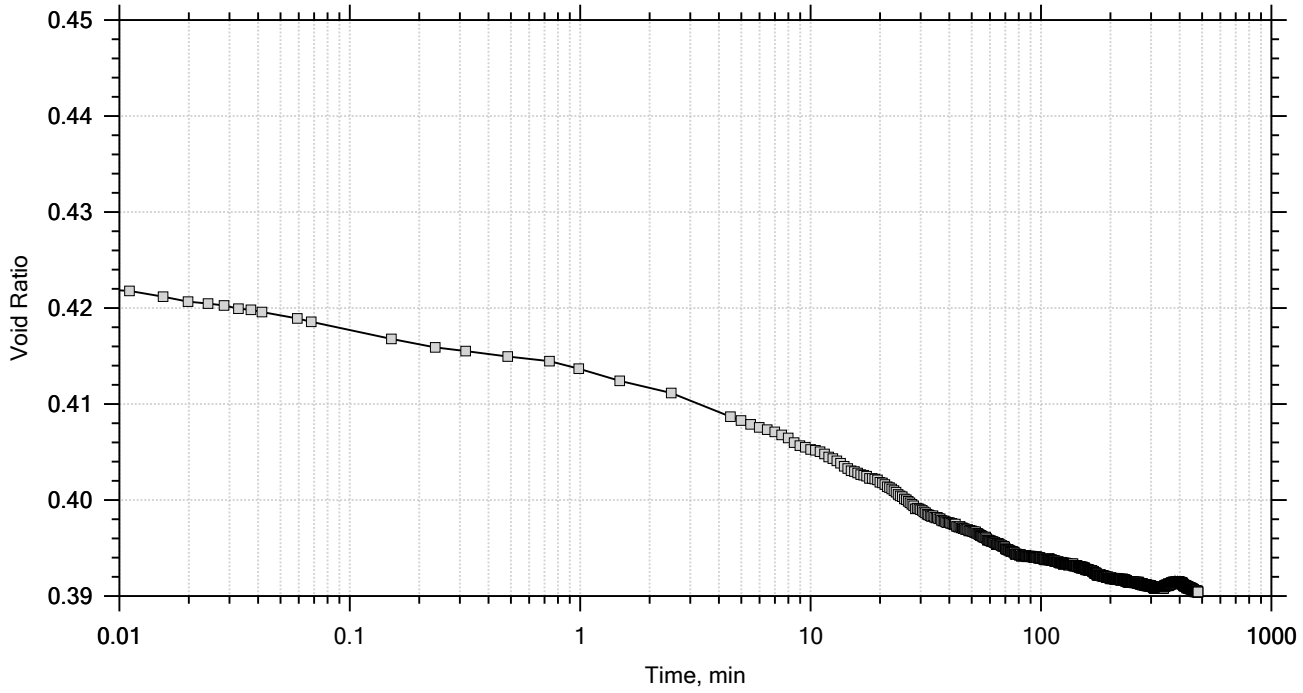


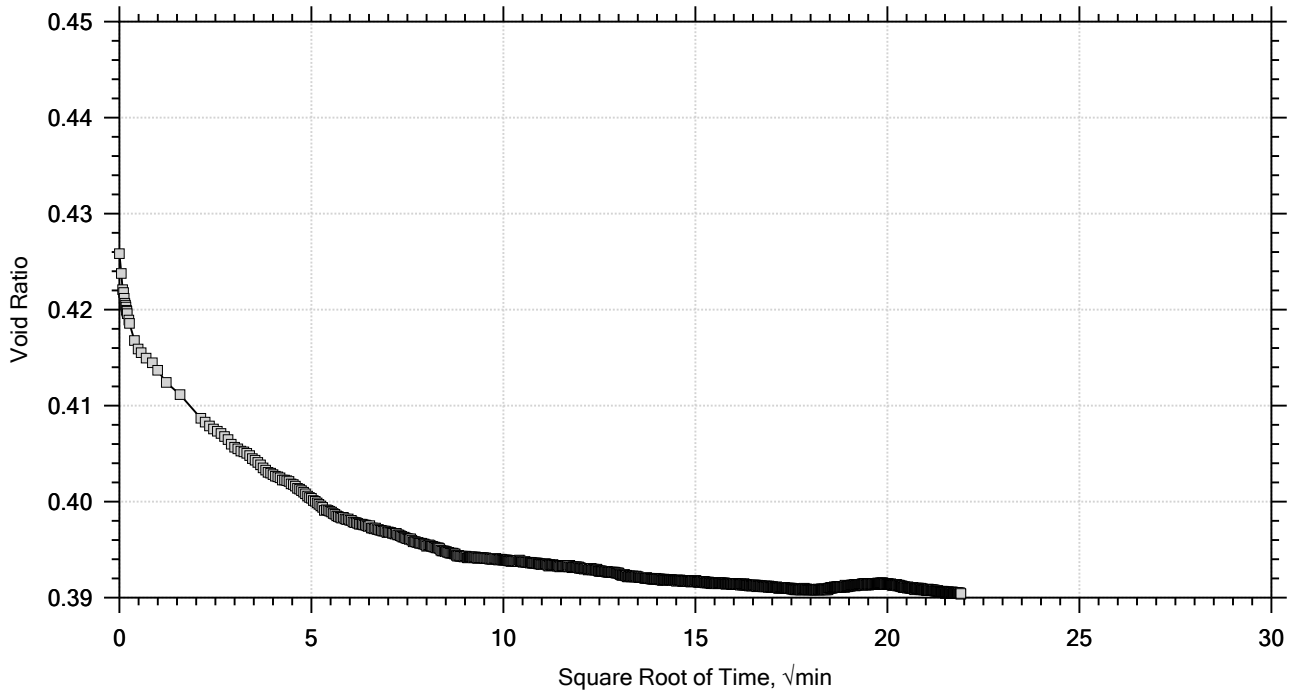


Project: CCR Ph. 3D	Location: Richland/Lexington County	Project No.: G5662.030
Boring No.: P3D-B1U	Tested By: RMC/WAP	Checked By: WAP/WJG
Sample No.: 25-1630	Test Date: 6/20/2025	Depth: 2.0' - 6.0'
Test No.: ST-2.D	Sample Type: Undisturbed	Elevation:
Description: Lean CLAY (CL/A-6) with Sand, LL=37, PL=13, PI=24, %200=72.1		
Remarks:		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 13 of 14
Constant Load Step
Stress: 7.14 tsf

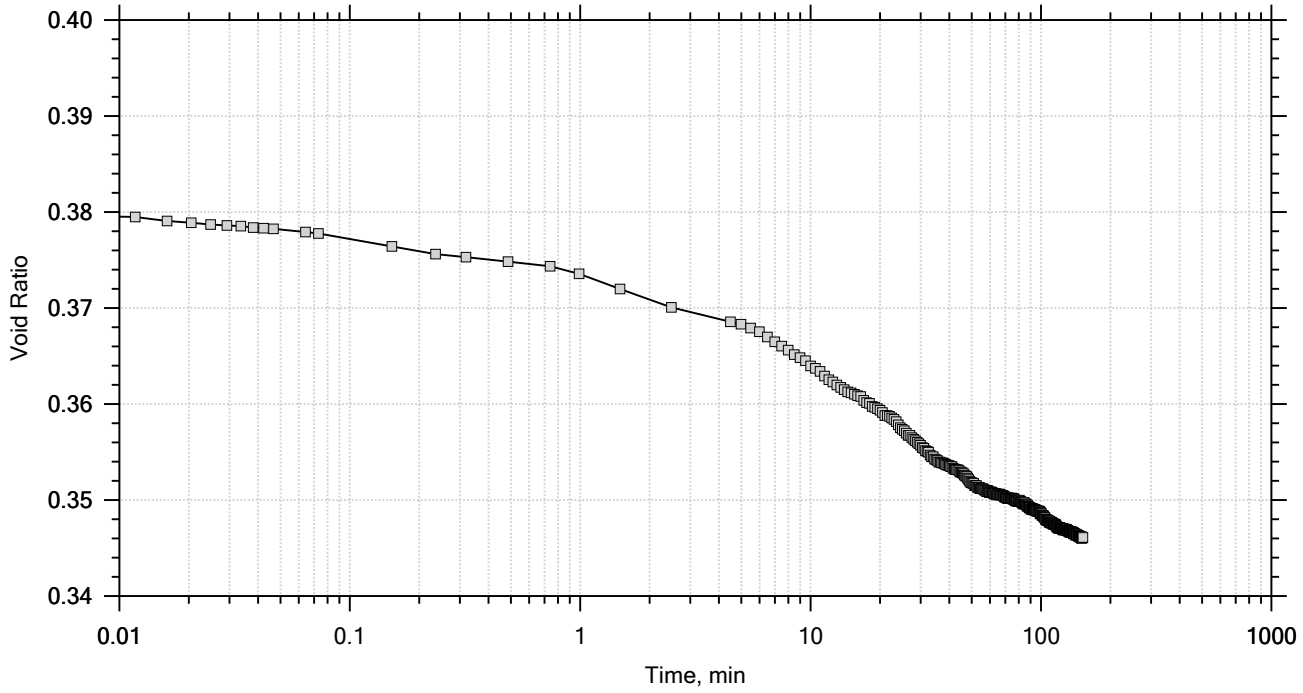


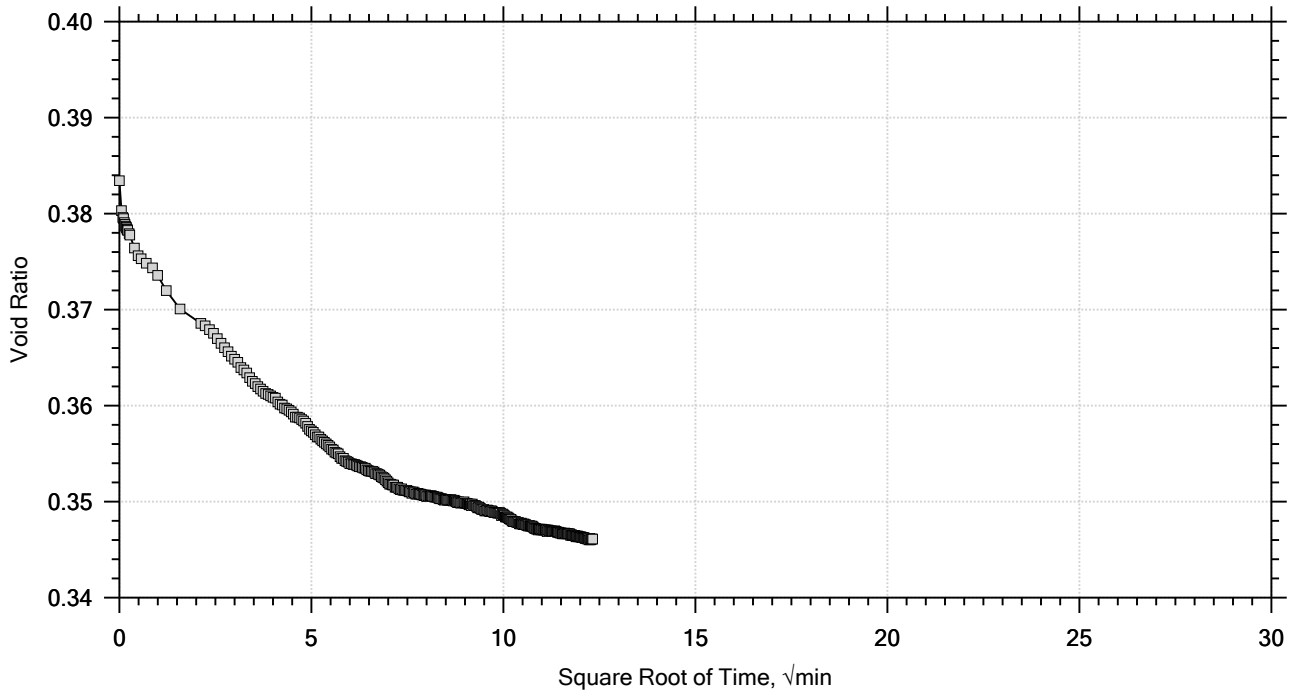


Project: CCR Ph. 3D	Location: Richland/Lexington County	Project No.: G5662.030
Boring No.: P3D-B1U	Tested By: RMC/WAP	Checked By: WAP/WJG
Sample No.: 25-1630	Test Date: 6/20/2025	Depth: 2.0' - 6.0'
Test No.: ST-2.D	Sample Type: Undisturbed	Elevation:
Description: Lean CLAY (CL/A-6) with Sand, LL=37, PL=13, PI=24, %200=72.1		
Remarks:		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 14 of 14
Constant Load Step
Stress: 14.3 tsf





Project: CCR Ph. 3D	Location: Richland/Lexington County	Project No.: G5662.030
Boring No.: P3D-B1U	Tested By: RMC/WAP	Checked By: WAP/WJG
Sample No.: 25-1630	Test Date: 6/20/2025	Depth: 2.0' - 6.0'
Test No.: ST-2.D	Sample Type: Undisturbed	Elevation:
Description: Lean CLAY (CL/A-6) with Sand, LL=37, PL=13, PI=24, %200=72.1		
Remarks:		

One-Dimensional Consolidation by ASTM D2435 - Method B

Specimen Diameter: 2.50 in	Measured Specific Gravity: 2.69	Liquid Limit: 37
Initial Height: 1.00 in	Initial Void Ratio: 0.607	Plastic Limit: 13
Final Height: 0.86 in	Final Void Ratio: 0.385	Plasticity Index: 24

	Before Test Trimmings	Before Test Specimen	After Test Specimen	After Test Trimmings
Container ID		RING		
Mass Container, gm	6.65	108.73	108.73	7.7
Mass Container + Wet Soil, gm	294.91	269.27	264.79	162.05
Mass Container + Dry Soil, gm	248.11	243.37	243.37	140.86
Mass Dry Soil, gm	241.46	134.64	134.64	133.16
Water Content, %	19.38	19.24	15.91	15.91
Void Ratio	---	0.61	0.39	---
Degree of Saturation, %	---	85.24	111.07	---
Dry Unit Weight, pcf	---	104.49	121.22	---

Project: CCR Ph. 3D	Location: Richland/Lexington County	Project No.: G5662.030
Boring No.: P3D-B1U	Tested By: RMC/WAP	Checked By: WAP/WJG
Sample No.: 25-1630	Test Date: 6/20/2025	Depth: 2.0' - 6.0'
Test No.: ST-2.D	Sample Type: Undisturbed	Elevation:
Description: Lean CLAY (CL/A-6) with Sand, LL=37, PL=13, PI=24, %200=72.1		
Remarks:		

One-Dimensional Consolidation by ASTM D2435 - Method B

Log of Time Coefficients

Step	Applied Stress tsf	Final Displacement in	Void Ratio	Strain at End %	Log T50 min	Cv ft²/s	Mv 1/tsf	k ft/day	Ca %
1	0.0560	0.005923	0.598	0.592	0.000	0.00e+00	1.06e-01	0.00e+00	0.00e+00
2	0.112	0.007737	0.595	0.774	0.000	0.00e+00	3.24e-02	0.00e+00	0.00e+00
3	0.233	0.01298	0.586	1.30	0.000	0.00e+00	4.33e-02	0.00e+00	0.00e+00
4	0.446	0.02107	0.573	2.11	0.000	0.00e+00	3.79e-02	0.00e+00	0.00e+00
5	0.893	0.03857	0.545	3.86	0.000	0.00e+00	3.92e-02	0.00e+00	0.00e+00
6	1.79	0.06734	0.499	6.73	0.000	0.00e+00	3.22e-02	0.00e+00	0.00e+00
7	3.57	0.1034	0.441	10.3	0.000	0.00e+00	2.02e-02	0.00e+00	0.00e+00
8	0.223	0.08177	0.476	8.18	0.000	0.00e+00	6.46e-03	0.00e+00	0.00e+00
9	0.446	0.08329	0.473	8.33	0.000	0.00e+00	6.83e-03	0.00e+00	0.00e+00
10	0.893	0.08753	0.467	8.75	0.000	0.00e+00	9.48e-03	0.00e+00	0.00e+00
11	1.79	0.09506	0.454	9.51	0.000	0.00e+00	8.43e-03	0.00e+00	0.00e+00
12	3.57	0.1068	0.436	10.7	0.000	0.00e+00	6.55e-03	0.00e+00	0.00e+00
13	7.14	0.1349	0.390	13.5	0.000	0.00e+00	7.87e-03	0.00e+00	0.00e+00
14	14.3	0.1624	0.346	16.2	12.024	3.44e-07	3.86e-03	3.58e-06	0.00e+00

F&ME CONSULTANTS	Project: CCR Ph. 3D	Location: Richland/Lexington County	Project No.: G5662.030
	Boring No.: P3D-B1U	Tested By: RMC/WAP	Checked By: WAP/WJG
	Sample No.: 25-1630	Test Date: 6/20/2025	Depth: 2.0' - 6.0'
	Test No.: ST-2.D	Sample Type: Undisturbed	Elevation:
	Description: Lean CLAY (CL/A-6) with Sand, LL=37, PL=13, PI=24, %200=72.1		
	Remarks:		
	Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B

Square Root of Time Coefficients

Step	Applied Stress tsf	Final Displacement in	Void Ratio	Strain at End %	Sq.Rt. T90 min	Cv ft²/s	Mv 1/tsf	k ft/day
1	0.0560	0.005923	0.598	0.592	0.000	0.00e+00	1.06e-01	0.00e+00
2	0.112	0.007737	0.595	0.774	17.564	1.38e-06	3.24e-02	1.20e-04
3	0.233	0.01298	0.586	1.30	0.000	0.00e+00	4.33e-02	0.00e+00
4	0.446	0.02107	0.573	2.11	35.737	6.63e-07	3.79e-02	6.78e-05
5	0.893	0.03857	0.545	3.86	93.841	2.46e-07	3.92e-02	2.60e-05
6	1.79	0.06734	0.499	6.73	83.373	2.64e-07	3.22e-02	2.29e-05
7	3.57	0.1034	0.441	10.3	80.967	2.54e-07	2.02e-02	1.38e-05
8	0.223	0.08177	0.476	8.18	20.975	9.63e-07	6.46e-03	1.68e-05
9	0.446	0.08329	0.473	8.33	188.253	1.10e-07	6.83e-03	2.02e-06
10	0.893	0.08753	0.467	8.75	225.477	9.10e-08	9.48e-03	2.33e-06
11	1.79	0.09506	0.454	9.51	39.291	5.16e-07	8.43e-03	1.17e-05
12	3.57	0.1068	0.436	10.7	122.138	1.62e-07	6.55e-03	2.87e-06
13	7.14	0.1349	0.390	13.5	91.984	2.06e-07	7.87e-03	4.38e-06
14	14.3	0.1624	0.346	16.2	43.689	4.07e-07	3.86e-03	4.24e-06

F&ME CONSULTANTS	Project: CCR Ph. 3D	Location: Richland/Lexington County	Project No.: G5662.030
	Boring No.: P3D-B1U	Tested By: RMC/WAP	Checked By: WAP/WJG
	Sample No.: 25-1630	Test Date: 6/20/2025	Depth: 2.0' - 6.0'
	Test No.: ST-2.D	Sample Type: Undisturbed	Elevation:
	Description: Lean CLAY (CL/A-6) with Sand, LL=37, PL=13, PI=24, %200=72.1		
	Remarks:		
	Displacement at End of Increment		

FME & SME 2018 INVESTIGATION

Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

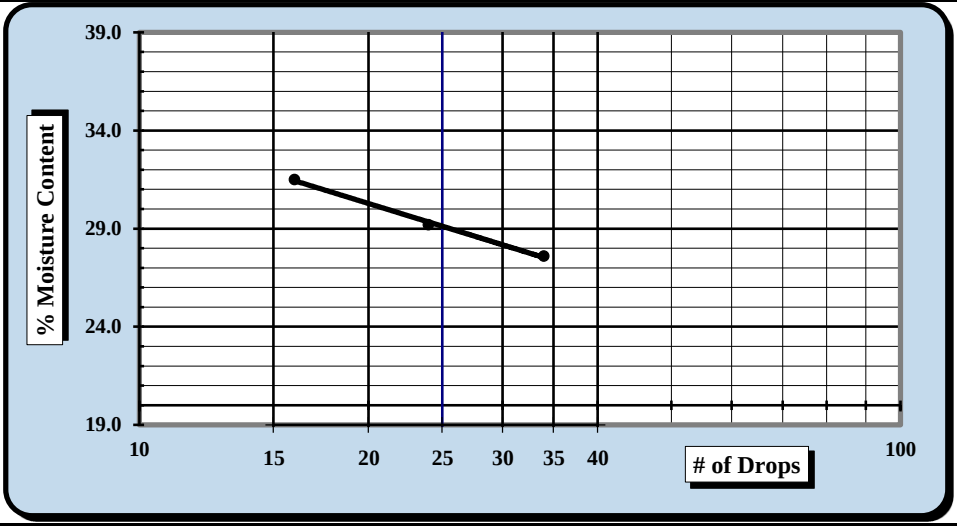
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	5/22/18
Project Name:	Carolina Crossroads Project	Test Date:	5/14/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-34UD	Sample #:	UD-1	Sample Date:	3/29/2018
Location:	Bridge Boring	Type:	Undisturbed Sample	Depth:	33.5' - 35.5'
Sample Description:	Sandy Lean Clay (CL, A-6(4))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	6	7	8				9	10	
A	Tare Weight	27.75	26.30	27.30				26.84	26.74	
B	Wet Soil Weight + A	42.16	41.16	42.21				34.85	34.43	
C	Dry Soil Weight + A	39.04	37.80	38.64				33.77	33.40	
D	Water Weight (B-C)	3.12	3.36	3.57				1.08	1.03	
E	Dry Soil Weight (C-A)	11.29	11.50	11.34				6.93	6.66	
F	% Moisture (D/E)*100	27.6%	29.2%	31.5%				15.6%	15.5%	
N	# OF DROPS	34	24	16				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**15.6%**		



One Point Liquid Limit

N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**29**
Plastic Limit	**16**
Plastic Index	**13**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	5/22/18	Matthew F. Cooke, P.G.	5/22/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

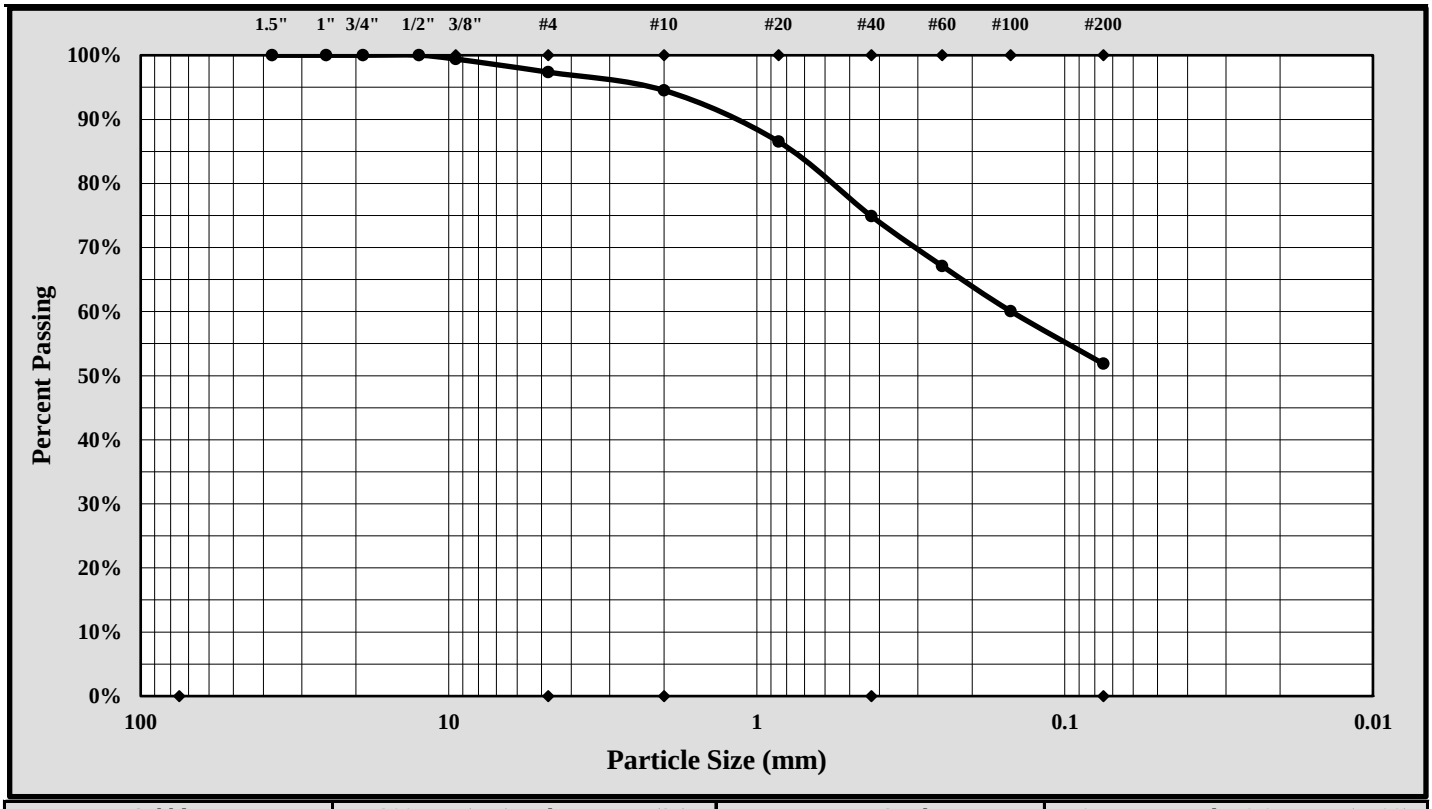
This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	5/22/18
Project Name:	Carolina Crossroads Project	Test Date(s):	5/05 - 5/14/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-34UD	Sample #: UD-1	Sample Date: 3/29/2018
Location:	Bridge Boring	Type: Undisturbed	Depth: 33.5' - 35.5'
Sample Description:	Sandy Lean Clay (CL, A-6(4))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	9.50 mm	Gravel:	2.6%
Silt & Clay (% Passing #200):	51.9%	Total Sand:	45.5%

Liquid Limit	29	Plastic Limit	16	Plastic Index	13
Coarse Sand:	2.8%	Medium Sand:	19.6%	Fine Sand:	23.0%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
5/22/18 — *Date*

This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Form No: TR-D854-1B
Revision No. 1
Revision Date: 08/09/17

SPECIFIC GRAVITY OF SOIL

Oven dried Specimens ASTM D 854 Method B

S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	5/22/18
Project Name:	Carolina Crossroads Project	Test Date(s):	5/02 - 5/04/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-34UD	Sample #: UD-1	Sample Date: 3/29/2018
Location:	Bridge Boring	Type: Undisturbed Sample	Depth: 33.5' - 35.5'
Sample Description:	Sandy Lean Clay (CL, A-6(4))		
Material Excluded:	2.6%		% Passing #4 Sieve: 97.4%

Balance ID.	*0.01 gram*	*ID#:*	*13942*	*Cal. Date:*	*8/18/17*	*Cal. Due:*	*8/18/18*
Pycnometer ID No.	*23161*	*Cal. Date:*	*2/10/18*	*Balance Verification*		Check Mass:	500 gram

Pycnometer Volume (V_p)	249.81	ml.	Mass Determination: 500.00 grams
Pycnometer Mass (PM)	110.90	grams	*If [PM-M_p] is greater than .06 grams,*
Ave. Pycnometer Mass (M_p)	110.90	grams	*recalibrate the dry mass of the pycnometer.*

Method B: Oven-dried Specimens

Soaking Time ASTM C127: 24 ± 4 hrs. ☐
Aggregate not initially dried ☐

Table 2 ASTM D 854	Specimen Dry Mass (g.)	
Soil Type	*250-ml. beaker*	*500-ml. beaker*
SP, SP-SM	*60 ± 10*	*100 ± 10*
SP-SC, SM, SC	*45 ± 10*	*75 ± 10*
Silt or Clay	*35 ± 5*	*50 ± 10*

Initial Dry Mass of Test Specimen - *not required.* grams

$M_{psw;t}$ = *Mass of the Pycnometer, soil, and water =* **384.59** *grams*

Mass of Dry Soil (grams)		Tare #	BB-2
A	Tare Weight		227.24
C	Dry Wt. + Tare Wt.		266.08
M_s	Dry Weight	**C-A**	**38.84**

T_t =	Test Temperature T_t	**21.6** °C
K =	Temperature Coefficient at T_t	**0.99966**
K =	Temperature Coefficient at 23°C	**0.99933**
$p_{w;t}$ =	Density of Water at T_t	**0.99786** g./ml.

$M_{pw;t}$ =	Mass of the Pycnometer and water at T_t	$M_{pw;t} = M_p + (V_p \times p_{w;t})$	**360.18** grams
G_t =	Specific Gravity of Soil Solids at the T_t	$G_t = M_s / (M_{pw;t} - (M_{psw;t}-M_s))$	**2.692**
G =	Specific Gravity of Soil Solids at the 20°C	$G = K \times G_t$	**2.691**

Soils containing plus #4 material tested per **ASTM C 127**

R = *% of Soil retained on the #4 sieve* **2.6%**
P = *% of Soil passing the #4 sieve* **97.4%**

G_{+4} Apparent Specific Gravity of plus #4 material at the 23°C per ASTM C127
Apparent Specific Gravity of plus #4 material corrected to 20°C

G_{total} *Total Sample Specific Gravity* **G_{total}** = $\dfrac{1}{\dfrac{R}{100 \times G_{+4}} + \dfrac{P}{100 \times G}}$ = **2.691**

Notes / Deviations / References: ASTM D854: Specific Gravity of Soil Solids by Water Pycnometer

Matthew F. Cooke, P.G. — *Project Manager*
Project Manager — *Position*
5/22/18 — Date

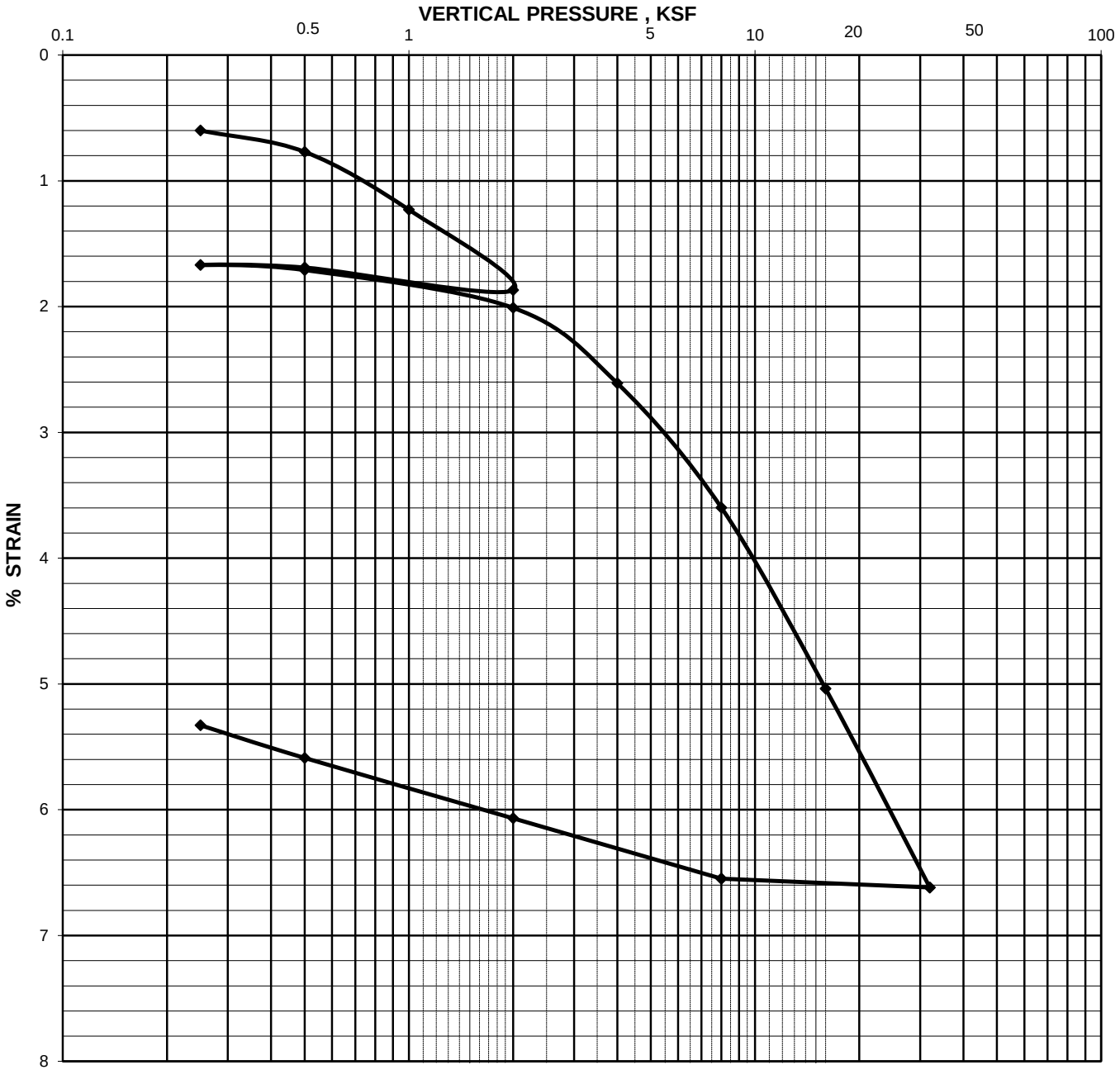
This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

CONSOLIDATION TEST REPORT

(ASTM D 2435)

Project Name:	Carolina Crossroads Project				
Project No.:	**1461-16-047.2B**			**Report Date:**	5/22/2018
Client Name:	HDR Engineering, Inc.			**Boring No.:**	B-34
Client Address:	4400 Leeds Ave., North Charleston, South Carolina			**Depth/Elev.:**	33.5 - 35.5'
Initial Wet Density, γ_{wet}, pcf:	136.3	**Load vs. Time Plot:**	Log of time	**Sample Type:**	Undisturbed
Initial Void Ratio, e_o:	0.403	**Final Void Ratio, e_f:**	0.328	**Log No.:**	UD-1
Initial Saturation, S_O, %:	92.9	**Final Saturation, S_f, %:**	100.0	**Sp. Gravity, G_S:**	2.691
Initial Dry Density, γ_{DRY}, pcf:	119.7	**Final Dry Density, γ_{DRY}, pcf:**	127.2	**Estimated Preconsolidation**	
Initial Moisture Content, %.:	13.9	**Final Moisture Content, %:**	13.3	**Stress, P_e, ksf:**	4.6
Liquid Limit, %:	29	**Plasticity Index, %:**	13	**Fines, %:**	51.9
Sample Description:	Sandy Lean Clay [CL, A-6(4)]				
Remolded Properties:	-	-		-	

Notes: Loading Schedule - (ksf) - 0.25, 0.5, 1.0, 2.0, 0.5, 0.25, 0.5, 2.0, 4.0, 8.0, 16.0, 32.0, 8.0, 2.0, 0.5, 0.25

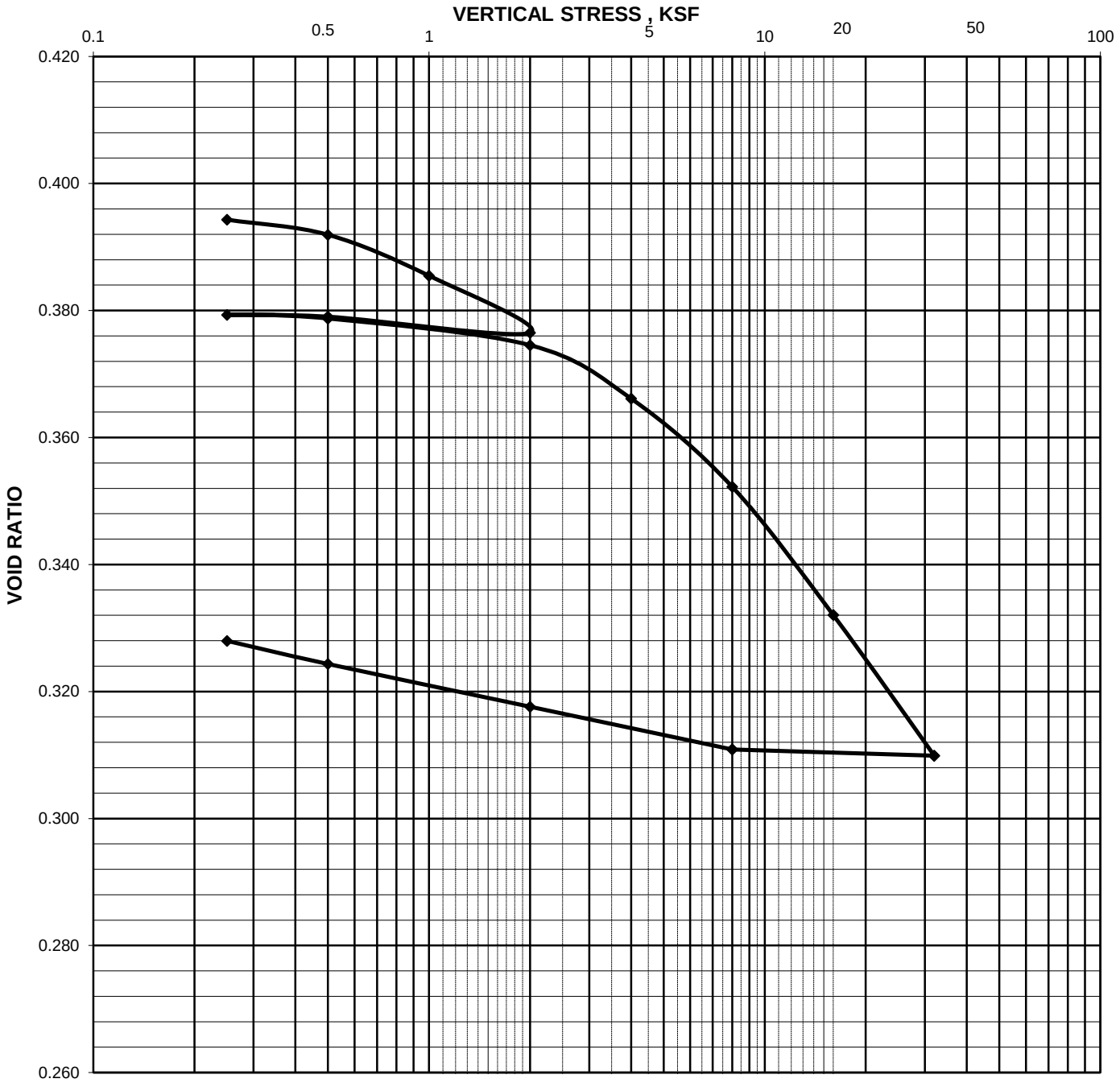


CONSOLIDATION TEST REPORT

(ASTM D 2435)

Project Name:	Carolina Crossroads Project				
Project No.:	**1461-16-047.2B**			**Report Date:**	5/22/2018
Client Name:	HDR Engineering, Inc.			**Boring No.:**	B-34
Client Address:	4400 Leeds Ave., North Charleston, South Carolina			**Depth/Elev.:**	33.5 - 35.5'
Initial Wet Density,γ_{wet}, pcf:	136.3	**Load vs. Time Plot:**	Log of time	**Sample Type:**	Undisturbed
Initial Void Ratio, e_o:	0.403	**Final Void Ratio, e_f:**	0.328	**Log No.:**	UD-1
Initial Saturation, S_O, %:	92.9	**Final Saturation, S_f, %:**	100.0	**Sp. Gravity, G_S:**	2.691
Initial Dry Density, γ_{DRY}, pcf:	119.7	**Final Dry Density, γ_{DRY}, pcf:**	127.2	**Estimated Preconsolidation**	
Initial Moisture Content, %.:	13.9	**Final Moisture Content, %:**	13.3	**Stress, P_e, ksf:**	4.6
Liquid Limit, %:	29	**Plasticity Index, %:**	13	**Fines, %:**	51.9
Sample Description:	Sandy Lean Clay [CL, A-6(4)]				
Remolded Properties:	-	-		-	

Notes: Loading Schedule - (ksf) - 0.25, 0.5, 1.0, 2.0, 0.5, 0.25, 0.5, 2.0, 4.0, 8.0, 16.0, 32.0, 8.0, 2.0, 0.5, 0.25

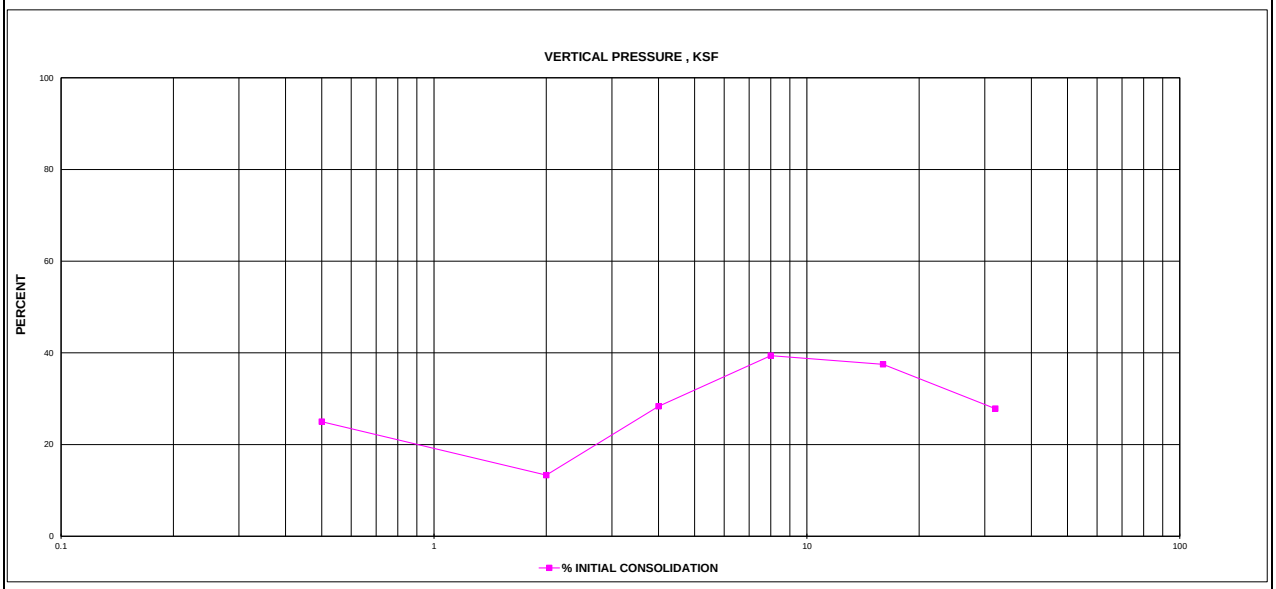


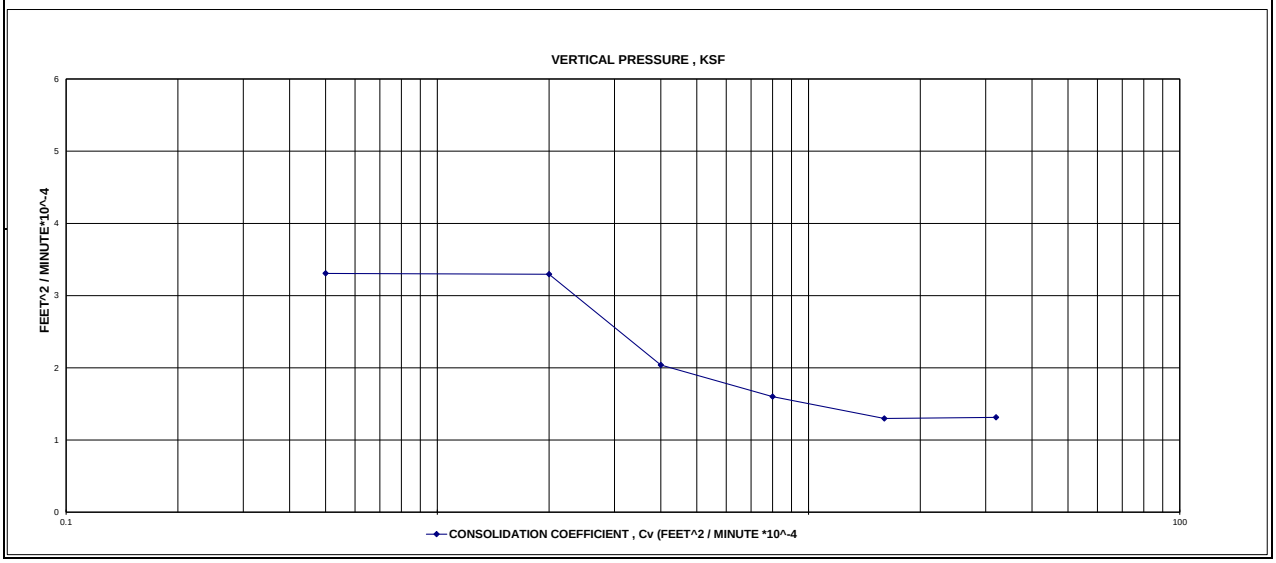
CONSOLIDATION TEST REPORT

(ASTM D 2435)

Project Name:	Carolina Crossroads Project		
Project No.:	**1461-16-047.2B**	**Report Date:**	5/22/2018
Client Name:	HDR Engineering, Inc.	**Boring No.:**	B-34
Client Address:	4400 Leeds Ave., North Charleston, South Carolina	**Depth/Elev.:**	33.5 - 35.5'

Pressure (ksf)	D_0 (in.)	D_{100} (in.)	D_{50} (in.)	Stone Correction (in.)	D_{0c} (in.)	D_{100c}	D_{50c} (in.)	h (in.)	VOID RATIO e	Percent Strain (%)	t_{50}/t_{90} t_{50}	C_v Log of Time ($ft^2/10^{-4}$min)	C_i (%)
0.25		0.0060		0.0000		0.0060			0.394	0.600			
0.5		0.0083		0.0006		0.0077			0.392	0.770			
1.0		0.0135		0.0012		0.0123			0.385	1.230			
2.0		0.0206		0.0019		0.0187			0.377	1.869			
0.5		0.0183		0.0014		0.0169			0.379	1.689			
0.25		0.0175		0.0008		0.0167			0.379	1.669			
0.5	0.0180	0.0183	0.0182	0.0012	0.0168	0.0171	0.0170	0.4917	0.379	1.709	1.0	3.31	25.0
2.0	0.0194	0.0220	0.0207	0.0019	0.0175	0.0201	0.0188	0.4908	0.375	2.009	1.0	3.29	13.3
4.0	0.0250	0.0293	0.0272	0.0032	0.0218	0.0261	0.0240	0.4882	0.366	2.609	1.6	2.04	28.3
8.0	0.0345	0.0405	0.0375	0.0045	0.0300	0.0360	0.0330	0.4837	0.352	3.599	2.0	1.60	39.4
16.0	0.0470	0.0560	0.0515	0.0056	0.0414	0.0504	0.0459	0.4772	0.332	5.038	2.4	1.30	37.5
32.0	0.0614	0.0728	0.0671	0.0066	0.0548	0.0662	0.0605	0.4699	0.310	6.618	2.3	1.31	27.8
8.0		0.0700		0.0045		0.0655			0.311	6.548			
2.0		0.0642		0.0035		0.0607			0.318	6.068			
0.25		0.0548		0.0015		0.0533			0.328	5.328			





Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

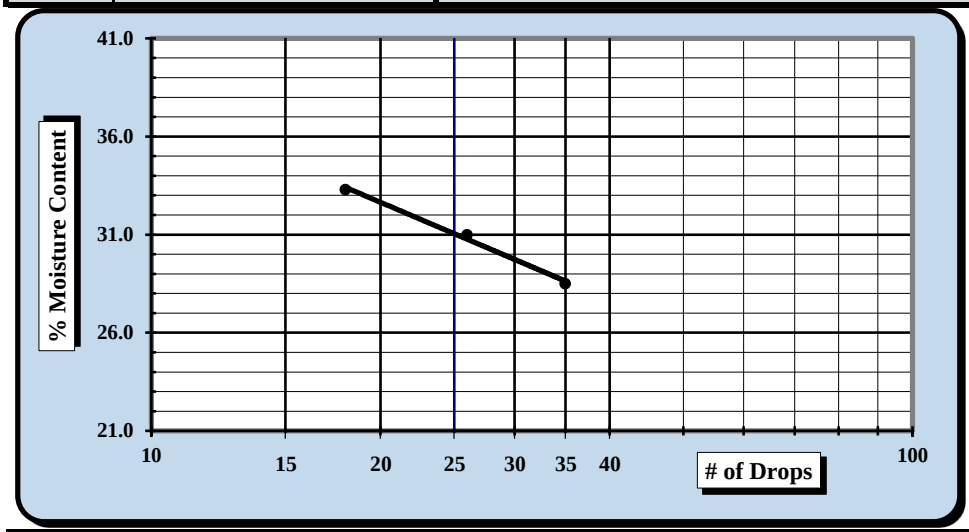
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	5/15/18
Project Name:	Carolina Crossroads Project	Test Date:	5/14/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-34	Sample #:	UD-2	Sample Date:	Various
Location:	UD borings	Type:	Undisturbed	Depth:	36 - 38'
Sample Description:	Clayey Sand [SC, A-2-6(1)]				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	1	2	3				4	5	
A	Tare Weight	26.70	26.48	26.32				25.92	26.94	
B	Wet Soil Weight + A	42.17	41.88	42.34				34.25	34.27	
C	Dry Soil Weight + A	38.74	38.24	38.34				33.23	33.37	
D	Water Weight (B-C)	3.43	3.64	4.00				1.02	0.90	
E	Dry Soil Weight (C-A)	12.04	11.76	12.02				7.31	6.43	
F	% Moisture (D/E)*100	28.5%	31.0%	33.3%				14.0%	14.0%	
N	# OF DROPS	35	26	18				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**14.0%**		



One Point Liquid Limit

N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**31**
Plastic Limit	**14**
Plastic Index	**17**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	5/15/18	Matthew F. Cooke, P.G.	5/15/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

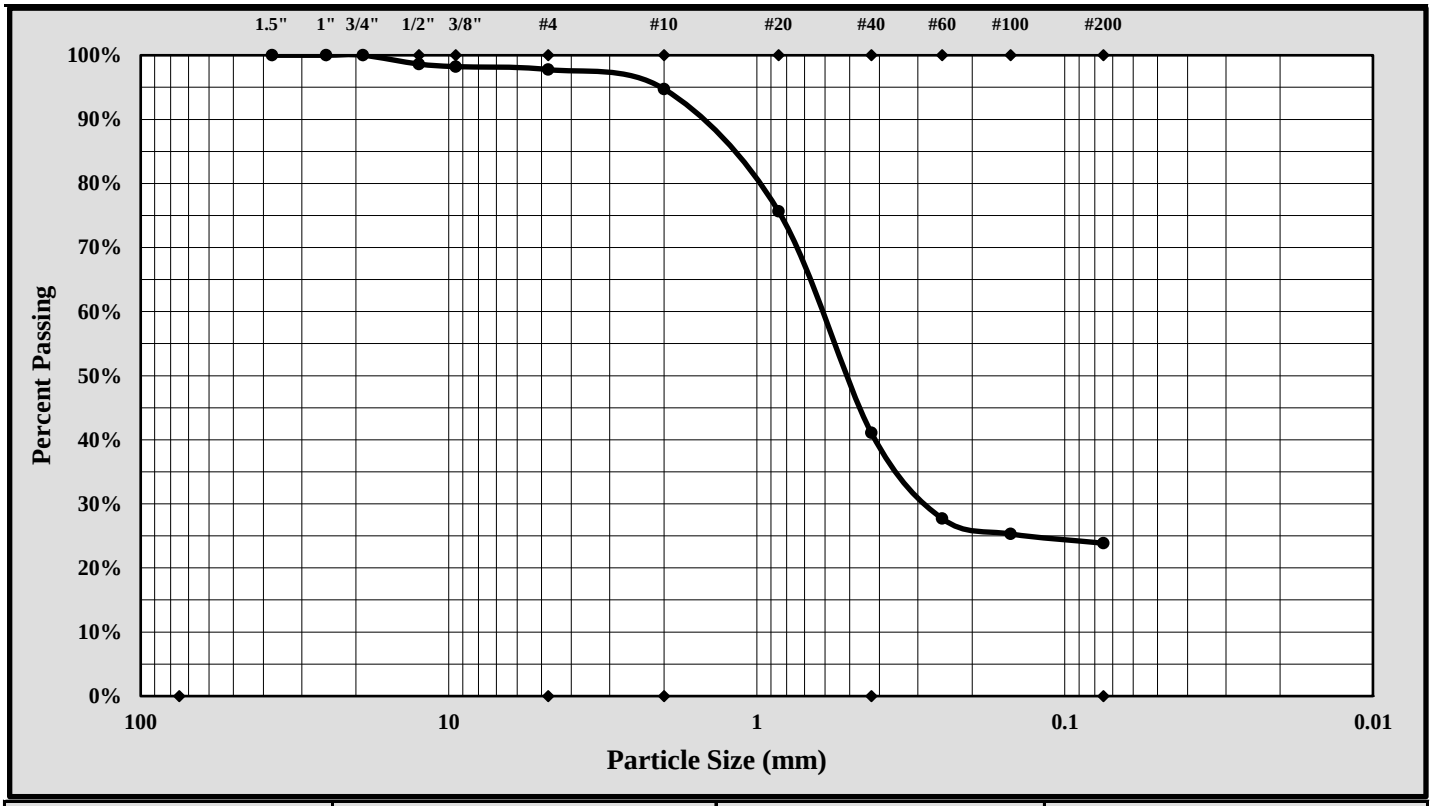
This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	5/15/18
Project Name:	Carolina Crossroads Project	Test Date(s):	5/01 - 5/10/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-34	Sample #: UD-2	Sample Date: Various
Location:	UD borings	Type: Undisturbed	Depth: 36 - 38'
Sample Description:	Clayey Sand [SC, A-2-6(1)]		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	19.0 mm	Gravel:	2.2%
Silt & Clay (% Passing #200):	23.9%	Total Sand:	73.9%

Liquid Limit	31	Plastic Limit	14	Plastic Index	17		
Coarse Sand:	3.0%	Medium Sand:	53.6%	Fine Sand:	17.3%		
Description of Sand and Gravel	Rounded ☐	Angular ☒	Hard & Durable ☒	Soft ☐	Weathered & Friable ☐		

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
5/15/18 — *Date*

This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Form No: TR-D854-1B
Revision No. 1
Revision Date: 08/09/17

SPECIFIC GRAVITY OF SOIL

Oven dried Specimens ASTM D 854 Method B

S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	5/15/18
Project Name:	Carolina Crossroads Project	Test Date(s):	5/02 - 5/04/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-34	Sample #: UD-2	Sample Date: Various
Location:	UD Borings	Type: Undisturbed	Depth: 36 - 38'
Sample Description:	Clayey Sand [SC, A-2-6(1)]		
Material Excluded:	2.2%		% Passing #4 Sieve: 97.8%

Balance ID. *0.01 gram* *ID#:* *13942* *Cal. Date:* *8/18/17* *Cal. Due:* *8/18/18*

Pycnometer ID No. *23162* *Cal. Date:* *2/10/18* *Balance Verification* Check Mass: 500 gram

Pycnometer Volume (V_p)	249.82	ml.	Mass Determination: 500.00 grams
Pycnometer Mass (PM)	115.03	grams	*If [PM-M_p] is greater than .06 grams,*
Ave. Pycnometer Mass (M_p)	115.03	grams	*recalibrate the dry mass of the pycnometer.*

Method B: Oven-dried Specimens

Soaking Time ASTM C127: 24 ± 4 hrs. ☐
Aggregate not initially dried ☐

Table 2 ASTM D 854	Specimen Dry Mass (g.)	
Soil Type	*250-ml. beaker*	*500-ml. beaker*
SP, SP-SM	*60 ± 10*	*100 ± 10*
SP-SC, SM, SC	*45 ± 10*	*75 ± 10*
Silt or Clay	*35 ± 5*	*50 ± 10*

Initial Dry Mass of Test Specimen - *not required.* grams

$M_{psw;t}$ = *Mass of the Pycnometer, soil, and water* = **388.48** *grams*

Mass of Dry Soil (grams)		Tare #	8
A	Tare Weight		203.88
C	Dry Wt. + Tare Wt.		242.43
M_s	Dry Weight	**C-A**	**38.55**

T_t =	Test Temperature T_t	**21.8** °C
K =	Temperature Coefficient at T_t	**0.99961**
K =	Temperature Coefficient at 23°C	**0.99933**
$p_{w;t}$ =	Density of Water at T_t	**0.99782** g./ml.

$M_{pw;t}$ =	Mass of the Pycnometer and water at T_t	$M_{pw;t} = M_p + (V_p \times p_{w;t})$	**364.31** grams
G_t =	Specific Gravity of Soil Solids at the T_t	$G_t = M_s / (M_{pw;t} - (M_{psw;t}-M_s))$	**2.681**
G =	Specific Gravity of Soil Solids at the 20°C	$G = K \times G_t$	**2.680**

Soils containing plus #4 material tested per ***ASTM C 127***

R = *% of Soil retained on the #4 sieve* **2.2%**
P = *% of Soil passing the #4 sieve* **97.8%**

G_{+4} Apparent Specific Gravity of plus #4 material at the 23°C per ASTM C127
Apparent Specific Gravity of plus #4 material corrected to 20°C

G_{total} *Total Sample Specific Gravity* **G_{total}** = $\dfrac{1}{\dfrac{R}{100 \times G_{+4}} + \dfrac{P}{100 \times G}}$ = **2.680**

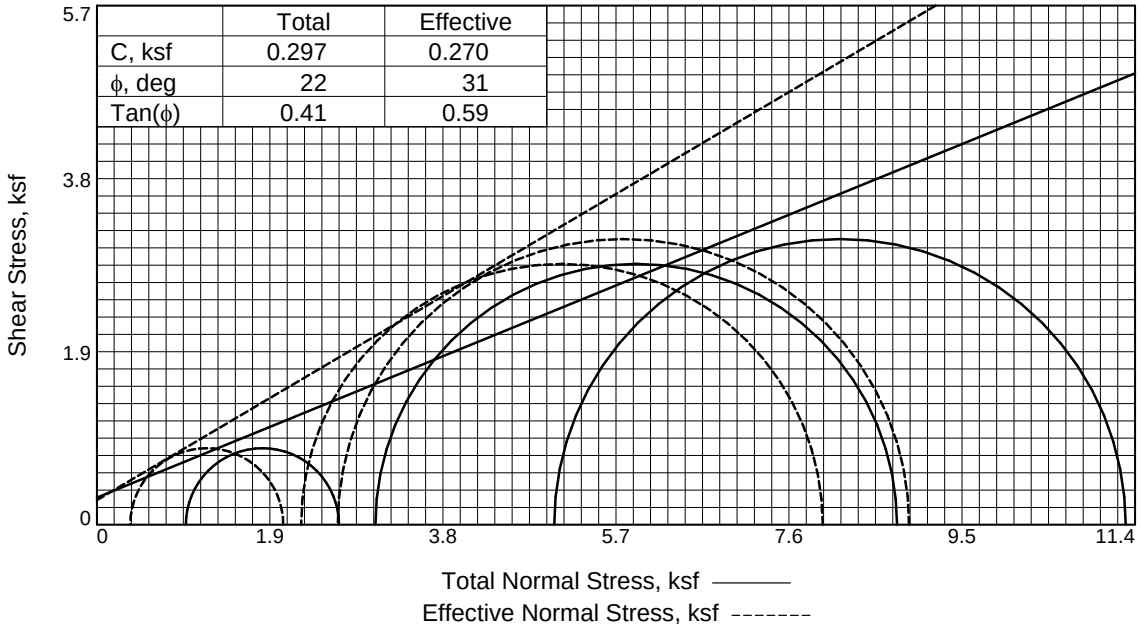
Notes / Deviations / References: ASTM D854: Specific Gravity of Soil Solids by Water Pycnometer

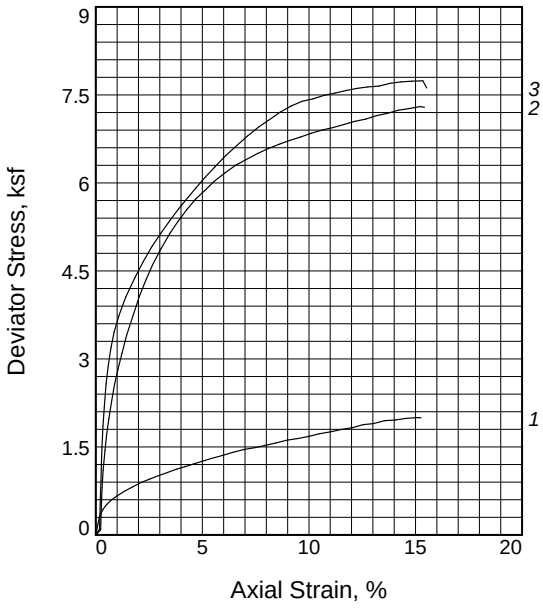
Matthew F. Cooke — *Project Manager*
Project Manager — *Position*
5/15/18 — Date

This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

C & phi are not test results but an interpretation of the test results. The designer is responsible for interpreting test data as provided by S&ME.

	Total	Effective
C, ksf	0.297	0.270
ϕ, deg	22	31
Tan(ϕ)	0.41	0.59





Specimen No.		1	2	3
Initial	Water Content, %	17.2	15.6	18.4
	Dry Density, pcf	106.4	111.0	106.9
	Saturation, %	80.3	82.6	87.4
	Void Ratio	0.5729	0.5068	0.5651
	Diameter, in.	2.857	2.886	2.858
	Height, in.	5.796	5.795	5.735
At Test	Water Content, %	20.2	17.2	17.6
	Dry Density, pcf	108.6	114.4	113.6
	Saturation, %	100.0	100.0	100.0
	Void Ratio	0.5411	0.4618	0.4722
	Diameter, in.	2.839	2.858	2.802
	Height, in.	5.750	5.732	5.613
Strain rate, %/min.		0.25	0.25	0.25
Eff. Cell Pressure, ksf		0.978	3.059	5.023
Fail. Stress, ksf		1.680	5.727	6.274
Total Pore Pr., ksf		8.531	8.735	10.298
Strain, %		10.0	4.7	5.6
Ult. Stress, ksf		2.000	7.304	7.741
Total Pore Pr., ksf		8.347	7.702	9.435
Strain, %		15.1	15.2	15.3
$\bar{\sigma}_1$ Failure, ksf		2.047	7.971	8.919
$\bar{\sigma}_3$ Failure, ksf		0.367	2.243	2.644

Type of Test:
CU with Pore Pressures
Sample Type: Undisturbed
Description: Clayey Sand [SC, A-2-6(1)]

LL= 31 **PL=** 14 **PI=** 17
Specific Gravity= 2.68
Remarks: Specimen failed in shear. Failure selected at peak obliquity. ASTM D4767. Percent passing the #200 sieve: 23.9%

Figure 1

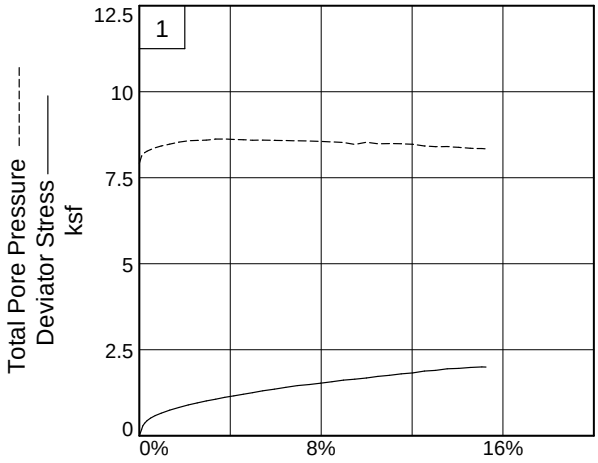
Client: HDR Engineering, Inc.

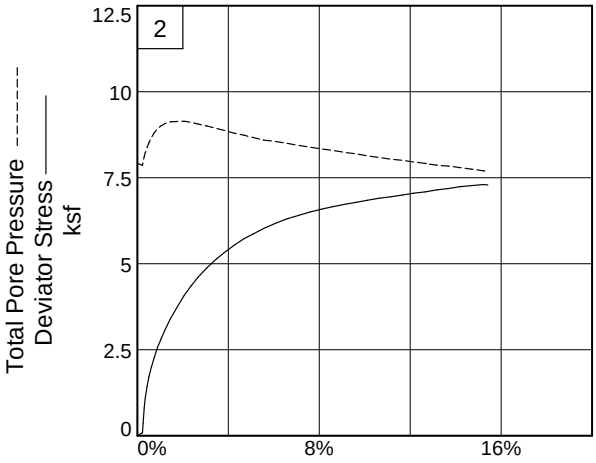
Project: Carolina Crossroads Project

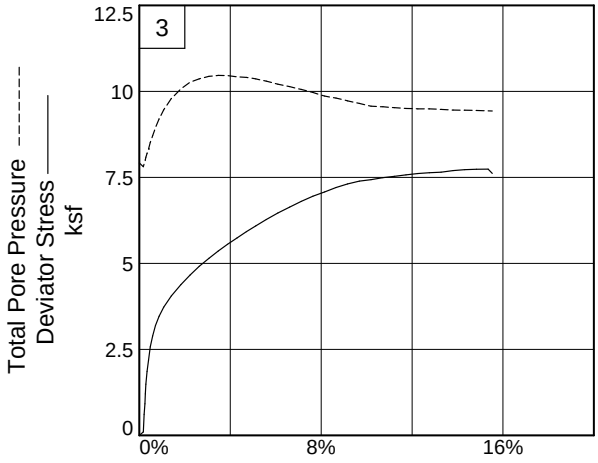
Location: UD borings
Sample Number: B-34 **Depth:** 36 - 38'
Proj. No.: 1461-16-047.2B **Date Sampled:** Various

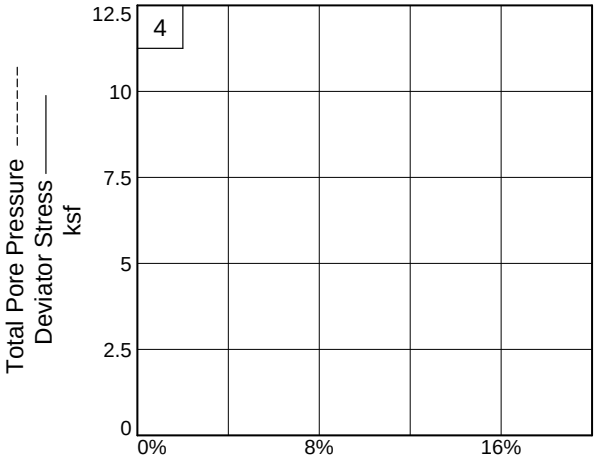
TRIAXIAL SHEAR TEST REPORT
S&ME, Inc.
Greenville, SC

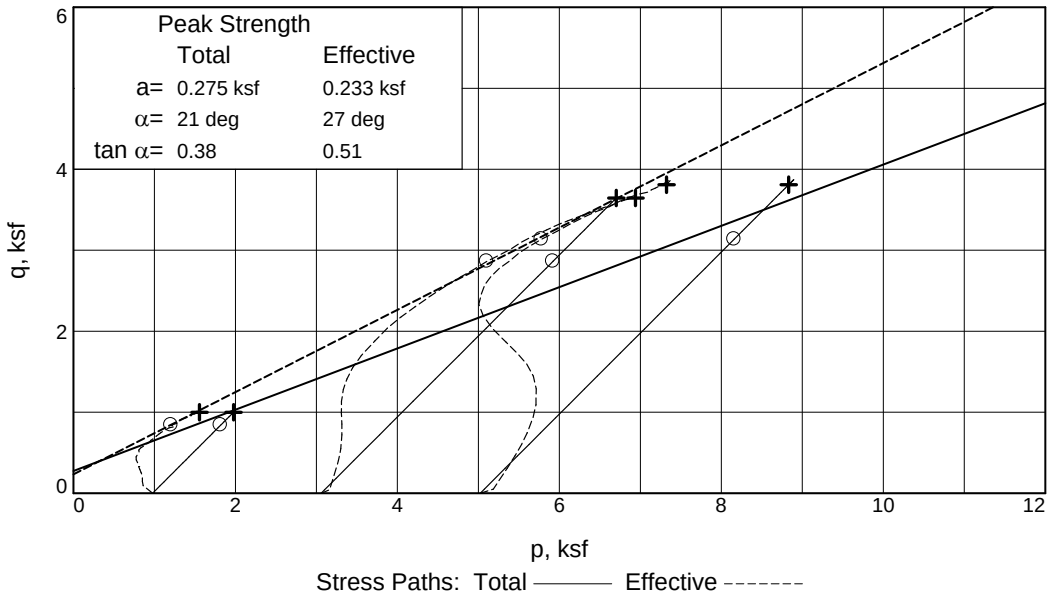
Tested By: Benjamin Kovaleski **Checked By:** Matthew F. Cooke, P.G.











Client: HDR Engineering, Inc.
Project: Carolina Crossroads Project
Location: UD borings **Depth:** 36 - 38' **Sample Number:** B-34
Project No.: 1461-16-047.2B **Figure** 2

S&ME, Inc.

Tested By: Benjamin Kovaleski **Checked By:** Matthew F. Cooke, P.G.

C & phi are not test results but an interpretation of the test results. The designer is responsible for interpreting test data as provided by S&ME.

TRIAXIAL COMPRESSION TEST 5/17/2018

CU with Pore Pressures 4:22 PM

Date: Various
Client: HDR Engineering, Inc.
Project: Carolina Crossroads Project
Project No.: 1461-16-047.2B
Location: UD borings
Depth: 36 - 38' **Sample Number:** B-34
Description: Clayey Sand [SC, A-2-6(1)]
Remarks: Specimen failed in shear. Failure selected at peak obliquity. ASTM D4767. Percent passing the #200 sieve: 23.9%
Type of Sample: Undisturbed
Specific Gravity=2.68 **LL=**31 **PL=**14 **PI=**17
Test Method: ASTM D 4767 Method A

Parameters for Specimen No. 1

Specimen Parameter	Initial	Saturated	Consolidated	Final
Moisture content: Moist soil+tare, gms.	56.320			1291.150
Moisture content: Dry soil+tare, gms.	48.070			1074.340
Moisture content: Tare, gms.	0.000			0.000
Moisture, %	17.2	21.3	20.2	20.2
Moist specimen weight, gms.	1215.50			
Diameter, in.	2.857	2.856	2.839	
Area, in.²	6.411	6.406	6.331	
Height, in.	5.796	5.794	5.750	
Net decrease in height, in.		0.002	0.044	
Net decrease in water volume, cc.			11.700	
Wet density, pcf	124.6	129.2	130.5	
Dry density, pcf	106.4	106.5	108.6	
Void ratio	0.5729	0.5713	0.5411	
Saturation, %	80.3	100.0	100.0	

Test Readings for Specimen No. 1

Membrane modulus = .167543 kN/cm²
Membrane thickness = .03048 cm
Consolidation cell pressure = 61.790 psi (8.898 ksf)
Consolidation back pressure = 55.000 psi (7.920 ksf)
Consolidation effective confining stress = 0.978 ksf
Strain rate, %/min. = 0.25
Fail. Stress = 1.680 ksf **at reading no.** 27
Ult. Stress = 2.000 ksf **at reading no.** 37

Test Readings for Specimen No. 1

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress ksf	Minor Eff. Stress ksf	Major Eff. Stress ksf	1:3 Ratio	Pore Press. psi	P ksf	Q ksf
0	0.0000	0.000	0.0	0.0	0.000	0.978	0.978	1.00	55.000	0.978	0.000
1	0.0057	8.147	8.1	0.1	0.185	0.769	0.954	1.24	56.450	0.861	0.093
2	0.0089	12.624	12.6	0.2	0.287	0.708	0.995	1.40	56.871	0.852	0.143
3	0.0137	16.132	16.1	0.2	0.366	0.668	1.034	1.55	57.149	0.851	0.183
4	0.0196	19.362	19.4	0.3	0.439	0.628	1.067	1.70	57.429	0.847	0.219
5	0.0284	22.668	22.7	0.5	0.513	0.579	1.092	1.89	57.772	0.835	0.257
6	0.0400	25.893	25.9	0.7	0.585	0.527	1.112	2.11	58.130	0.819	0.292
7	0.0554	29.184	29.2	1.0	0.657	0.477	1.134	2.38	58.481	0.805	0.329
8	0.0769	33.193	33.2	1.3	0.745	0.421	1.166	2.77	58.863	0.794	0.372
9	0.1002	36.809	36.8	1.7	0.823	0.365	1.187	3.26	59.258	0.776	0.411
10	0.1237	40.351	40.4	2.2	0.898	0.325	1.223	3.76	59.534	0.774	0.449
11	0.1466	43.139	43.1	2.5	0.956	0.314	1.270	4.04	59.608	0.792	0.478
12	0.1694	45.840	45.8	2.9	1.012	0.305	1.317	4.31	59.670	0.811	0.506
13	0.1933	48.428	48.4	3.4	1.064	0.275	1.339	4.87	59.882	0.807	0.532
14	0.2164	51.118	51.1	3.8	1.119	0.271	1.390	5.12	59.906	0.831	0.559
15	0.2392	53.307	53.3	4.2	1.162	0.286	1.448	5.07	59.807	0.867	0.581
16	0.2627	55.630	55.6	4.6	1.207	0.292	1.499	5.14	59.766	0.895	0.604
17	0.2866	58.053	58.1	5.0	1.255	0.307	1.562	5.09	59.658	0.934	0.627
18	0.3124	60.707	60.7	5.4	1.306	0.305	1.610	5.28	59.674	0.958	0.653
19	0.3415	63.339	63.3	5.9	1.355	0.313	1.668	5.33	59.618	0.990	0.678
20	0.3706	66.220	66.2	6.4	1.409	0.318	1.727	5.44	59.584	1.022	0.705
21	0.4000	68.896	68.9	7.0	1.458	0.326	1.784	5.48	59.529	1.055	0.729
22	0.4302	70.808	70.8	7.5	1.490	0.330	1.820	5.51	59.495	1.075	0.745
23	0.4583	72.951	73.0	8.0	1.527	0.342	1.869	5.47	59.416	1.105	0.764
24	0.4876	75.475	75.5	8.5	1.571	0.357	1.928	5.40	59.308	1.143	0.786
25	0.5163	78.040	78.0	9.0	1.616	0.372	1.988	5.34	59.205	1.180	0.808
26	0.5452	79.832	79.8	9.5	1.644	0.431	2.074	4.82	58.799	1.253	0.822
27	0.5746	82.069	82.1	10.0	1.680	0.367	2.047	5.58	59.245	1.207	0.840
28	0.6035	84.735	84.7	10.5	1.725	0.412	2.137	5.19	58.929	1.274	0.862
29	0.6330	86.804	86.8	11.0	1.757	0.406	2.163	5.33	58.972	1.284	0.878
30	0.6626	89.421	89.4	11.5	1.799	0.409	2.209	5.40	58.949	1.309	0.900
31	0.6915	91.364	91.4	12.0	1.828	0.427	2.255	5.29	58.827	1.341	0.914
32	0.7211	94.561	94.6	12.5	1.881	0.475	2.356	4.96	58.492	1.415	0.941
33	0.7491	96.012	96.0	13.0	1.899	0.496	2.396	4.83	58.343	1.446	0.950
34	0.7789	99.072	99.1	13.5	1.948	0.492	2.440	4.96	58.371	1.466	0.974
35	0.8080	100.242	100.2	14.1	1.960	0.516	2.476	4.80	58.207	1.496	0.980
36	0.8371	102.236	102.2	14.6	1.987	0.542	2.529	4.66	58.024	1.536	0.993
37	0.8666	103.515	103.5	15.1	2.000	0.550	2.550	4.63	57.968	1.550	1.000
38	0.8771	103.688	103.7	15.3	1.999	0.557	2.556	4.59	57.921	1.556	0.999

Parameters for Specimen No. 2

Specimen Parameter	Initial	Saturated	Consolidated	Final
Moisture content: Moist soil+tare, gms.	87.210			1268.000
Moisture content: Dry soil+tare, gms.	75.430			1081.530
Moisture content: Tare, gms.	0.000			0.000
Moisture, %	15.6	18.7	17.2	17.2
Moist specimen weight, gms.	1277.46			
Diameter, in.	2.886	2.882	2.858	
Area, in.²	6.542	6.523	6.416	
Height, in.	5.795	5.787	5.732	
Net decrease in height, in.		0.008	0.055	
Net decrease in water volume, cc.			15.950	
Wet density, pcf	128.4	132.3	134.2	
Dry density, pcf	111.0	111.5	114.4	
Void ratio	0.5068	0.5005	0.4618	
Saturation, %	82.6	100.0	100.0	

Test Readings for Specimen No. 2

Membrane modulus = .167543 kN/cm²
Membrane thickness = .03048 cm
Consolidation cell pressure = 76.240 psi (10.979 ksf)
Consolidation back pressure = 55.000 psi (7.920 ksf)
Consolidation effective confining stress = 3.059 ksf
Strain rate, %/min. = 0.25
Fail. Stress = 5.727 ksf **at reading no.** 21
Ult. Stress = 7.304 ksf **at reading no.** 42

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress ksf	Minor Eff. Stress ksf	Major Eff. Stress ksf	1:3 Ratio	Pore Press. psi	P ksf	Q ksf
0	0.0000	0.000	0.0	0.0	0.000	3.059	3.059	1.00	55.000	3.059	0.000
1	0.0128	3.800	3.8	0.2	0.085	3.120	3.205	1.03	54.576	3.162	0.043
2	0.0143	16.333	16.3	0.2	0.366	3.024	3.390	1.12	55.239	3.207	0.183
3	0.0169	36.007	36.0	0.3	0.806	2.869	3.675	1.28	56.313	3.272	0.403
4	0.0199	49.292	49.3	0.3	1.102	2.750	3.853	1.40	57.139	3.302	0.551
5	0.0246	64.530	64.5	0.4	1.442	2.593	4.035	1.56	58.232	3.314	0.721
6	0.0289	76.413	76.4	0.5	1.706	2.462	4.168	1.69	59.143	3.315	0.853
7	0.0351	88.963	89.0	0.6	1.984	2.316	4.300	1.86	60.158	3.308	0.992
8	0.0422	101.886	101.9	0.7	2.270	2.175	4.445	2.04	61.135	3.310	1.135
9	0.0504	115.054	115.1	0.9	2.559	2.052	4.612	2.25	61.987	3.332	1.280
10	0.0597	126.998	127.0	1.0	2.821	1.966	4.787	2.43	62.586	3.376	1.410
11	0.0703	139.513	139.5	1.2	3.093	1.900	4.992	2.63	63.048	3.446	1.546
12	0.0830	153.802	153.8	1.4	3.402	1.854	5.256	2.84	63.367	3.555	1.701
13	0.1011	170.441	170.4	1.8	3.758	1.842	5.600	3.04	63.445	3.721	1.879
14	0.1176	185.431	185.4	2.1	4.076	1.837	5.913	3.22	63.483	3.875	2.038
15	0.1354	198.832	198.8	2.4	4.357	1.870	6.226	3.33	63.257	4.048	2.178
16	0.1523	210.602	210.6	2.7	4.601	1.915	6.516	3.40	62.938	4.216	2.300
17	0.1756	224.422	224.4	3.1	4.882	1.976	6.858	3.47	62.518	4.417	2.441
18	0.1994	237.354	237.4	3.5	5.142	2.046	7.188	3.51	62.032	4.617	2.571
19	0.2221	248.072	248.1	3.9	5.352	2.115	7.467	3.53	61.554	4.791	2.676
20	0.2456	258.444	258.4	4.3	5.552	2.188	7.739	3.54	61.047	4.964	2.776
21	0.2690	267.767	267.8	4.7	5.727	2.243	7.971	3.55	60.662	5.107	2.864
22	0.2924	275.552	275.6	5.1	5.869	2.313	8.182	3.54	60.178	5.247	2.934

Test Readings for Specimen No. 2

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress ksf	Minor Eff. Stress ksf	Major Eff. Stress ksf	1:3 Ratio	Pore Press. psi	P ksf	Q ksf
23	0.3181	284.236	284.2	5.5	6.025	2.384	8.409	3.53	59.685	5.396	3.013
24	0.3472	292.692	292.7	6.1	6.171	2.422	8.593	3.55	59.423	5.507	3.085
25	0.3765	300.619	300.6	6.6	6.304	2.477	8.781	3.54	59.037	5.629	3.152
26	0.4056	307.038	307.0	7.1	6.403	2.536	8.939	3.52	58.629	5.738	3.202
27	0.4352	313.578	313.6	7.6	6.503	2.592	9.096	3.51	58.238	5.844	3.252
28	0.4639	319.311	319.3	8.1	6.586	2.640	9.226	3.49	57.906	5.933	3.293
29	0.4930	324.639	324.6	8.6	6.659	2.686	9.345	3.48	57.587	6.016	3.330
30	0.5219	329.701	329.7	9.1	6.726	2.741	9.467	3.45	57.207	6.104	3.363
31	0.5506	334.298	334.3	9.6	6.782	2.784	9.566	3.44	56.905	6.175	3.391
32	0.5799	339.423	339.4	10.1	6.847	2.842	9.689	3.41	56.505	6.265	3.424
33	0.6092	344.119	344.1	10.6	6.902	2.890	9.792	3.39	56.171	6.341	3.451
34	0.6388	348.359	348.4	11.1	6.947	2.939	9.886	3.36	55.828	6.413	3.473
35	0.6678	352.925	352.9	11.7	6.998	2.972	9.970	3.35	55.601	6.471	3.499
36	0.6966	357.598	357.6	12.2	7.050	3.020	10.070	3.33	55.267	6.545	3.525
37	0.7262	361.733	361.7	12.7	7.090	3.064	10.154	3.31	54.961	6.609	3.545
38	0.7551	366.880	366.9	13.2	7.149	3.115	10.264	3.30	54.611	6.689	3.575
39	0.7843	370.946	370.9	13.7	7.186	3.141	10.327	3.29	54.429	6.734	3.593
40	0.8133	375.877	375.9	14.2	7.239	3.184	10.422	3.27	54.132	6.803	3.619
41	0.8431	379.774	379.8	14.7	7.270	3.231	10.500	3.25	53.805	6.866	3.635
42	0.8725	383.867	383.9	15.2	7.304	3.276	10.580	3.23	53.489	6.928	3.652
43	0.8837	384.022	384.0	15.4	7.290	3.295	10.585	3.21	53.356	6.940	3.645

Parameters for Specimen No. 3

Specimen Parameter	Initial	Saturated	Consolidated	Final
Moisture content: Moist soil+tare, gms.	80.430			1218.300
Moisture content: Dry soil+tare, gms.	67.910			1035.790
Moisture content: Tare, gms.	0.000			0.000
Moisture, %	18.4	19.9	17.6	17.6
Moist specimen weight, gms.	1222.70			
Diameter, in.	2.858	2.839	2.802	
Area, in.²	6.415	6.330	6.166	
Height, in.	5.735	5.697	5.613	
Net decrease in height, in.		0.038	0.084	
Net decrease in water volume, cc.			23.800	
Wet density, pcf	126.6	130.8	133.7	
Dry density, pcf	106.9	109.1	113.6	
Void ratio	0.5651	0.5340	0.4722	
Saturation, %	87.4	100.0	100.0	

Test Readings for Specimen No. 3

Membrane modulus = .167543 kN/cm²
Membrane thickness = .03048 cm
Consolidation cell pressure = 89.880 psi (12.943 ksf)
Consolidation back pressure = 55.000 psi (7.920 ksf)
Consolidation effective confining stress = 5.023 ksf
Strain rate, %/min. = 0.25
Fail. Stress = 6.274 ksf **at reading no.** 23
Ult. Stress = 7.741 ksf **at reading no.** 42

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress ksf	Minor Eff. Stress ksf	Major Eff. Stress ksf	1:3 Ratio	Pore Press. psi	P ksf	Q ksf
0	0.0000	0.000	0.0	0.0	0.000	5.023	5.023	1.00	55.000	5.023	0.000
1	0.0098	4.372	4.4	0.2	0.102	5.133	5.235	1.02	54.233	5.184	0.051
2	0.0119	26.400	26.4	0.2	0.615	5.048	5.663	1.12	54.826	5.355	0.308
3	0.0138	39.528	39.5	0.2	0.921	4.991	5.912	1.18	55.222	5.451	0.460
4	0.0149	51.755	51.8	0.3	1.206	4.930	6.136	1.24	55.642	5.533	0.603
5	0.0162	63.977	64.0	0.3	1.490	4.858	6.348	1.31	56.142	5.603	0.745
6	0.0191	80.008	80.0	0.3	1.862	4.743	6.605	1.39	56.942	5.674	0.931
7	0.0226	93.986	94.0	0.4	2.186	4.618	6.804	1.47	57.812	5.711	1.093
8	0.0271	110.841	110.8	0.5	2.576	4.426	7.002	1.58	59.143	5.714	1.288
9	0.0330	124.619	124.6	0.6	2.893	4.232	7.125	1.68	60.495	5.678	1.447
10	0.0400	137.721	137.7	0.7	3.194	3.999	7.193	1.80	62.107	5.596	1.597
11	0.0486	149.557	149.6	0.9	3.463	3.745	7.207	1.92	63.876	5.476	1.731
12	0.0603	161.422	161.4	1.1	3.730	3.478	7.207	2.07	65.730	5.342	1.865
13	0.0791	176.188	176.2	1.4	4.057	3.150	7.207	2.29	68.007	5.178	2.028
14	0.1029	191.195	191.2	1.8	4.384	2.868	7.251	2.53	69.964	5.060	2.192
15	0.1254	204.233	204.2	2.2	4.663	2.674	7.338	2.74	71.309	5.006	2.332
16	0.1480	216.211	216.2	2.6	4.917	2.579	7.496	2.91	71.971	5.037	2.458
17	0.1718	227.339	227.3	3.1	5.147	2.505	7.652	3.05	72.482	5.079	2.574
18	0.1951	237.833	237.8	3.5	5.362	2.478	7.840	3.16	72.671	5.159	2.681
19	0.2176	247.438	247.4	3.9	5.555	2.482	8.036	3.24	72.647	5.259	2.777
20	0.2412	256.855	256.9	4.3	5.741	2.520	8.261	3.28	72.378	5.391	2.871
21	0.2644	266.069	266.1	4.7	5.921	2.534	8.456	3.34	72.281	5.495	2.961
22	0.2873	274.869	274.9	5.1	6.091	2.579	8.670	3.36	71.971	5.624	3.045

Test Readings for Specimen No. 3

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress ksf	Minor Eff. Stress ksf	Major Eff. Stress ksf	1:3 Ratio	Pore Press. psi	P ksf	Q ksf
23	0.3134	284.532	284.5	5.6	6.274	2.644	8.919	3.37	71.515	5.782	3.137
24	0.3421	294.825	294.8	6.1	6.466	2.736	9.202	3.36	70.882	5.969	3.233
25	0.3710	304.226	304.2	6.6	6.636	2.805	9.441	3.37	70.401	6.123	3.318
26	0.3997	313.535	313.5	7.1	6.801	2.886	9.687	3.36	69.841	6.286	3.401
27	0.4286	322.299	322.3	7.6	6.953	2.975	9.928	3.34	69.218	6.452	3.476
28	0.4576	330.022	330.0	8.2	7.079	3.080	10.160	3.30	68.488	6.620	3.540
29	0.4857	337.794	337.8	8.7	7.207	3.138	10.344	3.30	68.091	6.741	3.603
30	0.5145	344.666	344.7	9.2	7.312	3.217	10.529	3.27	67.541	6.873	3.656
31	0.5433	350.343	350.3	9.7	7.390	3.293	10.683	3.24	67.013	6.988	3.695
32	0.5723	354.431	354.4	10.2	7.434	3.374	10.808	3.20	66.446	7.091	3.717
33	0.6015	359.334	359.3	10.7	7.493	3.390	10.883	3.21	66.336	7.137	3.747
34	0.6303	363.337	363.3	11.2	7.533	3.416	10.949	3.20	66.155	7.183	3.766
35	0.6587	367.437	367.4	11.7	7.575	3.438	11.012	3.20	66.007	7.225	3.787
36	0.6879	371.433	371.4	12.3	7.612	3.449	11.061	3.21	65.928	7.255	3.806
37	0.7163	374.855	374.9	12.8	7.638	3.451	11.088	3.21	65.918	7.269	3.819
38	0.7453	377.666	377.7	13.3	7.649	3.466	11.115	3.21	65.813	7.290	3.825
39	0.7748	382.373	382.4	13.8	7.698	3.487	11.184	3.21	65.666	7.336	3.849
40	0.8036	385.979	386.0	14.3	7.724	3.489	11.213	3.21	65.654	7.351	3.862
41	0.8324	388.883	388.9	14.8	7.735	3.496	11.232	3.21	65.601	7.364	3.868
42	0.8613	391.533	391.5	15.3	7.741	3.508	11.249	3.21	65.522	7.378	3.871
43	0.8715	386.134	386.1	15.5	7.618	3.515	11.133	3.17	65.473	7.324	3.809

Project Name: Carolina Crossroads Project

Boring #: B-34

Depth: 36 – 38′

Sample #: UD-2

Test Type: Consolidated Undrained Triaxial Shear (ASTM D4767)



Specimen #1 Specimen #2 Specimen #3

Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☐ AASHTO T 89 ☐ AASHTO T 90 ☐

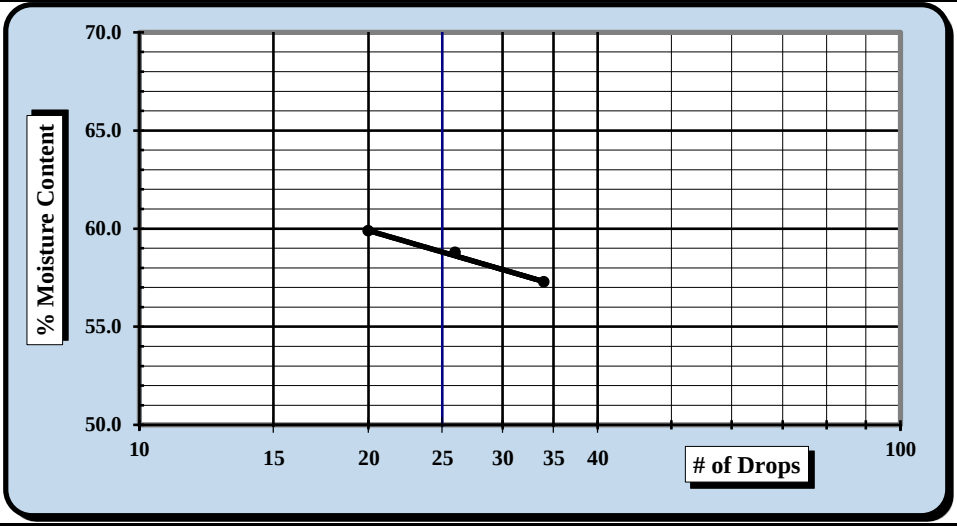
S&ME, Inc. Charlotte: 9751 Southern Pine Boulevard, Charlotte, NC 28273

Project #:	1461-16-047.2B	Report Date:	6/1/18
Project Name:	Carolina Crossroads Project	Test Date(s)	4/18-5/20/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Avenue, North Charleston, SC 29405		

Boring #:	W-23UD	Sample #: UD-2	Sample Date: Various
Location:	UD Borings	Offset: NA	Elevation: 8.5-10
Sample Description:	Brown Gray Clay (CH)		

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	3222	7/29/2017	Grooving tool	30427	9/27/2017
LL Apparatus	20336	2/21/2018	Grooving tool		
Oven	10844	8/22/2017	Grooving tool		

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	LL	60	II				BB	23	
A	Tare Weight	16.98	13.90	16.92				15.37	14.09	
B	Wet Soil Weight + A	26.73	24.76	28.05				23.54	22.37	
C	Dry Soil Weight + A	23.18	20.74	23.88				21.96	20.75	
D	Water Weight (B-C)	3.55	4.02	4.17				1.58	1.62	
E	Dry Soil Weight (C-A)	6.20	6.84	6.96				6.59	6.66	
F	% Moisture (D/E)*100	57.3%	58.8%	59.9%				24.0%	24.3%	
N	# OF DROPS	34	26	20						
LL	LL = **F** * FACTOR									
Ave.	*Average*							**24.2%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**59**
Plastic Limit	**24**
Plastic Index	**35**
Group Symbol	**CH**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:*

Notes / Deviations / References:

Karen Warner	6/1/2018	Matthew F. Cooke, P.G.	7/18/2018
Technician Name	*Date*	*Technical Responsibility*	*Date*

This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

SIEVE ANALYSIS OF SOILS

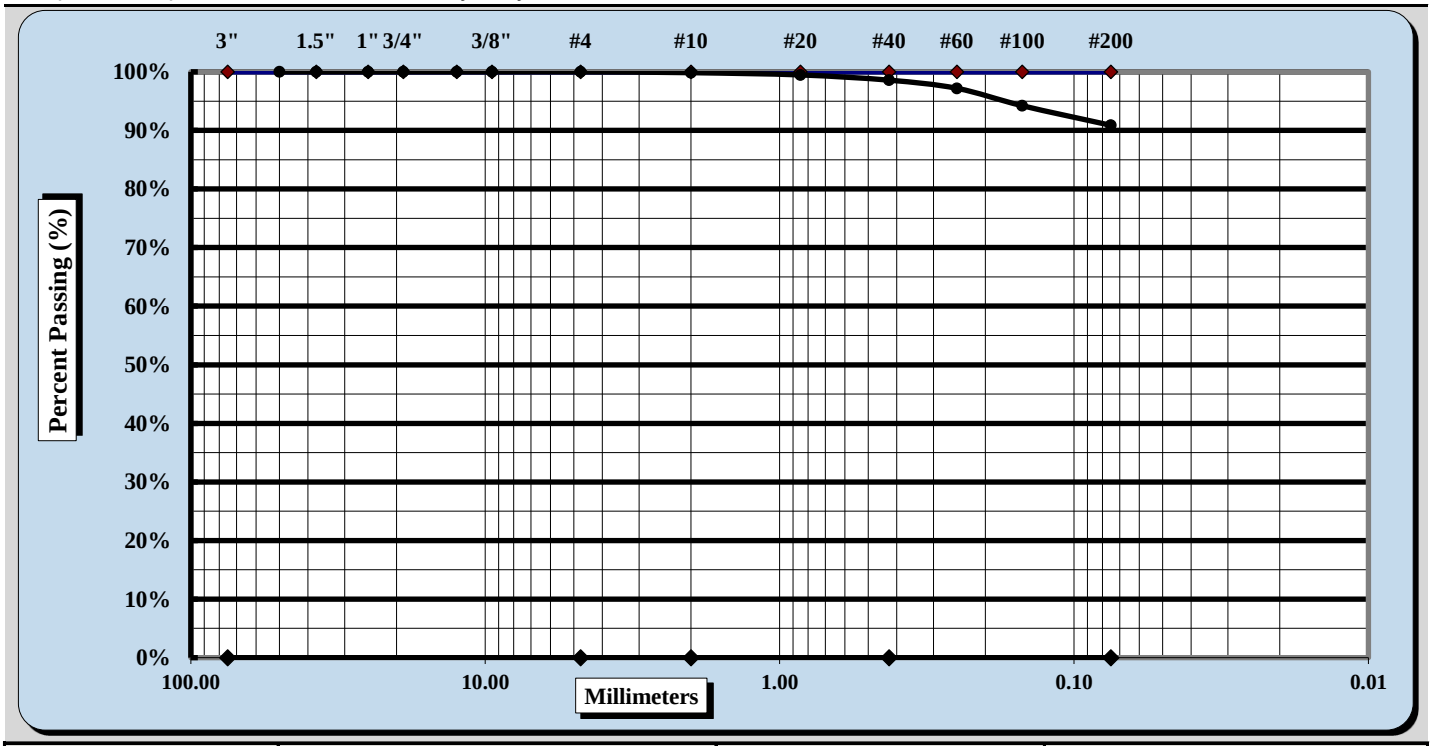
ASTM D 422

S&ME, Inc. Charlotte: 9751 Southern Pine Boulevard, Charlotte, NC 28273

Project #:	1461-16-047.2B	Report Date:	6/1/18
Project Name:	Carolina Crossroads Project	Test Date(s):	4/18-25/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Avenue, North Charleston, SC 29405		

Sample Id.	W-23UD	Type:	Undisturbed	Sample Date:	Various
Location:	UD Borings	Sample:	UD-2	Elevation:	8.5-10

Sample Description: Brown Gray Clay (CH)



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size	#10	Coarse Sand	0.1%	Fine Sand	7.7%
Gravel	0.0%	Medium Sand	1.3%	Silt & Clay	90.9%
Liquid Limit	59	Plastic Limit	24	Plastic Index	35
Specific Gravity	ND			Moisture Content	Various
Coarse Sand	0.1%	Medium Sand	1.3%	Fine Sand	7.7%

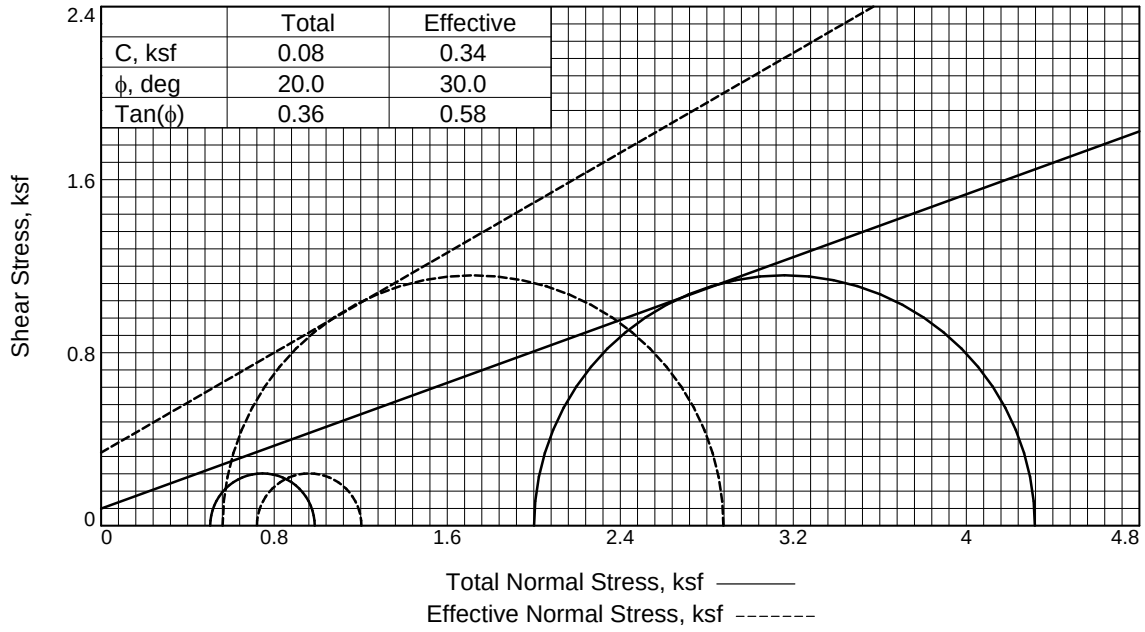
Description of Sand & Gravel Particles: Rounded ☐ Angular ☒
Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

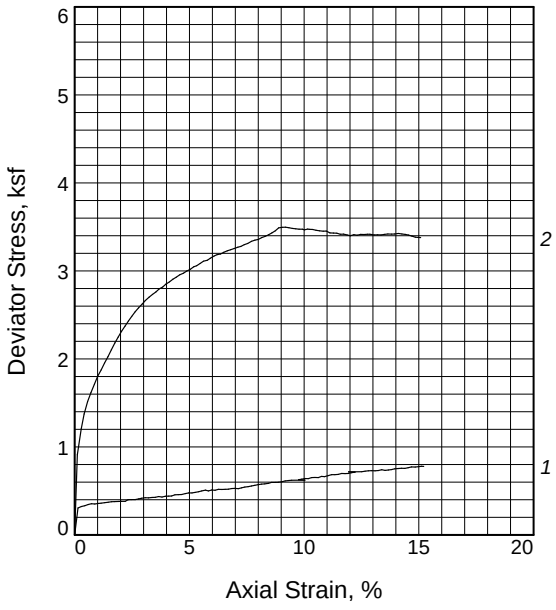
Notes / Deviations / References: ND: Not Determined

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
7/8/2018 — *Date*

This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

C & phi are not test results but an interpretation of the test results. The designer is responsible for interpreting test data as provided by S&ME.





Sample No.		1	2
Initial	Water Content, %	25.0	25.0
	Dry Density, pcf	84.3	96.2
	Saturation, %	68.8	92.1
	Void Ratio	0.9634	0.7194
	Diameter, in.	2.857	2.854
	Height, in.	6.362	6.180
At Test	Water Content, %	30.1	23.8
	Dry Density, pcf	92.0	101.4
	Saturation, %	100.0	100.0
	Void Ratio	0.7972	0.6320
	Diameter, in.	2.774	2.805
	Height, in.	6.179	6.074
Strain rate, in./min.		0.009	0.009
Eff. Cell Pressure, ksf		0.50	2.00
Fail. Stress, ksf		0.48	2.32
Total Pore Pr., ksf		8.42	10.08
Strain, %		5.2	2.0
Ult. Stress, ksf		0.78	3.38
Total Pore Pr., ksf		8.32	9.00
Strain, %		15.2	15.1
$\bar{\sigma}_1$ Failure, ksf		1.20	2.88
$\bar{\sigma}_3$ Failure, ksf		0.72	0.56

Type of Test:
CU with Pore Pressures
Sample Type: Undisturbed
Description: Brown Gray Clay (CH)

LL= 59 **PL=** 24 **PI=** 35
Assumed Specific Gravity= 2.65
Remarks: Only 2 specimens suitable for testing. Specimen S-1 failed in bulge, S-2 Specimen failed in shear (ASTM 4767).

Figure W-23UD UD-2

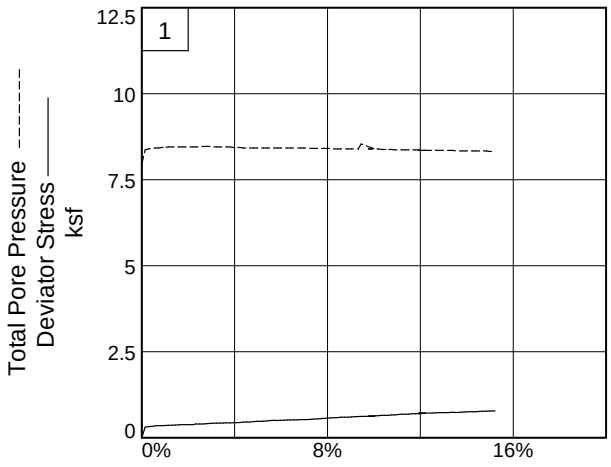
Client: HDR Engineering, Inc.

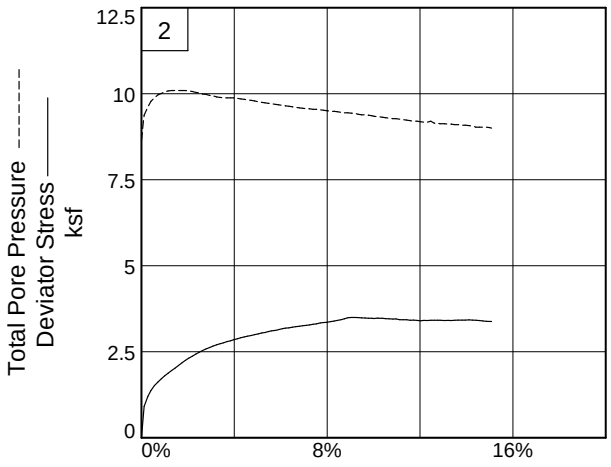
Project: Carolina Crossroads Project

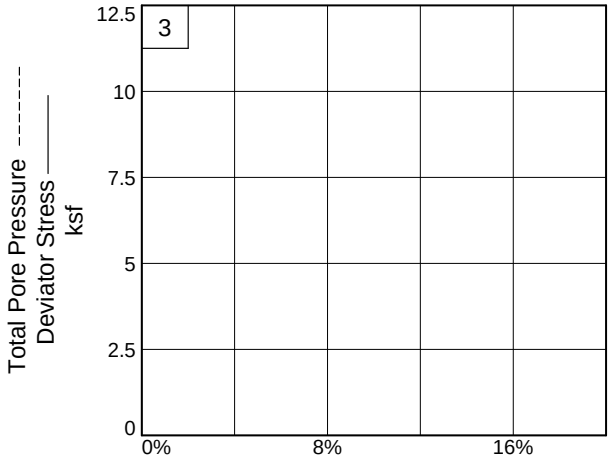
Location: UD Borings
Sample Number: W-23UD UD-2 **Depth:** 8.5-10.5
Proj. No.: 1461-16-047.2B **Date Sampled:** Various

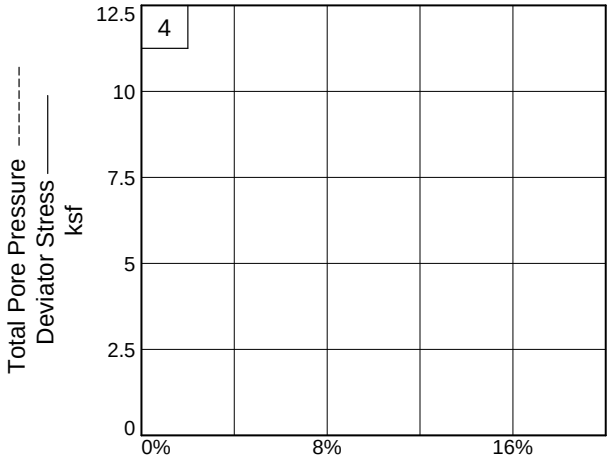
TRIAXIAL SHEAR TEST REPORT
S & ME, INC.
Charlotte, North Carolina

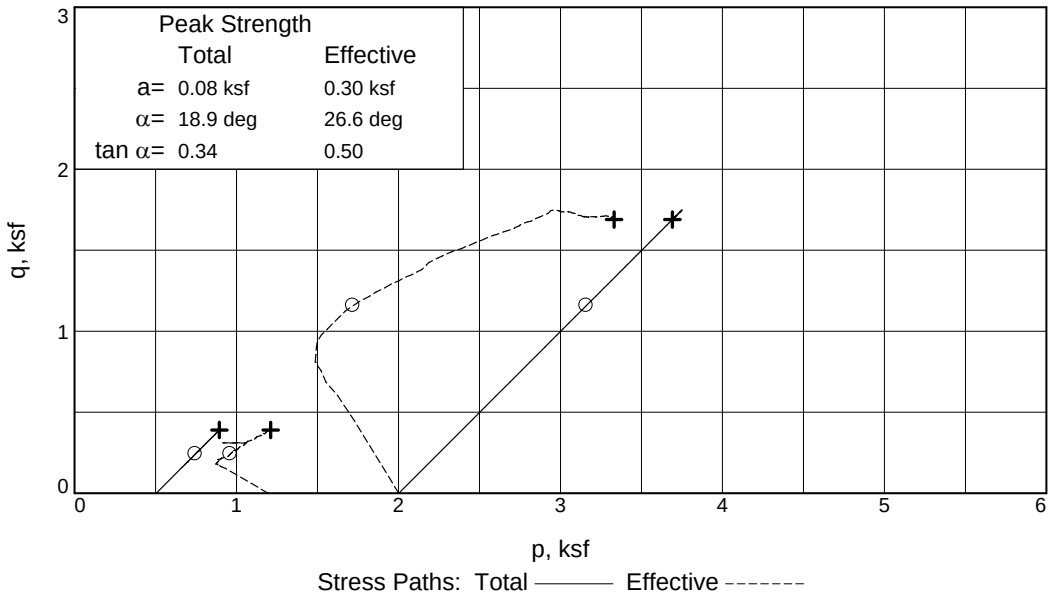
Tested By: Karen Warner **Checked By:** Jason Reeves











Client: HDR Engineering, Inc.
Project: Carolina Crossroads Project
Location: UD Borings **Depth:** 8.5-10.5 **Sample Number:** W-23UD UD-2
Project No.: 1461-16-047.2B **Figure** W-23UD UD-2

S & ME, INC.

Tested By: Karen Warner **Checked By:** Jason Reeves

C & phi are not test results but an interpretation of the test results. The designer is responsible for interpreting test data as provided by S&ME.

TRIAXIAL COMPRESSION TEST

6/28/2018

CU with Pore Pressures

5:03 PM

Date: Various
Client: HDR Engineering, Inc.
Project: Carolina Crossroads Project
Project No.: 1461-16-047.2B
Location: UD Borings
Depth: 8.5-10.5 **Sample Number:** W-23UD UD-2
Description: Brown Gray Clay (CH)
Remarks: Only 2 specimens suitable for testing. Specimen S-1 failed in bulge, S-2 Specimen failed in shear (ASTM 4767).
Type of Sample: Undisturbed
Assumed Specific Gravity=2.65 **LL=**59 **PL=**24 **PI=**35
Test Method: COE uniform strain

Parameters for Specimen No. 1

Specimen Parameter	Initial	Saturated	Consolidated	Final
Moisture content: Moist soil+tare, gms.	243.730			1261.270
Moisture content: Dry soil+tare, gms.	211.340			1200.000
Moisture content: Tare, gms.	81.830			84.570
Moisture, %	25.0	34.9	30.1	5.5
Moist specimen weight, gms.	1127.68			
Diameter, in.	2.857	2.839	2.774	
Area, in.²	6.411	6.328	6.042	
Height, in.	6.362	6.321	6.179	
Net decrease in height, in.		0.041	0.142	
Wet density, pcf	105.3	115.9	119.7	
Dry density, pcf	84.3	85.9	92.0	
Void ratio	0.9634	0.9256	0.7972	
Saturation, %	68.8	100.0	100.0	

Test Readings for Specimen No. 1

Consolidation cell pressure = 63.50 psi (9.14 ksf)
Consolidation back pressure = 60.00 psi (8.64 ksf)
Consolidation effective confining stress = 0.50 ksf
Strain rate, in./min. = 0.009
Fail. Stress = 0.48 ksf **at reading no.** 36
Ult. Stress = 0.78 ksf **at reading no.** 105

Test Readings for Specimen No. 1

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress ksf	Minor Eff. Stress ksf	Major Eff. Stress ksf	1:3 Ratio	Pore Press. psi	P ksf	Q ksf
0	0.0100	18.100	0.0	0.0	0.00	1.20	1.20	1.00	55.20	1.20	0.00
1	0.0190	31.000	12.9	0.1	0.31	0.78	1.08	1.39	58.10	0.93	0.15
2	0.0280	31.700	13.6	0.3	0.32	0.75	1.07	1.43	58.30	0.91	0.16
3	0.0370	32.100	14.0	0.4	0.33	0.73	1.07	1.45	58.40	0.90	0.17
4	0.0460	32.700	14.6	0.6	0.35	0.72	1.07	1.48	58.50	0.89	0.17
5	0.0550	33.100	15.0	0.7	0.35	0.72	1.07	1.49	58.50	0.90	0.18
6	0.0640	33.000	14.9	0.9	0.35	0.71	1.06	1.50	58.60	0.88	0.18
7	0.0730	33.300	15.2	1.0	0.36	0.71	1.06	1.51	58.60	0.88	0.18
8	0.0810	33.400	15.3	1.1	0.36	0.69	1.05	1.52	58.70	0.87	0.18
9	0.0910	33.700	15.6	1.3	0.37	0.69	1.06	1.53	58.70	0.87	0.18
10	0.1000	33.900	15.8	1.5	0.37	0.69	1.06	1.54	58.70	0.88	0.19
11	0.1090	34.200	16.1	1.6	0.38	0.69	1.07	1.55	58.70	0.88	0.19
12	0.1180	34.300	16.2	1.7	0.38	0.69	1.07	1.55	58.70	0.88	0.19
13	0.1270	34.400	16.3	1.9	0.38	0.69	1.07	1.55	58.70	0.88	0.19
14	0.1360	34.500	16.4	2.0	0.38	0.69	1.07	1.55	58.70	0.88	0.19
15	0.1460	34.500	16.4	2.2	0.38	0.69	1.07	1.55	58.70	0.88	0.19
16	0.1540	35.300	17.2	2.3	0.40	0.69	1.09	1.58	58.70	0.89	0.20
17	0.1640	35.400	17.3	2.5	0.40	0.69	1.09	1.58	58.70	0.89	0.20
18	0.1730	35.400	17.3	2.6	0.40	0.68	1.08	1.59	58.80	0.88	0.20
19	0.1820	35.800	17.7	2.8	0.41	0.68	1.09	1.61	58.80	0.88	0.21
20	0.1900	36.100	18.0	2.9	0.42	0.68	1.09	1.62	58.80	0.89	0.21
21	0.2000	36.400	18.3	3.1	0.42	0.69	1.11	1.61	58.70	0.90	0.21
22	0.2090	36.400	18.3	3.2	0.42	0.69	1.11	1.61	58.70	0.90	0.21
23	0.2180	36.600	18.5	3.4	0.43	0.69	1.12	1.62	58.70	0.90	0.21
24	0.2270	36.700	18.6	3.5	0.43	0.69	1.12	1.62	58.70	0.91	0.21
25	0.2360	37.100	19.0	3.7	0.44	0.69	1.13	1.63	58.70	0.91	0.22
26	0.2450	36.900	18.8	3.8	0.43	0.69	1.12	1.62	58.70	0.91	0.22
27	0.2540	37.300	19.2	3.9	0.44	0.71	1.15	1.62	58.60	0.93	0.22
28	0.2630	37.400	19.3	4.1	0.44	0.71	1.15	1.63	58.60	0.93	0.22
29	0.2710	37.500	19.4	4.2	0.44	0.71	1.15	1.63	58.60	0.93	0.22
30	0.2800	38.100	20.0	4.4	0.46	0.72	1.18	1.63	58.50	0.95	0.23
31	0.2890	38.200	20.1	4.5	0.46	0.72	1.18	1.64	58.50	0.95	0.23
32	0.2980	38.300	20.2	4.7	0.46	0.72	1.18	1.64	58.50	0.95	0.23
33	0.3080	38.800	20.7	4.8	0.47	0.72	1.19	1.65	58.50	0.95	0.23
34	0.3170	39.200	21.1	5.0	0.48	0.72	1.20	1.66	58.50	0.96	0.24
35	0.3260	39.200	21.1	5.1	0.48	0.72	1.20	1.66	58.50	0.96	0.24
36	0.3340	39.500	21.4	5.2	0.48	0.72	1.20	1.67	58.50	0.96	0.24
37	0.3440	39.900	21.8	5.4	0.49	0.72	1.21	1.68	58.50	0.97	0.25
38	0.3520	40.300	22.2	5.5	0.50	0.72	1.22	1.69	58.50	0.97	0.25
39	0.3620	40.800	22.7	5.7	0.51	0.72	1.23	1.71	58.50	0.98	0.26
40	0.3700	40.400	22.3	5.8	0.50	0.72	1.22	1.70	58.50	0.97	0.25
41	0.3790	40.900	22.8	6.0	0.51	0.72	1.23	1.71	58.50	0.98	0.26
42	0.3880	40.800	22.7	6.1	0.51	0.72	1.23	1.71	58.50	0.97	0.25
43	0.3970	41.300	23.2	6.3	0.52	0.72	1.24	1.72	58.50	0.98	0.26
44	0.4060	41.300	23.2	6.4	0.52	0.72	1.24	1.72	58.50	0.98	0.26
45	0.4150	41.400	23.3	6.6	0.52	0.72	1.24	1.72	58.50	0.98	0.26
46	0.4240	41.500	23.4	6.7	0.52	0.72	1.24	1.72	58.50	0.98	0.26

Test Readings for Specimen No. 1

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress ksf	Minor Eff. Stress ksf	Major Eff. Stress ksf	1:3 Ratio	Pore Press. psi	P ksf	Q ksf
47	0.4330	41.900	23.8	6.8	0.53	0.72	1.25	1.73	58.50	0.98	0.26
48	0.4410	42.000	23.9	7.0	0.53	0.72	1.25	1.74	58.50	0.98	0.26
49	0.4510	41.900	23.8	7.1	0.53	0.72	1.25	1.73	58.50	0.98	0.26
50	0.4590	42.300	24.2	7.3	0.53	0.73	1.27	1.73	58.40	1.00	0.27
51	0.4680	42.800	24.7	7.4	0.55	0.73	1.28	1.74	58.40	1.01	0.27
52	0.4770	43.000	24.9	7.6	0.55	0.73	1.28	1.75	58.40	1.01	0.27
53	0.4860	43.400	25.3	7.7	0.56	0.73	1.29	1.76	58.40	1.01	0.28
54	0.4950	43.800	25.7	7.8	0.56	0.73	1.30	1.77	58.40	1.02	0.28
55	0.5040	44.200	26.1	8.0	0.57	0.73	1.31	1.78	58.40	1.02	0.29
56	0.5130	44.500	26.4	8.1	0.58	0.73	1.31	1.79	58.40	1.02	0.29
57	0.5220	44.700	26.6	8.3	0.58	0.75	1.33	1.78	58.30	1.04	0.29
58	0.5320	45.000	26.9	8.4	0.59	0.75	1.34	1.78	58.30	1.04	0.29
59	0.5400	45.500	27.4	8.6	0.60	0.75	1.35	1.80	58.30	1.05	0.30
60	0.5500	45.600	27.5	8.7	0.60	0.75	1.35	1.80	58.30	1.05	0.30
61	0.5590	45.700	27.6	8.9	0.60	0.75	1.35	1.80	58.30	1.05	0.30
62	0.5680	46.000	27.9	9.0	0.60	0.75	1.35	1.81	58.30	1.05	0.30
63	0.5770	46.500	28.4	9.2	0.61	0.75	1.36	1.82	58.30	1.06	0.31
64	0.5860	46.700	28.6	9.3	0.62	0.75	1.37	1.83	58.30	1.06	0.31
65	0.5940	46.900	28.8	9.5	0.62	0.60	1.23	2.03	59.30	0.92	0.31
66	0.6300	47.200	29.1	10.0	0.62	0.75	1.37	1.83	58.30	1.06	0.31
67	0.6130	47.300	29.2	9.8	0.63	0.75	1.38	1.84	58.30	1.06	0.31
68	0.6210	47.600	29.5	9.9	0.63	0.75	1.38	1.85	58.30	1.07	0.32
69	0.6300	48.000	29.9	10.0	0.64	0.75	1.39	1.86	58.30	1.07	0.32
70	0.6390	48.000	29.9	10.2	0.64	0.75	1.39	1.85	58.30	1.07	0.32
71	0.6480	48.600	30.5	10.3	0.65	0.76	1.42	1.85	58.20	1.09	0.33
72	0.6570	48.700	30.6	10.5	0.65	0.76	1.42	1.86	58.20	1.09	0.33
73	0.6660	48.700	30.6	10.6	0.65	0.76	1.42	1.85	58.20	1.09	0.33
74	0.6750	49.400	31.3	10.8	0.67	0.76	1.43	1.87	58.20	1.10	0.33
75	0.6830	49.300	31.2	10.9	0.66	0.78	1.44	1.85	58.10	1.11	0.33
76	0.6930	49.900	31.8	11.1	0.67	0.78	1.45	1.87	58.10	1.11	0.34
77	0.7020	50.500	32.4	11.2	0.69	0.78	1.46	1.88	58.10	1.12	0.34
78	0.7110	50.500	32.4	11.3	0.68	0.78	1.46	1.88	58.10	1.12	0.34
79	0.7200	50.700	32.6	11.5	0.69	0.78	1.47	1.88	58.10	1.12	0.34
80	0.7290	51.300	33.2	11.6	0.70	0.78	1.48	1.90	58.10	1.13	0.35
81	0.7380	51.300	33.2	11.8	0.70	0.78	1.48	1.90	58.10	1.13	0.35
82	0.7470	51.400	33.3	11.9	0.70	0.78	1.48	1.90	58.10	1.13	0.35
83	0.7560	51.900	33.8	12.1	0.71	0.79	1.50	1.89	58.00	1.15	0.35
84	0.7650	52.200	34.1	12.2	0.71	0.79	1.51	1.90	58.00	1.15	0.36
85	0.7474	52.300	34.2	11.9	0.72	0.79	1.51	1.91	58.00	1.15	0.36
86	0.7830	52.600	34.5	12.5	0.72	0.79	1.51	1.91	58.00	1.15	0.36
87	0.7920	52.900	34.8	12.7	0.72	0.79	1.52	1.91	58.00	1.15	0.36
88	0.8010	53.200	35.1	12.8	0.73	0.79	1.52	1.92	58.00	1.16	0.36
89	0.8100	53.300	35.2	12.9	0.73	0.79	1.52	1.92	58.00	1.16	0.37
90	0.8190	53.300	35.2	13.1	0.73	0.79	1.52	1.92	58.00	1.16	0.36
91	0.8280	53.500	35.4	13.2	0.73	0.79	1.52	1.92	58.00	1.16	0.37
92	0.8370	54.000	35.9	13.4	0.74	0.79	1.53	1.94	58.00	1.16	0.37
93	0.8460	53.700	35.6	13.5	0.73	0.81	1.54	1.91	57.90	1.17	0.37

Test Readings for Specimen No. 1

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress ksf	Minor Eff. Stress ksf	Major Eff. Stress ksf	1:3 Ratio	Pore Press. psi	P ksf	Q ksf
94	0.8550	54.000	35.9	13.7	0.74	0.81	1.55	1.92	57.90	1.18	0.37
95	0.8630	54.300	36.2	13.8	0.74	0.81	1.55	1.92	57.90	1.18	0.37
96	0.8720	54.800	36.7	14.0	0.75	0.81	1.56	1.93	57.90	1.18	0.38
97	0.8810	55.000	36.9	14.1	0.76	0.81	1.56	1.94	57.90	1.18	0.38
98	0.8900	55.200	37.1	14.2	0.76	0.81	1.56	1.94	57.90	1.19	0.38
99	0.8990	55.200	37.1	14.4	0.76	0.81	1.56	1.94	57.90	1.18	0.38
100	0.9080	55.600	37.5	14.5	0.76	0.81	1.57	1.95	57.90	1.19	0.38
101	0.9170	56.100	38.0	14.7	0.77	0.81	1.58	1.96	57.90	1.19	0.39
102	0.9270	56.100	38.0	14.8	0.77	0.81	1.58	1.96	57.90	1.19	0.39
103	0.9360	56.400	38.3	15.0	0.78	0.82	1.60	1.95	57.80	1.21	0.39
104	0.9440	56.700	38.6	15.1	0.78	0.82	1.60	1.95	57.80	1.21	0.39
105	0.9500	56.700	38.6	15.2	0.78	0.82	1.60	1.95	57.80	1.21	0.39

Parameters for Specimen No. 2

Specimen Parameter	Initial	Saturated	Consolidated	Final
Moisture content: Moist soil+tare, gms.	243.730			n/a
Moisture content: Dry soil+tare, gms.	211.340			n/a
Moisture content: Tare, gms.	81.830			n/a
Moisture, %	25.0	26.7	23.8	
Moist specimen weight, gms.	1248.21			
Diameter, in.	2.854	2.848	2.805	
Area, in.²	6.397	6.370	6.178	
Height, in.	6.180	6.167	6.074	
Net decrease in height, in.		0.013	0.093	
Wet density, pcf	120.3	122.7	125.5	
Dry density, pcf	96.2	96.8	101.4	
Void ratio	0.7194	0.7086	0.6320	
Saturation, %	92.1	100.0	100.0	

Test Readings for Specimen No. 2

Consolidation cell pressure = 73.90 psi (10.64 ksf)
Consolidation back pressure = 60.00 psi (8.64 ksf)
Consolidation effective confining stress = 2.00 ksf
Strain rate, in./min. = 0.009
Fail. Stress = 2.32 ksf **at reading no.** 14
Ult. Stress = 3.38 ksf **at reading no.** 103

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress ksf	Minor Eff. Stress ksf	Major Eff. Stress ksf	1:3 Ratio	Pore Press. psi	P ksf	Q ksf
0	0.0190	15.500	0.0	0.0	0.00	2.00	2.00	1.00	60.00	2.00	0.00
1	0.0260	54.600	39.1	0.1	0.91	1.27	2.18	1.72	65.10	1.72	0.46
2	0.0360	67.300	51.8	0.3	1.20	1.02	2.23	2.18	66.80	1.62	0.60
3	0.0440	74.700	59.2	0.4	1.37	0.86	2.24	2.59	67.90	1.55	0.69
4	0.0530	80.900	65.4	0.6	1.52	0.76	2.28	2.99	68.60	1.52	0.76
5	0.0620	85.400	69.9	0.7	1.62	0.68	2.29	3.39	69.20	1.49	0.81
6	0.0710	89.600	74.1	0.9	1.71	0.63	2.35	3.70	69.50	1.49	0.86
7	0.0800	93.700	78.2	1.0	1.80	0.59	2.39	4.06	69.80	1.49	0.90
8	0.0890	96.900	81.4	1.2	1.88	0.56	2.44	4.34	70.00	1.50	0.94
9	0.0980	100.400	84.9	1.3	1.95	0.55	2.50	4.57	70.10	1.52	0.98

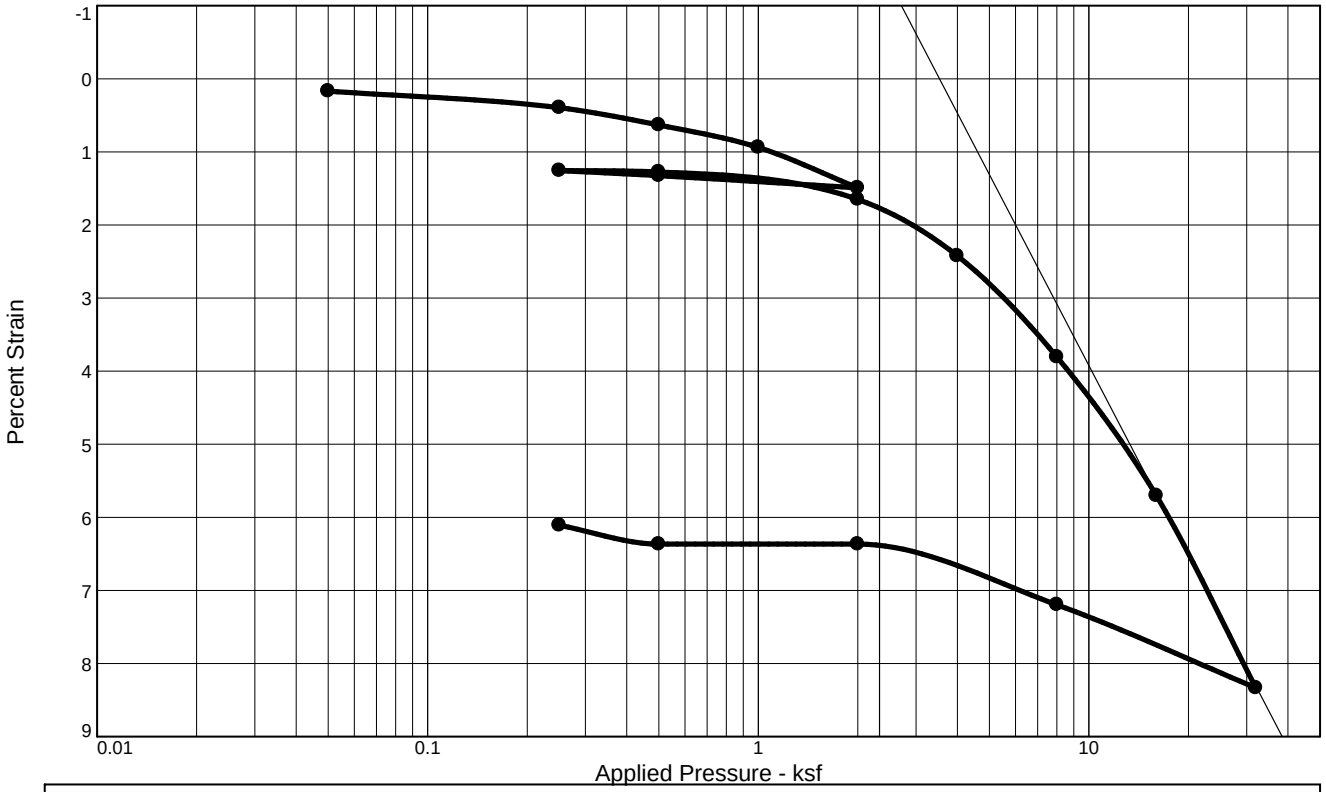
Test Readings for Specimen No. 2

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress ksf	Minor Eff. Stress ksf	Major Eff. Stress ksf	1:3 Ratio	Pore Press. psi	P ksf	Q ksf
10	0.1070	103.700	88.2	1.4	2.03	0.55	2.57	4.70	70.10	1.56	1.01
11	0.1160	107.200	91.7	1.6	2.10	0.55	2.65	4.84	70.10	1.60	1.05
12	0.1250	110.700	95.2	1.7	2.18	0.55	2.73	4.98	70.10	1.64	1.09
13	0.1340	113.800	98.3	1.9	2.25	0.55	2.80	5.11	70.10	1.67	1.12
14	0.1430	116.900	101.4	2.0	2.32	0.56	2.88	5.12	70.00	1.72	1.16
15	0.1520	119.500	104.0	2.2	2.37	0.58	2.95	5.12	69.90	1.76	1.19
16	0.1610	122.300	106.8	2.3	2.43	0.60	3.04	5.02	69.70	1.82	1.22
17	0.1700	124.800	109.3	2.5	2.48	0.62	3.10	5.01	69.60	1.86	1.24
18	0.1790	127.300	111.8	2.6	2.54	0.65	3.19	4.92	69.40	1.92	1.27
19	0.1880	129.400	113.9	2.8	2.58	0.66	3.24	4.90	69.30	1.95	1.29
20	0.1980	131.500	116.0	2.9	2.62	0.69	3.32	4.80	69.10	2.00	1.31
21	0.2060	133.400	117.9	3.1	2.66	0.71	3.37	4.77	69.00	2.04	1.33
22	0.2160	135.300	119.8	3.2	2.70	0.73	3.44	4.68	68.80	2.09	1.35
23	0.2250	136.900	121.4	3.4	2.73	0.75	3.48	4.65	68.70	2.12	1.37
24	0.2340	138.300	122.8	3.5	2.76	0.76	3.52	4.62	68.60	2.14	1.38
25	0.2430	140.100	124.6	3.7	2.80	0.76	3.56	4.67	68.60	2.16	1.40
26	0.2520	141.200	125.7	3.8	2.82	0.76	3.58	4.69	68.60	2.17	1.41
27	0.2600	142.800	127.3	4.0	2.85	0.76	3.61	4.73	68.60	2.19	1.42
28	0.2700	144.200	128.7	4.1	2.88	0.78	3.65	4.70	68.50	2.22	1.44
29	0.2790	145.800	130.3	4.3	2.91	0.79	3.70	4.67	68.40	2.25	1.45
30	0.2880	147.000	131.5	4.4	2.93	0.81	3.74	4.63	68.30	2.27	1.46
31	0.2970	148.400	132.9	4.6	2.96	0.82	3.78	4.60	68.20	2.30	1.48
32	0.3070	149.500	134.0	4.7	2.98	0.84	3.81	4.56	68.10	2.32	1.49
33	0.3150	150.700	135.2	4.9	3.00	0.85	3.85	4.53	68.00	2.35	1.50
34	0.3250	151.900	136.4	5.0	3.02	0.88	3.90	4.44	67.80	2.39	1.51
35	0.3340	153.400	137.9	5.2	3.05	0.89	3.94	4.41	67.70	2.42	1.52
36	0.3420	154.100	138.6	5.3	3.06	0.91	3.97	4.37	67.60	2.44	1.53
37	0.3510	155.500	140.0	5.5	3.08	0.92	4.01	4.35	67.50	2.46	1.54
38	0.3600	156.900	141.4	5.6	3.11	0.94	4.05	4.32	67.40	2.49	1.56
39	0.3700	157.600	142.1	5.8	3.12	0.95	4.07	4.28	67.30	2.51	1.56
40	0.3780	158.900	143.4	5.9	3.14	0.96	4.11	4.26	67.20	2.54	1.57
41	0.3880	160.300	144.8	6.1	3.17	0.98	4.15	4.24	67.10	2.56	1.59
42	0.3960	161.200	145.7	6.2	3.19	0.99	4.18	4.21	67.00	2.59	1.59
43	0.4050	161.800	146.3	6.4	3.19	1.01	4.20	4.17	66.90	2.60	1.60
44	0.4140	162.900	147.4	6.5	3.21	1.02	4.23	4.14	66.80	2.63	1.61
45	0.4230	163.900	148.4	6.7	3.23	1.04	4.27	4.11	66.70	2.65	1.61
46	0.4320	164.700	149.2	6.8	3.24	1.05	4.29	4.08	66.60	2.67	1.62
47	0.4410	165.600	150.1	6.9	3.26	1.07	4.32	4.06	66.50	2.69	1.63
48	0.4510	166.500	151.0	7.1	3.27	1.08	4.35	4.03	66.40	2.71	1.63
49	0.4590	167.200	151.7	7.2	3.28	1.08	4.36	4.04	66.40	2.72	1.64
50	0.4680	168.300	152.8	7.4	3.30	1.09	4.39	4.01	66.30	2.74	1.65
51	0.4770	169.200	153.7	7.5	3.31	1.09	4.41	4.03	66.30	2.75	1.66
52	0.4870	170.600	155.1	7.7	3.34	1.11	4.45	4.01	66.20	2.78	1.67
53	0.4960	171.500	156.0	7.9	3.35	1.12	4.47	3.98	66.10	2.80	1.68
54	0.5050	172.100	156.6	8.0	3.36	1.14	4.50	3.95	66.00	2.82	1.68
55	0.5140	173.300	157.8	8.1	3.38	1.15	4.53	3.93	65.90	2.84	1.69
56	0.5230	174.200	158.7	8.3	3.39	1.15	4.54	3.94	65.90	2.85	1.70

Test Readings for Specimen No. 2

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress ksf	Minor Eff. Stress ksf	Major Eff. Stress ksf	1:3 Ratio	Pore Press. psi	P ksf	Q ksf
57	0.5320	175.300	159.8	8.4	3.41	1.17	4.58	3.92	65.80	2.87	1.71
58	0.5410	176.600	161.1	8.6	3.43	1.18	4.61	3.91	65.70	2.90	1.72
59	0.5500	178.000	162.5	8.7	3.46	1.20	4.65	3.89	65.60	2.92	1.73
60	0.5590	179.800	164.3	8.9	3.49	1.20	4.68	3.92	65.60	2.94	1.74
61	0.5680	180.400	164.9	9.0	3.50	1.21	4.71	3.89	65.50	2.96	1.75
62	0.5770	180.700	165.2	9.2	3.50	1.21	4.71	3.89	65.50	2.96	1.75
63	0.5860	180.700	165.2	9.3	3.49	1.24	4.73	3.82	65.30	2.98	1.75
64	0.5950	180.600	165.1	9.5	3.48	1.25	4.74	3.78	65.20	2.99	1.74
65	0.6040	180.700	165.2	9.6	3.48	1.25	4.73	3.78	65.20	2.99	1.74
66	0.6130	180.700	165.2	9.8	3.47	1.27	4.74	3.74	65.10	3.00	1.74
67	0.6220	181.000	165.5	9.9	3.47	1.28	4.76	3.71	65.00	3.02	1.74
68	0.6270	180.800	165.3	10.0	3.47	1.30	4.76	3.68	64.90	3.03	1.73
69	0.6360	181.500	166.0	10.2	3.48	1.31	4.79	3.65	64.80	3.05	1.74
70	0.6400	181.500	166.0	10.2	3.47	1.31	4.78	3.65	64.80	3.05	1.74
71	0.6490	181.700	166.2	10.4	3.47	1.32	4.80	3.62	64.70	3.06	1.74
72	0.6580	181.500	166.0	10.5	3.46	1.34	4.80	3.59	64.60	3.07	1.73
73	0.6670	181.500	166.0	10.7	3.46	1.35	4.81	3.55	64.50	3.08	1.73
74	0.6770	181.600	166.1	10.8	3.45	1.37	4.82	3.52	64.40	3.09	1.73
75	0.6850	181.900	166.4	11.0	3.45	1.37	4.82	3.52	64.40	3.09	1.73
76	0.6950	181.200	165.7	11.1	3.43	1.38	4.81	3.48	64.30	3.10	1.72
77	0.7040	181.400	165.9	11.3	3.43	1.40	4.83	3.46	64.20	3.11	1.72
78	0.7130	181.600	166.1	11.4	3.43	1.41	4.84	3.43	64.10	3.13	1.71
79	0.7220	181.300	165.8	11.6	3.42	1.43	4.84	3.40	64.00	3.13	1.71
80	0.7310	181.600	166.1	11.7	3.42	1.44	4.86	3.37	63.90	3.15	1.71
81	0.7400	181.500	166.0	11.9	3.41	1.44	4.85	3.37	63.90	3.15	1.71
82	0.7490	181.300	165.8	12.0	3.40	1.45	4.85	3.34	63.80	3.15	1.70
83	0.7580	182.200	166.7	12.2	3.41	1.47	4.88	3.32	63.70	3.18	1.71
84	0.7670	182.200	166.7	12.3	3.41	1.47	4.88	3.32	63.70	3.17	1.70
85	0.7760	182.900	167.4	12.5	3.42	1.44	4.86	3.37	63.90	3.15	1.71
86	0.7850	183.100	167.6	12.6	3.41	1.50	4.91	3.28	63.50	3.20	1.71
87	0.7940	183.500	168.0	12.8	3.42	1.50	4.91	3.28	63.50	3.21	1.71
88	0.8003	183.700	168.2	12.9	3.42	1.51	4.93	3.26	63.40	3.22	1.71
89	0.8120	183.700	168.2	13.1	3.41	1.51	4.92	3.25	63.40	3.22	1.70
90	0.8210	184.100	168.6	13.2	3.41	1.53	4.94	3.23	63.30	3.23	1.71
91	0.8300	184.300	168.8	13.4	3.41	1.53	4.94	3.23	63.30	3.23	1.70
92	0.8390	184.900	169.4	13.5	3.42	1.54	4.96	3.22	63.20	3.25	1.71
93	0.8480	185.400	169.9	13.6	3.42	1.54	4.96	3.22	63.20	3.25	1.71
94	0.8580	185.700	170.2	13.8	3.42	1.56	4.97	3.20	63.10	3.26	1.71
95	0.8660	186.000	170.5	13.9	3.42	1.56	4.98	3.20	63.10	3.27	1.71
96	0.8760	186.600	171.1	14.1	3.43	1.57	5.00	3.18	63.00	3.28	1.71
97	0.8850	186.600	171.1	14.3	3.42	1.58	5.00	3.16	62.90	3.29	1.71
98	0.8940	186.700	171.2	14.4	3.42	1.61	5.03	3.12	62.70	3.32	1.71
99	0.9030	186.600	171.1	14.6	3.41	1.61	5.02	3.11	62.70	3.32	1.70
100	0.9120	186.300	170.8	14.7	3.40	1.61	5.01	3.11	62.70	3.31	1.70
101	0.9210	186.000	170.5	14.9	3.38	1.61	5.00	3.10	62.70	3.30	1.69
102	0.9300	186.100	170.6	15.0	3.38	1.63	5.01	3.08	62.60	3.32	1.69
103	0.9350	186.200	170.7	15.1	3.38	1.64	5.02	3.06	62.50	3.33	1.69

CONSOLIDATION TEST REPORT



Coefficients of Consolidation and Secondary Consolidation

No.	Load (ksf)	C_v (ft.^{2}/day)	C_α	No.	Load (ksf)	C_v (ft.^{2}/day)	C_α	No.	Load (ksf)	C_v (ft.^{2}/day)	C_α
1	0.05	1.833		9	2.00	6.245		17	0.25	1.363	
3	0.50	1.599		10	4.00	22.622					
4	1.00	14.756		11	8.00	11.809					
5	2.00	12.743		12	16.00	10.330					
6	0.50	16.286		13	32.00	12.406					
7	0.25	0.774		14	8.00	11.094					
8	0.50	13.246		16	0.50	1.421					

Natural		Dry Dens. (pcf)	LL	PI	Sp. Gr.	Overburden (ksf)	e_o	Swell Press. (ksf)	Swell %	C_r
Sat.	Moist.									
90.5 %	25.0 %	95.6	59	35	2.70		0.746			0.02

MATERIAL DESCRIPTION	USCS	AASHTO
Brown Gray Clay (CH)	CH	

Project No. 1461-16- **Client:** HDR Engineering, Inc.

Project: Carolina Crossroads Project

Location: UD Borings **Depth:** 8.5-10.5 **Sample Number:** W-23UD UD-2

Remarks:
Tested Unsaturated

S & ME, INC.

Charlotte, North Carolina

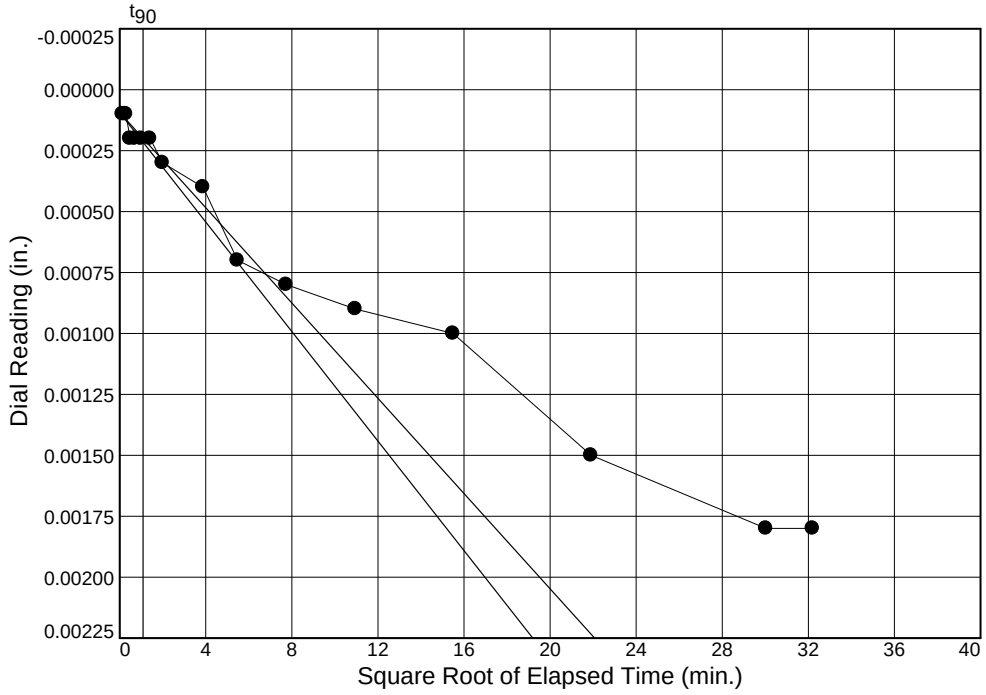
Figure W-23 UD-

Tested By: Karen Warner **Checked By:** Jason Reeves

Dial Reading vs. Time

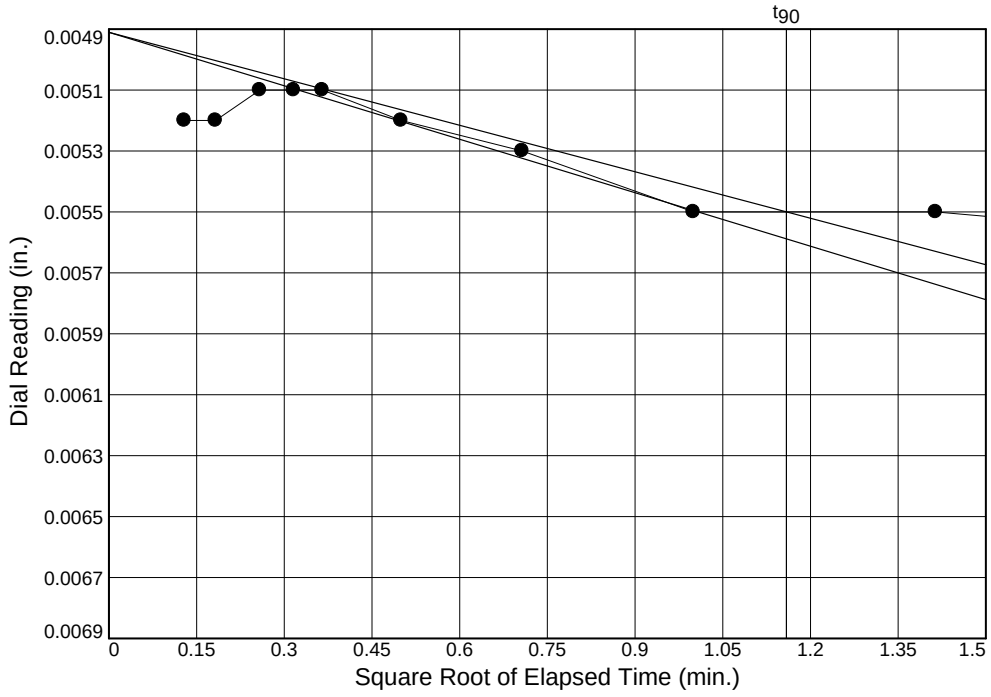
Project No.: 1461-16-047.2B
Project: Carolina Crossroads Project

Location: UD Borings Depth: 8.5-10.5 Sample Number: W-23UD UD-2



Load No.= 1
Load= 0.05 ksf
D_0 = 0.0001
D_{90} = 0.0002
D_{100} = 0.0002
T_{90} = 1.18 min.

C_v @ T_{90}
1.833 ft.^{2}/day



Load No.= 3
Load= 0.50 ksf
D_0 = 0.0049
D_{90} = 0.0055
D_{100} = 0.0056
T_{90} = 1.34 min.

C_v @ T_{90}
1.599 ft.^{2}/day

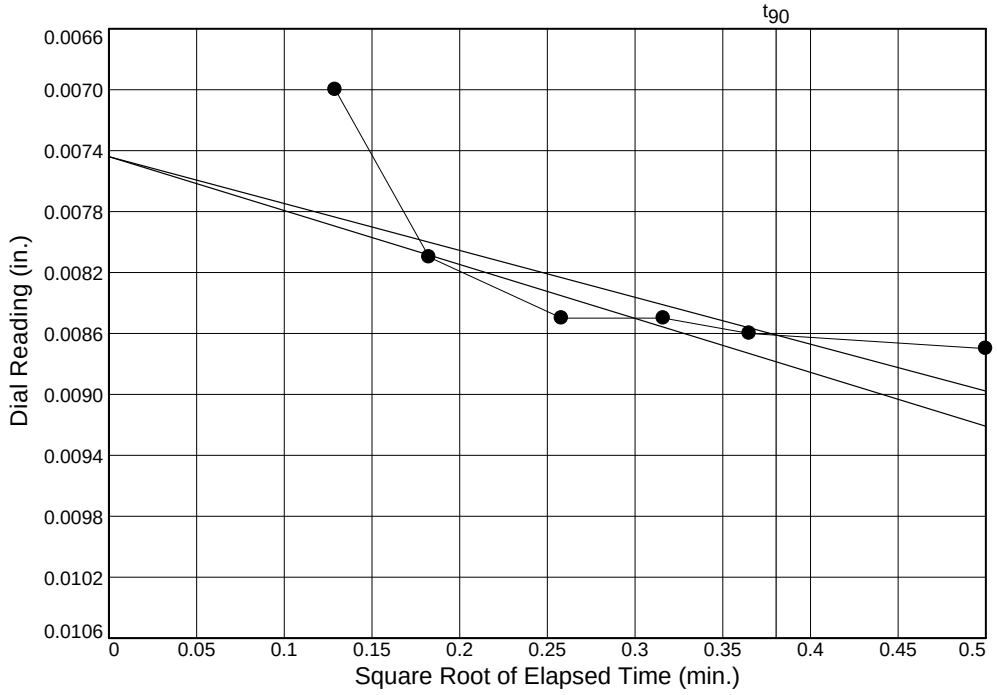
Figure W-23 UD-

S & ME, INC.

Dial Reading vs. Time

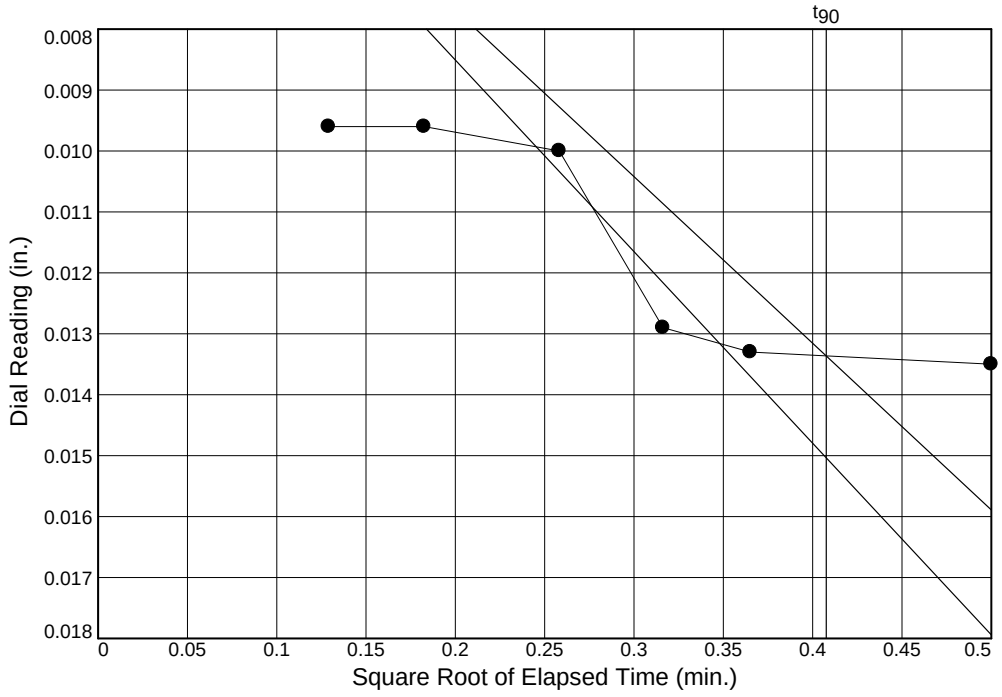
Project No.: 1461-16-047.2B
Project: Carolina Crossroads Project

Location: UD Borings Depth: 8.5-10.5 Sample Number: W-23UD UD-2



Load No.= 4
Load= 1.00 ksf
D_0 = 0.0074
D_{90} = 0.0086
D_{100} = 0.0087
T_{90} = 0.14 min.

C_v @ T_{90}
14.756 ft.^{2}/day



Load No.= 5
Load= 2.00 ksf
D_0 = 0.0022
D_{90} = 0.0134
D_{100} = 0.0146
T_{90} = 0.17 min.

C_v @ T_{90}
12.743 ft.^{2}/day

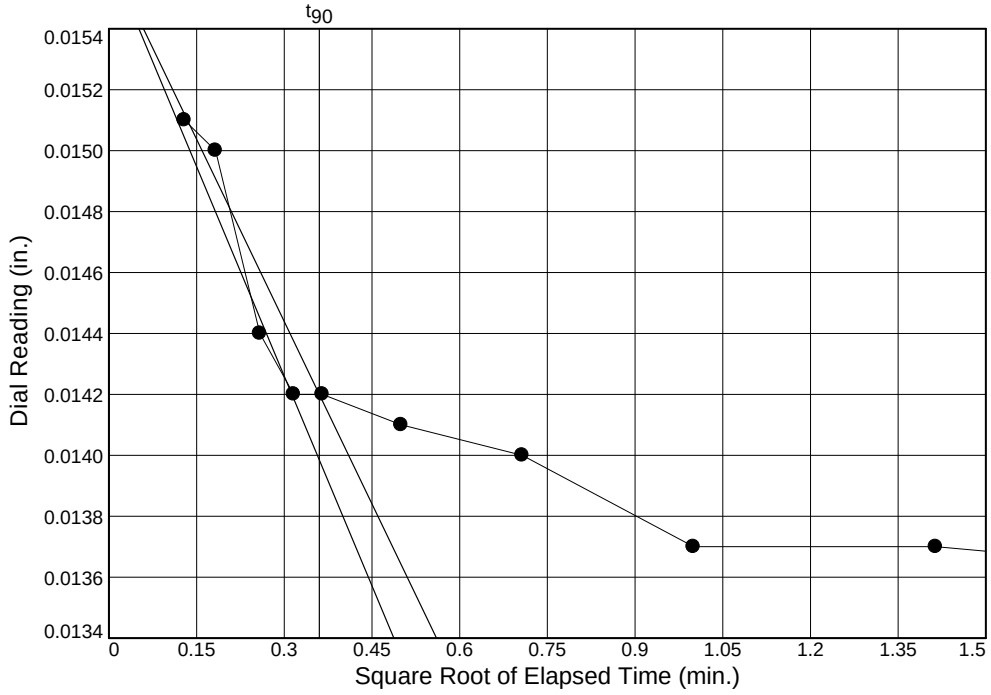
Figure W-23 UD-

S & ME, INC.

Dial Reading vs. Time

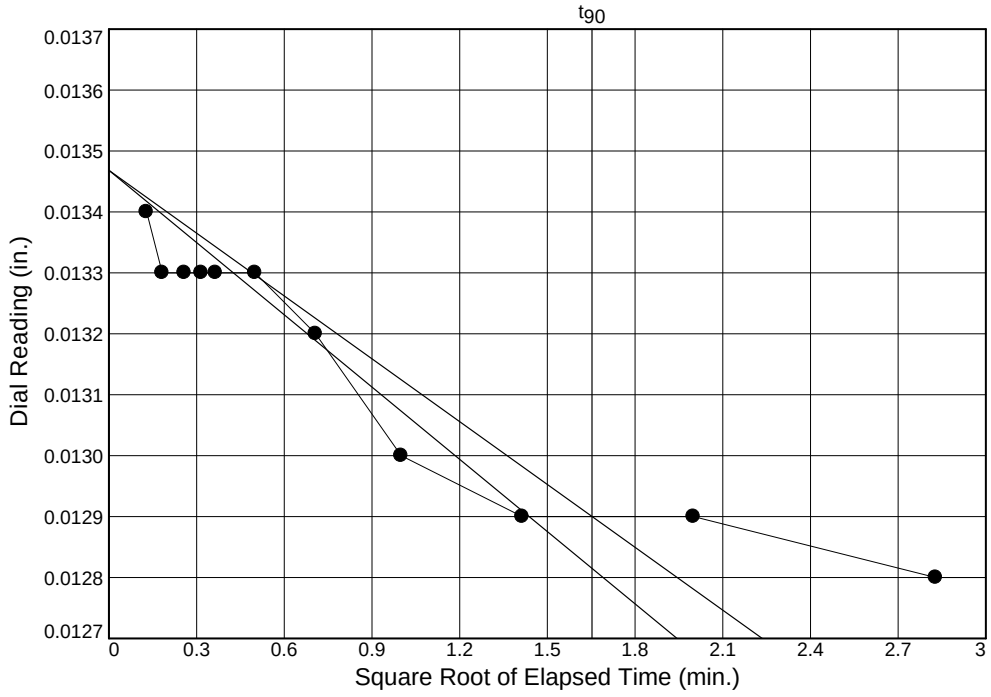
Project No.: 1461-16-047.2B
Project: Carolina Crossroads Project

Location: UD Borings Depth: 8.5-10.5 Sample Number: W-23UD UD-2



Load No.= 6
Load= 0.50 ksf
D_0 = 0.0156
D_{90} = 0.0142
D_{100} = 0.0140
T_{90} = 0.13 min.

C_v @ T_{90}
16.286 ft.^{2}/day



Load No.= 7
Load= 0.25 ksf
D_0 = 0.0135
D_{90} = 0.0129
D_{100} = 0.0128
T_{90} = 2.73 min.

C_v @ T_{90}
0.774 ft.^{2}/day

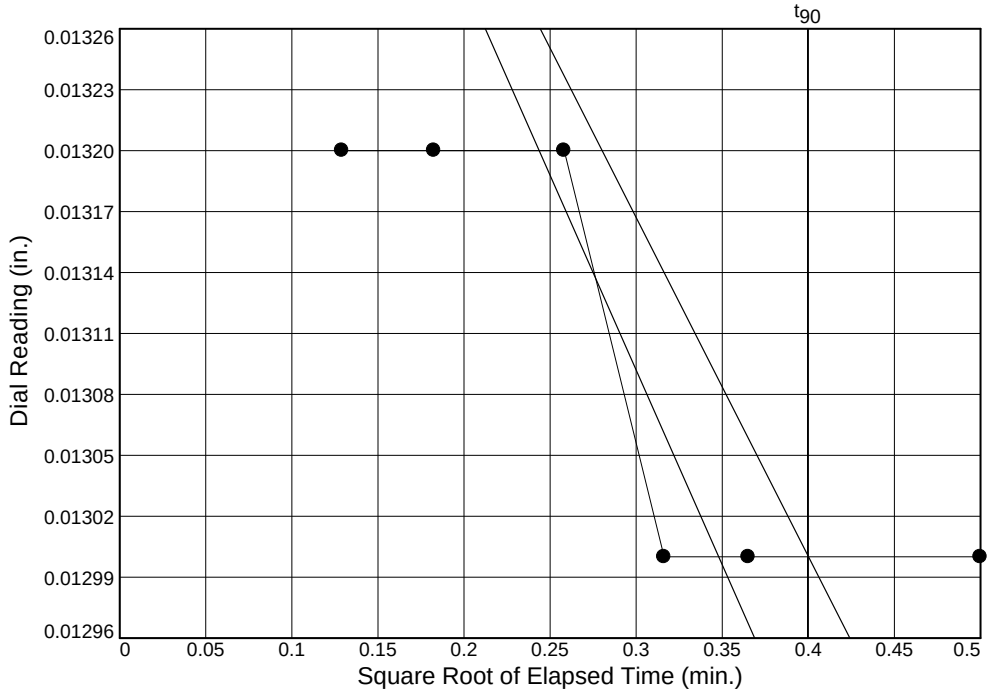
Figure W-23 UD-

S & ME, INC.

Dial Reading vs. Time

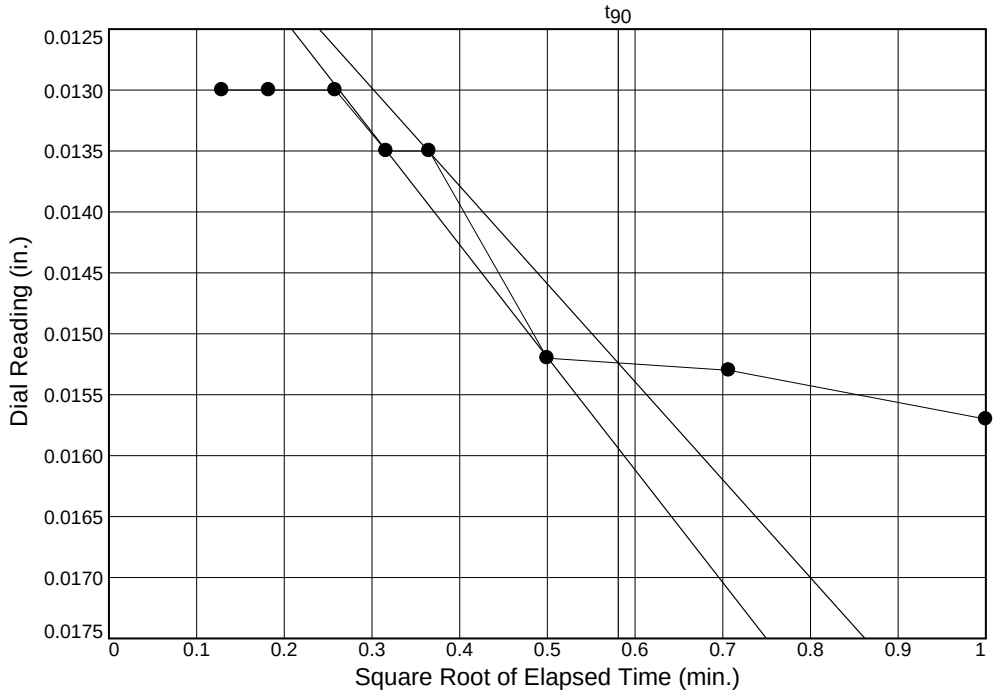
Project No.: 1461-16-047.2B
Project: Carolina Crossroads Project

Location: UD Borings Depth: 8.5-10.5 Sample Number: W-23UD UD-2



Load No.= 8
Load= 0.50 ksf
D_0 = 0.0137
D_{90} = 0.0130
D_{100} = 0.0129
T_{90} = 0.16 min.

C_v @ T_{90}
13.246 ft.^{2}/day



Load No.= 9
Load= 2.00 ksf
D_0 = 0.0106
D_{90} = 0.0152
D_{100} = 0.0158
T_{90} = 0.34 min.

C_v @ T_{90}
6.245 ft.^{2}/day

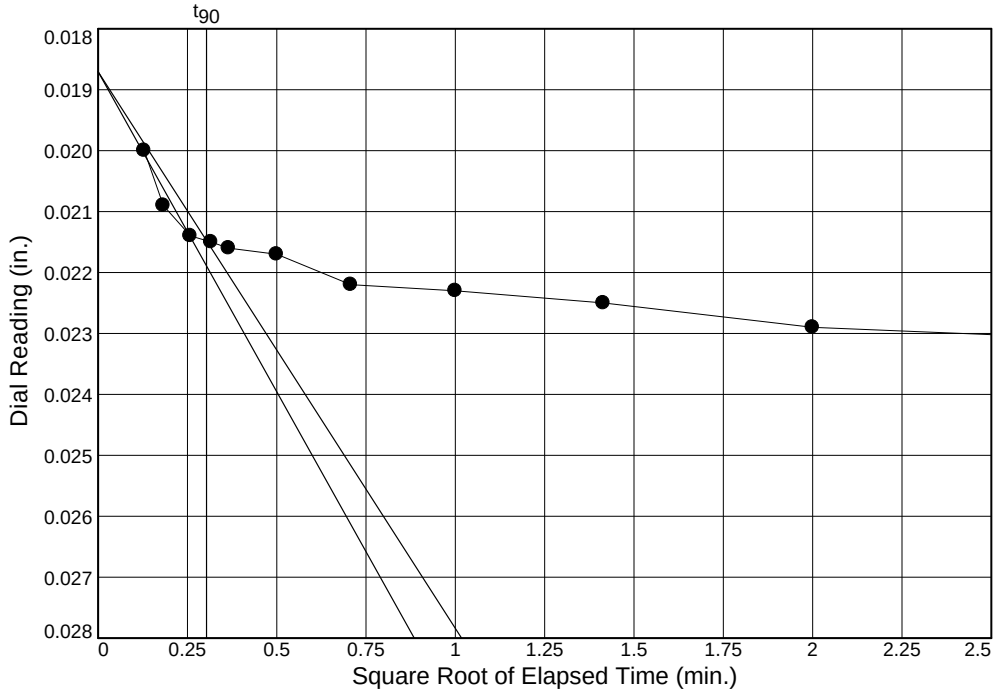
Figure W-23 UD-

S & ME, INC.

Dial Reading vs. Time

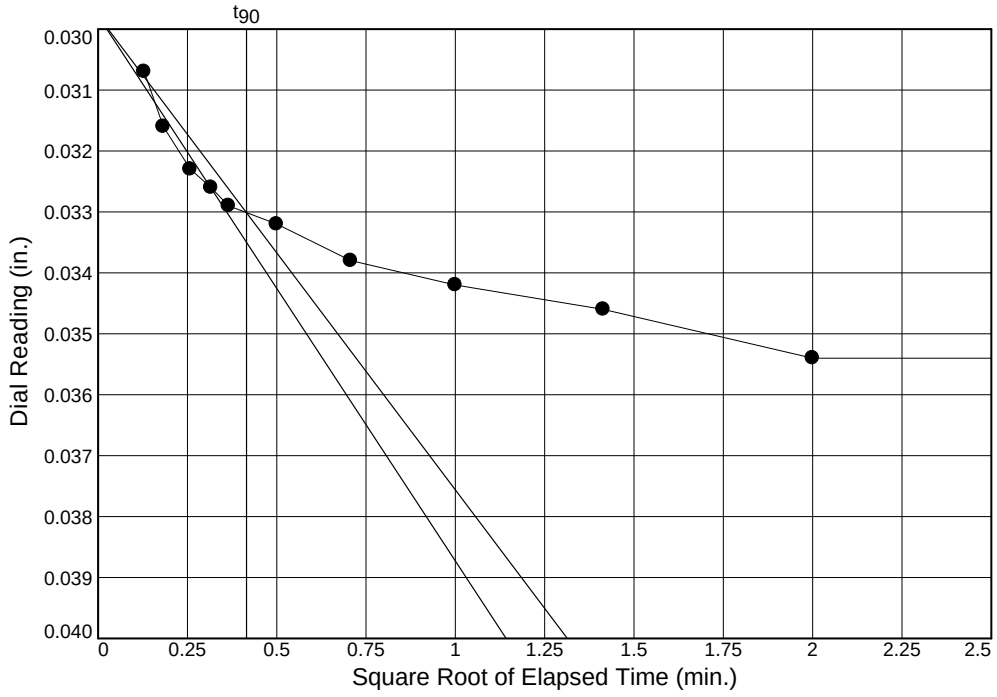
Project No.: 1461-16-047.2B
Project: Carolina Crossroads Project

Location: UD Borings Depth: 8.5-10.5 Sample Number: W-23UD UD-2



Load No.= 10
Load= 4.00 ksf
D_0 = 0.0187
D_{90} = 0.0215
D_{100} = 0.0218
T_{90} = 0.09 min.

C_v @ T_{90}
22.622 ft.^{2}/day



Load No.= 11
Load= 8.00 ksf
D_0 = 0.0298
D_{90} = 0.0330
D_{100} = 0.0334
T_{90} = 0.17 min.

C_v @ T_{90}
11.809 ft.^{2}/day

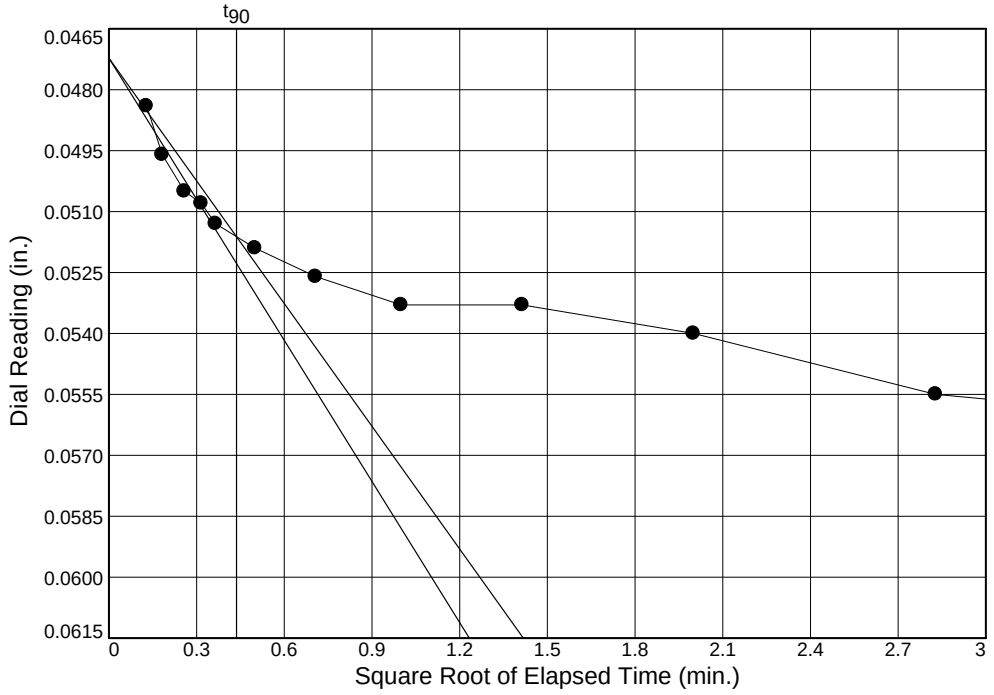
Figure W-23 UD-

S & ME, INC.

Dial Reading vs. Time

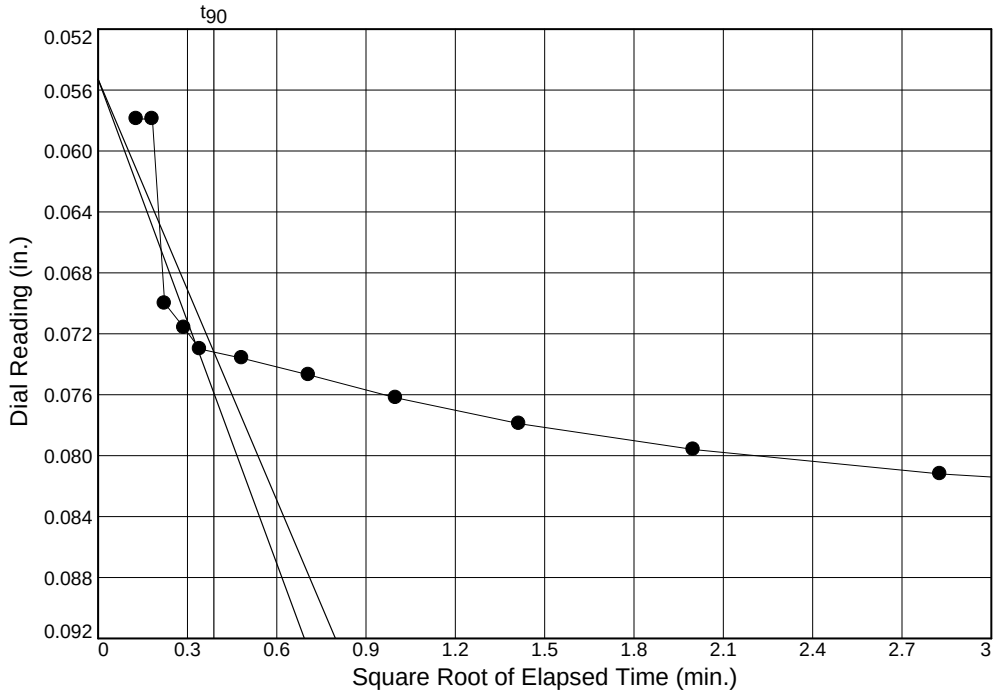
Project No.: 1461-16-047.2B
Project: Carolina Crossroads Project

Location: UD Borings Depth: 8.5-10.5 Sample Number: W-23UD UD-2



Load No.= 12
Load= 16.00 ksf
D_0 = 0.0472
D_{90} = 0.0516
D_{100} = 0.0521
T_{90} = 0.19 min.

C_v @ T_{90}
10.330 ft.^{2}/day



Load No.= 13
Load= 32.00 ksf
D_0 = 0.0553
D_{90} = 0.0732
D_{100} = 0.0752
T_{90} = 0.15 min.

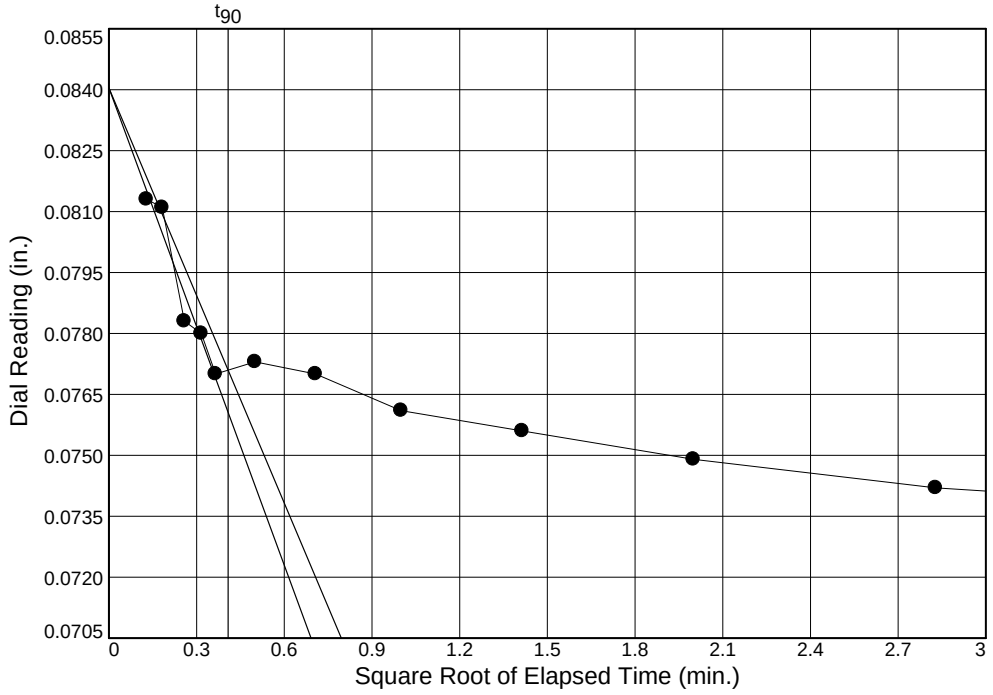
C_v @ T_{90}
12.406 ft.^{2}/day

Figure W-23 UD-

Dial Reading vs. Time

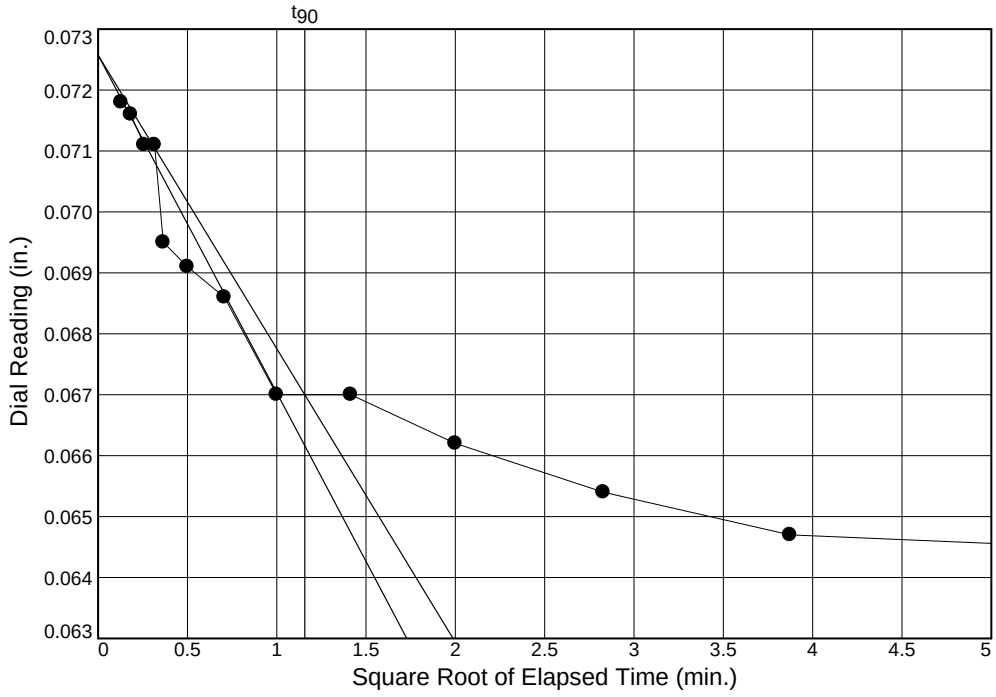
Project No.: 1461-16-047.2B
Project: Carolina Crossroads Project

Location: UD Borings Depth: 8.5-10.5 Sample Number: W-23UD UD-2



Load No.= 14
Load= 8.00 ksf
D_0 = 0.0840
D_{90} = 0.0771
D_{100} = 0.0763
T_{90} = 0.17 min.

C_v @ T_{90}
11.094 ft.^{2}/day



Load No.= 16
Load= 0.50 ksf
D_0 = 0.0726
D_{90} = 0.0670
D_{100} = 0.0664
T_{90} = 1.34 min.

C_v @ T_{90}
1.421 ft.^{2}/day

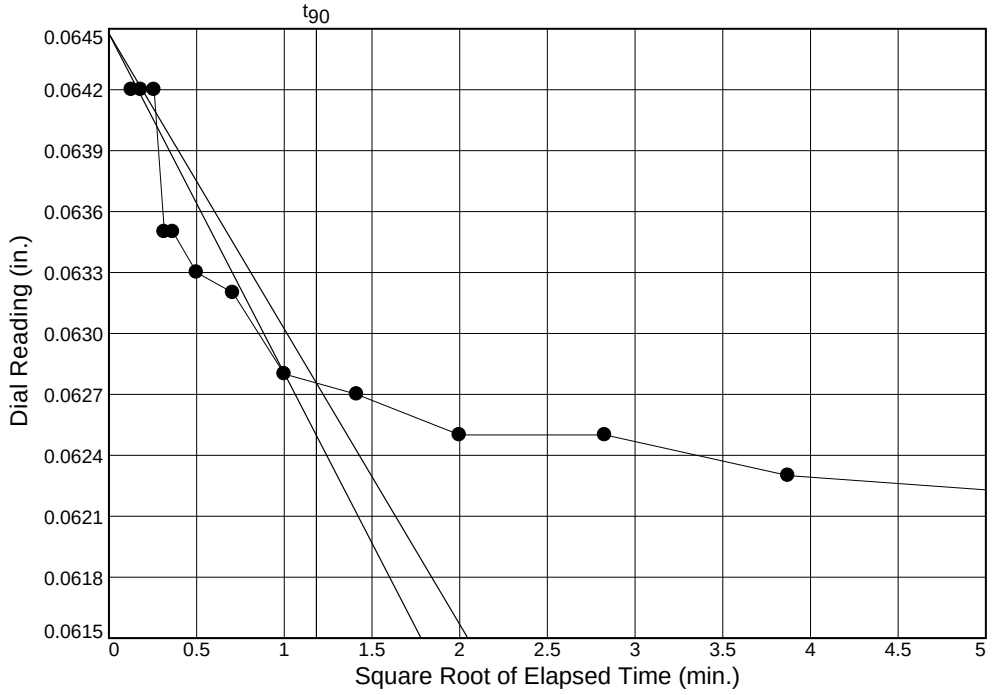
Figure W-23 UD-

S & ME, INC.

Dial Reading vs. Time

Project No.: 1461-16-047.2B
Project: Carolina Crossroads Project

Location: UD Borings Depth: 8.5-10.5 Sample Number: W-23UD UD-2



Load No.= 17

Load= 0.25 ksf

D_0 = 0.0645

D_{90} = 0.0628

D_{100} = 0.0626

T_{90} = 1.40 min.

C_v @ T_{90}
1.363 ft.^{2}/day

Figure W-23 UD-

CONSOLIDATION TEST DATA

6/28/2018

Client: HDR Engineering, Inc.
Project: Carolina Crossroads Project
Project Number: 1461-16-047.2B
Location: UD Borings
Depth: 8.5-10.5 **Sample Number:** W-23UD UD-2
Material Description: Brown Gray Clay (CH)
Liquid Limit: 59 **Plasticity Index:** 35
USCS: CH
Figure No.: W-23 UD-2
Testing Remarks: Tested Unsaturated
Tested by: Karen Warner **Checked by:** Jason Reeves

Test Specimen Data

NATURAL MOISTURE		VOID RATIO		AFTER TEST	
Wet w+t =	243.73 g.	Spec. Gr. =	2.70	Wet w+t =	251.83 g.
Dry w+t =	211.34 g.	Est. Ht. Solids =	0.579 in.	Dry w+t =	223.77 g.
Tare Wt. =	81.83 g.	Init. V.R. =	0.746	Tare Wt. =	98.37 g.
Moisture =	25.0 %	Init. Sat. =	90.5 %	Moisture =	22.4 %
UNIT WEIGHT		TEST START		Dry Wt. =	125.40* g.
Height =	0.998 in.	Height =	1.012 in.		
Diameter =	2.496 in.	Diameter =	2.496 in.		
Weight =	153.16 g.				
Dry Dens. =	95.6 pcf				

End-Of-Load Summary

Pressure (ksf)	Final Dial (in.)	Deformation (in.)	C_v (ft.^{2}/day)	C_α	Void Ratio	% Strain
start	0.00010	0.00000			0.746	
0.05	0.00180	0.00170	1.833		0.743	0.2 Comprs.
0.25	0.00410	0.00400			0.739	0.4 Comprs.
0.50	0.00650	0.00640	1.599		0.735	0.6 Comprs.
1.00	0.00960	0.00950	14.756		0.729	0.9 Comprs.
2.00	0.01520	0.01510	12.743		0.720	1.5 Comprs.
0.50	0.01350	0.01340	16.286		0.723	1.3 Comprs.
0.25	0.01280	0.01270	0.774		0.724	1.3 Comprs.
0.50	0.01300	0.01290	13.246		0.724	1.3 Comprs.
2.00	0.01680	0.01670	6.245		0.717	1.7 Comprs.
4.00	0.02460	0.02450	22.622		0.704	2.4 Comprs.
8.00	0.03860	0.03850	11.809		0.679	3.8 Comprs.
16.00	0.05780	0.05770	10.330		0.646	5.7 Comprs.
32.00	0.08440	0.08430	12.406		0.600	8.3 Comprs.
8.00	0.07290	0.07280	11.094		0.620	7.2 Comprs.
2.00	0.06450	0.06440			0.635	6.4 Comprs.
0.50	0.06450	0.06440	1.421		0.635	6.4 Comprs.
0.25	0.06190	0.06180	1.363		0.639	6.1 Comprs.

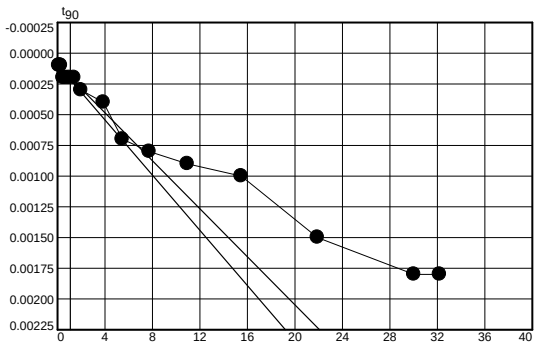
TEST RESULTS SUMMARY

Compression index (C_c), ksf = 0.15 **Preconsolidation pressure (P_p), ksf =** 6.4 **Void ratio at P_p (e_m) =** 0.688

Recompression index (C_r) = 0.02

Pressure: 0.05 ksf **TEST READINGS** **Load No. 1**

No.	Clock Time	Dial Reading	No.	Clock Time	Dial Reading
1	+0 00:00:01	0.00010	11	+0 00:30:00	0.00070
2	+0 00:00:02	0.00010	12	+0 00:60:00	0.00080
3	+0 00:00:04	0.00010	13	+0 02:00:00	0.00090
4	+0 00:00:06	0.00010	14	+0 04:00:00	0.00100
5	+0 00:00:15	0.00020	15	+0 08:00:00	0.00150
6	+0 00:00:30	0.00020	16	+0 15:02:00	0.00180
7	+0 00:00:60	0.00020	17	+0 17:17:00	0.00180
8	+0 00:02:00	0.00020			
9	+0 00:04:00	0.00030			
10	+0 00:15:00	0.00040			



Void Ratio = 0.743 **Compression =** 0.2%

D_0 = 0.0001 **D_{90} =** 0.0002 **D_{100} =** 0.0002 **C_v at 1.18 min. =** 1.833 ft.^{2}/day

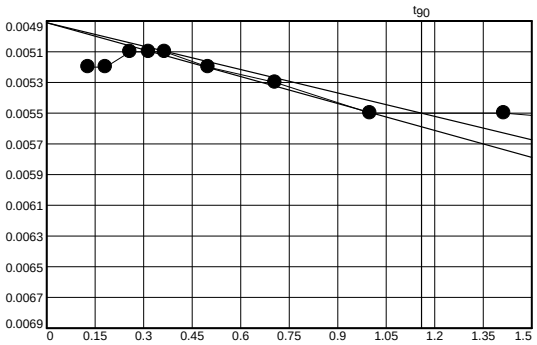
Pressure: 0.25 ksf **TEST READINGS** **Load No. 2**

No.	Clock Time	Dial Reading	No.	Clock Time	Dial Reading
1	0	0.00180	11	+0 00:04:00	0.00350
2	+0 00:00:01	0.00250	12	+0 00:08:00	0.00350
3	+0 00:00:02	0.00350	13	+0 00:15:00	0.00360
4	+0 00:00:04	0.00350	14	+0 00:30:00	0.00360
5	+0 00:00:06	0.00350	15	+0 00:60:00	0.00390
6	+0 00:00:08	0.00350	16	+0 02:00:00	0.00410
7	+0 00:00:15	0.00350	17	+0 02:35:00	0.00410
8	+0 00:00:30	0.00350			
9	+0 00:00:60	0.00350			
10	+0 00:02:00	0.00350			

Void Ratio = 0.739 **Compression =** 0.4%

Pressure: 0.50 ksf | **TEST READINGS** | **Load No. 3**

No.	Clock Time	Dial Reading	No.	Clock Time	Dial Reading
1	0	0.00410	11	+0 00:04:00	0.00560
2	+0 00:00:01	0.00520	12	+0 00:08:00	0.00570
3	+0 00:00:02	0.00520	13	+0 00:15:00	0.00580
4	+0 00:00:04	0.00510	14	+0 00:30:00	0.00580
5	+0 00:00:06	0.00510	15	+0 00:60:00	0.00600
6	+0 00:00:08	0.00510	16	+0 02:00:00	0.00630
7	+0 00:00:15	0.00520	17	+0 03:20:00	0.00650
8	+0 00:00:30	0.00530			
9	+0 00:00:60	0.00550			
10	+0 00:02:00	0.00550			

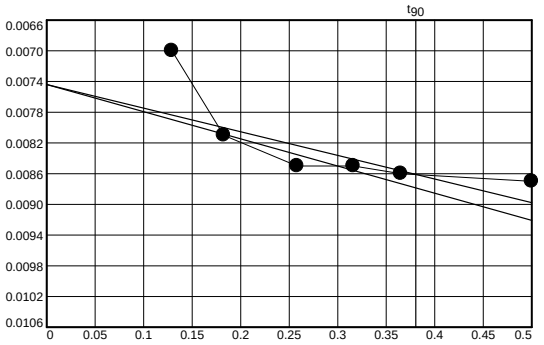


Void Ratio = 0.735 **Compression =** 0.6%

D_0 = 0.0049 **D_{90} =** 0.0055 **D_{100} =** 0.0056 **C_V at 1.34 min. =** 1.599 ft.^{2}/day

Pressure: 1.00 ksf | **TEST READINGS** | **Load No. 4**

No.	Clock Time	Dial Reading	No.	Clock Time	Dial Reading
1	0	0.00650	11	+0 00:04:00	0.00890
2	+0 00:00:01	0.00700	12	+0 00:08:00	0.00920
3	+0 00:00:02	0.00810	13	+0 00:15:00	0.00930
4	+0 00:00:04	0.00850	14	+0 00:30:00	0.00950
5	+0 00:00:06	0.00850	15	+0 00:60:00	0.00960
6	+0 00:00:08	0.00860	16	+0 00:63:00	0.00960
7	+0 00:00:15	0.00870			
8	+0 00:00:30	0.00870			
9	+0 00:00:60	0.00880			
10	+0 00:02:00	0.00880			

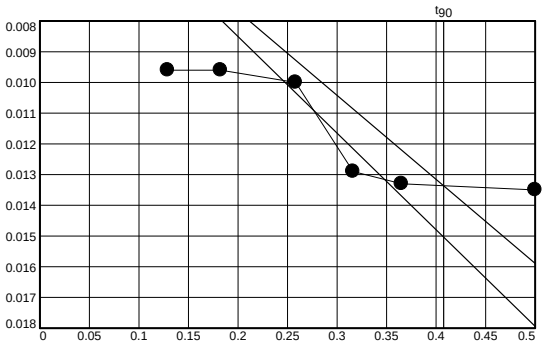


Void Ratio = 0.729 **Compression =** 0.9%

D_0 = 0.0074 **D_{90} =** 0.0086 **D_{100} =** 0.0087 **C_V at 0.14 min. =** 14.756 ft.^{2}/day

Pressure: 2.00 ksf | **TEST READINGS** | **Load No. 5**

No.	Clock Time	Dial Reading	No.	Clock Time	Dial Reading
1	0	0.00960	11	+0 00:04:00	0.01430
2	+0 00:00:01	0.00960	12	+0 00:08:00	0.01440
3	+0 00:00:02	0.00960	13	+0 00:15:00	0.01460
4	+0 00:00:04	0.01000	14	+0 00:30:00	0.01490
5	+0 00:00:06	0.01290	15	+0 00:60:00	0.01510
6	+0 00:00:08	0.01330	16	+0 00:68:00	0.01520
7	+0 00:00:15	0.01350			
8	+0 00:00:30	0.01360			
9	+0 00:00:60	0.01390			
10	+0 00:02:00	0.01420			

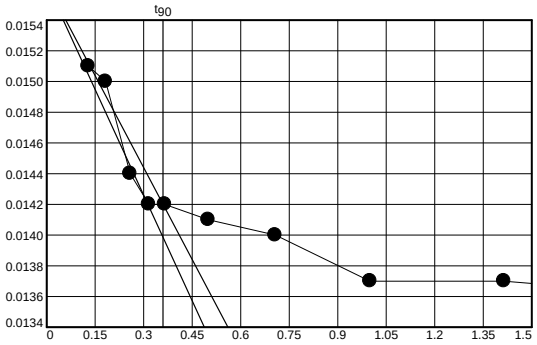


Void Ratio = 0.720 **Compression =** 1.5%

D_0 = 0.0022 **D_{90} =** 0.0134 **D_{100} =** 0.0146 **C_V at 0.17 min. =** 12.743 ft.^{2}/day

Pressure: 0.50 ksf | **TEST READINGS** | **Load No. 6**

No.	Clock Time	Dial Reading	No.	Clock Time	Dial Reading
1	0	0.01520	11	+0 00:04:00	0.01360
2	+0 00:00:01	0.01510	12	+0 00:08:00	0.01360
3	+0 00:00:02	0.01500	13	+0 00:15:00	0.01360
4	+0 00:00:04	0.01440	14	+0 00:30:00	0.01360
5	+0 00:00:06	0.01420	15	+0 00:60:00	0.01360
6	+0 00:00:08	0.01420	16	+0 01:30:00	0.01350
7	+0 00:00:15	0.01410			
8	+0 00:00:30	0.01400			
9	+0 00:00:60	0.01370			
10	+0 00:02:00	0.01370			

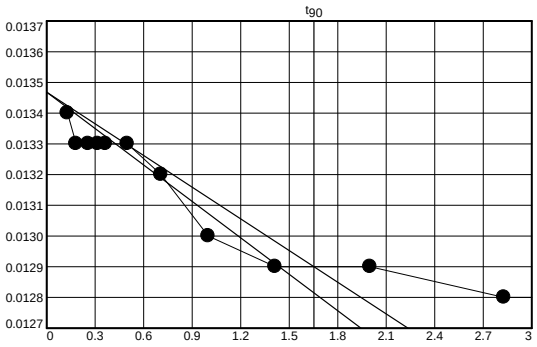


Void Ratio = 0.723 **Compression =** 1.3%

D_0 = 0.0156 **D_{90} =** 0.0142 **D_{100} =** 0.0140 **C_V at 0.13 min. =** 16.286 ft.^{2}/day

Pressure: 0.25 ksf | **TEST READINGS** | **Load No. 7**

No.	Clock Time	Dial Reading	No.	Clock Time	Dial Reading
1	0	0.01350	11	+0 00:04:00	0.01290
2	+0 00:00:01	0.01340	12	+0 00:08:00	0.01280
3	+0 00:00:02	0.01330	13	+0 00:15:00	0.01280
4	+0 00:00:04	0.01330	14	+0 00:30:00	0.01280
5	+0 00:00:06	0.01330	15	+0 00:60:00	0.01280
6	+0 00:00:08	0.01330	16	+0 02:00:00	0.01280
7	+0 00:00:15	0.01330	17	+0 04:00:00	0.01280
8	+0 00:00:30	0.01320	18	+0 08:00:00	0.01280
9	+0 00:00:60	0.01300	19	+0 14:10:00	0.01280
10	+0 00:02:00	0.01290			

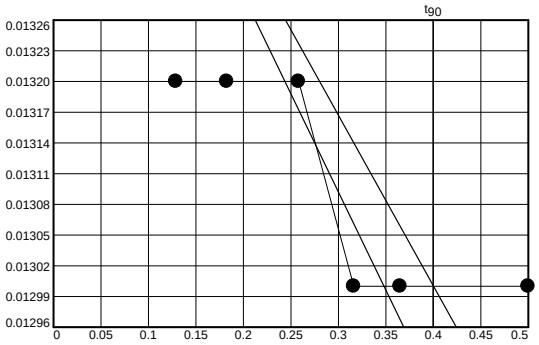


Void Ratio = 0.724 **Compression =** 1.3%

D_0 = 0.0135 **D_{90} =** 0.0129 **D_{100} =** 0.0128 **C_v at 2.73 min. =** 0.774 ft.^{2}/day

Pressure: 0.50 ksf | **TEST READINGS** | **Load No. 8**

No.	Clock Time	Dial Reading	No.	Clock Time	Dial Reading
1	0	0.01280	11	+0 00:04:00	0.01300
2	+0 00:00:01	0.01320	12	+0 00:08:02	0.01300
3	+0 00:00:02	0.01320	13	+0 00:15:00	0.01300
4	+0 00:00:04	0.01320	14	+0 00:30:05	0.01300
5	+0 00:00:06	0.01300	15	+0 00:60:01	0.01300
6	+0 00:00:08	0.01300	16	+0 00:77:10	0.01300
7	+0 00:00:15	0.01300			
8	+0 00:00:30	0.01300			
9	+0 00:00:60	0.01300			
10	+0 00:02:00	0.01300			

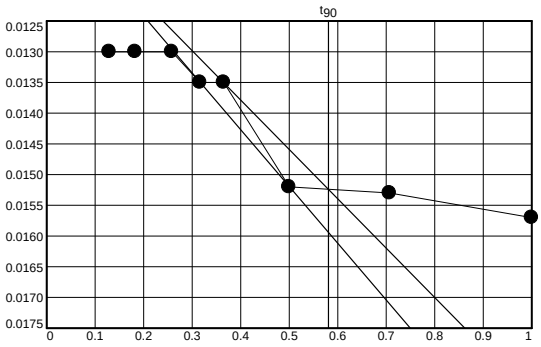


Void Ratio = 0.724 **Compression =** 1.3%

D_0 = 0.0137 **D_{90} =** 0.0130 **D_{100} =** 0.0129 **C_v at 0.16 min. =** 13.246 ft.^{2}/day

Pressure: 2.00 ksf | **TEST READINGS** | **Load No. 9**

No.	Clock Time	Dial Reading	No.	Clock Time	Dial Reading
1	0	0.01300	11	+0 00:04:00	0.01580
2	+0 00:00:01	0.01300	12	+0 00:08:00	0.01590
3	+0 00:00:02	0.01300	13	+0 00:15:00	0.01600
4	+0 00:00:04	0.01300	14	+0 00:30:05	0.01610
5	+0 00:00:06	0.01350	15	+0 00:60:00	0.01650
6	+0 00:00:08	0.01350	16	+0 02:00:00	0.01660
7	+0 00:00:15	0.01520	17	+0 03:29:00	0.01680
8	+0 00:00:30	0.01530			
9	+0 00:00:60	0.01570			
10	+0 00:02:00	0.01580			

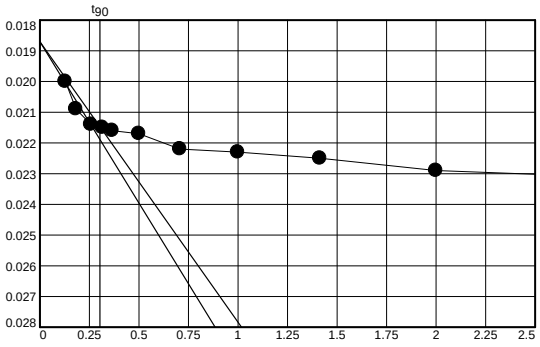


Void Ratio = 0.717 **Compression =** 1.7%

D_0 = 0.0106 **D_{90} =** 0.0152 **D_{100} =** 0.0158 **C_v at 0.34 min. =** 6.245 ft.^{2}/day

Pressure: 4.00 ksf | **TEST READINGS** | **Load No. 10**

No.	Clock Time	Dial Reading	No.	Clock Time	Dial Reading
1	0	0.01680	11	+0 00:04:00	0.02290
2	+0 00:00:01	0.02000	12	+0 00:08:00	0.02310
3	+0 00:00:02	0.02090	13	+0 00:15:00	0.02320
4	+0 00:00:04	0.02140	14	+0 00:30:00	0.02350
5	+0 00:00:06	0.02150	15	+0 00:60:00	0.02380
6	+0 00:00:08	0.02160	16	+0 02:00:00	0.02400
7	+0 00:00:15	0.02170	17	+0 04:00:00	0.02460
8	+0 00:00:30	0.02220	18	+0 04:55:00	0.02460
9	+0 00:00:60	0.02230			
10	+0 00:02:00	0.02250			

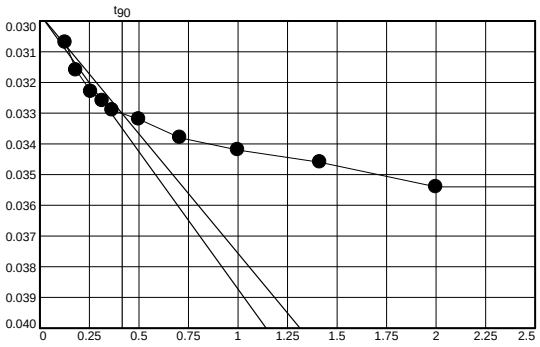


Void Ratio = 0.704 **Compression =** 2.4%

D_0 = 0.0187 **D_{90} =** 0.0215 **D_{100} =** 0.0218 **C_v at 0.09 min. =** 22.622 ft.^{2}/day

Pressure: 8.00 ksf | **TEST READINGS** | **Load No. 11**

No.	Clock Time	Dial Reading	No.	Clock Time	Dial Reading
1	0	0.02460	11	+0 00:04:00	0.03540
2	+0 00:00:01	0.03070	12	+0 00:08:00	0.03540
3	+0 00:00:02	0.03160	13	+0 00:15:00	0.03580
4	+0 00:00:04	0.03230	14	+0 00:30:00	0.03620
5	+0 00:00:06	0.03260	15	+0 00:60:00	0.03650
6	+0 00:00:08	0.03290	16	+0 02:00:00	0.03700
7	+0 00:00:15	0.03320	17	+0 04:00:00	0.03720
8	+0 00:00:30	0.03380	18	+0 08:00:00	0.03780
9	+0 00:00:60	0.03420	19	+0 15:00:00	0.03850
10	+0 00:02:00	0.03460	20	+0 16:16:00	0.03860

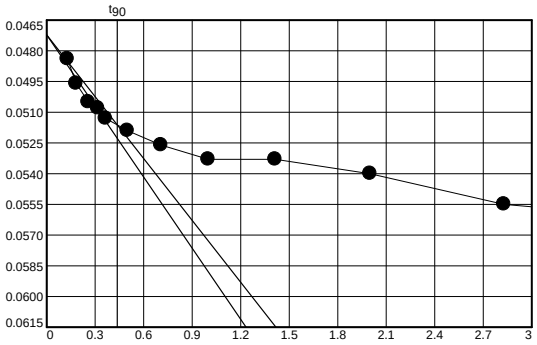


Void Ratio = 0.679 **Compression =** 3.8%

D_0 = 0.0298 **D_{90} =** 0.0330 **D_{100} =** 0.0334 **C_V at 0.17 min. =** 11.809 ft.^{2}/day

Pressure: 16.00 ksf | **TEST READINGS** | **Load No. 12**

No.	Clock Time	Dial Reading	No.	Clock Time	Dial Reading
1	0	0.03860	11	+0 00:04:00	0.05400
2	+0 00:00:01	0.04840	12	+0 00:08:00	0.05550
3	+0 00:00:02	0.04960	13	+0 00:15:00	0.05620
4	+0 00:00:04	0.05050	14	+0 00:30:00	0.05670
5	+0 00:00:06	0.05080	15	+0 00:60:00	0.05710
6	+0 00:00:08	0.05130	16	+0 02:00:00	0.05740
7	+0 00:00:15	0.05190	17	+0 03:47:00	0.05780
8	+0 00:00:30	0.05260			
9	+0 00:00:60	0.05330			
10	+0 00:02:00	0.05330			

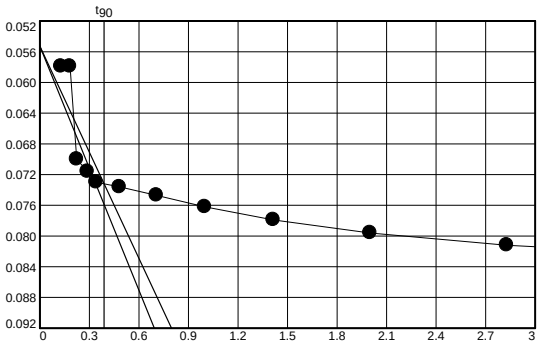


Void Ratio = 0.646 **Compression =** 5.7%

D_0 = 0.0472 **D_{90} =** 0.0516 **D_{100} =** 0.0521 **C_V at 0.19 min. =** 10.330 ft.^{2}/day

Pressure: 32.00 ksf | **TEST READINGS** | **Load No. 13**

No.	Clock Time	Dial Reading	No.	Clock Time	Dial Reading
1	0	0.05780	11	+0 00:04:00	0.07960
2	+0 00:00:01	0.05790	12	+0 00:08:00	0.08120
3	+0 00:00:02	0.05790	13	+0 00:15:00	0.08240
4	+0 00:00:03	0.07000	14	+0 00:30:00	0.08310
5	+0 00:00:05	0.07160	15	+0 00:60:00	0.08350
6	+0 00:00:07	0.07300	16	+0 02:00:00	0.08410
7	+0 00:00:14	0.07360	17	+0 04:00:00	0.08440
8	+0 00:00:30	0.07470	18	+0 08:00:00	0.08440
9	+0 00:00:60	0.07620	19	+0 15:00:00	0.08440
10	+0 00:02:00	0.07790	20	+0 29:25:00	0.08440

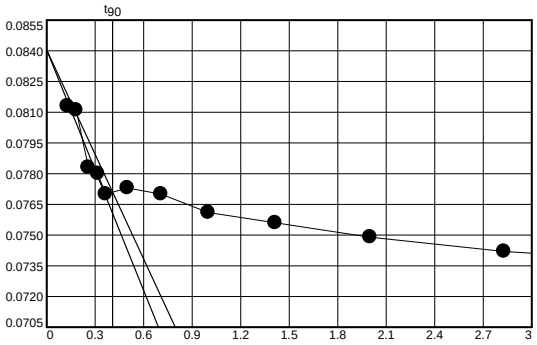


Void Ratio = 0.600 **Compression =** 8.3%

D_0 = 0.0553 **D_{90} =** 0.0732 **D_{100} =** 0.0752 **C_V at 0.15 min. =** 12.406 ft.^{2}/day

Pressure: 8.00 ksf | **TEST READINGS** | **Load No. 14**

No.	Clock Time	Dial Reading	No.	Clock Time	Dial Reading
1	0	0.08440	11	+0 00:04:00	0.07490
2	+0 00:00:01	0.08130	12	+0 00:08:00	0.07420
3	+0 00:00:02	0.08110	13	+0 00:15:02	0.07370
4	+0 00:00:04	0.07830	14	+0 00:30:03	0.07340
5	+0 00:00:06	0.07800	15	+0 00:60:00	0.07340
6	+0 00:00:08	0.07700	16	+0 02:00:00	0.07320
7	+0 00:00:15	0.07730	17	+0 03:20:05	0.07290
8	+0 00:00:30	0.07700			
9	+0 00:00:60	0.07610			
10	+0 00:02:00	0.07560			



Void Ratio = 0.620 **Compression =** 7.2%

D_0 = 0.0840 **D_{90} =** 0.0771 **D_{100} =** 0.0763 **C_V at 0.17 min. =** 11.094 ft.^{2}/day

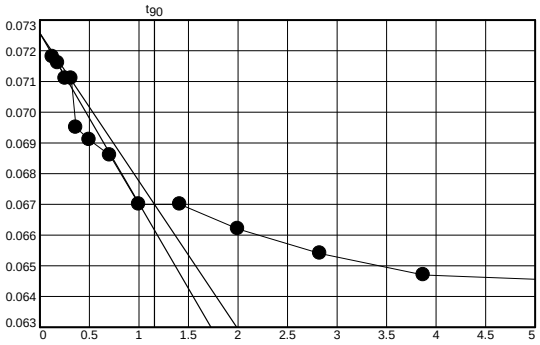
Pressure: 2.00 ksf | **TEST READINGS** | **Load No. 15**

No.	Clock Time	Dial Reading	No.	Clock Time	Dial Reading
1	0	0.07290	11	+0 00:04:00	0.06620
2	+0 00:00:01	0.01780	12	+0 00:08:20	0.06540
3	+0 00:00:02	0.07160	13	+0 00:15:00	0.06470
4	+0 00:00:04	0.07110	14	+0 00:30:00	0.06450
5	+0 00:00:06	0.07000	15	+0 00:60:00	0.06450
6	+0 00:00:08	0.06950	16	+0 00:67:00	0.06450
7	+0 00:00:15	0.06910			
8	+0 00:00:30	0.06860			
9	+0 00:00:60	0.06790			
10	+0 00:02:00	0.06710			

Void Ratio = 0.635 **Compression =** 6.4%

Pressure: 0.50 ksf | **TEST READINGS** | **Load No. 16**

No.	Clock Time	Dial Reading	No.	Clock Time	Dial Reading
1	0	0.06450	11	+0 00:04:00	0.06620
2	+0 00:00:01	0.07180	12	+0 00:08:00	0.06540
3	+0 00:00:02	0.07160	13	+0 00:15:00	0.06470
4	+0 00:00:04	0.07110	14	+0 00:30:00	0.06450
5	+0 00:00:06	0.07110	15	+0 00:60:00	0.06450
6	+0 00:00:08	0.06950	16	+0 00:67:00	0.06450
7	+0 00:00:15	0.06910			
8	+0 00:00:30	0.06860			
9	+0 00:00:60	0.06700			
10	+0 00:02:00	0.06700			

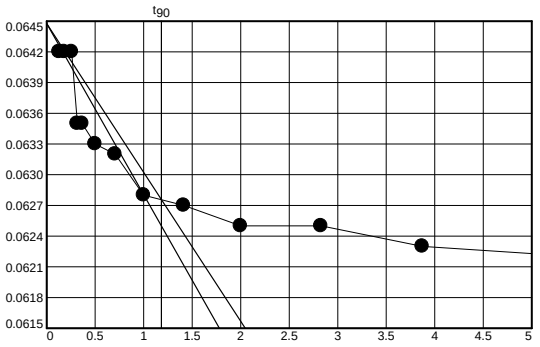


Void Ratio = 0.635 **Compression =** 6.4%

D_0 = 0.0726 **D_{90} =** 0.0670 **D_{100} =** 0.0664 **C_V at 1.34 min. =** 1.421 ft.^{2}/day

Pressure: 0.25 ksf | **TEST READINGS** | **Load No. 17**

No.	Clock Time	Dial Reading	No.	Clock Time	Dial Reading
1	0	0.06450	11	+0 00:04:00	0.06250
2	+0 00:00:01	0.06420	12	+0 00:08:00	0.06250
3	+0 00:00:02	0.06420	13	+0 00:15:00	0.06230
4	+0 00:00:04	0.06420	14	+0 00:30:00	0.06220
5	+0 00:00:06	0.06350	15	+0 00:60:00	0.06210
6	+0 00:00:08	0.06350	16	+0 02:00: 0	0.06190
7	+0 00:00:15	0.06330	17	+0 04:00:00	0.06190
8	+0 00:00:30	0.06320	18	+0 06:09:00	0.06190
9	+0 00:00:60	0.06280			
10	+0 00:02:00	0.06270			



Void Ratio = 0.639 **Compression =** 6.1%

D_0 = 0.0645 **D_{90} =** 0.0628 **D_{100} =** 0.0626 **C_V at 1.40 min. =** 1.363 ft.^{2}/day

ASTM D4767 CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION TEST FOR COHESIVE SOILS

Project No.: 1461-16-047 .2B
Project Name: Carolina Crossroads

Sample ID: 1461-16-047.2B W-23UD UD-2
Depth: 8.5-10.5'

Failed Specimens

Specimen No.: 1
Effective Confining Pressure: 3.5 psi
Notes: Failed in shear



Specimen No.:
Effective Confining Pressure:
Notes: No Specimen

Specimen No.: 3
Effective Confining Pressure: 13.9 psi
Notes: Failed in shear



Sheared By: Karen Warner
Reviewed By: Jason Reeves Date: 6/26/2018

APPENDIX

SECTION 4 LABORATORY TEST RESULTS

SECTION 4D BULK SAMPLES

FME & SME 2018 INVESTIGATION

Form No: TR-D2216-T265-1
Revision No. 1
Revision Date: 08/16/17

LABORATORY DETERMINATION OF WATER CONTENT

ASTM D 2216 ☑ *AASHTO T 265* ☐

S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	2/6/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	1/30-2/1/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sample by:	S&ME	Sample Date(s):	1/24/2018
Sampling Method:	Bulk	Drill Rig :	CME 55

Method: **A (1%)** ☐ **B (0.1%)** ☑ Balance ID. 25711 Calibration Date: 8/30/17 Oven ID. 25722 Calibration Date: 8/18/17

Boring No.	Sample No.	Sample Depth	Tare #	Tare Weight	Tare Wt.+ Wet Wt	Tare Wt. + Dry Wt	Water Weight	Percent Moisture	Note
		ft.		grams	grams	grams	grams	%	
P-65	BS-1	0.8 - 10.8	219	152.45	536.04	436.62	99.42	35.0%	

Notes / Deviations / References

ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass

Matthew Wolfe
Technician Name

NICET 123218
Certification Type / No.

Matthew F. Cooke, P.G.
Technical Responsibility

Project Manager
Position

4/27/2018
Date

Form No: TR-D2216-T265-1
Revision No. 1
Revision Date: 08/16/17

LABORATORY DETERMINATION OF WATER CONTENT

ASTM D 2216 ☑ *AASHTO T 265* ☐

S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	4/25/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	2/20-2/21/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sample by:	S&ME	Sample Date(s):	1/31/2018
Sampling Method:	Bulk	Drill Rig :	CME 55

Method: **A (1%)** ☐ **B (0.1%)** ☑ Balance ID. 25711 Calibration Date: 8/30/17 Oven ID. 25722 Calibration Date: 8/18/17

Boring No.	Sample No.	Sample Depth	Tare #	Tare Weight	Tare Wt.+ Wet Wt	Tare Wt. + Dry Wt	Water Weight	Percent Moisture	Note
		ft.		grams	grams	grams	grams	%	
P-67	BS-1	0.6 - 10.6	210	156.76	607.01	554.87	52.14	13.1%	

Notes / Deviations / References

ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass

Matthew Wolfe
Technician Name

NICET 123218
Certification Type / No.

Matthew F. Cooke, P.G.
Technical Responsibility

Project Manager
Position

4/27/2018
Date

Form No: TR-D2216-T265-1
Revision No. 1
Revision Date: 08/16/17

LABORATORY DETERMINATION OF WATER CONTENT

ASTM D 2216 ☑ *AASHTO T 265* ☐

S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	2/9/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	1/30-2/5/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sample by:	S&ME	Sample Date(s):	1/23-1/24/2018
Sampling Method:	Bulk	Drill Rig :	Diedrich D-50

Method: **A (1%)** ☐ **B (0.1%)** ☑ Balance ID. 25711 Calibration Date: 8/30/17 Oven ID. 25722 Calibration Date: 8/18/17

Boring No.	Sample No.	Sample Depth	Tare #	Tare Weight	Tare Wt.+ Wet Wt	Tare Wt. + Dry Wt	Water Weight	Percent Moisture	Note
		ft.		grams	grams	grams	grams	%	
RW-35	BS-1	0.0 - 10.0	224	155.05	413.06	350.51	62.55	32.0%	

Notes / Deviations / References

ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass

Matthew Wolfe
Technician Name

NICET 123218
Certification Type / No.

Matthew F. Cooke, P.G.
Technical Responsibility

Project Manager
Position

3/28/2018
Date

Form No: TR-D2216-T265-1
Revision No. 1
Revision Date: 08/16/17

LABORATORY DETERMINATION OF WATER CONTENT

ASTM D 2216 ☑ *AASHTO T 265* ☐

S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	4/25/18
Project Name:	Carolina Crossroads Project	Test Date(s):	3/26 - 3/27/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sampled by:	S&ME	Sample Date(s):	Various
Sampling Method:	Bulk	Drill Rig:	CME 55/Diedrich D-50

Method: **A (1%)** ☐ **B (0.1%)** ☑ Balance ID. 13942 Calibration Date: 8/18/17 Oven ID. 13978 Calibration Date: 10/07/17

Boring No.	Sample No.	Sample Depth	Tare #	Tare Weight	Tare Wt.+ Wet Wt	Tare Wt. + Dry Wt	Water Weight	Percent Moisture	Note
		ft.		grams	grams	grams	grams	%	
RW-36	BS-1	0.0 - 10.0	FB-4	0.00	544.5	442.0	102.5	23.2%	
RW-41	BS-1	0.0 - 10.0	DM-5	0.00	561.1	495.4	65.7	13.3%	

Notes / Deviations / References

AASHTO T 265: Laboratory Determination of Moisture Content of Soils

ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass

Benjamin Kovaleski	Benjamin J. Kovaleski	NICET Lab Level III/117226	4/25/18
Technician Name	*Signature*	*Certification Type / No.*	*Date*
Matthew F. Cooke, P.G.		Project Manager	4/25/18
Technical Responsibility		*Position*	*Date*

Form No: TR-D2216-T265-1
Revision No. 1
Revision Date: 08/16/17

LABORATORY DETERMINATION OF WATER CONTENT

ASTM D 2216 ☑ *AASHTO T 265* ☐

S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	5/03/18
Project Name:	Carolina Crossroads Project	Test Date(s):	4/24 - 4/26/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sampled by:	S&ME	Sample Date(s):	Various
Sampling Method:	Bulk	Drill Rig:	CME 55/Diedrich D-50

Method: **A (1%)** ☐ **B (0.1%)** ☑ Balance ID. 13942 Calibration Date: 8/18/17 Oven ID. 13978 Calibration Date: 10/07/17

Boring No.	Sample No.	Sample Depth	Tare #	Tare Weight	Tare Wt.+ Wet Wt	Tare Wt. + Dry Wt	Water Weight	Percent Moisture	Note
		ft.		grams	grams	grams	grams	%	
RW-38	BS-1	0.0 - 10.0	BK-12	0.00	228.7	190.7	38.0	19.9%	
RW-42	BS-1	0.0 - 10.0	BK-3	0.00	212.2	192.4	19.8	10.3%	
RW-43	BS-1	0.0 - 10.0	BK-12	0.00	241.5	210.9	30.6	14.5%	

Notes / Deviations / References

AASHTO T 265: Laboratory Determination of Moisture Content of Soils

ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass

Benjamin Kovaleski	Benjamin J. Kovaleski	NICET Lab Level III/117226	5/03/18
Technician Name	*Signature*	*Certification Type / No.*	*Date*
Matthew F. Cooke, P.G.		Project Manager	5/03/18
Technical Responsibility		*Position*	*Date*

Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

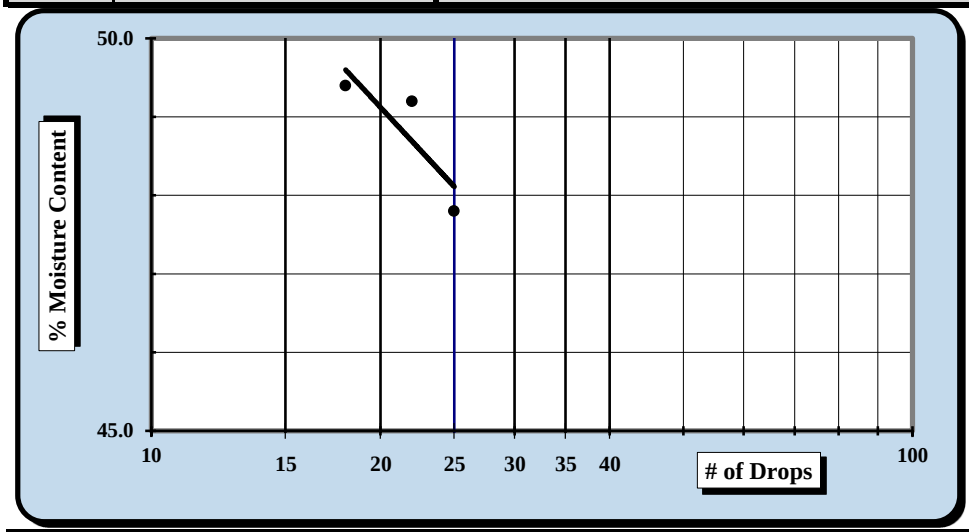
ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	2/9/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	1/30-2/8/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	RW-35	Sample #: BS-1	Sample Date: 1/23-1/24/2018
Location:	Embankment Boring	Offset: N/A	Depth: 0.0' - 10.0'
Sample Description:	Sandy Lean Clay (CL, A-7-6(16))		

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	15425	8/30/2017	Flat Grooving tool	28573	11/10/2017
LL Apparatus	28562	5/12/2017			
Oven	25722	8/18/2017	No. 40 Sieve	21775	1/8/2018

Pan # 1		Liquid Limit						Plastic Limit		
	Tare #:	147	100	25				235	35	
A	Tare Weight	20.76	20.56	20.61				20.75	20.76	
B	Wet Soil Weight + A	29.73	29.57	29.62				28.42	27.15	
C	Dry Soil Weight + A	26.83	26.59	26.65				27.00	26.00	
D	Water Weight (B-C)	2.90	2.98	2.97				1.42	1.15	
E	Dry Soil Weight (C-A)	6.07	6.03	6.04				6.25	5.24	
F	% Moisture (D/E)*100	47.8%	49.4%	49.2%				22.7%	21.9%	
N	# OF DROPS	25	18	22				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**22.3%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**48**
Plastic Limit	**22**
Plastic Index	**26**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☑ Dry Preparation ☐ Air Dried ☐ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Matthew Wolfe	NICET 123218	Matthew F. Cooke, P.G.	3/28/2018
Technician Name	*Certification*	*Technical Responsibility*	*Date*

This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Form No. 61-D422-2
Revision No. 0
Revision Date: 05/05/2017

Particle Size Analysis of Soils

ASTM D422 / D6913

S&ME, Inc. Columbia Office, 134 Suber Road Columbia SC 29210

Project #:	**1461-16-047.2B**	Report Date:	2/9/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	1/30-2/8/2018
Client Name:	HDR Engineering, Inc.	Address:	4400 Leeds Ave., North Charleston, South C
Boring #:	RW-35	Sample #:	BS-1
Location:	Embankment Boring	Offset:	N/A
Sample Description:	Sandy Lean Clay (CL, A-7-6(16))		

Initial Test Sample Pan #:	SB1								
Split Sample Pan #:	315								
Pan Tare Weight (grams):	458.3		**Moisture Content**		Hygroscopic				
Total Sample Air Dried Wt. + tare wt. (grams):	1999.3		Tare #		219				
Weight of Total Sample Air Dried:	1541.0	A	Tare Wt.		152.42				
Weight of Air Dried Split Sample (g):	116.08	B	Wet Wt. + A		244.98				
Total Sample Oven Dried:	1489.44	C	Dry Wt. + A		241.70				
Split Sample Oven Dried (**W**):	111.97	D	Water Wt. (B-C)		3.28				
% Passing #4:	94.2%	E	Dry Wt. (C-A)		89.28				
			% Moisture (100 x D/E)		3.67%				

Sieve	Retained Wt.	Percent Passing	
3.0"	0.0		100.0%
1.5"	0.0		100.0%
1.0"	0.0		100.0%
3/4"	20.0		98.7%
1/2"	60.4		95.9%
3/8"	69.1		95.4%
#4	85.9	100.0%	94.2%
#10	4.1	96.4%	90.8%
#20	10.4	90.8%	85.5%
#40	17.9	84.0%	79.1%
#60	23.2	79.2%	74.7%
#100	27.2	75.7%	71.3%
#200	32.6	70.9%	66.8%

Description of Sand & Gravel Particles — Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☒

Dispersion Agent Used?: Yes ☒ No ☐

Equipment Used:

Sieve:	*ID No.*	21773	*Cal. Date:* 1/8/2018	*Sieve:*	*ID No.*	21622	*Cal. Date:* 1/8/2018
Sieve:	*ID No.*	21704	*Cal. Date:* 1/8/2018	*Sieve:*	*ID No.*	21251	*Cal. Date:* 1/8/2018
Sieve:	*ID No.*	18204	*Cal. Date:* 1/8/2018				
Sieve:	*ID No.*	8077	*Cal. Date:* 1/8/2018	*Oven:*	*ID No.*	25722	*Cal. Date:* 8/18/2017
Sieve:	*ID No.*	8062	*Cal. Date:* 1/8/2018	*Sieve Shaker:*	*ID No.*	*	*Cal. Date:* *
Sieve:	*ID No.*	8061	*Cal. Date:* 1/8/2018	*Balance:*	*ID No.*	25711	*Cal. Date:* 8/30/2017
Sieve:	*ID No.*	8075	*Cal. Date:* 1/8/2018	*Balance:*	*ID No.*	17866	*Cal. Date:* 8/30/2017
Sieve:	*ID No.*	8064	*Cal. Date:* 1/8/2018	*Timer:*	*ID No.*	28427	*Cal. Date:* 1/22/2018
Sieve:	*ID No.*	8065	*Cal. Date:* 1/8/2018				
Sieve:	*ID No.*	21774	*Cal. Date:* 1/8/2018				
Sieve:	*ID No.*	19476	*Cal. Date:* 1/8/2018				
Sieve:	*ID No.*	8492	*Cal. Date:* 1/8/2018				

References / Comments / Deviations ASTM D 422, D 2487, D 4318, D 6913. Material separated using the #4 sieve. The material passing the #200 sieve was not analyzed.

Matthew Wolfe	NICET 123218	Matt Cooke, PG		
Technician Name	*Certification #*	*Technical Responsibility*	*Position*	*Date*

Form No. TR-D698-2
Revision No. : 1
Revision Date: 07/25/17

MOISTURE - DENSITY REPORT

Quality Assurance

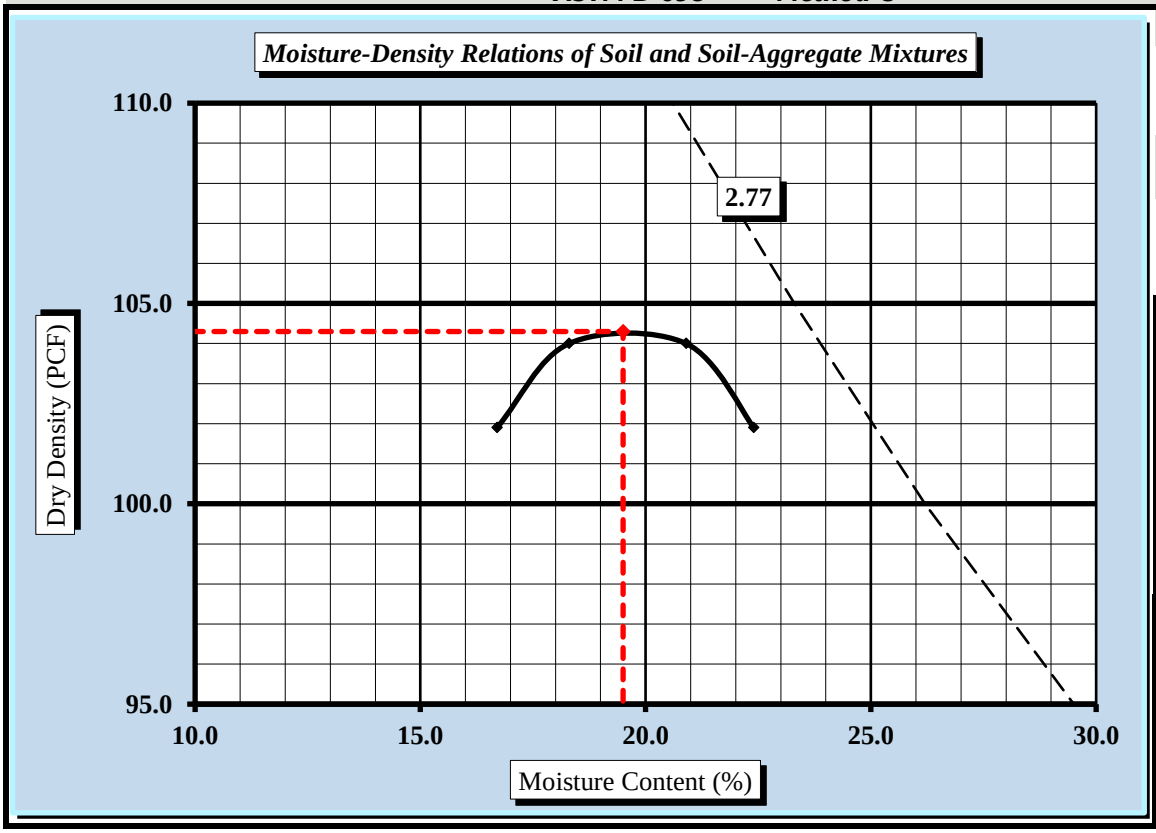
S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

S&ME Project #:	1461-16-047.2B	Report Date:	2/9/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	2/5-2/9/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	RW-35	Sample #:	BS-1	Sample Date:	1/23-1/24/2018
Location:	Embankment Boring	Offset:	N/A	Depth:	0.0' - 10.0'
Sample Description:	Sandy Lean Clay (CL, A-7-6(16))				

Maximum Dry Density 104.3 PCF. Optimum Moisture Content 19.5%

ASTM D 698 - - Method C



Soil Properties

Natural Moisture Content	32.0%
Specific Gravity of Soil	TNP
Liquid Limit	48
Plastic Limit	22
Plastic Index	26

% Passing	
3/4"	98.7%
3/8"	95.4%
#4	94.2%
#10	90.8%
#40	79.1%
#60	74.7%
#200	66.8%

Oversize Fraction	
Bulk Gravity	
% Moisture	
% Oversize	1.3%
MDD	
Opt. MC	

Moisture-Density Curve Displayed: Fine Fraction ☒ Corrected for Oversize Fraction (ASTM D 4718) ☐

Sieve Size used to separate the Oversize Fraction: #4 Sieve ☐ 3/8 inch Sieve ☐ 3/4 inch Sieve ☒

Mechanical Rammer ☐ Manual Rammer ☒ Moist Preparation ☐ Dry Preparation ☒

References / Comments / Deviations:

ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass

ASTM D 698: Laboratory Compaction Characteristics of Soil Using Standard Effort

Matthew F. Cooke, P.G.	Project Manager	3/28/2018
Technical Responsibility	*Position*	*Date*

This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Form No. TR-26-SCT36-1
Revision No. 0
Revision Date: 2/21/18

% Ignition Loss of Inorganic Soils

SC T 36

Project #: **1461-16-047.2B** Report Date: 2/28/18
Project Name: **Carolina Crossroads Project** Test Date(s): 2/26/18
Client Name: HDR Engineering, Inc.
Client Address: 4400 Leeds Ave., North Charleston, South Carolina

Boring #:	RW-35	Sample #:	BS-1	Sample Date:	1/24/2018
Location:	Embankment Boring	Type:	Bulk	Depth:	0.0' - 10.0'

Sample Description: Sandy Lean Clay (CL, A-7-6 (16))

Equipment: Balance (GP1/G1): S&ME ID# **13942** *0.01 g.Readability, 500g. Minimum Capacity*
Oven: S&ME ID# **13978** Muffle Furnace: S&ME ID# **23123**

Gradation Percentage Determination

		Tare #	YM-2
T	Total Mass of Oven Dry Sample	grams	213.81
d	Mass Retained on 2mm Sieve	grams	8.70
e	Mass Passing 2mm and Retained on 75µm Sieve	grams	53.56
f	Mass Passing 75µm Sieve	T-(d+e)	151.55
P	%Passing 75µm Sieve of Sample Passing 2mm Sieve	1-(f/(e+f))*100	26.1%

% Ignition Loss Determination

Muffle Furnace Temperature: **1000 + 50** **°C**

		Tare #	B
t	Tare Weight *(Dish plus Aluminum Foil Cover)*	grams	56.78
b	Mass of Oven Dry Specimen + Tare Wt.	grams	77.73
c	Ash Weight + Tare Wt.	grams	77.34
M	Mass of Oven Dry Specimen	(b-t)	20.95
C	Ash Weight	c-t	20.56
L	Loss	M-C	**0.39**
	% Ignition Loss	(P*L)/M*100	**0.5%**

Remarks:

References: SC T 36: Procedure for Determining % Ignition Loss of Inorganic Soils

Technician Name: Benjamin Kovaleski NICET Lab Level III 117226
Certification #

Technical Responsibility: Brian Vaughan, P.E. *Signature* Group Leader *Position*

Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

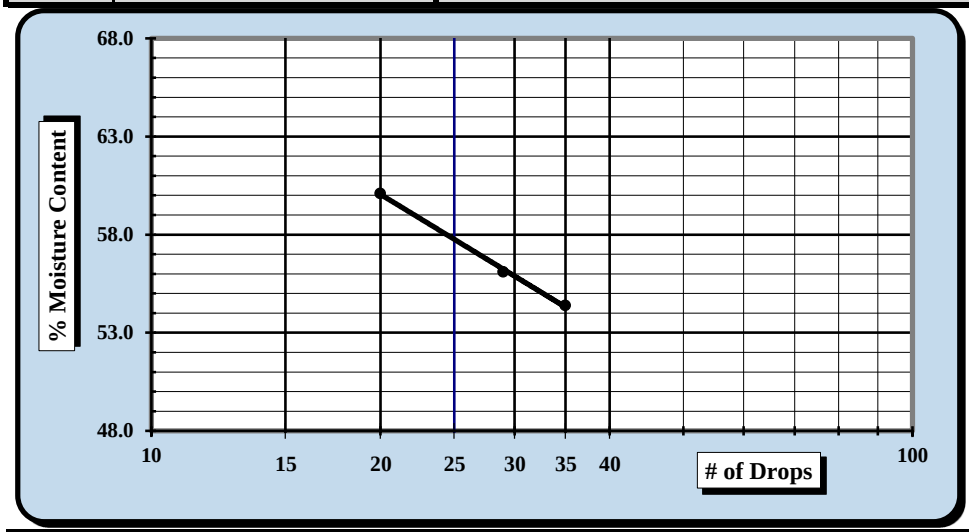
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	4/25/18
Project Name:	Carolina Crossroads Project	Test Date:	4/21/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	RW-36	Sample #:	BS-1	Sample Date:	3/1/2018
Location:	Embankment Boring	Type:	Bulk	Depth:	0.0' - 10.0'
Sample Description:	Fat Clay with Sand (CH, A-7-6(30))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	1	2	3				4	5	
A	Tare Weight	26.69	26.46	26.34				25.93	26.96	
B	Wet Soil Weight + A	43.13	44.33	47.19				32.24	35.06	
C	Dry Soil Weight + A	37.34	37.91	39.36				31.04	33.55	
D	Water Weight (B-C)	5.79	6.42	7.83				1.20	1.51	
E	Dry Soil Weight (C-A)	10.65	11.45	13.02				5.11	6.59	
F	% Moisture (D/E)*100	54.4%	56.1%	60.1%				23.5%	22.9%	
N	# OF DROPS	35	29	20				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**23.2%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**58**
Plastic Limit	**23**
Plastic Index	**35**
Group Symbol	**CH**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	4/25/18	Matthew F. Cooke, P.G.	4/27/2018
Technician Name	*Date*	*Technical Responsibility*	*Date*

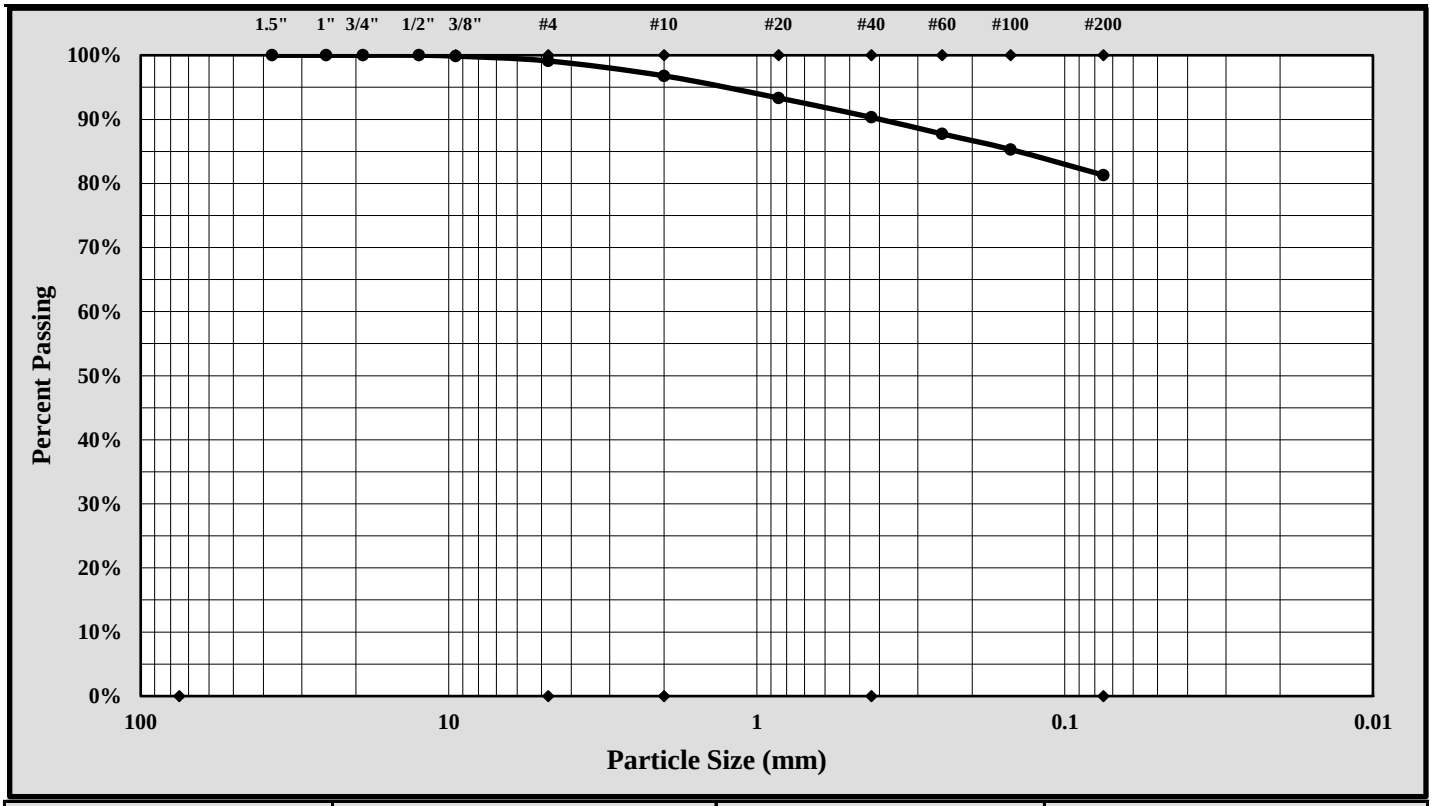
This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	4/25/18
Project Name:	Carolina Crossroads Project	Test Date(s):	4/11 - 4/20/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	RW-36 Sample #: BS-1	Sample Date:	3/1/2018
Location:	Embankment Boring Type: Bulk	Depth:	0.0' - 10.0'
Sample Description:	Fat Clay with Sand (CH, A-7-6(30))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	4.75 mm	Gravel:	0.9%
Silt & Clay (% Passing #200):	81.3%	Total Sand:	17.8%

Liquid Limit	58	Plastic Limit	23	Plastic Index	35
Coarse Sand:	2.3%	Medium Sand:	6.5%	Fine Sand:	9.0%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/25/18 — *Date*

This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Form No. TR-D698-2
Revision No. : 1
Revision Date: 07/25/17

MOISTURE - DENSITY REPORT

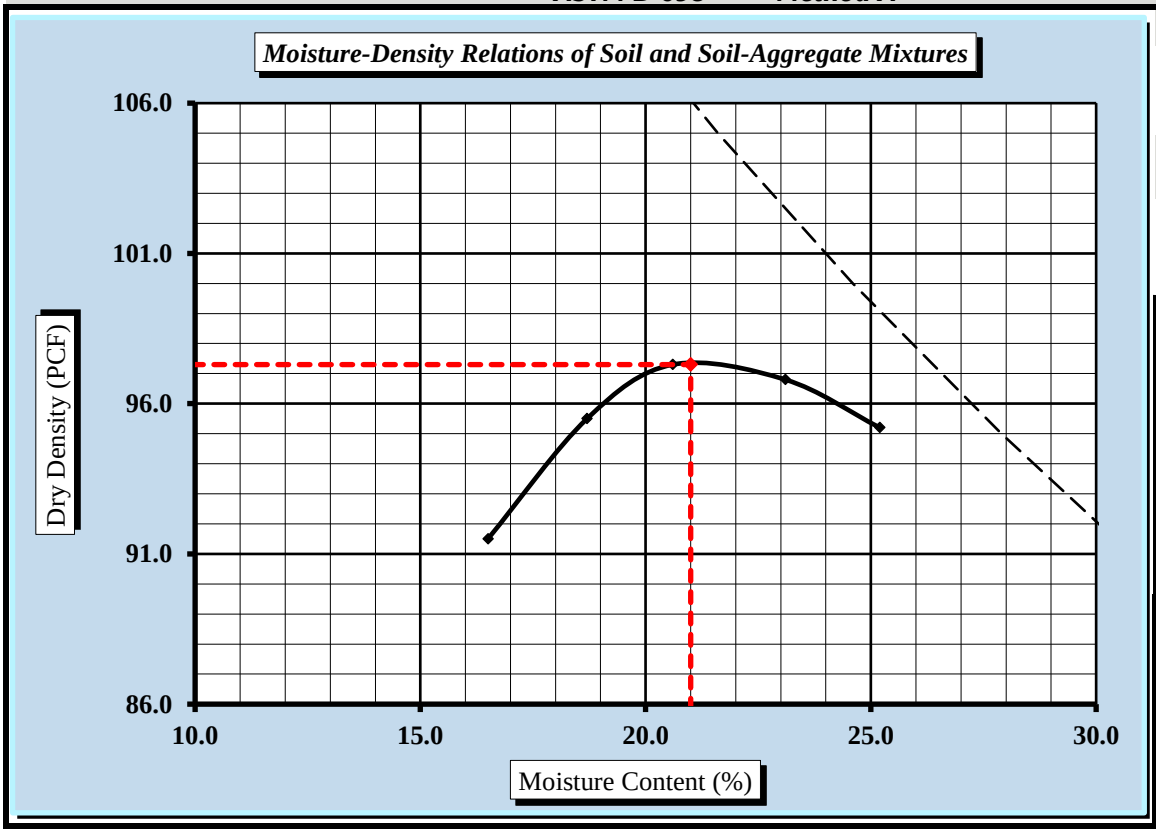
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	4/25/18
Project Name:	Carolina Crossroads Project	Test Date(s):	3/26/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	RW-36	Sample #:	BS-1	Sample Date:	3/1/18
Location:	Embankment Boring	Type:	Bulk	Depth:	0.0' - 10.0'
Sample Description:	Fat Clay with Sand (CH, A-7-6(30))				

Maximum Dry Density 97.3 PCF. Optimum Moisture Content 21.0%

ASTM D 698 - - Method A



Soil Properties

Natural Moisture Content	23.2%
Specific Gravity of Soil	2.650
Liquid Limit	58
Plastic Limit	23
Plastic Index	35

% Passing	
3/4"	100.0%
3/8"	99.9%
#4	99.1%
#10	96.8%
#40	90.3%
#60	87.7%
#100	85.3%
#200	81.3%

Oversize Fraction	
Bulk Gravity	
% Moisture	
% Oversize	
MDD	
Opt. MC	

Moisture-Density Curve Displayed: Fine Fraction ☒ Corrected for Oversize Fraction (ASTM D 4718) ☐

Sieve Size used to separate the Oversize Fraction: #4 Sieve ☒ 3/8 inch Sieve ☐ 3/4 inch Sieve ☐

Mechanical Rammer ☐ Manual Rammer ☒ Moist Preparation ☐ Dry Preparation ☒

References / Comments / Deviations:

ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass

ASTM D 698: Laboratory Compaction Characteristics of Soil Using Standard Effort

Matthew F. Cooke, P.G.	Project Manager	4/27/2018
Technical Responsibility	*Position*	*Date*

This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Form No. TR-26-SCT36-1
Revision No. 0
Revision Date: 2/21/18

% Ignition Loss of Inorganic Soils

SC T 36

Project #: **1461-16-047.2B** Report Date: 4/25/18
Project Name: **Carolina Crossroads Project** Test Date(s): 4/21/18
Client Name: HDR Engineering, Inc.
Client Address: 4400 Leeds Ave., North Charleston, South Carolina

Boring #:	RW-36	Sample #:	BS-1	Sample Date:	3/1/2018
Location:	Embankment Boring	Type:	Bulk	Depth:	0.0' - 10.0'

Sample Description: Fat Clay with Sand (CH, A-7-6(30))

Equipment: Balance (GP1/G1): S&ME ID# **13942** *0.01 g.Readability, 500g. Minimum Capacity*
Oven: S&ME ID# **13978** Muffle Furnace: S&ME ID# **23123**

Gradation Percentage Determination

		Tare #	D-7
T	Total Mass of Oven Dry Sample	grams	1641.48
d	Mass Retained on 2mm Sieve	grams	52.53
e	ass Passing 2mm and Retained on 75µm Sieve	grams	254.43
f	Mass Passing 75µm Sieve	T-(d+e)	1334.52
P	%Passing 75µm Sieve of Sample Passing 2mm Sieve	1-(f/(e+f))*100	16.0%

% Ignition Loss Determination

Muffle Furnace Temperature: **1000 ± 50** **°C**

		Tare #	B
t	Tare Weight *(Dish plus Aluminum Foil Cover)*	grams	56.22
b	Mass of Oven Dry Specimen + Tare Wt.	grams	76.46
c	Ash Weight + Tare Wt.	grams	76.12
M	Mass of Oven Dry Specimen	(b-t)	20.24
C	Ash Weight	c-t	19.90
L	Loss	M-C	**0.34**
	% Ignition Loss	(P*L)/M*100	**0.3%**

Remarks:

References: SC T 36: Procedure for Determining % Ignition Loss of Inorganic Soils

Technician Name: Benjamin Kovaleski NICET Lab Level III 117226
Certification #

Technical Responsibility: Matthew F. Cooke, P.G. Project Manager
Position

Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

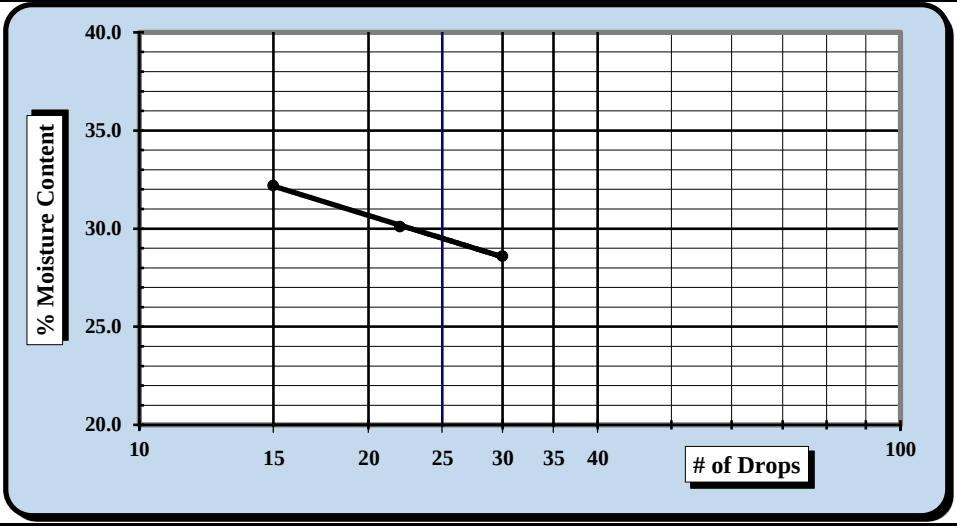
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	5/3/18
Project Name:	Carolina Crossroads Project	Test Date:	5/2/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	RW-38	Sample #:	BS-1	Sample Date:	4/3/2018
Location:	Embankment Boring	Type:	Bulk	Depth:	0.0' - 10'
Sample Description:	Sandy Lean Clay (CL, A-6(7))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	1	2	3				4	5	
A	Tare Weight	26.69	26.48	26.33				25.93	26.95	
B	Wet Soil Weight + A	41.72	41.16	43.70				34.37	35.03	
C	Dry Soil Weight + A	38.38	37.76	39.47				33.13	33.84	
D	Water Weight (B-C)	3.34	3.40	4.23				1.24	1.19	
E	Dry Soil Weight (C-A)	11.69	11.28	13.14				7.20	6.89	
F	% Moisture (D/E)*100	28.6%	30.1%	32.2%				17.2%	17.3%	
N	# OF DROPS	30	22	15				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**17.3%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**30**
Plastic Limit	**17**
Plastic Index	**13**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	5/4/2018	Matthew F. Cooke, P.G.	5/4/2018
Technician Name	*Date*	*Technical Responsibility*	*Date*

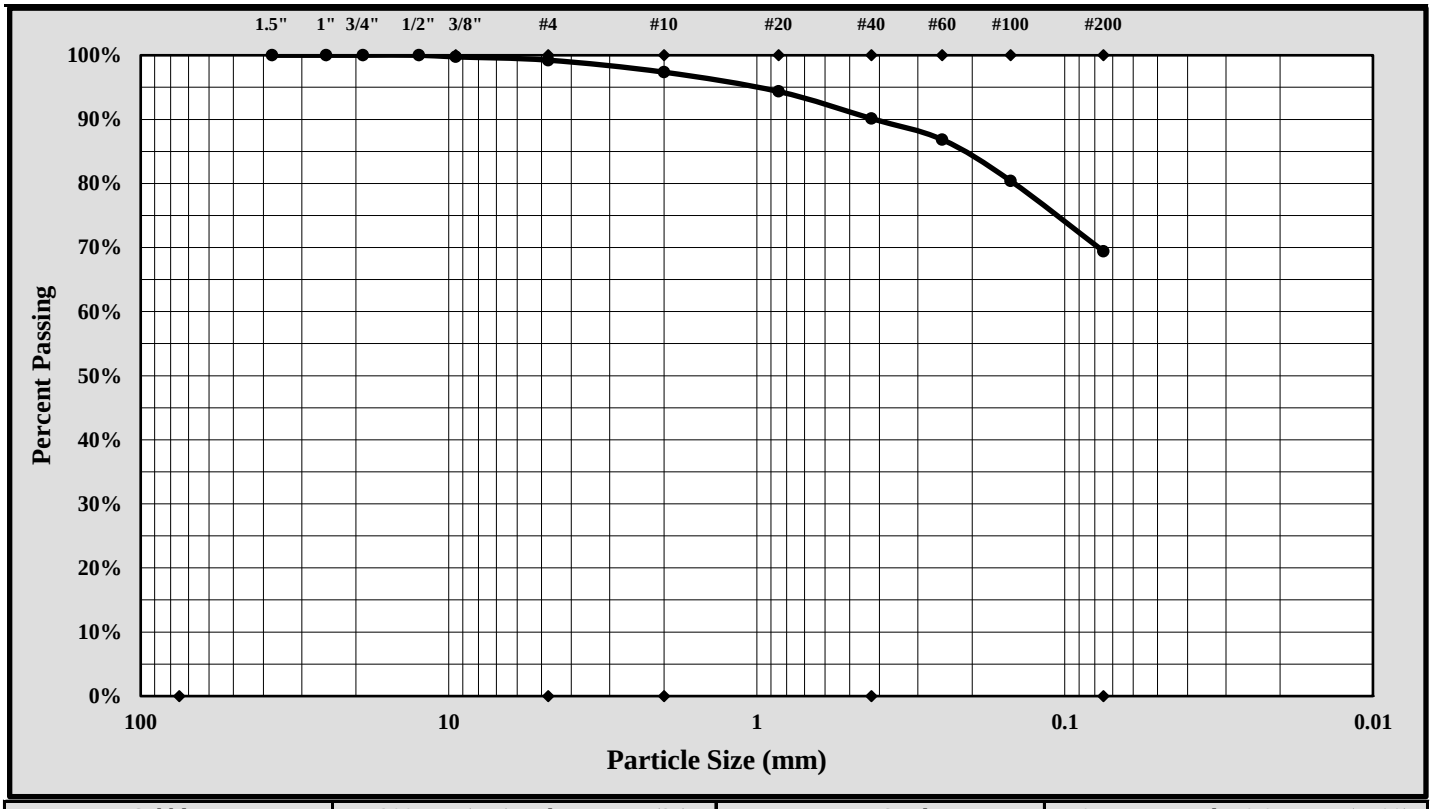
This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	5/03/18
Project Name:	Carolina Crossroads Project	Test Date(s):	5/01 - 5/03/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	RW-38 Sample #: BS-1	Sample Date:	4/3/2018
Location:	Embankment Boring Type: Bulk	Depth:	0.0' - 10.0'
Sample Description:	Sandy Lean Clay (CL, A-6(7))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	4.75 mm	Gravel:	0.8%
Silt & Clay (% Passing #200):	69.4%	Total Sand:	29.8%

Liquid Limit	30	Plastic Limit	17	Plastic Index	13
Coarse Sand:	1.9%	Medium Sand:	7.2%	Fine Sand:	20.7%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
5/03/18 — *Date*

This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Form No. TR-D698-2
Revision No. : 1
Revision Date: 07/25/17

MOISTURE - DENSITY REPORT

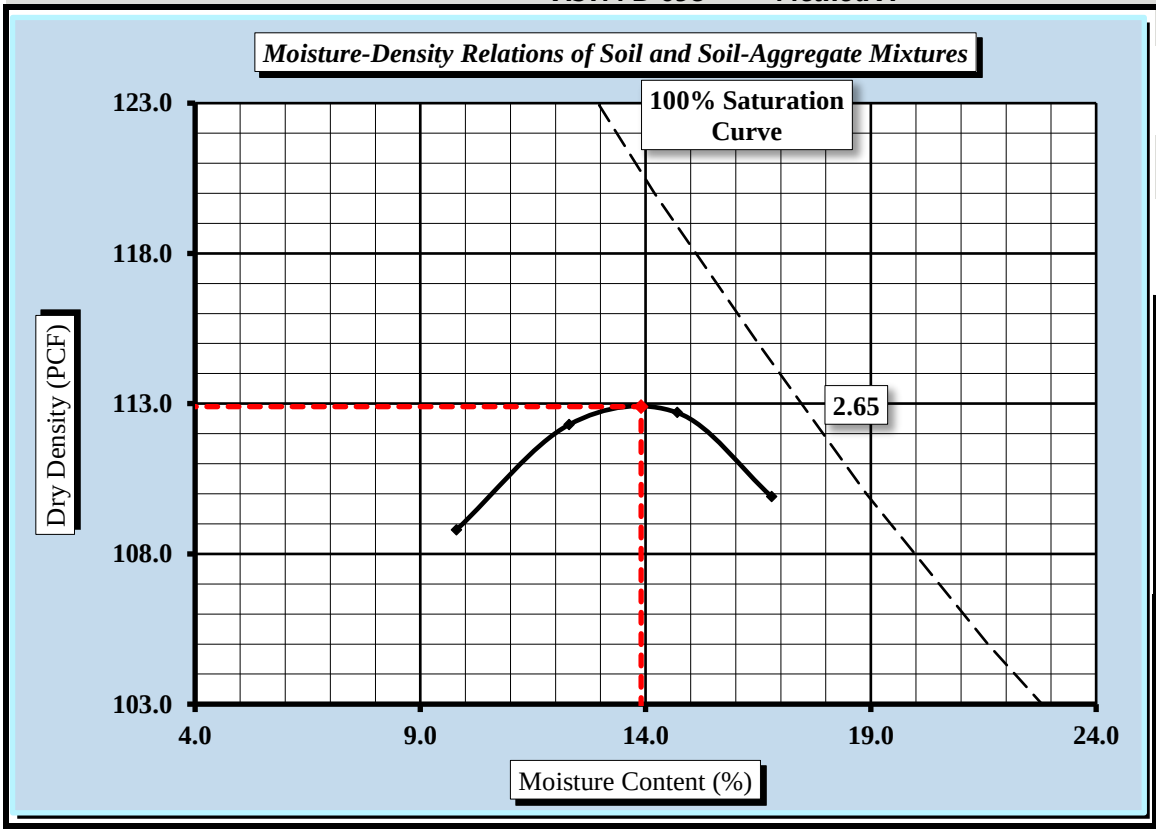
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	5/03/18
Project Name:	Carolina Crossroads Project	Test Date(s):	4/24/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	RW-38	Sample #:	BS-1	Sample Date:	4/3/18
Location:	Embankment Boring	Type:	Bulk	Depth:	0.0' - 10.0'
Sample Description:	Sandy Lean Clay (CL, A-6(7))				

Maximum Dry Density 112.9 PCF. Optimum Moisture Content 13.9%

ASTM D 698 - - Method A



Soil Properties	
Natural Moisture Content	19.9%
Specific Gravity of Soil	2.650
Liquid Limit	30
Plastic Limit	17
Plastic Index	13
% Passing	
3/4"	100.0%
3/8"	99.7%
#4	99.2%
#10	97.4%
#40	90.1%
#60	86.8%
#100	80.4%
#200	69.4%
Oversize Fraction	
Bulk Gravity	
% Moisture	
% Oversize	
MDD	
Opt. MC	

Moisture-Density Curve Displayed: Fine Fraction ☒ Corrected for Oversize Fraction (ASTM D 4718) ☐

Sieve Size used to separate the Oversize Fraction: #4 Sieve ☒ 3/8 inch Sieve ☐ 3/4 inch Sieve ☐

Mechanical Rammer ☐ Manual Rammer ☒ Moist Preparation ☐ Dry Preparation ☒

References / Comments / Deviations:

ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass

ASTM D 698: Laboratory Compaction Characteristics of Soil Using Standard Effort

Matthew F. Cooke, P.G.	Project Manager	5/03/18
Technical Responsibility	*Position*	*Date*

This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Form No. TR-26-SCT36-1
Revision No. 0
Revision Date: 2/21/18

% Ignition Loss of Inorganic Soils

SC T 36

Project #: **1461-16-047.2B** Report Date: 5/04/18
Project Name: **Carolina Crossroads Project** Test Date(s): 5/03/18
Client Name: HDR Engineering, Inc.
Client Address: 4400 Leeds Ave., North Charleston, South Carolina

Boring #:	RW-38	Sample #:	BS-1	Sample Date:	4/3/2018
Location:	Embankment Boring	Type:	Bulk	Depth:	0.0' - 10.0'
Sample Description:	Sandy Lean Clay (CL, A-6(7))				

Equipment: Balance (GP1/G1): S&ME ID# **13942** *0.01 g.Readability, 500g. Minimum Capacity*
Oven: S&ME ID# **13978** Muffle Furnace: S&ME ID# **23123**

Gradation Percentage Determination

		Tare #	D-5
T	Total Mass of Oven Dry Sample	grams	1310.38
d	Mass Retained on 2mm Sieve	grams	34.07
e	ass Passing 2mm and Retained on 75µm Sieve	grams	366.91
f	Mass Passing 75µm Sieve	T-(d+e)	909.40
P	%Passing 75µm Sieve of Sample Passing 2mm Sieve	1-(f/(e+f))*100	28.7%

% Ignition Loss Determination

Muffle Furnace Temperature: **1000 ± 50 °C**

		Tare #	H
t	Tare Weight *(Dish plus Aluminum Foil Cover)*	grams	56.20
b	Mass of Oven Dry Specimen + Tare Wt.	grams	77.04
c	Ash Weight + Tare Wt.	grams	76.80
M	Mass of Oven Dry Specimen	(b-t)	20.84
C	Ash Weight	c-t	20.60
L	Loss	M-C	**0.24**
	% Ignition Loss	(P*L)/M*100	**0.3%**

Remarks:

References: SC T 36: Procedure for Determining % Ignition Loss of Inorganic Soils

Technician Name: Benjamin Kovaleski NICET Lab Level III 117226
Certification #

Technical Responsibility: Matthew F. Cooke, P.G. Project Manager
Position

Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

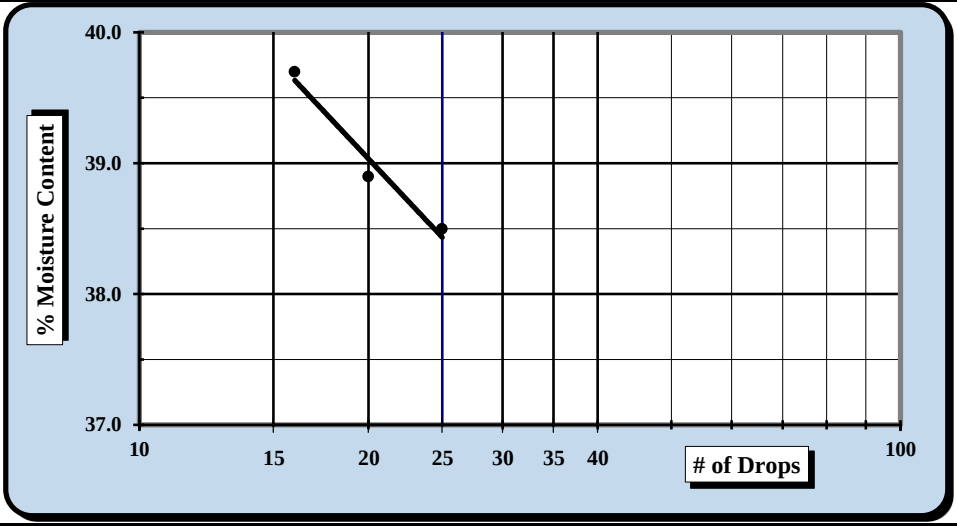
S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	2/9/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	1/30-2/8/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	P-65	Sample #: BS-1		Sample Date: 1/24/2018	
Location:	Pavement Boring	Offset: N/A		Depth: 0.8' - 10.8'	
Sample Description:	Sandy Lean Clay (CL, A-7-6(6))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	15425	8/30/2017	Flat Grooving tool	28573	11/10/2017
LL Apparatus	28562	5/12/2017			
Oven	25722	8/18/2017	No. 40 Sieve	21775	1/8/2018

Pan # 2		Liquid Limit						Plastic Limit		
	Tare #:	229	207	9				6	222	
A	Tare Weight	20.71	20.93	20.78				20.57	20.83	
B	Wet Soil Weight + A	30.49	28.57	28.94				27.09	26.82	
C	Dry Soil Weight + A	27.77	26.43	26.62				25.98	25.80	
D	Water Weight (B-C)	2.72	2.14	2.32				1.11	1.02	
E	Dry Soil Weight (C-A)	7.06	5.50	5.84				5.41	4.97	
F	% Moisture (D/E)*100	38.5%	38.9%	39.7%				20.5%	20.5%	
N	# OF DROPS	25	20	16				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**20.5%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**38**
Plastic Limit	**21**
Plastic Index	**17**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☑ Dry Preparation ☐ Air Dried ☐ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group Symbol refers only to material passing the No. 40 sieve.

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Matthew Wolfe	NICET 123218	Matthew F. Cooke, P.G.	4/27/2018
Technician Name	*Certification*	*Technical Responsibility*	*Date*

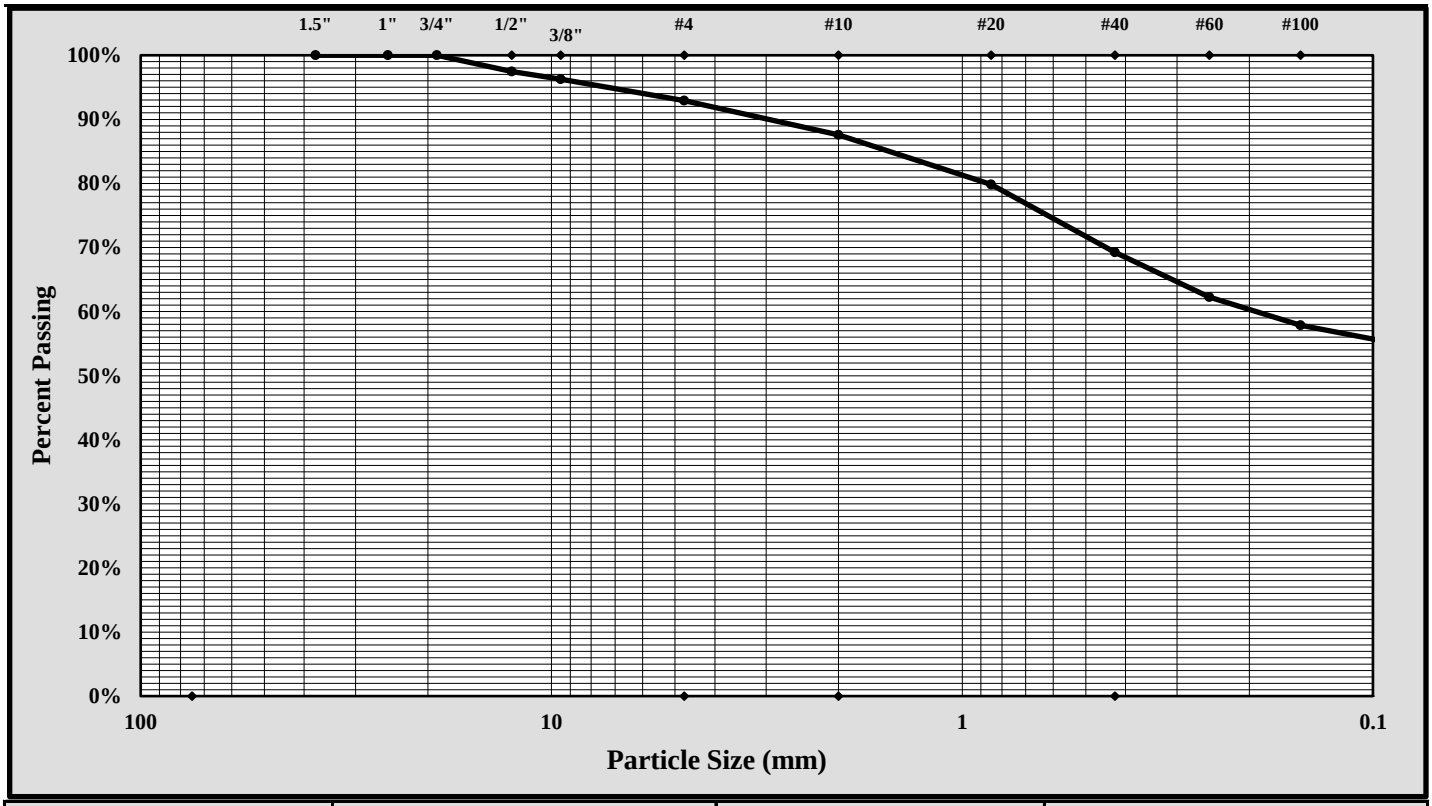
This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Columbia Office, 134 Suber Road Columbia SC 29210

S&ME Project #:	1461-16-047.2B	Report Date:	2/6/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	1/30-2/5/2018
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-65 Sample #: BS-1	Sample Date:	1/24/2018
Location:	Pavement Boring Offset: N/A	Depth:	0.8' - 10.8'
Sample Description:	Sandy Lean Clay (CL, A-7-6(6))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	1/2-inch	Gravel:	7.1%
Silt & Clay (% Passing #200):	54.2%	Total Sand:	38.7%

Liquid Limit	38	Plastic Limit	21	Plastic Index	17
Coarse Sand:	5.3%	Medium Sand:	18.3%	Fine Sand:	15.1%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☒

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/27/2018 — *Date*

This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Form No. TR-D698-2
Revision No. : 1
Revision Date: 07/25/17

MOISTURE - DENSITY REPORT

Quality Assurance

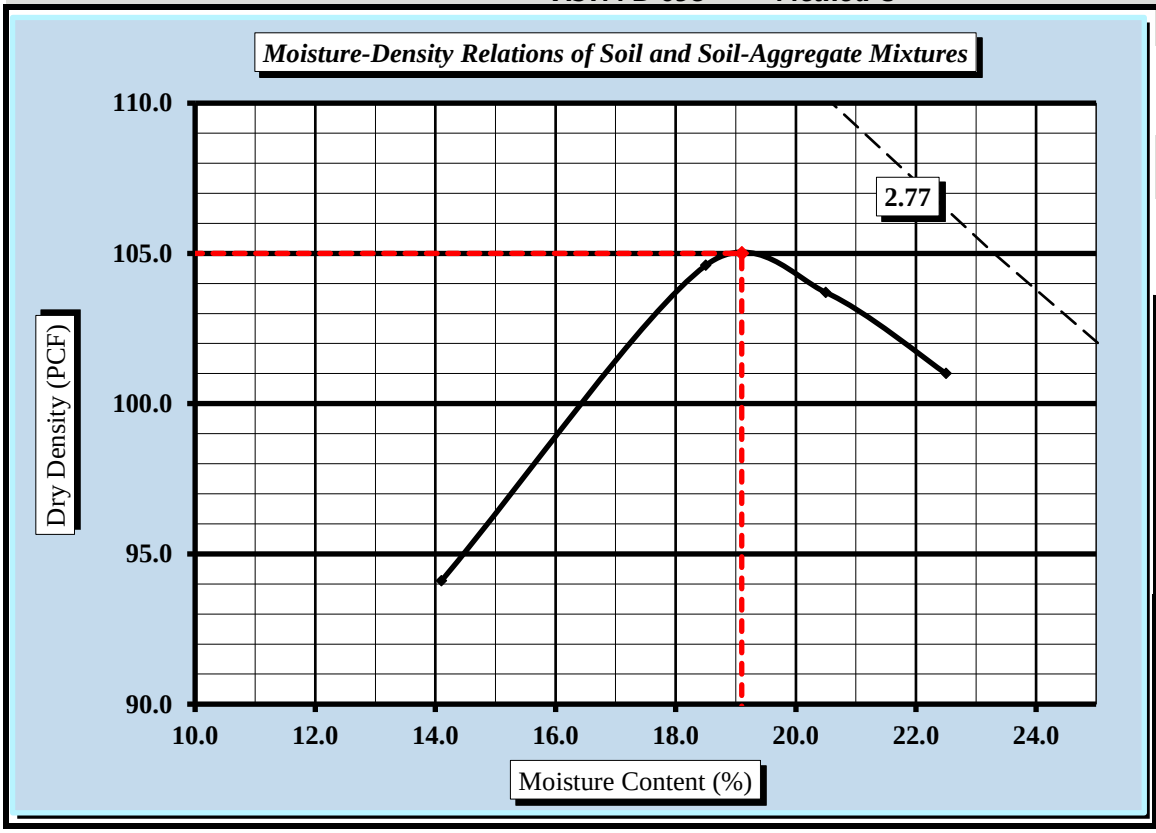
S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

S&ME Project #:	1461-16-047.2B	Report Date:	2/16/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	2/2-2/15/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	P-65	Sample #:	BS-1	Sample Date:	1/24/2018
Location:	Pavement Boring	Offset:	N/A	Depth:	0.8' - 10.8'
Sample Description:	Sandy Lean Clay (CL, A-7-6(6))				

Maximum Dry Density 105.0 PCF. Optimum Moisture Content 19.1%

ASTM D 698 - - Method C



Soil Properties

Natural Moisture Content	35.0%
Specific Gravity of Soil	TNP
Liquid Limit	38
Plastic Limit	21
Plastic Index	17

% Passing	
3/4"	100.0%
3/8"	96.3%
#4	92.9%
#10	87.6%
#40	69.3%
#60	62.3%
#200	54.2%

Oversize Fraction	
Bulk Gravity	
% Moisture	
% Oversize	0.0%
MDD	
Opt. MC	

Moisture-Density Curve Displayed: Fine Fraction ☒ Corrected for Oversize Fraction (ASTM D 4718) ☐

Sieve Size used to separate the Oversize Fraction: #4 Sieve ☐ 3/8 inch Sieve ☐ 3/4 inch Sieve ☒

Mechanical Rammer ☐ Manual Rammer ☒ Moist Preparation ☐ Dry Preparation ☒

References / Comments / Deviations:

ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass

ASTM D 698: Laboratory Compaction Characteristics of Soil Using Standard Effort

Matthew F. Cooke, P.G.	Project Manager	4/27/2018
Technical Responsibility	*Position*	*Date*

This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Form No. TR-D1883-T193-3
Revision No. 2
Revision Date: 08/11/17

CBR (CALIFORNIA BEARING RATIO) OF LABORATORY COMPACTED SOIL

ASTM D 1883

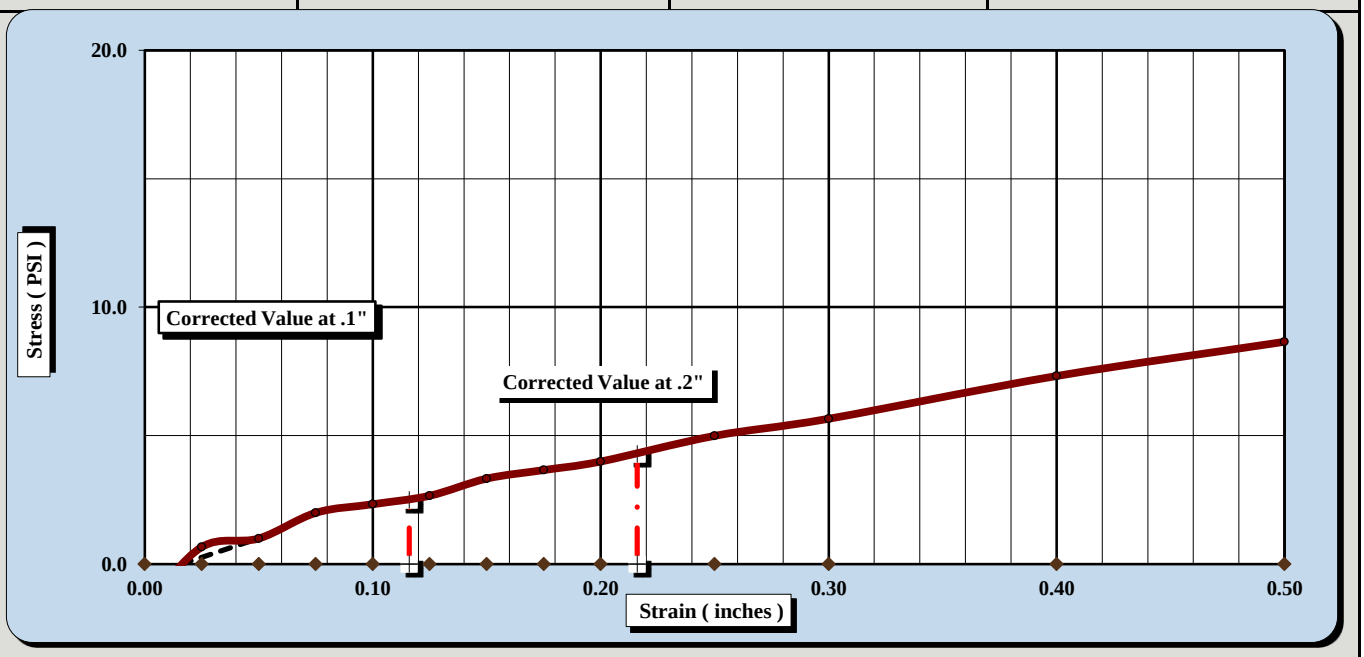
S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	2/16/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	2/8-2/12/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-65	Sample #: BS-1	Sample Date: 1/24/2018
Location:	Pavement Boring	Offset: N/A	Depth: 0.8' - 10.8'
Sample Description:	Sandy Lean Clay (CL, A-7-6(6))		

ASTM D 698 *Method C* Maximum Dry Density: 105.0 PCF Optimum Moisture Content: 19.1%

Compaction Test performed on grading complying with CBR spec. % Retained on the 3/4" sieve: 0.0%

Uncorrected CBR Values		Corrected CBR Values	
CBR at 0.1 in. 0.2	CBR at 0.2 in. 0.3	CBR at 0.1 in. 0.3	CBR at 0.2 in. 0.3



CBR Sample Preparation:

The replacement method was used and compacted in a 6" CBR mold in accordance with ASTM D1883, Section 6.1.1

Before Soaking		*After Soaking*	
Compactive Effort (Blows per Layer)	15		
Initial Dry Density (PCF)	83.7	Final Dry Density (PCF)	82.1
Moisture Content of the Compacted Specimen	17.7%	Moisture Content (top 1" after soaking)	34.7%
Percent Compaction	79.7%	Percent Swell	2.0%

Soak Time:	96 hours	Surcharge Weight	10.0	Surcharge Wt. per sq. Ft.	50.9
Liquid Limit	38	Plastic Index	17	Apparent Relative Density	TNP

Notes/Deviations/References:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/27/2018 — *Date*

This report shall not be reproduced, except in full without the written approval of S&ME, Inc.

CBR (CALIFORNIA BEARING RATIO) OF LABORATORY COMPACTED SOIL

ASTM D 1883

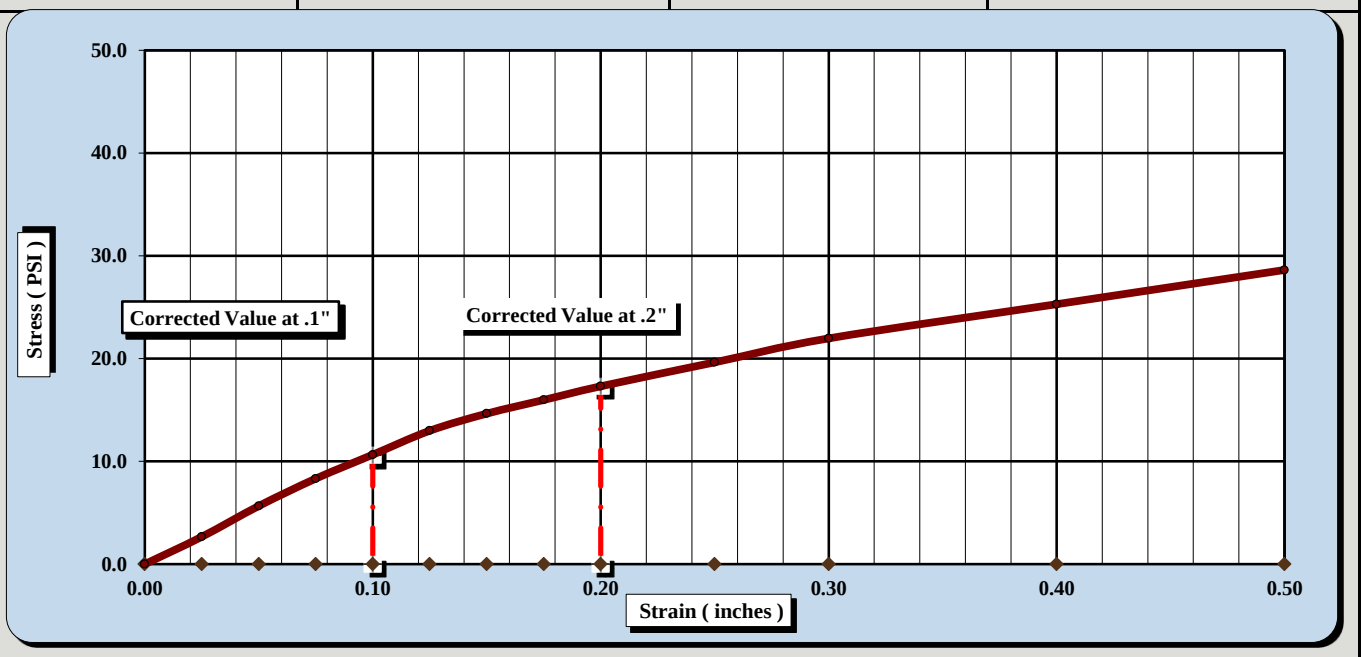
S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	2/16/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	2/8-2/12/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-65	Sample #: BS-1	Sample Date: 1/24/2018
Location:	Pavement Boring	Offset: N/A	Depth: 0.8' - 10.8'
Sample Description:	Sandy Lean Clay (CL, A-7-6(6))		

ASTM D 698 *Method C* Maximum Dry Density: 105.0 PCF Optimum Moisture Content: 19.1%

Compaction Test performed on grading complying with CBR spec. % Retained on the 3/4" sieve: 0.0%

Uncorrected CBR Values		Corrected CBR Values	
CBR at 0.1 in. 1.1	CBR at 0.2 in. 1.2	CBR at 0.1 in. 1.1	CBR at 0.2 in. 1.2



CBR Sample Preparation:

The replacement method was used and compacted in a 6" CBR mold in accordance with ASTM D1883, Section 6.1.1

Before Soaking		*After Soaking*	
Compactive Effort (Blows per Layer)	35		
Initial Dry Density (PCF)	97.0	Final Dry Density (PCF)	93.2
Moisture Content of the Compacted Specimen	16.9%	Moisture Content (top 1" after soaking)	30.8%
Percent Compaction	92.4%	Percent Swell	4.1%

Soak Time:	96 hours	Surcharge Weight	10.0	Surcharge Wt. per sq. Ft.	50.8
Liquid Limit	38	Plastic Index	17	Apparent Relative Density	TNP

Notes/Deviations/References:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/27/2018 — *Date*

This report shall not be reproduced, except in full without the written approval of S&ME, Inc.

Form No. TR-D1883-T193-3
Revision No. 2
Revision Date: 08/11/17

CBR (CALIFORNIA BEARING RATIO) OF LABORATORY COMPACTED SOIL

ASTM D 1883

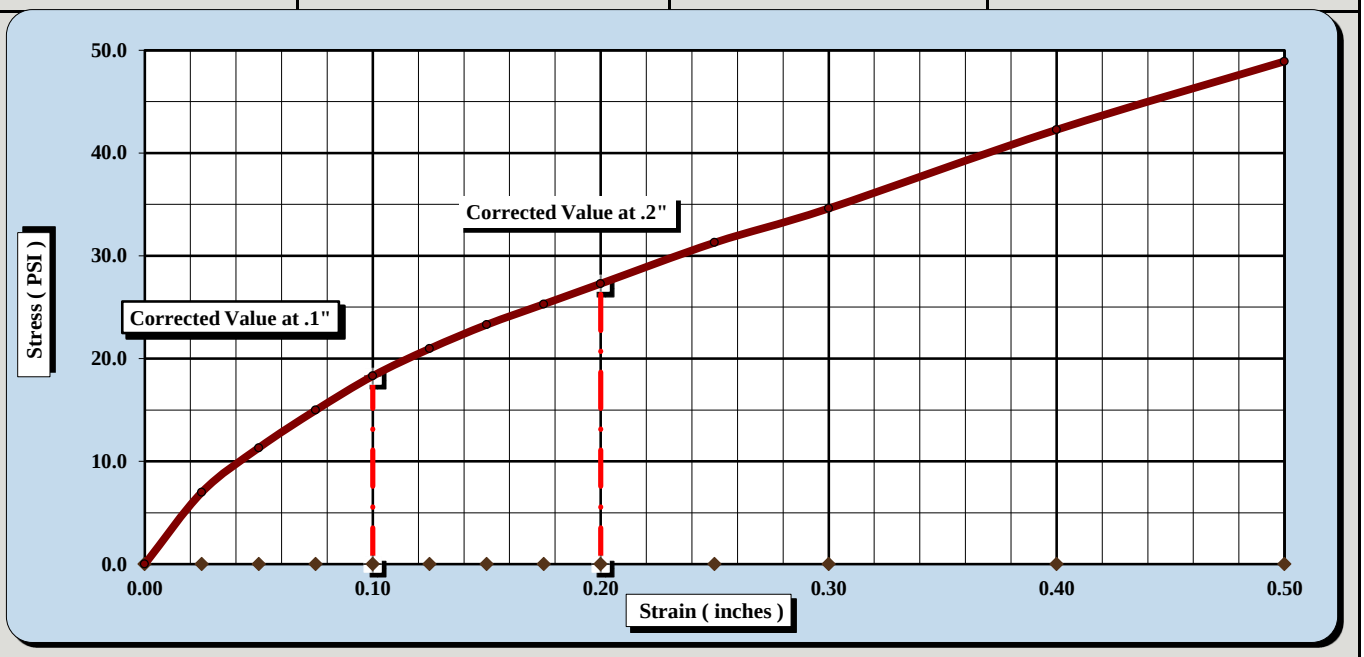
S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	2/13/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	2/8-2/12/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-65	Sample #: BS-1	Sample Date: 1/24/2018
Location:	Pavement Boring	Offset: N/A	Depth: 0.8' - 10.8'
Sample Description:	Sandy Lean Clay (CL, A-7-6(6))		

ASTM D 698 *Method C* Maximum Dry Density: 105.0 PCF Optimum Moisture Content: 19.1%

Compaction Test performed on grading complying with CBR spec. % Retained on the 3/4" sieve: 0.0%

Uncorrected CBR Values				Corrected CBR Values			
CBR at 0.1 in.	1.8	CBR at 0.2 in.	1.8	CBR at 0.1 in.	1.8	CBR at 0.2 in.	1.8



CBR Sample Preparation:

The replacement method was used and compacted in a 6" CBR mold in accordance with ASTM D1883, Section 6.1.1

Before Soaking		*After Soaking*	
Compactive Effort (Blows per Layer)	65		
Initial Dry Density (PCF)	100.6	Final Dry Density (PCF)	95.6
Moisture Content of the Compacted Specimen	17.0%	Moisture Content (top 1" after soaking)	30.4%
Percent Compaction	95.8%	Percent Swell	5.2%

Soak Time:	96 hours	Surcharge Weight	10.0	Surcharge Wt. per sq. Ft.	50.9
Liquid Limit	38	Plastic Index	17	Apparent Relative Density	TNP

Notes/Deviations/References:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/27/2018 — *Date*

This report shall not be reproduced, except in full without the written approval of S&ME, Inc.

Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

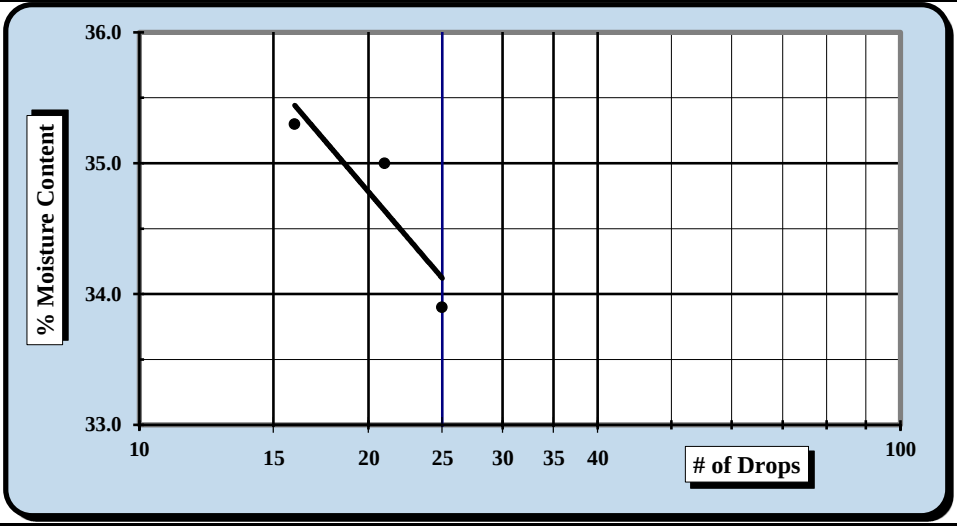
S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	4/25/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	2/22-2/23/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	P-67	Sample #: BS-1	Sample Date: 1/31/2018
Location:	Pavement Boring	Offset: N/A	Depth: 0.6' - 10.6'
Sample Description:	Clayey Sand (SC, A-6(2))		

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	15425	8/30/2017	Flat Grooving tool	28575	11/10/2017
LL Apparatus	28562	5/12/2017			
Oven	25722	8/18/2017	No. 40 Sieve	21775	1/8/2018

Pan #	d-1	Liquid Limit						Plastic Limit		
	Tare #:	10	226	212				24	209	
A	Tare Weight	20.78	20.92	20.85				20.77	21.08	
B	Wet Soil Weight + A	28.68	28.05	27.52				27.09	28.51	
C	Dry Soil Weight + A	26.68	26.20	25.78				26.24	27.53	
D	Water Weight (B-C)	2.00	1.85	1.74				0.85	0.98	
E	Dry Soil Weight (C-A)	5.90	5.28	4.93				5.47	6.45	
F	% Moisture (D/E)*100	33.9%	35.0%	35.3%				15.5%	15.2%	
N	# OF DROPS	25	21	16				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**15.4%**		



One Point Liquid Limit

N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**34**
Plastic Limit	**15**
Plastic Index	**19**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group Symbol for minus No. 40 sieve potion only.

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Matthew Wolfe	NICET 123218	Matthew F. Cooke, P.G.	4/27/2018
Technician Name	*Certification*	*Technical Responsibility*	*Date*

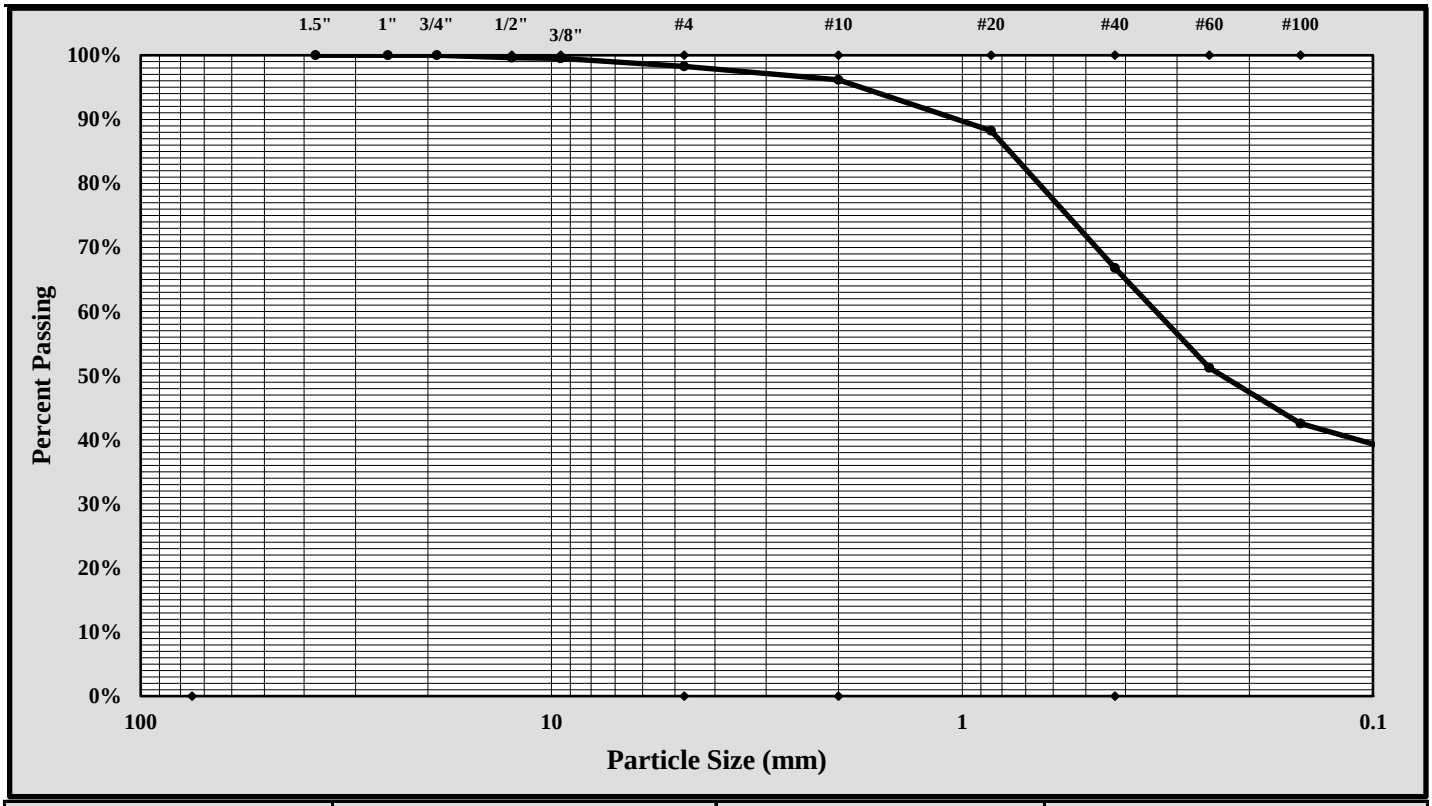
This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Columbia Office, 134 Suber Road Columbia SC 29210

S&ME Project #:	1461-16-047.2B	Report Date:	4/25/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	2/20-3/1/2018
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-67 Sample #: BS-1	Sample Date:	1/24/2018
Location:	Pavement Boring Offset: N/A	Depth:	0.6' - 10.6'
Sample Description:	Clayey Sand (SC, A-6(2))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	1/2-inch	Gravel:	1.7%
Silt & Clay (% Passing #200):	37.1%	Total Sand:	61.2%

Liquid Limit	34	Plastic Limit	15	Plastic Index	19
Coarse Sand:	2.1%	Medium Sand:	29.4%	Fine Sand:	29.7%

Description of Sand and Gravel	Rounded ☐	Angular ☒	Hard & Durable ☒	Soft ☐	Weathered & Friable ☒		

References / Comments / Deviations:

Matthew F. Cooke, P.G.	Project Manager	4/27/2018
Technical Responsibility	*Position*	*Date*

This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Form No. TR-D698-2
Revision No. : 1
Revision Date: 07/25/17

MOISTURE - DENSITY REPORT

Quality Assurance

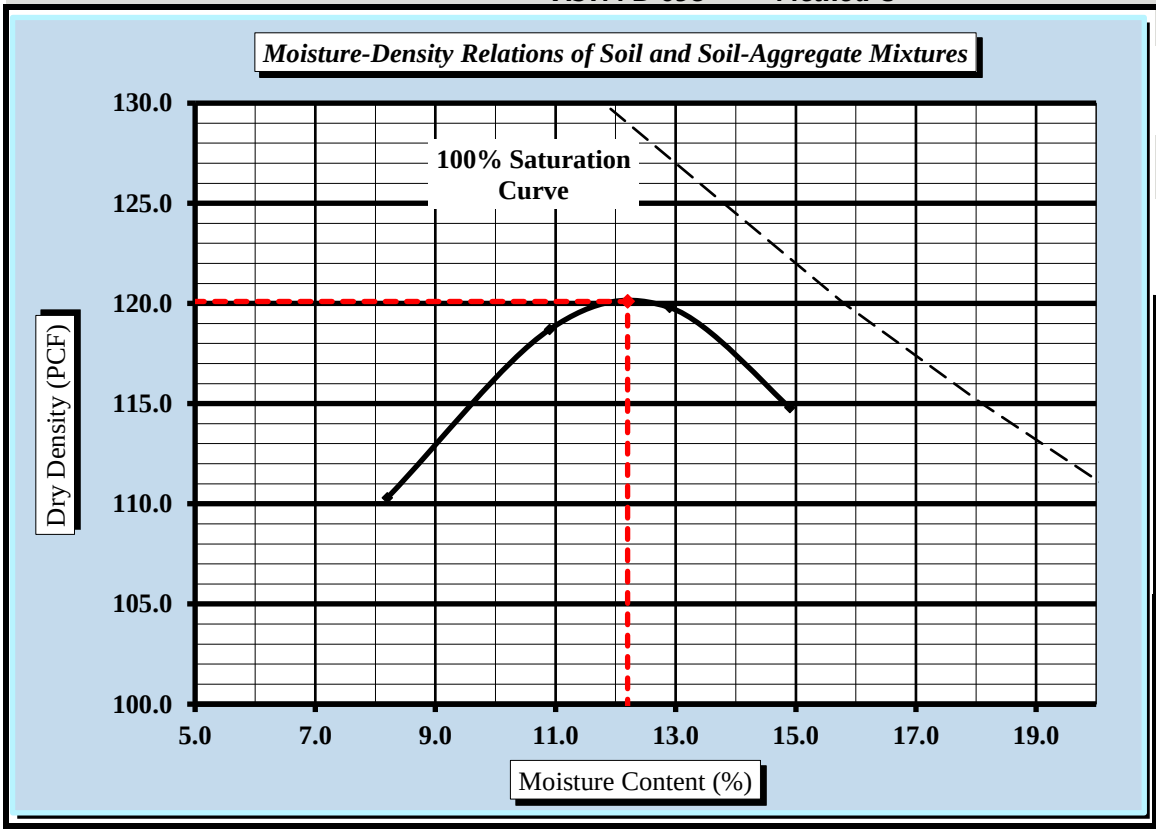
S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

S&ME Project #:	1461-16-047.2B	Report Date:	4/25/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	2/22-3/2/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	P-67	Sample #:	BS-1	Sample Date:	1/24/2018
Location:	Pavement Boring	Offset:	N/A	Depth:	0.6' - 10.6'
Sample Description:	Clayey Sand (SC, A-6(2))				

Maximum Dry Density 120.1 PCF. Optimum Moisture Content 12.2%

ASTM D 698 - - Method C



Soil Properties

Natural Moisture Content	13.1%
Specific Gravity of Soil	TNP
Liquid Limit	34
Plastic Limit	15
Plastic Index	19

% Passing	
3/4"	100.0%
3/8"	99.5%
#4	98.3%
#10	96.2%
#40	66.8%
#60	51.2%
#200	37.1%

Oversize Fraction	
Bulk Gravity	
% Moisture	
% Oversize	0.0%
MDD	
Opt. MC	

Moisture-Density Curve Displayed: Fine Fraction ☒ Corrected for Oversize Fraction (ASTM D 4718) ☐

Sieve Size used to separate the Oversize Fraction: #4 Sieve ☐ 3/8 inch Sieve ☐ 3/4 inch Sieve ☒

Mechanical Rammer ☐ Manual Rammer ☒ Moist Preparation ☐ Dry Preparation ☒

References / Comments / Deviations:

ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass

ASTM D 698: Laboratory Compaction Characteristics of Soil Using Standard Effort

Matthew F. Cooke, P.G.	Project Manager	4/27/2018
Technical Responsibility	*Position*	*Date*

This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Form No. TR-D1883-T193-3
Revision No. 2
Revision Date: 08/11/17

CBR (CALIFORNIA BEARING RATIO) OF LABORATORY COMPACTED SOIL

ASTM D 1883

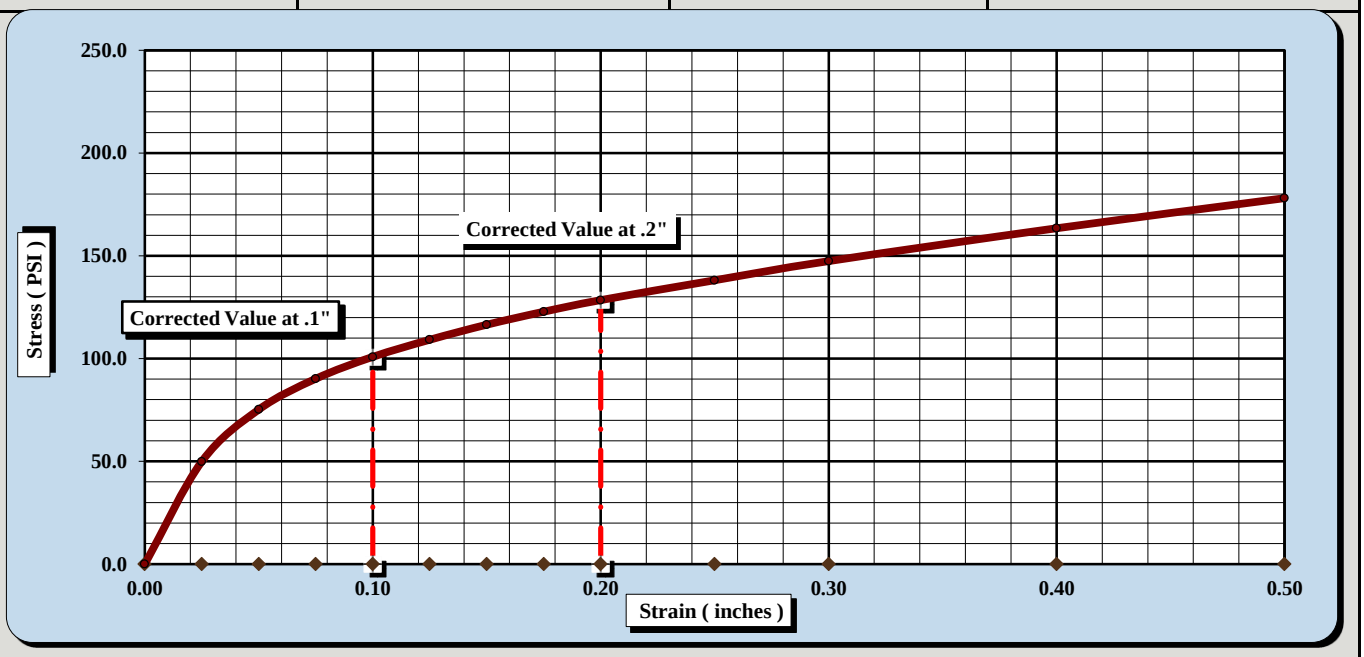
S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	4/25/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	3/9-3/13/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-67	Sample #: BS-1	Sample Date: 1/24/2018
Location:	Pavement Boring	Offset: N/A	Depth: 0.6' - 10.6'
Sample Description:	Clayey Sand (SC, A-6(2))		

ASTM D 698 *Method C* Maximum Dry Density: 120.1 PCF Optimum Moisture Content: 12.2%

Compaction Test performed on grading complying with CBR spec. % Retained on the 3/4" sieve: 0.0%

Uncorrected CBR Values		Corrected CBR Values	
CBR at 0.1 in. 10.1	CBR at 0.2 in. 8.6	CBR at 0.1 in. 10.1	CBR at 0.2 in. 8.6



CBR Sample Preparation:

The replacement method was used and compacted in a 6" CBR mold in accordance with ASTM D1883, Section 6.1.1

Before Soaking		*After Soaking*	
Compactive Effort (Blows per Layer)	25		
Initial Dry Density (PCF)	111.7	Final Dry Density (PCF)	111.7
Moisture Content of the Compacted Specimen	11.6%	Moisture Content (top 1" after soaking)	14.8%
Percent Compaction	93.0%	Percent Swell	0.0%

Soak Time:	96 hours	Surcharge Weight	10.0	Surcharge Wt. per sq. Ft.	50.8
Liquid Limit	34	Plastic Index	19	Apparent Relative Density	TNP

Notes/Deviations/References: Liquid Limit: ASTM D 4318, Classification: ASTM D 2487

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/27/2018 — *Date*

This report shall not be reproduced, except in full without the written approval of S&ME, Inc.

Form No. TR-D1883-T193-3
Revision No. 2
Revision Date: 08/11/17

CBR (CALIFORNIA BEARING RATIO) OF LABORATORY COMPACTED SOIL

ASTM D 1883

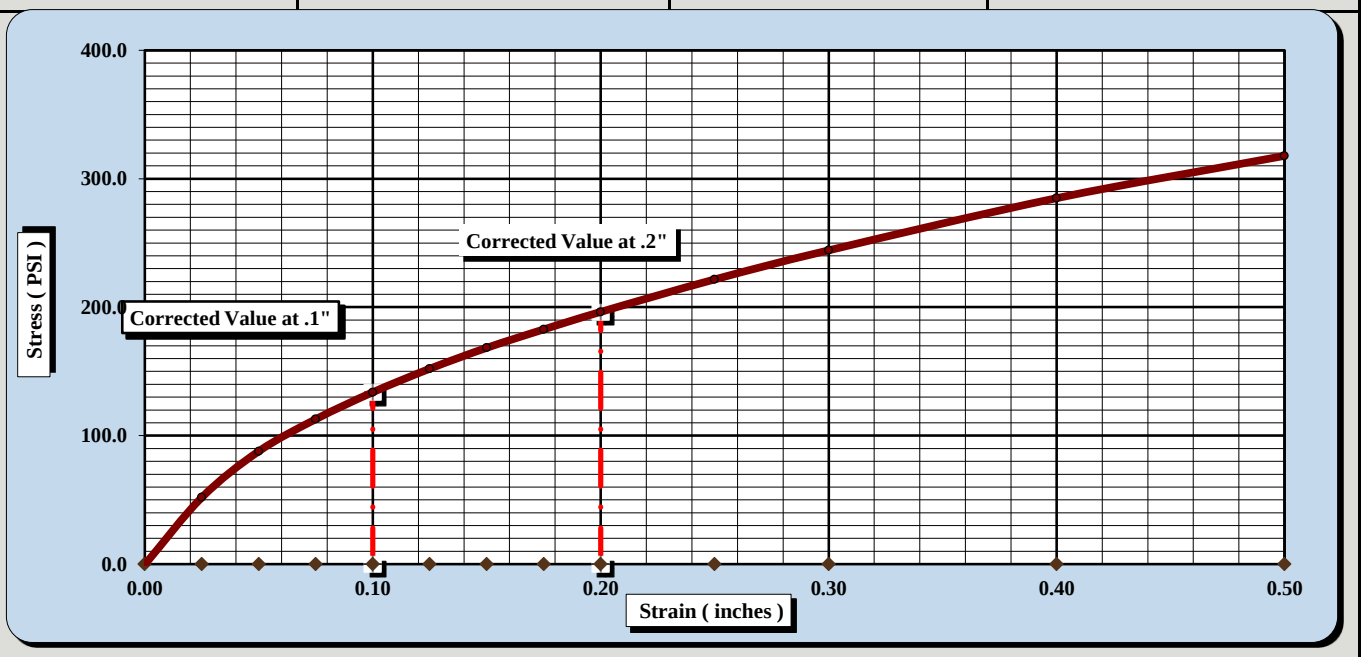
S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	4/25/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	3/9-3/13/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-67	Sample #: BS-1	Sample Date: 1/24/2018
Location:	Pavement Boring	Offset: N/A	Depth: 0.6' - 10.6'
Sample Description:	Clayey Sand (SC, A-6(2))		

ASTM D 698 *Method C* Maximum Dry Density: 120.1 PCF Optimum Moisture Content: 12.2%

Compaction Test performed on grading complying with CBR spec. % Retained on the 3/4" sieve: 0.0%

Uncorrected CBR Values		Corrected CBR Values	
CBR at 0.1 in. 13.4	CBR at 0.2 in. 13.1	CBR at 0.1 in. 13.4	CBR at 0.2 in. 13.1



CBR Sample Preparation:

The replacement method was used and compacted in a 6" CBR mold in accordance with ASTM D1883, Section 6.1.1

Before Soaking		*After Soaking*	
Compactive Effort (Blows per Layer)	35		
Initial Dry Density (PCF)	117.1	Final Dry Density (PCF)	117.1
Moisture Content of the Compacted Specimen	11.9%	Moisture Content (top 1" after soaking)	14.4%
Percent Compaction	97.5%	Percent Swell	0.0%

Soak Time:	96 hours	Surcharge Weight	10.0	Surcharge Wt. per sq. Ft.	50.9
Liquid Limit	34	Plastic Index	19	Apparent Relative Density	TNP

Notes/Deviations/References: Liquid Limit: ASTM D 4318, Classification: ASTM D 2487

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/27/2018 — *Date*

This report shall not be reproduced, except in full without the written approval of S&ME, Inc.

Form No. TR-D1883-T193-3
Revision No. 2
Revision Date: 08/11/17

CBR (CALIFORNIA BEARING RATIO) OF LABORATORY COMPACTED SOIL

ASTM D 1883

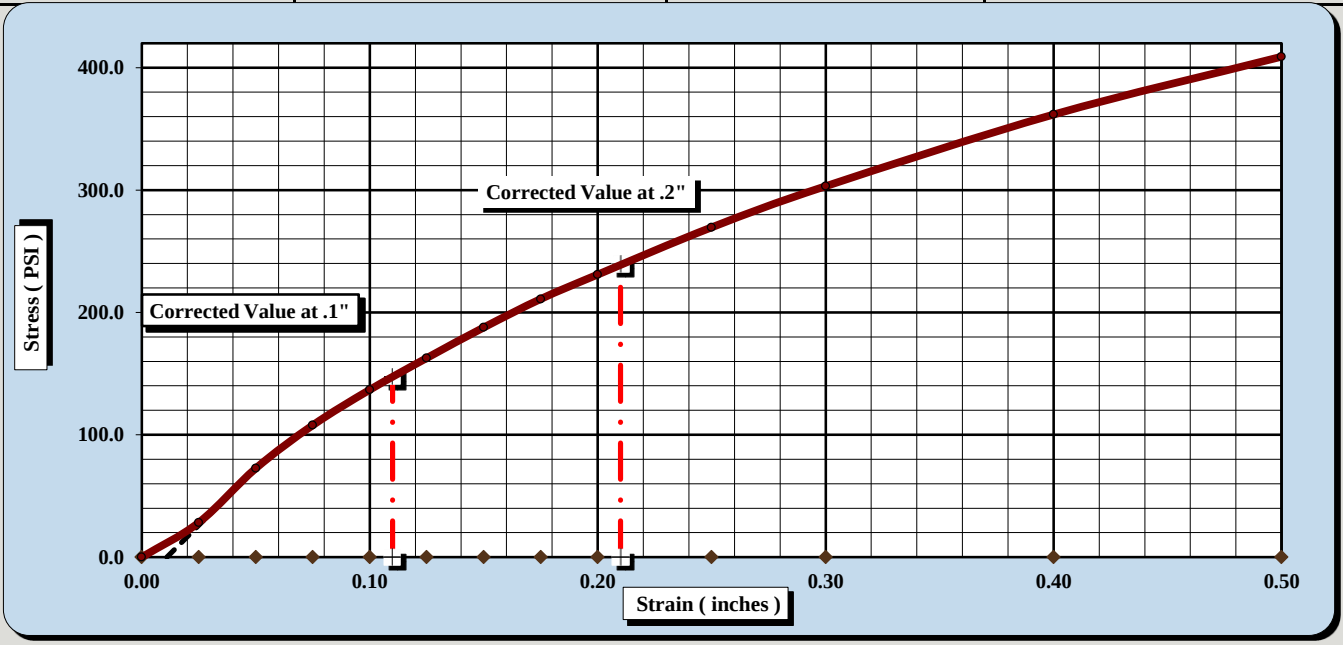
S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	4/25/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	3/9-3/13/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-67	Sample #: BS-1	Sample Date: 1/24/2018
Location:	Pavement Boring	Offset: N/A	Depth: 0.6' - 10.6'
Sample Description:	Clayey Sand (SC, A-6(2))		

ASTM D 698 *Method C* Maximum Dry Density: 120.1 PCF Optimum Moisture Content: 12.2%

Compaction Test performed on grading complying with CBR spec. % Retained on the 3/4" sieve: 0.0%

Uncorrected CBR Values		Corrected CBR Values	
CBR at 0.1 in. 13.7	CBR at 0.2 in. 15.4	CBR at 0.1 in. 14.8	CBR at 0.2 in. 16.0



CBR Sample Preparation:

The replacement method was used and compacted in a 6" CBR mold in accordance with ASTM D1883, Section 6.1.1

Before Soaking		*After Soaking*	
Compactive Effort (Blows per Layer)	56		
Initial Dry Density (PCF)	120.1	Final Dry Density (PCF)	120.1
Moisture Content of the Compacted Specimen	11.8%	Moisture Content (top 1" after soaking)	13.1%
Percent Compaction	100.0%	Percent Swell	0.0%

Soak Time:	96 hours	Surcharge Weight	10.0	Surcharge Wt. per sq. Ft.	50.9
Liquid Limit	34	Plastic Index	19	Apparent Relative Density	TNP

Notes/Deviations/References: Liquid Limit: ASTM D 4318, Classification: ASTM D 2487

Matthew F. Cooke, P.G.	Project Manager	4/27/2018
Technical Responsibility	*Position*	*Date*

This report shall not be reproduced, except in full without the written approval of S&ME, Inc.

APPENDIX

SECTION 5 ROCK CORE PHOTOS

FME 2025 INVESTIGATION

CCR Ph. 3D

CORE PHOTOGRAPHS: B-1

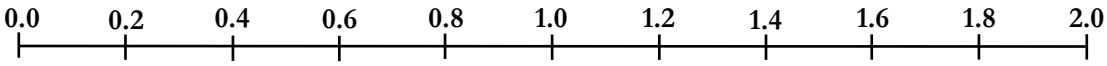
Begin Run 1
16.7-ft.

Begin Run 2
21.7-ft.

Begin Run 3
26.7-ft.



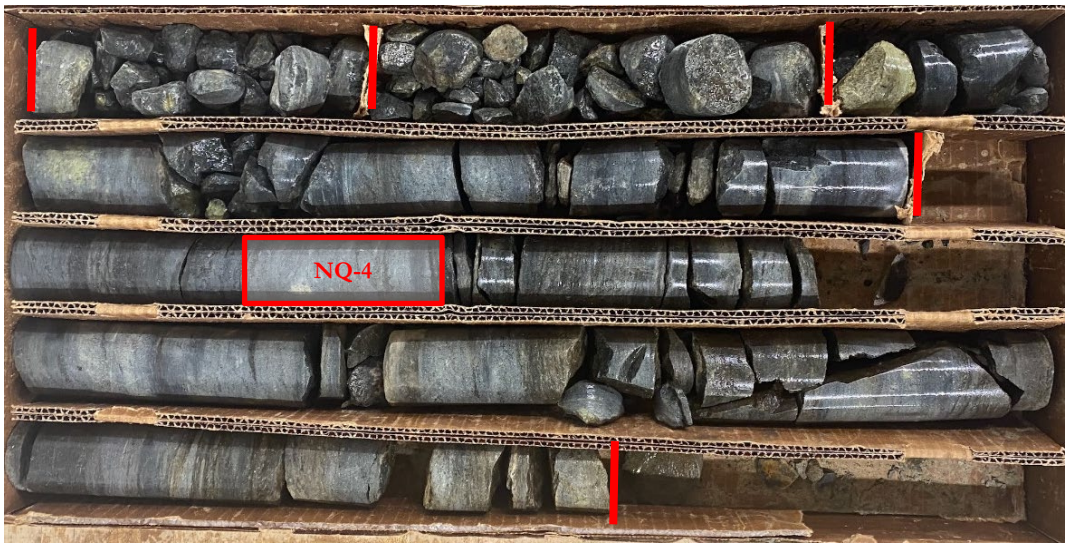
End Run 3
31.7-ft.



SCALE (FEET)

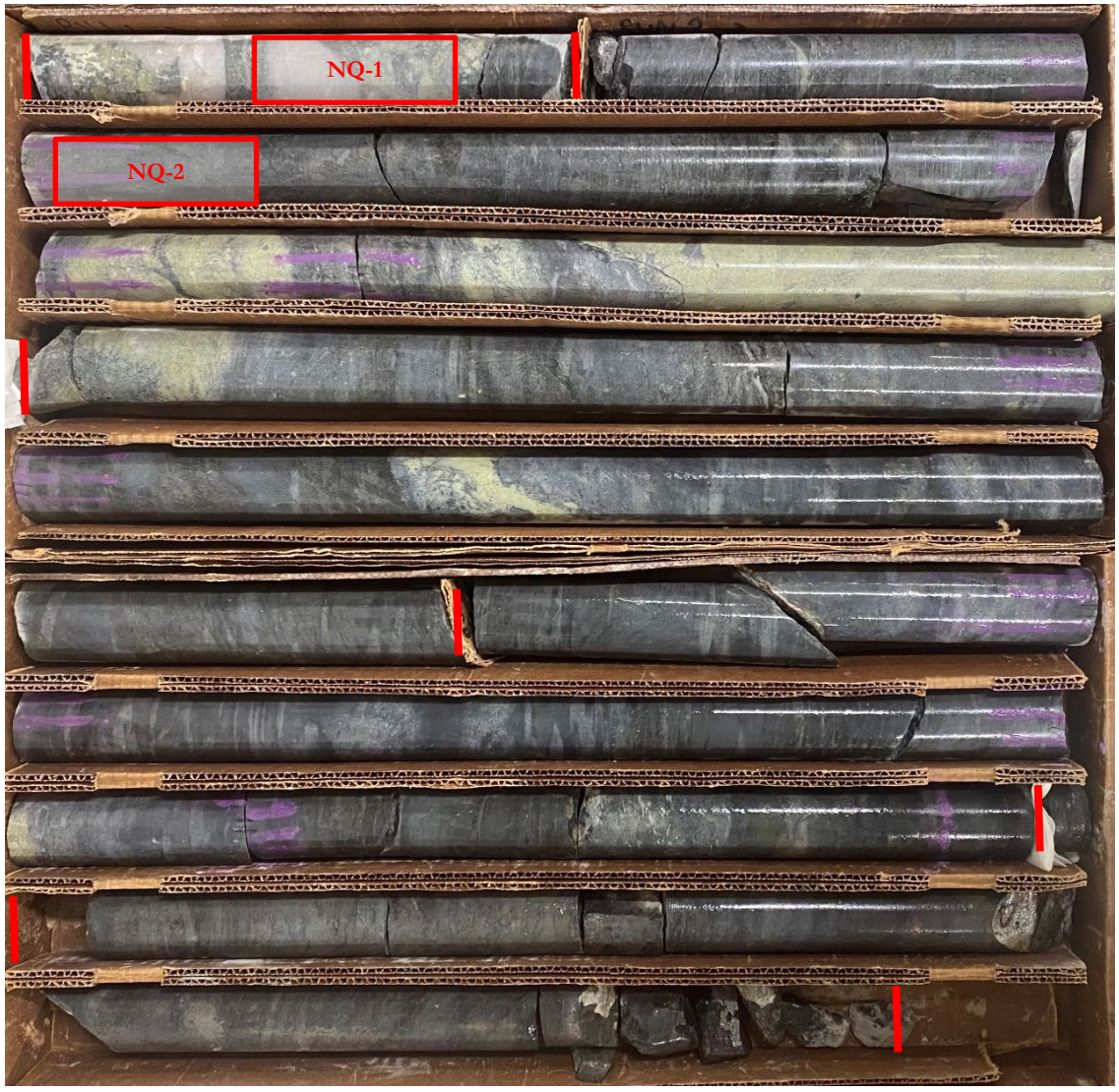
CCR Ph3D

CORE PHOTOGRAPHS: B-2



CCR Ph3D

CORE PHOTOGRAPHS: B-3



Begin Run 1
44.8-ft.

Begin Run 2
45.8-ft.

Begin Run 3
50.8-ft.

Begin Run 4
55.8-ft.

Begin Run 5
60.8-ft.

End Run 5
64.8-ft.

0.0 0.2 0.4 0.6 0.8 1.0 1.2 1.4 1.6 1.8 2.0

SCALE (FEET)

CCR Ph3D

CORE PHOTOGRAPHS: B-4



Begin Run 1
25.3-ft.

Begin Run 2
26.3-ft.

Begin Run 3
31.3-ft.

Begin Run 4
36.3-ft.

Begin Run 5
41.3-ft.

Begin Run 6
46.3-ft.

Begin Run 7
51.3-ft.

Begin Run 8
56.3-ft.

End Run 8
56.3-ft.

0.0 0.2 0.4 0.6 0.8 1.0 1.2 1.4 1.6 1.8 2.0

SCALE (FEET)

CCR Ph3D

CORE PHOTOGRAPHS: B-5



Begin Run 1
16.1-ft.

Begin Run 2
21.1-ft.

Begin Run 3
26.1-ft.

Begin Run 4
31.1-ft.

Begin Run 5
36.1-ft.

Begin Run 6
41.1-ft.

Begin Run 7
46.1-ft.

Begin Run 8
51.1-ft.

Begin Run 9
56.1-ft.

End Run 10
66.1-ft.

Begin Run 10
61.1-ft.

0.0 0.2 0.4 0.6 0.8 1.0 1.2 1.4 1.6 1.8 2.0

SCALE (FEET)

CCR Ph3D

CORE PHOTOGRAPHS: B-6

Begin Run 1
31.2-ft.

Begin Run 2
32.2-ft.

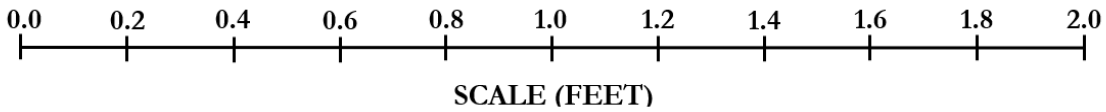
Begin Run 5
47.2-ft.



Begin Run 3
37.2-ft.

Begin Run 4
42.2-ft.

End Run 5
52.2-ft.



CCR Ph3D

CORE PHOTOGRAPHS: B-8

Begin Run 1
48.5-ft.

Begin Run 3
56.5-ft.

Begin Run 5
66.5-ft.

Begin Run 7
76.5-ft.

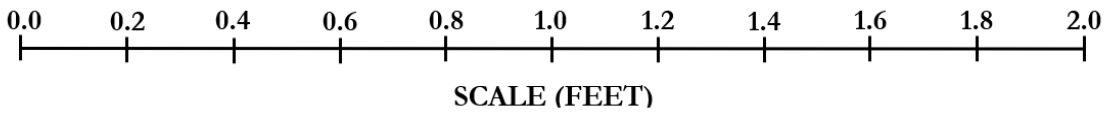


Begin Run 2
51.5-ft.

Begin Run 4
61.5-ft.

Begin Run 6
71.5-ft.

End Run 7
78.5-ft.



SCALE (FEET)

CCR Ph3D

CORE PHOTOGRAPHS: B-9

Begin Run 1
73.5-ft.

Begin Run 3
81.5-ft.

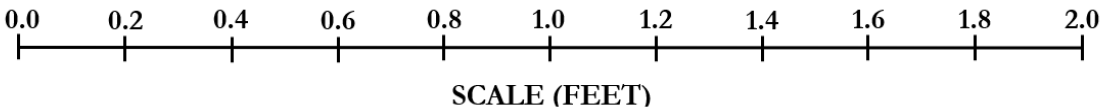
Begin Run 5
91.5-ft.



Begin Run 2
76.5-ft.

Begin Run 4
86.5-ft.

End Run 5
93.5-ft.



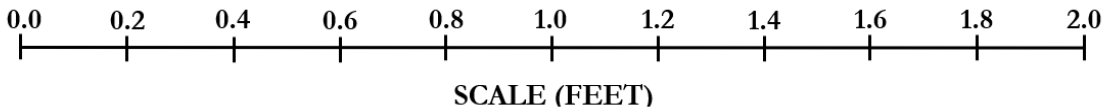
CCR Ph3D

CORE PHOTOGRAPHS: B-10

Begin Run 1
10.1-ft.



End Run 1
15.1-ft.



CCR Ph3D

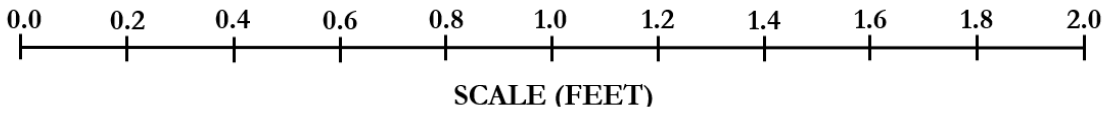
CORE PHOTOGRAPHS: B-11

Begin Run 1
41.5-ft.



Begin Run 2
46.5-ft.

End Run 2
51.5-ft.



SCALE (FEET)

CCR Ph3D

CORE PHOTOGRAPHS: B-12

Begin Run 1
32.1-ft.

Begin Run 2
37.1-ft.

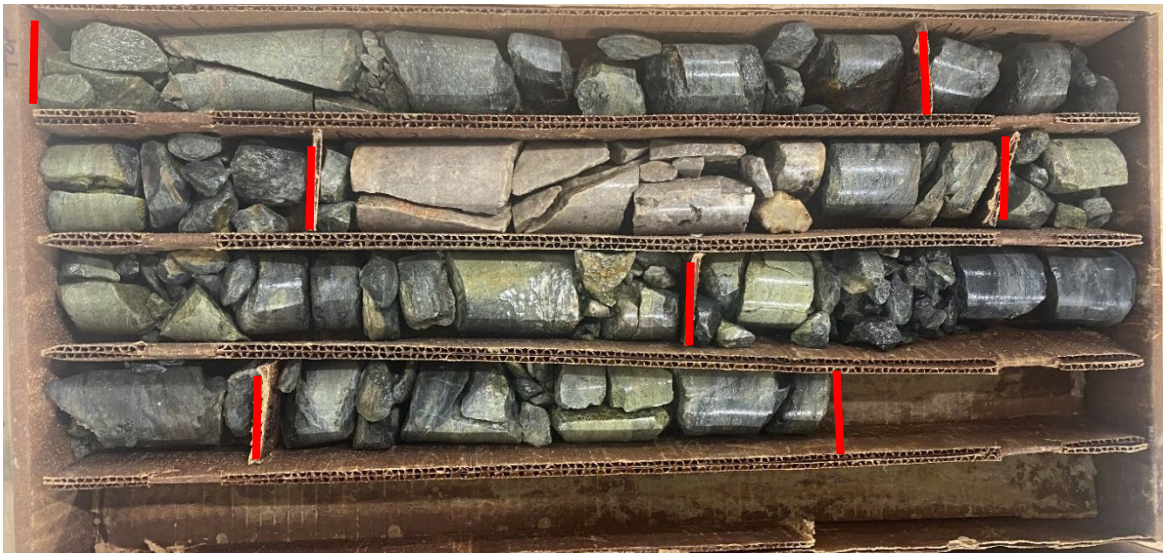
Begin Run 3
42.1-ft.

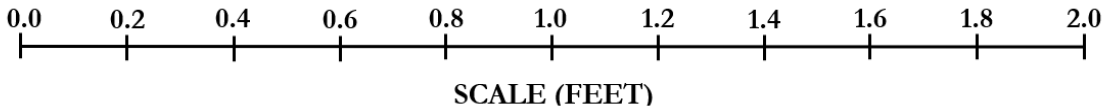
Begin Run 4
47.1-ft.

Begin Run 5
52.1-ft.

Begin Run 6
57.1-ft.

End Run 6
62.1-ft.





CCR Ph3D

CORE PHOTOGRAPHS: B-14

Begin Run 1
69.1-ft.



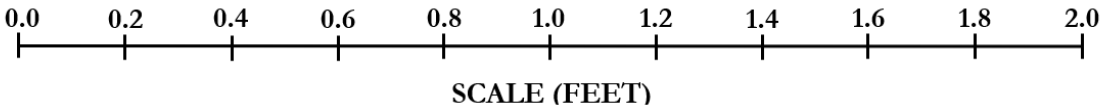
Begin Run 2
71.3-ft.

Begin Run 3
76.3-ft.

Begin Run 4
81.3-ft.

Begin Run 5
86.3-ft.

End Run 5
89.3-ft.



CCR Ph3D

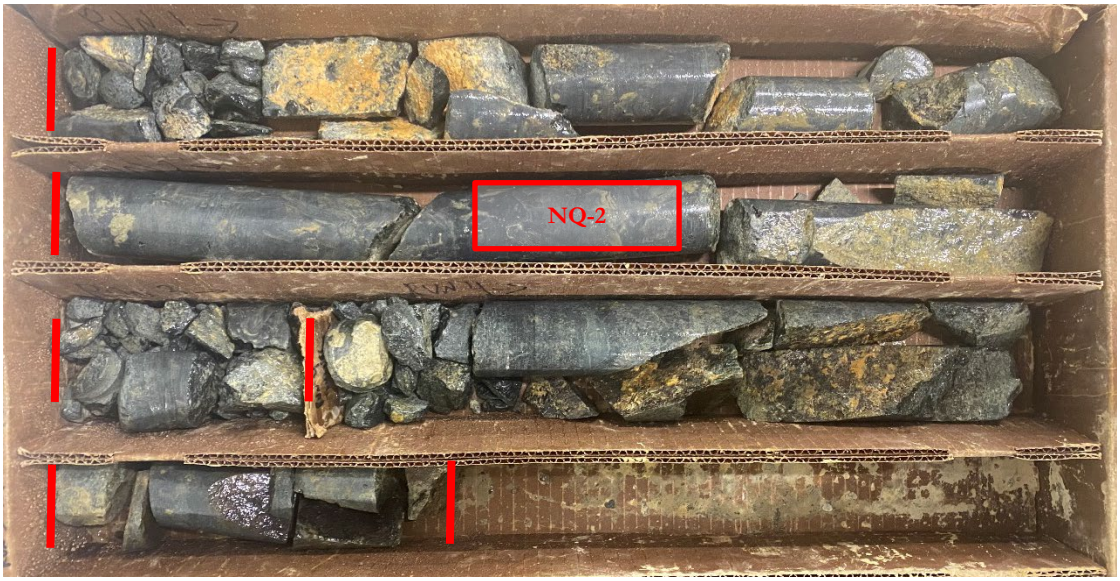
CORE PHOTOGRAPHS: B-16

Begin Run 1
32-ft.

Begin Run 2
36.5-ft.

Begin Run 3
41.5-ft.

Begin Run 5
51.5-ft.



Begin Run 4
46.5-ft.

End Run 5
56.5-ft.

0.0 0.2 0.4 0.6 0.8 1.0 1.2 1.4 1.6 1.8 2.0

SCALE (FEET)

CCR Ph3D

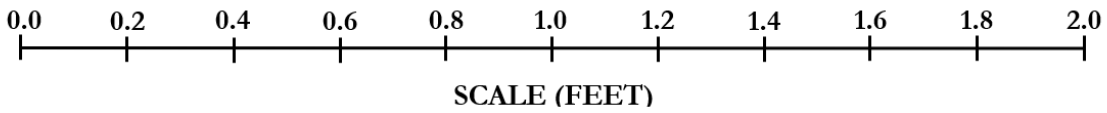
CORE PHOTOGRAPHS: B-17

Begin Run 1
31.0-ft.



Begin Run 2
36.0-ft.

End Run 2
41.0-ft.



SCALE (FEET)

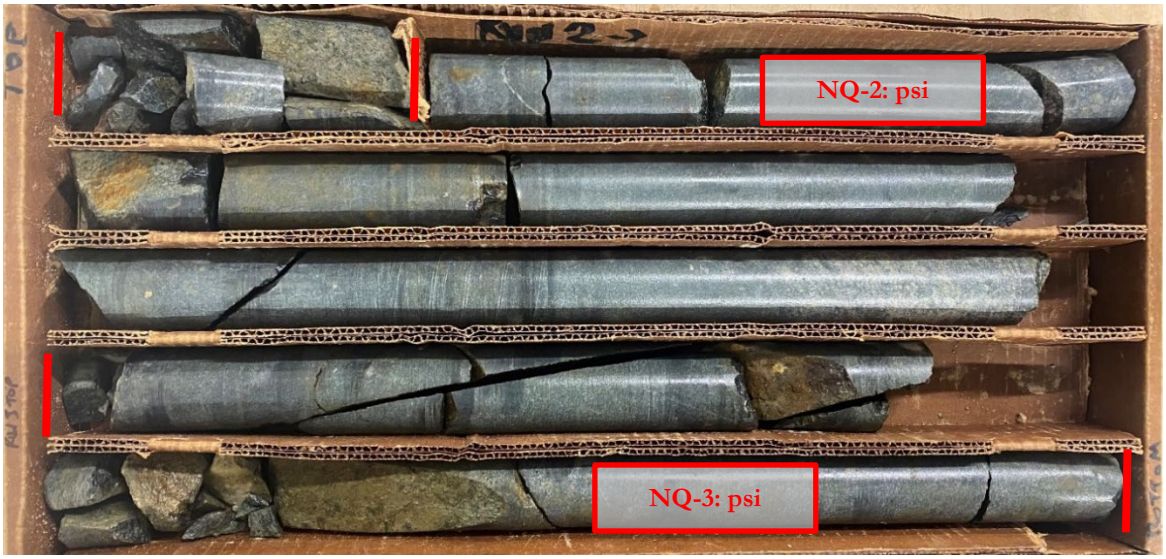
CCR Ph3D

CORE PHOTOGRAPHS: B-18

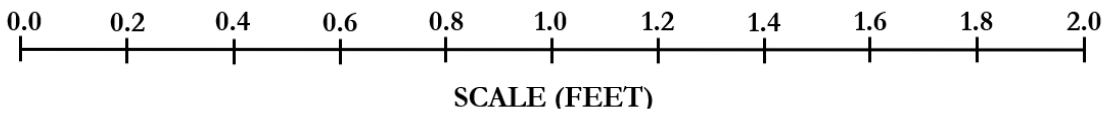
Begin Run 1
14.1-ft.

Begin Run 2
15.3-ft.

Begin Run 3
20.3-ft.



End Run 3
25.3-ft.



SCALE (FEET)

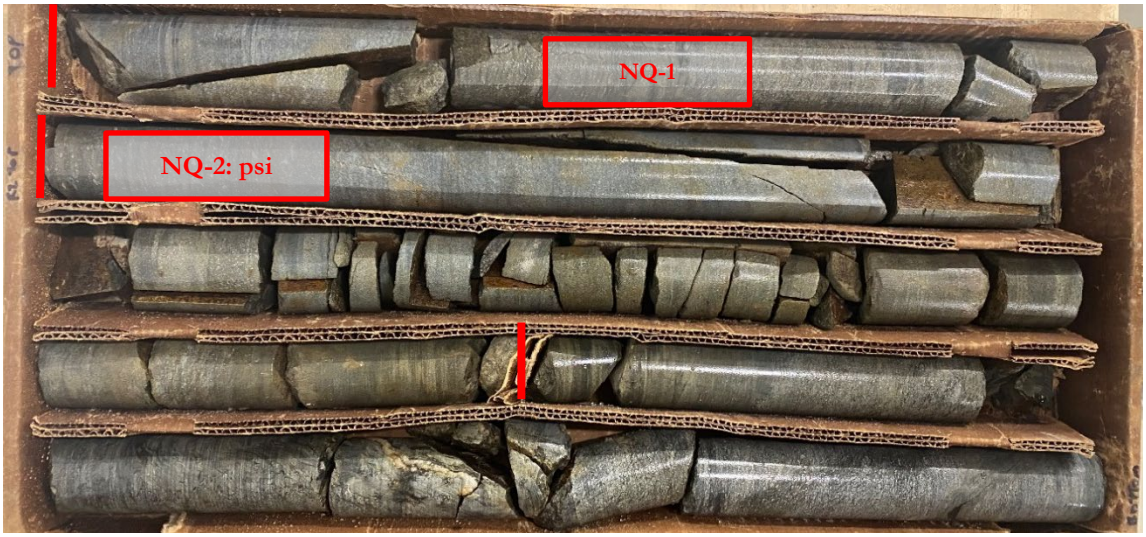
CCR Ph3D

CORE PHOTOGRAPHS: B-19

Begin Run 1
39.7-ft.

Begin Run 2
41.8-ft.

Begin Run 3
46.8-ft.

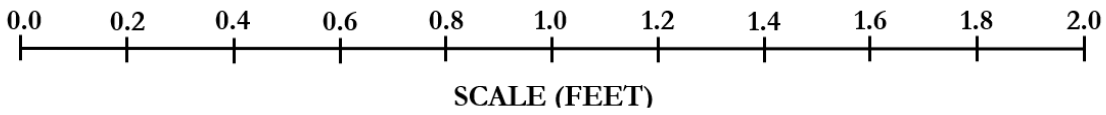


Begin Run 4
51.8-ft.

Begin Run 5
56.8-ft.



End Run 5
59.8-ft.



SCALE (FEET)

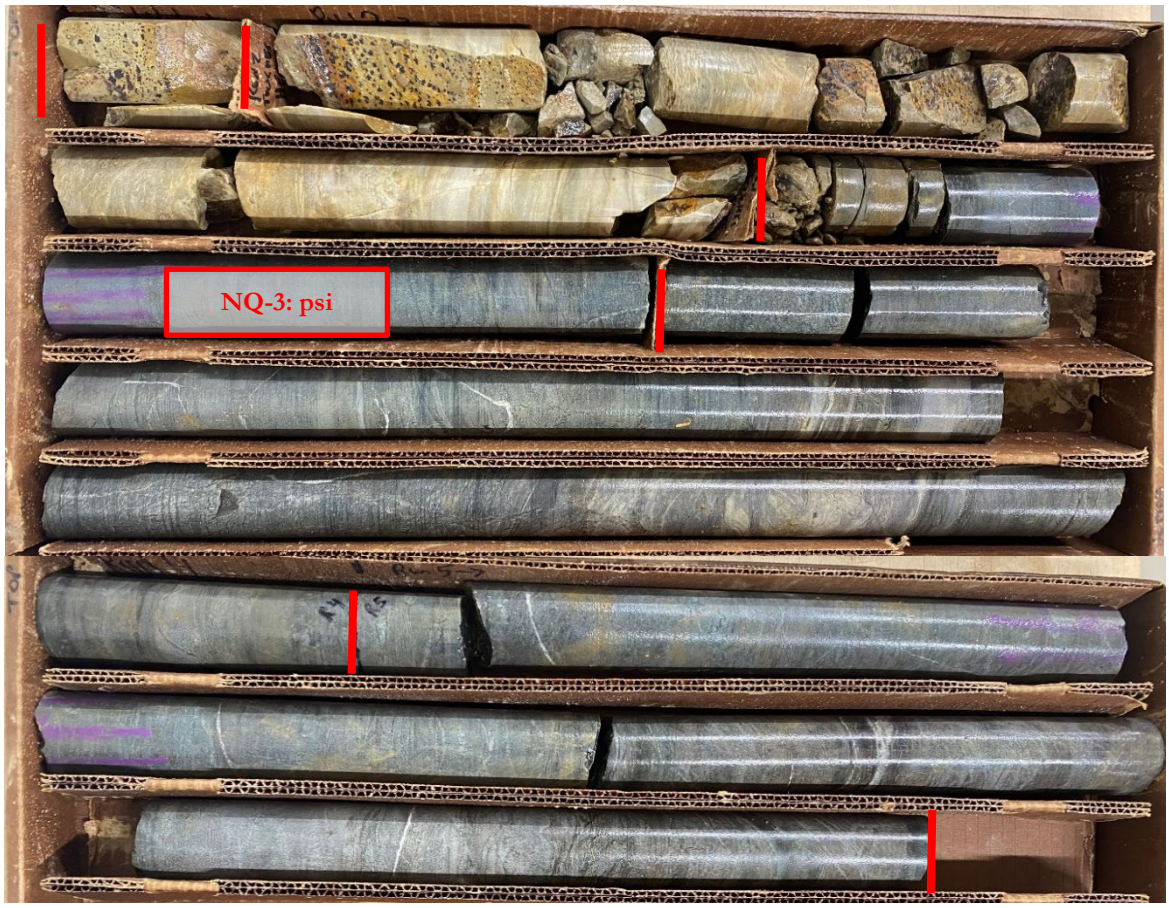
CCR Ph3D

CORE PHOTOGRAPHS: B-20



CCR Ph3D

CORE PHOTOGRAPHS: B-21



CCR Ph3D

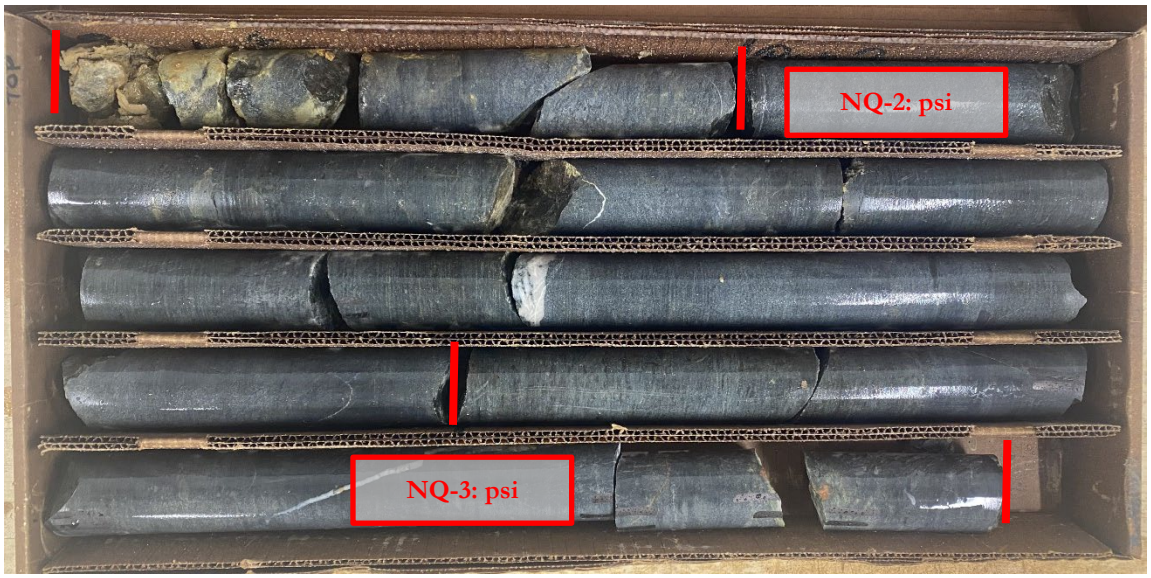
CORE PHOTOGRAPHS: B-22



CCR Ph3D

CORE PHOTOGRAPHS: B-23

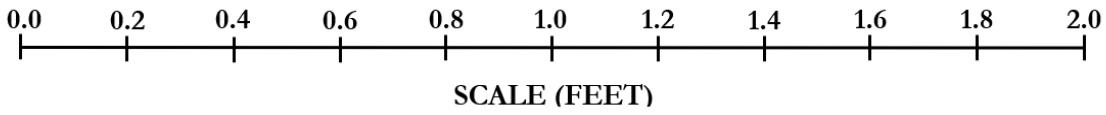
Begin Run 1
59.7-ft.



Begin Run 2
61.7-ft.

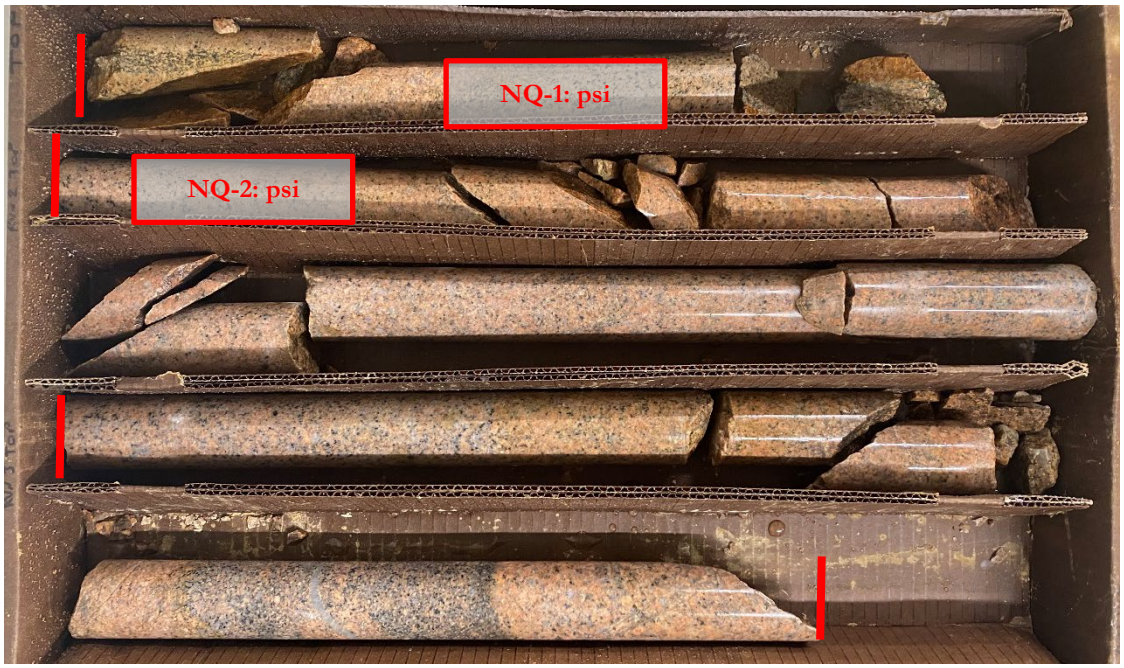
Begin Run 3
66.7-ft.

End Run 3
69.7-ft.



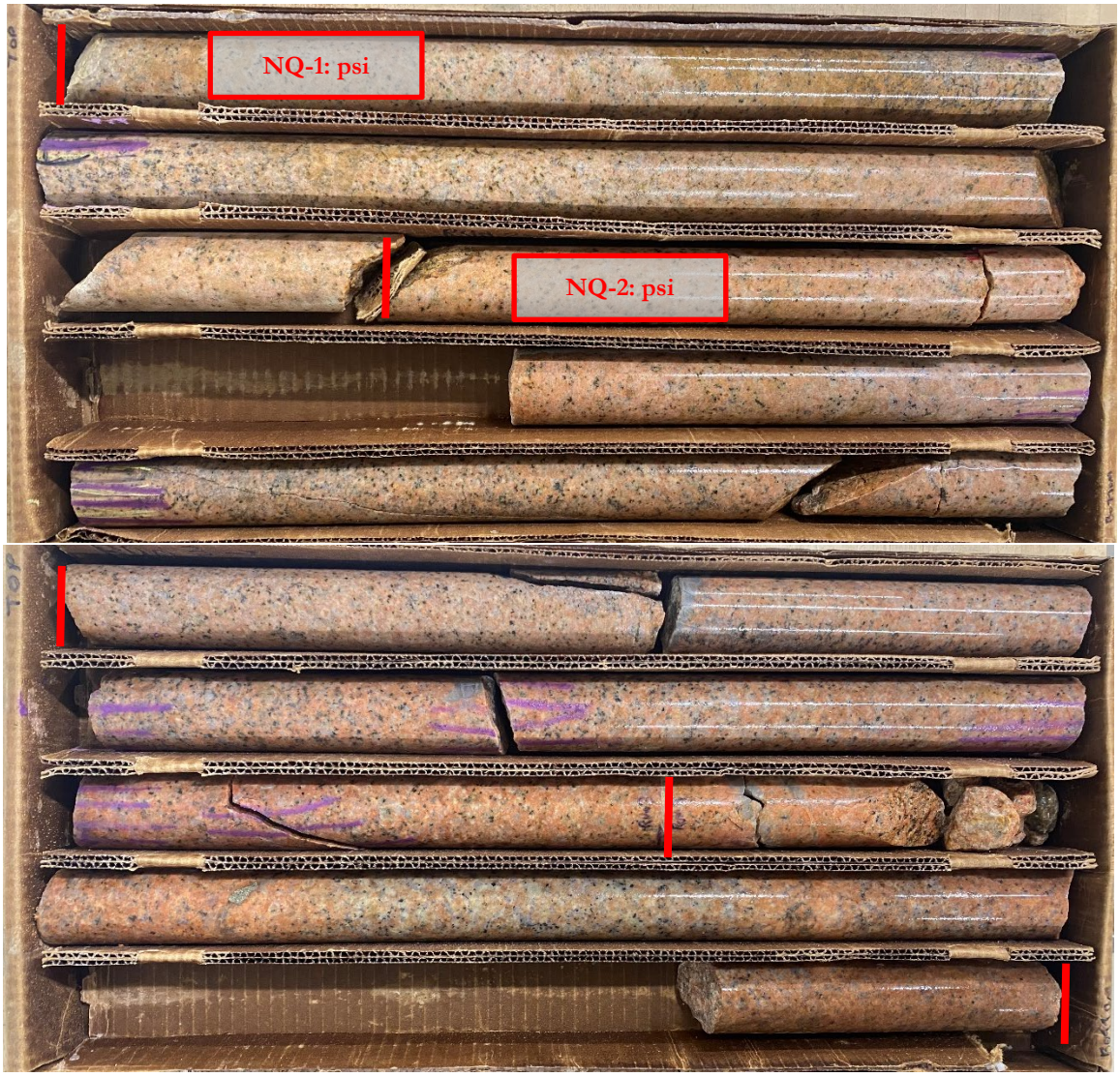
CCR Ph3D

CORE PHOTOGRAPHS: B-24



CCR Ph3D

CORE PHOTOGRAPHS: B-25



CCR Ph3D

CORE PHOTOGRAPHS: B-26



CCR Ph3D

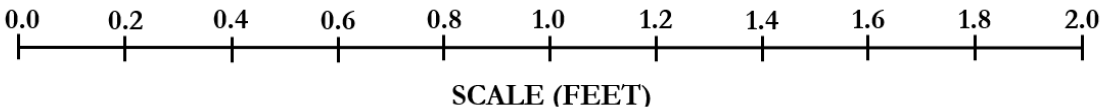
CORE PHOTOGRAPHS: B-26

Begin Run 5
71.7-ft.



Begin Run 6
76.7-ft.

End Run 6
81.7-ft.



CCR Ph3D

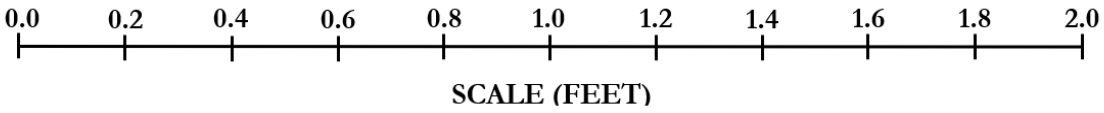
CORE PHOTOGRAPHS: B-27

Begin Run 1
42.9-ft.

Begin Run 2
47.3-ft.



End Run 2
52.3-ft.



FME & SME 2018 INVESTIGATION

I-20/26/126 CORRIDOR IMPROVEMENTS

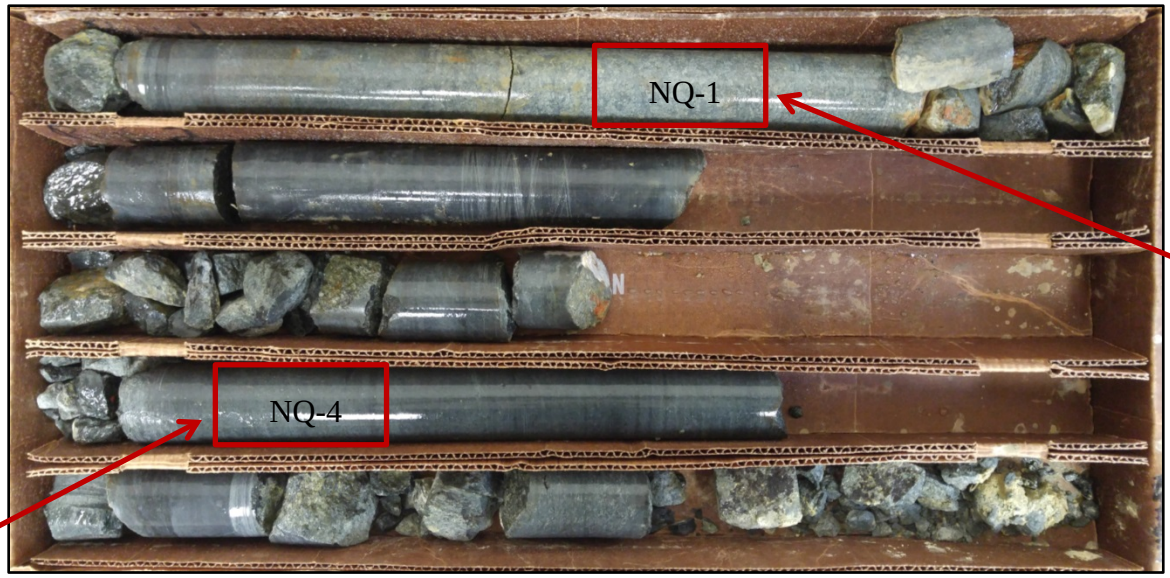
Boring DH-3A: I26RCA Alignment – Station 5383+53, 113 ft – R

Begin Run 1
(1.7-5.5 ft)

Begin Run 2
(13.9-15.8 ft)

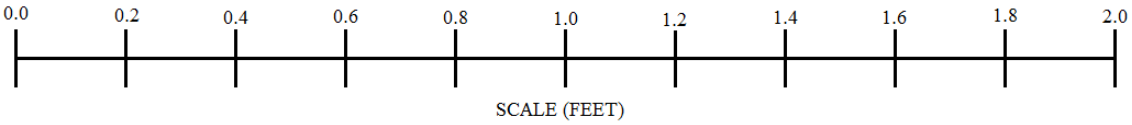
Begin Run 3
(15.8-20.8 ft)

Begin Run 4
(20.8-25.8 ft)



UC Strength
69510 psi

UC Strength
36670 psi





Soil (clay) was recovered in coring samples NQ-5 & NQ-6.

I-20/26/126 CORRIDOR IMPROVEMENTS

Boring DH-3A: I26RCA Alignment – Station 5383+53, 113 ft – R

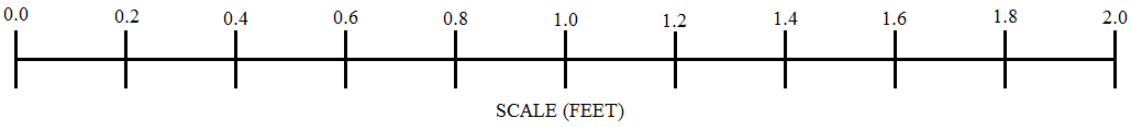
Begin Run 7
(64.5-66.3 ft)

Begin Run 8
(66.3-71.3 ft)

Begin Run 9
(71.3-76.3 ft)

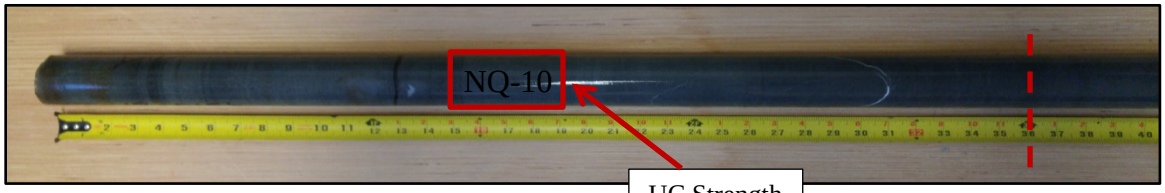


UC Strength
22610 psi



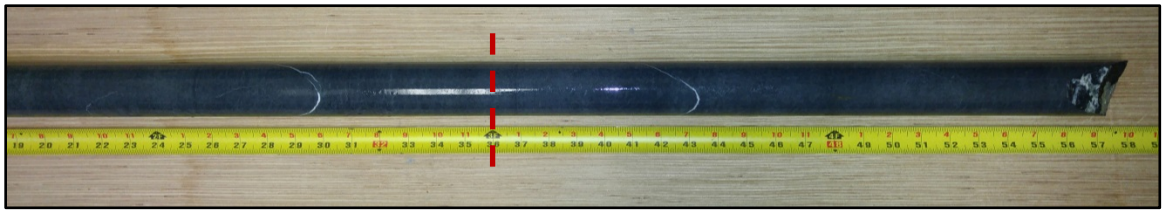
End Run 9 /
Begin Run 10
(76.3 ft)





NQ-9 & NQ-10 (Top of Core)

UC Strength
13710 psi



NQ-10 (Bottom of Core)

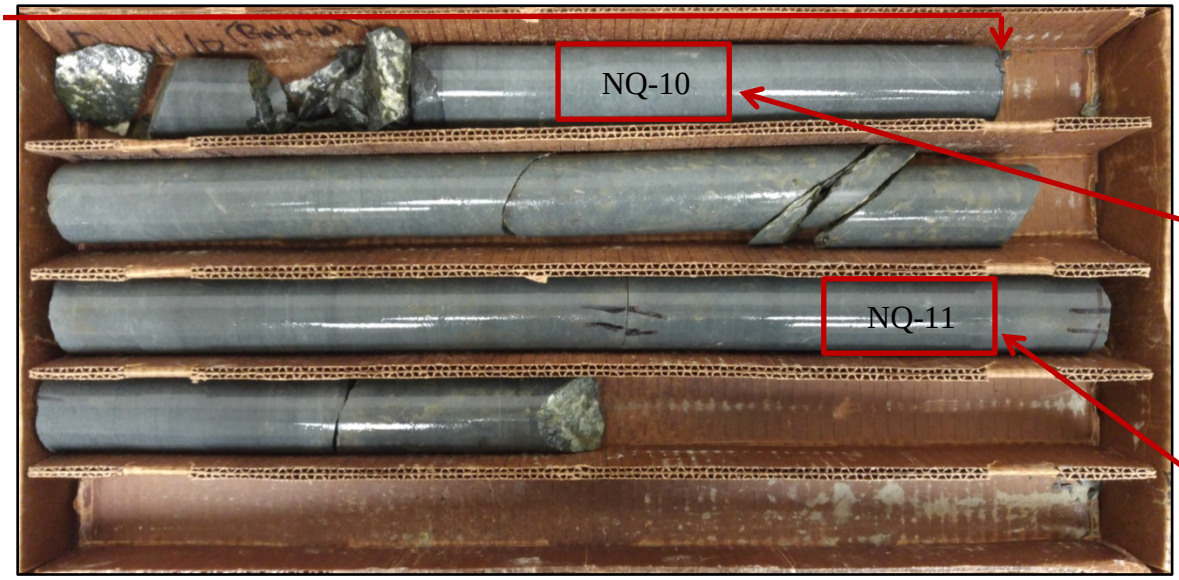
F&ME CONSULTANTS

I-20/26/126 CORRIDOR IMPROVEMENTS

Boring DH-3A: I26RCA Alignment – Station 5383+53, 113 ft – R

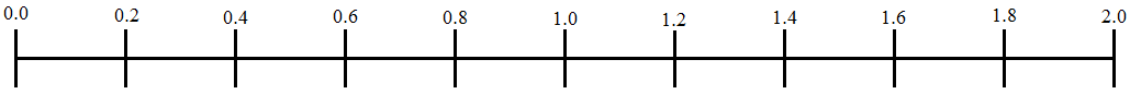
End Run 10
(81.3 ft)

Begin Run 11
(81.3-86.3 ft)



UC Strength
16760 psi

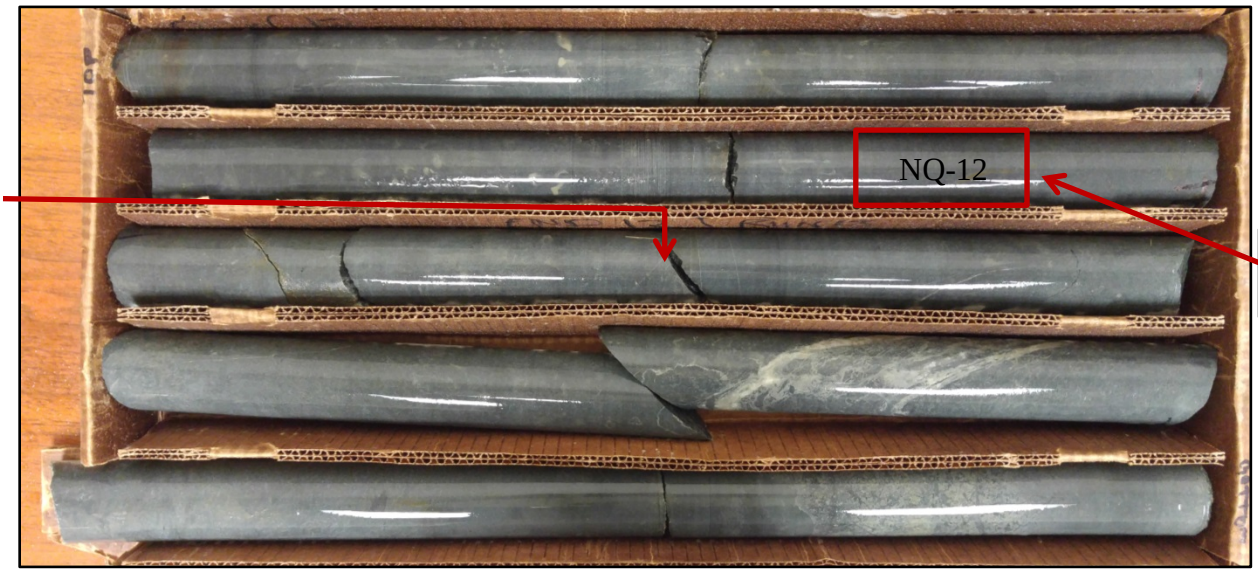
UC Strength
28600 psi



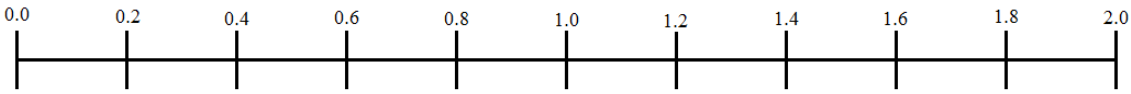
SCALE (FEET)

Begin Run 12
(86.3-91.3 ft)

Begin Run 13
(91.3-96.3 ft)



UC Strength
37260 psi



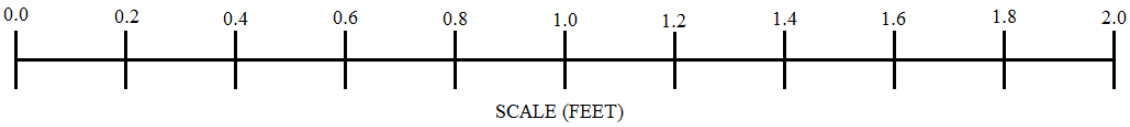
SCALE (FEET)

I-20/26/126 CORRIDOR IMPROVEMENTS

Boring DH-3A: I26RCA Alignment – Station 5383+53, 113 ft – R

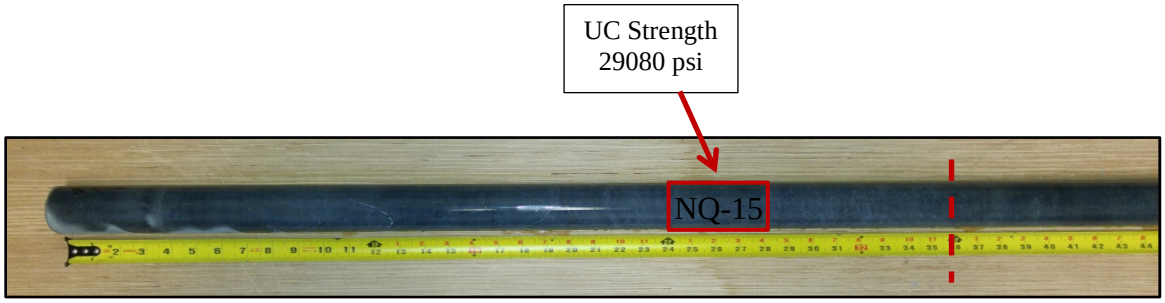
Begin Run 14
(96.3-101.3 ft)



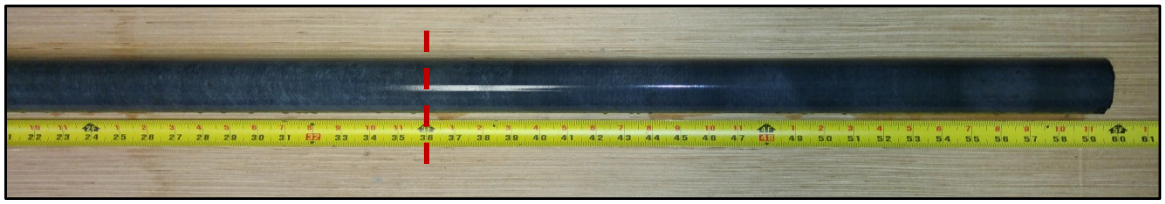




NQ-15 (101.3-106.3 ft)



NQ-15 (Top of Core)



NQ-15 (Bottom of Core)

F&ME CONSULTANTS

I-20/26/126 CORRIDOR IMPROVEMENTS

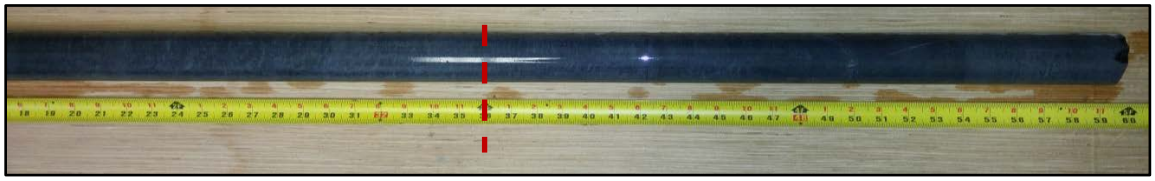
Boring DH-3A: I26RCA Alignment – Station 5383+53, 113 ft – R



NQ-16 (106.3-111.3)

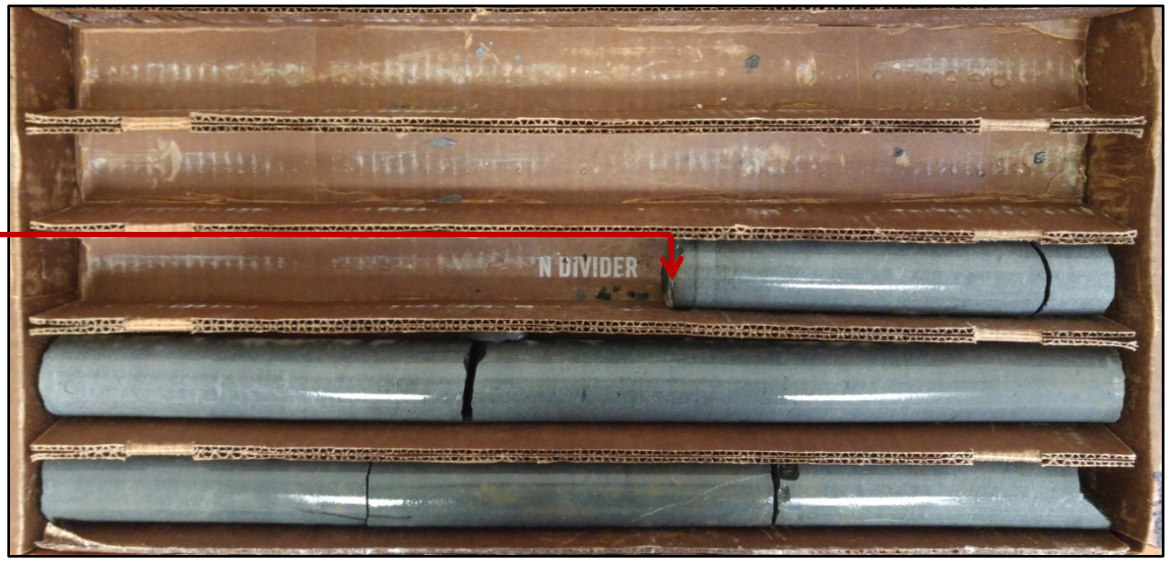


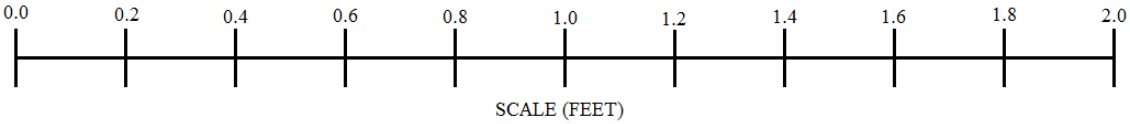
NQ-16 (Top of Core)



NQ-16 (Bottom of Core)

Begin Run 17
(111.3-116.3 ft)



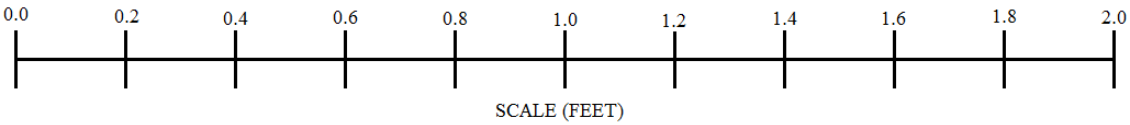


I-20/26/126 CORRIDOR IMPROVEMENTS

Boring DH-3A: I26RCA Alignment – Station 5383+53, 113 ft – R

Begin Run 18
(111.3-120.7 ft)





Boring B-31, Box 1 & 2



1	Remarks:	Boring B-31, Box 1



2	Remarks:	Boring B-31, Box 2

Boring B-32, Box 1



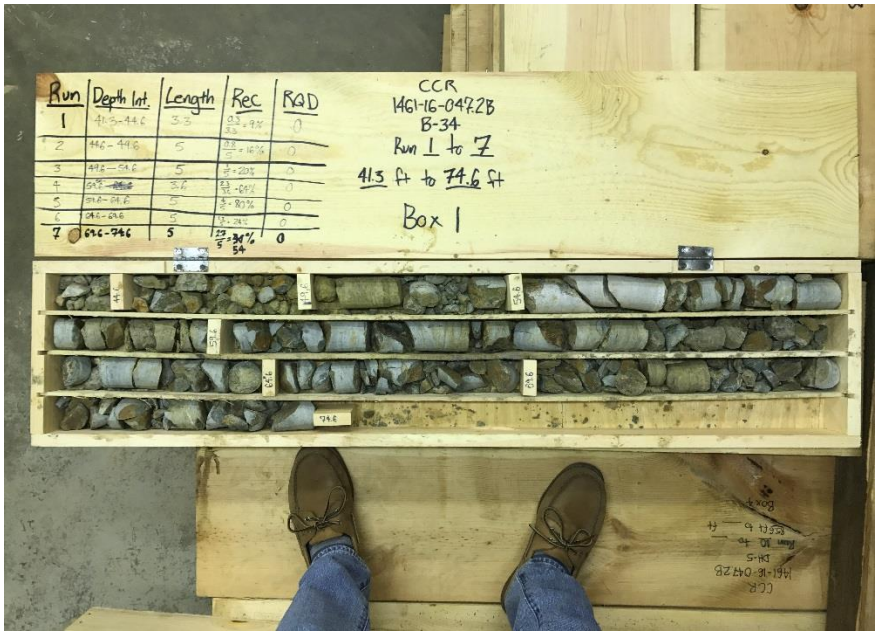
1	**Remarks:**	**Boring B-32, Box 1**

Boring B-33, Box 1



1	**Remarks:**	**Boring B-33, Box 1**

Boring B-34, Box 1



1	**Remarks:**	**Boring B-34, Box 1**

Boring B-35, Box 1



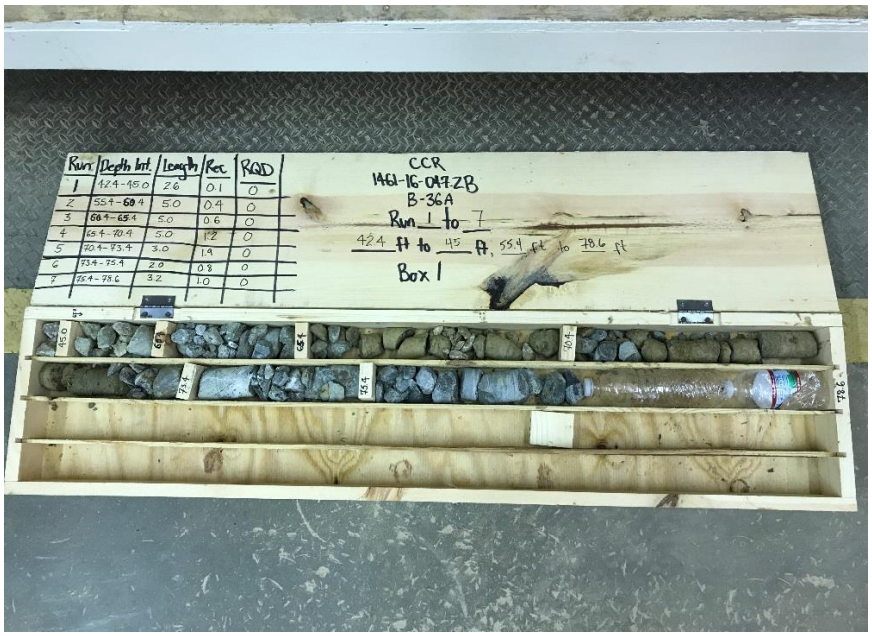
1	**Remarks:**	**Boring B-35, Box 1**

Boring B-36, Box 1



1	**Remarks:**	**Boring B-36, Box 1**

Boring B-36A, Box 1



1	**Remarks:**	**Boring B-36A, Box 1**

Boring B-37, Box 1 & 2



1	**Remarks:**	**Boring B-37, Box 1**



2	**Remarks:**	**Boring B-37, Box 2**

Boring B-43, Box 1 & 2



1	**Remarks:**	**Boring B-43, Box 1**



2	**Remarks:**	**Boring B-43, Box 2**

Boring B-44, Box 1 & 2



1	**Remarks:**	**Boring B-44, Box 1**

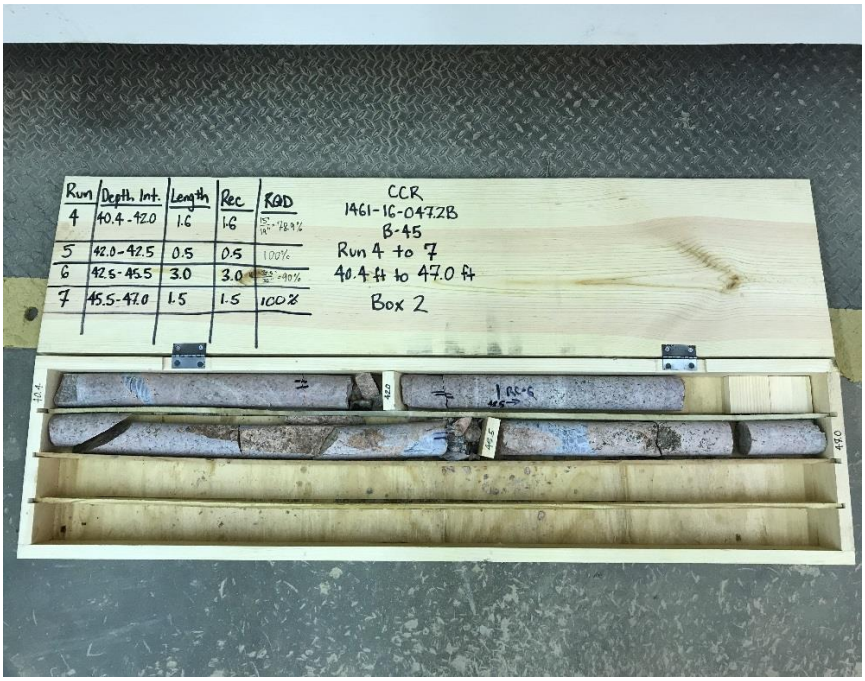


2	**Remarks:**	**Boring B-44, Box 2**

Boring B-45, Box 1 & 2



1	**Remarks:**	**Boring B-45, Box 1**



2	**Remarks:**	**Boring B-45, Box 2**

Boring B-46, Box 1 & 2



1	Remarks:	Boring B-46, Box 1



2	Remarks:	Boring B-46, Box 2

Boring B-62, Box 1



1	**Remarks:**	**Boring B-62, Box 1**

Boring W-22, Box 1



1	**Remarks:**	**Boring W-22, Box 1**

Boring W-23, Box 1



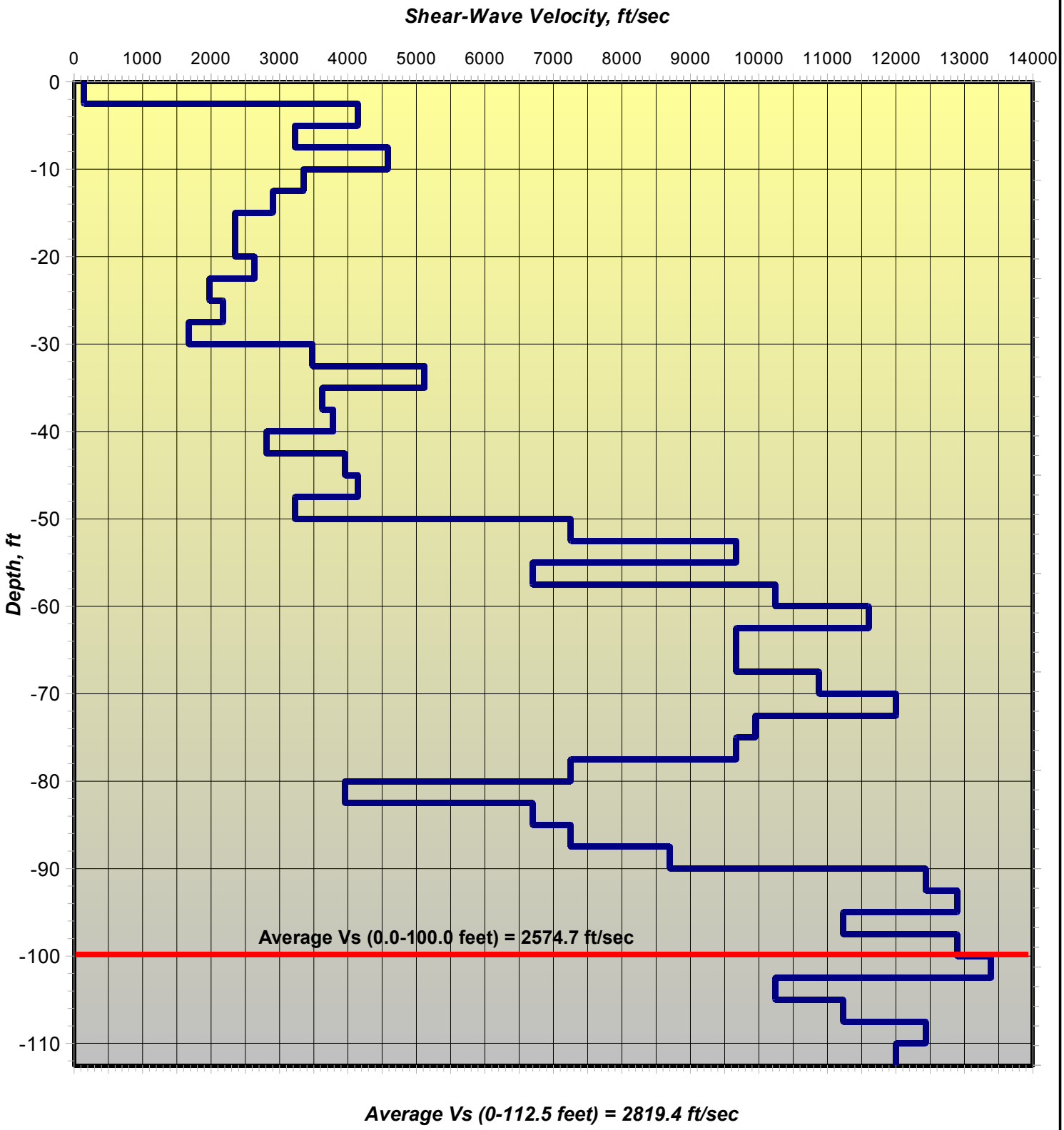
1	**Remarks:**	**Boring W-23, Box 1**

APPENDIX

SECTION 6 GEOPHYSICAL TEST RESULTS

DH-1

34° 4.423'N 81° 8.890'W



Average Vs (0-112.5 feet) = 2819.4 ft/sec

GeoWave Solutions, Inc.
4575 Ansley Lane
Cumming, Georgia 30040
Tel: 770-886-3776
Fax: 770-886-7212
www.geowavesolutions.com

I-26 Corridor Improvements at I-20/I-126

F&ME Consultants

Downhole Seismic Shear-Wave Investigation

Project Manager: M. Ellers

February 7, 2018

DH-1

34° 4.423'N 81° 8.890'W

Depth (ft)	Vs (ft/sec)
-2.5	145.6
-5.0	4144.8
-7.5	3223.7
-10.0	4581.0
-12.5	3347.7
-15.0	2901.3
-17.5	2352.4
-20.0	2352.4
-22.5	2637.6
-25.0	1978.2
-27.5	2176.0
-30.0	1673.8
-32.5	3481.6
-35.0	5120.0
-37.5	3626.7
-40.0	3784.4
-42.5	2807.7
-45.0	3956.4
-47.5	4144.7
-50.0	3223.7
-52.5	7253.4
-55.0	9671.1
-57.5	6695.4
-60.0	10240.0
-62.5	11605.5
-65.0	9671.1
-67.5	9671.1
-70.0	10880.0
-72.5	12005.4
-75.0	9947.5
-77.5	9671.1
-80.0	7253.4
-82.5	3956.4
-85.0	6695.4
-87.5	7253.3
-90.0	8704.0
-92.5	12434.2
-95.0	12894.9
-97.5	11231.0
-100.0	12894.6
-102.5	13391.0
-105.0	10240.0
-107.5	11230.9
-110.0	12434.5
-112.5	12005.4

GeoWave Solutions, Inc.
4575 Ansley Lane
Cumming, Georgia 30040
Tel: 770-886-3776
Fax: 770-886-7212
www.geowavesolutions.com

I-26 Corridor Improvements at I-20/I-126

F&ME Consultants

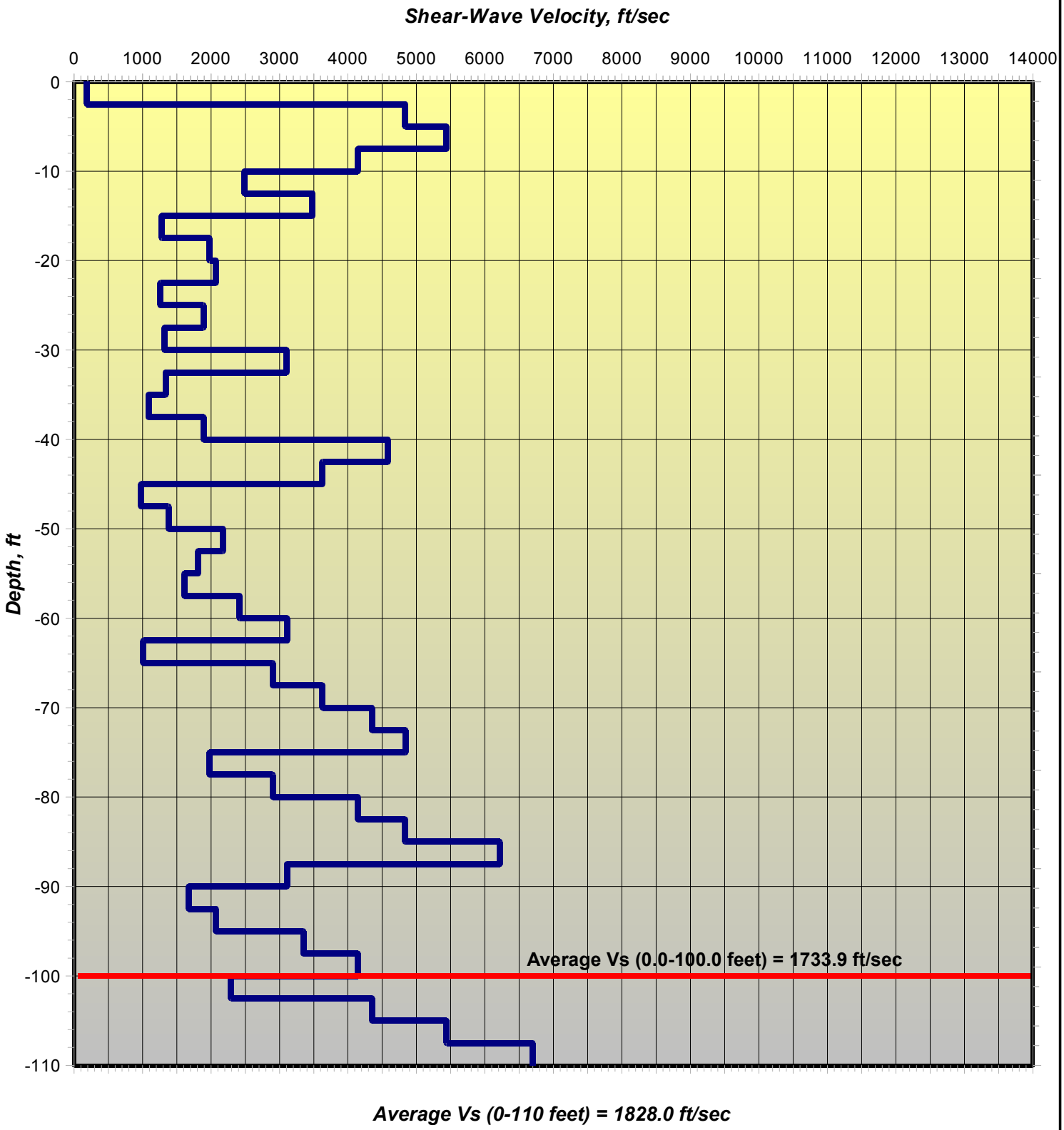
Downhole Seismic Shear-Wave Investigation

Project Manager: M. Ellers

February 7, 2018

DH-2

34° 2.305'N 81° 6.693'W



Average Vs (0-110 feet) = 1828.0 ft/sec

GeoWave Solutions, Inc.
4575 Ansley Lane
Cumming, Georgia 30040
Tel: 770-886-3776
Fax: 770-886-7212
www.geowavesolutions.com

I-26 Corridor Improvements at I-20/I-126

F&ME Consultants

Downhole Seismic Shear-Wave Investigation

Project Manager: M. Ellers

February 7, 2018

DH-2

34° 2.305'N 81° 6.693'W

Depth (ft)	Vs (ft/sec)
-2.5	187.6
-5.0	4835.6
-7.5	5440.0
-10.0	4144.8
-12.5	2486.9
-15.0	3481.6
-17.5	1280.0
-20.0	1978.2
-22.5	2072.4
-25.0	1261.7
-27.5	1891.1
-30.0	1319.3
-32.5	3105.6
-35.0	1339.4
-37.5	1088.0
-40.0	1892.2
-42.5	4581.0
-45.0	3626.7
-47.5	978.0
-50.0	1381.9
-52.5	2175.8
-55.0	1812.9
-57.5	1611.9
-60.0	2417.6
-62.5	3109.5
-65.0	1012.1
-67.5	2900.2
-70.0	3628.4
-72.5	4347.8
-75.0	4837.8
-77.5	1978.2
-80.0	2901.3
-82.5	4144.8
-85.0	4835.6
-87.5	6217.1
-90.0	3108.6
-92.5	1673.8
-95.0	2072.4
-97.5	3347.7
-100.0	4144.7
-102.5	2290.5
-105.0	4352.0
-107.5	5440.0
-110.0	6695.4

GeoWave Solutions, Inc.
4575 Ansley Lane
Cumming, Georgia 30040
Tel: 770-886-3776
Fax: 770-886-7212
www.geowavesolutions.com

I-26 Corridor Improvements at I-20/I-126

F&ME Consultants

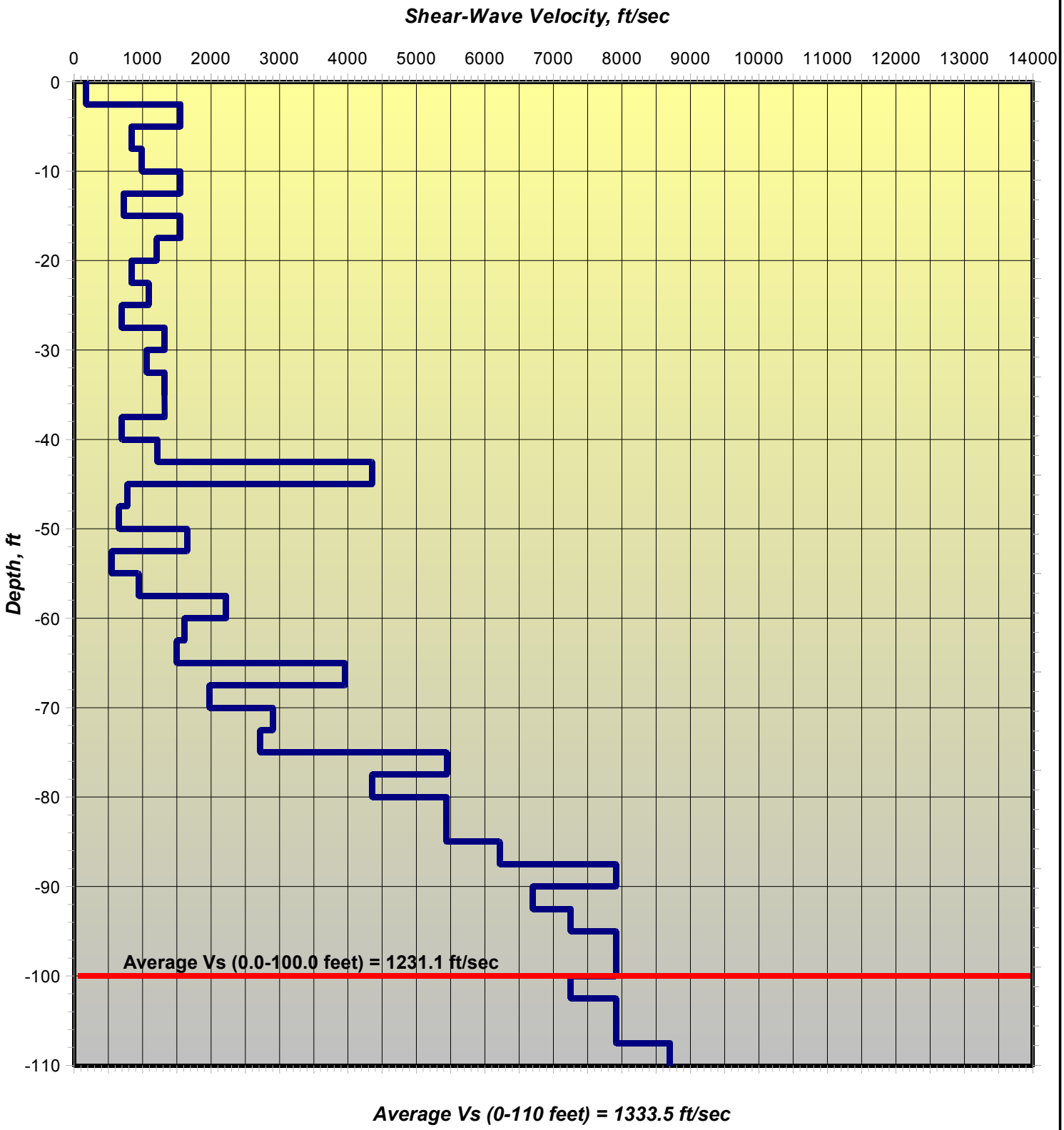
Downhole Seismic Shear-Wave Investigation

Project Manager: M. Ellers

February 7, 2018

DH-3

34° 1.683'N 81° 6.111'W



Average Vs (0-110 feet) = 1333.5 ft/sec

GeoWave Solutions, Inc.
4575 Ansley Lane
Cumming, Georgia 30040
Tel: 770-886-3776
Fax: 770-886-7212
www.geowavesolutions.com

I-26 Corridor Improvements at I-20/I-126

F&ME Consultants

Downhole Seismic Shear-Wave Investigation

Project Manager: M. Ellers

February 7, 2018

DH-3

34° 1.683'N 81° 6.111'W

Depth (ft)	Vs (ft/sec)
-2.5	172.7
-5.0	1553.8
-7.5	837.0
-10.0	989.3
-12.5	1553.8
-15.0	725.5
-17.5	1553.8
-20.0	1208.9
-22.5	837.0
-25.0	1087.9
-27.5	692.7
-30.0	1322.8
-32.5	1058.0
-35.0	1322.1
-37.5	1322.8
-40.0	696.0
-42.5	1216.1
-45.0	4352.0
-47.5	777.1
-50.0	659.1
-52.5	1652.3
-55.0	551.0
-57.5	944.8
-60.0	2222.2
-62.5	1611.4
-65.0	1500.7
-67.5	3956.4
-70.0	1978.2
-72.5	2900.4
-75.0	2720.4
-77.5	5442.0
-80.0	4352.0
-82.5	5440.0
-85.0	5440.0
-87.5	6217.1
-90.0	7912.8
-92.5	6695.4
-95.0	7253.3
-97.5	7912.8
-100.0	7912.7
-102.5	7253.3
-105.0	7912.8
-107.5	7912.7
-110.0	8704.1

GeoWave Solutions, Inc.
4575 Ansley Lane
Cumming, Georgia 30040
Tel: 770-886-3776
Fax: 770-886-7212
www.geowavesolutions.com

I-26 Corridor Improvements at I-20/I-126

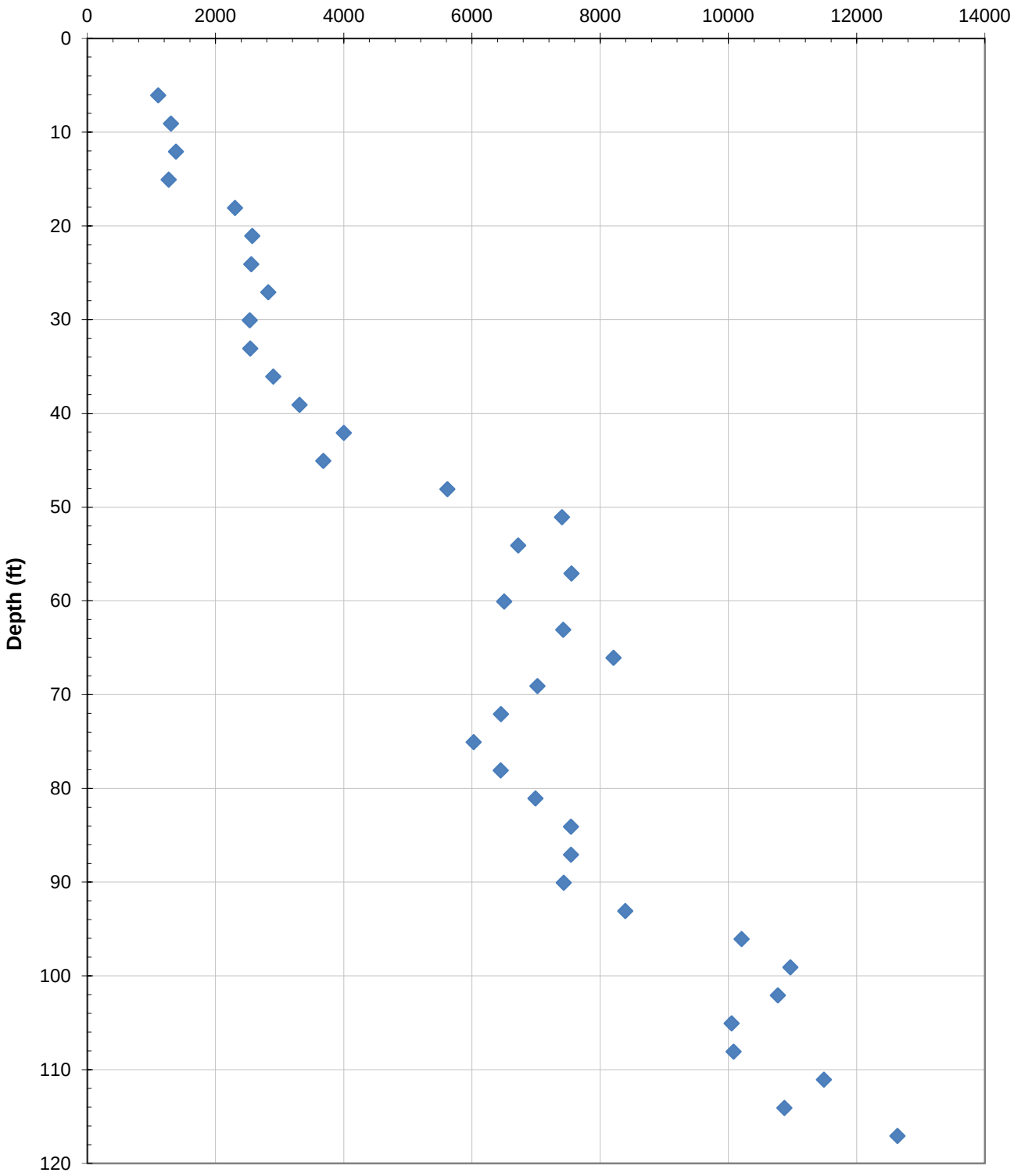
F&ME Consultants

Downhole Seismic Shear-Wave Investigation

Project Manager: M. Ellers

February 7, 2018

Shear Wave Velocity Profile DH-4
I-20/26/126 Improvement Project
Lexington and Richland Counties, South Carolina
1461-16-047



Shear Wave Velocity Calculations

Carolina Crossroads I-20/26/126 Improvement Project

Lexington and Richland Counties, South Carolina

Sounding ID: **DH-4**

Project Number: **1461-16-047**

Geophone Offset: 0.00 Feet

Casing Stickup: 1.42 Feet

Source Offset: 6.00 Feet

Date: 17-Jan-17

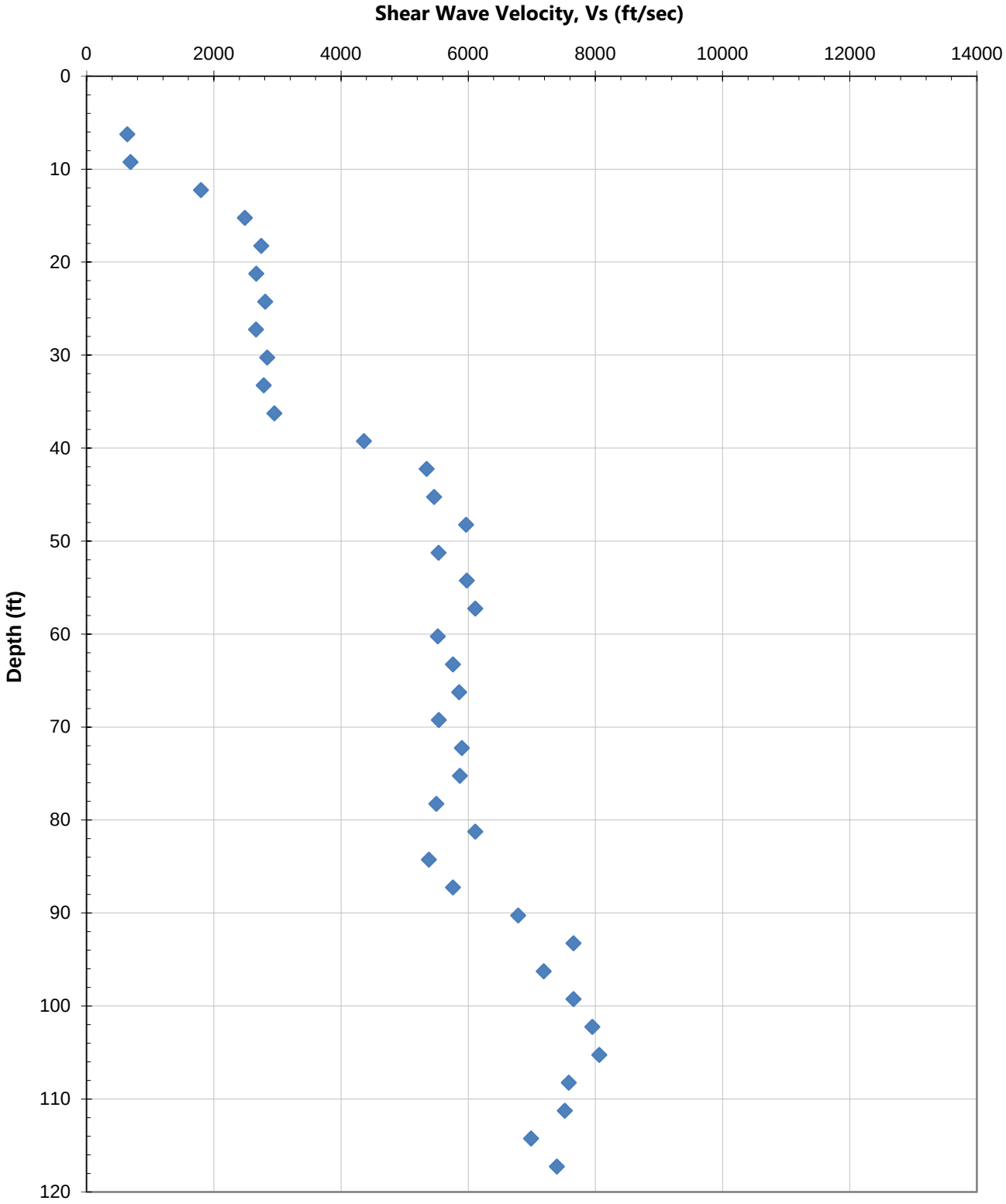
Rig: n/a

Test Depth (feet)	Geophone Depth (feet)	Waveform Ray Path (feet)	Incremental Distance (feet)	S-WAVE Characteristic Arrival Time (seconds)	S-WAVE Incremental Time Interval (seconds)	S-WAVE Interval Velocity (ft/s)	Interval Depth (feet)	d_i/v_{si}	Poissons
4.58	4.58	7.55	7.55	0.0075					
7.58	7.58	9.67	2.12	0.0094	0.0019	1102.7	6.08	0.00551	0.34
10.58	10.58	12.16	2.50	0.0113	0.0019	1302.6	9.08	0.00230	0.41
13.58	13.58	14.85	2.68	0.0133	0.0019	1380.2	12.08	0.00217	0.45
16.58	16.58	17.63	2.79	0.0155	0.0022	1266.7	15.08	0.00237	0.47
19.58	19.58	20.48	2.85	0.0167	0.0012	2303.5	18.08	0.00130	0.48
22.58	22.58	23.36	2.88	0.0178	0.0011	2570.4	21.08	0.00117	0.46
25.58	25.58	26.27	2.91	0.0190	0.0011	2554.7	24.08	0.00117	0.46
28.58	28.58	29.20	2.93	0.0200	0.0010	2823.4	27.08	0.00106	0.45
31.58	31.58	32.14	2.94	0.0212	0.0012	2531.7	30.08	0.00118	0.47
34.58	34.58	35.10	2.95	0.0223	0.0012	2540.2	33.08	0.00118	0.47
37.58	37.58	38.06	2.96	0.0233	0.0010	2900.4	36.08	0.00103	0.46
40.58	40.58	41.02	2.97	0.0242	0.0009	3310.9	39.08	0.00091	0.44
43.58	43.58	43.99	2.97	0.0250	0.0007	3999.6	42.08	0.00075	0.41
46.58	46.58	46.96	2.97	0.0258	0.0008	3681.6	45.08	0.00081	0.42
49.58	49.58	49.94	2.98	0.0263	0.0005	5616.9	48.08	0.00053	0.28
52.58	52.58	52.92	2.98	0.0267	0.0004	7403.3	51.08	0.00041	0.23
55.58	55.58	55.90	2.98	0.0272	0.0004	6718.6	54.08	0.00045	0.31
58.58	58.58	58.89	2.98	0.0276	0.0004	7551.0	57.08	0.00040	0.36
61.58	61.58	61.87	2.99	0.0280	0.0005	6501.6	60.08	0.00046	0.37
64.58	64.58	64.86	2.99	0.0284	0.0004	7420.8	63.08	0.00040	0.44
67.58	67.58	67.85	2.99	0.0288	0.0004	8207.1	66.08	0.00037	0.38
70.58	70.58	70.83	2.99	0.0292	0.0004	7019.9	69.08	0.00043	0.44
73.58	73.58	73.82	2.99	0.0297	0.0005	6449.5	72.08	0.00047	0.44
76.58	76.58	76.81	2.99	0.0302	0.0005	6025.6	75.08	0.00050	0.41
79.58	79.58	79.81	2.99	0.0306	0.0005	6448.5	78.08	0.00047	0.43
82.58	82.58	82.80	2.99	0.0311	0.0004	6990.9	81.08	0.00043	0.42
85.58	85.58	85.79	2.99	0.0315	0.0004	7541.6	84.08	0.00040	0.37
88.58	88.58	88.78	2.99	0.0319	0.0004	7542.9	87.08	0.00040	0.37
91.58	91.58	91.78	2.99	0.0323	0.0004	7431.8	90.08	0.00040	0.39
94.58	94.58	94.77	2.99	0.0326	0.0004	8391.0	93.08	0.00036	0.36
97.58	97.58	97.76	2.99	0.0329	0.0003	10204.3	96.08	0.00029	0.26
100.58	100.58	100.76	2.99	0.0332	0.0003	10965.0	99.08	0.00027	0.20
103.58	103.58	103.75	2.99	0.0335	0.0003	10770.2	102.08	0.00028	0.23
106.58	106.58	106.75	3.00	0.0338	0.0003	10048.3	105.08	0.00030	0.22
109.58	109.58	109.74	3.00	0.0341	0.0003	10081.9	108.08	0.00030	0.33
112.58	112.58	112.74	3.00	0.0343	0.0003	11488.9	111.08	0.00026	0.26
115.58	115.58	115.74	3.00	0.0346	0.0003	10872.6	114.08	0.00028	0.29
118.58	118.58	118.73	3.00	0.0348	0.0002	12634.3	117.08	0.00024	0.24

Weighted Average Soil Shear Wave Velocity, v_s 100 (ft/s): 3232 0.37

Note: The weighted average shear wave velocity reported above is for the interval from 6.08 to 105.08 feet.

Shear Wave Velocity Profile DH-5
I-20/26/126 Improvement Project
Lexington and Richland Counties, South Carolina
1461-16-047



Shear Wave Velocity Calculations

Carolina Crossroads I-20/26/126 Improvement Project

Lexington and Richland Counties, South Carolina

Sounding ID: **DH-5**

Project Number: **1461-16-047**

Geophone Offset: 0.00 Feet

Casing Stickup: 1.25 Feet

Source Offset: 6.00 Feet

Date: 17-Jan-17

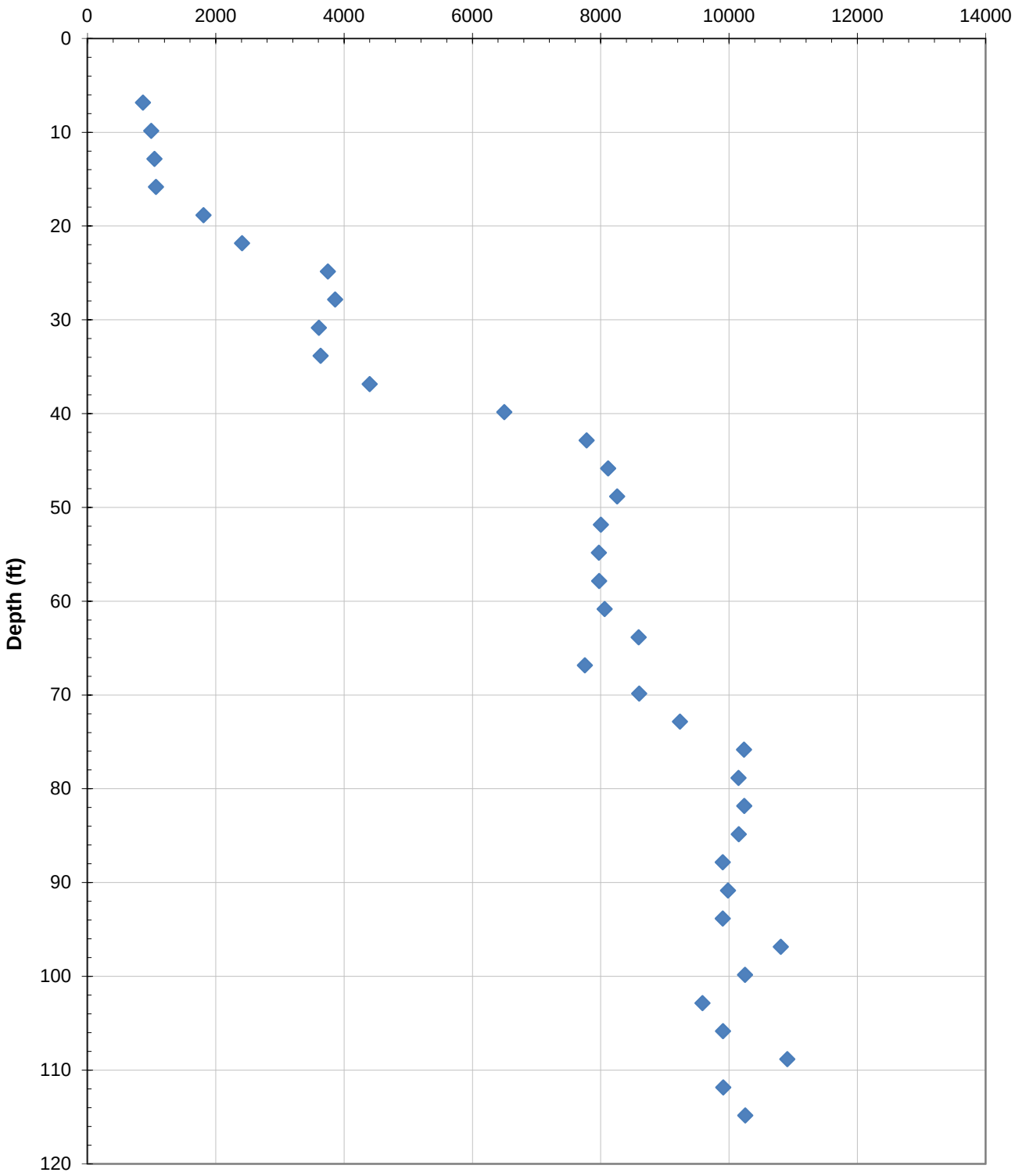
Rig: n/a

Test Depth (feet)	Geophone Depth (feet)	Waveform Ray Path (feet)	Incremental Distance (feet)	S-WAVE Characteristic Arrival Time (seconds)	S-WAVE Incremental Time Interval (seconds)	S-WAVE Interval Velocity (ft/s)	Interval Depth (feet)	d_i/v_{si}	Poissons
4.75	4.75	7.65	7.65	0.0105					
7.75	7.75	9.80	2.15	0.0139	0.0034	639.9	6.25	0.00977	0.50
10.75	10.75	12.31	2.51	0.0175	0.0036	688.8	9.25	0.00436	0.50
13.75	13.75	15.00	2.69	0.0190	0.0015	1798.3	12.25	0.00167	0.49
16.75	16.75	17.79	2.79	0.0201	0.0011	2486.0	15.25	0.00121	0.48
19.75	19.75	20.64	2.85	0.0212	0.0010	2746.6	18.25	0.00109	0.48
22.75	22.75	23.53	2.89	0.0222	0.0011	2666.2	21.25	0.00113	0.48
25.75	25.75	26.44	2.91	0.0233	0.0010	2807.1	24.25	0.00107	0.48
28.75	28.75	29.37	2.93	0.0244	0.0011	2664.1	27.25	0.00113	0.48
31.75	31.75	32.31	2.94	0.0254	0.0010	2836.7	30.25	0.00106	0.48
34.75	34.75	35.26	2.95	0.0265	0.0011	2785.2	33.25	0.00108	0.47
37.75	37.75	38.22	2.96	0.0275	0.0010	2949.9	36.25	0.00102	0.46
40.75	40.75	41.19	2.97	0.0282	0.0007	4359.7	39.25	0.00069	0.42
43.75	43.75	44.16	2.97	0.0287	0.0006	5346.8	42.25	0.00056	0.35
46.75	46.75	47.13	2.97	0.0293	0.0005	5465.2	45.25	0.00055	0.39
49.75	49.75	50.11	2.98	0.0298	0.0005	5968.2	48.25	0.00050	0.31
52.75	52.75	53.09	2.98	0.0303	0.0005	5533.3	51.25	0.00054	0.41
55.75	55.75	56.07	2.98	0.0308	0.0005	5977.8	54.25	0.00050	0.35
58.75	58.75	59.06	2.98	0.0313	0.0005	6110.6	57.25	0.00049	0.25
61.75	61.75	62.04	2.99	0.0318	0.0005	5521.5	60.25	0.00054	0.34
64.75	64.75	65.03	2.99	0.0323	0.0005	5759.7	63.25	0.00052	0.32
67.75	67.75	68.02	2.99	0.0329	0.0005	5856.6	66.25	0.00051	0.33
70.75	70.75	71.00	2.99	0.0334	0.0005	5538.3	69.25	0.00054	0.27
73.75	73.75	73.99	2.99	0.0339	0.0005	5900.7	72.25	0.00051	0.24
76.75	76.75	76.98	2.99	0.0344	0.0005	5867.9	75.25	0.00051	0.21
79.75	79.75	79.98	2.99	0.0350	0.0005	5496.9	78.25	0.00055	0.39
82.75	82.75	82.97	2.99	0.0354	0.0005	6109.7	81.25	0.00049	0.36
85.75	85.75	85.96	2.99	0.0360	0.0006	5380.8	84.25	0.00056	0.39
88.75	88.75	88.95	2.99	0.0365	0.0005	5760.1	87.25	0.00052	0.38
91.75	91.75	91.95	2.99	0.0370	0.0004	6784.9	90.25	0.00044	0.33
94.75	94.75	94.94	2.99	0.0374	0.0004	7654.5	93.25	0.00039	0.23
97.75	97.75	97.93	2.99	0.0378	0.0004	7186.7	96.25	0.00042	0.30
100.75	100.75	100.93	2.99	0.0382	0.0004	7656.4	99.25	0.00039	0.24
103.75	103.75	103.92	2.99	0.0385	0.0004	7951.9	102.25	0.00038	0.32
106.75	106.75	106.92	3.00	0.0389	0.0004	8060.1	105.25	0.00037	0.15
109.75	109.75	109.91	3.00	0.0393	0.0004	7580.9	108.25	0.00040	0.26
112.75	112.75	112.91	3.00	0.0397	0.0004	7518.3	111.25	0.00040	0.24
115.75	115.75	115.91	3.00	0.0401	0.0004	6988.9	114.25	0.00043	0.34
118.75	118.75	118.90	3.00	0.0405	0.0004	7393.8	117.25	0.00041	0.42

Weighted Average Soil Shear Wave Velocity, v_s 100 (ft/s): **2775** 0.36

Note: The weighted average shear wave velocity reported above is for the interval from 6.25 to 105.25 feet.

Shear Wave Velocity Profile DH-6
I-20/26/126 Improvement Project
Lexington and Richland Counties, South Carolina
1461-16-047



Shear Wave Velocity Calculations

Carolina Crossroads I-20/26/126 Improvement Project

Lexington and Richland Counties, South Carolina

Sounding ID: **DH-6** Project Number: **1461-16-047**

Geophone Offset: 0.00 Feet Date: 30-Jan-17

Casing Stickup: 0.66 Feet

Source Offset: 6.00 Feet Rig: n/a

Test Depth (feet)	Geophone Depth (feet)	Waveform Ray Path (feet)	Incremental Distance (feet)	S-WAVE Characteristic Arrival Time (seconds)	S-WAVE Incremental Time Interval (seconds)	S-WAVE Interval Velocity (ft/s)	Interval Depth (feet)	d_i/v_{si}	Poissons
5.34	5.34	8.03	8.03	0.0071					
8.34	8.34	10.27	2.24	0.0097	0.0026	866.1	6.84	0.00790	0.20
11.34	11.34	12.83	2.56	0.0123	0.0026	992.4	9.84	0.00302	0.25
14.34	14.34	15.54	2.72	0.0149	0.0026	1044.3	12.84	0.00287	0.23
17.34	17.34	18.35	2.80	0.0175	0.0026	1069.2	15.84	0.00281	0.22
20.34	20.34	21.21	2.86	0.0191	0.0016	1807.2	18.84	0.00166	0.20
23.34	23.34	24.10	2.89	0.0203	0.0012	2410.4	21.84	0.00124	0.33
26.34	26.34	27.01	2.92	0.0211	0.0008	3745.7	24.84	0.00080	0.35
29.34	29.34	29.95	2.93	0.0218	0.0008	3860.8	27.84	0.00078	0.33
32.34	32.34	32.89	2.94	0.0227	0.0008	3607.6	30.84	0.00083	0.35
35.34	35.34	35.85	2.95	0.0235	0.0008	3635.6	33.84	0.00083	0.41
38.34	38.34	38.81	2.96	0.0241	0.0007	4398.1	36.84	0.00068	0.42
41.34	41.34	41.77	2.97	0.0246	0.0005	6495.9	39.84	0.00046	0.35
44.34	44.34	44.74	2.97	0.0250	0.0004	7782.0	42.84	0.00039	0.24
47.34	47.34	47.72	2.97	0.0253	0.0004	8117.4	45.84	0.00037	0.20
50.34	50.34	50.70	2.98	0.0257	0.0004	8256.0	48.84	0.00036	0.21
53.34	53.34	53.68	2.98	0.0261	0.0004	8001.4	51.84	0.00037	0.21
56.34	56.34	56.66	2.98	0.0265	0.0004	7971.4	54.84	0.00038	0.20
59.34	59.34	59.64	2.98	0.0268	0.0004	7976.1	57.84	0.00038	0.20
62.34	62.34	62.63	2.99	0.0272	0.0004	8061.7	60.84	0.00037	0.21
65.34	65.34	65.61	2.99	0.0275	0.0003	8591.3	63.84	0.00035	0.20
68.34	68.34	68.60	2.99	0.0279	0.0004	7751.9	66.84	0.00039	0.23
71.34	71.34	71.59	2.99	0.0283	0.0003	8597.4	69.84	0.00035	0.24
74.34	74.34	74.58	2.99	0.0286	0.0003	9235.8	72.84	0.00032	0.25
77.34	77.34	77.57	2.99	0.0289	0.0003	10233.7	75.84	0.00029	0.28
80.34	80.34	80.56	2.99	0.0292	0.0003	10148.6	78.84	0.00030	0.29
83.34	83.34	83.56	2.99	0.0295	0.0003	10238.2	81.84	0.00029	0.21
86.34	86.34	86.55	2.99	0.0298	0.0003	10152.6	84.84	0.00030	0.32
89.34	89.34	89.54	2.99	0.0301	0.0003	9900.4	87.84	0.00030	0.36
92.34	92.34	92.53	2.99	0.0304	0.0003	9985.1	90.84	0.00030	0.35
95.34	95.34	95.53	2.99	0.0307	0.0003	9903.3	93.84	0.00030	0.30
98.34	98.34	98.52	2.99	0.0310	0.0003	10805.0	96.84	0.00028	0.22
101.34	101.34	101.52	2.99	0.0312	0.0003	10247.2	99.84	0.00029	0.34
104.34	104.34	104.51	2.99	0.0316	0.0003	9587.1	102.84	0.00031	0.33
107.34	107.34	107.51	3.00	0.0319	0.0003	9907.6	105.84	0.00030	0.23
110.34	110.34	110.50	3.00	0.0321	0.0003	10908.4	108.84	0.00028	0.28
113.34	113.34	113.50	3.00	0.0324	0.0003	9909.3	111.84	0.00030	0.31
116.34	116.34	116.49	3.00	0.0327	0.0003	10251.7	114.84	0.00029	0.25
119.34	119.34	119.49	3.00	0.0330	0.0003	10164.8	117.84	0.00030	0.42
						Weighted Average Soil Shear Wave Velocity, v_s100 (ft/s):		**3207**	0.28

Note: The weighted average shear wave velocity reported above is for the interval from 6.84 to 105.84 feet.

APPENDIX

SECTION 7 SPT HAMMER ENERGY REPORTS

FME 2025 INVESTIGATION

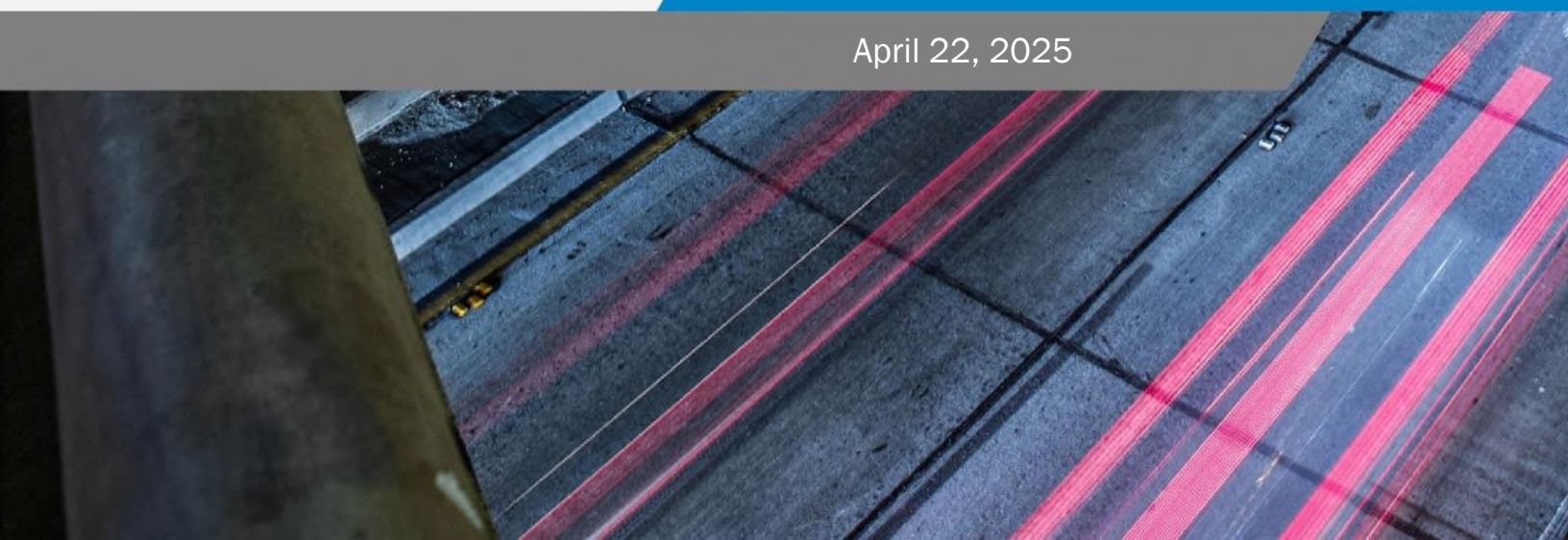


CAROLINAS GEOTECHNICAL GROUP

Report of SPT Hammer Energy

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

April 22, 2025



CAROLINAS GEOTECHNICAL GROUP

N.C. Firm License: P-1904

1805 Sardis Road N
Suite 100
Charlotte, NC 28270

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

April 22, 2025

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

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

Dear Mr. Shannon:

Carolinas Geotechnical Group, PLLC (CG2) has completed the Standard Penetration Test (SPT) energy measurements on the automatic hammer mounted on a Breccia Construction, LLC (Breccia) CME 550X ATV-mounted drill rig with a serial number of 249533, see attached Drill Rig Photo Log. This service was performed by Mr. Robert E. Kral, PE on April 11, 2025. 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 9, 2025.

DYNAMIC TESTING METHODOLOGY

Testing was performed using a model SPT (Serial No. 4549 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 (replaced by K11957)) 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 11, 2025 to observe and perform high-strain dynamic testing during SPT sampling on the CME 550X ATV-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 34.7703698, -81.2451628. No Soil Test Boring Log was maintained. SPT energy measurements were recorded during three intervals at depths of approximately 28½, 33½, and 38½ feet below the existing ground surface. The information presented in the table below summarizes the equipment tested and tooling used during the SPT energy measurements.

Table 1: SPT Field Data

Drill Rig Information	
Manufacturer	CME
Model	550X
Serial Number	249533
Operator	D. Harris
Carrier	ATV
Hammer Information	
Model / Type	CME / Auto
Serial Number	249533
Anvil Height (inches)	11.5
Anvil Diameter (inches)	2.5
Drop Height (inches)	30
Ram Weight (pounds)	140
Ram Serial Number	N/A
Drilling and Instrumented Rod Information	
Drill Rod Type	AWJ
OD (inches)	1.75
ID (inches)	1.25
Cross-Sectional Area (in^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

Accelerometer A4 (Serial No. K10960) was observed to have issues during sample intervals 28½ to 30 and 33½ to 35. Therefore, this accelerometer was turned off during the data analysis of these sample intervals. This accelerometer was replaced for the 38½ to 40 sample interval.

The total rod length from the instrumentation to the tip of the split-spoon sampler was determined by adding 3.6 feet to the required drill rod length at each sample depth. Based on the test data, the automatic hammer on the CME 550X ATV-mounted drill rig operated at a rate of about 51.4 to 52.6 blows per minute (BPM) during dynamic testing. The measured transferred hammer energy (EFV) ranged from 273.7 to 327.9 foot-pounds, which corresponds to Energy Transfer Ratio (ETR) values of 78.2 to 93.7%, respectively. These data ranges are based on the overall minimum and maximum values for the last 12 inches of each sample interval.

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

- Penetration vs. BLC
- Penetration vs. 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	5-10-12 / 22	SA SILT	51.6	292.6	83.6
2	33½ - 35	35	38.6	6-9-11 / 20	SA SILT	52.3	297.2	84.9
3	38½ - 40	40	43.6	6-7-9 / 16	SA SILT	51.6	313.8	89.7
					Overall Average	**51.8**	**300.0**	**85.7**

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

drill rig (for the depth intervals presented in Table 2) was 300.0 foot-pounds, with an average ETR of 85.7%.

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

Signed by:
Pressley M. Perry
9A08DF24DA0A440...
Pressley M. Perry, EIT
Staff Professional

Signed by:
Robert E. Kral
AAF88FF73C5E4B1...
Robert E. Kral, PE
Geotechnical Design Manager
NC Registration No. 042642

NORTH CAROLINA PROFESSIONAL SEAL 042642 ENGINEER ROBERT E. KRAL

Appendices:

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

APPENDIX I

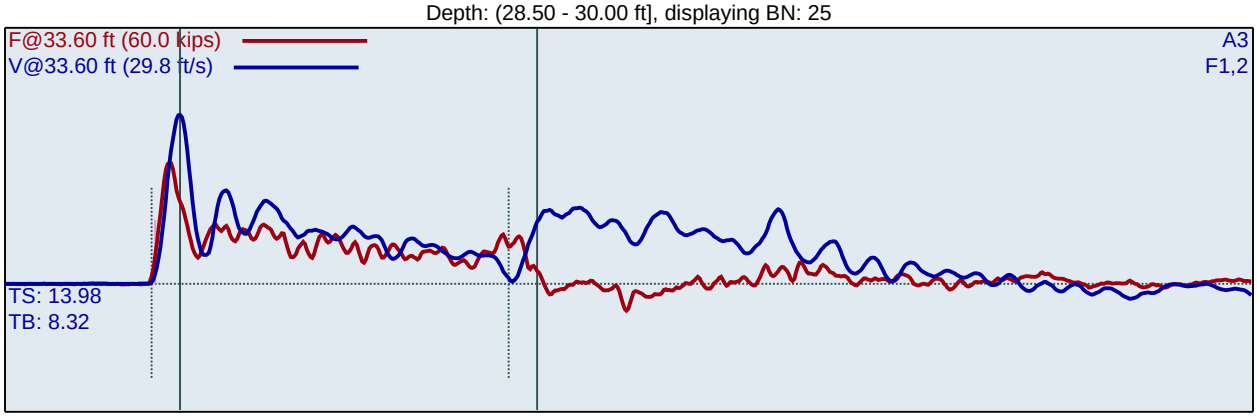
CME 550X (SN 249533)
REK
B-5

B-5
Interval start: 4/11/2025

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: 25



F1 : [728AWJ1] 224.649 PDICAL (1) FF1
F2 : [728AWJ2] 224.139 PDICAL (1) FF1

A3 (PR): [K10959] 420.036 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	%
28.60	1	5	62.2	27.3	19.9	1.7	24.2	1.2	304.1	86.9
28.70	2	5	52.8	24.0	17.6	1.4	21.2	1.2	282.3	80.7
28.80	3	5	51.6	25.0	17.5	1.3	22.1	1.2	294.4	84.1
28.90	4	5	51.6	25.0	17.5	1.3	22.2	1.2	283.1	80.9
29.00	5	5	51.5	24.6	17.7	1.2	21.7	1.2	284.7	81.3
29.05	6	10	51.5	24.2	17.2	1.3	21.4	0.6	287.3	82.1
29.10	7	10	51.8	24.0	17.3	0.9	21.3	0.6	273.7	78.2
29.15	8	10	51.4	24.6	17.8	0.9	21.8	0.6	287.4	82.1
29.20	9	10	51.7	24.4	17.3	0.9	21.6	0.6	280.3	80.1
29.25	10	10	51.6	27.2	18.7	0.9	24.1	0.6	299.0	85.4
29.30	11	10	51.6	24.6	18.2	1.0	21.8	0.6	292.3	83.5
29.35	12	10	51.7	26.4	18.0	0.9	23.4	0.6	290.7	83.1
29.40	13	10	51.4	24.4	17.1	1.0	21.6	0.6	287.7	82.2
29.45	14	10	51.6	28.1	18.9	0.8	24.8	0.6	298.9	85.4
29.50	15	10	51.5	25.1	17.5	1.2	22.2	0.6	290.6	83.0
29.54	16	12	51.6	25.6	18.3	0.8	22.7	0.5	293.7	83.9
29.58	17	12	51.5	27.5	19.3	0.8	24.4	0.5	307.2	87.8
29.63	18	12	51.7	24.9	18.0	0.7	22.0	0.5	294.0	84.0
29.67	19	12	51.4	24.4	17.5	0.9	21.6	0.5	295.5	84.4
29.71	20	12	51.6	27.8	19.3	0.7	24.6	0.5	300.7	85.9
29.75	21	12	51.5	25.1	18.3	0.7	22.2	0.5	292.8	83.6
29.79	22	12	51.6	24.4	17.8	0.8	21.6	0.5	290.4	83.0
29.83	23	12	51.6	24.5	18.0	0.6	21.7	0.5	286.0	81.7
29.88	24	12	51.5	26.9	19.1	0.7	23.8	0.5	302.9	86.5
29.92	25	12	51.4	28.4	19.6	0.6	25.1	0.5	304.8	87.1
29.96	26	12	51.4	28.6	19.3	0.6	25.3	0.5	303.7	86.8
30.00	27	12	51.7	23.8	17.6	0.5	21.1	0.5	276.8	79.1

Average	51.6	25.7	18.2	0.8	22.7	0.5	292.6	83.6
Std Dev	0.1	1.6	0.8	0.2	1.4	0.0	8.6	2.5
Maximum	51.8	28.6	19.6	1.3	25.3	0.6	307.2	87.8
Minimum	51.4	23.8	17.1	0.5	21.1	0.5	273.7	78.2

N-value: 22

Sample Interval Time: 30.24 seconds.

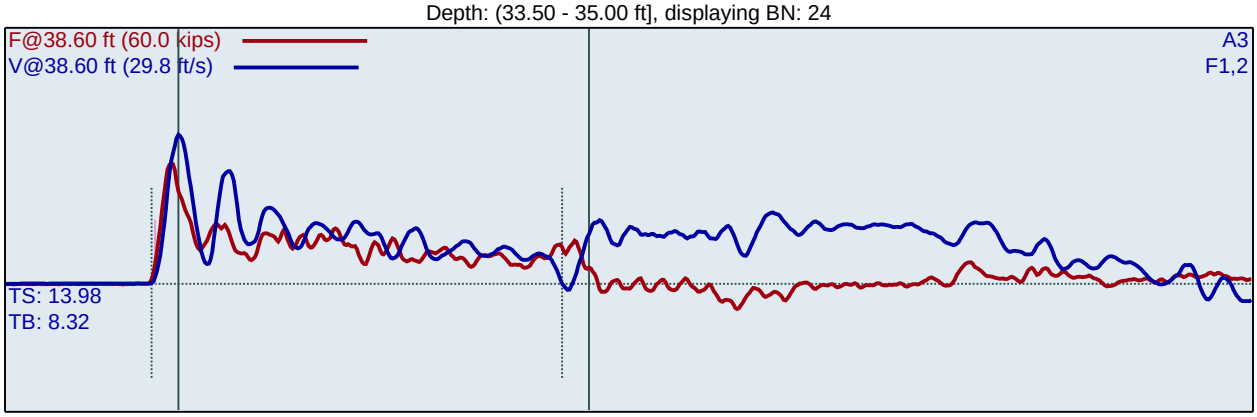
CME 550X (SN 249533)
REK
B-5

B-5
Interval start: 4/11/2025

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: 24



F1 : [728AWJ1] 224.649 PDICAL (1) FF1
F2 : [728AWJ2] 224.139 PDICAL (1) FF1

A3 (PR): [K10959] 420.036 mv/6.4v/5000g (1) VF1

LP ft	BL#	BC /6"	BPM bpm	FMX kips	VMX ft/s	DMX in	CSX ksi	DFN in	EFV ft-lb	ETR %
33.58	1	6	63.2	26.1	20.6	1.1	23.1	1.0	303.3	86.7
33.67	2	6	52.4	26.4	21.5	1.4	23.3	1.0	323.4	92.4
33.75	3	6	52.3	25.9	20.0	1.1	22.9	1.0	309.7	88.5
33.83	4	6	52.4	25.0	19.6	1.0	22.1	1.0	291.5	83.3
33.92	5	6	52.3	26.1	19.7	1.1	23.1	1.0	297.0	84.9
34.00	6	6	52.2	26.5	19.8	1.0	23.4	1.0	309.5	88.4
34.06	7	9	52.5	27.6	18.6	0.8	24.4	0.7	286.0	81.7
34.11	8	9	52.3	26.8	19.0	1.0	23.7	0.7	300.2	85.8
34.17	9	9	52.6	26.5	19.0	0.9	23.4	0.7	294.1	84.0
34.22	10	9	51.9	26.8	19.1	0.8	23.7	0.7	294.5	84.1
34.28	11	9	52.4	25.1	17.3	1.0	22.2	0.7	287.3	82.1
34.33	12	9	52.4	26.9	18.8	0.9	23.8	0.7	301.7	86.2
34.39	13	9	52.1	24.2	16.5	0.9	21.4	0.7	297.5	85.0
34.44	14	9	52.3	26.8	19.2	0.8	23.7	0.7	311.1	88.9
34.50	15	9	52.4	27.3	18.4	1.0	24.1	0.7	302.8	86.5
34.55	16	11	52.1	26.5	18.4	0.9	23.4	0.5	312.9	89.4
34.59	17	11	52.3	27.6	17.8	0.7	24.5	0.5	287.0	82.0
34.64	18	11	52.4	27.8	18.6	0.9	24.6	0.5	304.9	87.1
34.68	19	11	52.2	28.8	18.4	1.0	25.5	0.5	303.7	86.8
34.73	20	11	52.3	26.6	16.8	0.7	23.6	0.5	289.2	82.6
34.77	21	11	52.2	28.1	18.1	0.9	24.9	0.5	301.2	86.1
34.82	22	11	52.3	28.6	17.7	0.7	25.3	0.5	296.4	84.7
34.86	23	11	52.2	29.2	18.2	0.9	25.8	0.5	306.4	87.6
34.91	24	11	52.2	28.0	17.3	0.8	24.8	0.5	294.6	84.2
34.95	25	11	52.5	28.5	16.8	0.7	25.2	0.5	288.2	82.3
35.00	26	11	52.2	28.1	16.8	0.7	24.8	0.5	283.4	81.0

Average	52.3	27.3	18.0	0.9	24.2	0.6	297.2	84.9
Std Dev	0.2	1.2	0.8	0.1	1.0	0.1	8.3	2.4
Maximum	52.6	29.2	19.2	1.0	25.8	0.7	312.9	89.4
Minimum	51.9	24.2	16.5	0.7	21.4	0.5	283.4	81.0

N-value: 20

Sample Interval Time: 28.67 seconds.

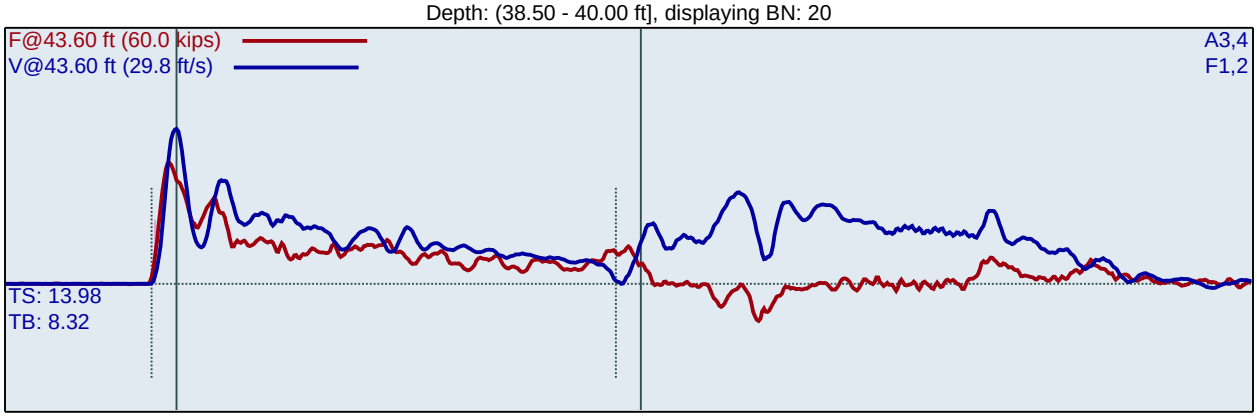
CME 550X (SN 249533)
REK
B-5

B-5
Interval start: 4/11/2025

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



F1 : [728AWJ1] 224.649 PDICAL (1) FF1
F2 : [728AWJ2] 224.139 PDICAL (1) FF1

A3 (PR): [K10959] 420.036 mv/6.4v/5000g (1) VF1
A4 (PR): [K11957] 412.26 mv/6.4v/5000g (1) VF1

LP ft	BL#	BC /6"	BPM bpm	FMX kips	VMX ft/s	DMX in	CSX ksi	DFN in	EFV ft-lb	ETR %
38.58	1	6	1.9	28.0	17.7	1.7	24.8	1.0	320.1	91.5
38.67	2	6	51.0	27.2	17.6	1.8	24.0	1.0	316.6	90.5
38.75	3	6	50.8	25.9	16.6	1.5	22.9	1.0	303.6	86.7
38.83	4	6	51.1	25.6	16.9	1.5	22.7	1.0	298.8	85.4
38.92	5	6	51.7	26.1	16.7	1.5	23.1	1.0	300.3	85.8
39.00	6	6	51.5	27.9	17.2	1.4	24.7	1.0	303.1	86.6
39.07	7	7	51.5	27.2	16.9	1.3	24.1	0.9	296.3	84.7
39.14	8	7	51.7	27.0	17.9	1.4	23.9	0.9	317.4	90.7
39.21	9	7	51.6	27.3	17.1	1.3	24.1	0.9	301.5	86.1
39.29	10	7	51.7	27.6	16.9	1.3	24.4	0.9	303.6	86.7
39.36	11	7	51.6	26.1	16.6	1.2	23.1	0.9	302.9	86.5
39.43	12	7	51.5	28.0	18.2	1.4	24.8	0.9	320.3	91.5
39.50	13	7	51.5	27.3	17.7	1.2	24.2	0.9	296.7	84.8
39.56	14	9	51.8	29.5	18.9	1.3	26.1	0.7	324.1	92.6
39.61	15	9	51.5	29.6	18.9	1.2	26.2	0.7	318.5	91.0
39.67	16	9	51.6	29.7	18.9	1.2	26.3	0.7	327.9	93.7
39.72	17	9	51.6	27.4	17.3	1.0	24.2	0.7	306.9	87.7
39.78	18	9	51.6	27.8	17.3	1.1	24.6	0.7	309.0	88.3
39.83	19	9	51.4	28.5	18.0	1.0	25.2	0.7	317.1	90.6
39.89	20	9	51.5	28.3	18.0	1.2	25.1	0.7	326.5	93.3
39.94	21	9	51.5	30.1	18.2	1.1	26.6	0.7	324.3	92.7
40.00	22	9	51.5	29.5	18.3	1.1	26.1	0.7	327.9	93.7
		Average	51.6	28.2	17.8	1.2	24.9	0.7	313.8	89.7
		Std Dev	0.1	1.1	0.7	0.1	1.0	0.1	10.9	3.1
		Maximum	51.8	30.1	18.9	1.4	26.6	0.9	327.9	93.7
		Minimum	51.4	26.1	16.6	1.0	23.1	0.7	296.3	84.7
					N-value: 16					

Sample Interval Time: 24.50 seconds.

Summary of SPT Test Results

Project: CME 550X (SN 249533), Test Date: 4/11/2025

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

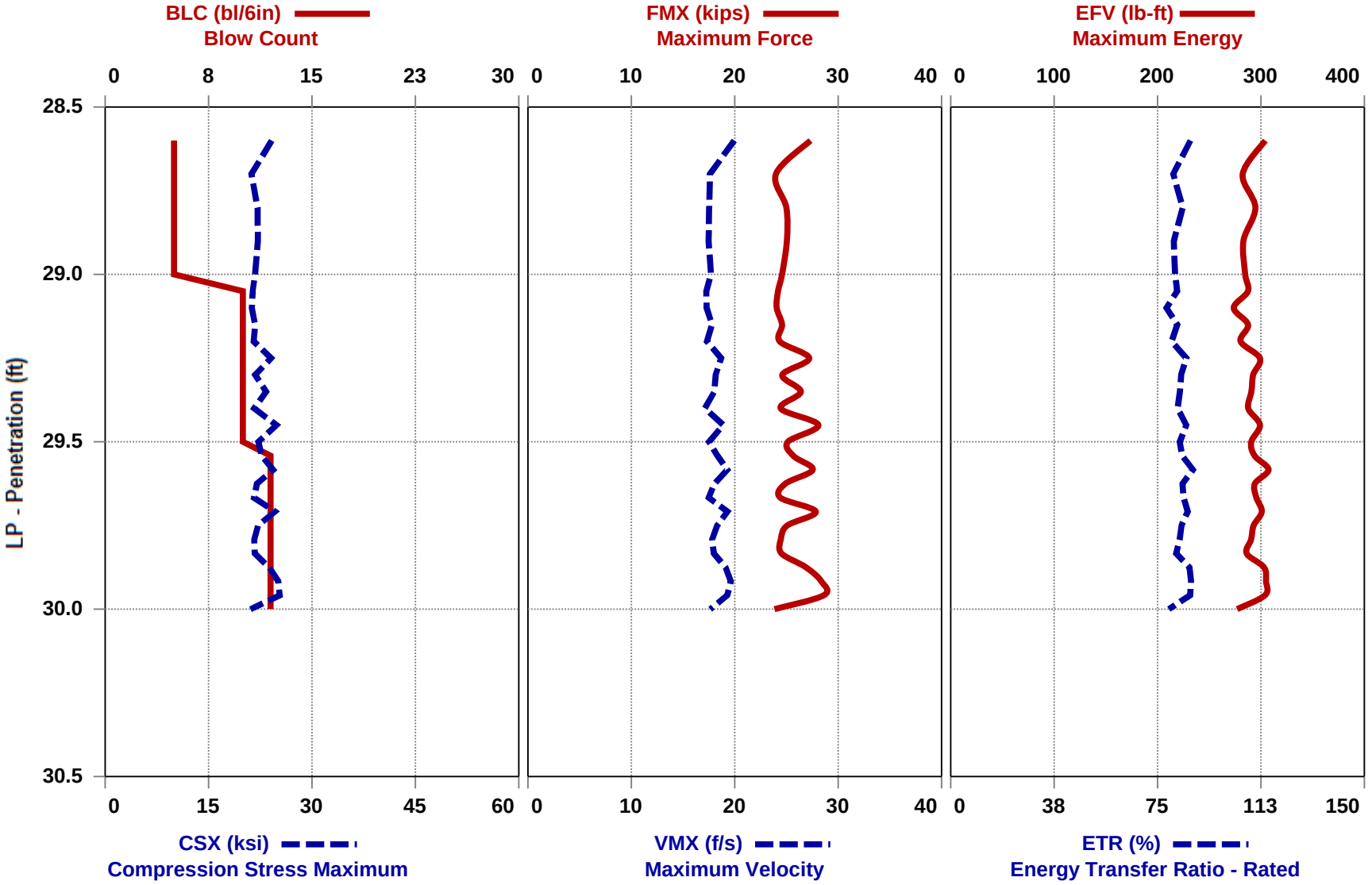
Instr. Length ft	Start Depth ft	Final Depth ft	Blows Applied /6"	**N Value**	**N60 Value**	Average BPM bpm	Average FMX kips	Average VMX ft/s	Average DMX in	Average CSX ksi	Average DFN in	Average EFV ft-lb	Average ETR %
33.60	28.50	30.00	**5-10-12**	**22**	**31**	51.6	25.7	18.2	0.8	22.7	0.5	292.6	83.6
38.60	33.50	35.00	**6-9-11**	**20**	**28**	52.3	27.3	18.0	0.9	24.2	0.6	297.2	84.9
43.60	38.50	40.00	**6-7-9**	**16**	**22**	51.6	28.2	17.8	1.2	24.9	0.7	313.8	89.7
				Overall Average Values:		51.8	26.9	18.0	0.9	23.8	0.6	300.0	85.7
				Standard Deviation:		0.4	1.7	0.8	0.2	1.5	0.1	12.7	3.6
				Overall Maximum Value:		52.6	30.1	19.6	1.4	26.6	0.9	327.9	93.7
				Overall Minimum Value:		51.4	23.8	16.5	0.5	21.1	0.5	273.7	78.2

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

Printed: 21-April-2025 Test started: 11-April-2025

CME 550X (SN 249533) - 28.5 TO 30.0

B-5



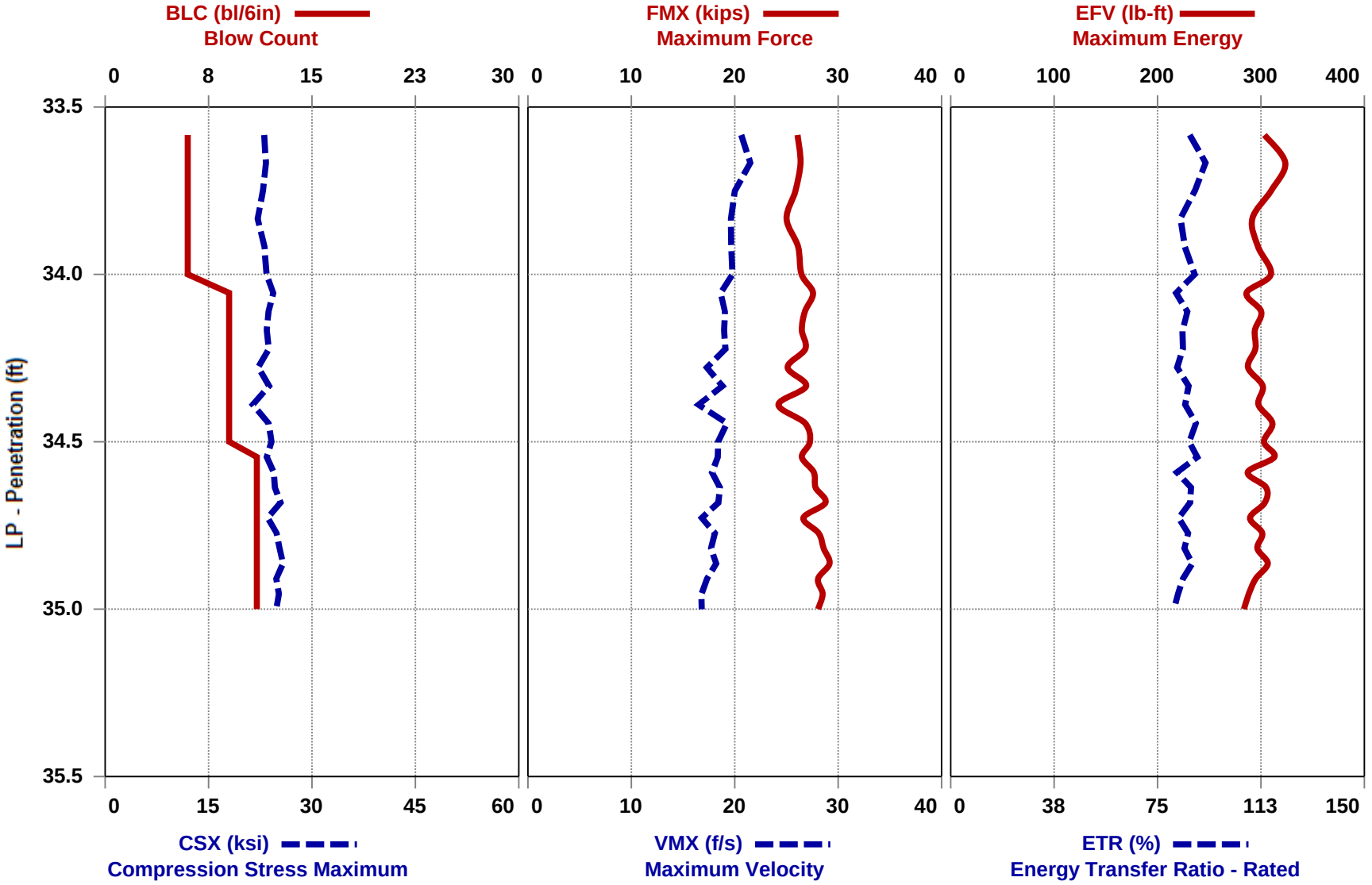
GRL Engineers, Inc. - PDIPLOT2 Ver 2021.1.61.0 - Case Method & iCAP® Results

Printed: 21-April-2025

Test started: 11-April-2025

CME 550X (SN 249533) - 33.5 TO 35.0

B-5

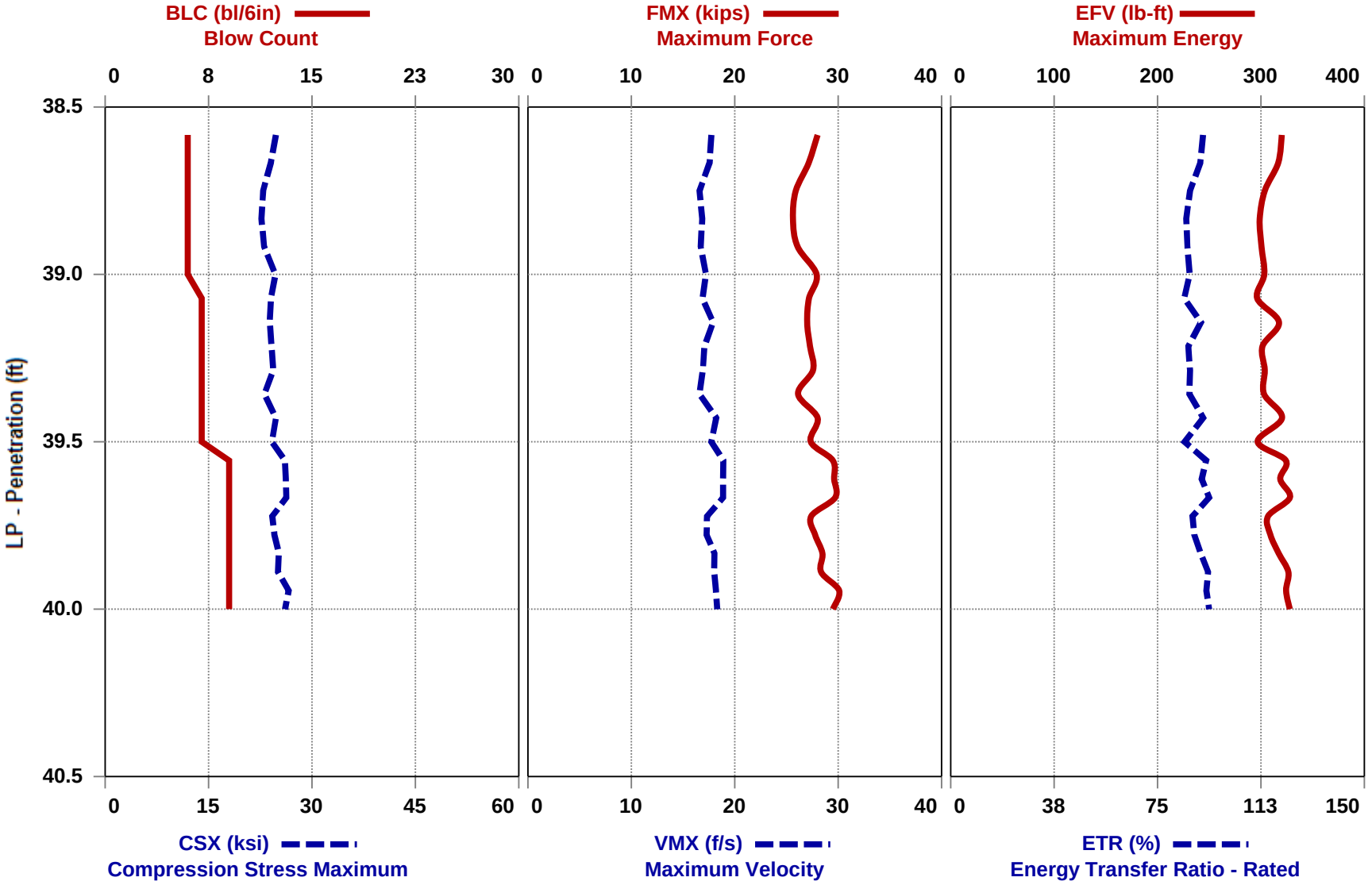


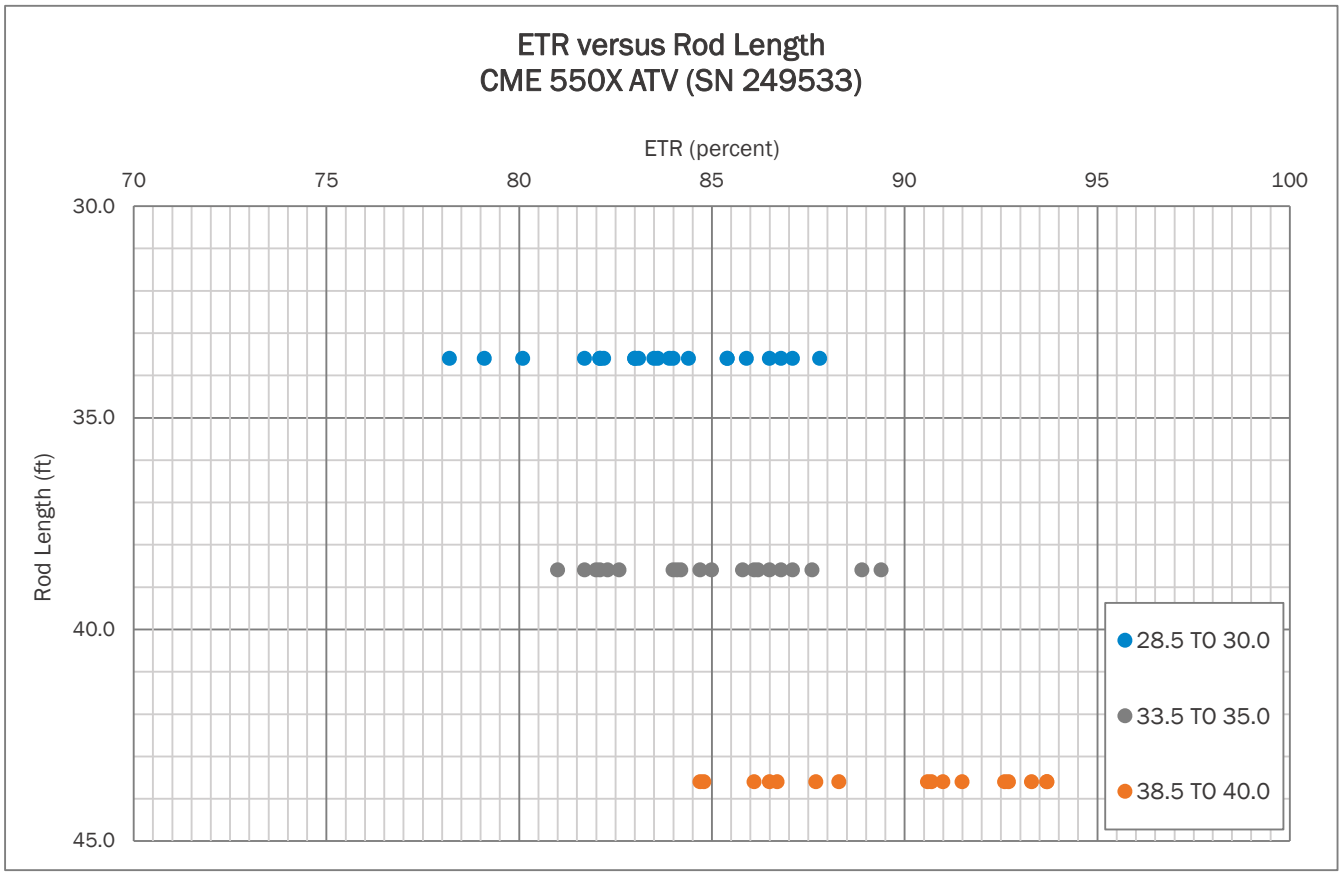
GRL Engineers, Inc. - PDIPLOT2 Ver 2021.1.61.0 - Case Method & iCAP® Results

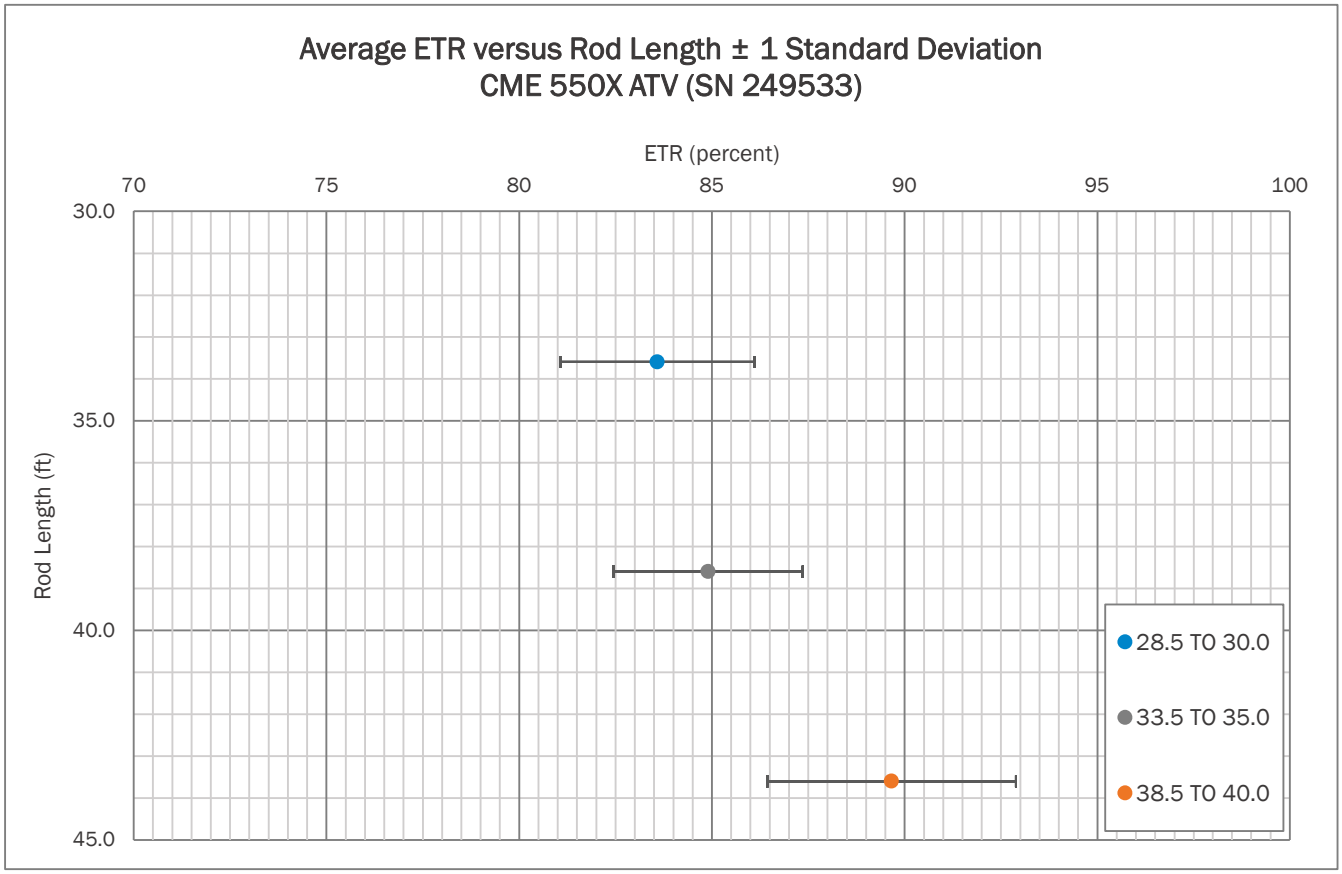
Printed: 21-April-2025 Test started: 11-April-2025

CME 550X (SN 249533) - 38.5 TO 40.0

B-5




ETR versus Rod Length
CME 550X ATV (SN 249533)
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 550X ATV (SN 249533)
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:**	4/11/2025
Project No.:	240021095	**Weather:**	50's / PARTLY CLOUDY
Boring No.:	B-5	**Drill Rod Type:**	AWJ

On-site Personnel

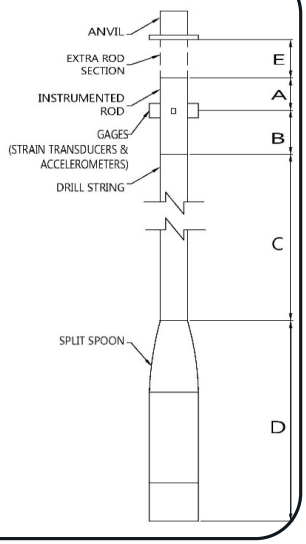
Drilling Company:	BRECCIA CONSTRUCTION, LLC
Rig Operator:	D. HARRIS
Engr/Geologist:	N/A
Client Rep.:	N/A
Analyzer Oper.:	R. KRAL

Rig/Hammer Info

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

Rod Info

(A + E) Impact Surface to Gages Length:	1.36	ft
(B) Instr. Rod Length below Gages:	0.70	ft
(A) + (B) Instr. Rod Length:	2.00	ft
(D) Spoon Length:	2.85	ft
(E) Rod Length Above Instr. Rod (if applicable):	0.06	ft
Instr. Rod S/N:	728AWJ	
Instr. Rod Outside Dia.:	1.75	in.
Instr. Rod Area:	1.13	in^2
PDA Make/Model:	SPT	
PDA Serial No.:	4549 TB	
Calib. Pulse Test (y/n):	Y	



Gage Info

Gage		Serial No.	Calibration No.
Accel.	A3	K10959	420.00
	A4	K10960/K11957	416.30/412.30
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.
11-Apr	28.5 TO 30.0	1101/1103	30	33.6	52	5	10	12	22	Y	SA SI
11-Apr	33.5 TO 35.0	1111/1112	35	38.6	52	6	9	11	20	Y	SA SI
11-Apr	38.5 TO 40.0	1120/1120	40	43.6	52	6	7	9	16	Y	SA SI

Notes:
TESTING PERFORMED AT 1817 LOWRYS HIGHWAY IN CHESTER, SOUTH CAROLINA (CHESTER COUNTY). THE APPROXIMATE COORDINATES ARE 34.7703698, -81.2451628. A4 ACCELEROMETER ISSUES, SWAPPED K10960 FOR K11957 BETWEEN INTERVALS.

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

Prepared By (print/signature)

4/11/2025
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: 4549 TB

was calibrated on 17 May 2024

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.



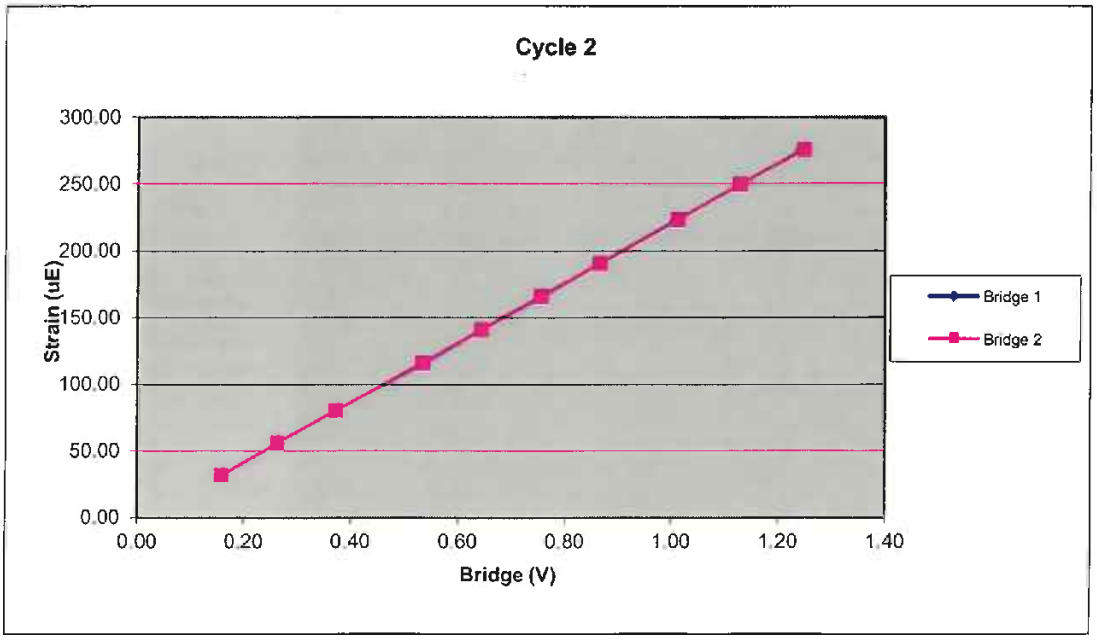
Tested by: MG

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

528AWJ		Cycle 2		
Sample	Force (lb)	Strain (µE)	Bridge 1 (V)	Bridge 2 (V)
1	0.00	0.00	0.00	0.00
2	1275.09	30.72	0.16	0.16
3	2117.68	54.81	0.26	0.26
4	3006.08	79.31	0.37	0.37
5	4307.49	114.86	0.54	0.53
6	5174.25	139.41	0.64	0.64
7	6086.83	164.67	0.76	0.76
8	6980.20	189.06	0.87	0.87
9	8159.37	222.00	1.01	1.01
10	9091.83	248.52	1.13	1.13
11	10060.07	274.72	1.25	1.25

Bridge 1		Bridge 2	
Force Calibration (lb/V)	8074.08	Force Calibration (lb/V)	8058.01
Offset	-15.56	Offset	-1.74
Correlation	0.999996	Correlation	0.999999
Strain Calibration (µE/V)	224.12	Strain Calibration (µE/V)	223.67
Offset	-4.79	Offset	-4.40
Correlation	0.999991	Correlation	0.999992

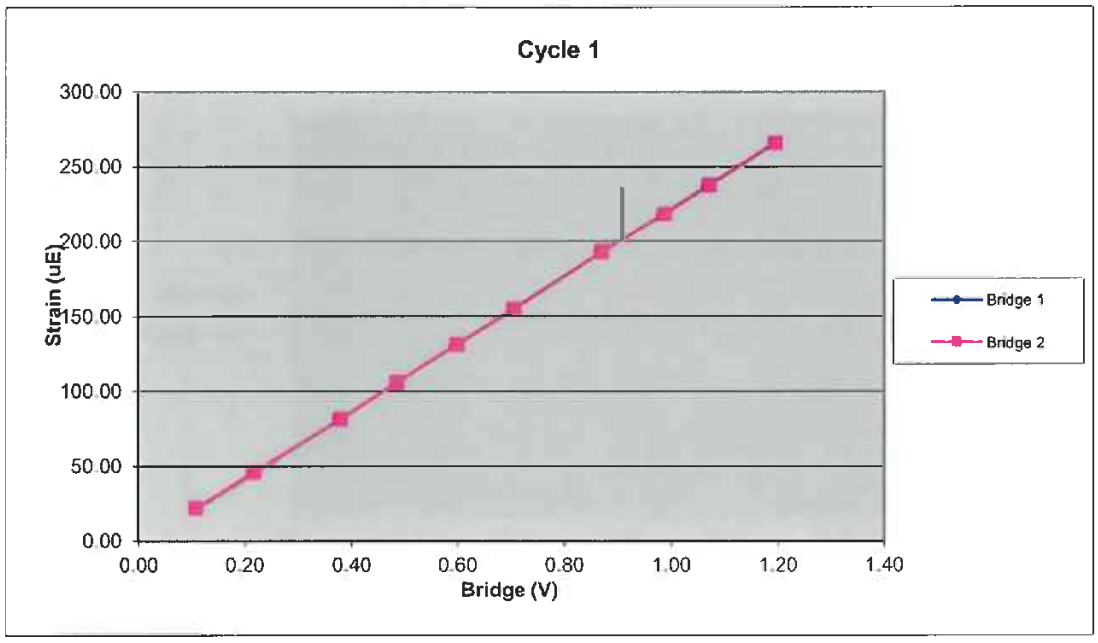
Force Strain Calibration	
EA (Kips)	36025.06
Offset	156.98
Correlation	0.999993



528AWJ		Cycle 1		
Sample	**Force (lb)**	**Strain (µE)**	**Bridge 1 (V)**	**Bridge 2 (V)**
1	0.00	0.00	0.00	0.00
2	884.31	20.98	0.11	0.11
3	1783.92	45.13	0.22	0.22
4	3073.53	80.67	0.38	0.38
5	3932.89	105.36	0.49	0.49
6	4836.79	130.28	0.60	0.60
7	5716.12	154.14	0.70	0.71
8	7053.40	191.99	0.87	0.87
9	7971.93	217.29	0.99	0.99
10	8671.71	236.63	1.07	1.07
11	9674.35	264.84	1.20	1.20

Bridge 1		**Bridge 2**	
Force Calibration (lb/V)	**8081.78**	**Force Calibration (lb/V)**	**8061.53**
Offset	10.48	Offset	19.76
Correlation	0.999997	Correlation	0.999997
Strain Calibration (µE/V)	**224.52**	**Strain Calibration (µE/V)**	**223.96**
Offset	-3.88	Offset	-3.62
Correlation	0.999994	Correlation	0.999991

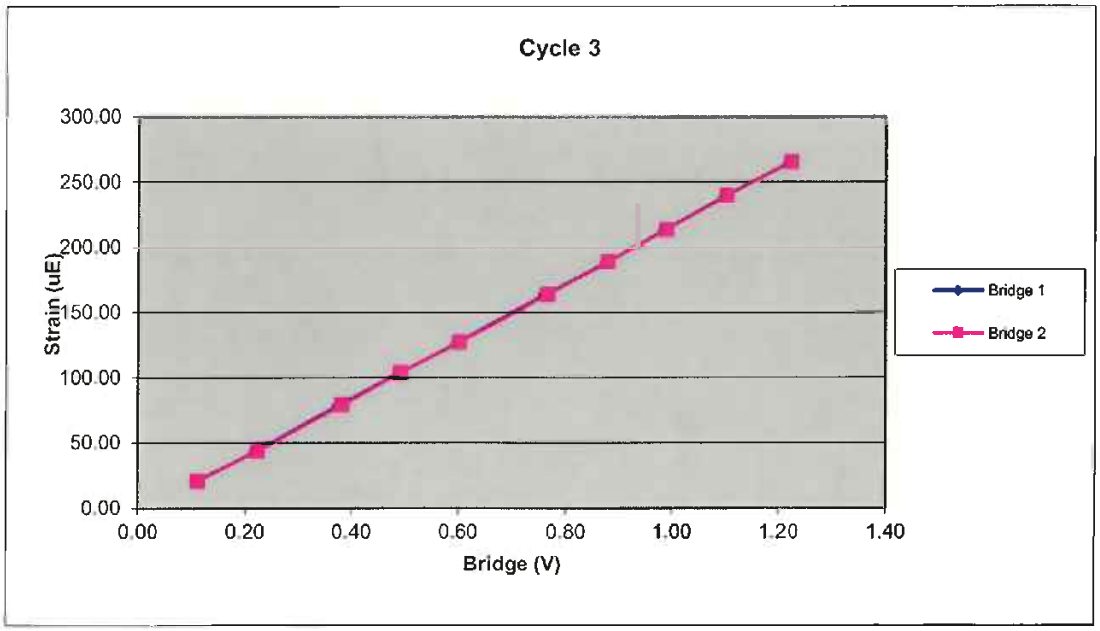
Force Strain Calibration	
EA (Kips)	**35995.56**
Offset	150.23
Correlation	0.999991



528AWJ		Cycle 3		
Sample	**Force (lb)**	**Strain (µE)**	**Bridge 1 (V)**	**Bridge 2 (V)**
1	0.00	0.00	0.00	0.00
2	901.56	19.94	0.11	0.11
3	1793.96	43.13	0.22	0.22
4	3064.57	78.60	0.38	0.38
5	3959.40	103.11	0.49	0.49
6	4851.51	126.42	0.60	0.60
7	6166.76	162.91	0.76	0.77
8	7098.54	187.86	0.88	0.88
9	7986.55	212.63	0.99	0.99
10	8919.01	238.54	1.10	1.10
11	9888.22	264.36	1.22	1.23

Bridge 1		**Bridge 2**	
Force Calibration (lb/V)	**8075.82**	**Force Calibration (lb/V)**	**8080.86**
Offset	**7.47**	Offset	**-14.23**
Correlation	**0.999999**	Correlation	**0.999998**
Strain Calibration (µE/V)	**220.19**	**Strain Calibration (µE/V)**	**220.33**
Offset	**-5.00**	Offset	**-5.59**
Correlation	**0.999981**	Correlation	**0.999982**

Force Strain Calibration	
EA (Kips)	**36675.33**
Offset	**190.88**
Correlation	**0.999985**



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

Calibration Factors	528AWJ		
Bridge 1 (µE/V)	222.94	Bridge 2 (µE/V)	222.65
EA Factor (Kips)	36231.98	Area (in^2)	1.21

Calibrated by: 
Calibrated Date: 6/17/2024

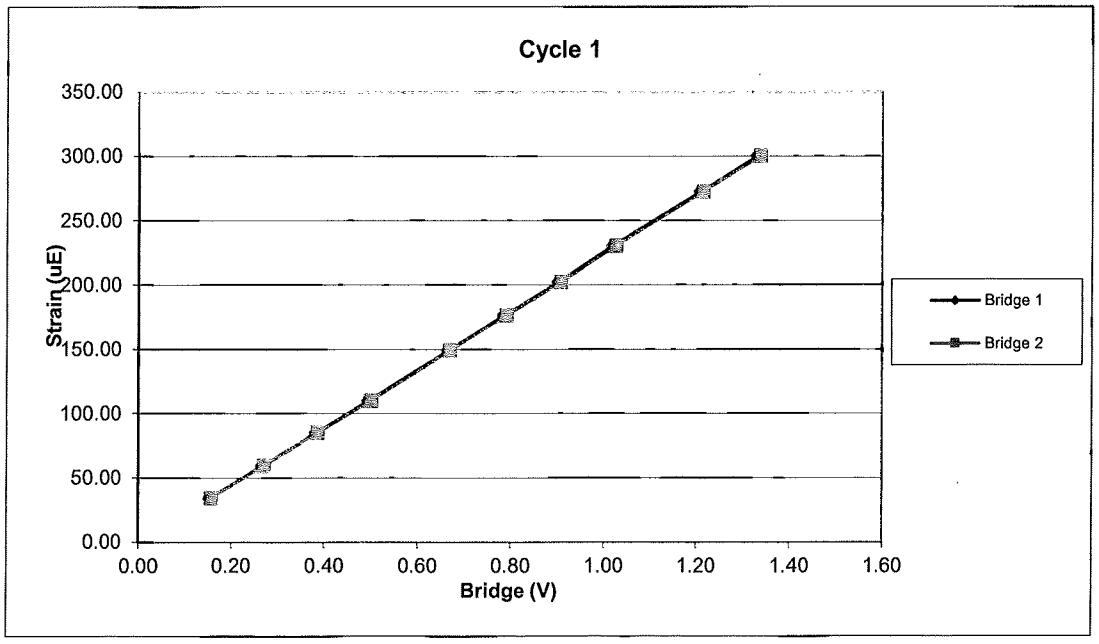
Pile Dynamics Inc
30725 Aurora Rd
Solon, OH 44139

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

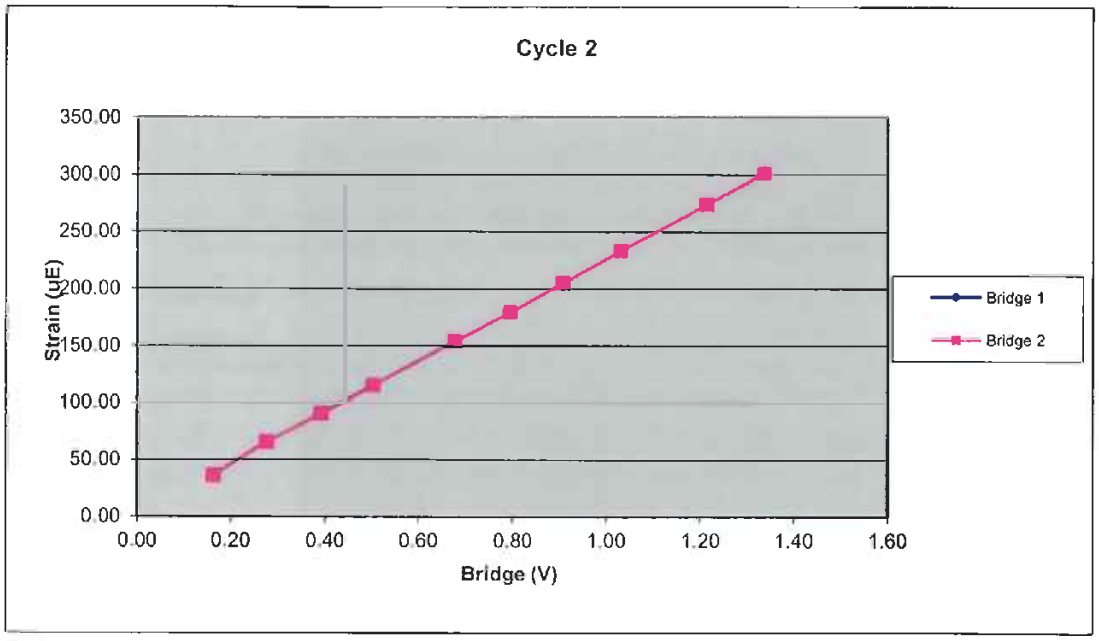
Force Strain Calibration	
EA (Kips)	**33548.47**
Offset	63.54
Correlation	0.999983



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**

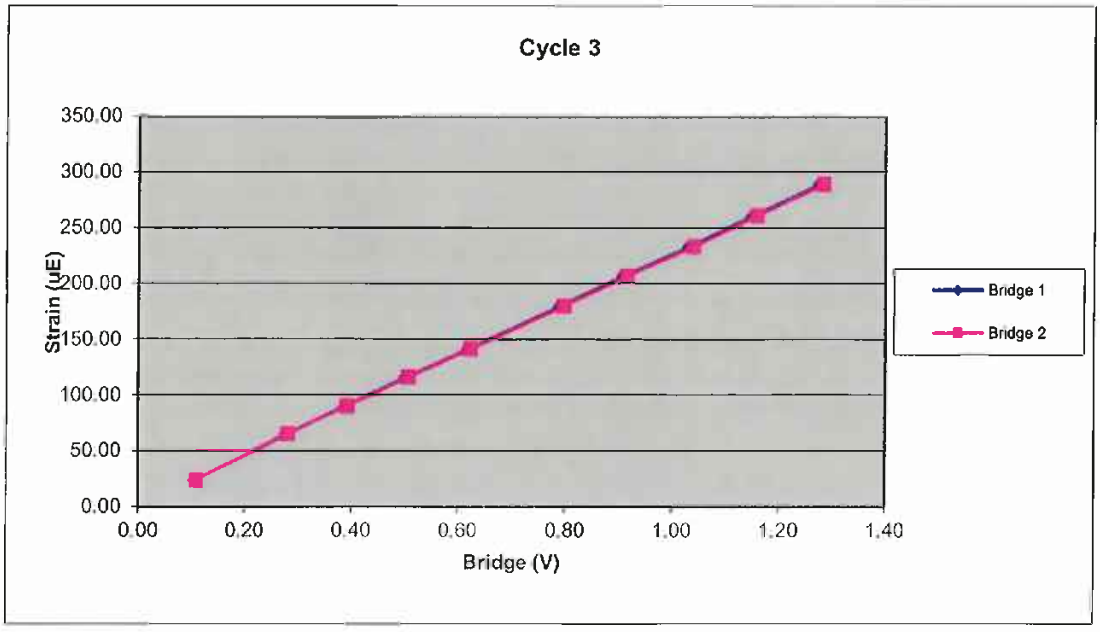
Force Strain Calibration	
EA (Kips)	**33843.24**
Offset	**-37.68**
Correlation	**0.999950**



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
Solon, OH 44139

Traceable to N.I.S.T.

Accelerometer Calibration Certificate
Pile Dynamics, Inc.

Calibrated by Pile Dynamics, Inc.
Calibration performed on 11Jul2024

Serial No:	K11957	**Temperature:**	24.9 °C
Model:	PR	**Humidity:**	54%
Calibrated on:	Channel 4 on 8G 5161 LE		

Ref Acc 1:	78270! 971 g's/volt	**Cal on:**	11Jan2024
Ref Acc 2:	78268! 986 g's/volt	**Cal on:**	11Jan2024

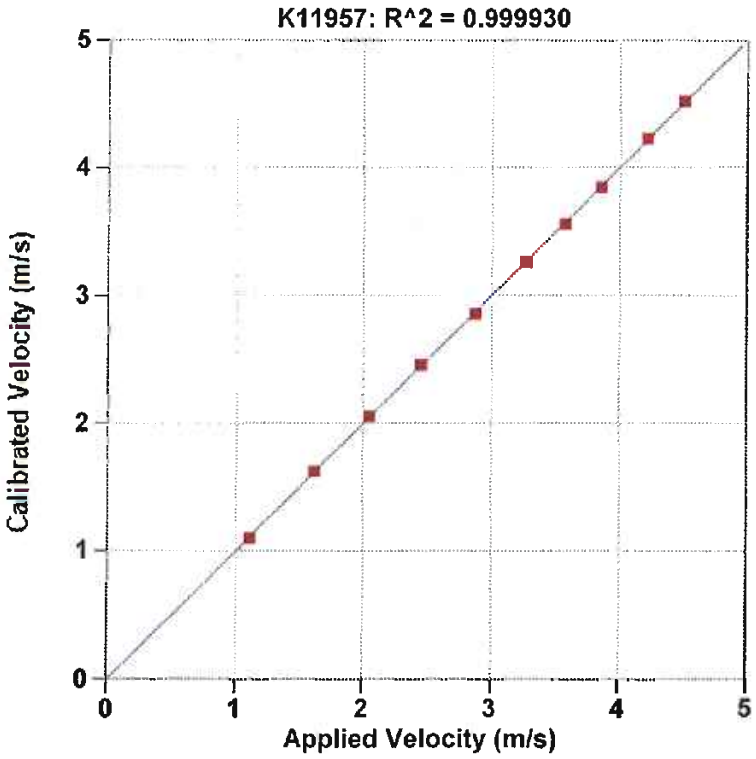
Reference accelerometer calibrations are traceable to the United States National Institute of Standards and Technology (NIST).

PDA CALIBRATION FACTOR

412.3 mv/5000g
(82.5 µv/g)
R^2: 0.999930 [Chip programmed]

Operator: William Johnson

Signed



Reference Velocity	S/N K11957 Velocity
m/s	m/s
1.113	1.104
1.621	1.626
2.052	2.057
2.451	2.459
2.874	2.861
3.272	3.266
3.574	3.565
3.858	3.850
4.220	4.230
4.510	4.521

Maximum Acceleration: 975 g's

Accelerometer Calibration Certificate
Pile Dynamics, Inc.

Calibrated by Pile Dynamics, Inc.
Calibration performed on 11Jul2024

Serial No:	K10959	**Temperature:**	24.9 °C
Model:	PR	**Humidity:**	55%
Calibrated on:	Channel 4 on 8G 5161 LE		

Ref Acc 1:	78270! 971 g's/volt	**Cal on:**	11Jan2024
Ref Acc 2:	78268! 986 g's/volt	**Cal on:**	11Jan2024

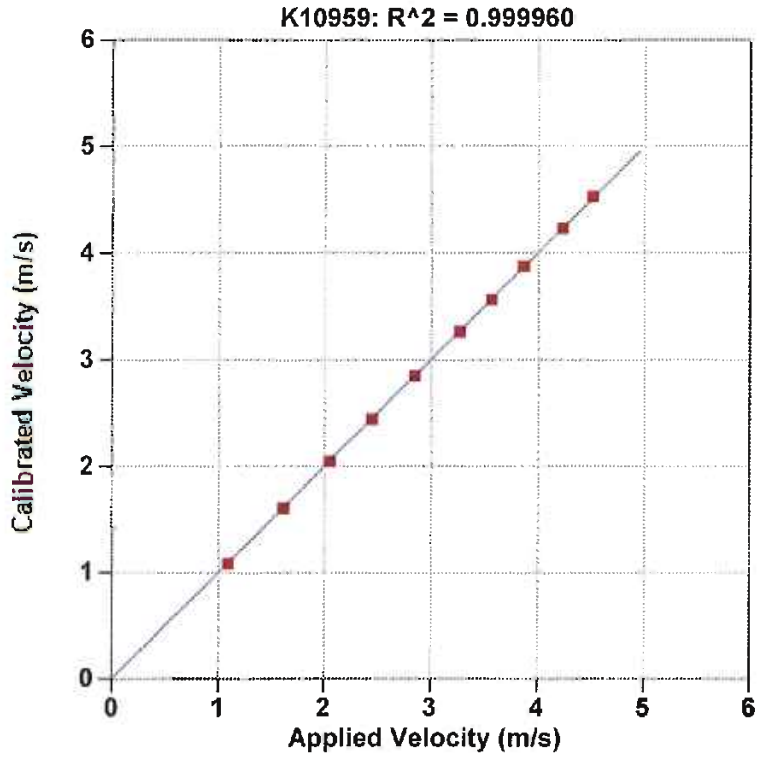
Reference accelerometer calibrations are traceable to the United States National Institute of Standards and Technology (NIST).

PDA CALIBRATION FACTOR

420.0 mv/5000g
(84.0 µv/g)
R^2: 0.999960 [Chip programmed]

Operator: William Johnson

Signed



Reference Velocity	S/N K10959 Velocity
m/s	m/s
1.091	1.084
1.611	1.607
2.051	2.046
2.449	2.442
2.851	2.852
3.271	3.264
3.571	3.564
3.872	3.878
4.232	4.232
4.516	4.531

Maximum Acceleration: 976 g's

Accelerometer Calibration Certificate
Pile Dynamics, Inc.

Calibrated by Pile Dynamics, Inc.
Calibration performed on 11Jul2024

Serial No:	K10960	**Temperature:**	24.9 °C
Model:	PR	**Humidity:**	55%
Calibrated on:	Channel 3 on 8G 5161 LE		

Ref Acc 1:	78270! 971 g's/volt	**Cal on:**	11Jan2024
Ref Acc 2:	78268! 986 g's/volt	**Cal on:**	11Jan2024

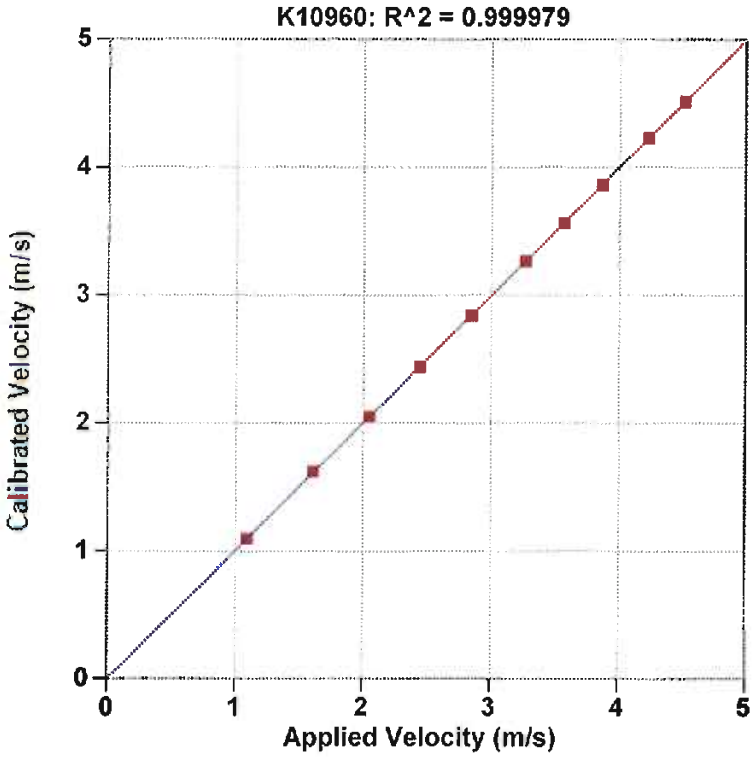
Reference accelerometer calibrations are traceable to the United States National Institute of Standards and Technology (NIST).

PDA CALIBRATION FACTOR

416.3 mv/5000g
(83.3 µv/g)
R^2: 0.999979 [Chip programmed]

Operator: William Johnson

Signed



Reference Velocity	S/N K10960 Velocity
m/s	m/s
1.091	1.095
1.611	1.622
2.051	2.053
2.449	2.443
2.851	2.847
3.271	3.271
3.571	3.571
3.872	3.866
4.232	4.237
4.516	4.517

Maximum Acceleration: 976 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

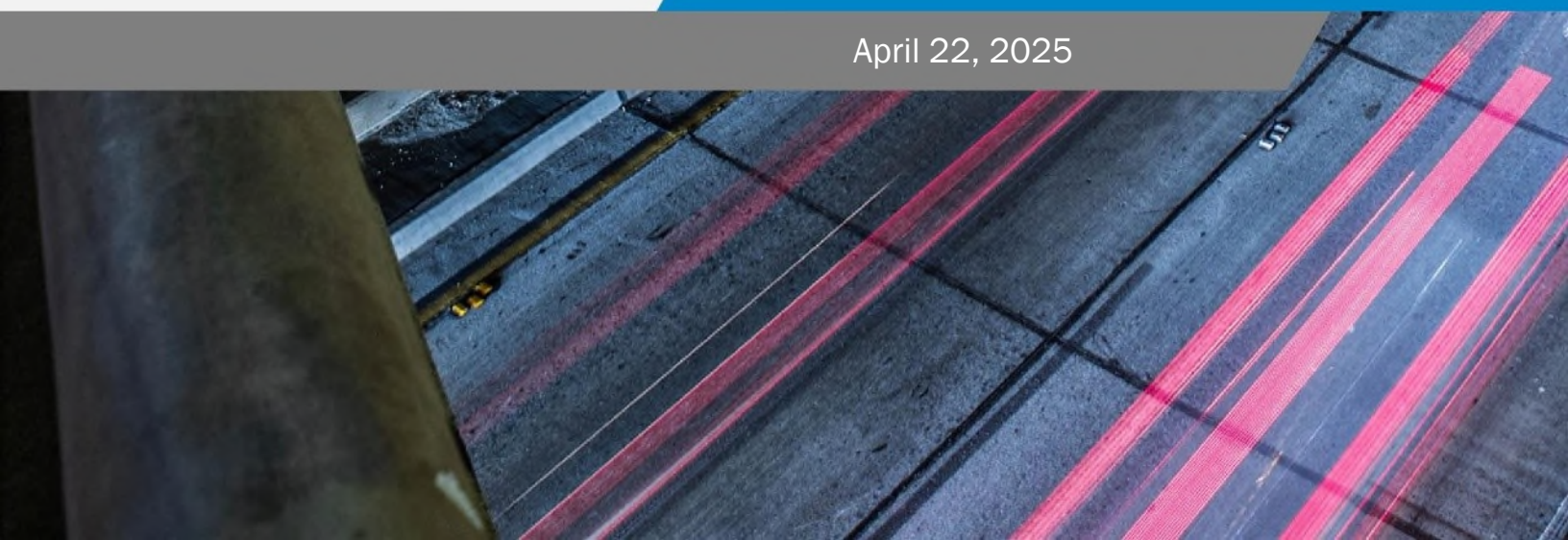


CAROLINAS GEOTECHNICAL GROUP

Report of SPT Hammer Energy

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

April 22, 2025



CAROLINAS GEOTECHNICAL GROUP

N.C. Firm License: P-1904

1805 Sardis Rd N
Suite 100
Charlotte, NC 28270

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

April 22, 2025

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

SUBJECT: **Report of SPT Hammer Energy**
Breccia Construction, LLC CME 550X ATV Rig (SN 244323)
Chester, South Carolina
CG2 Project No.: 240021095

Dear Mr. Shannon:

Carolinas Geotechnical Group, PLLC (CG2) has completed the Standard Penetration Test (SPT) energy measurements on the automatic hammer mounted on a Breccia Construction, LLC (Breccia) CME 550X ATV-mounted drill rig with a serial number of 244323, see attached Drill Rig Photo Log. This service was performed by Mr. Robert E. Kral, PE on April 11, 2025. 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 9, 2025.

DYNAMIC TESTING METHODOLOGY

Testing was performed using a model SPT (Serial No. 4549 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 11, 2025 to observe and perform high-strain dynamic testing during SPT sampling on the CME 550X ATV-mounted drill rig operated by J. Phillips of Breccia. The measurements were taken during drilling operations at 1817 Lowrys Highway in Chester, South Carolina (Chester County). The approximate coordinates (not professionally surveyed) for the test location are 34.7704222, -81.2451179. No Soil Test Boring Log was maintained. SPT energy measurements were recorded during three intervals at depths of approximately 28½, 33½, and 38½ feet below the existing ground surface. The information presented in the table below summarizes the equipment tested and tooling used during the SPT energy measurements.

Table 1: SPT Field Data

Drill Rig Information	
Manufacturer	CME
Model	550X
Serial Number	244323
Operator	J. Phillips
Carrier	ATV
Hammer Information	
Model / Type	CME / Auto
Serial Number	N/A
Anvil Height (inches)	11.5
Anvil Diameter (inches)	2.5
Drop Height (inches)	30
Ram Weight (pounds)	140
Ram Serial Number	N/A
Drilling and Instrumented Rod Information	
Drill Rod Type	AWJ
OD (inches)	1.75
ID (inches)	1.25
Cross-Sectional Area (in^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, the automatic hammer on the CME 550X ATV-mounted drill rig operated at a rate of about 44.7 to 56.0 blows per minute (BPM) during dynamic testing. The measured transferred hammer energy (EFV) ranged from 311.4 to 354.7 foot-pounds, which corresponds to Energy Transfer Ratio (ETR) values of 89.0 to 101.4%, 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	5-10-11 / 21	SA SILT	55.6	343.8	98.2
2	33½ - 35	35	38.6	4-5-8 / 13	SA SILT	50.1	339.6	97.0
3	38½ - 40	40	43.6	4-5-5 / 10	SA SILT	48.9	326.5	93.3
					Overall Average	**52.4**	**338.6**	**96.7**

The average hammer rate, transferred energy, and transfer ratio were calculated for each depth interval. Per ASTM D4633, only the blows from the final foot of each sample interval (i.e., the blows that determine the N-value) were included when computing the average values shown in Table 2. The overall average transferred hammer energy for the automatic hammer on the CME 550X ATV-mounted drill rig (for the depth intervals presented in Table 2) was 338.6 foot-pounds, with an average ETR of 96.7%.

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

Signed by:
Pressley M. Perry
9A08DF24DA0A440...
Pressley M. Perry, EIT
Staff Professional

Signed by:
Robert E. Kral
AAF88FE73C5E4B1...
Robert E. Kral, PE
Geotechnical Design Manager
NC Registration No. 042642



Appendices:

- Appendix I - CME 550X ATV Rig (SN 244323) SPT Energy Measurements Summary Plots and Tables
- Appendix II - SPT Hammer Energy Field Form (Field Log) and Drill Rig Photo Log
- Appendix III - Instrumented Rod and Accelerometer Calibration Sheets
- Appendix IV - Certificate of Proficiency

APPENDIX I

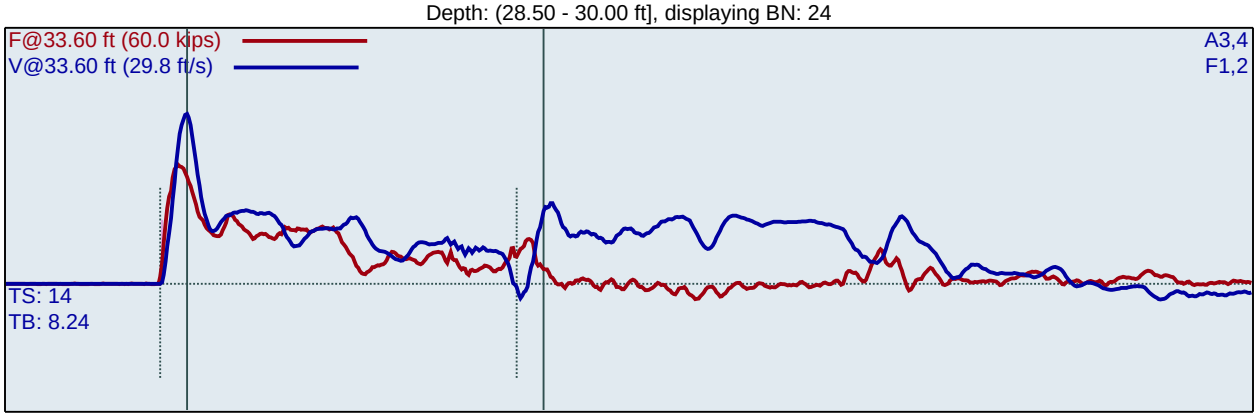
CME 550X (SN 244323)
REK
B-2

B-2
Interval start: 4/11/2025

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: 24



F1 : [728AWJ1] 224.649 PDICAL (1) FF1
F2 : [728AWJ2] 224.139 PDICAL (1) FF1

A3 (PR): [K10959] 420.036 mv/6.4v/5000g (1) VF1
A4 (PR): [K10960] 416.342 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	%
28.60	1	5	58.0	28.1	19.6	1.4	24.9	1.2	329.5	94.2
28.70	2	5	49.0	28.2	19.7	1.5	25.0	1.2	332.3	94.9
28.80	3	5	51.9	27.1	19.9	1.5	24.0	1.2	342.4	97.8
28.90	4	5	55.0	29.2	20.4	1.4	25.9	1.2	344.2	98.3
29.00	5	5	55.4	28.1	20.1	1.3	24.9	1.2	338.5	96.7
29.05	6	10	54.8	29.3	20.8	1.1	25.9	0.6	350.6	100.2
29.10	7	10	55.4	28.1	20.1	1.0	24.9	0.6	353.1	100.9
29.15	8	10	55.3	28.7	20.0	1.0	25.4	0.6	350.0	100.0
29.20	9	10	55.6	28.1	20.5	0.9	24.9	0.6	339.2	96.9
29.25	10	10	55.5	27.9	19.9	0.9	24.7	0.6	335.7	95.9
29.30	11	10	55.6	28.9	20.4	1.0	25.6	0.6	345.5	98.7
29.35	12	10	55.7	27.7	19.8	0.9	24.5	0.6	337.4	96.4
29.40	13	10	55.2	28.3	19.9	0.8	25.1	0.6	339.6	97.0
29.45	14	10	55.8	28.7	19.8	0.9	25.4	0.6	346.4	99.0
29.50	15	10	55.8	29.3	20.7	0.9	25.9	0.6	350.6	100.2
29.55	16	11	55.7	28.8	19.9	0.9	25.5	0.5	346.6	99.0
29.59	17	11	55.9	29.2	20.7	0.9	25.8	0.5	350.3	100.1
29.64	18	11	55.7	28.3	19.7	0.8	25.0	0.5	339.9	97.1
29.68	19	11	55.7	29.0	20.3	0.9	25.6	0.5	351.2	100.3
29.73	20	11	55.8	29.6	20.6	0.9	26.2	0.5	353.3	100.9
29.77	21	11	55.9	27.2	19.5	0.8	24.1	0.5	333.7	95.4
29.82	22	11	55.5	28.5	20.0	0.8	25.3	0.5	340.8	97.4
29.86	23	11	56.0	28.3	20.3	0.8	25.1	0.5	335.9	96.0
29.91	24	11	55.6	27.9	19.7	0.8	24.7	0.5	336.8	96.2
29.95	25	11	55.7	28.8	20.2	0.9	25.5	0.5	348.4	99.6
30.00	26	11	55.6	27.5	19.9	0.8	24.3	0.5	334.8	95.7

Average	55.6	28.5	20.1	0.9	25.2	0.6	343.8	98.2
Std Dev	0.3	0.6	0.4	0.1	0.6	0.0	6.6	1.9
Maximum	56.0	29.6	20.8	1.1	26.2	0.6	353.3	100.9
Minimum	54.8	27.2	19.5	0.8	24.1	0.5	333.7	95.4

N-value: 21

Sample Interval Time: 27.20 seconds.

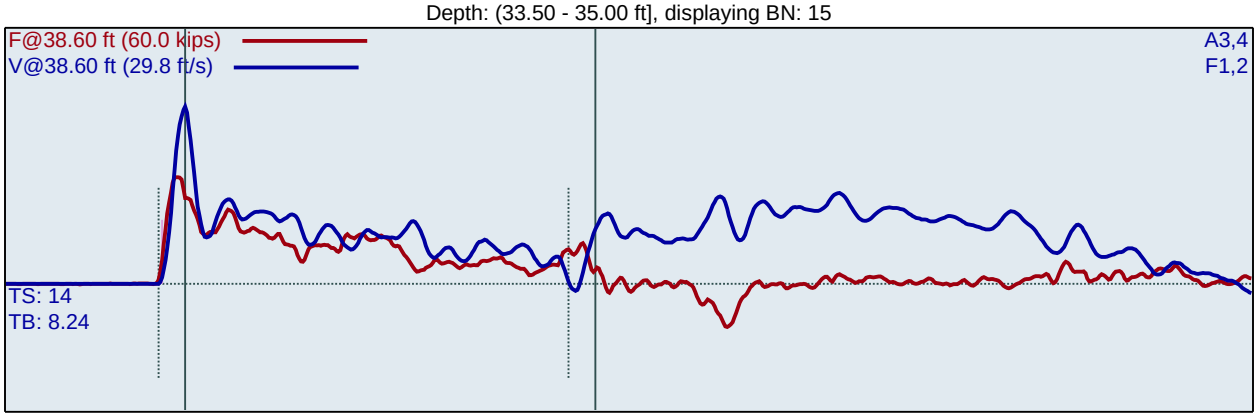
CME 550X (SN 244323)
REK
B-2

B-2
Interval start: 4/11/2025

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: 15



F1 : [728AWJ1] 224.649 PDICAL (1) FF1
F2 : [728AWJ2] 224.139 PDICAL (1) FF1

A3 (PR): [K10959] 420.036 mv/6.4v/5000g (1) VF1
A4 (PR): [K10960] 416.342 mv/6.4v/5000g (1) VF1

LP ft	BL#	BC /6"	BPM bpm	FMX kips	VMX ft/s	DMX in	CSX ksi	DFN in	EFV ft-lb	ETR %
33.63	1	4	1.9	26.7	20.4	2.1	23.7	1.5	340.4	97.3
33.75	2	4	54.9	25.8	20.8	2.1	22.8	1.5	346.0	98.8
33.88	3	4	55.4	26.3	21.3	2.1	23.3	1.5	340.5	97.3
34.00	4	4	56.0	26.0	21.0	2.2	23.0	1.5	353.2	100.9
34.10	5	5	55.8	25.7	21.4	1.8	22.7	1.2	353.3	100.9
34.20	6	5	51.1	25.6	21.8	1.6	22.6	1.2	338.4	96.7
34.30	7	5	50.0	24.8	21.2	1.6	21.9	1.2	339.3	96.9
34.40	8	5	49.7	25.9	21.8	1.5	22.9	1.2	351.4	100.4
34.50	9	5	49.5	24.6	21.1	1.6	21.7	1.2	347.1	99.2
34.56	10	8	49.3	23.8	20.7	1.5	21.0	0.7	337.1	96.3
34.63	11	8	49.6	24.1	20.8	1.6	21.3	0.8	354.7	101.4
34.69	12	8	49.3	25.3	20.8	1.1	22.4	0.7	327.1	93.5
34.75	13	8	49.2	23.5	20.6	1.4	20.8	0.7	344.3	98.4
34.81	14	8	49.5	23.5	20.2	1.3	20.8	0.7	336.4	96.1
34.88	15	8	49.3	25.0	20.6	1.2	22.1	0.8	328.0	93.7
34.94	16	8	49.5	25.1	21.2	1.1	22.2	0.7	330.3	94.4
35.00	17	8	49.3	24.6	20.9	1.2	21.8	0.8	327.0	93.4
		Average	50.1	24.7	21.0	1.4	21.9	0.9	339.6	97.0
		Std Dev	1.7	0.8	0.5	0.2	0.7	0.2	9.6	2.7
		Maximum	55.8	25.9	21.8	1.8	22.9	1.2	354.7	101.4
		Minimum	49.2	23.5	20.2	1.1	20.8	0.7	327.0	93.4

N-value: 13

Sample Interval Time: 18.84 seconds.

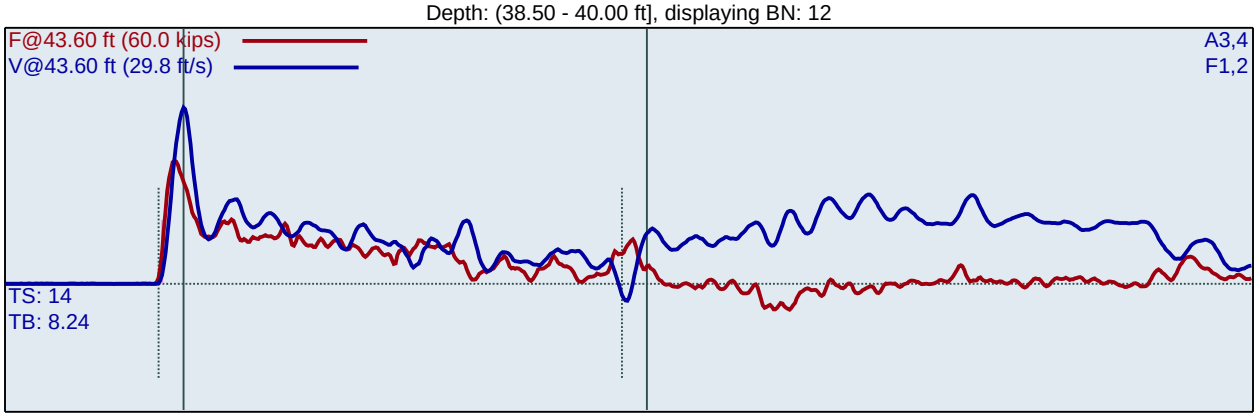
CME 550X (SN 244323)
REK
B-2

B-2
Interval start: 4/11/2025

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: 12



F1 : [728AWJ1] 224.649 PDICAL (1) FF1
F2 : [728AWJ2] 224.139 PDICAL (1) FF1

A3 (PR): [K10959] 420.036 mv/6.4v/5000g (1) VF1
A4 (PR): [K10960] 416.342 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 %
38.63	1	4	1.9	28.1	19.4	2.0	24.9	1.5	332.3	94.9
38.75	2	4	44.5	27.0	20.2	2.0	23.9	1.5	328.0	93.7
38.88	3	4	44.7	27.7	19.5	1.7	24.5	1.5	316.0	90.3
39.00	4	4	45.0	27.1	19.7	1.7	24.0	1.5	313.0	89.4
39.10	5	5	44.7	26.9	19.6	1.6	23.8	1.2	319.9	91.4
39.20	6	5	44.9	27.0	19.7	1.5	23.9	1.2	311.4	89.0
39.30	7	5	45.2	27.3	20.1	1.5	24.2	1.2	328.3	93.8
39.40	8	5	48.7	27.7	20.3	1.5	24.5	1.2	332.5	95.0
39.50	9	5	50.8	27.3	20.1	1.4	24.1	1.2	334.4	95.5
39.60	10	5	51.0	28.2	20.7	1.4	25.0	1.2	329.4	94.1
39.70	11	5	51.0	29.0	20.8	1.3	25.7	1.2	331.1	94.6
39.80	12	5	50.9	28.9	20.5	1.3	25.5	1.2	328.6	93.9
39.90	13	5	51.1	29.3	20.6	1.2	25.9	1.2	329.7	94.2
40.00	14	5	50.5	27.1	20.3	1.3	24.0	1.2	319.5	91.3
		Average	48.9	27.9	20.3	1.4	24.7	1.2	326.5	93.3
		Std Dev	2.7	0.9	0.4	0.1	0.8	0.0	6.8	1.9
		Maximum	51.1	29.3	20.8	1.6	25.9	1.2	334.4	95.5
		Minimum	44.7	26.9	19.6	1.2	23.8	1.2	311.4	89.0

N-value: 10

Sample Interval Time: 16.38 seconds.

Summary of SPT Test Results

Project: CME 550X (SN 244323), Test Date: 4/11/2025

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

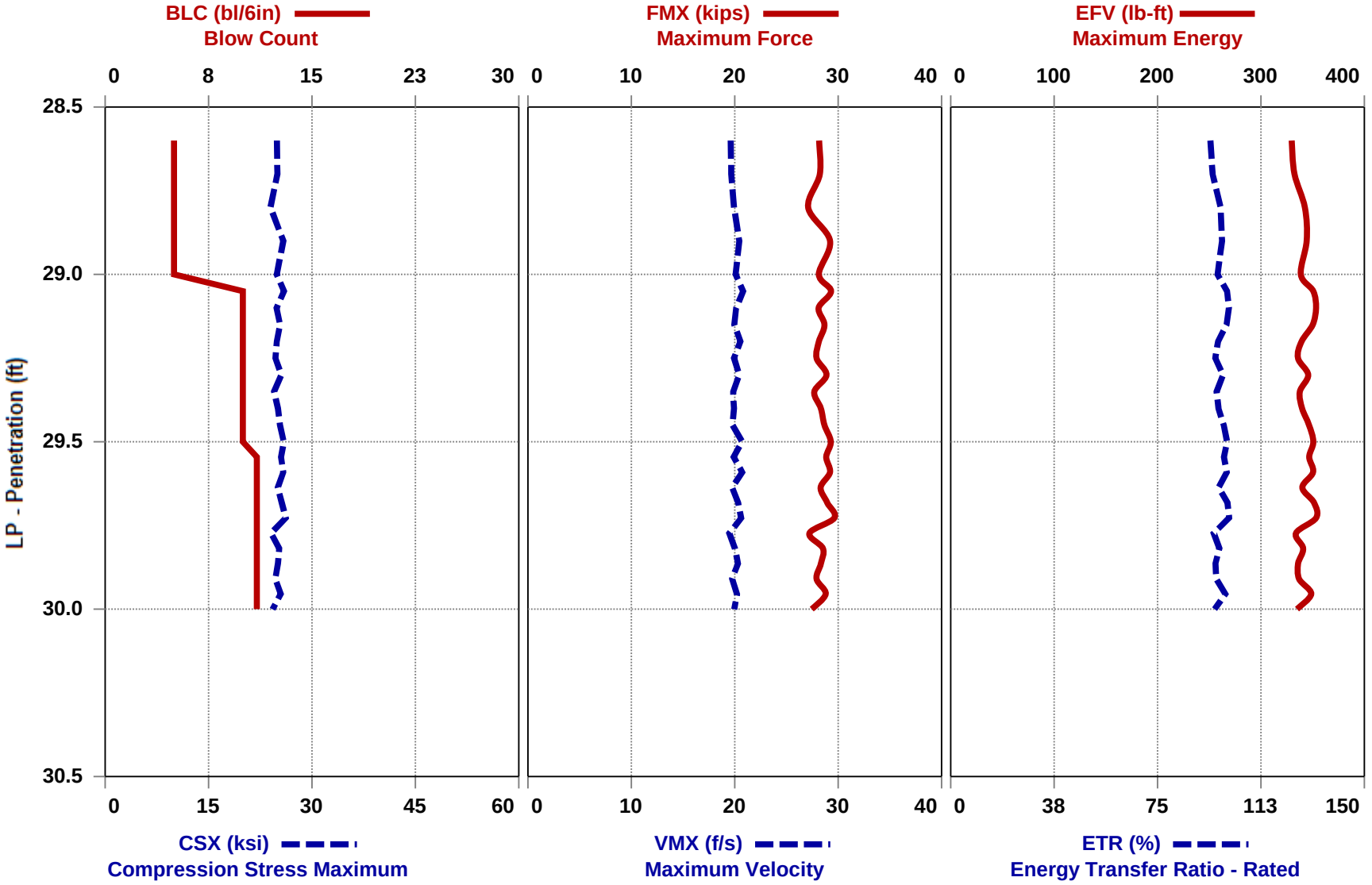
Instr. Length ft	Start Depth ft	Final Depth ft	Blows Applied /6"	**N Value**	**N60 Value**	Average BPM bpm	Average FMX kips	Average VMX ft/s	Average DMX in	Average CSX ksi	Average DFN in	Average EFV ft-lb	Average ETR %
33.60	28.50	30.00	**5-10-11**	**21**	**33**	55.6	28.5	20.1	0.9	25.2	0.6	343.8	98.2
38.60	33.50	35.00	**4-5-8**	**13**	**20**	50.1	24.7	21.0	1.4	21.9	0.9	339.6	97.0
43.60	38.50	40.00	**4-5-5**	**10**	**16**	48.9	27.9	20.3	1.4	24.7	1.2	326.5	93.3
				Overall Average Values:		52.4	27.2	20.4	1.2	24.1	0.8	338.6	96.7
				Standard Deviation:		3.4	1.8	0.5	0.3	1.6	0.3	10.2	2.9
				Overall Maximum Value:		56.0	29.6	21.8	1.8	26.2	1.2	354.7	101.4
				Overall Minimum Value:		44.7	23.5	19.5	0.8	20.8	0.5	311.4	89.0

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

Printed: 18-April-2025 Test started: 11-April-2025

CME 550X (SN 244323) - 28.5 TO 30.0

B-2

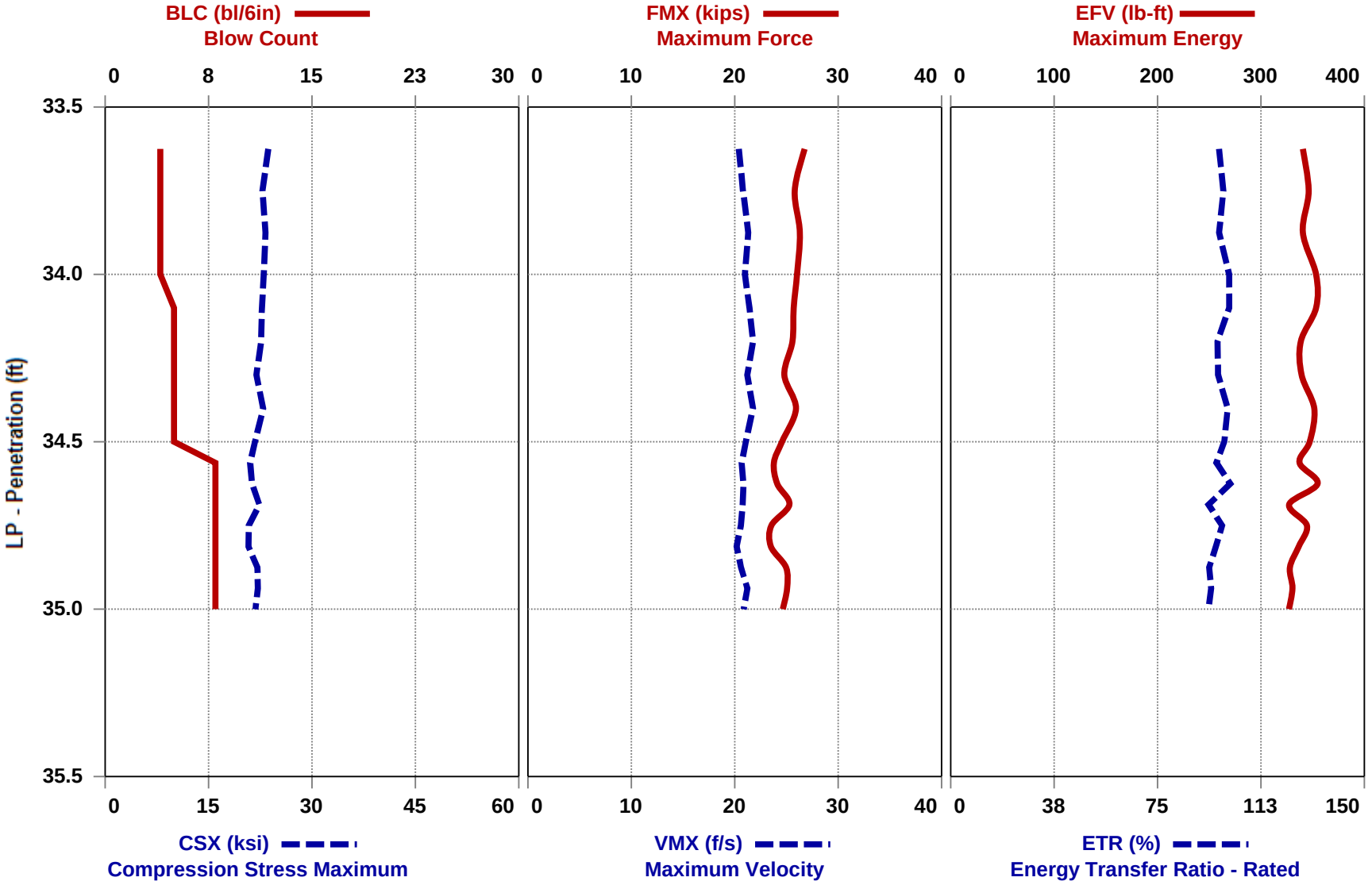


GRL Engineers, Inc. - PDIPLOT2 Ver 2021.1.61.0 - Case Method & iCAP® Results

Printed: 18-April-2025 Test started: 11-April-2025

CME 550X (SN 244323) - 33.5 TO 35.0

B-2

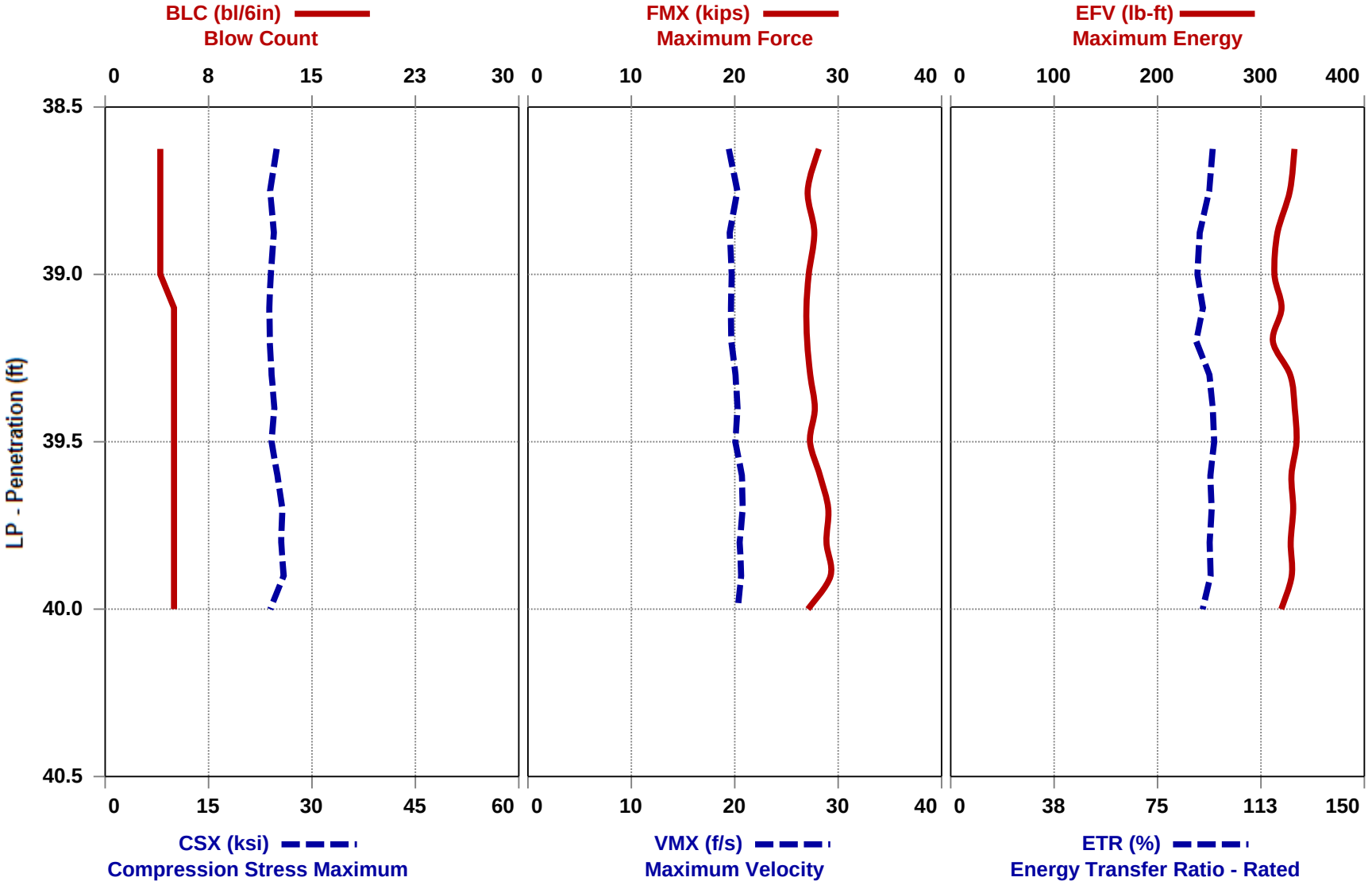


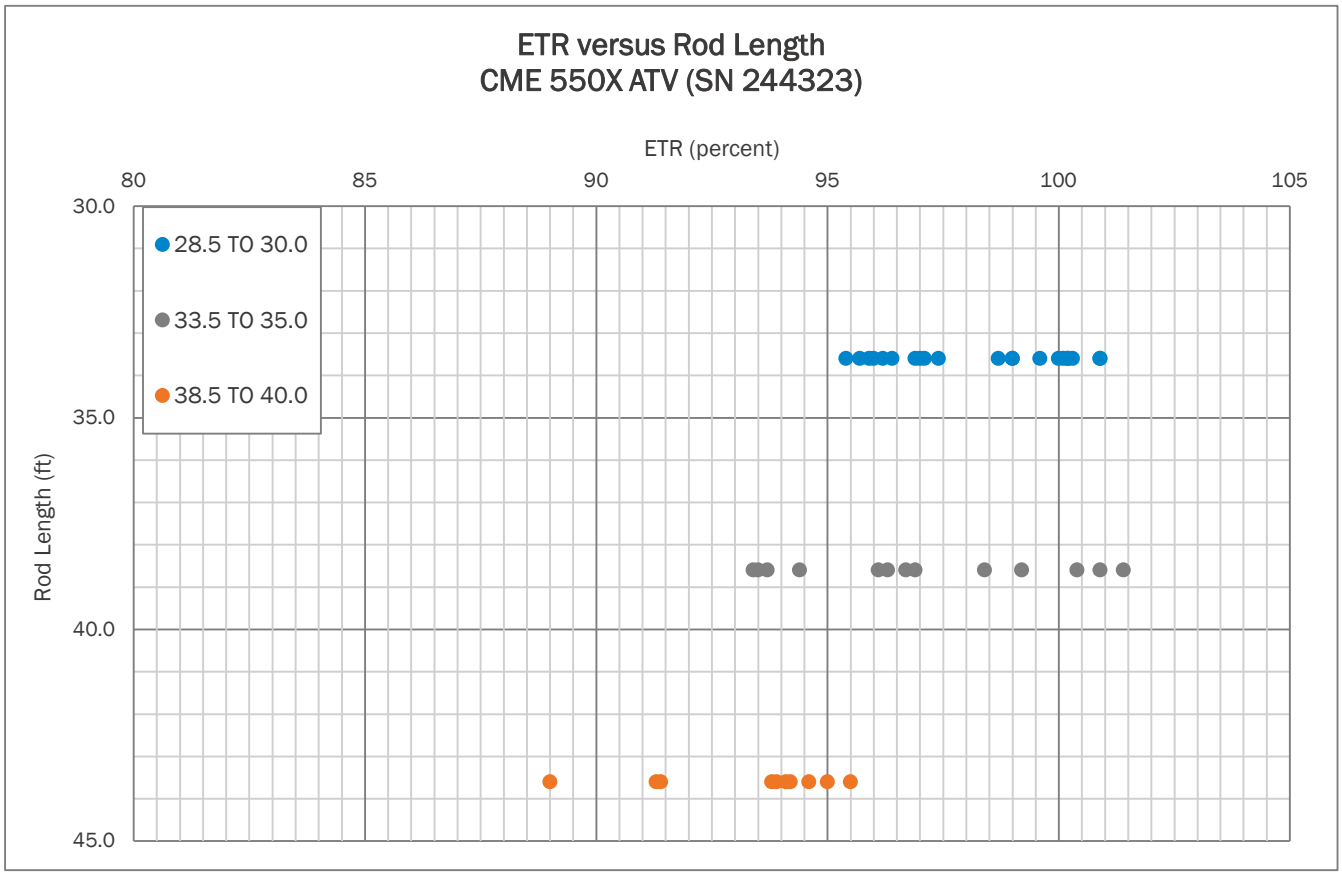
GRL Engineers, Inc. - PDIPLOT2 Ver 2021.1.61.0 - Case Method & iCAP® Results

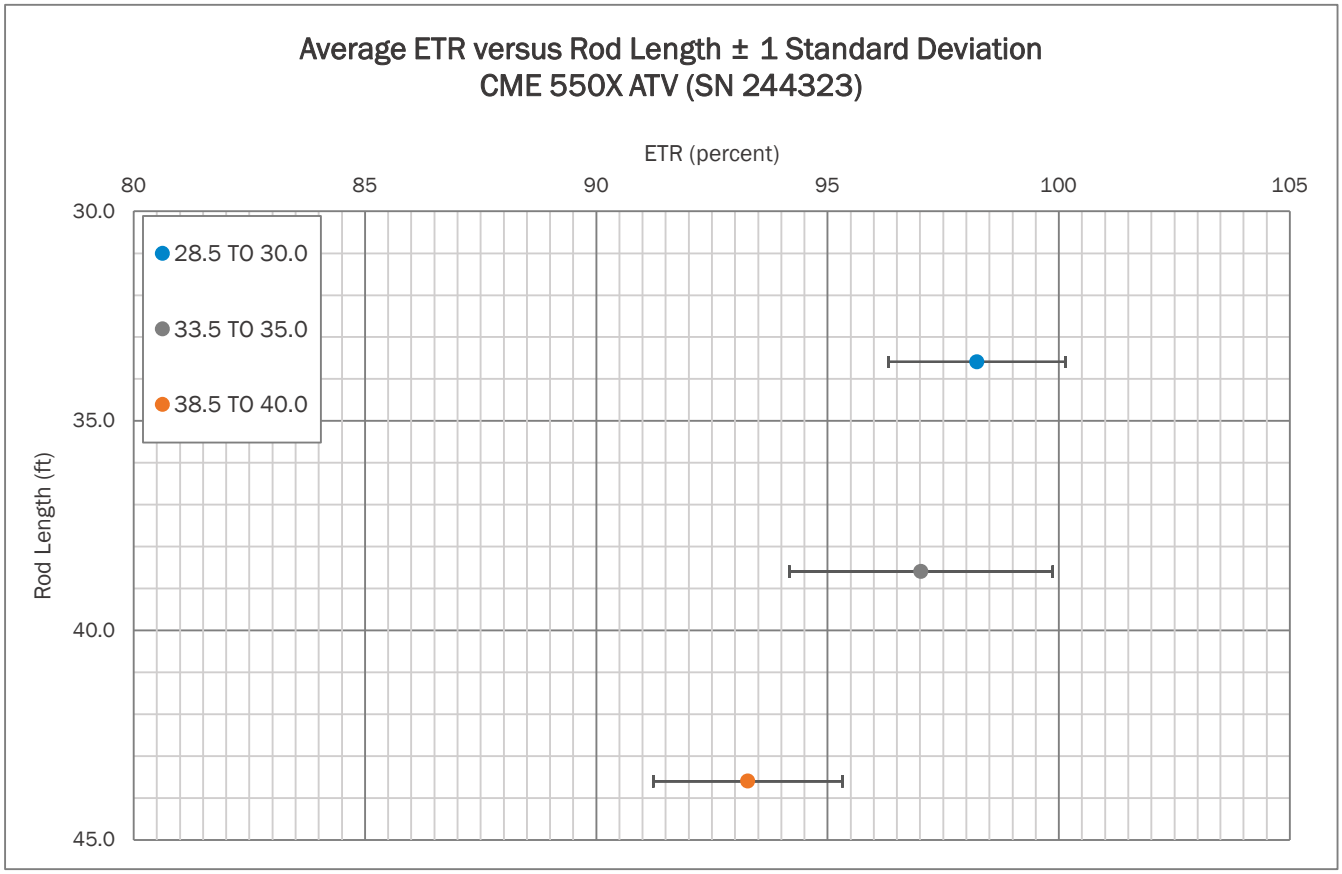
Printed: 18-April-2025 Test started: 11-April-2025

CME 550X (SN 244323) - 38.5 TO 40.0

B-2




ETR versus Rod Length
CME 550X ATV (SN 244323)
ETR (percent)
80
85
90
95
100
105
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 550X ATV (SN 244323)
ETR (percent)
80
85
90
95
100
105
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:**	4/11/2025
Project No.:	240021095	**Weather:**	50's / PARTLY CLOUDY
Boring No.:	B-2	**Drill Rod Type:**	AWJ

On-site Personnel

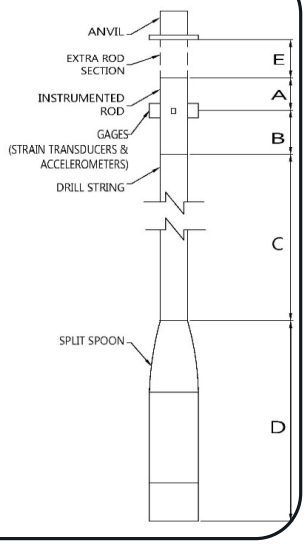
Drilling Company:	BRECCIA CONSTRUCTION, LLC
Rig Operator:	J. PHILLIPS
Engr/Geologist:	N/A
Client Rep.:	N/A
Analyzer Oper.:	R. KRAL

Rig/Hammer Info

Drill Rig Make/Model:	CME 550X
Carrier Type:	ATV
Rig Serial No.:	244323
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.:	4549 TB	
Calib. Pulse Test (y/n):	Y	



Gage Info

Gage		Serial No.	Calibration No.
Accel.	A3	K10959	420.00
	A4	K10960	416.30
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.
11-Apr	28.5 TO 30.0	1008/1008	30	33.6	55	5	10	11	21	Y	SA SI
11-Apr	33.5 TO 35.0	1019/1019	35	38.6	50	4	5	8	13	Y	SA SI
11-Apr	38.5 TO 40.0	1027/1027	40	43.6	51	4	5	5	10	Y	SA SI

Notes:
TESTING PERFORMED AT 1817 LOWRYS HIGHWAY IN CHESTER, SOUTH CAROLINA (CHESTER COUNTY). THE APPROXIMATE COORDINATES ARE 34.7704222, -81.2451179.

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)

4/11/2025
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: 4549 TB

was calibrated on 17 May 2024

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.



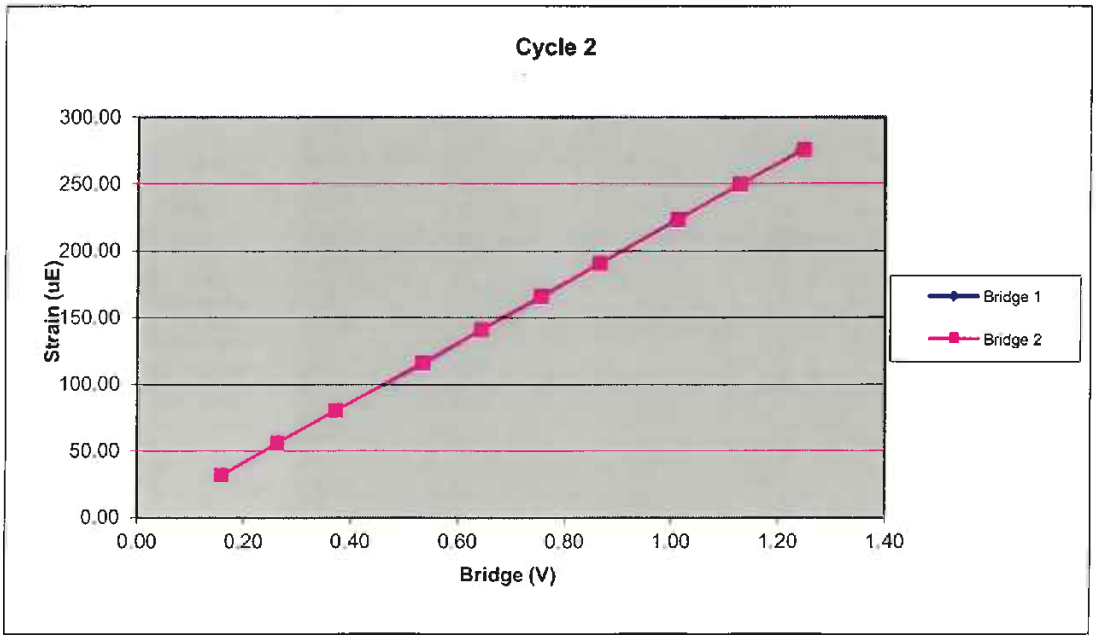
Tested by: MG

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

528AWJ		Cycle 2		
Sample	Force (lb)	Strain (µE)	Bridge 1 (V)	Bridge 2 (V)
1	0.00	0.00	0.00	0.00
2	1275.09	30.72	0.16	0.16
3	2117.68	54.81	0.26	0.26
4	3006.08	79.31	0.37	0.37
5	4307.49	114.86	0.54	0.53
6	5174.25	139.41	0.64	0.64
7	6086.83	164.67	0.76	0.76
8	6980.20	189.06	0.87	0.87
9	8159.37	222.00	1.01	1.01
10	9091.83	248.52	1.13	1.13
11	10060.07	274.72	1.25	1.25

Bridge 1		Bridge 2	
Force Calibration (lb/V)	8074.08	Force Calibration (lb/V)	8058.01
Offset	-15.56	Offset	-1.74
Correlation	0.999996	Correlation	0.999999
Strain Calibration (µE/V)	224.12	Strain Calibration (µE/V)	223.67
Offset	-4.79	Offset	-4.40
Correlation	0.999991	Correlation	0.999992

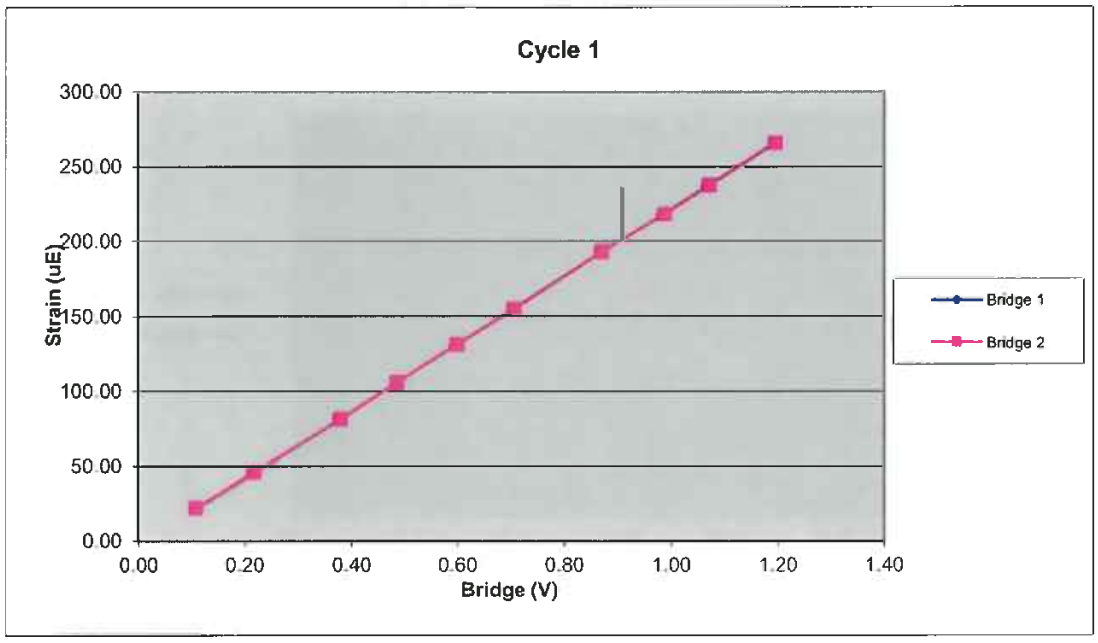
Force Strain Calibration	
EA (Kips)	36025.06
Offset	156.98
Correlation	0.999993



528AWJ		Cycle 1		
Sample	**Force (lb)**	**Strain (µE)**	**Bridge 1 (V)**	**Bridge 2 (V)**
1	0.00	0.00	0.00	0.00
2	884.31	20.98	0.11	0.11
3	1783.92	45.13	0.22	0.22
4	3073.53	80.67	0.38	0.38
5	3932.89	105.36	0.49	0.49
6	4836.79	130.28	0.60	0.60
7	5716.12	154.14	0.70	0.71
8	7053.40	191.99	0.87	0.87
9	7971.93	217.29	0.99	0.99
10	8671.71	236.63	1.07	1.07
11	9674.35	264.84	1.20	1.20

Bridge 1		**Bridge 2**	
Force Calibration (lb/V)	**8081.78**	**Force Calibration (lb/V)**	**8061.53**
Offset	10.48	Offset	19.76
Correlation	0.999997	Correlation	0.999997
Strain Calibration (µE/V)	**224.52**	**Strain Calibration (µE/V)**	**223.96**
Offset	-3.88	Offset	-3.62
Correlation	0.999994	Correlation	0.999991

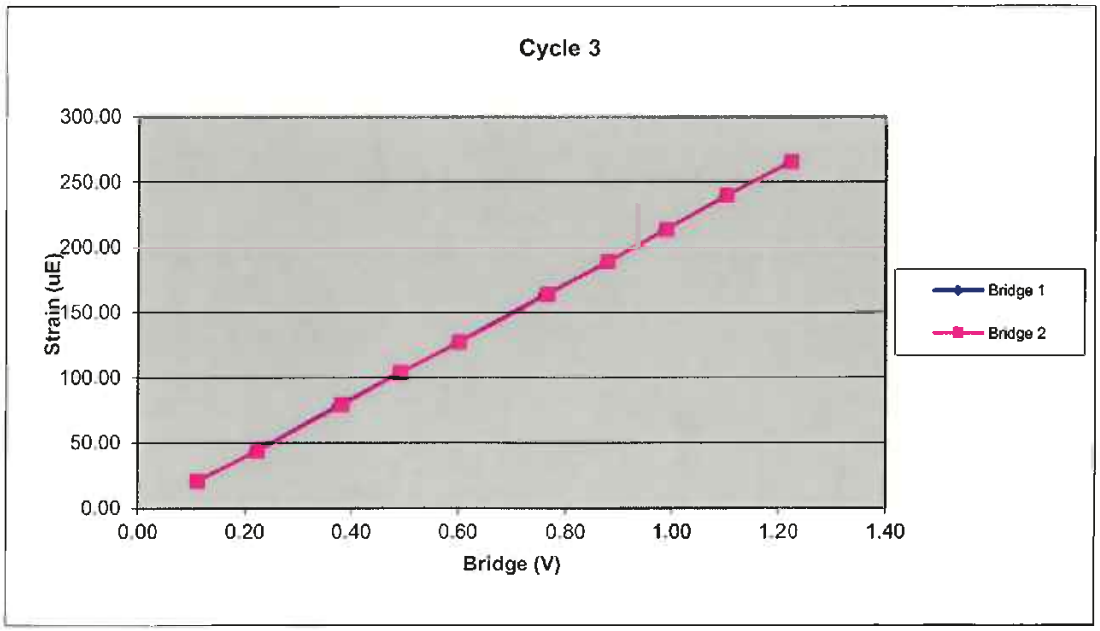
Force Strain Calibration	
EA (Kips)	**35995.56**
Offset	150.23
Correlation	0.999991



528AWJ		Cycle 3		
Sample	**Force (lb)**	**Strain (µE)**	**Bridge 1 (V)**	**Bridge 2 (V)**
1	0.00	0.00	0.00	0.00
2	901.56	19.94	0.11	0.11
3	1793.96	43.13	0.22	0.22
4	3064.57	78.60	0.38	0.38
5	3959.40	103.11	0.49	0.49
6	4851.51	126.42	0.60	0.60
7	6166.76	162.91	0.76	0.77
8	7098.54	187.86	0.88	0.88
9	7986.55	212.63	0.99	0.99
10	8919.01	238.54	1.10	1.10
11	9888.22	264.36	1.22	1.23

Bridge 1		**Bridge 2**	
Force Calibration (lb/V)	**8075.82**	**Force Calibration (lb/V)**	**8080.86**
Offset	**7.47**	Offset	**-14.23**
Correlation	**0.999999**	Correlation	**0.999998**
Strain Calibration (µE/V)	**220.19**	**Strain Calibration (µE/V)**	**220.33**
Offset	**-5.00**	Offset	**-5.59**
Correlation	**0.999981**	Correlation	**0.999982**

Force Strain Calibration	
EA (Kips)	**36675.33**
Offset	**190.88**
Correlation	**0.999985**



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

Calibration Factors	528AWJ		
Bridge 1 (µE/V)	222.94	Bridge 2 (µE/V)	222.65
EA Factor (Kips)	36231.98	Area (in^2)	1.21

Calibrated by: 
Calibrated Date: 6/17/2024

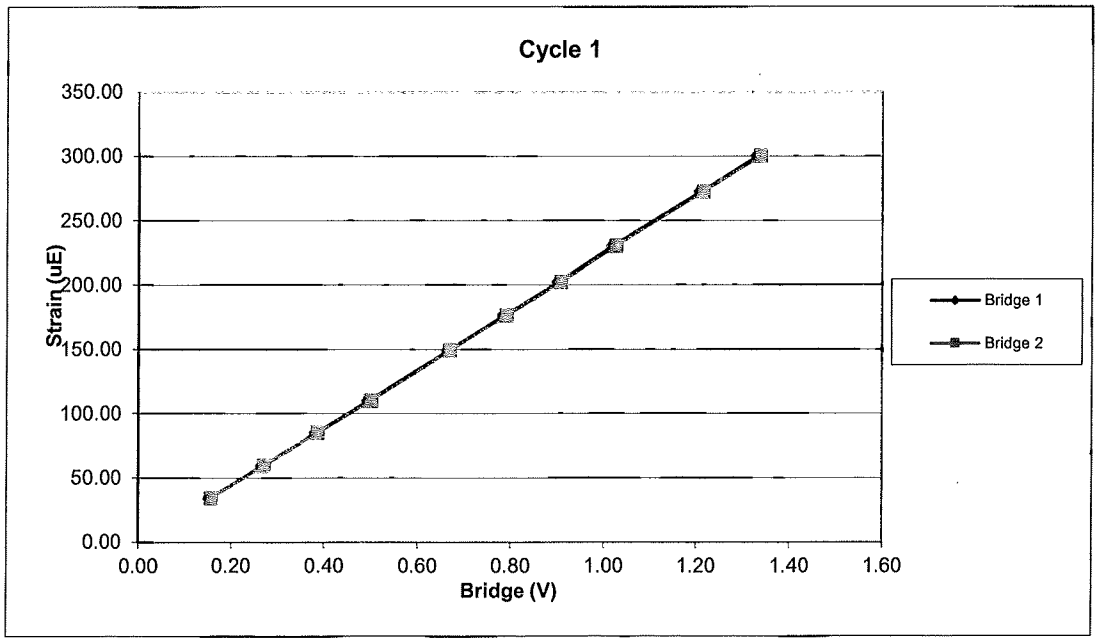
Pile Dynamics Inc
30725 Aurora Rd
Solon, OH 44139

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

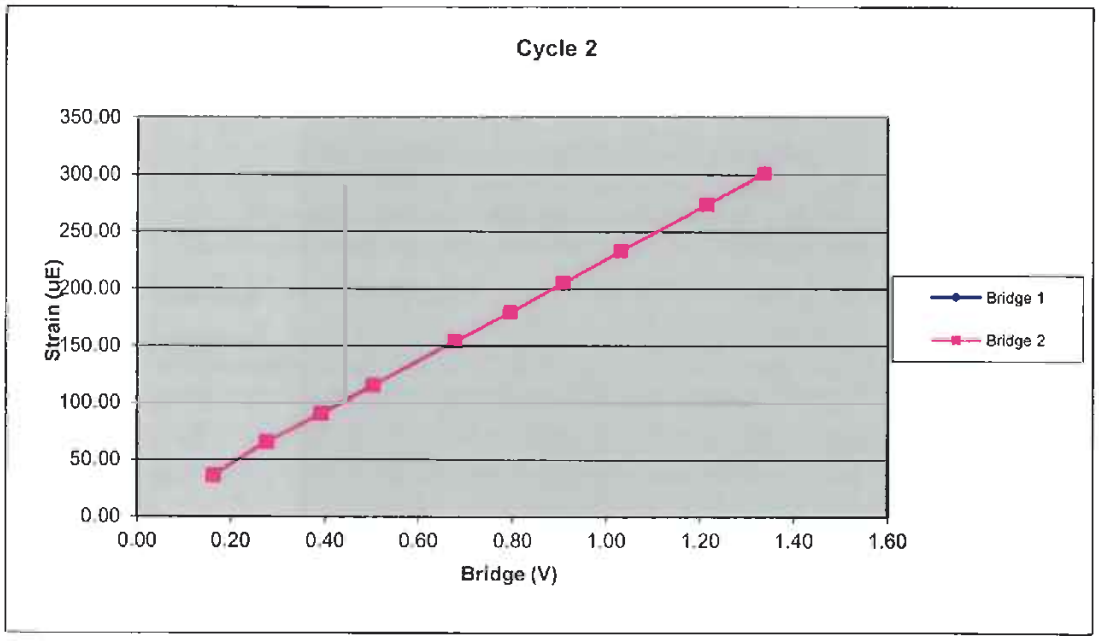
Force Strain Calibration	
EA (Kips)	**33548.47**
Offset	63.54
Correlation	0.999983



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**

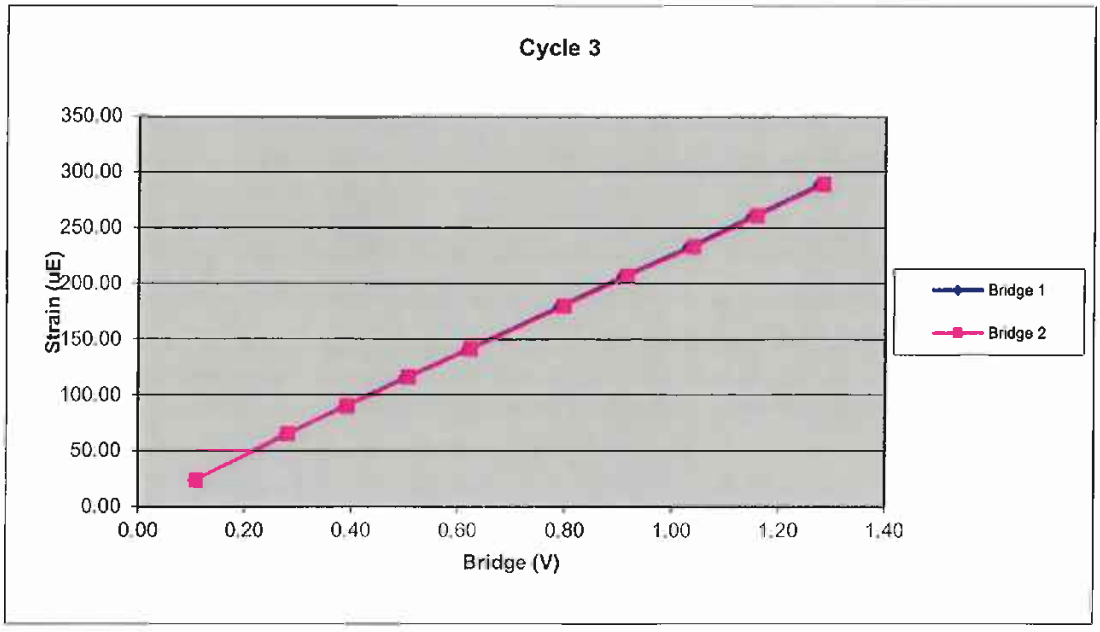
Force Strain Calibration	
EA (Kips)	**33843.24**
Offset	**-37.68**
Correlation	**0.999950**



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
Solon, OH 44139

Traceable to N.I.S.T.

Accelerometer Calibration Certificate
Pile Dynamics, Inc.

Calibrated by Pile Dynamics, Inc.
Calibration performed on 11Jul2024

Serial No:	K11957	**Temperature:**	24.9 °C
Model:	PR	**Humidity:**	54%
Calibrated on:	Channel 4 on 8G 5161 LE		

Ref Acc 1:	78270! 971 g's/volt	**Cal on:**	11Jan2024
Ref Acc 2:	78268! 986 g's/volt	**Cal on:**	11Jan2024

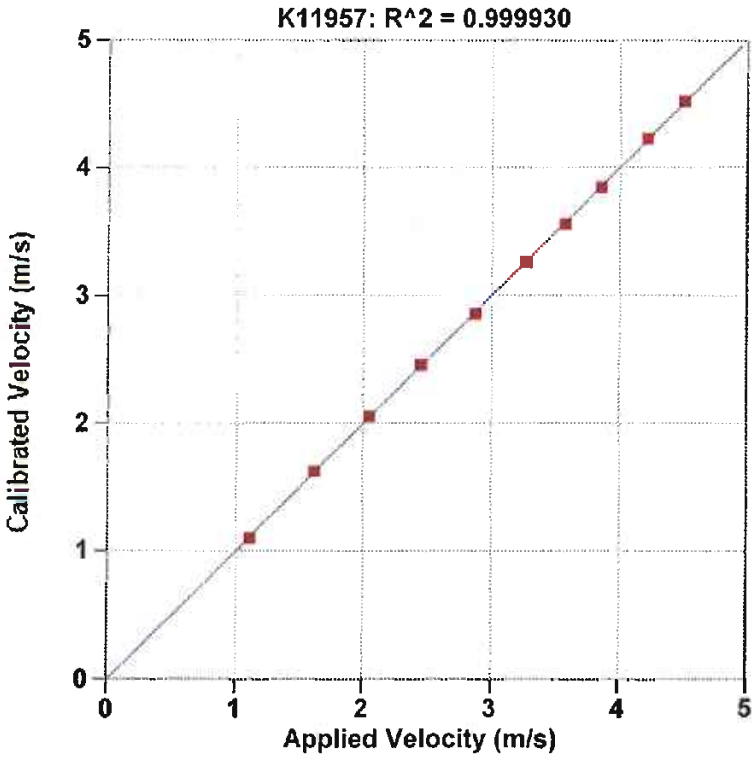
Reference accelerometer calibrations are traceable to the United States National Institute of Standards and Technology (NIST).

PDA CALIBRATION FACTOR

412.3 mv/5000g
(82.5 µv/g)
R^2: 0.999930 [Chip programmed]

Operator: William Johnson

Signed



Reference Velocity	S/N K11957 Velocity
m/s	m/s
1.113	1.104
1.621	1.626
2.052	2.057
2.451	2.459
2.874	2.861
3.272	3.266
3.574	3.565
3.858	3.850
4.220	4.230
4.510	4.521

Maximum Acceleration: 975 g's

Accelerometer Calibration Certificate
Pile Dynamics, Inc.

Calibrated by Pile Dynamics, Inc.
Calibration performed on 11Jul2024

Serial No:	K10959	**Temperature:**	24.9 °C
Model:	PR	**Humidity:**	55%
Calibrated on:	Channel 4 on 8G 5161 LE		

Ref Acc 1:	78270! 971 g's/volt	**Cal on:**	11Jan2024
Ref Acc 2:	78268! 986 g's/volt	**Cal on:**	11Jan2024

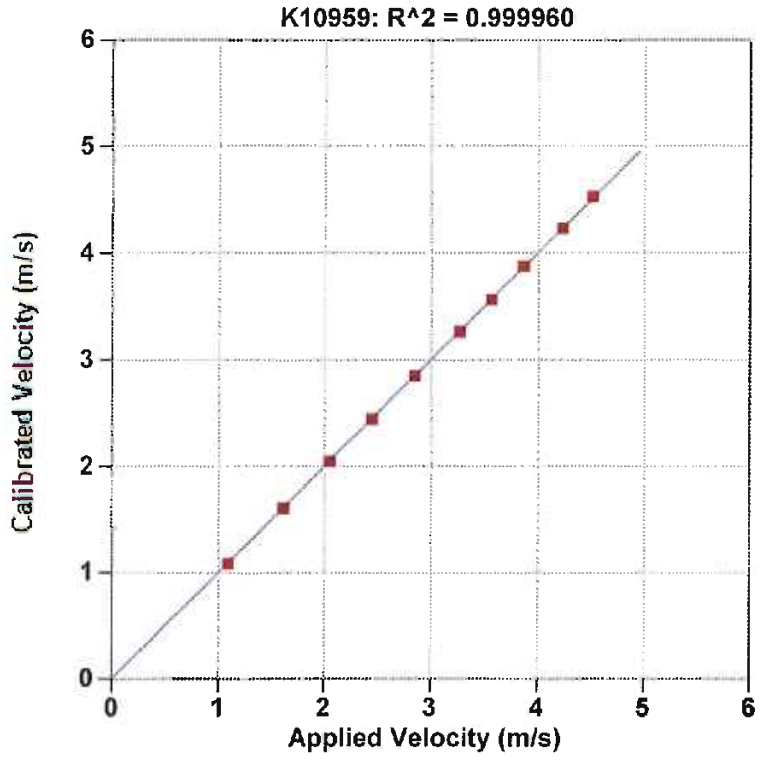
Reference accelerometer calibrations are traceable to the United States National Institute of Standards and Technology (NIST).

PDA CALIBRATION FACTOR

420.0 mv/5000g
(84.0 µv/g)
R^2: 0.999960 [Chip programmed]

Operator: William Johnson

Signed



Reference Velocity	S/N K10959 Velocity
m/s	m/s
1.091	1.084
1.611	1.607
2.051	2.046
2.449	2.442
2.851	2.852
3.271	3.264
3.571	3.564
3.872	3.878
4.232	4.232
4.516	4.531

Maximum Acceleration: 976 g's

Accelerometer Calibration Certificate
Pile Dynamics, Inc.

Calibrated by Pile Dynamics, Inc.
Calibration performed on 11Jul2024

Serial No:	K10960	**Temperature:**	24.9 °C
Model:	PR	**Humidity:**	55%
Calibrated on:	Channel 3 on 8G 5161 LE		

Ref Acc 1:	78270! 971 g's/volt	**Cal on:**	11Jan2024
Ref Acc 2:	78268! 986 g's/volt	**Cal on:**	11Jan2024

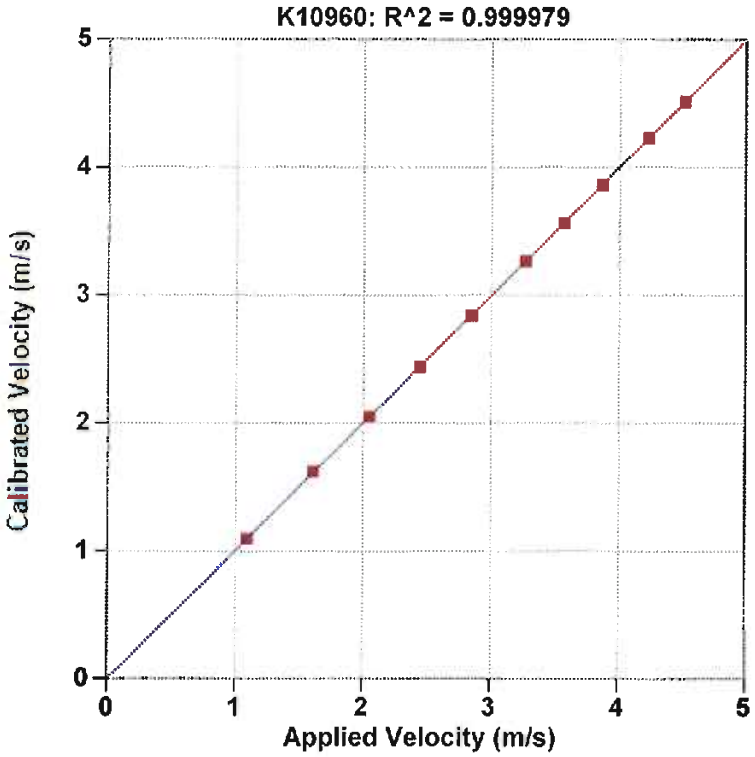
Reference accelerometer calibrations are traceable to the United States National Institute of Standards and Technology (NIST).

PDA CALIBRATION FACTOR

416.3 mv/5000g
(83.3 µv/g)
R^2: 0.999979 [Chip programmed]

Operator: William Johnson

Signed



Reference Velocity	S/N K10960 Velocity
m/s	m/s
1.091	1.095
1.611	1.622
2.051	2.053
2.449	2.443
2.851	2.847
3.271	3.271
3.571	3.571
3.872	3.866
4.232	4.237
4.516	4.517

Maximum Acceleration: 976 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

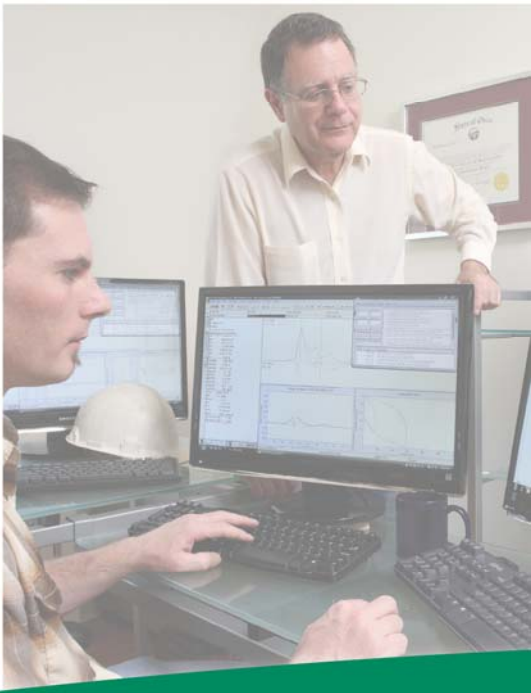
FME & SME 2018 INVESTIGATION













GRL engineers, inc.

Dynamic Measurements and Analyses

Job No. 179016-1

Report on: Standard Penetration Test Energy Measurements
F & ME Drill Rigs
Chester County, North Carolina

Prepared for F & ME Consultants, Inc.

By Scott D. Webster, P.E. and Mark A Rawlings

April 10, 2017

April 10, 2017

Mr. Adam Shannon
F & ME Consultants, Inc.
3112 Devine Street
Columbia, SC 29205

Re: Standard Penetration Test Energy Measurements
F & ME Drill Rigs
Chester County, North Carolina GRL Job No. 179016-1

Dear Mr. Shannon;

This report presents results of energy measurements obtained on March 31, 2017 during Standard Penetration Test (SPT) sampling. Two automatic hammers mounted on two different drill rigs owned by F & ME were tested. The drill rigs included an ATV mounted CME 550X and a trailer mounted CME 45B. Dynamic tests were performed on AWJ drill rods. GRL Engineers, Inc. obtained the dynamic measurements with an instrumented AW-J subsection and a PAX Model Pile Driving Analyzer®. This report describes the testing procedures and summarizes the test results. Appendix A describes our measurement and analysis methods, Appendix B contains the instrumentation calibration certificates, Appendix C contains a summary of the field data, and Appendix D contains plots of the force and velocity measurements.

PURPOSE AND SCOPE OF WORK

At the request of F & ME Consultants, Inc., GRL Engineers conducted SPT energy measurements according to ASTM D4633-10. Specifically, we provided SPT energy measurements for two drill rigs, at five-foot sample intervals starting at a depth of 28.5 feet and ending at a maximum depth of 55 feet below the existing ground surface. All of the SPT samples were driven for a total of three 6 inch increments, or 1.5 feet. GRL performed energy measurements during six sampling events for each drill rig. The soil retrieved was generally classified as a brown to tan sandy silt.

EQUIPMENT

Drilling and SPT Hammer Equipment

CME 550X ATV Mounted (Serial Number 249533)

SPT energy measurements were made on a CME automatic hammer mounted on a CME 550X ATV mounted drill rig. Energy measurements were collected every five feet while taking six soil samples in Boring 1. Blind drilling was performed before collecting the first sample. Testing started with sample 1 from 28.5 to 30 feet and concluding with sample 6 from 53.5 to 55 feet.

CME 45B Trailer Mounted (Serial Number 303304)

Energy measurements were made on a CME automatic SPT hammer mounted on a CME 45B trailer mounted drill rig. Energy measurements for this drill rig were collected in Boring 2. Six samples were taken at five foot intervals after blind drilling to the sample 1 depth of 28.5 to 30 feet and continuing to the sample 6 depth from 48.5 to 50 feet.

Instrumentation

A PAX Model Pile Driving Analyzer (PDA) data acquisition system was used to collect and process the dynamic measurements of force and velocity. A two foot long subsection of AWJ rod was instrumented with two full bridge foil resistance strain gages and two piezoresistive accelerometers mounted in the midpoint location of the instrumented rod.

Analog signals from the strain gages and accelerometers were conditioned, digitized, processed and stored with the PDA. Selected output from the PDA for each recorded impact included the maximum calculated maximum energy transfer, (EFV); the energy transfer ratio, (ETR); the maximum calculated rod force, (FMX); maximum rod top velocity, (VMX); the hammer operating rate, (BPM); the maximum computed displacement, (DMX); the final displacement, (DFN); and the maximum compressive stress at the gage location, (CSX).

MEASUREMENTS AND CALCULATIONS

FV Method (EFV)

Energy transfer to the PDA gage location, EFV, was computed by the PDA using force, F(t), and velocity, v(t), records as follows:

$$EFV = \int_a^b F(t) \cdot v(t) dt$$

The time "a" corresponds to the start of the record when the energy transfer begins, and "b" is the time at which energy transferred to the rod reaches a maximum value. The FV Method is currently recognized in ASTM D4633-10, and is the theoretically correct result; therefore, no other energy calculation methods are reported.

Corrected SPT number (N_{60})

While the primary purpose of SPT energy testing is to calculate the maximum transferred energy of each hammer blow, the overall average energy transfer value can be used to calculate the corrected SPT number (N_{60}). To adjust the SPT N-values for hammer performance, the following correction as suggested by Seed for N-value adjustment to 60 percent transfer efficiency (e.g. 210 foot-pounds) was used:

$$N_{60} = \left(\frac{E_m}{210}\right) N_m$$

Where:

N_{60} = Corrected N-value
E_m = overall average measured energy transfer (EFV)
N_m =number of blows for last 12 inches of sampler penetration

A general introduction to dynamic SPT testing methods is included in Appendix A. References for more detailed descriptions of our testing and analysis methods are available upon request.

Any cross-sectional area difference between the GRL rod subsection and the drill rods, any loose connections or changes in area at section joints, or any cross-sectional area differences between the individual drill rod sections could result in stress wave reflections that could influence the energy transfer. The EFV transferred energy calculation method, utilizing both force and velocity records, is theoretically correct and gives energy transfer results that are not significantly affected by cross-sectional area changes or loose connectors. The EFV results are included in Appendix C for all records collected and accepted after checking them for consistency.

RESULTS

The records collected by the PDA were checked for consistency and accuracy. For example, records from very weak startup or final impacts were not included in average results. Appendix C contains a representative plot of force and normalized velocity versus time, as well as plots and tables of PDA results for all hammer blows at each dynamically monitored sampling depth. The PDA results include the transferred energy by the FV method, as recommended by ASTM D4633-10, EFV; the energy transfer ratio for the EFV method, ETR; the maximum rod top force, FMX; the maximum rod top velocity, VMX; and the hammer operating rate, BPM. The plots display PDA results versus split-spoon penetration, while the tables show the individual blow results for the N value blows and also statistical summaries for each 6 inch increment. At the end of each table is a statistical evaluation of the results which includes the average and standard deviation of the entire measurement sample.

The table below and tables 1 through 2 summarize the average transferred energy values calculated by the EFV method. The records consist of averaged hammer blows from the last 12 inches (i.e. N value) at each dynamically monitored sampling depth. The “energy transfer ratio” (ETR) is defined as the ratio of maximum transferred energy EFV divided by the theoretical hammer potential energy of 350 ft-lbs (i.e., computed per the 140 pound SPT hammer and the standard 30 inch drop as specified by ASTM D1586-99). A summary of the dynamic measurements of the energy transfer to the drill rods using the EFV equation for each drill rig is provided in the table below.

Drill Rig	Avg. EFV (ft-lbs)	Avg. ETR (%)	Range of EFV (ft-lbs)	Range of ETR (%)
CME 550X S/N 249533	311	89	302 – 318	86 – 91
CME 45B S/N 303304	314	90	301 – 324	86 – 93

CONCLUSIONS

Based upon the dynamic test data obtained, the following conclusions are presented:

1. Loose connections in the drill string were sometimes observed in the force and velocity records. However, energy transfer values calculated using the EFV equation are not adversely affected by the connectors and therefore are considered a better indication of transferred energy.

2. Dynamic measurements of the transferred energy to the drill rods using the EFV equation ranged from 301 to 324 ft-lbs for both of the drill rigs. This corresponds to energy transfer ratios ranging from 86 to 93 percent of the SPT hammer energy of 350 ft-lbs.

3. The average transferred energy (EFV) and energy transfer ratio (ETR) for each drill rig tested was as follows:

   CME 550X S/N 249533: Average EFV = 311 ft-lbs, Average ETR = 89%

   CME 45B S/N 303304: Average EFV = 314 ft-lbs, Average ETR = 90%

Please review both ASTM D4633-10 and ASTM D1586-99 prior to applying these test results. The energy calibrations reported herein are valid for the same hammer/drill rig, with the same drill operator, same anvil dimensions, and same drilling methods.

We appreciate the opportunity to be of assistance to you on this project. Please contact our office should you have any questions regarding this submittal, require additional information, or if we may be of further service.

Sincerely,

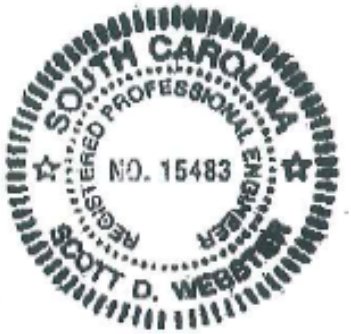
GRL Engineers, Inc.

Mark A. Rawlings

Mark A. Rawlings

Scott D. Webster

Scott D. Webster, P.E.



SDW:MAR:dms

TABLE 2: Summary of SPT Energy Measurements
F & ME Consultants CME 45B - S/N 303304
Chester County, SC - March 30, 2017

Soil Sample	Reported Sample Depth (feet)	Reported Rod Length[1] (feet)	Reported Blow Count (blows/6")	SPT Field N Value	Average Energy Transfer To Rod[2] (ft-lbs)	Average Energy Transfer Ratio[3] (%)	SPT Hammer Operating Rate (blows / min.)	SPT N Value Corrected for 60% Energy[4] N60
Boring B2 - CME Auto Hammer - AW Rod								
1	28.5 - 30.0	34.3	4-7-8	15	301	86	53.9	22
2	33.5 - 35.0	39.3	5-6-8	14	309	88	55.1	21
3	38.5 - 40.0	44.3	3-5-5	10	318	91	59.4	15
4	43.5 - 45.0	49.3	4-5-5	10	312	89	58.1	15
5	48.5 - 50.0	54.3	4-5-7	12	324	93	59.1	19
6	53.5 - 55.0	59.3	4-6-9	15	324	93	58.4	23
				Average	**314**	**90**	**57.1**	
				Standard Deviation	**5**	**1.5**	**0.2**	

1) Below the testing gage location. Add 1.0 foot for total rod length.
2) Average energy transfer over second and third increment from FV Method.
3) Energy calculated by FV method divided by 350 ft-lbs (140 pound ram dropped 2.5 feet).
4) SPT N value corrected for 60% energy using the Seed Correction Method.

APPENDIX A

An Introduction Into

SPT Dynamic Testing Methods

APPENDIX A
AN INTRODUCTION INTO SPT DYNAMIC PILE TESTING

The following has been written by GRL Engineers, Inc. and may only be copied with its written permission.

1. BACKGROUND

The Standard Penetration Test is frequently conducted as an in-situ assessment of soil strength. This test requires that a 140 lb weight is dropped 30 inches onto a drive rod at whose bottom a sampler is usually installed. The sampler is driven for 18 inches; the number of blows required for the last 12 inches of driving is the so-called N-value. The N-value may be used as a strength indicator for foundation design or as a means of assessing the liquefaction potential of soils.

Obviously, the SPT hammer efficiency is an important consideration when using the N-values for design purposes. Measurements have indicated that the energy in the drive rod is sometimes only 30% and and may reach 90% of the potential or rated energy of the SPT hammer (E-rated = 0.35 kip-ft or 0.475 kJ). The type of hammer used to drive the rod is the main reason for these variations. On the average, the energy in the drive rod is 60% of the standard rated energy.

Because of the variability of energy, methods based on N-values are considered unreliable. However, measurements during SPT testing using the Case Method can be done on a routine basis and these measurements yield the transferred energy values. With measured energy, EMX, known, an adjustment of the measured N-value, N_m, can be made as follows.

$$N_{60} = N_m [E_m / (0.6E_r)] \quad (1)$$

Thus, if the measured energy value is equal to the normally expected transferred energy of 60% of E-rated then the adjusted and measured N-values are identical. On the other hand, if the measured energy is only 30% then the adjusted blow count will be reduced by 50%.

2. DYNAMIC TESTING AND ANALYSIS METHODS APPLIED TO SPT

The Case Method of dynamic pile testing, named after the Case Institute of Technology where it was developed between 1964 and 1975, requires that a substantial ram mass (e.g. a pile driving hammer) impacts the pile top such that the pile undergoes at least a small permanent set. Thus, the method is also referred to as a “High Strain Method”. The Case Method requires dynamic measurements on the pile or shaft under the ram impact and then a calculation of various quantities. Conveniently, for SPT applications, the measurements and analyses are done by a single piece of equipment: the SPT Analyzer (SPTA). The Pile Driving Analyzer® (PDA) is also suitable to perform these measurements and data processing.

A related analysis method is the “Wave Equation Analysis” which calculates a relationship between bearing capacity, pile stresses, transferred energy and field blow count. The GRLWEAP™ program performs this analysis and provides a complete set of helpful information and input data. This program can be used very effectively to simulate the SPT driving process.

3. MEASUREMENTS

GRL uses equipment manufactured by Pile Dynamics, Inc. The system includes either an SPT-Analyzer™ (SPTA) or a Pile Driving Analyzer® (PDA), an instrumented rod section and two accelerometers. SPT energy testing is very closely related to and borrows procedures from dynamic pile testing. Those interested in the basis of the SPT energy testing method may obtain extensive literature on dynamic pile testing from GRL Engineers, Inc.

3.1 SPT Analyzer or Pile Driving Analyzer

The basis for the results calculated by the SPTA or PDA are strain and acceleration measured in an instrumented rod section. These signals are

converted to rod top force, F(t), and rod top velocity, v(t). The SPTA or PDA conditions, calibrates and displays these signals and immediately computes average pile force and velocity thereby eliminating bending effects. The product of these two measurements is then integrated over time which yields the energy transferred to the instrumented section as a function of time (see Section 4.1).

For convenience and accuracy, strain measurements are usually taken on an instrumented section of SPT drive rod. Ideally, the section properties of the instrumented rod and those of the drive rod are the same, however, using subs, other sections can also be utilized.

For the instrumented section, PDI provides a force calibration in such a way that the output of the instrumented rod is directly calculated without the need for an accurate elastic modulus or cross sectional area of the rod section.

The acceleration measurements are often demanding in the SPT environment, because of high frequency and high acceleration motion components. An experienced measurement engineer, therefore, has to evaluate the quality of this data before final conclusions are drawn from the numerical results calculated by SPTA or PDA.

SPTA or PDA records are taken while the standard N-value is acquired in the conventional manner. This then allows a direct correlation between N-value and average transferred energy.

3.2 HPA

The SPT hammer's ram velocity may be directly obtained using radar technology in the Hammer Performance Analyzer™. The impact velocity results can be automatically processed with a PC or recorded on a strip chart. HPA measurements yield a hammer kinetic energy, but not the energy transferred to the drive rod.

4 RECORD EVALUATION BY SPTA OR PDA

4.1 HAMMER PERFORMANCE

The PDA calculates the energy transferred to the pile top from:

$$E(t) = {}_0\int^t F(\tau)v(\tau)\, d\tau \qquad (2)$$

The maximum of the E(t) curve is often called **ENTHRU or EMX;** it is the most important quantity for an overall evaluation of the performance of a hammer and driving system. **EMX** allows for a classification of the hammer's performance when presented as, e_T, the rated transfer efficiency, also called energy transfer ratio (**ETR**) or global efficiency.

$$e_T = EMX/E_R \qquad (3)$$

where E_R is the hammer manufacturer's rated energy value or 0.35 kip-ft (0.475 kJ) in the case of the SPT hammer.

Often in the SPT literature one finds also reference to the EF2 energy. This evaluation is based on assumed proportionality between force and velocity (see also Section 5):

$$v(t) = F(t) / Z \qquad (4)$$

where Z = EA/c is the pile impedance, E is the elastic modulus, A is the cross sectional area and c is the speed of the stress wave in the pile material..

Combining equations 2 and 4 leads to

$$EF(t) = {}_0\int^t F(\tau)^2 / Z\, d\tau \qquad (5)$$

The EF2 transferred energy value is the EF-value at the time t = 2L/c, where L is the drive rod length and c is the stress wave speed in steel (16,800 ft/s or 5,124 m/s). Since the force is easier to measure than both force and velocity, Equation 5 is preferred by some test engineers. However, the EF method is fraught with errors and certain correction factors have to be applied to make it approximately correct. Among the error sources are the following:

- Proportionality is often violated prior to time 2L/c. The proportionality between force and velocity in a downward traveling wave only

holds if the wave does not encounter a disturbance prior to reflecting off the pile toe. Such disturbances include a change in cross sectional area, an open or loose splice or joint, or resistance along the shaft.

- Using only one force measurement precludes a data quality check based on the proportionality between force and velocity. Thus, a force measurement that is for some reason in error may not be detectable, which will lead to errors in the EF2 value. Data quality checks will be discussed further in Section 5.

The use if EF2 is therefore not recommended but it is often included in result presentations for the sake of completeness.

4.2 STRESSES

During SPT monitoring, it is also of interest to monitor compressive stresses at both the top of the drive rod and at its bottom.

At the pile top (location of sensors) the maximum compression stress averaged over the rod's cross section, **CSX**, is directly obtained from the measurements. Note that this stress value refers to the instrumented section. If the rod has a different cross sectional area then the stress in the rod will be different from CSX.

The SPTA or PDA can also calculate, in an approximate manner, the force at the rod bottom, **CFB**. To obtain the corresponding stress, this force value should be divided by the appropriate cross sectional area, e.g. by the rod area just above the sampler or by the sampler area itself. Of course, non-uniform stress components as they might occur at the sampler tip due to a sloping rock are not considered in this calculation.

5. DATA QUALITY CHECKS

Quality data is the first and foremost requirement for accurate dynamic testing results. It is therefore important that the measurement engineer performing SPTA or PDA tests has the experience necessary to recognize measurement problems and take appropriate corrective action should problems develop. Fortunately, dynamic pile testing allows for certain data quality checks because two independent measurements are taken that have to conform to the so-called proportionality relationship.

As long as there is only a wave traveling in one direction, as is the case during impact when only a downward traveling wave exists in the rod, force and velocity measured at its top are proportional

$$F = v\,Z \qquad (5)$$

where Z is again the pile impedance, Z = EA/c. This relationship can also be expressed in terms of stress

$$\sigma = F/A = v\,(E/c) \qquad (6)$$

or strain

$$\epsilon = \sigma/E = v / c \qquad (7)$$

This means that the early portion of strain times wave speed must be equal to the velocity unless the proportionality is affected by high friction near the pile top or by a pile cross sectional change not far below the sensors. Checking the proportionality is an excellent means of assuring meaningful measurements but is only truly meaningful for perfectly uniform rods. Open or loose splices, for example, will lead to a non-proportionality. For SPT rods it is fortunate that usually no soil resistance acts along the shaft and for that reason, proportionality can exist until the stress wave returns from sampler top or rod bottom unless connectors are not sufficiently tightened or have a significant mass.

Velocity data quality can also be checked by looking at the final displacement, DFN, which is calculated from the acceleration by double integration. If the calculated final displacement is much higher or lower than indicated by the N-value, the accelerometer attachment may be loose or the sensor may be faulty. If major drift in the velocity is observed, the EMX value may be in error, even though proportionality from impact to time 2L/c exists. In this case, it may be useful to evaluate the energy transferred to the drill rod at time 2L/c, which is calculated by the PDA or SPTA as the E2E quantity.

© 2003 GRL Engineers, Inc.

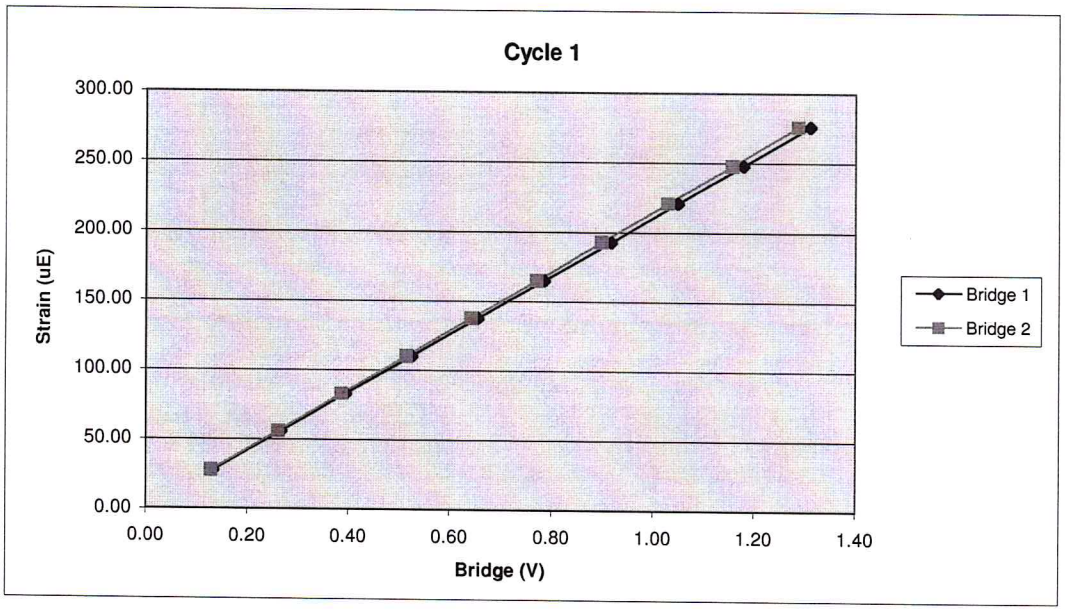
APPENDIX B

Instrumentation Calibration Information

168AWJ		Cycle 1		
Sample	**Force (lb)**	**Strain (µE)**	**Bridge 1 (V)**	**Bridge 2 (V)**
1	0.00	0.00	0.00	0.00
2	985.12	27.81	0.13	0.13
3	1999.42	55.96	0.27	0.26
4	2962.46	82.88	0.39	0.39
5	3948.57	110.23	0.52	0.51
6	4934.08	137.55	0.65	0.64
7	5929.06	165.07	0.79	0.77
8	6918.72	192.89	0.92	0.90
9	7919.02	220.92	1.05	1.03
10	8900.20	247.97	1.18	1.16
11	9910.36	276.00	1.31	1.29

Bridge 1		**Bridge 2**	
Force Calibration (lb/V)	**7574.02**	**Force Calibration (lb/V)**	**7709.66**
Offset	-21.90	Offset	-11.13
Correlation	0.999999	Correlation	0.999999
Strain Calibration (µE/V)	**210.70**	**Strain Calibration (µE/V)**	**214.48**
Offset	-0.24	Offset	0.06
Correlation	0.999999	Correlation	0.999998

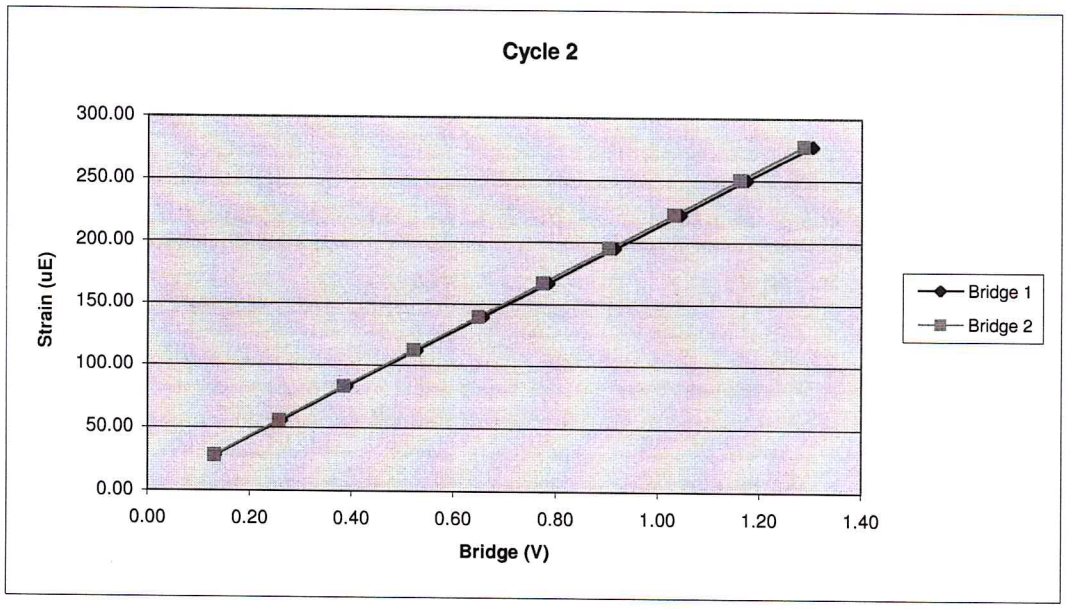
Force Strain Calibration	
EA (Kips)	**35946.33**
Offset	-13.36
Correlation	0.999999



168AWJ		Cycle 2		
Sample	**Force (lb)**	**Strain (µE)**	**Bridge 1 (V)**	**Bridge 2 (V)**
1	0.00	0.00	0.00	0.00
2	982.95	28.05	0.13	0.13
3	1974.19	55.76	0.26	0.26
4	2953.39	82.87	0.39	0.38
5	4000.42	112.22	0.53	0.52
6	4972.13	139.35	0.66	0.65
7	5950.75	167.00	0.79	0.77
8	6945.33	194.94	0.92	0.90
9	7917.84	222.00	1.04	1.03
10	8919.91	250.27	1.17	1.16
11	9896.36	277.50	1.30	1.29

Bridge 1		**Bridge 2**	
Force Calibration (lb/V)	**7606.16**	**Force Calibration (lb/V)**	**7700.14**
Offset	**-19.82**	Offset	**-11.88**
Correlation	**0.999999**	Correlation	**0.999998**
Strain Calibration (µE/V)	**213.01**	**Strain Calibration (µE/V)**	**215.64**
Offset	**-0.22**	Offset	**0.00**
Correlation	**0.999997**	Correlation	**0.999997**

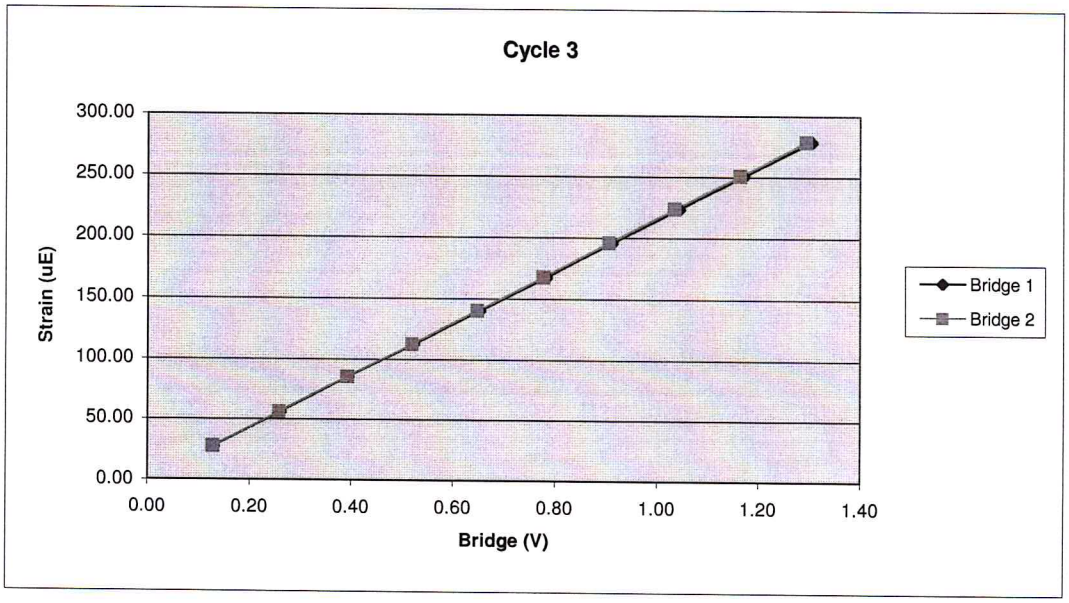
Force Strain Calibration	
EA (Kips)	**35708.56**
Offset	**-11.96**
Correlation	**0.999998**



168AWJ		Cycle 3		
Sample	**Force (lb)**	**Strain (µE)**	**Bridge 1 (V)**	**Bridge 2 (V)**
1	0.00	0.00	0.00	0.00
2	976.84	27.67	0.13	0.13
3	1972.21	55.77	0.26	0.26
4	3006.62	85.22	0.39	0.39
5	3988.79	112.54	0.52	0.52
6	4966.61	140.12	0.65	0.65
7	5959.03	167.81	0.78	0.78
8	6952.23	195.83	0.91	0.91
9	7951.15	223.79	1.04	1.03
10	8937.66	250.72	1.17	1.16
11	9937.17	278.64	1.30	1.29

Bridge 1		**Bridge 2**	
Force Calibration (lb/V)	**7629.36**	**Force Calibration (lb/V)**	**7688.81**
Offset	**-3.45**	Offset	**-7.58**
Correlation	**0.999997**	Correlation	**0.999999**
Strain Calibration (µE/V)	**213.70**	**Strain Calibration (µE/V)**	**215.36**
Offset	**0.65**	Offset	**0.53**
Correlation	**0.999990**	Correlation	**0.999994**

Force Strain Calibration	
EA (Kips)	**35701.55**
Offset	**-26.47**
Correlation	**0.999992**



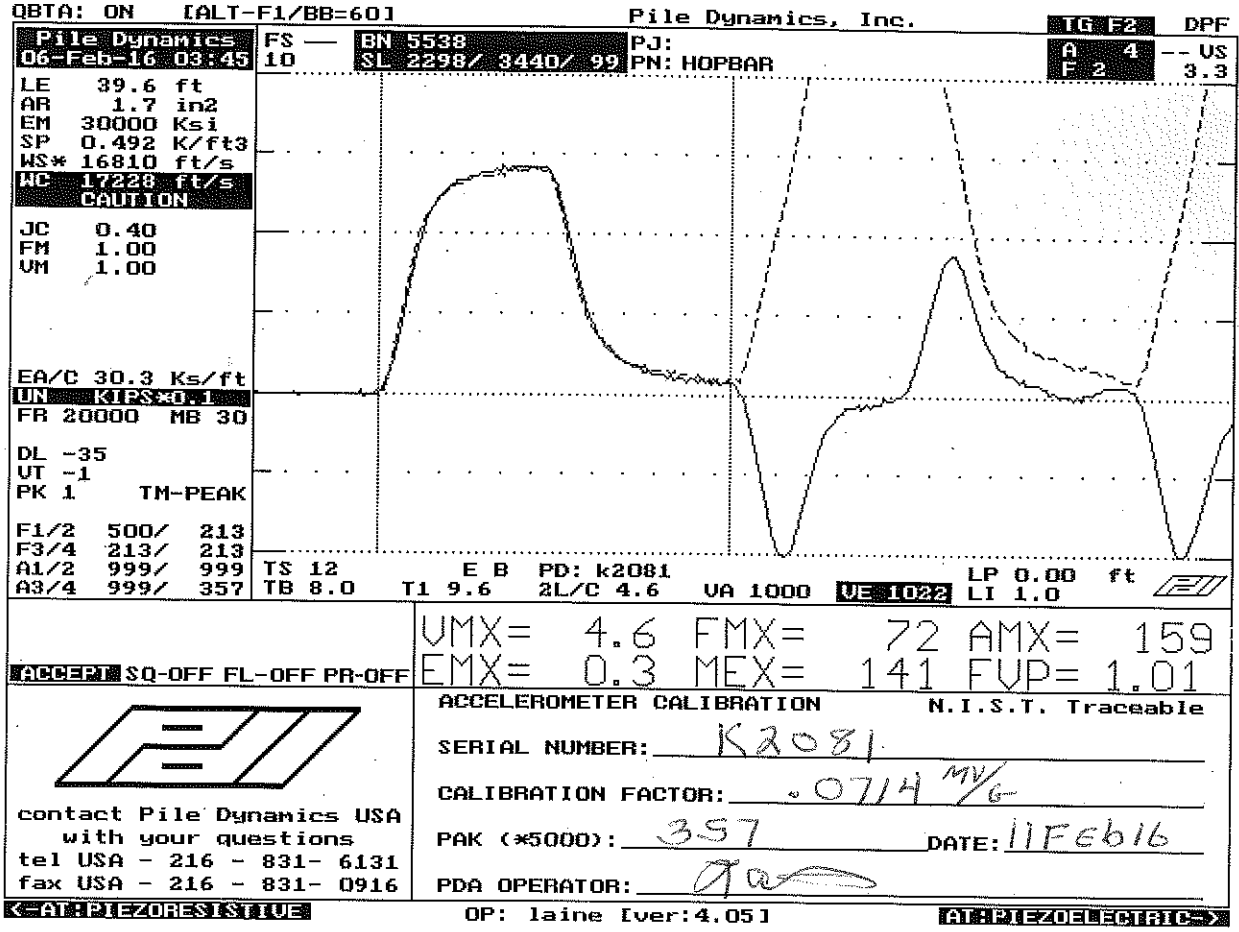
Bridge Excitation (V) 5
Shunt Resitor (ohm) 60.4k

Calibration Factors	168AWJ		
Bridge 1 (µE/V)	212.47	Bridge 2 (µE/V)	215.16
EA Factor (Kips)	35785.48	Area (in^2)	1.19

Calibrated by: David Bermudez
Calibrated Date: 9/21/2015

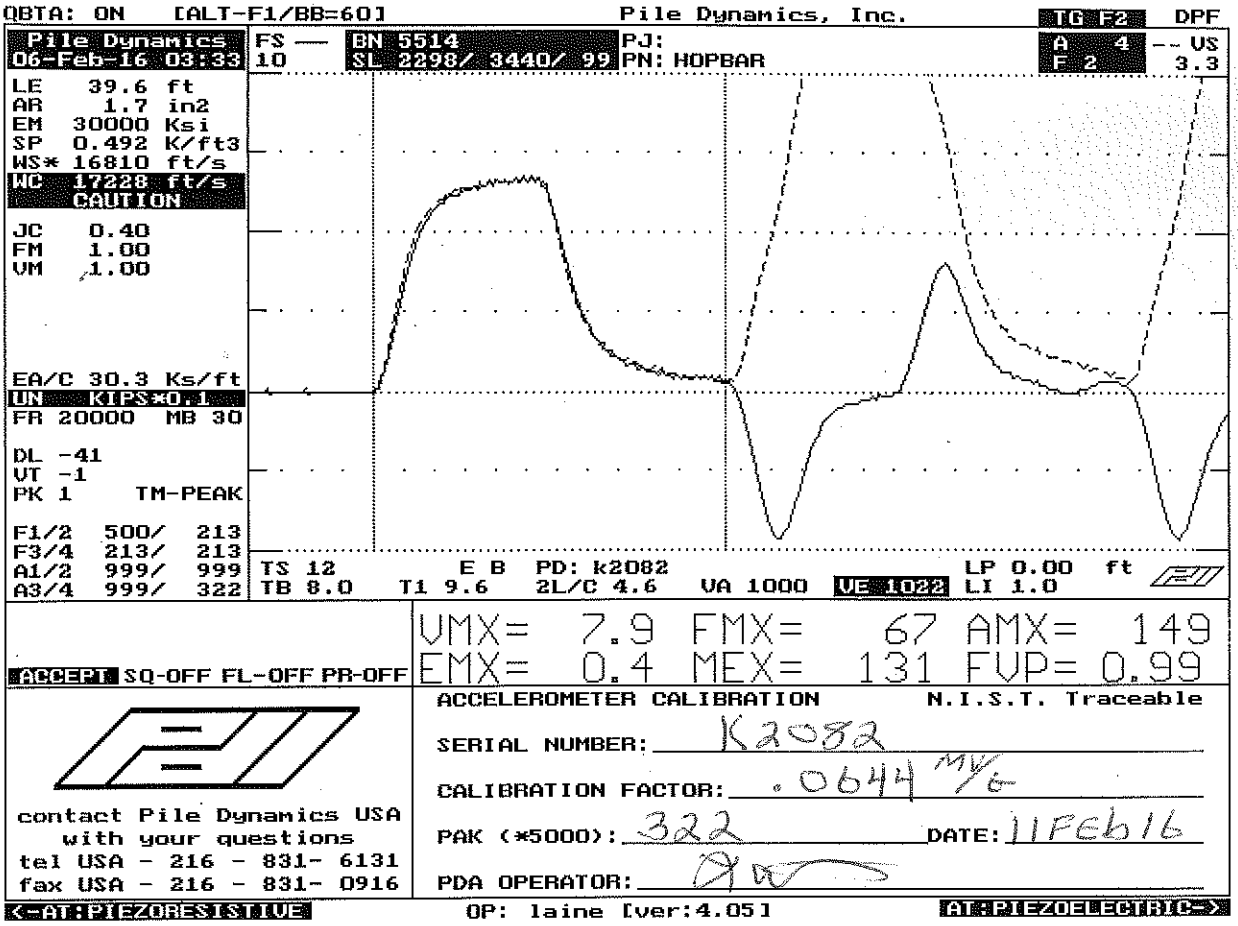
Pile Dynamics Inc
30725 Aurora Rd
Solon, OH 44139

Traceable to N.I.S.T.



Smart Sensor

Smart Chip Programmed By D.M.W. **on** 11Feb16 **CRC Value** 5AC1



Smart Sensor

Smart Chip Programmed By R.M.N. **on** 11Feb16 **CRC Value** CBFD

PDCA
PILE DRIVING CONTRACTORS ASSOCIATION

This documents that

Pile Dynamics, Inc.

Mark Rawlings
GRL Engineers, Inc.

has on January 26, 2017 achieved the rank of

MASTER

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 Master level seek to attain Expert level through additional study within eight 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. 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. This certificate can be verified at www.PDAproficiencytest.com.

Steven A. Hall, Executive Director
Pile Driving Contractors Association

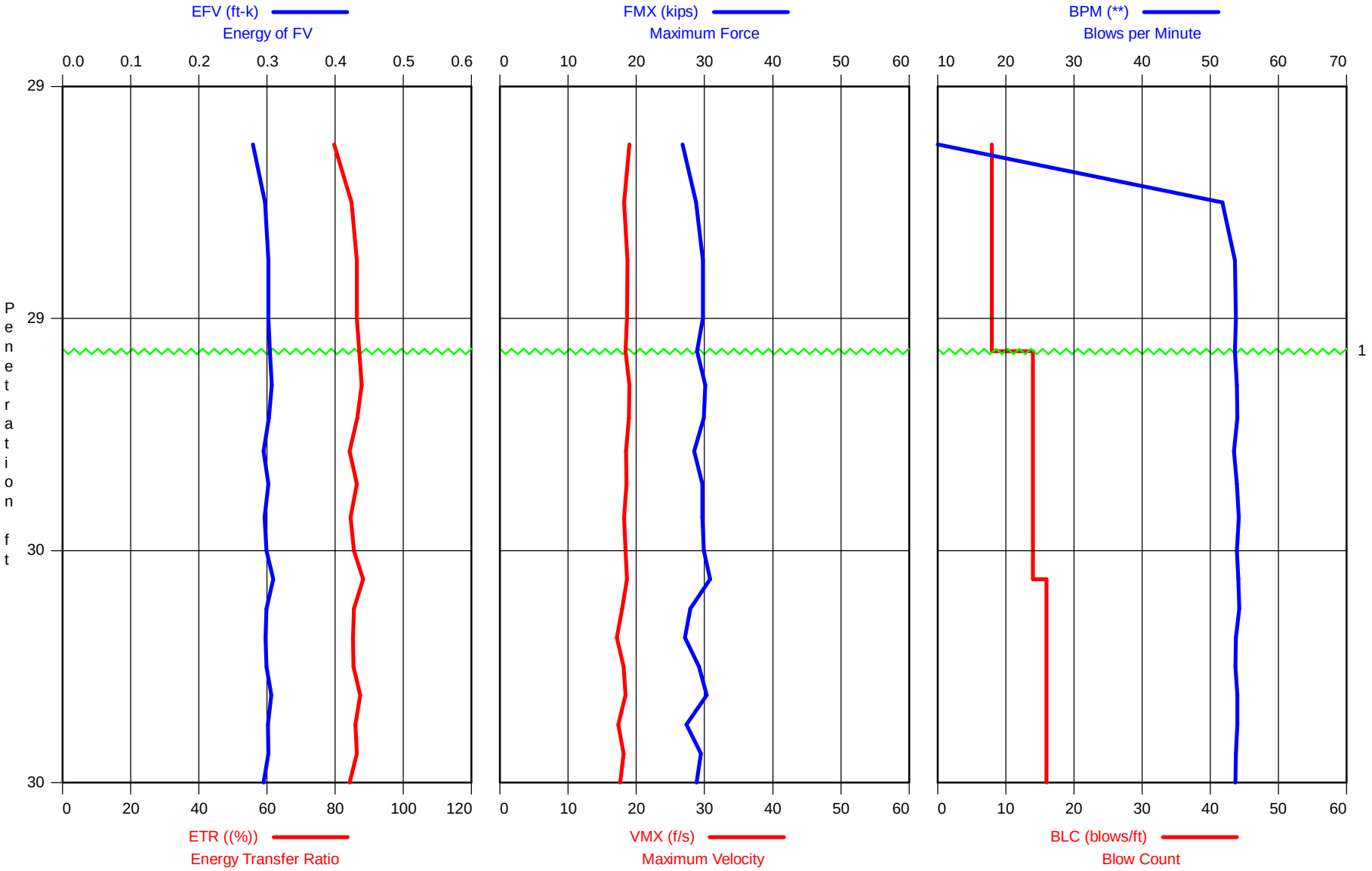
Garland Likins, Senior Partner
Pile Dynamics, Inc.

No. 2181

APPENDIX C

Dynamic Energy Measurement Results

F & ME SPT Calibration - Boring 2 Sample 1
CME 45B S/N 303304, AW Rod



1 - Start of N value blows

F & ME SPT Calibration - Boring 2 Sample 1
OP: MR

CME 45B S/N 303304, AW Rod
Test date: 30-Mar-2017

AR: 1.19 in^2
LE: 34.33 ft
WS: 16,807.9 f/s

SP: 0.492 k/ft3
EM: 30,000 ksi
JC: 0.00

EFV: Energy of FV
ETR: Energy Transfer Ratio
FMX: Maximum Force
VMX: Maximum Velocity

BPM: Blows per Minute
DMX: Maximum Displacement
DFN: Final Displacement
CSX: Max Measured Compr. Stress

BL#	BLC	EFV	ETR	FMX	VMX	BPM	DMX	DFN	CSX
	bl/ft	ft-k	(%)	kips	f/s	**	in	in	ksi
5	14	0.304	87.0	28.9	18.4	53.6	1.03	0.86	24.3
6	14	0.307	87.7	30.1	19.0	53.9	0.98	0.86	25.3
7	14	0.303	86.5	29.9	18.9	54.0	0.98	0.86	25.1
8	14	0.295	84.2	28.5	18.5	53.5	0.92	0.86	24.0
9	14	0.302	86.3	29.7	18.6	53.9	0.93	0.86	25.0
10	14	0.296	84.5	29.7	18.2	54.2	0.87	0.86	24.9
11	14	0.299	85.6	29.9	18.4	53.9	0.89	0.86	25.1
12	16	0.309	88.2	30.9	18.6	54.1	0.88	0.75	25.9
13	16	0.299	85.6	27.9	17.9	54.3	0.83	0.75	23.4
14	16	0.298	85.2	27.1	17.1	53.8	0.77	0.75	22.8
15	16	0.299	85.4	29.2	18.2	53.7	0.75	0.75	24.6
16	16	0.306	87.3	30.3	18.4	54.0	0.76	0.75	25.5
17	16	0.301	85.9	27.3	17.3	54.0	0.76	0.75	23.0
18	16	0.302	86.4	29.5	18.1	53.8	0.75	0.75	24.8
19	16	0.295	84.2	28.8	17.6	53.7	0.75	0.75	24.2
Average		0.301	86.0	29.2	18.2	53.9	0.86	0.80	24.5
Std. Dev.		0.004	1.2	1.0	0.5	0.2	0.09	0.05	0.9
Maximum		0.309	88.2	30.9	19.0	54.3	1.03	0.86	25.9
Minimum		0.295	84.2	27.1	17.1	53.5	0.75	0.75	22.8

Total number of blows analyzed: 15

BL#	Comments
5	Start of N value blows

Time Summary

Drive 20 seconds 9:35:08 AM - 9:35:28 AM (3/30/2017) BN 1 - 19

F & ME SPT Calibration - Boring 2 Sample 1
OP: MR

CME 45B S/N 303304, AW Rod
Test date: 30-Mar-2017

AR: 1.19 in^2
LE: 34.33 ft
WS: 16,807.9 f/s

SP: 0.492 k/ft3
EM: 30,000 ksi
JC: 0.00

EFV: Energy of FV
ETR: Energy Transfer Ratio
FMX: Maximum Force
VMX: Maximum Velocity

BPM: Blows per Minute
DMX: Maximum Displacement
DFN: Final Displacement
CSX: Max Measured Compr. Stress

BL# end	depth ft	BLC bl/ft	TYPE	EFV ft-k	ETR (%)	FMX kips	VMX f/s	BPM **	DMX in	DFN in	CSX ksi
4	29.00	8	AV4	0.295	84.3	28.8	18.6	40.3	1.70	1.50	24.2
			STD	0.009	2.7	1.2	0.3	22.2	0.30	0.00	1.0
			MAX	0.302	86.4	29.8	19.0	53.8	2.22	1.50	25.0
			MIN	0.279	79.7	26.7	18.2	1.9	1.50	1.50	22.5
11	29.50	14	AV7	0.301	86.0	29.5	18.6	53.9	0.94	0.86	24.8
			STD	0.004	1.2	0.5	0.3	0.2	0.05	0.00	0.5
			MAX	0.307	87.7	30.1	19.0	54.2	1.03	0.86	25.3
			MIN	0.295	84.2	28.5	18.2	53.5	0.87	0.86	24.0
19	30.00	16	AV8	0.301	86.0	28.9	17.9	53.9	0.78	0.75	24.3
			STD	0.004	1.2	1.3	0.5	0.2	0.04	0.00	1.1
			MAX	0.309	88.2	30.9	18.6	54.3	0.88	0.75	25.9
			MIN	0.295	84.2	27.1	17.1	53.7	0.75	0.75	22.8
			Average	0.300	85.6	29.1	18.3	51.0	1.03	0.95	24.4
			Std. Dev.	0.006	1.8	1.1	0.5	11.6	0.38	0.29	0.9
			Maximum	0.309	88.2	30.9	19.0	54.3	2.22	1.50	25.9
			Minimum	0.279	79.7	26.7	17.1	1.9	0.75	0.75	22.5

Total number of blows analyzed: 19

BL#	depth (ft)	Comments
5	29.07	Start of N value blows

Time Summary

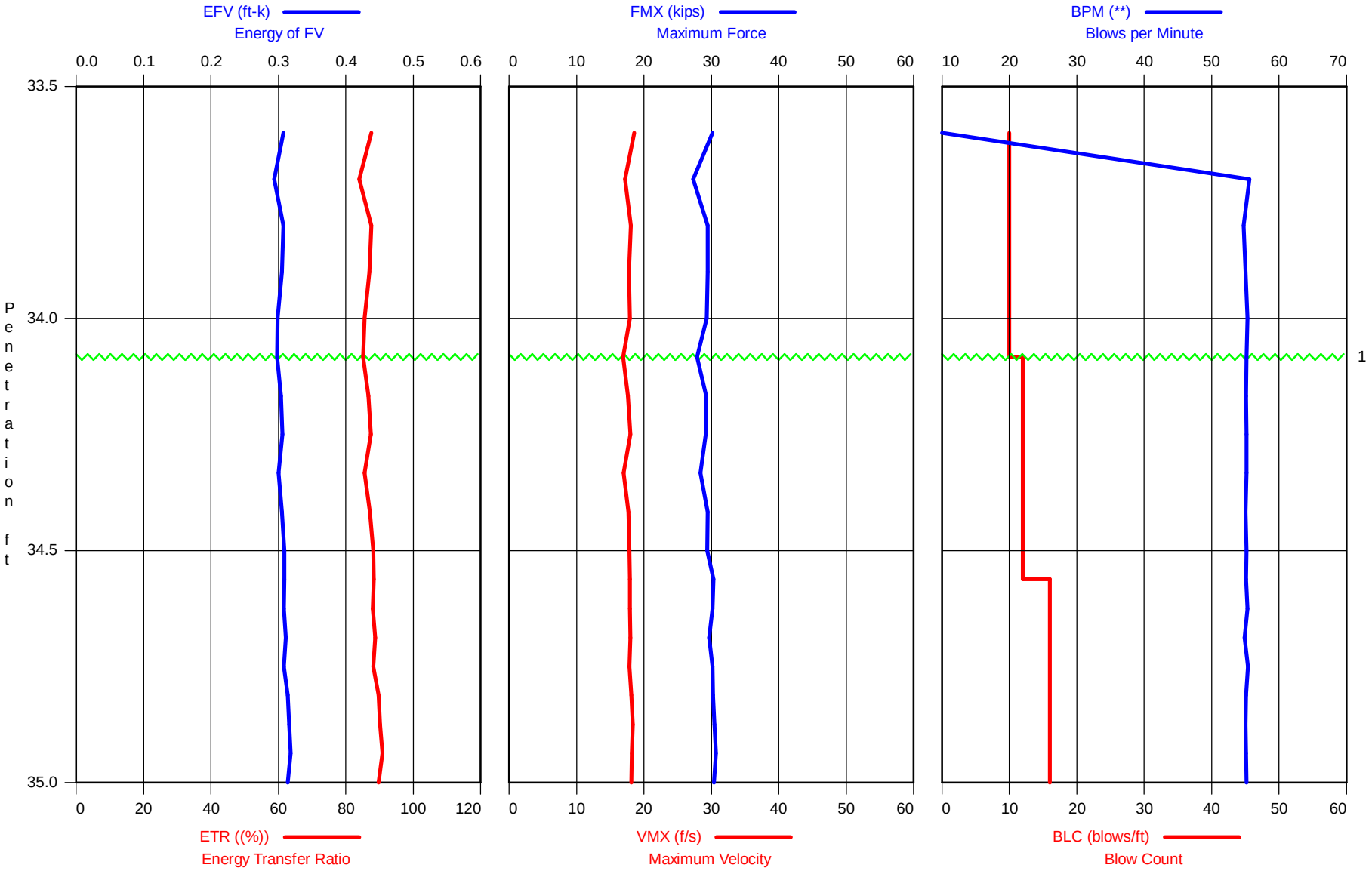
Drive 20 seconds 9:35:08 AM - 9:35:28 AM (3/30/2017) BN 1 - 19

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

PDIPLOT Ver. 2014.2 - Printed: 30-Mar-2017

Test date: 30-Mar-2017

F & ME SPT Calibration - Boring 2 Sample 2
CME 45B S/N 303304, AW Rod



1 - Start of N value blows

F & ME SPT Calibration - Boring 2 Sample 2
OP: MR

CME 45B S/N 303304, AW Rod
Test date: 30-Mar-2017

AR: 1.19 in^2
LE: 39.33 ft
WS: 16,807.9 f/s

SP: 0.492 k/ft3
EM: 30,000 ksi
JC: 0.00

EFV: Energy of FV
ETR: Energy Transfer Ratio
FMX: Maximum Force
VMX: Maximum Velocity

BPM: Blows per Minute
DMX: Maximum Displacement
DFN: Final Displacement
CSX: Max Measured Compr. Stress

BL#	BLC	EFV	ETR	FMX	VMX	BPM	DMX	DFN	CSX
	bl/ft	ft-k	(%)	kips	f/s	**	in	in	ksi
6	12	0.298	85.2	27.9	16.9	55.2	1.12	1.00	23.4
7	12	0.304	86.8	29.2	17.7	55.1	1.09	1.00	24.5
8	12	0.306	87.5	29.1	18.0	55.2	1.12	1.00	24.5
9	12	0.300	85.6	28.4	17.0	55.2	1.11	1.00	23.9
10	12	0.305	87.1	29.5	17.7	55.0	1.09	1.00	24.8
11	12	0.309	88.2	29.4	17.8	55.2	1.02	1.00	24.7
12	16	0.309	88.3	30.3	17.9	55.1	0.94	0.75	25.5
13	16	0.308	88.0	30.2	18.0	55.3	0.91	0.75	25.4
14	16	0.311	88.7	29.7	18.0	54.9	0.88	0.75	24.9
15	16	0.308	88.1	30.2	17.8	55.4	0.85	0.75	25.4
16	16	0.314	89.7	30.2	18.1	55.1	0.82	0.75	25.4
17	16	0.316	90.2	30.5	18.3	55.0	0.82	0.75	25.6
18	16	0.318	90.8	30.7	18.2	55.1	0.84	0.75	25.8
19	16	0.314	89.8	30.4	18.1	55.2	0.80	0.75	25.5
Average		0.309	88.1	29.7	17.8	55.1	0.96	0.86	25.0
Std. Dev.		0.006	1.6	0.8	0.4	0.1	0.12	0.12	0.7
Maximum		0.318	90.8	30.7	18.3	55.4	1.12	1.00	25.8
Minimum		0.298	85.2	27.9	16.9	54.9	0.80	0.75	23.4

Total number of blows analyzed: 14

BL#	Comments
6	Start of N value blows

Time Summary

Drive 20 seconds 9:42:04 AM - 9:42:24 AM (3/30/2017) BN 1 - 19

F & ME SPT Calibration - Boring 2 Sample 2
OP: MR

CME 45B S/N 303304, AW Rod
Test date: 30-Mar-2017

AR: 1.19 in^2
LE: 39.33 ft
WS: 16,807.9 f/s

SP: 0.492 k/ft3
EM: 30,000 ksi
JC: 0.00

EFV: Energy of FV
ETR: Energy Transfer Ratio
FMX: Maximum Force
VMX: Maximum Velocity

BPM: Blows per Minute
DMX: Maximum Displacement
DFN: Final Displacement
CSX: Max Measured Compr. Stress

BL# end	depth ft	BLC bl/ft	TYPE	EFV ft-k	ETR (%)	FMX kips	VMX f/s	BPM **	DMX in	DFN in	CSX ksi
5	34.00	10	AV5	0.302	86.4	29.1	17.9	44.5	1.30	1.20	24.5
			STD	0.005	1.4	1.0	0.4	21.3	0.06	0.00	0.8
			MAX	0.307	87.6	30.2	18.5	55.6	1.42	1.20	25.4
			MIN	0.294	84.0	27.3	17.2	1.9	1.25	1.20	22.9
11	34.50	12	AV6	0.304	86.7	28.9	17.5	55.2	1.09	1.00	24.3
			STD	0.004	1.0	0.6	0.4	0.1	0.03	0.00	0.5
			MAX	0.309	88.2	29.5	18.0	55.2	1.12	1.00	24.8
			MIN	0.298	85.2	27.9	16.9	55.0	1.02	1.00	23.4
19	35.00	16	AV8	0.312	89.2	30.3	18.1	55.1	0.86	0.75	25.4
			STD	0.004	1.0	0.3	0.1	0.1	0.05	0.00	0.2
			MAX	0.318	90.8	30.7	18.3	55.4	0.94	0.75	25.8
			MIN	0.308	88.0	29.7	17.8	54.9	0.80	0.75	24.9
			Average	0.307	87.7	29.5	17.8	52.3	1.05	0.95	24.8
			Std. Dev.	0.006	1.7	0.9	0.4	11.9	0.19	0.18	0.7
			Maximum	0.318	90.8	30.7	18.5	55.6	1.42	1.20	25.8
			Minimum	0.294	84.0	27.3	16.9	1.9	0.80	0.75	22.9

Total number of blows analyzed: 19

BL#	depth (ft)	Comments
6	34.08	Start of N value blows

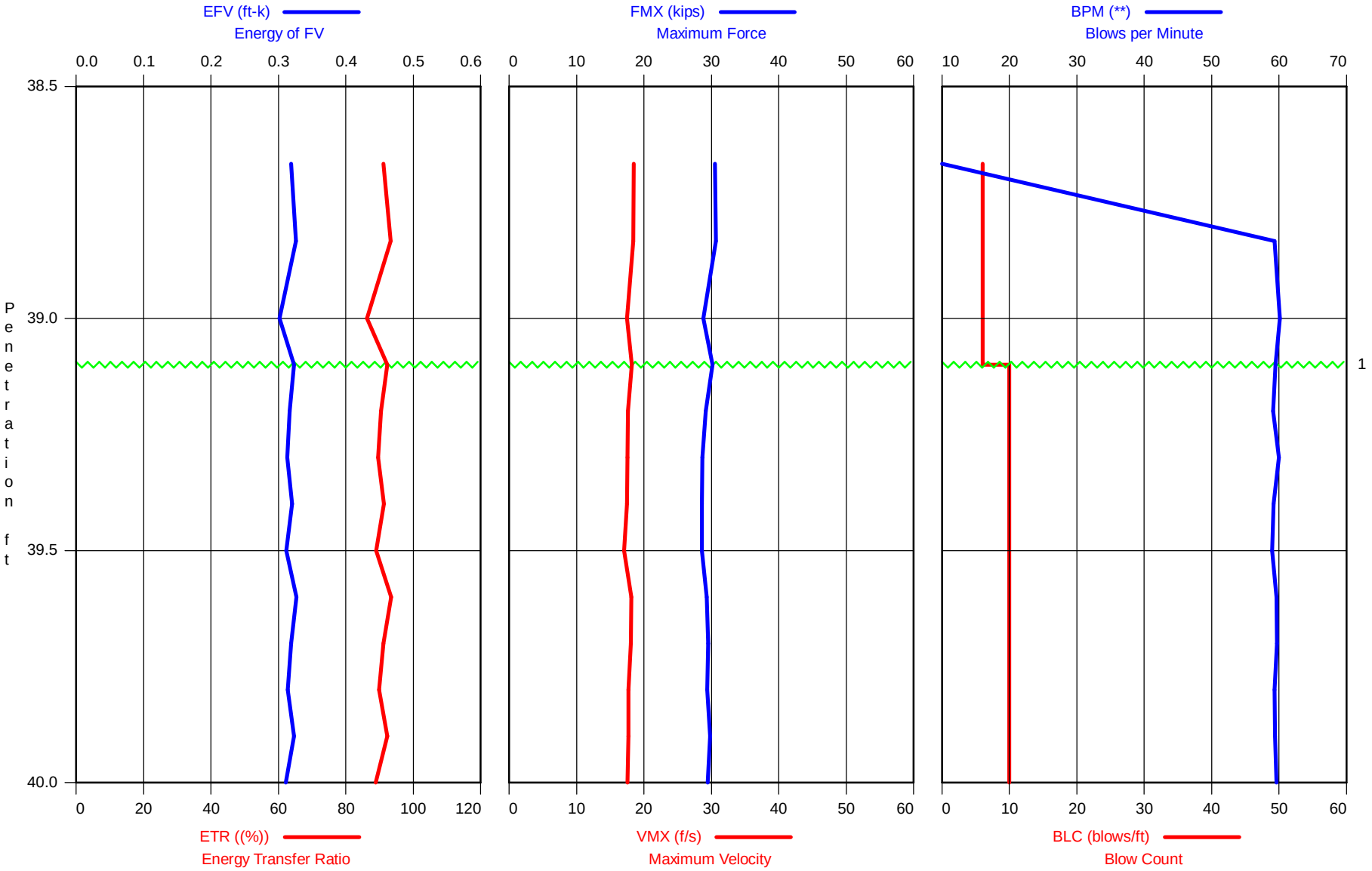
Time Summary

Drive 20 seconds 9:42:04 AM - 9:42:24 AM (3/30/2017) BN 1 - 19

PDIPLOT Ver. 2014.2 - Printed: 30-Mar-2017

Test date: 30-Mar-2017

F & ME SPT Calibration - Boring 2 Sample 3
CME 45B S/N 303304, AW Rod



1 - Start of N value blows

F & ME SPT Calibration - Boring 2 Sample 3
OP: MR

CME 45B S/N 303304, AW Rod
Test date: 30-Mar-2017

AR: 1.19 in^2
LE: 44.33 ft
WS: 16,807.9 f/s

SP: 0.492 k/ft3
EM: 30,000 ksi
JC: 0.00

EFV: Energy of FV
ETR: Energy Transfer Ratio
FMX: Maximum Force
VMX: Maximum Velocity

BPM: Blows per Minute
DMX: Maximum Displacement
DFN: Final Displacement
CSX: Max Measured Compr. Stress

BL#	BLC bl/ft	EFV ft-k	ETR (%)	FMX kips	VMX f/s	BPM **	DMX in	DFN in	CSX ksi
4	10	0.323	92.4	30.1	18.2	59.5	1.36	1.20	25.3
5	10	0.317	90.5	29.2	17.6	59.1	1.20	1.20	24.5
6	10	0.313	89.5	28.6	17.5	60.0	1.20	1.20	24.1
7	10	0.320	91.3	28.6	17.5	59.2	1.24	1.20	24.0
8	10	0.312	89.1	28.6	17.1	59.0	1.33	1.20	24.0
9	10	0.327	93.5	29.3	18.1	59.6	1.25	1.20	24.6
10	10	0.319	91.1	29.6	18.0	59.7	1.20	1.20	24.8
11	10	0.314	89.9	29.4	17.7	59.3	1.23	1.20	24.7
12	10	0.323	92.3	29.8	17.7	59.4	1.20	1.20	25.1
13	10	0.311	88.9	29.4	17.5	59.6	1.20	1.20	24.7
Average		0.318	90.8	29.3	17.7	59.4	1.24	1.20	24.6
Std. Dev.		0.005	1.5	0.5	0.3	0.3	0.05	0.00	0.4
Maximum		0.327	93.5	30.1	18.2	60.0	1.36	1.20	25.3
Minimum		0.311	88.9	28.6	17.1	59.0	1.20	1.20	24.0

Total number of blows analyzed: 10

BL#	Comments
4	Start of N value blows

Time Summary

Drive 12 seconds 9:48:27 AM - 9:48:39 AM (3/30/2017) BN 1 - 13

F & ME SPT Calibration - Boring 2 Sample 3
OP: MR

CME 45B S/N 303304, AW Rod
Test date: 30-Mar-2017

AR: 1.19 in^2
LE: 44.33 ft
WS: 16,807.9 f/s

SP: 0.492 k/ft3
EM: 30,000 ksi
JC: 0.00

EFV: Energy of FV
ETR: Energy Transfer Ratio
FMX: Maximum Force
VMX: Maximum Velocity

BPM: Blows per Minute
DMX: Maximum Displacement
DFN: Final Displacement
CSX: Max Measured Compr. Stress

BL# end	depth ft	BLC bl/ft	TYPE	EFV ft-k	ETR (%)	FMX kips	VMX f/s	BPM **	DMX in	DFN in	CSX ksi
3	39.00	6	AV3	0.316	90.2	30.0	18.1	40.4	2.07	2.00	25.2
			STD	0.010	2.9	0.8	0.5	27.2	0.10	0.00	0.7
			MAX	0.326	93.2	30.6	18.5	60.1	2.20	2.00	25.7
			MIN	0.302	86.2	28.8	17.5	1.9	2.00	2.00	24.2
8	39.50	10	AV5	0.317	90.5	29.0	17.6	59.4	1.27	1.20	24.4
			STD	0.004	1.2	0.6	0.3	0.4	0.07	0.00	0.5
			MAX	0.323	92.4	30.1	18.2	60.0	1.36	1.20	25.3
			MIN	0.312	89.1	28.6	17.1	59.0	1.20	1.20	24.0
13	40.00	10	AV5	0.319	91.1	29.5	17.8	59.5	1.22	1.20	24.8
			STD	0.006	1.7	0.2	0.2	0.1	0.02	0.00	0.2
			MAX	0.327	93.5	29.8	18.1	59.7	1.25	1.20	25.1
			MIN	0.311	88.9	29.3	17.5	59.3	1.20	1.20	24.6
			Average	0.317	90.7	29.4	17.8	55.1	1.43	1.38	24.7
			Std. Dev.	0.007	1.9	0.7	0.4	15.3	0.35	0.34	0.6
			Maximum	0.327	93.5	30.6	18.5	60.1	2.20	2.00	25.7
			Minimum	0.302	86.2	28.6	17.1	1.9	1.20	1.20	24.0

Total number of blows analyzed: 13

BL#	depth (ft)	Comments
4	39.10	Start of N value blows

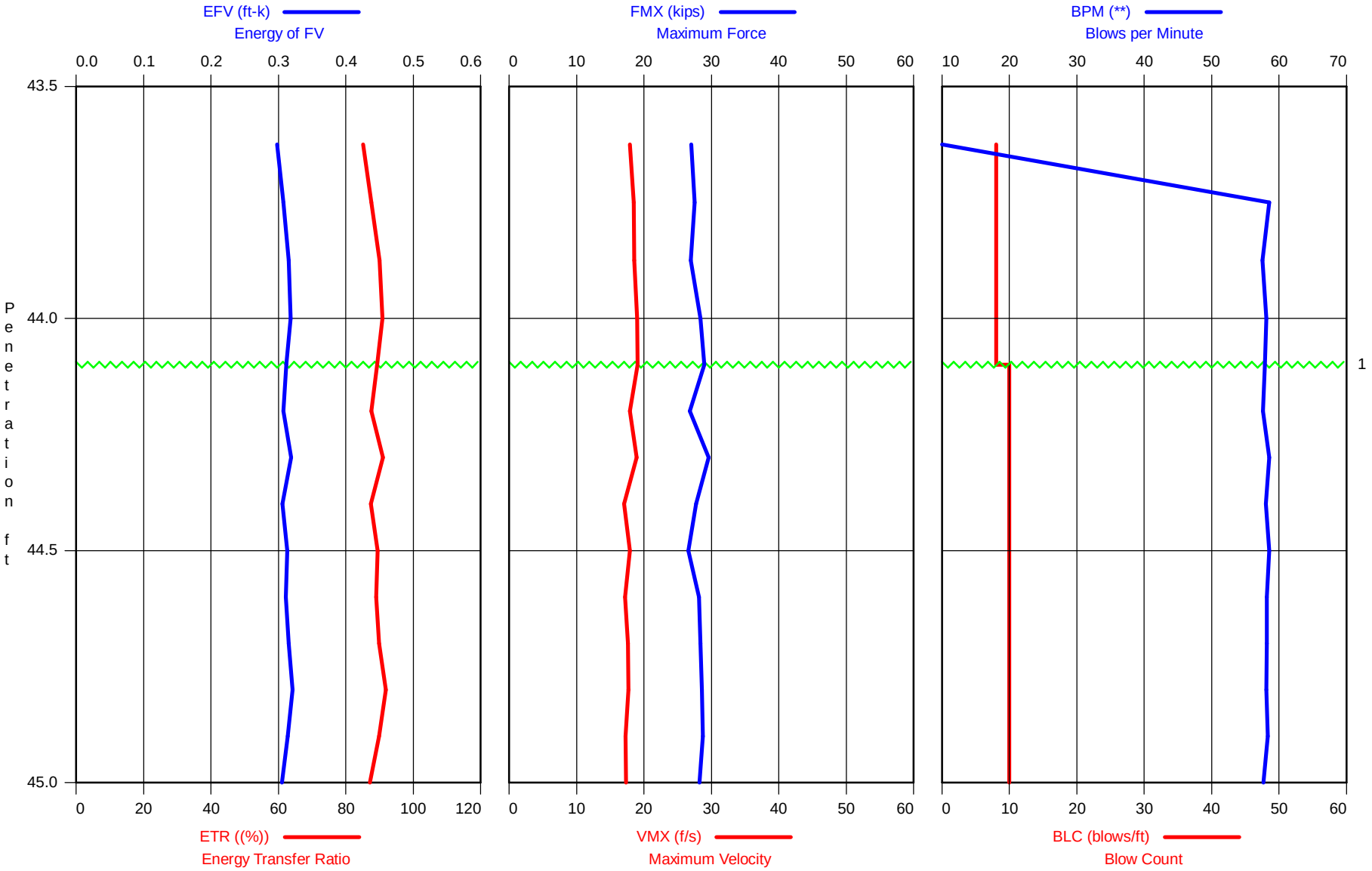
Time Summary

Drive 12 seconds 9:48:27 AM - 9:48:39 AM (3/30/2017) BN 1 - 13

PDIPLOT Ver. 2014.2 - Printed: 30-Mar-2017

Test date: 30-Mar-2017

F & ME SPT Calibration - Boring 2 Sample 4
CME 45B S/N 303304, AW Rod



1 - Start of N value blows

F & ME SPT Calibration - Boring 2 Sample 4
OP: MR

CME 45B S/N 303304, AW Rod
Test date: 30-Mar-2017

AR: 1.19 in^2
LE: 49.33 ft
WS: 16,807.9 f/s

SP: 0.492 k/ft3
EM: 30,000 ksi
JC: 0.00

EFV: Energy of FV
ETR: Energy Transfer Ratio
FMX: Maximum Force
VMX: Maximum Velocity

BPM: Blows per Minute
DMX: Maximum Displacement
DFN: Final Displacement
CSX: Max Measured Compr. Stress

BL#	BLC	EFV	ETR	FMX	VMX	BPM	DMX	DFN	CSX
	bl/ft	ft-k	(%)	kips	f/s	**	in	in	ksi
5	10	0.312	89.3	28.9	19.0	57.9	1.41	1.20	24.3
6	10	0.307	87.6	26.8	17.9	57.6	1.41	1.20	22.5
7	10	0.319	91.1	29.6	18.9	58.5	1.39	1.20	24.8
8	10	0.306	87.4	27.7	17.0	58.0	1.20	1.20	23.3
9	10	0.313	89.4	26.6	17.9	58.5	1.26	1.20	22.3
10	10	0.311	89.0	28.1	17.2	58.2	1.26	1.20	23.6
11	10	0.315	89.9	28.4	17.6	58.2	1.24	1.20	23.9
12	10	0.321	91.8	28.6	17.7	58.1	1.22	1.20	24.0
13	10	0.314	89.9	28.7	17.3	58.3	1.20	1.20	24.2
14	10	0.305	87.1	28.2	17.3	57.7	1.23	1.20	23.7
Average		0.312	89.3	28.2	17.8	58.1	1.28	1.20	23.7
Std. Dev.		0.005	1.5	0.9	0.7	0.3	0.08	0.00	0.7
Maximum		0.321	91.8	29.6	19.0	58.5	1.41	1.20	24.8
Minimum		0.305	87.1	26.6	17.0	57.6	1.20	1.20	22.3

Total number of blows analyzed: 10

BL#	Comments
5	Start of N value blows

Time Summary

Drive 13 seconds 9:57:24 AM - 9:57:37 AM (3/30/2017) BN 1 - 14

F & ME SPT Calibration - Boring 2 Sample 4
OP: MR

CME 45B S/N 303304, AW Rod
Test date: 30-Mar-2017

AR: 1.19 in^2
LE: 49.33 ft
WS: 16,807.9 f/s

SP: 0.492 k/ft3
EM: 30,000 ksi
JC: 0.00

EFV: Energy of FV
ETR: Energy Transfer Ratio
FMX: Maximum Force
VMX: Maximum Velocity

BPM: Blows per Minute
DMX: Maximum Displacement
DFN: Final Displacement
CSX: Max Measured Compr. Stress

BL# end	depth ft	BLC bl/ft	TYPE	EFV ft-k	ETR (%)	FMX kips	VMX f/s	BPM **	DMX in	DFN in	CSX ksi
4	44.00	8	AV4	0.310	88.4	27.5	18.5	44.0	1.68	1.50	23.1
			STD	0.008	2.2	0.6	0.4	24.3	0.08	0.00	0.5
			MAX	0.318	90.8	28.4	19.0	58.5	1.80	1.50	23.9
			MIN	0.298	85.2	26.9	17.9	1.9	1.58	1.50	22.6
9	44.50	10	AV5	0.311	88.9	27.9	18.2	58.1	1.33	1.20	23.5
			STD	0.005	1.3	1.2	0.7	0.4	0.09	0.00	1.0
			MAX	0.319	91.1	29.6	19.0	58.5	1.41	1.20	24.8
			MIN	0.306	87.4	26.6	17.0	57.6	1.20	1.20	22.3
14	45.00	10	AV5	0.313	89.6	28.4	17.4	58.1	1.23	1.20	23.9
			STD	0.005	1.5	0.2	0.2	0.2	0.02	0.00	0.2
			MAX	0.321	91.8	28.7	17.7	58.3	1.26	1.20	24.2
			MIN	0.305	87.1	28.1	17.2	57.7	1.20	1.20	23.6
			Average	0.312	89.0	28.0	18.0	54.1	1.40	1.29	23.5
			Std. Dev.	0.006	1.7	0.9	0.7	14.5	0.20	0.14	0.7
			Maximum	0.321	91.8	29.6	19.0	58.5	1.80	1.50	24.8
			Minimum	0.298	85.2	26.6	17.0	1.9	1.20	1.20	22.3

Total number of blows analyzed: 14

BL#	depth (ft)	Comments
5	44.10	Start of N value blows

Time Summary

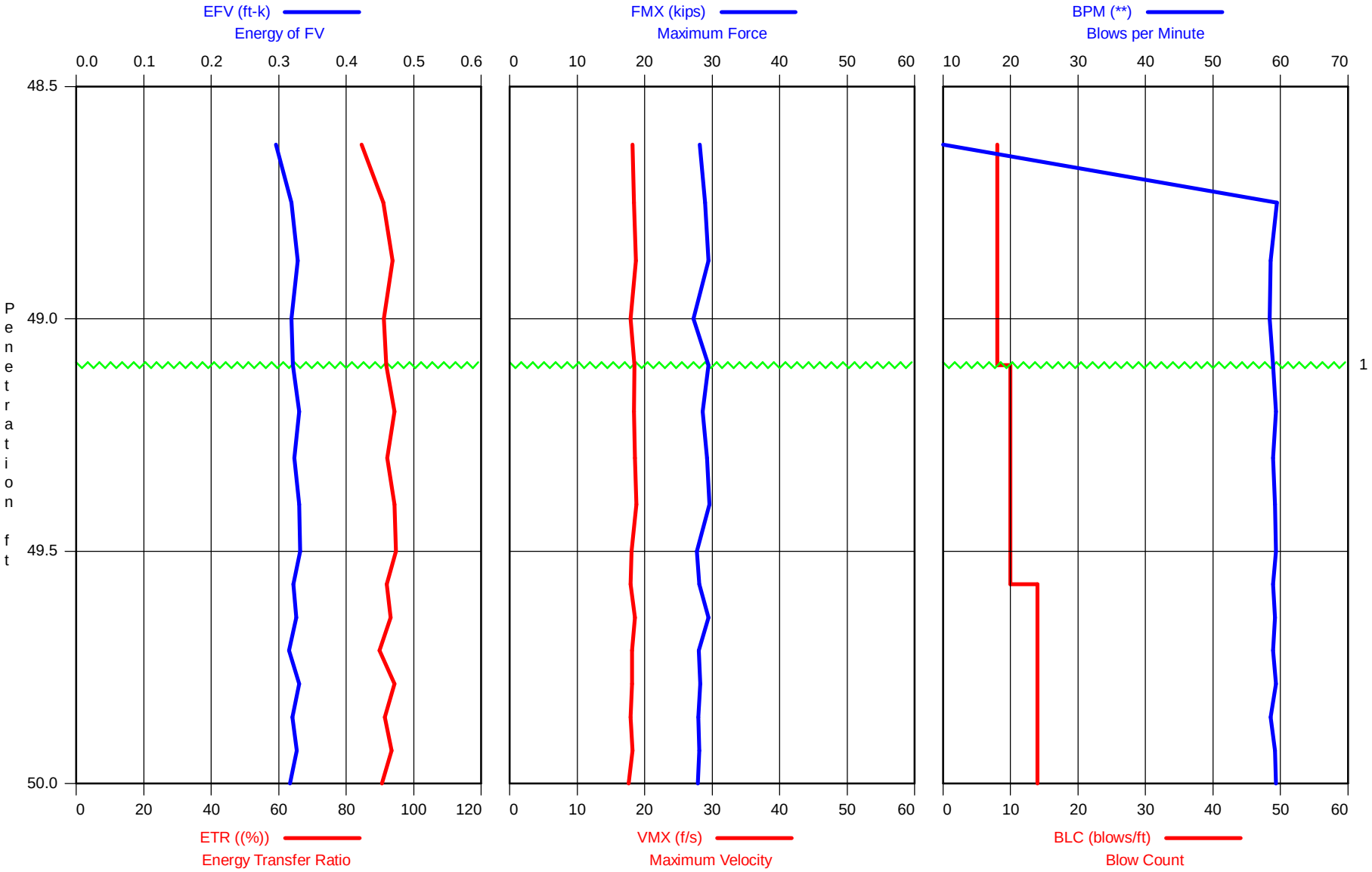
Drive 13 seconds 9:57:24 AM - 9:57:37 AM (3/30/2017) BN 1 - 14

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

PDIPLOT Ver. 2014.2 - Printed: 30-Mar-2017

Test date: 30-Mar-2017

F & ME SPT Calibration - Boring 2 Sample 5
CME 45B S/N 303304, AW Rod



1 - Start of N value blows

F & ME SPT Calibration - Boring 2 Sample 5

CME 45B S/N 303304, AW Rod

OP: MR

Test date: 30-Mar-2017

AR: 1.19 in^2
LE: 54.33 ft
WS: 16,807.9 f/s

SP: 0.492 k/ft3
EM: 30,000 ksi
JC: 0.00

EFV: Energy of FV
ETR: Energy Transfer Ratio
FMX: Maximum Force
VMX: Maximum Velocity

BPM: Blows per Minute
DMX: Maximum Displacement
DFN: Final Displacement
CSX: Max Measured Compr. Stress

BL#	BLC	EFV	ETR	FMX	VMX	BPM	DMX	DFN	CSX
	bl/ft	ft-k	(%)	kips	f/s	**	in	in	ksi
5	10	0.321	91.8	29.4	18.5	58.9	1.39	1.20	24.7
6	10	0.330	94.3	28.6	18.4	59.3	1.29	1.20	24.0
7	10	0.323	92.2	29.2	18.6	58.9	1.20	1.20	24.6
8	10	0.330	94.3	29.6	18.8	59.2	1.20	1.20	24.9
9	10	0.332	94.8	27.7	18.0	59.3	1.20	1.20	23.3
10	14	0.322	92.0	28.1	17.9	58.9	0.95	0.86	23.6
11	14	0.326	93.2	29.5	18.6	59.2	0.96	0.86	24.8
12	14	0.315	89.9	28.1	18.1	58.9	0.90	0.86	23.6
13	14	0.330	94.3	28.2	18.1	59.3	0.90	0.86	23.7
14	14	0.320	91.4	27.9	18.0	58.5	0.92	0.86	23.5
15	14	0.327	93.4	28.1	18.2	59.2	0.91	0.86	23.6
16	14	0.317	90.6	27.9	17.6	59.3	0.90	0.86	23.4
Average		0.324	92.7	28.5	18.2	59.1	1.06	1.00	24.0
Std. Dev.		0.005	1.5	0.7	0.3	0.2	0.17	0.17	0.6
Maximum		0.332	94.8	29.6	18.8	59.3	1.39	1.20	24.9
Minimum		0.315	89.9	27.7	17.6	58.5	0.90	0.86	23.3

Total number of blows analyzed: 12

BL#	Comments
5	Start of N value blows

Time Summary

Drive 16 seconds 10:05:38 AM - 10:05:54 AM (3/30/2017) BN 1 - 16

F & ME SPT Calibration - Boring 2 Sample 5
OP: MR

CME 45B S/N 303304, AW Rod
Test date: 30-Mar-2017

AR: 1.19 in^2
LE: 54.33 ft
WS: 16,807.9 f/s

SP: 0.492 k/ft3
EM: 30,000 ksi
JC: 0.00

EFV: Energy of FV
ETR: Energy Transfer Ratio
FMX: Maximum Force
VMX: Maximum Velocity

BPM: Blows per Minute
DMX: Maximum Displacement
DFN: Final Displacement
CSX: Max Measured Compr. Stress

BL# end	depth ft	BLC bl/ft	TYPE	EFV ft-k	ETR (%)	FMX kips	VMX f/s	BPM **	DMX in	DFN in	CSX ksi
4	49.00	8	AV4	0.316	90.1	28.4	18.3	44.6	1.67	1.50	23.9
			STD	0.012	3.4	0.8	0.3	24.6	0.02	0.00	0.7
			MAX	0.328	93.7	29.5	18.7	59.5	1.69	1.50	24.8
			MIN	0.296	84.6	27.2	17.9	1.9	1.65	1.50	22.9
9	49.50	10	AV5	0.327	93.5	28.9	18.5	59.1	1.26	1.20	24.3
			STD	0.004	1.2	0.7	0.2	0.2	0.07	0.00	0.6
			MAX	0.332	94.8	29.6	18.8	59.3	1.39	1.20	24.9
			MIN	0.321	91.8	27.7	18.0	58.9	1.20	1.20	23.3
16	50.00	14	AV7	0.322	92.1	28.3	18.1	59.0	0.92	0.86	23.7
			STD	0.005	1.5	0.5	0.3	0.3	0.02	0.00	0.4
			MAX	0.330	94.3	29.5	18.6	59.3	0.96	0.86	24.8
			MIN	0.315	89.9	27.9	17.6	58.5	0.90	0.86	23.4
			Average	0.322	92.0	28.5	18.3	55.5	1.21	1.12	24.0
			Std. Dev.	0.008	2.4	0.7	0.3	13.8	0.30	0.26	0.6
			Maximum	0.332	94.8	29.6	18.8	59.5	1.69	1.50	24.9
			Minimum	0.296	84.6	27.2	17.6	1.9	0.90	0.86	22.9

Total number of blows analyzed: 16

BL#	depth (ft)	Comments
5	49.10	Start of N value blows

Time Summary

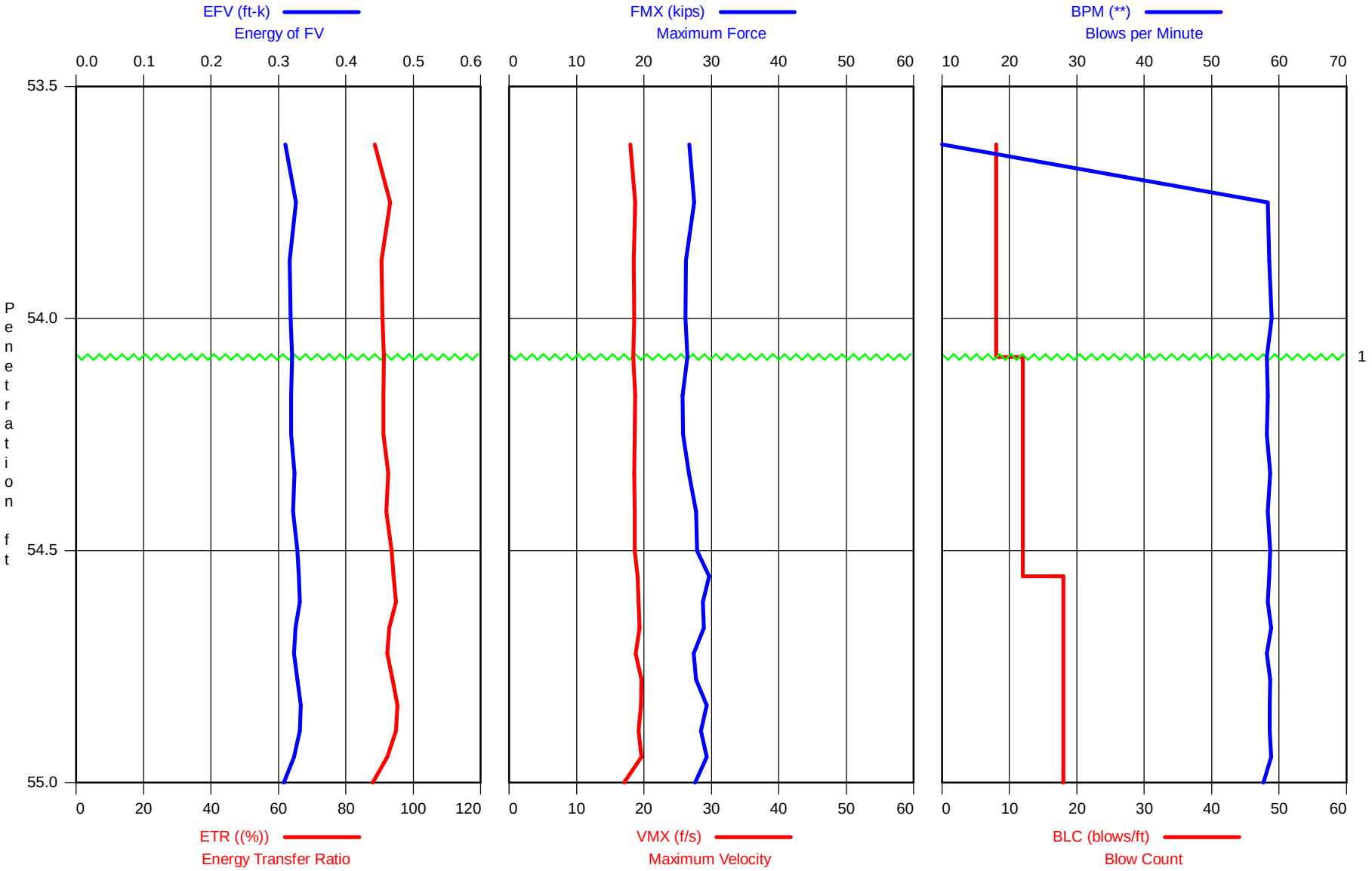
Drive 16 seconds 10:05:38 AM - 10:05:54 AM (3/30/2017) BN 1 - 16

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

PDIPLOT Ver. 2014.2 - Printed: 30-Mar-2017

Test date: 30-Mar-2017

F & ME SPT Calibration - Boring 2 Sample 6
CME 45B S/N 303304, AW Rod



1 - Start of N value blows

F & ME SPT Calibration - Boring 2 Sample 6
OP: MR

CME 45B S/N 303304, AW Rod
Test date: 30-Mar-2017

AR: 1.19 in^2
LE: 59.33 ft
WS: 16,807.9 f/s

SP: 0.492 k/ft3
EM: 30,000 ksi
JC: 0.00

EFV: Energy of FV
ETR: Energy Transfer Ratio
FMX: Maximum Force
VMX: Maximum Velocity

BPM: Blows per Minute
DMX: Maximum Displacement
DFN: Final Displacement
CSX: Max Measured Compr. Stress

BL#	BLC	EFV	ETR	FMX	VMX	BPM	DMX	DFN	CSX
	bl/ft	ft-k	(%)	kips	f/s	**	in	in	ksi
5	12	0.320	91.4	26.4	18.4	58.2	1.13	1.00	22.2
6	12	0.319	91.2	25.7	18.7	58.3	1.07	1.00	21.6
7	12	0.319	91.2	25.8	18.6	58.2	1.00	1.00	21.7
8	12	0.324	92.6	26.7	18.6	58.7	1.00	1.00	22.4
9	12	0.322	92.0	27.7	18.6	58.3	1.00	1.00	23.3
10	12	0.328	93.6	27.9	18.6	58.7	1.01	1.00	23.4
11	18	0.330	94.2	29.7	19.1	58.5	0.73	0.67	24.9
12	18	0.332	94.9	28.8	19.2	58.3	0.77	0.67	24.2
13	18	0.325	92.9	28.9	19.3	58.8	0.73	0.67	24.3
14	18	0.323	92.3	27.4	18.8	58.2	0.75	0.67	23.0
15	18	0.328	93.8	27.7	19.6	58.7	0.76	0.67	23.3
16	18	0.333	95.3	29.3	19.5	58.6	0.78	0.67	24.7
17	18	0.332	94.8	28.4	19.2	58.6	0.78	0.67	23.9
18	18	0.323	92.4	29.3	19.7	58.8	0.74	0.67	24.6
19	18	0.308	88.0	27.6	17.1	57.7	0.72	0.67	23.2
Average		0.324	92.7	27.8	18.9	58.4	0.86	0.80	23.4
Std. Dev.		0.006	1.8	1.2	0.6	0.3	0.14	0.16	1.0
Maximum		0.333	95.3	29.7	19.7	58.8	1.13	1.00	24.9
Minimum		0.308	88.0	25.7	17.1	57.7	0.72	0.67	21.6

Total number of blows analyzed: 15

BL#	Comments
5	Start of N value blows

Time Summary

Drive 18 seconds 10:15:57 AM - 10:16:15 AM (3/30/2017) BN 1 - 19

F & ME SPT Calibration - Boring 2 Sample 6
OP: MR

CME 45B S/N 303304, AW Rod
Test date: 30-Mar-2017

AR: 1.19 in^2
LE: 59.33 ft
WS: 16,807.9 f/s

SP: 0.492 k/ft3
EM: 30,000 ksi
JC: 0.00

EFV: Energy of FV
ETR: Energy Transfer Ratio
FMX: Maximum Force
VMX: Maximum Velocity

BPM: Blows per Minute
DMX: Maximum Displacement
DFN: Final Displacement
CSX: Max Measured Compr. Stress

BL# end	depth ft	BLC bl/ft	TYPE	EFV ft-k	ETR (%)	FMX kips	VMX f/s	BPM **	DMX in	DFN in	CSX ksi
4	54.00	8	AV4	0.318	90.8	26.6	18.4	44.4	1.65	1.50	22.4
			STD	0.006	1.7	0.5	0.3	24.5	0.15	0.00	0.4
			MAX	0.326	93.2	27.4	18.7	58.9	1.86	1.50	23.0
			MIN	0.310	88.6	26.2	18.0	1.9	1.50	1.50	22.0
10	54.50	12	AV6	0.322	92.0	26.7	18.6	58.4	1.04	1.00	22.4
			STD	0.003	0.9	0.8	0.1	0.2	0.05	0.00	0.7
			MAX	0.328	93.6	27.9	18.7	58.7	1.13	1.00	23.4
			MIN	0.319	91.2	25.7	18.4	58.2	1.00	1.00	21.6
19	55.00	18	AV9	0.326	93.2	28.6	19.1	58.5	0.75	0.67	24.0
			STD	0.007	2.1	0.8	0.7	0.3	0.02	0.00	0.7
			MAX	0.333	95.3	29.7	19.7	58.8	0.78	0.67	24.9
			MIN	0.308	88.0	27.4	17.1	57.7	0.72	0.67	23.0
			Average	0.323	92.3	27.6	18.8	55.5	1.03	0.95	23.2
			Std. Dev.	0.007	1.9	1.2	0.6	12.6	0.35	0.32	1.0
			Maximum	0.333	95.3	29.7	19.7	58.9	1.86	1.50	24.9
			Minimum	0.308	88.0	25.7	17.1	1.9	0.72	0.67	21.6

Total number of blows analyzed: 19

BL#	depth (ft)	Comments
5	54.08	Start of N value blows

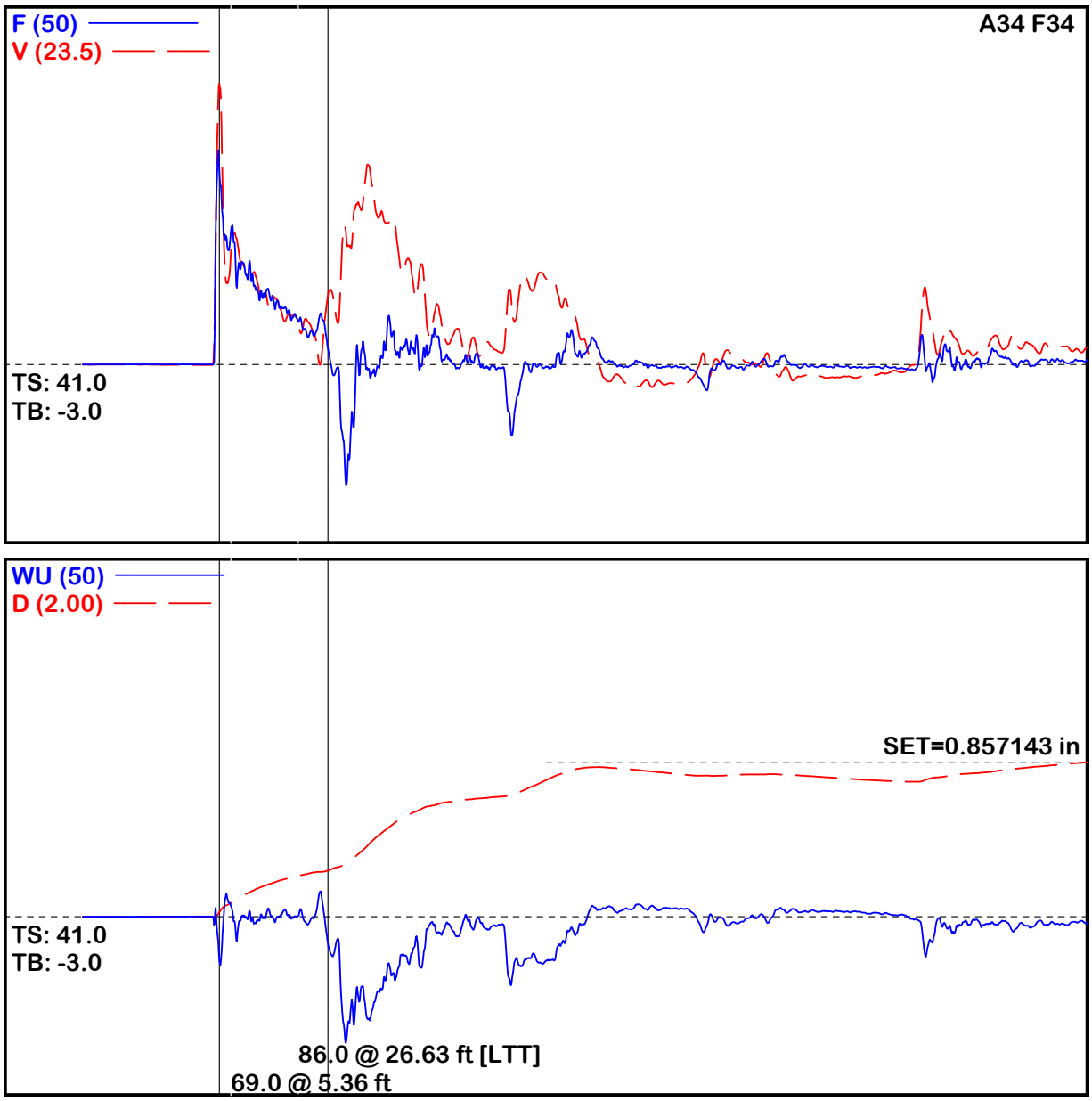
Time Summary

Drive 18 seconds 10:15:57 AM - 10:16:15 AM (3/30/2017) BN 1 - 19

APPENDIX D

Force and Velocity Plots

F & ME SPT Calibration Boring 2 Sample 1



Project Information

PROJECT: F & ME SPT Calibration
PILE NAME: Boring 2 Sample 1
DESCR: CME 45B S/N 303304, AW Rod
OPERATOR: MR
FILE: Boring 2 Sample 1 Final.W01
3/30/2017 9:35:18 AM
Blow Number 11

Pile Properties

LE	34.33	ft
AR	1.19	in^2
EM	30000	ksi
SP	0.492	k/ft3
WS	16807.9	f/s
EA/C	2.1	ksec/ft
2L/C	4.10	ms
JC		[]
LP	29.50	ft

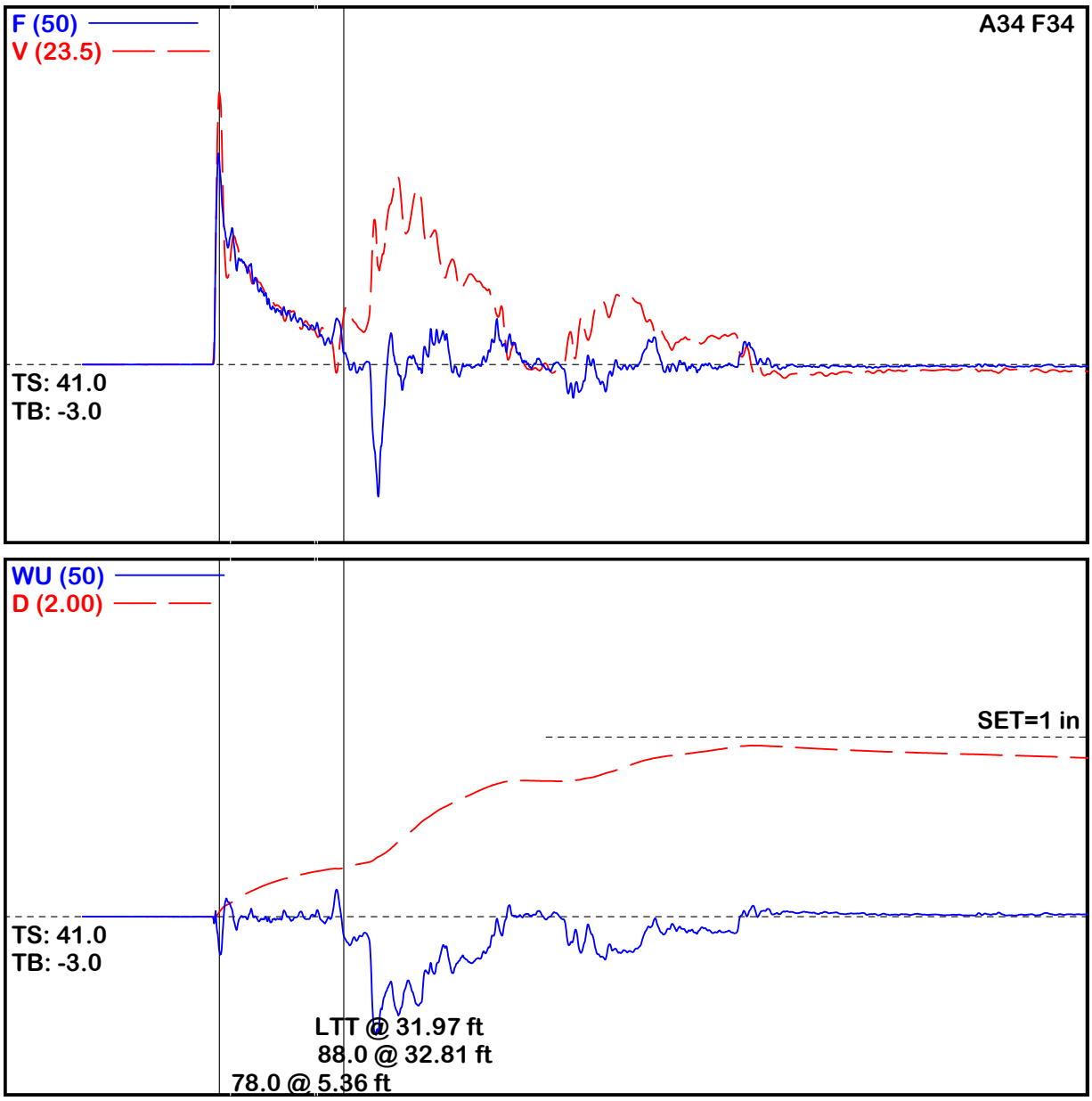
Quantity Results

EFV	0.299	ft-k
ETR	85.6	(%)
FMX	30	kips
VMX	18.4	f/s
BPM	53.9	bpm
FVP	0.69	[]
DMX	0.89	in
DFN	0.86	in
CSX	25.1	ksi

Sensors

F3: [168 AWJ-1] 212.47 (1)
F4: [168 AWJ-2] 215.16 (1)
A3: [K 2081] 357 mv/5000g's (1)
A4: [K 2082] 322 mv/5000g's (1)
CLIP: OK

F & ME SPT Calibration Boring 2 Sample 2



Project Information

PROJECT: F & ME SPT Calibration
PILE NAME: Boring 2 Sample 2
DESCR: CME 45B S/N 303304, AW Rod
OPERATOR: MR
FILE: Boring 2 Sample 2 Final.W01
3/30/2017 9:42:15 AM
Blow Number 11

Pile Properties

LE	39.33 ft
AR	1.19 in^2
EM	30000 ksi
SP	0.492 k/ft3
WS	16807.9 f/s
EA/C	2.1 ksec/ft
2L/C	4.70 ms
JC	[]
LP	34.50 ft

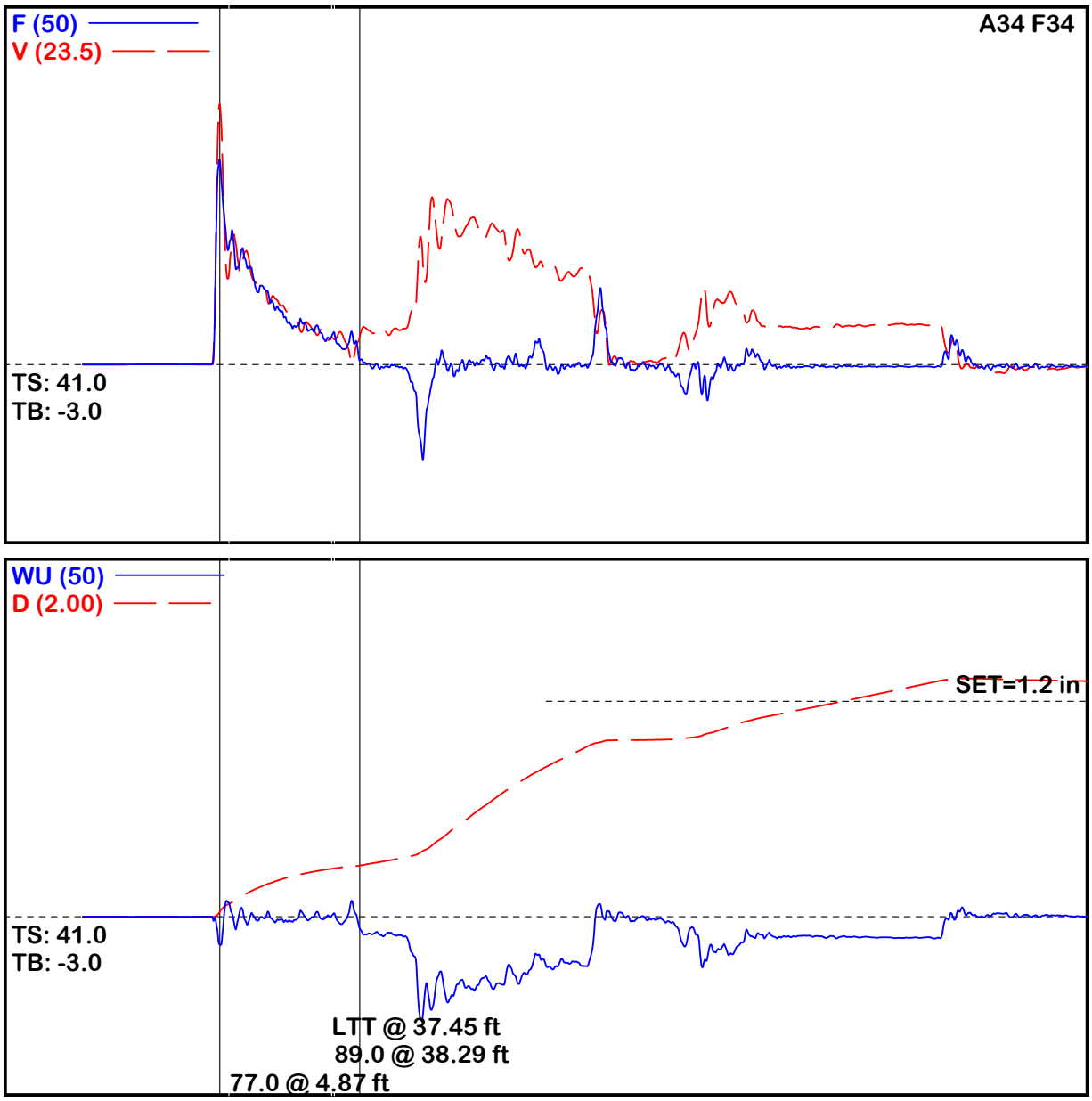
Quantity Results

EFV	0.309 ft-k
ETR	88.2 (%)
FMX	29 kips
VMX	17.8 f/s
BPM	55.2 bpm
FVP	0.75 []
DMX	1.02 in
DFN	1.00 in
CSX	24.7 ksi

Sensors

F3: [168 AWJ-1] 212.47 (1)
F4: [168 AWJ-2] 215.16 (1)
A3: [K 2081] 357 mv/5000g's (1)
A4: [K 2082] 322 mv/5000g's (1)
CLIP: OK

F & ME SPT Calibration Boring 2 Sample 3



Project Information

PROJECT: F & ME SPT Calibration
PILE NAME: Boring 2 Sample 3
DESCR: CME 45B S/N 303304, AW Rod
OPERATOR: MR
FILE: Boring 2 Sample 3 Final.W01
3/30/2017 9:48:34 AM
Blow Number 8

Pile Properties

LE	44.33	ft
AR	1.19	in^2
EM	30000	ksi
SP	0.492	k/ft3
WS	16807.9	f/s
EA/C	2.1	ksec/ft
2L/C	5.28	ms
JC		[]
LP	39.50	ft

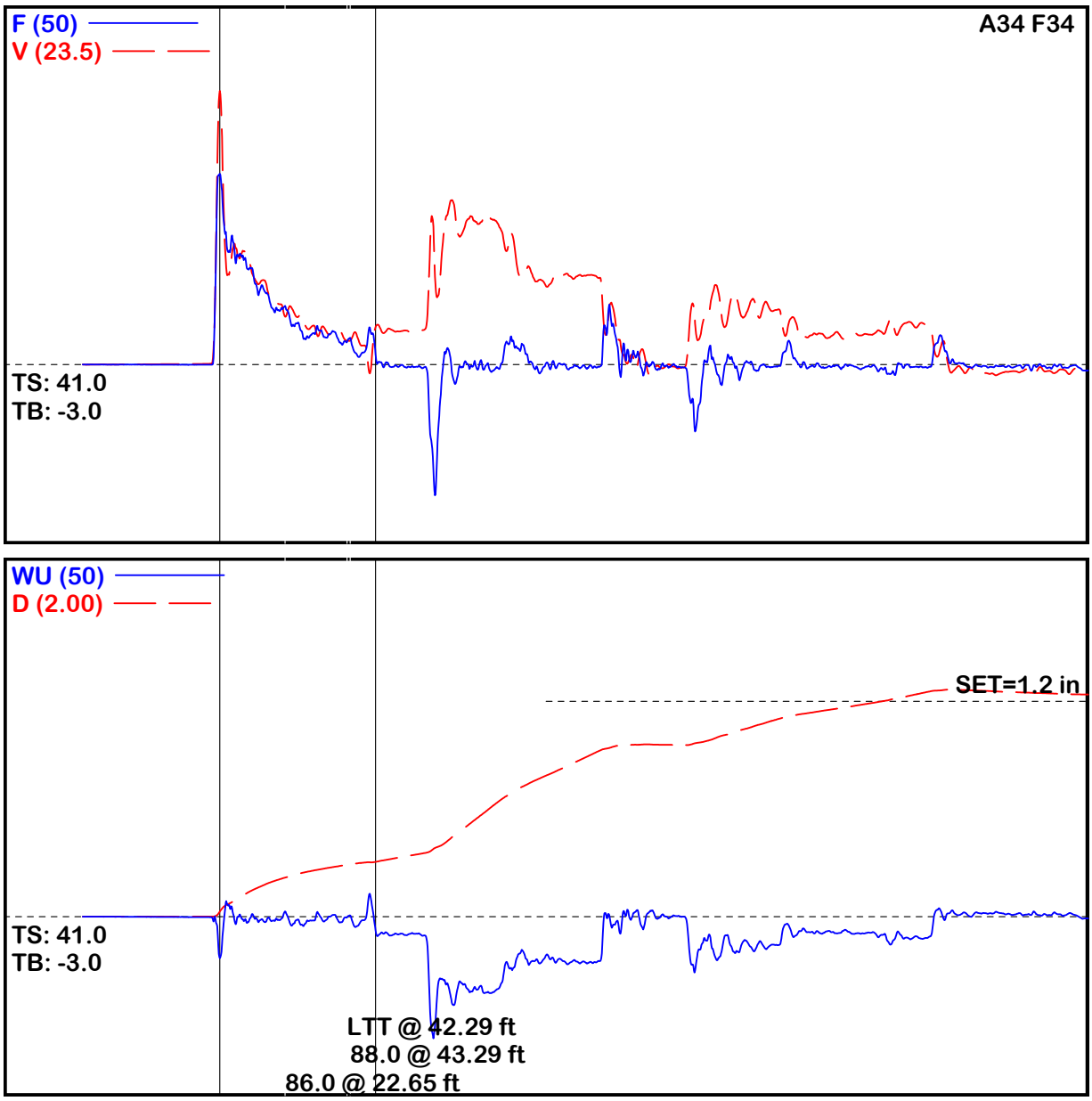
Quantity Results

EFV	0.312	ft-k
ETR	89.1	(%)
FMX	29	kips
VMX	17.1	f/s
BPM	59.0	bpm
FVP	0.78	[]
DMX	1.33	in
DFN	1.20	in
CSX	24.0	ksi

Sensors

F3: [168 AWJ-1] 212.47 (1)
F4: [168 AWJ-2] 215.16 (1)
A3: [K 2081] 357 mv/5000g's (1)
A4: [K 2082] 322 mv/5000g's (1)
CLIP: OK

F & ME SPT Calibration Boring 2 Sample 4



Project Information

PROJECT: F & ME SPT Calibration
PILE NAME: Boring 2 Sample 4
DESCR: CME 45B S/N 303304, AW Rod
OPERATOR: MR
FILE: Boring 2 Sample 4 Final.W01
3/30/2017 9:57:31 AM
Blow Number 9

Pile Properties

LE	49.33 ft
AR	1.19 in^2
EM	30000 ksi
SP	0.492 k/ft3
WS	16807.9 f/s
EA/C	2.1 ksec/ft
2L/C	5.88 ms
JC	[]
LP	44.50 ft

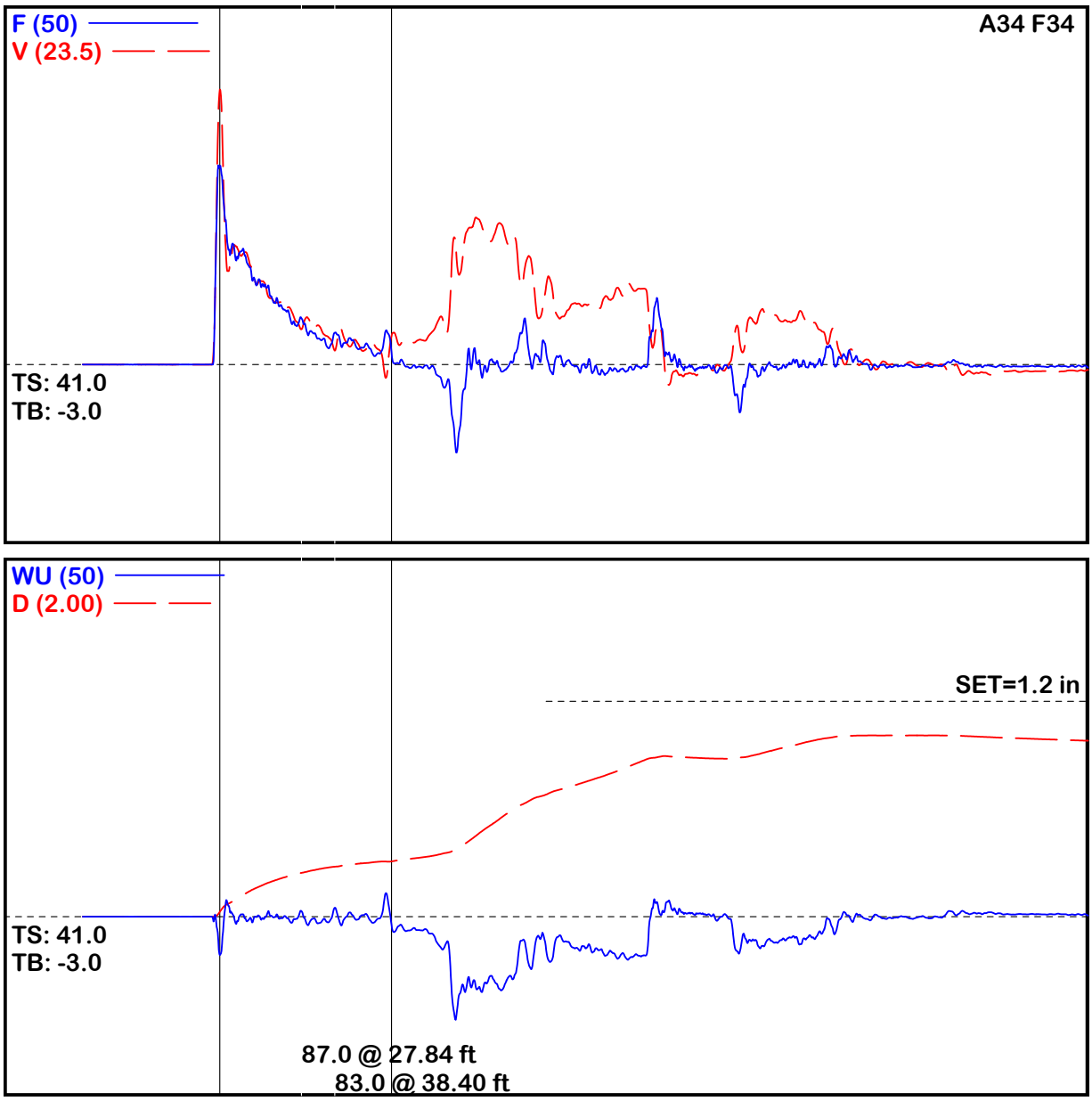
Quantity Results

EFV	0.313 ft-k
ETR	89.4 (%)
FMX	27 kips
VMX	17.9 f/s
BPM	58.5 bpm
FVP	0.70 []
DMX	1.26 in
DFN	1.20 in
CSX	22.3 ksi

Sensors

F3: [168 AWJ-1] 212.47 (1)
F4: [168 AWJ-2] 215.16 (1)
A3: [K 2081] 357 mv/5000g's (1)
A4: [K 2082] 322 mv/5000g's (1)
CLIP: OK

F & ME SPT Calibration Boring 2 Sample 5



Project Information

PROJECT: F & ME SPT Calibration
PILE NAME: Boring 2 Sample 5
DESCR: CME 45B S/N 303304, AW Rod
OPERATOR: MR
FILE: Boring 2 Sample 5 Final.W01
3/30/2017 10:05:46 AM
Blow Number 9

Pile Properties

LE	54.33	ft
AR	1.19	in^2
EM	30000	ksi
SP	0.492	k/ft3
WS	16807.9	f/s
EA/C	2.1	ksec/ft
2L/C	6.48	ms
JC		[]
LP	49.50	ft

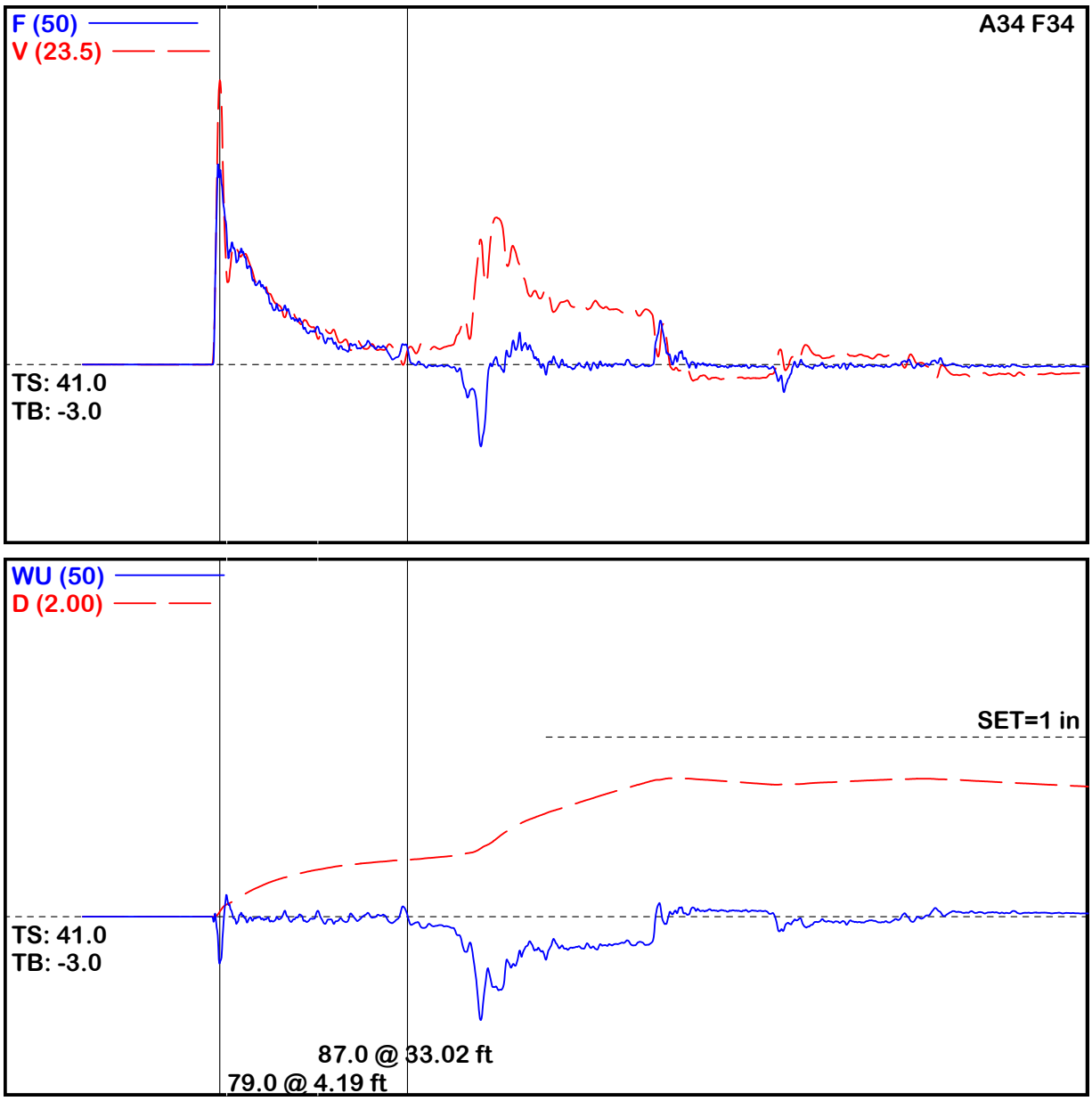
Quantity Results

EFV	0.332	ft-k
ETR	94.8	(%)
FMX	28	kips
VMX	18.0	f/s
BPM	59.3	bpm
FVP	0.72	[]
DMX	1.20	in
DFN	1.20	in
CSX	23.3	ksi

Sensors

F3: [168 AWJ-1] 212.47 (1)
F4: [168 AWJ-2] 215.16 (1)
A3: [K 2081] 357 mv/5000g's (1)
A4: [K 2082] 322 mv/5000g's (1)
CLIP: OK

F & ME SPT Calibration Boring 2 Sample 6



Project Information

PROJECT: F & ME SPT Calibration
PILE NAME: Boring 2 Sample 6
DESCR: CME 45B S/N 303304, AW Rod
OPERATOR: MR
FILE: Boring 2 Sample 6 Final.W01
3/30/2017 10:16:06 AM
Blow Number 10

Pile Properties

LE	59.33	ft
AR	1.19	in^2
EM	30000	ksi
SP	0.492	k/ft3
WS	16807.9	f/s
EA/C	2.1	ksec/ft
2L/C	7.08	ms
JC		[]
LP	54.50	ft

Quantity Results

EFV	0.328	ft-k
ETR	93.6	(%)
FMX	28	kips
VMX	18.6	f/s
BPM	58.7	bpm
FVP	0.67	[]
DMX	1.01	in
DFN	1.00	in
CSX	23.4	ksi

Sensors

F3: [168 AWJ-1] 212.47 (1)
F4: [168 AWJ-2] 215.16 (1)
A3: [K 2081] 357 mv/5000g's (1)
A4: [K 2082] 322 mv/5000g's (1)
CLIP: OK

Report of SPT Energy Measurements
S&ME CME-55 Truck (SN 328245)
Fayetteville, North Carolina
S&ME Project No. 6235-17-009

Prepared for:

North Carolina Department of Transportation
Geotechnical Engineering Unit
1589 Mail Service Center
Raleigh, North Carolina 27699

Prepared by:

S&ME, Inc.
9751 Southern Pine Boulevard
Charlotte, NC 28273

May 1, 2017

May 1, 2017

North Carolina Department of Transportation
Geotechnical Engineering Unit
1589 Mail Service Center
Raleigh, North Carolina 27699

Attention: Mr. Shunyi (Chris) Chen, Ph.D., P.E.

cc: Ms. Cheryl A. Youngblood, L.G.

Reference: **Report of SPT Energy Measurements**
S&ME CME-55 Truck (SN 328245)
Fayetteville, North Carolina
S&ME Project No. 6235-17-009

Dear Mr. Chen:

We have completed the Standard Penetration Test (SPT) energy measurements on the automatic hammer mounted on our CME-55 Truck drill rig with a serial number of 328245. This service was performed by our Mr. Robert E. Kral on April 4, 2017 between the times of 11:39 AM and 12:40 PM. SPT energy testing was performed in general accordance with ASTM D4633 and the most recent revision of the North Carolina Department of Transportation, Geotechnical Engineering Unit's requirements. The testing procedures, equipment used during testing, and detailed results are presented in this report.

1.0 Dynamic Testing Methodology

Testing was performed using a model PAX (Serial No. 3733L) Pile Driving Analyzer™ (PDA) manufactured by Pile Dynamics, Inc. The PDA records and interprets data from two piezoresistive accelerometers (Serial Nos. K5641 and K5642) bolted to a 2-foot long AWJ drill rod (SN203) internally instrumented with two strain transducers. The instrumented AWJ drill rod has a cross-sectional area of 1.20 square inches, an outside diameter of approximately 1.75 inches, and an inside diameter of 1.375 inches at the gage location. Calibration sheets for the accelerometers and the instrumented rod are included in the Appendix. The accelerometers and strain gages, which are mounted on opposing axes near the middle of the instrumented rod, monitor acceleration and strain for each hammer blow. The analyzer converts the data to velocities and forces, computing the maximum transferred hammer energies with the "EFV" method described in ASTM D4633. All results are recorded and displayed in real time for each blow.

2.0 Testing and Observations

S&ME personnel were on site on April 4, 2017 to observe and perform testing during SPT sampling on the CME-55 truck mounted rig operated by Ted Miller of S&ME. The measurements were taken during drilling operations at the Fayetteville Outer Loop (TIP U-2519AA) project in Fayetteville, North Carolina. The measurements were obtained during the SPT sampling of Soil Test Boring Y2_2800. SPT energy measurements were recorded during four intervals at depths of approximately 57.6, 62.6, 67.6, and 72.6 ft below the existing ground surface. The information presented in the tables below summarizes the equipment tested and tooling used for this Report of SPT Energy Measurements.

Table 2-1: Drill Rig Information

Manufacturer	CME
Model	55
Serial Number	328245
Operator	Ted Miller
Carrier	Truck

Table 2-2: 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

Table 2-3: Drilling and Instrumented Rod Information

Drill Rod Type	AWJ
OD (inches)	1.75
ID (inches)	1.25
Cross-Sectional Area (in^2)	1.20
Typical Length (feet)	5 and 10
Instrumented Rod Type	AWJ (SN 203)
OD (inches)	1.75
ID (inches)	1.25
Cross-Sectional Area (in^2)	1.20
Total Instrumented Rod Length (feet)	2.0
Length Below Gages (feet)	0.88
Split Spoon Length (feet)	2.88

The reported blow counts, obtained by the drill rig personnel, are presented with the energy data in Table 3-1 and on the Field and Boring Logs in the Appendix. A representative graph of force and normalized velocity vs. time for a typical blow and the following list of plots and tables are incorporated into the Appendix.

3.0 Dynamic Testing Results

Based on the test data, the automatic hammer on the CME-55 truck mounted rig operated at a rate of about 51.6 to 52.2 blows per minute (bpm) during dynamic testing. The measured transferred hammer energy (EFV) was generally in the range of about 267.1 to 307.3 ft-lbs, which corresponds to Energy Transfer Ratio (ETR) values of about 76.3% to 87.8%, respectively. The SPT Energy Measurement Data Summary tables in the Appendix 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, and a summary of the test data and average computed hammer energy and transfer ratio values are provided in Table 3-1. Plots and tables of the following are also included in the Appendix 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 3-1: Summary of Dynamic Testing Results

Data Set ID	Instrumentation to Sampler Tip Length (ft)	Sample Depth (ft)	Blows per 6" Increment / N-value	Soil Sample Description (Residual)	Avg. BPM	Avg. EFV (ft-lbs)	Avg. ETR (percent)
1	63.76	57.6 - 59.1	7-10-9 / 19	SAND	51.9	286.9	82.0
2	68.76	62.6 - 64.1	9-10-12 / 22	SAND	52.0	298.6	85.3
3	73.76	67.6 - 69.1	6-13-17 / 30	SAND	51.9	295.9	84.5
4	78.76	72.6 - 74.1	6-11-10 / 21	SAND	51.9	294.8	84.2
				Overall Average	**51.9**	**294.4**	**84.1**

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 these average values. **The overall average transferred hammer energy for the automatic hammer on the CME-55 truck mounted rig (for all the depth intervals tested) was 294.4 foot-pounds, with an average ETR of 84.1%.**

4.0 Limitations of Report

This report has been prepared in accordance with generally accepted geotechnical engineering practice for specific application to this project. The conclusions 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.

5.0 Closing

S&ME appreciates the opportunity to provide this report to the North Carolina Department of Transportation Geotechnical Engineering Unit. Please let us know if you have any questions concerning this report.

Sincerely,

S&ME, Inc.

R. Heath Forbes, P.E. (SC)
Geotechnical Project Manager

NORTH CAROLINA PROFESSIONAL SEAL 042642 ENGINEER ROBERT E. KRAL
rkral@sandmeinc.com
2017.05.01 17:16:49 -05'00'

Robert E. Kral, P.E.
Transportation Services Project Manager
N.C. Registration No. 042642

Senior Reviewed By: Kristen H. Hill, L.G., P.E.

Appendices:

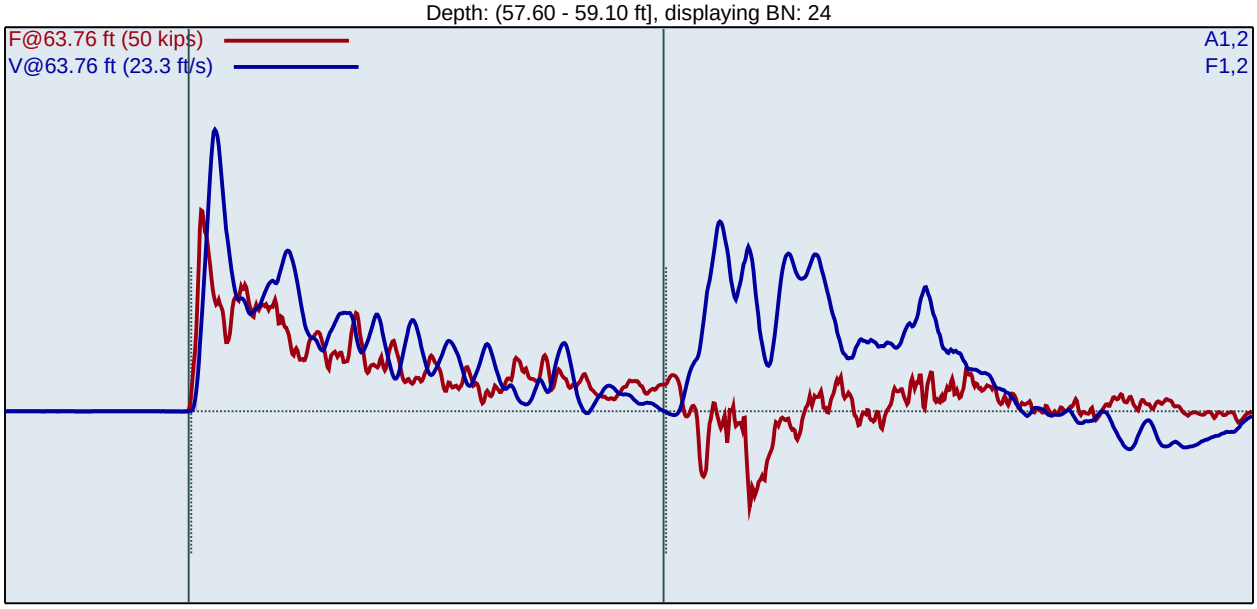
- Appendix I - CME 55 (SN 328245) SPT Energy Measurements Summary Plots and Tables
- Appendix II - Field Log and Boring Log
- Appendix III - Instrumented Rod and Accelerometer Calibration Sheets
- Appendix IV - Certificate of Proficiency

Appendix I

CME55 Truck (SN 328245)
R. Kral
AR: 1.20 in^2
LE: 63.76 ft
WS: 16807.9 ft/s

28+00, 20LT
Test date: 4/4/2017
SP: 0.492 k/ft3
EM: 30000 ksi

Depth: (57.60 - 59.10 ft], displaying BN: 24



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

BL#	LP ft	BC /6"	BPM bpm	FMX kips	VMX ft/s	DMX in	CSX ksi	DFN in	EFV ft-lb	ETR (%)
1	57.67	7	60.7	27	14.5	1.02	22.9	0.78	247.9	70.8
2	57.74	7	52.7	27	14.5	1.03	22.2	0.82	266.7	76.2
3	57.81	7	52.0	27	14.5	0.84	22.7	0.81	255.9	73.1
4	57.89	7	51.8	27	14.6	0.82	22.7	0.81	266.4	76.1
5	57.96	7	52.2	27	14.9	0.81	22.6	0.81	264.2	75.5
6	58.03	7	52.0	27	15.1	0.83	22.8	0.82	275.9	78.8
7	58.10	7	52.1	27	15.5	0.86	22.7	0.83	286.6	81.9
8	58.15	10	51.9	27	15.9	0.70	22.9	0.57	280.6	80.2
9	58.20	10	51.9	27	15.8	0.67	22.5	0.56	275.1	78.6
10	58.25	10	52.0	27	15.9	0.67	22.6	0.56	273.4	78.1
11	58.30	10	51.9	28	16.0	0.68	23.0	0.57	275.0	78.6
12	58.35	10	52.0	28	16.3	0.78	23.2	0.56	290.9	83.1
13	58.40	10	51.7	28	16.5	0.69	23.1	0.57	279.9	80.0
14	58.45	10	52.2	28	16.5	0.67	23.5	0.57	274.3	78.4
15	58.50	10	51.7	27	16.6	0.77	22.8	0.57	292.7	83.6
16	58.55	10	52.1	27	16.5	0.75	22.5	0.57	290.2	82.9
17	58.60	10	52.2	27	16.3	0.74	22.6	0.57	287.9	82.3
18	58.66	9	51.7	27	16.3	0.76	22.2	0.63	294.5	84.2
19	58.71	9	52.0	27	16.3	0.73	22.2	0.65	289.5	82.7
20	58.77	9	51.9	25	16.5	0.74	20.8	0.64	292.3	83.5
21	58.82	9	51.9	27	16.2	0.72	22.3	0.64	290.6	83.0
22	58.88	9	51.9	26	17.3	0.71	21.9	0.64	295.6	84.5
23	58.93	9	52.2	27	16.8	0.71	22.3	0.64	290.4	83.0
24	58.99	9	51.9	26	17.1	0.71	21.8	0.64	291.7	83.4
25	59.04	9	52.0	25	16.9	0.71	21.1	0.64	293.0	83.7

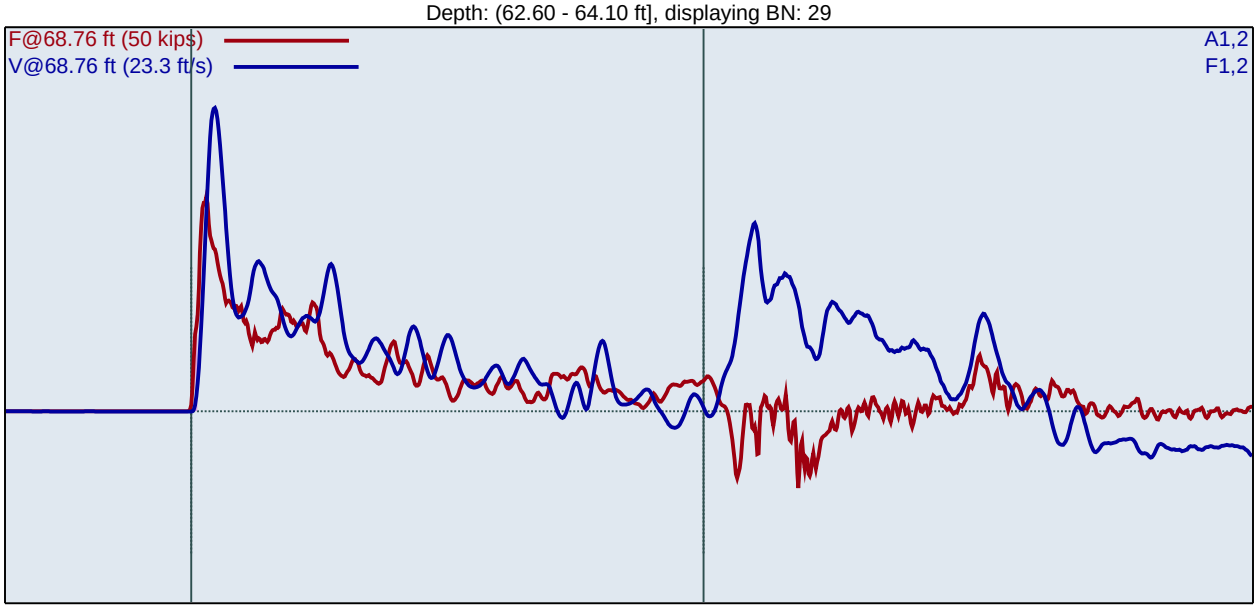
26	59.10	9	51.9	25	16.1	0.70	20.6	0.64	293.7	83.9
		Average	51.9	27	16.4	0.72	22.3	0.60	286.9	82.0
		Std Dev	0.1	1	0.4	0.03	0.8	0.04	7.5	2.1
		Maximum	52.2	28	17.3	0.78	23.5	0.65	295.6	84.5
		Minimum	51.7	25	15.8	0.67	20.6	0.56	273.4	78.1
					N-value: 19					

Sample Interval Time: 28.81 seconds.

CME55 Truck (SN 328245)
R. Kral
AR: 1.20 in^2
LE: 68.76 ft
WS: 16807.9 ft/s

28+00, 20LT
Test date: 4/4/2017
SP: 0.492 k/ft3
EM: 30000 ksi

Depth: (62.60 - 64.10 ft], displaying BN: 29



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

BL#	LP ft	BC /6"	BPM bpm	FMX kips	VMX ft/s	DMX in	CSX ksi	DFN in	EFV ft-lb	ETR (%)
1	62.66	9	61.1	27	16.9	0.69	22.6	0.61	261.9	74.8
2	62.71	9	52.2	27	17.0	0.69	22.8	0.62	269.8	77.1
3	62.77	9	52.1	28	17.2	0.70	23.0	0.63	277.9	79.4
4	62.82	9	51.7	28	17.1	0.67	23.7	0.63	275.2	78.6
5	62.88	9	52.1	30	17.7	0.67	24.6	0.63	280.4	80.1
6	62.93	9	51.9	29	18.1	0.73	24.2	0.64	295.0	84.3
7	62.99	9	52.1	27	18.1	0.68	22.7	0.63	289.4	82.7
8	63.04	9	52.0	28	17.9	0.68	23.6	0.63	284.1	81.2
9	63.10	9	51.8	27	17.8	0.72	22.1	0.64	291.3	83.2
10	63.15	10	52.1	26	17.7	0.68	22.1	0.57	288.0	82.3
11	63.20	10	51.8	27	17.9	0.64	22.6	0.56	281.8	80.5
12	63.25	10	52.0	26	17.5	0.72	21.9	0.56	297.4	85.0
13	63.30	10	51.7	26	17.7	0.73	21.9	0.56	296.1	84.6
14	63.35	10	52.1	26	17.4	0.67	21.6	0.57	291.3	83.2
15	63.40	10	51.8	27	17.8	0.67	22.4	0.57	291.6	83.3
16	63.45	10	52.1	27	17.9	0.71	22.4	0.57	299.7	85.6
17	63.50	10	52.0	27	18.0	0.62	22.7	0.57	286.6	81.9
18	63.55	10	51.9	28	18.1	0.67	23.0	0.58	300.7	85.9
19	63.60	10	52.0	27	17.9	0.68	22.5	0.57	297.1	84.9
20	63.64	12	51.8	28	18.5	0.68	23.5	0.48	300.2	85.8
21	63.68	12	51.9	28	18.5	0.68	23.6	0.48	304.5	87.0
22	63.73	12	51.9	28	18.6	0.67	23.3	0.48	305.1	87.2
23	63.77	12	52.2	28	18.3	0.67	23.4	0.47	304.9	87.1
24	63.81	12	51.8	28	18.4	0.67	23.1	0.47	306.8	87.7
25	63.85	12	52.2	28	18.2	0.64	23.0	0.47	301.2	86.1

26	63.89	12	51.8	28	18.2	0.64	23.1	0.47	300.9	86.0
27	63.93	12	52.0	28	18.3	0.64	23.1	0.47	301.1	86.0
28	63.98	12	51.9	28	18.4	0.65	23.0	0.47	306.1	87.4
29	64.02	12	51.9	28	18.4	0.64	23.3	0.47	304.6	87.0
30	64.06	12	52.1	28	18.4	0.64	23.0	0.47	303.1	86.6
31	64.10	12	51.9	27	18.2	0.63	22.9	0.47	301.4	86.1
		Average	52.0	27	18.1	0.67	22.8	0.52	298.6	85.3
		Std Dev	0.1	1	0.3	0.03	0.5	0.05	6.7	1.9
		Maximum	52.2	28	18.6	0.73	23.6	0.58	306.8	87.7
		Minimum	51.7	26	17.4	0.62	21.6	0.47	281.8	80.5

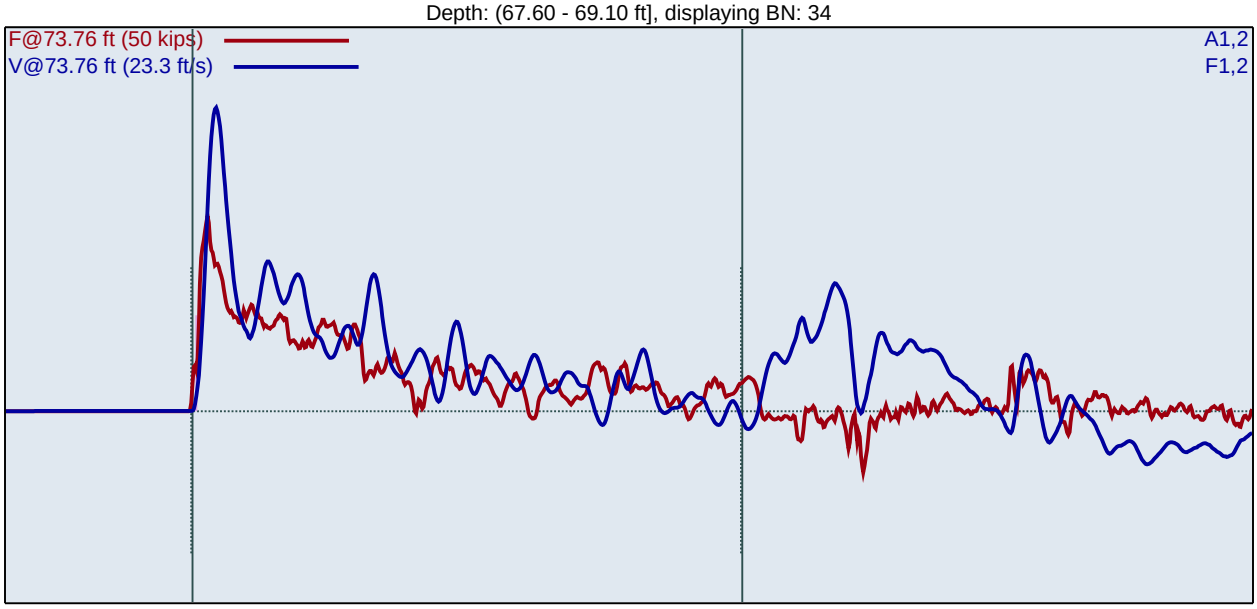
N-value: 22

Sample Interval Time: 34.59 seconds.

CME55 Truck (SN 328245)
R. Kral
AR: 1.20 in^2
LE: 73.76 ft
WS: 16807.9 ft/s

28+00, 20LT
Test date: 4/4/2017
SP: 0.492 k/ft3
EM: 30000 ksi

Depth: (67.60 - 69.10 ft], displaying BN: 34



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

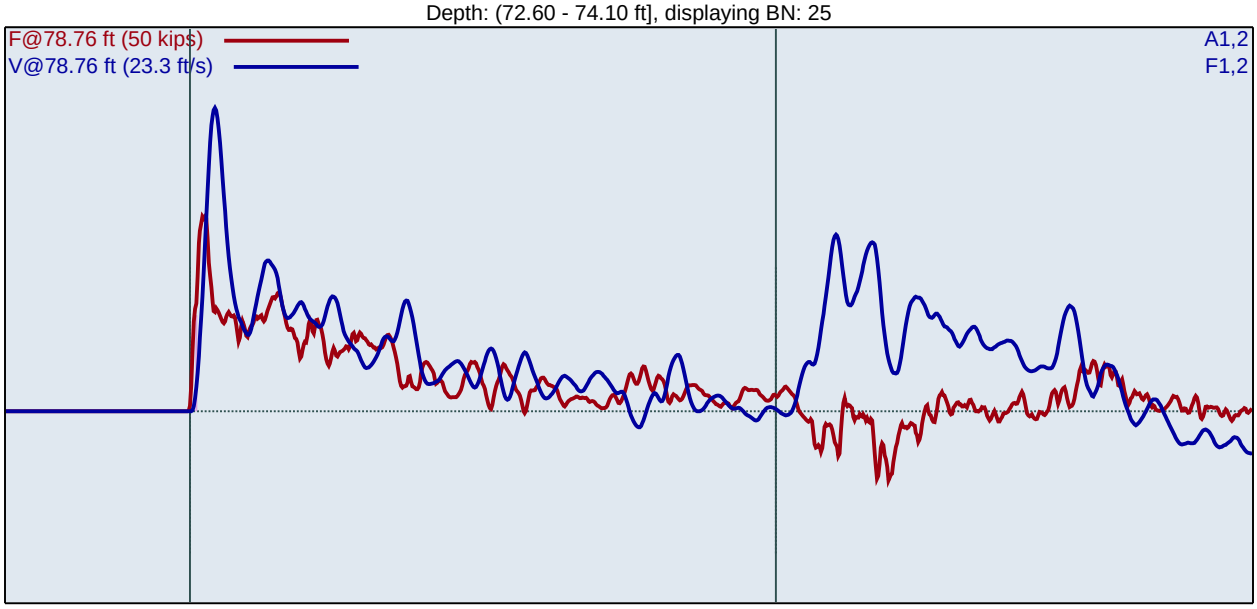
BL#	LP ft	BC /6"	BPM bpm	FMX kips	VMX ft/s	DMX in	CSX ksi	DFN in	EFV ft-lb	ETR (%)
1	67.68	6	107.6	26	17.9	1.46	22.0	0.93	302.9	86.5
2	67.77	6	52.5	27	18.4	1.25	22.6	0.94	298.6	85.3
3	67.85	6	51.6	26	17.8	1.10	22.0	0.95	295.1	84.3
4	67.93	6	52.1	27	18.0	1.00	22.3	0.97	297.0	84.8
5	68.02	6	52.0	27	18.1	0.96	22.3	0.96	298.5	85.3
6	68.10	6	51.7	27	18.2	0.97	22.3	0.97	297.2	84.9
7	68.14	13	52.0	26	17.9	0.81	21.8	0.43	296.1	84.6
8	68.18	13	52.0	26	18.3	0.62	21.4	0.42	274.8	78.5
9	68.22	13	51.8	26	18.2	0.59	22.1	0.42	274.6	78.5
10	68.25	13	52.2	25	18.2	0.55	20.8	0.42	267.1	76.3
11	68.29	13	52.0	25	18.3	0.57	21.0	0.42	271.7	77.6
12	68.33	13	51.9	26	18.1	0.59	21.4	0.43	282.2	80.6
13	68.37	13	51.8	25	17.7	0.61	20.6	0.44	291.8	83.4
14	68.41	13	51.7	25	17.5	0.54	20.8	0.44	289.3	82.7
15	68.45	13	52.1	26	18.2	0.53	21.4	0.44	298.8	85.4
16	68.48	13	51.9	24	17.6	0.53	19.7	0.44	294.4	84.1
17	68.52	13	51.9	25	18.0	0.52	20.5	0.44	296.4	84.7
18	68.56	13	51.6	24	17.8	0.52	20.2	0.44	300.1	85.7
19	68.60	13	52.1	24	17.4	0.51	20.3	0.44	298.5	85.3
20	68.63	17	51.8	24	17.3	0.51	19.7	0.33	299.4	85.5
21	68.66	17	52.1	24	17.5	0.52	20.1	0.34	298.9	85.4
22	68.69	17	51.8	26	18.3	0.49	21.3	0.33	296.4	84.7
23	68.72	17	51.9	24	17.7	0.53	20.2	0.33	302.2	86.3
24	68.75	17	51.9	25	17.7	0.54	20.7	0.33	302.7	86.5
25	68.78	17	51.9	23	17.3	0.54	19.5	0.33	300.3	85.8

26	68.81	17	51.8	25	17.6	0.54	20.7	0.33	302.2	86.3
27	68.84	17	52.0	26	18.3	0.53	21.8	0.33	305.8	87.4
28	68.86	17	52.1	24	17.8	0.55	20.0	0.33	302.1	86.3
29	68.89	17	51.9	26	18.4	0.54	21.5	0.33	305.1	87.2
30	68.92	17	52.1	26	17.8	0.54	21.5	0.33	298.9	85.4
31	68.95	17	51.8	26	18.6	0.53	21.6	0.33	301.3	86.1
32	68.98	17	51.8	25	18.2	0.54	21.2	0.33	301.2	86.1
33	69.01	17	51.6	25	18.1	0.54	20.8	0.33	304.1	86.9
34	69.04	17	51.9	25	18.5	0.54	21.2	0.33	305.7	87.3
35	69.07	17	51.6	25	17.9	0.55	20.8	0.33	306.3	87.5
36	69.10	17	51.7	26	18.1	0.54	21.3	0.33	307.3	87.8
		Average	51.9	25	17.9	0.55	20.9	0.38	295.9	84.5
		Std Dev	0.2	1	0.4	0.06	0.7	0.05	10.7	3.1
		Maximum	52.2	26	18.6	0.81	22.1	0.44	307.3	87.8
		Minimum	51.6	23	17.3	0.49	19.5	0.33	267.1	76.3
					N-value: 30					

Sample Interval Time: 40.39 seconds.

CME55 Truck (SN 328245) — 28+00, 20LT
R. Kral — Test date: 4/4/2017
AR: 1.20 in^2 — SP: 0.492 k/ft3
LE: 78.76 ft — EM: 30000 ksi
WS: 16807.9 ft/s

Depth: (72.60 - 74.10 ft], displaying BN: 25



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

BL#	LP ft	BC /6"	BPM bpm	FMX kips	VMX ft/s	DMX in	CSX ksi	DFN in	EFV ft-lb	ETR (%)
1	72.68	6	60.7	26	18.7	1.34	21.6	0.94	303.1	86.6
2	72.77	6	52.6	25	17.9	1.18	20.9	0.95	297.0	84.9
3	72.85	6	52.2	27	17.8	1.01	22.1	0.96	292.2	83.5
4	72.93	6	52.0	24	17.9	1.00	19.9	0.96	290.9	83.1
5	73.02	6	51.9	23	18.0	0.96	19.2	0.96	297.6	85.0
6	73.10	6	52.1	24	18.4	0.96	20.0	0.96	296.8	84.8
7	73.15	11	51.8	23	18.1	0.76	19.4	0.50	296.0	84.6
8	73.19	11	52.1	24	18.6	0.76	20.2	0.50	297.6	85.0
9	73.24	11	51.7	25	18.9	0.74	20.8	0.51	298.2	85.2
10	73.28	11	52.2	24	18.3	0.72	19.8	0.51	297.6	85.0
11	73.33	11	52.0	24	19.1	0.71	20.1	0.51	297.5	85.0
12	73.37	11	52.2	25	19.4	0.71	21.1	0.51	296.2	84.6
13	73.42	11	51.7	23	18.5	0.72	19.5	0.51	295.7	84.5
14	73.46	11	51.9	26	18.9	0.72	21.9	0.51	298.1	85.2
15	73.51	11	52.1	25	19.6	0.72	20.8	0.51	297.2	84.9
16	73.55	11	51.8	26	19.0	0.71	21.7	0.51	294.0	84.0
17	73.60	11	52.0	26	20.0	0.72	21.8	0.51	299.1	85.5
18	73.65	10	52.0	26	19.3	0.71	21.4	0.57	294.4	84.1
19	73.70	10	52.1	25	19.1	0.70	20.6	0.57	290.9	83.1
20	73.75	10	51.7	25	20.2	0.70	21.0	0.57	297.5	85.0
21	73.80	10	52.0	27	19.1	0.69	22.3	0.58	290.9	83.1
22	73.85	10	52.0	25	18.9	0.70	21.2	0.58	293.6	83.9
23	73.90	10	52.0	26	18.8	0.69	21.4	0.58	292.7	83.6
24	73.95	10	52.1	25	18.9	0.68	20.9	0.58	288.9	82.5
25	74.00	10	51.6	25	18.4	0.68	21.1	0.58	288.7	82.5

26	74.05	10	52.1	25	18.9	0.69	21.0	0.57	294.1	84.0
27	74.10	10	51.8	25	19.2	0.68	20.7	0.58	291.6	83.3
		Average	51.9	25	19.0	0.71	20.9	0.54	294.8	84.2
		Std Dev	0.2	1	0.5	0.02	0.7	0.03	3.1	0.9
		Maximum	52.2	27	20.2	0.76	22.3	0.58	299.1	85.5
		Minimum	51.6	23	18.1	0.68	19.4	0.50	288.7	82.5
					N-value: 21					

Sample Interval Time: 29.95 seconds.

Summary of SPT Test Results

Project: CME55 Truck (SN 328245), Test Date: 4/4/2017

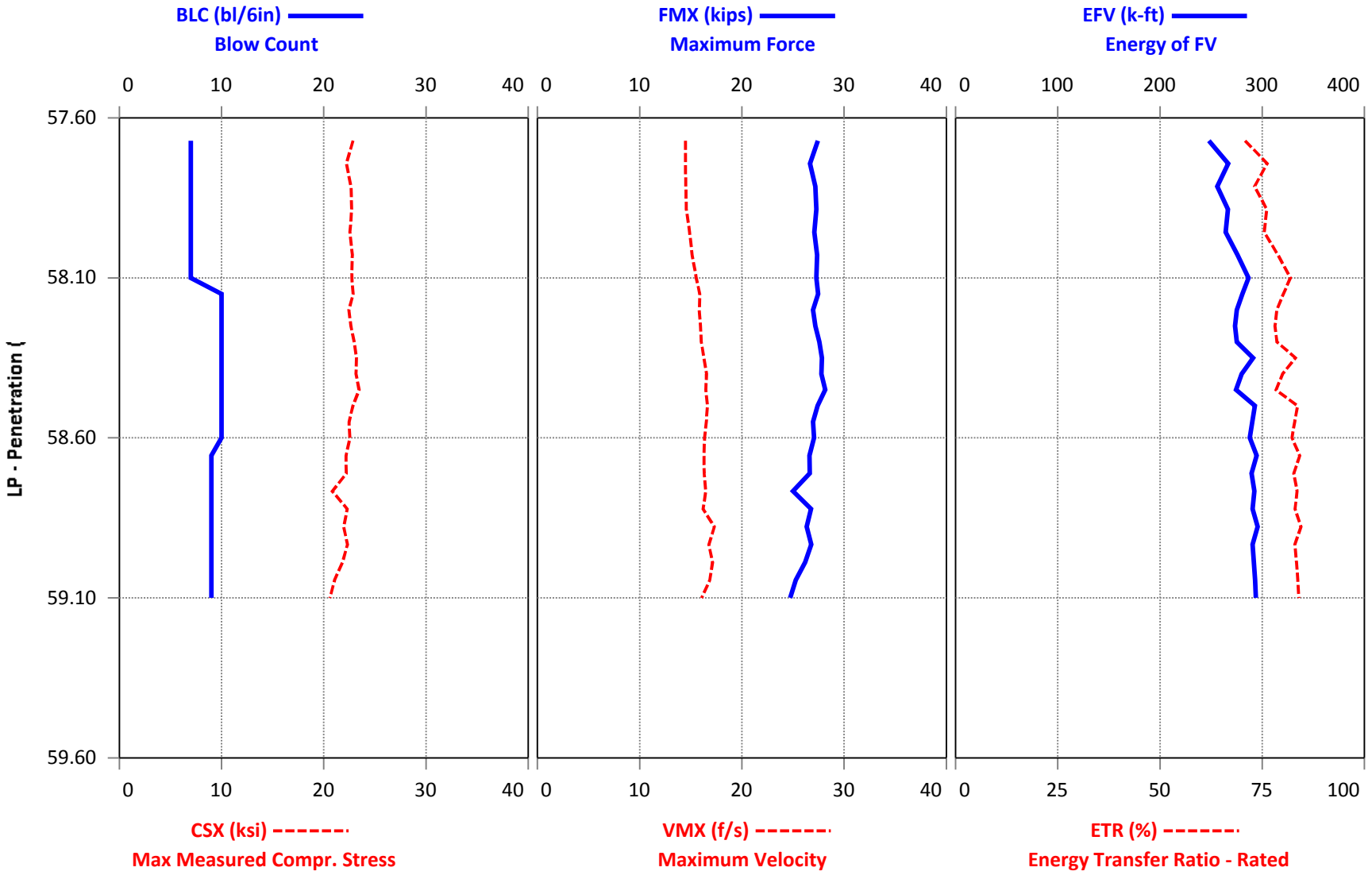
BPM: Blows/Minute
FMX: Maximum Force
VMX: Maximum Velocity
DMX: Maximum Displacement
CSX: Compression Stress Maximum
DFN: Final Displacement
EFV: Maximum Energy
ETR: Energy Transfer Ratio - Rated

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 (%)
63.76	57.60	59.10	**7-10-9**	**19**	**26**	51.9	27	16.4	0.72	22.3	0.60	286.9	82.0
68.76	62.60	64.10	**9-10-12**	**22**	**30**	52.0	27	18.1	0.67	22.8	0.52	298.6	85.3
73.76	67.60	69.10	**6-13-17**	**30**	**42**	51.9	25	17.9	0.55	20.9	0.38	295.9	84.5
78.76	72.60	74.10	**6-11-10**	**21**	**29**	51.9	25	19.0	0.71	20.9	0.54	294.8	84.2
				Overall Average Values:		51.9	26	17.9	0.65	21.6	0.49	294.4	84.1
				Standard Deviation:		0.2	1	1.0	0.08	1.1	0.10	8.9	2.5
				Overall Maximum Value:		52.2	28	20.2	0.81	23.6	0.65	307.3	87.8
				Overall Minimum Value:		51.6	23	15.8	0.49	19.4	0.33	267.1	76.3

Pile Dynamics, Inc. - PDIPLOT2 Ver 2016.2.57.6 - Case Method & iCAP® Results

S&ME Printed: 25-April-2017 Test started: 04-April-2017

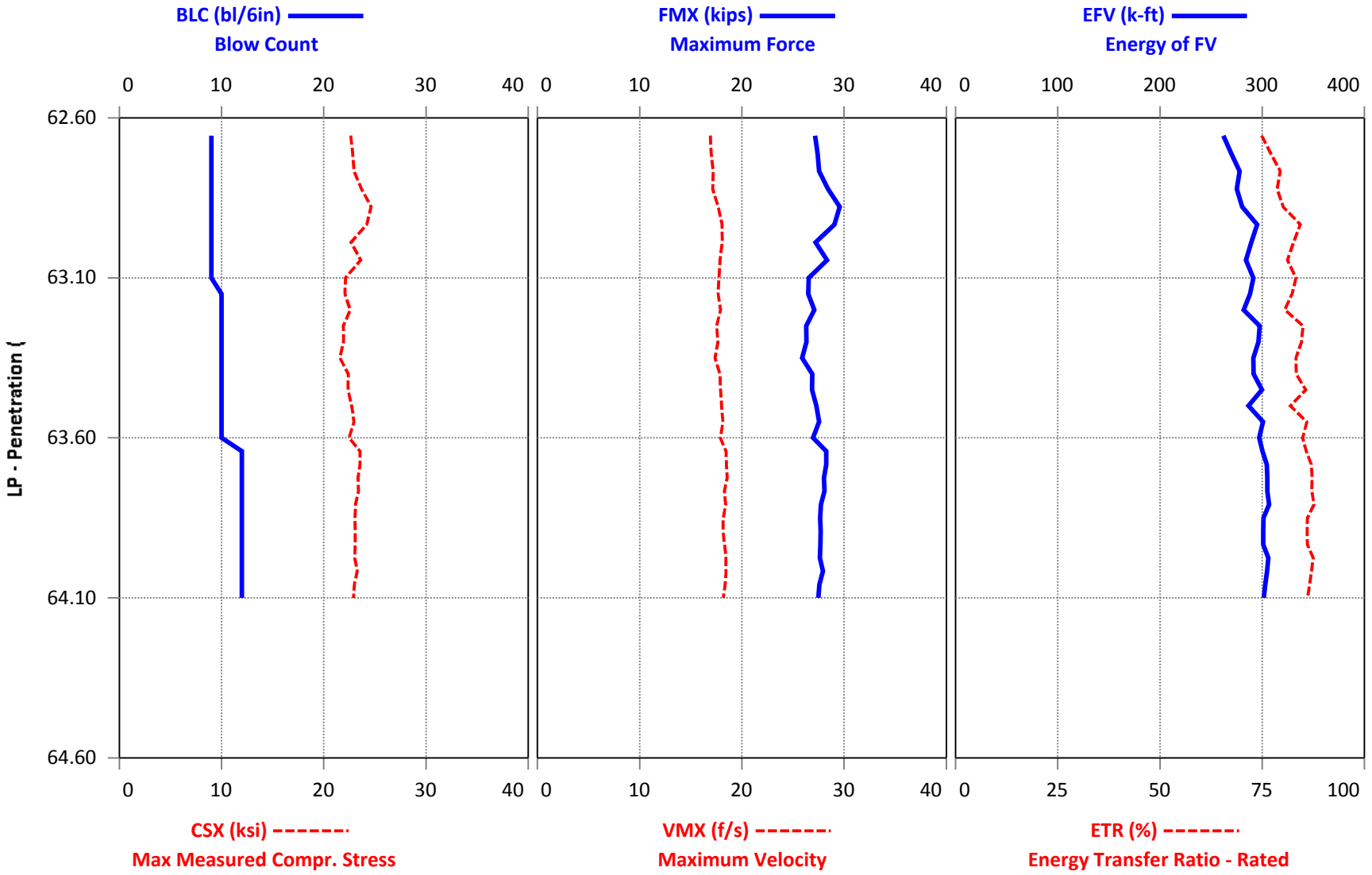
CME55 Truck (SN 328245) - 57.6 to 59.1 ft
28+00, 20LT



Pile Dynamics, Inc. - PDIPLOT2 Ver 2016.2.57.6 - Case Method & iCAP® Results

S&ME Printed: 25-April-2017 Test started: 04-April-2017

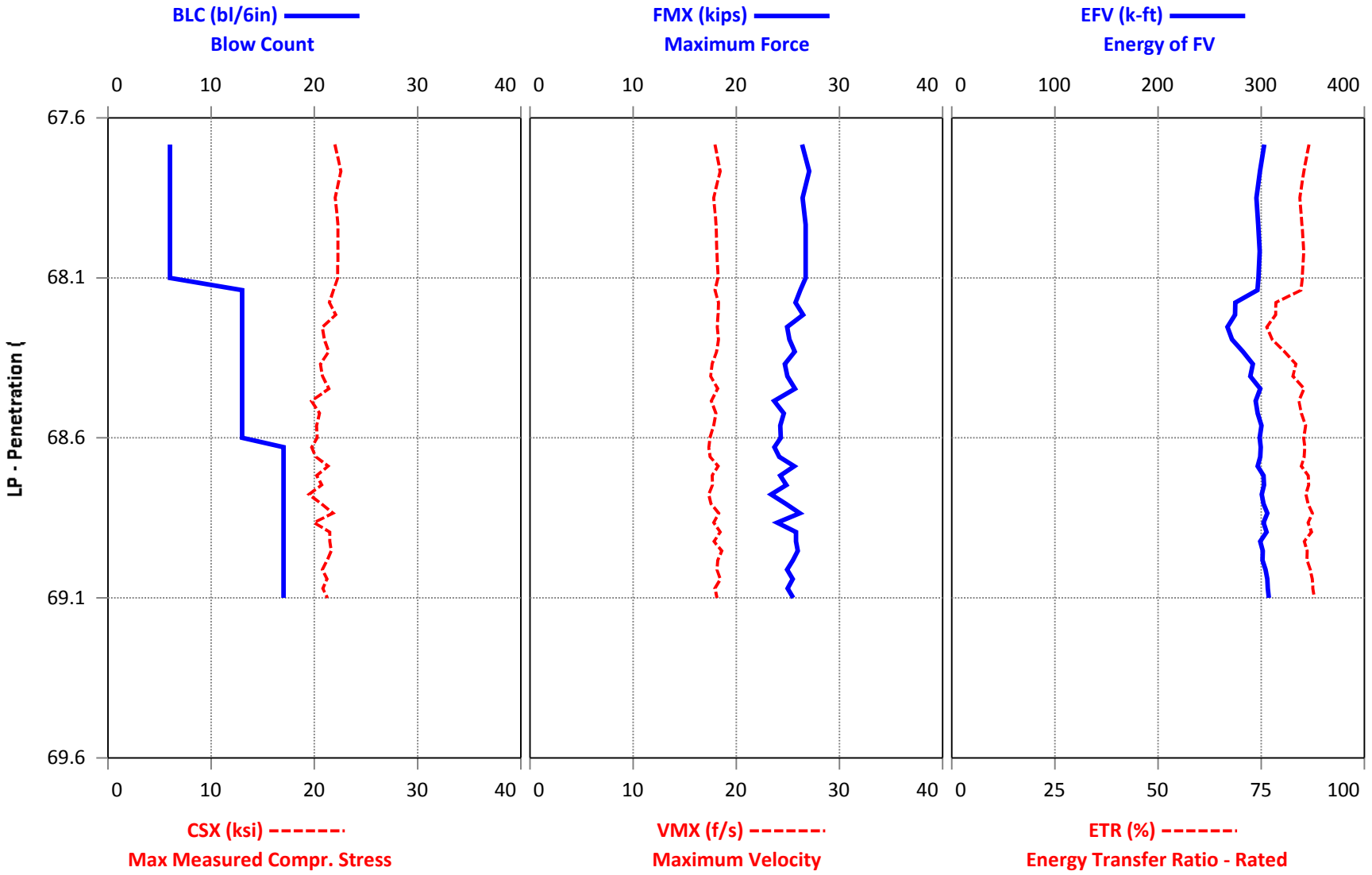
CME55 Truck (SN 328245) - 62.6 to 64.1 ft
28+00, 20LT



Pile Dynamics, Inc. - PDIPLOT2 Ver 2016.2.57.6 - Case Method & iCAP® Results

S&ME Printed: 25-April-2017 Test started: 04-April-2017

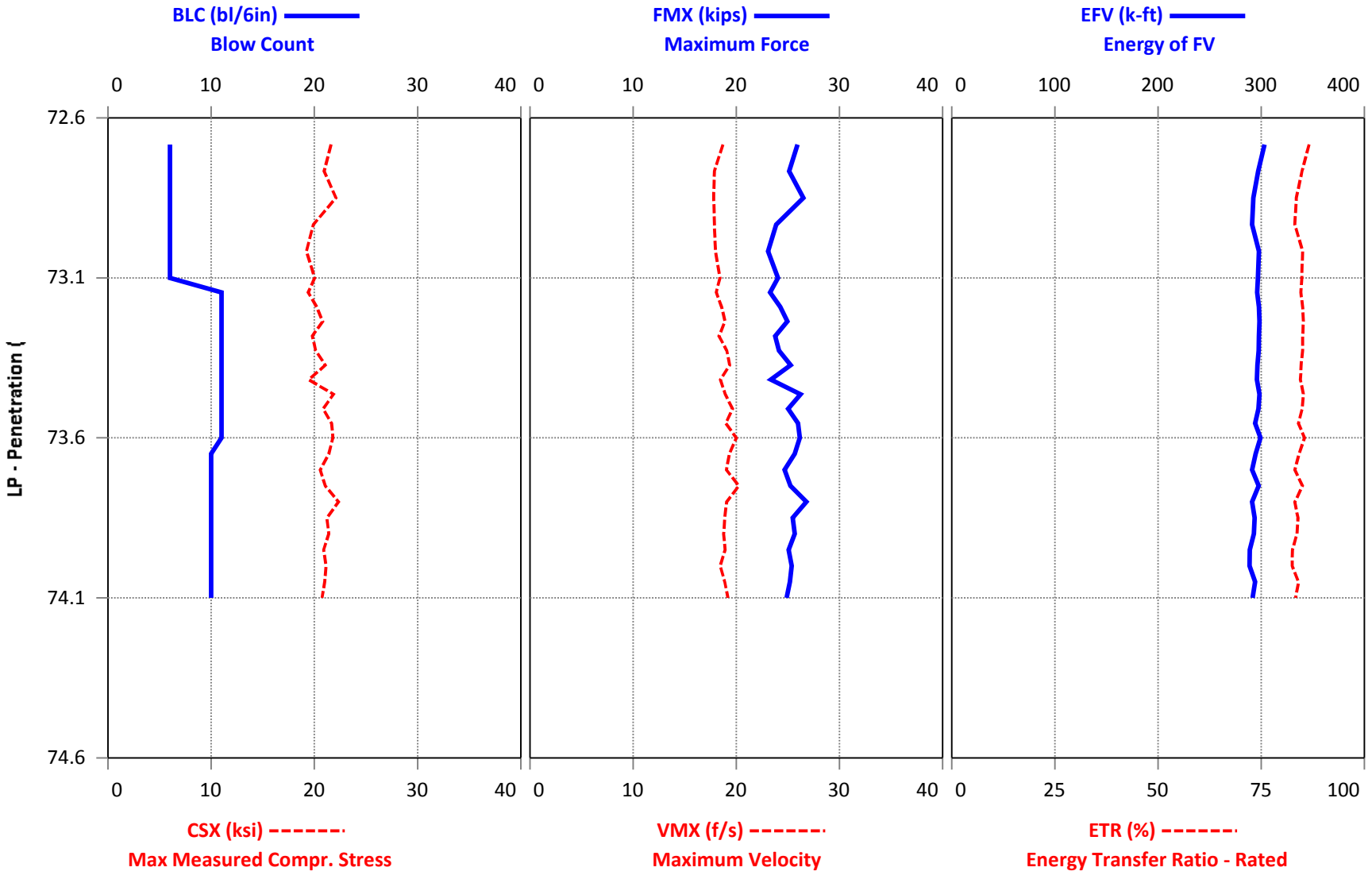
CME55 Truck (SN 328245) - 67.6 to 69.1 ft
28+00, 20LT

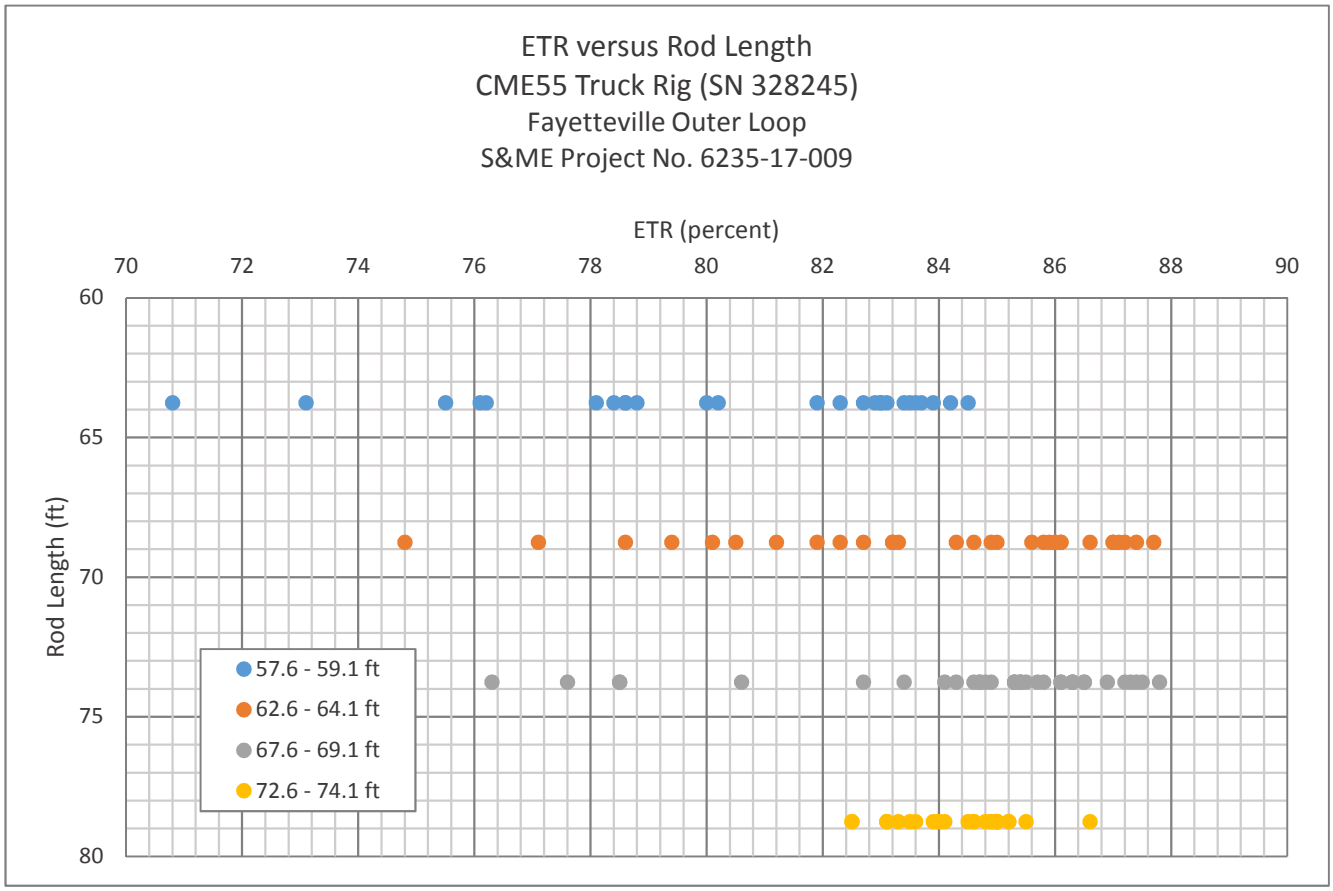


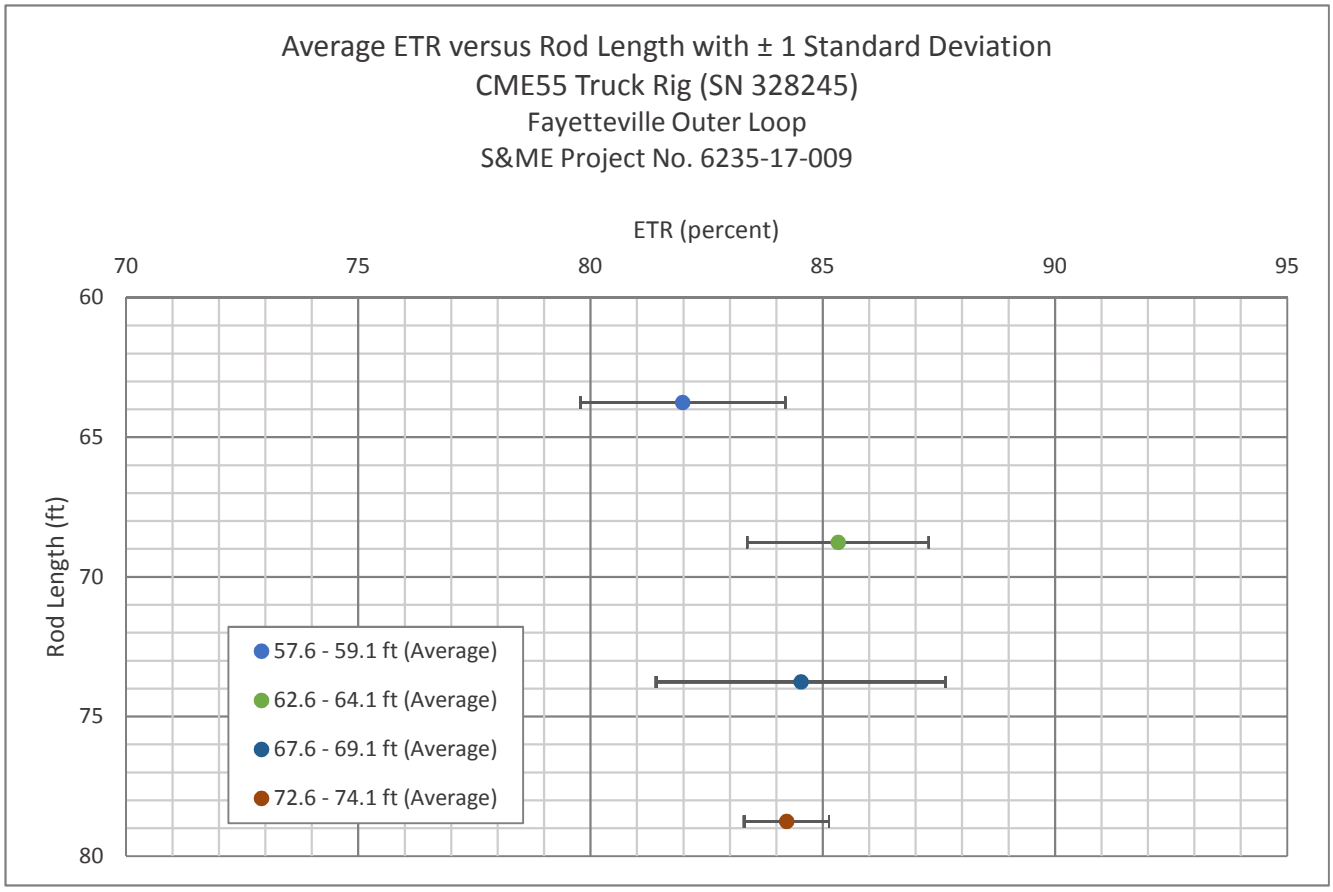
Pile Dynamics, Inc. - PDIPLOT2 Ver 2016.2.57.6 - Case Method & iCAP® Results

S&ME Printed: 25-April-2017 Test started: 04-April-2017

CME55 Truck (SN 328245) - 72.6 to 74.1 ft
28+00, 20LT




ETR versus Rod Length
CME55 Truck Rig (SN 328245)
Fayetteville Outer Loop
S&ME Project No. 6235-17-009
ETR (percent)
70
72
74
76
78
80
82
84
86
88
90
Rod Length (ft)
60
65
70
75
80
57.6 - 59.1 ft
62.6 - 64.1 ft
67.6 - 69.1 ft
72.6 - 74.1 ft


Average ETR versus Rod Length with ± 1 Standard Deviation
CME55 Truck Rig (SN 328245)
Fayetteville Outer Loop
S&ME Project No. 6235-17-009
ETR (percent)
70
75
80
85
90
95
Rod Length (ft)
60
65
70
75
80
57.6 - 59.1 ft (Average)
62.6 - 64.1 ft (Average)
67.6 - 69.1 ft (Average)
72.6 - 74.1 ft (Average)

Appendix II

Form No. QA-SPTEEVAL-01
Revision No. 2
Revision Date: 05-24-16

SPT Energy Evaluation Form

S&ME

Project: FAYETTEVILLE OUTER LOOP
Project No.: 6235-17-009
Boring No.: 28+00 20 LEFT -Y2-
Date (s): 4/4/17
Weather: PARTLY CLOUDY / 70°F
Drill Rod Type: AWJ

On-site Personnel

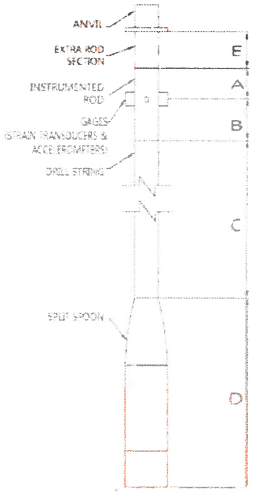
Drilling Company: S&ME
Rig Oper./Helper: T. MILLER / A. PLATTENBURG
Rig Engr/Geologist: J. SWARTLEY
Analyzer Oper.: R. KRAL

Rig/Hammer Info

Drill Rig Make/Model: CME 55
Carrier Type: TRUCK
Rig Serial No.: 328245
Hammer Type/Model: CME - AUTO
Hammer Serial No.: 328245
Hammer Drop System: AUTOMATIC
Lubrication Condition: PER. MANUFACTURER
Manufacturer Recommended Operation Rate (bpm): 50
Drop Height ~~from Calibration Record~~ (in.): 30
Hammer Weight ~~from Calibration Record~~ (lbs): 140
Anvil Dimension (in.): 11.5
Drilling Method: MUD ROTARY

Rod Info

(A + E) Impact Surface to Gages Length: 1.5 ft
(B) Instr. Rod Length below Gages: 0.88 ft
(A) + (B) Instr. Rod Length: 2 ft
(D) Spoon Length: 2.68 ft
(E) Rod Length Above Instr. Rod (if applicable): 0.38 ft
Instr. Rod S/N: 203 AWJ
Instr. Rod Outside Dia.: 1.75 in.
Instr. Rod Area: 1.20 in²
PDA Make/Model: PAX
PDA Serial No.: 3733L
Calib. Pulse Test (y/n): Y



Gage Information

Gage		Serial No.	Calibration No.	
Accel.	A3	K5641	~~358~~ 376	
	A4	K5642	~~314~~ 324	
Strain	F3	203 AWJ 1	~~211.46~~	212.63
	F4	203 AWJ 2	~~210.87~~	212.32

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)
~~4/4~~	~~33.5 TO 35.0~~	~~1038/1041~~	~~35~~	~~38.76~~		~~WOH~~	~~WOH~~	~~WOH~~	~~0~~	~~N/A~~
~~4/4~~	~~38.5 TO 40.0~~	~~1050/1054~~	~~40~~	~~43.76~~		~~3~~	~~2~~	~~4~~	~~3~~	~~Y~~
	~~37.6 TO 39.1~~	~~1139~~								
4/4	57.6 TO 59.6	1139/1140	60	63.76	52	7	10	9	19	Y
4/4	62.6 TO 64.1	1157/1158	65	68.76	52	9	10	12	22	Y
4/4	67.6 TO 69.1	1218/1219	70	73.76	52	6	13	17	30	Y
4/4	72.6 TO 74.1	1239/1240	75	78.76	52	6	11	10	21	Y

Comments: (1) **If there are any nonconformances or deficiencies identified during the testing, immediately pause the drilling and testing activities and notify the Site Manager** and **describe them in the space below;** (2) **Note any unusual hammer operating conditions that affect the hammer performance, or changes in operating conditions** (e.g. verticality, weather, or lubrication between trials). Drop height tolerance is ± 1 inch. Drop height verified by Rig Geologist/Engineer at time of SPT Energy measurement for CME hammers and at the beginning of the day for Diedrich hammers; (3) Note any changes in rod diameter along drill string and record locations of short rod sections; (4) Prepare a sketch or take a picture of the instrumented drill rod assembly and indicate the approximate relative location and orientation of the strain gauges, accelerometers, and LE Datum; (5) Note: Identify all attached pages, including photographs, with the Project No., Boring No., and date.

ROB KRAL — Prepared By (print/signature), SPT Energy Lead
4/4/17 — Date
Reviewed By (print/signature), Site Manager
Date

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34817.1.S5	**TIP** U-2519AA	**COUNTY** CUMBERLAND	**GEOLOGIST** Contract Geologist
SITE DESCRIPTION FAYETTEVILLE OUTER LOOP FROM I-95 TO SOUTH OF SR 1118 (PARKTON RD.)			**GROUND WTR (ft)**
BORING NO. Y2_2800	**STATION** 28+00	**OFFSET** 20 ft LT	**ALIGNMENT** -Y2-	**0 HR.** N/A
COLLAR ELEV. 184.7 ft	**TOTAL DEPTH** 104.1 ft	**NORTHING** 421,505	**EASTING** 2,013,281	**24 HR.** 23.0
DRILL RIG/HAMMER EFF./DATE SME275 CME-55 89% 01/15/2016		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER Contract Driller	**START DATE** 04/04/17	**COMP. DATE** 04/04/17	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft)	DEPTH (ft)
185											
	184.1	0.6	7	5	4	9		M		184.7 GROUND SURFACE	0.0
	182.1	2.6	3	4	4	8		M		184.1 **ROADWAY EMBANKMENT** (PAVEMENT) TAN, ORANGE AND GRAY, SILTY SAND	0.6
180											
	177.1	7.6	7	6	8	14		M			
175											
	172.1	12.6	6	3	5	8		M			
170											
	167.1	17.6	9	8	3	11		M			
165										164.7 **COASTAL PLAIN** ORANGE, RED AND GRAY, SANDY SILT (MIDDENDORF FORMATION)	20.0
	162.1	22.6	3	3	4	7	SS-78	W			
160										158.7 GRAY AND RED, SILTY SAND	26.0
	157.1	27.6	9	10	10	20		Sat.			
155										153.7 ORANGE AND TAN, SILTY CLAY	31.0
	152.1	32.6	WOR	WOR	WOH	0	SS-79	W			
150										148.7 ORANGE SAND	36.0
	147.1	37.6	3	2	1	3	SS-80	Sat.			
145											
	142.1	42.6	1	1	2	3		Sat.			
140										138.7 **COASTAL PLAIN** GRAY, SILTY CLAY (BLACK CREEK FORMATION)	46.0
	137.1	47.6	5	9	11	20		W			
135										133.7 GRAY, SILTY SAND	51.0
	132.1	52.6	7	8	17	25		Sat.		131.7 GRAY, SILTY CLAY	53.0
130										128.7 GRAY, SILTY SAND AND SAND	56.0
	127.1	57.6	7	10	9	19		Sat.			
125											
	122.1	62.6	9	10	12	22		Sat.			
120											
	117.1	67.6	6	13	17	30		Sat.			
115											
	112.1	72.6	6	11	10	21		Sat.			
110										108.7	76.0
	107.1	77.6	6	9	9	18		Sat.			
105											

DRAFT

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

SHEET

WBS 34817.1.S5	**TIP** U-2519AA	**COUNTY** CUMBERLAND	**GEOLOGIST** Contract Geologist	
SITE DESCRIPTION FAYETTEVILLE OUTER LOOP FROM I-95 TO SOUTH OF SR 1118 (PARKTON RD.)				**GROUND WTR (ft)**
BORING NO. Y2_2800	**STATION** 28+00	**OFFSET** 20 ft LT	**ALIGNMENT** -Y2-	**0 HR.** N/A
COLLAR ELEV. 184.7 ft	**TOTAL DEPTH** 104.1 ft	**NORTHING** 421,505	**EASTING** 2,013,281	**24 HR.** 23.0
DRILL RIG/HAMMER EFF./DATE SME275 CME-55 89% 01/15/2016		**DRILL METHOD** Mud Rotary		**HAMMER TYPE** Automatic
DRILLER Contract Driller	**START DATE** 04/04/17	**COMP. DATE** 04/04/17	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft)	DEPTH (ft)
105						Match Line					
	102.1	82.6	6	10	10	20		Sat.			
100										98.7	86.0
	97.1	87.6	5	8	14	22		W		GRAY, SILTY CLAY	
95											
	92.1	92.6	5	12	14	26		W			
90											
	87.1	97.6	7	8	9	17		W			
85											
	82.1	102.6	8	13	15	28		W		80.6	104.1
										Boring Terminated at Elevation 80.6 ft IN VERY STIFF CLAY (COASTAL PLAIN)	

DRAFT

Appendix III

Pile Dynamics, Inc.

Quality Assurance for Deep Foundations

PDI Certificate of Calibration

PDI Accelerometer Calibration

Model PR-Kicher Serial # K5641

Cal Date: 27Feb17 Cal Due : 27Feb19

Temperature: 64.5 deg. F Humidity 30 %

Calibrated at
Pile Dynamics, Inc.
30725 Aurora Road
Cleveland, OH 44139

Manufactured by Pile Dynamics, Inc.

Procedure used: PDA Accelerometer Calibration Procedure 2016-6, Revision 20160422

Equipment was found to be

✓ in tolerance As Received _____ out of tolerance As Received

✓ in tolerance As Returned _____ out of tolerance As Returned

PDI Calibration: .0752 mv/5000g

Calibration Standards Utilized
Hopkinson Bar Force Calibration F2, verified on 25APR16

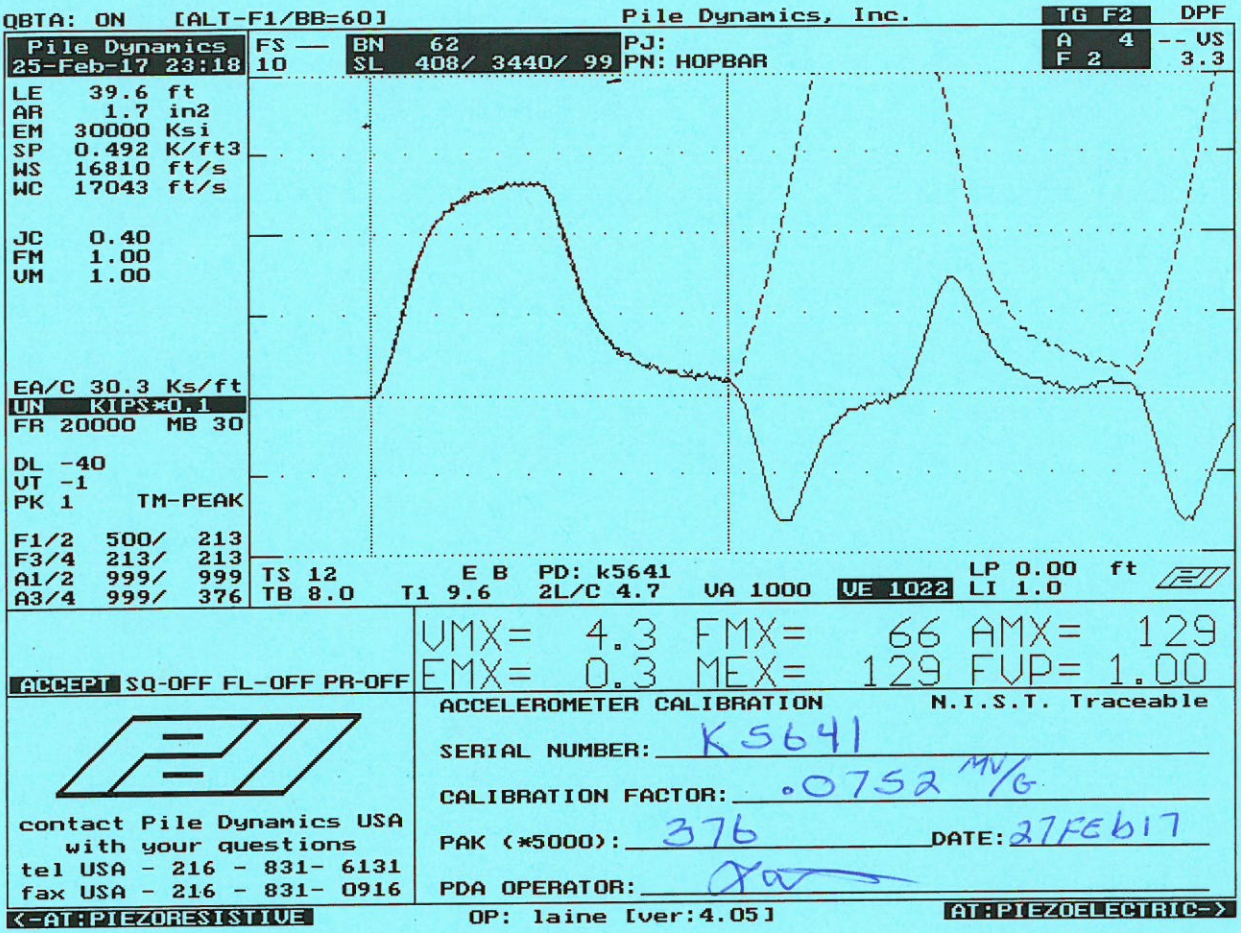
PDI HopBar DOS PAK, serial number 1273K, verified on 25 APR 16

Calibration performed by: L. M. Wright
Laine Wright, Technician

Reviewed by: Robert Sprenger
Robert Sprenger, Production Manager

Accelerometer CC-5 Issued 20160426

30725 Aurora Road • Cleveland, Ohio 44139 USA • +1-216-831-6131 • Fax +1-216-831-0916
E-mail: info@pile.com • www.pile.com



Smart Sensor

Smart Chip Programmed By RMW **on** 27FEB17 **CRC Value** 3C62

Pile Dynamics, Inc.

Quality Assurance for Deep Foundations

PDI Certificate of Calibration

PDI Accelerometer Calibration

Model PR-Kicher Serial # K5642

Cal Date: 27Feb17 Cal Due : 27Feb19

Temperature: 64.5 deg. F Humidity 30 %

Calibrated at
Pile Dynamics, Inc.
30725 Aurora Road
Cleveland, OH 44139

Manufactured by Pile Dynamics, Inc.

Procedure used: PDA Accelerometer Calibration Procedure 2016-6, Revision 20160422

Equipment was found to be

✓ in tolerance As Received _____ out of tolerance As Received

✓ in tolerance As Returned _____ out of tolerance As Returned

PDI Calibration: .0648 mv/5000g

Calibration Standards Utilized
Hopkinson Bar Force Calibration F2, verified on 25APRIL 16

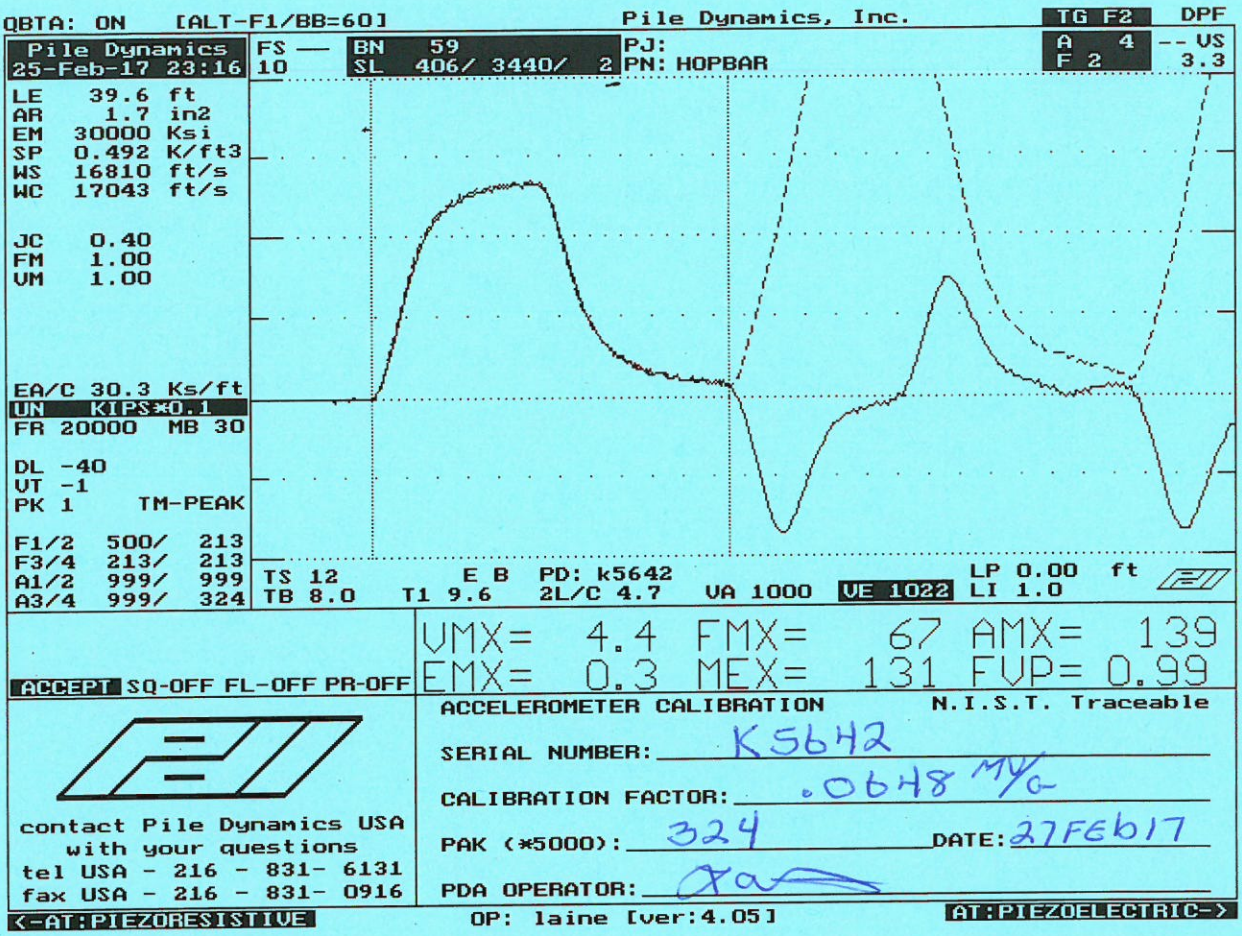
PDI HopBar DOS PAK, serial number 1273K, verified on 25April16

Calibration performed by: L. M. Wright
Laine Wright, Technician

Reviewed by: Robert Sprenger
Robert Sprenger, Production Manager

Accelerometer CC-5 Issued 20160426

30725 Aurora Road • Cleveland, Ohio 44139 USA • +1-216-831-6131 • Fax +1-216-831-0916
E-mail: info@pile.com • www.pile.com



Smart Sensor

Smart Chip Programmed By J.M.W. **on** 27 **CRC Value** 4A8A

Pile Dynamics, Inc.

Quality Assurance for Deep Foundations

PDI Certificate of Calibration

PDI SPT Drill Rod Serial # 203 AWJ

Cal Date: 3-6-17 Cal Due : 3-6-19

Temperature: 69.2 deg. F Humidity 42 %

Manufactured by Pile Dynamics, Inc.
Calibrated at: Pile Dynamics, Inc., 30725 Aurora Road, Cleveland, OH 44139
Procedure used: SPT Drill Rod Calibration Procedure 2016-4, Revision 20160422
Calibration Data: Attach SPT Rod Data Sheet DS-17

Equipment was found to be

✓ in tolerance As Received _____ out of tolerance As Received

✓ in tolerance As Returned _____ out of tolerance As Returned

Calibration Standards Utilized

1. PDI SPT Calibration Signal Conditioning Unit #000001, verified on 20160302
2. PDI Load Cell #75, Certificate #3482090006
3. Capacitec Displacement Sensor #2034, Certificate #3482090004
4. Capacitec Displacement Sensor #2040, Certificate #3482090004
5. Capacitec Displacement Mainframe #4004-671, Certificate #3482090004
6. Brown & Sharpe Digital Caliper #8G028506, Certificate #3482090001
7. National Instruments USB-6210 DAQ serial number 159AFDE, Certificate #3482090002

Calibration performed by:

David Burrell Technician

Reviewed by:

Robert Sprenger, Production Manager

SPT CC-16 Issued 20160425

30725 Aurora Road • Cleveland, Ohio 44139 USA • +1-216-831-6131 • Fax +1-216-831-0916
E-mail: info@pile.com • www.pile.com

Pile Dynamics, Inc.

Quality Assurance for Deep Foundations

SPT Calibration Data Sheet Revision number 20160426
Use Calibration Procedure Number 2016-8, Revision 20160422

SPT Drill Rod Data

Serial Number: 203 AWJ Calibration Date: 3-6-17

Temperature: 69.2 °F Humidity: 42 %

Calibration performed in accordance with PDI SPT Calibration Procedure 2016-4, Revision 20160422

As Received (circle one): (Operational) - Malfunctioning - Damaged

Calibration data
Pre-Load: 1. 8152 2. 8045 3. 8081

Total Load: 1. 18645 2. 17966 3. 9859

Common typical theoretical EA values based on SPT Rod Type:
AW: 35400 NW: 43100 or 68100 N3: 70800 BW:52344

EA Theoretical 35,400 EA Measured 36076.68 Error 1.91 %
Within 4% Tolerance: (Y) / N

Alternative EA verification: Measure wall thickness, calculate area and multiply by 30000. (use spreadsheet for calculation)

Calibration values
Channel 1: As Found: (last cal): 215.76 As Left: 212.63 Within 5% Tolerance: (Y) / N
Channel 2: As Found: (last cal): 215.53 As Left: 212.32 Within 5% Tolerance: (Y) / N
EA: As Found: (last cal): 35465 As Left: 36076.68 Difference: 1.7 %

Calibration performed by:

David Burrell, Technician

Reviewed by:

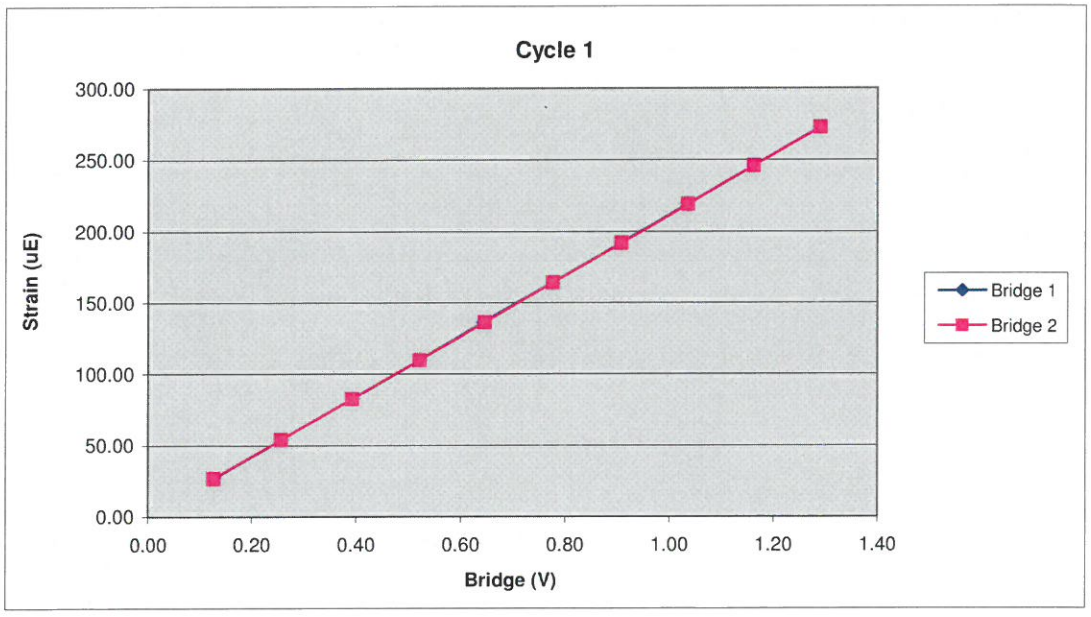
Robert Sprenger, Production Manager

30725 Aurora Road • Cleveland, Ohio 44139 USA • +1-216-831-6131 • Fax +1-216-831-0916
E-mail: info@pile.com • www.pile.com

203AWJ		Cycle 1		
Sample	**Force (lb)**	**Strain (µE)**	**Bridge 1 (V)**	**Bridge 2 (V)**
1	0.00	0.00	0.00	0.00
2	980.36	26.90	0.13	0.13
3	1968.60	54.22	0.26	0.26
4	3007.18	82.91	0.39	0.39
5	3992.07	109.88	0.52	0.52
6	4933.68	136.53	0.64	0.65
7	5952.40	164.15	0.78	0.78
8	6953.03	191.85	0.91	0.91
9	7927.29	218.90	1.04	1.04
10	8900.18	245.69	1.16	1.16
11	9893.92	272.74	1.29	1.29

Bridge 1		**Bridge 2**	
Force Calibration (lb/V)	**7662.50**	**Force Calibration (lb/V)**	**7652.99**
Offset	-1.78	Offset	1.71
Correlation	0.999999	Correlation	0.999997
Strain Calibration (µE/V)	**211.52**	**Strain Calibration (µE/V)**	**211.26**
Offset	-0.14	Offset	-0.05
Correlation	0.999998	Correlation	0.999999

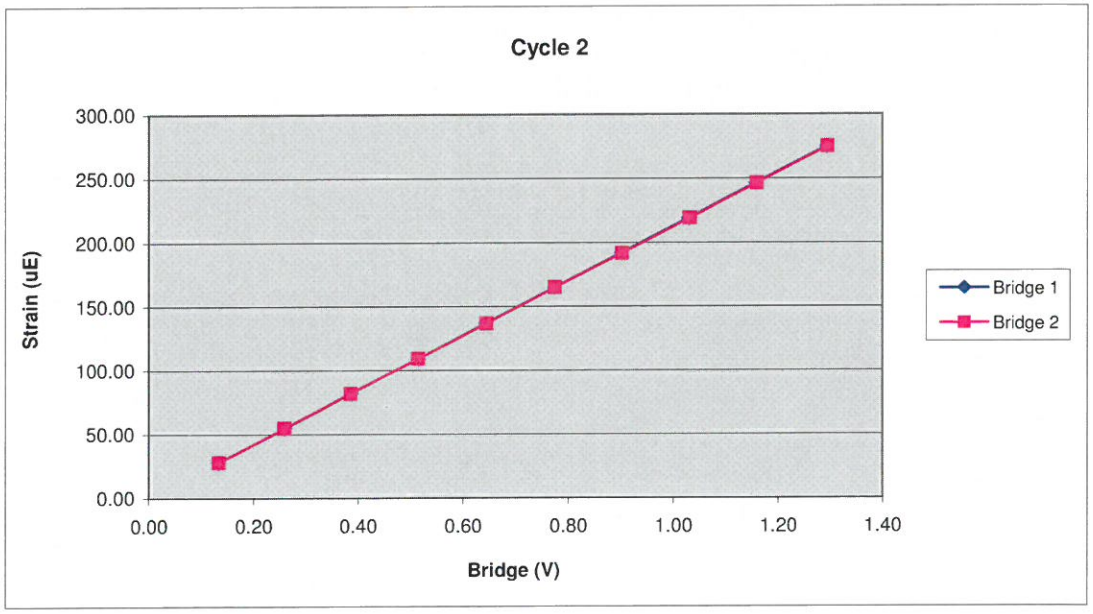
Force Strain Calibration	
EA (Kips)	**36225.50**
Offset	3.39
Correlation	0.999997



203AWJ		Cycle 2		
Sample	**Force (lb)**	**Strain (µE)**	**Bridge 1 (V)**	**Bridge 2 (V)**
1	0.00	0.00	0.00	0.00
2	1014.59	28.23	0.13	0.13
3	1983.94	54.87	0.26	0.26
4	2963.12	81.94	0.39	0.39
5	3939.16	109.15	0.51	0.51
6	4924.05	136.83	0.64	0.64
7	5932.34	164.92	0.77	0.78
8	6919.00	191.62	0.90	0.90
9	7908.80	219.00	1.03	1.03
10	8881.89	246.36	1.16	1.16
11	9921.85	274.90	1.29	1.29

Bridge 1		**Bridge 2**	
Force Calibration (lb/V)	**7681.97**	**Force Calibration (lb/V)**	**7665.41**
Offset	**-11.43**	Offset	**-6.15**
Correlation	**0.999999**	Correlation	**0.999998**
Strain Calibration (µE/V)	**212.92**	**Strain Calibration (µE/V)**	**212.46**
Offset	**-0.28**	Offset	**-0.14**
Correlation	**0.999998**	Correlation	**0.999998**

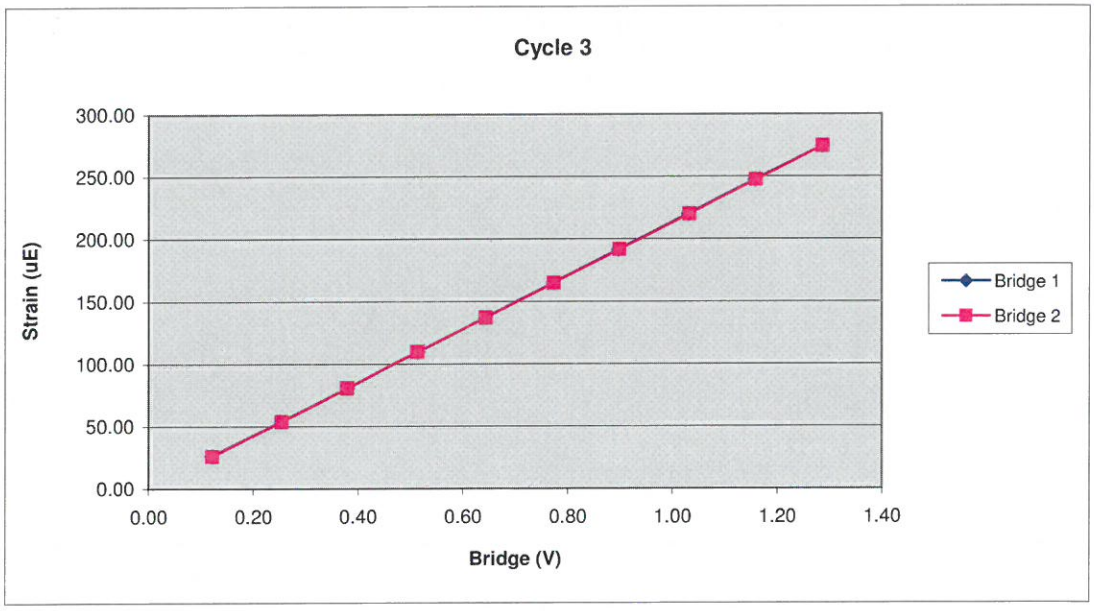
Force Strain Calibration	
EA (Kips)	**36079.71**
Offset	**-1.25**
Correlation	**0.999996**



203AWJ		Cycle 3		
Sample	**Force (lb)**	**Strain (µE)**	**Bridge 1 (V)**	**Bridge 2 (V)**
1	0.00	0.00	0.00	0.00
2	931.98	26.11	0.12	0.12
3	1944.40	53.79	0.25	0.25
4	2911.39	80.73	0.38	0.38
5	3940.93	109.71	0.51	0.51
6	4935.26	137.15	0.64	0.64
7	5929.39	164.84	0.77	0.77
8	6888.90	191.71	0.90	0.90
9	7914.90	219.99	1.03	1.03
10	8887.40	247.28	1.16	1.16
11	9859.30	274.46	1.29	1.29

Bridge 1		**Bridge 2**	
Force Calibration (lb/V)	**7667.78**	**Force Calibration (lb/V)**	**7660.59**
Offset	**2.72**	Offset	**1.09**
Correlation	**0.999999**	Correlation	**1.000000**
Strain Calibration (µE/V)	**213.44**	**Strain Calibration (µE/V)**	**213.24**
Offset	**-0.06**	Offset	**-0.11**
Correlation	**0.999998**	Correlation	**0.999997**

Force Strain Calibration	
EA (Kips)	**35924.82**
Offset	**4.97**
Correlation	**0.999998**



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

Calibration Factors	203AWJ		
Bridge 1 (µE/V)	212.63	Bridge 2 (µE/V)	212.32
EA Factor (Kips)	36076.68	Area (in^2)	1.20

Calibrated by: David Hannah
Calibrated Date: 2/24/2017

Pile Dynamics Inc
30725 Aurora Rd
Solon, OH 44139

Traceable to N.I.S.T.

Appendix IV

PDCA
PILE DRIVING CONTRACTORS ASSOCIATION

Pile Dynamics, Inc.

This documents that

Robert E. Kral
AMEC Foster Wheeler

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 four 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

Report of SPT Energy Measurements
S&ME Diedrich D-50 Track (SN 382)
Winston-Salem, North Carolina
S&ME Project No. 6235-17-020

PREPARED FOR:

North Carolina Department of Transportation
Geotechnical Engineering Unit
1589 Mail Service Center
Raleigh, North Carolina 27699

PREPARED BY:

S&ME, Inc.
9751 Southern Pine Boulevard
Charlotte, NC 28273

September 1, 2017

September 1, 2017

North Carolina Department of Transportation
Geotechnical Engineering Unit
1589 Mail Service Center
Raleigh, North Carolina 27699

Attention: Dr. Shunyi (Chris) Chen, Ph.D., P.E.

Cc: Ms. Cheryl A. Youngblood, L.G.

Reference: **Report of SPT Energy Measurements**
S&ME Diedrich D-50 Track (SN 382)
Winston-Salem, North Carolina
S&ME Project No. 6235-17-020

Dear Dr. Chen:

We have completed the Standard Penetration Test (SPT) energy measurements on the automatic hammer mounted on our Diedrich D-50 track-mounted drill rig with a serial number of 382. This service was performed by our Mr. Robert E. Kral, P.E. on August 22, 2017. SPT energy testing was performed in general accordance with ASTM D4633 and the most recent revision of the North Carolina Department of Transportation, Geotechnical Engineering Unit's requirements. The testing procedures, equipment used during testing, and detailed results are presented in this report.

1.0 Dynamic Testing Methodology

Testing was performed using a model PAX (Serial No. 3733L) Pile Driving Analyzer™ (PDA) manufactured by Pile Dynamics, Inc. The PDA records and interprets data from two piezoresistive accelerometers (Serial Nos. K5641 and K5642) bolted to a 2.67-foot long BW drill rod (SN102) internally instrumented with two strain transducers. The BW instrumented drill rod length included one BW box to BWJ pin and one BWJ box to BW pin sub. The instrumented BW drill rod has a cross-sectional area of 1.80 square inches, an outside diameter of approximately 2.125 inches, and an inside diameter of 1.75 inches at the gage location. The accelerometers and strain gages, 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, computing the maximum transferred hammer energies with the "EFV" method described in ASTM D4633. All results are recorded and displayed in real-time for each blow. Calibration sheets for the accelerometers and the instrumented rod are included in the Appendix.

2.0 Testing and Observations

S&ME personnel were on site on August 22, 2017, to observe and perform testing during SPT sampling on the Diedrich D-50 track-mounted rig operated by Justin Millwood of S&ME. The measurements were taken during drilling operations for the NCDOT R-2247CD Winston-Salem Northern Beltway Design-Build project in Winston-Salem, North Carolina. The measurements were obtained during the SPT sampling of Soil Test Boring Y25ARPB_2200. SPT energy measurements were recorded during four intervals at depths of approximately 33½, 38½, 43½, and 48½ ft below the existing ground surface. The information presented in the tables below summarizes the equipment tested and tooling used during the SPT Energy Measurements.

Table 2-1: Drill Rig Information

Manufacturer	Diedrich
Model	D-50
Serial Number	382
Operator	Justin Millwood
Carrier	Track

Table 2-2: Hammer Information

Model / Type	CME / Auto
Serial Number	382
Anvil Height (inches)	11.5
Anvil Diameter (inches)	2.5
Drop Height (inches)	30
Ram Weight (pounds)	140
Ram Serial Number	N/A

Table 2-3: Drilling and Instrumented Rod Information

Drill Rod Type	BWJ
OD (inches)	2.125
ID (inches)	1.75
Cross-Sectional Area (in^2)	1.80
Typical Lengths (feet)	5 and 10
Instrumented Rod Type	BW (SN 102)
OD (inches)	2.125
ID (inches)	1.75
Cross-Sectional Area (in^2)	1.80
Total Instrumented Rod Length (feet)	2.67
Length Below Gages (feet)	1.42
Split-Spoon Length (feet)	2.95

3.0 Dynamic Testing Results

The total rod length from the instrumentation to the tip of the split-spoon sampler was determined by adding 4.62 ft to the required drill rod length at each sample depth. Based on the test data, the automatic hammer on the Diedrich D-50 track-mounted rig operated at a rate of about 41.1 to 41.9 blows per minute (bpm) during dynamic testing. The measured transferred hammer energy (EFV) was generally in the range of about 282.2 to 320.4 ft-lbs, which corresponds to Energy Transfer Ratio (ETR) values of about 80.6% to 91.5%, respectively. The SPT Energy Measurement Data Summary tables in the Appendix 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, and a summary of the test data and average computed hammer energy and transfer ratio values are provided in Table 3-1. Plots and tables of the following are also included in the Appendix 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 3-1: 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 (Coastal Plain)	Avg. BPM	Avg. EFV (ft-lbs)	Avg. ETR (%)
1	33½ - 35	34	38.62	3-3-4 / 7	Sandy CLAY	41.5	297.2	84.9
2	38½ - 40	39	43.62	3-4-4 / 8	Sandy SILT	41.6	297.0	84.9
3	43½ - 45	44	48.62	4-6-11 / 17	Sandy SILT	41.5	303.8	86.8
4	48½ - 50	49	53.62	4-7-10 / 17	Sandy SILT	41.6	307.0	87.7
					Overall Average	**41.6**	**302.9**	**86.5**

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 3-1. The overall average transferred hammer energy for the automatic hammer on the Diedrich D-50 track-mounted rig (for all the depth intervals tested) was 302.9 foot-pounds, with an average ETR of 86.5%.

4.0 Limitations of Report

This report has been prepared in accordance with generally accepted geotechnical engineering practice for specific application to this project. The conclusions 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.

5.0 Closing

S&ME appreciates the opportunity to provide this report to the North Carolina Department of Transportation Geotechnical Engineering Unit. Please let us know if you have any questions concerning this report.

Sincerely,

S&ME, Inc.

Gregory J. Canivan, P.E.
Technical Principal

NORTH CAROLINA PROFESSIONAL SEAL 042642 ENGINEER ROBERT E. KRAL
rkral@smeinc.com
2017.09.01 16:37:43 -05'00'

Robert E. Kral, P.E.
Transportation Services Project Manager
N.C. Registration No. 042642

Appendices:

- Appendix I - Diedrich D-50 (SN 382) SPT Energy Measurements Summary Plots and Tables
- Appendix II - Field Log and Borelog Report
- Appendix III - Instrumented Rod and Accelerometer Calibration Sheets
- Appendix IV - Certificate of Proficiency

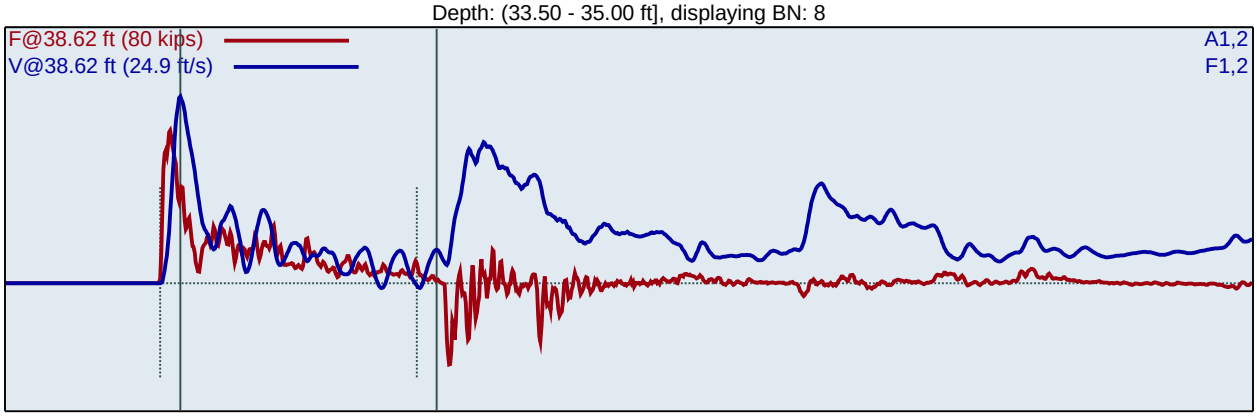
Appendices

Appendix I

DIEDRICH D50 (SN382)
R. KRAL
AR: 1.80 in^2
LE: 38.62 ft
WS: 16807.9 ft/s

Y25ARPB_2200
Test date: 8/22/2017
SP: 0.492 k/ft3
EM: 30000 ksi

Depth: (33.50 - 35.00 ft], displaying BN: 8



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

BL#	LP ft	BC /6"	BPM bpm	FMX kips	VMX ft/s	DMX in	CSX ksi	DFN in	EFV ft-lb	ETR (%)
1	33.67	3	1.9	45	14.5	2.25	24.9	2.00	261.5	74.7
2	33.83	3	41.1	46	16.5	2.26	25.8	2.00	301.0	86.0
3	34.00	3	41.9	46	18.1	2.17	25.5	2.00	312.3	89.2
4	34.17	3	41.5	46	17.0	2.00	25.3	2.00	298.7	85.3
5	34.33	3	41.4	49	18.1	2.00	27.2	2.00	304.9	87.1
6	34.50	3	41.6	48	16.9	2.00	26.5	2.00	288.7	82.5
7	34.63	4	41.5	48	17.5	1.51	26.5	1.50	295.4	84.4
8	34.75	4	41.6	48	18.2	1.50	26.5	1.50	299.8	85.7
9	34.88	4	41.1	48	17.3	1.50	26.8	1.50	295.9	84.5
10	35.00	4	41.8	49	18.1	1.50	27.2	1.50	297.0	84.9
		Average	41.5	48	17.6	1.72	26.6	1.71	297.2	84.9
		Std Dev	0.2	1	0.5	0.25	0.6	0.25	4.5	1.3
		Maximum	41.8	49	18.2	2.00	27.2	2.00	304.9	87.1
		Minimum	41.1	46	16.9	1.50	25.3	1.50	288.7	82.5

N-value: 7

Sample Interval Time: 13.01 seconds.

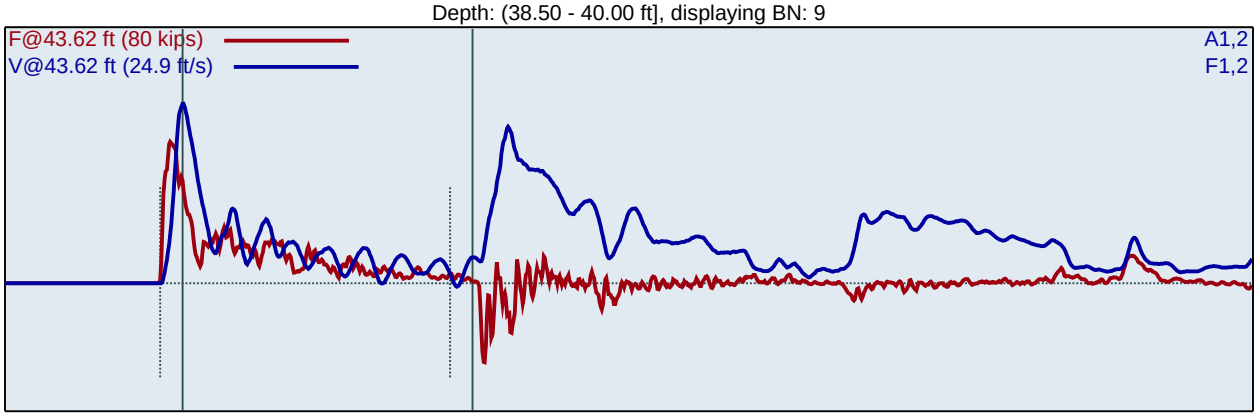
DIEDRICH D50 (SN382)
R. KRAL

Y25ARPB_2200
Test date: 8/22/2017

AR: 1.80 in^2
LE: 43.62 ft
WS: 16807.9 ft/s

SP: 0.492 k/ft3
EM: 30000 ksi

Depth: (38.50 - 40.00 ft], displaying BN: 9



BL#	LP ft	BC /6"	BPM bpm	FMX kips	VMX ft/s	DMX in	CSX ksi	DFN in	EFV ft-lb	ETR (%)
1	38.67	3	1.9	49	19.1	2.24	27.1	2.00	303.1	86.6
2	38.83	3	41.6	49	18.1	2.24	27.2	2.00	294.2	84.1
3	39.00	3	41.5	49	18.0	2.00	27.2	2.00	305.3	87.2
4	39.13	4	41.8	49	17.6	1.62	27.2	1.50	288.4	82.4
5	39.25	4	41.2	49	16.9	1.52	27.2	1.50	282.2	80.6
6	39.38	4	41.7	46	17.4	1.50	25.4	1.50	298.0	85.1
7	39.50	4	41.7	48	18.0	1.50	26.6	1.50	295.8	84.5
8	39.63	4	41.5	44	17.4	1.50	24.7	1.50	300.4	85.8
9	39.75	4	41.5	44	17.5	1.50	24.6	1.50	301.5	86.2
10	39.88	4	41.5	45	17.9	1.50	25.1	1.50	305.1	87.2
11	40.00	4	41.5	44	18.1	1.50	24.6	1.50	304.7	87.1
		Average	41.6	46	17.6	1.52	25.7	1.50	297.0	84.9
		Std Dev	0.2	2	0.4	0.04	1.1	0.00	7.5	2.1
		Maximum	41.8	49	18.1	1.62	27.2	1.50	305.1	87.2
		Minimum	41.2	44	16.9	1.50	24.6	1.50	282.2	80.6

N-value: 8

Sample Interval Time: 14.41 seconds.

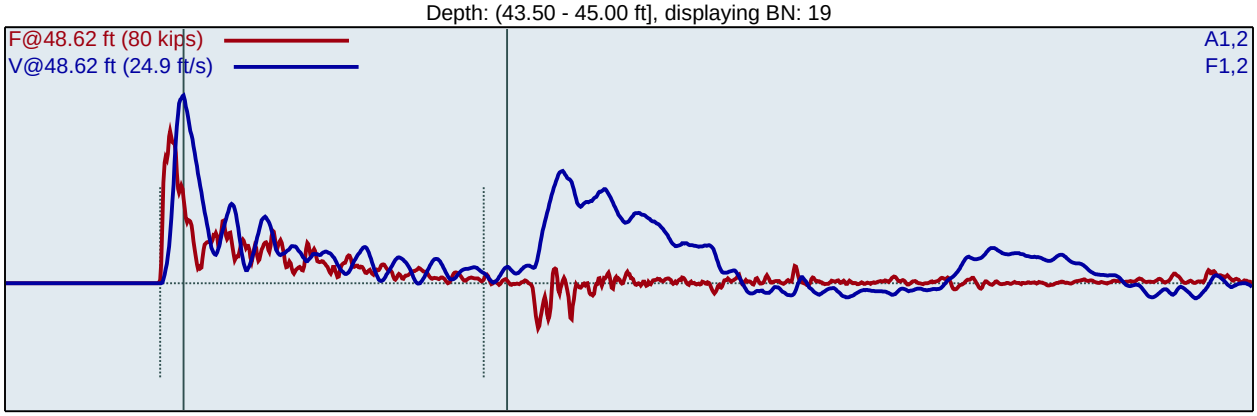
DIEDRICH D50 (SN382)
R. KRAL

Y25ARPB_2200
Test date: 8/22/2017

AR: 1.80 in^2
LE: 48.62 ft
WS: 16807.9 ft/s

SP: 0.492 k/ft3
EM: 30000 ksi

Depth: (43.50 - 45.00 ft], displaying BN: 19



BL#	LP ft	BC /6"	BPM bpm	FMX kips	VMX ft/s	DMX in	CSX ksi	DFN in	EFV ft-lb	ETR (%)
1	43.63	4	1.9	48	17.5	1.50	26.8	1.50	290.4	83.0
2	43.75	4	41.5	46	16.8	1.56	25.4	1.50	291.6	83.3
3	43.88	4	41.7	43	17.0	1.78	23.7	1.50	301.8	86.2
4	44.00	4	41.7	45	18.2	1.55	24.9	1.50	315.4	90.1
5	44.08	6	41.8	43	17.5	1.29	24.0	1.00	307.6	87.9
6	44.17	6	41.4	44	17.6	1.14	24.3	1.00	311.0	88.9
7	44.25	6	41.5	46	18.3	1.08	25.5	1.00	314.4	89.8
8	44.33	6	41.7	43	17.5	1.09	24.1	1.00	308.2	88.1
9	44.42	6	41.4	44	18.1	1.07	24.4	1.00	314.7	89.9
10	44.50	6	41.6	43	18.0	1.06	23.8	1.00	313.5	89.6
11	44.55	11	41.9	45	18.3	0.90	24.8	0.55	303.9	86.8
12	44.59	11	41.3	43	17.4	0.84	24.0	0.55	307.3	87.8
13	44.64	11	41.7	43	17.5	0.74	24.1	0.55	296.0	84.6
14	44.68	11	41.4	45	17.9	0.69	24.7	0.55	296.1	84.6
15	44.73	11	41.4	45	17.4	0.66	24.9	0.55	291.2	83.2
16	44.77	11	41.4	45	18.2	0.65	25.1	0.55	304.5	87.0
17	44.82	11	41.7	44	17.7	0.62	24.4	0.55	304.3	86.9
18	44.86	11	41.4	43	17.4	0.59	24.0	0.55	299.6	85.6
19	44.91	11	41.4	47	18.3	0.59	26.4	0.55	302.2	86.3
20	44.95	11	41.7	47	18.0	0.56	26.3	0.55	290.0	82.9
21	45.00	11	41.3	46	17.8	0.56	25.4	0.55	301.0	86.0
		Average	41.5	44	17.8	0.83	24.7	0.71	303.8	86.8
		Std Dev	0.2	1	0.3	0.24	0.8	0.22	7.4	2.1
		Maximum	41.9	47	18.3	1.29	26.4	1.00	314.7	89.9
		Minimum	41.3	43	17.4	0.56	23.8	0.55	290.0	82.9

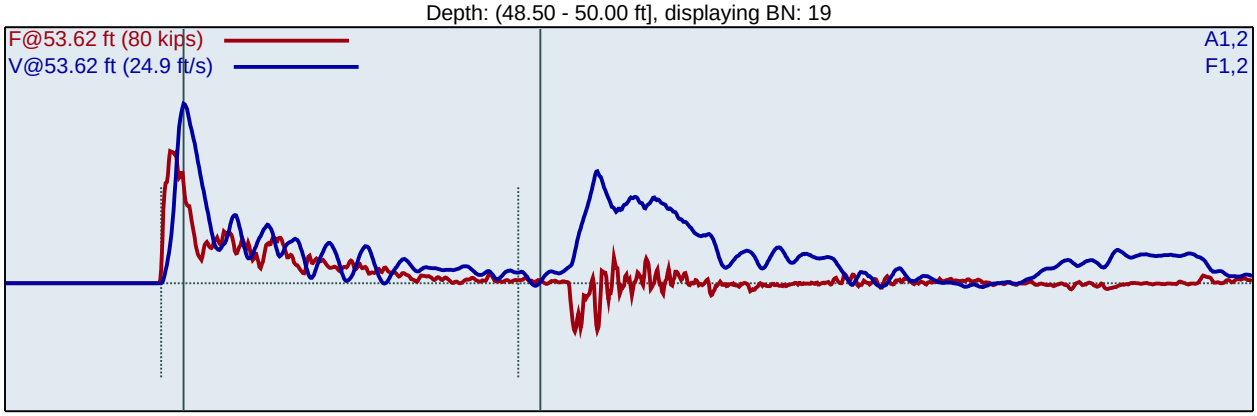
N-value: 17

Sample Interval Time: 28.83 seconds.

DIEDRICH D50 (SN382)
R. KRAL
AR: 1.80 in^2
LE: 53.62 ft
WS: 16807.9 ft/s

Y25ARPB_2200
Test date: 8/22/2017
SP: 0.492 k/ft3
EM: 30000 ksi

Depth: (48.50 - 50.00 ft], displaying BN: 19



BL#	LP ft	BC /6"	BPM bpm	FMX kips	VMX ft/s	DMX in	CSX ksi	DFN in	EFV ft-lb	ETR (%)
1	48.63	4	1.9	44	15.2	1.70	24.5	1.50	263.8	75.4
2	48.75	4	41.7	41	16.6	1.64	22.9	1.50	302.0	86.3
3	48.88	4	41.5	41	16.9	1.54	22.7	1.50	307.1	87.7
4	49.00	4	41.4	42	16.4	1.50	23.1	1.50	303.6	86.8
5	49.07	7	41.6	42	16.6	1.10	23.5	0.86	302.3	86.4
6	49.14	7	41.8	41	16.9	1.03	23.0	0.86	303.8	86.8
7	49.21	7	41.7	42	16.6	0.98	23.2	0.86	295.3	84.4
8	49.29	7	41.3	42	17.2	0.99	23.5	0.86	312.3	89.2
9	49.36	7	41.7	43	17.6	0.94	23.8	0.86	311.4	89.0
10	49.43	7	41.9	42	17.3	0.91	23.4	0.86	308.2	88.1
11	49.50	7	41.3	42	17.6	0.89	23.4	0.86	319.1	91.2
12	49.55	10	41.9	41	17.5	0.73	22.7	0.60	314.7	89.9
13	49.60	10	41.6	42	17.1	0.70	23.3	0.60	302.7	86.5
14	49.65	10	41.5	43	18.3	0.73	23.7	0.60	320.4	91.5
15	49.70	10	41.5	42	17.0	0.70	23.1	0.60	305.3	87.2
16	49.75	10	41.8	41	17.5	0.71	22.7	0.60	309.9	88.6
17	49.80	10	41.6	41	17.1	0.69	22.8	0.60	298.7	85.4
18	49.85	10	41.5	42	17.8	0.68	23.1	0.60	305.8	87.4
19	49.90	10	41.6	41	17.5	0.67	22.9	0.60	303.0	86.6
20	49.95	10	41.5	42	17.2	0.67	23.5	0.60	300.2	85.8
21	50.00	10	41.5	42	17.5	0.66	23.6	0.60	306.3	87.5
		Average	41.6	42	17.3	0.81	23.2	0.71	307.0	87.7
		Std Dev	0.2	1	0.4	0.15	0.3	0.13	6.7	1.9
		Maximum	41.9	43	18.3	1.10	23.8	0.86	320.4	91.5
		Minimum	41.3	41	16.6	0.66	22.7	0.60	295.3	84.4

N-value: 17

Sample Interval Time: 28.80 seconds.

Summary of SPT Test Results

Project: DIEDRICH D50 (SN382), Test Date: 8/22/2017

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

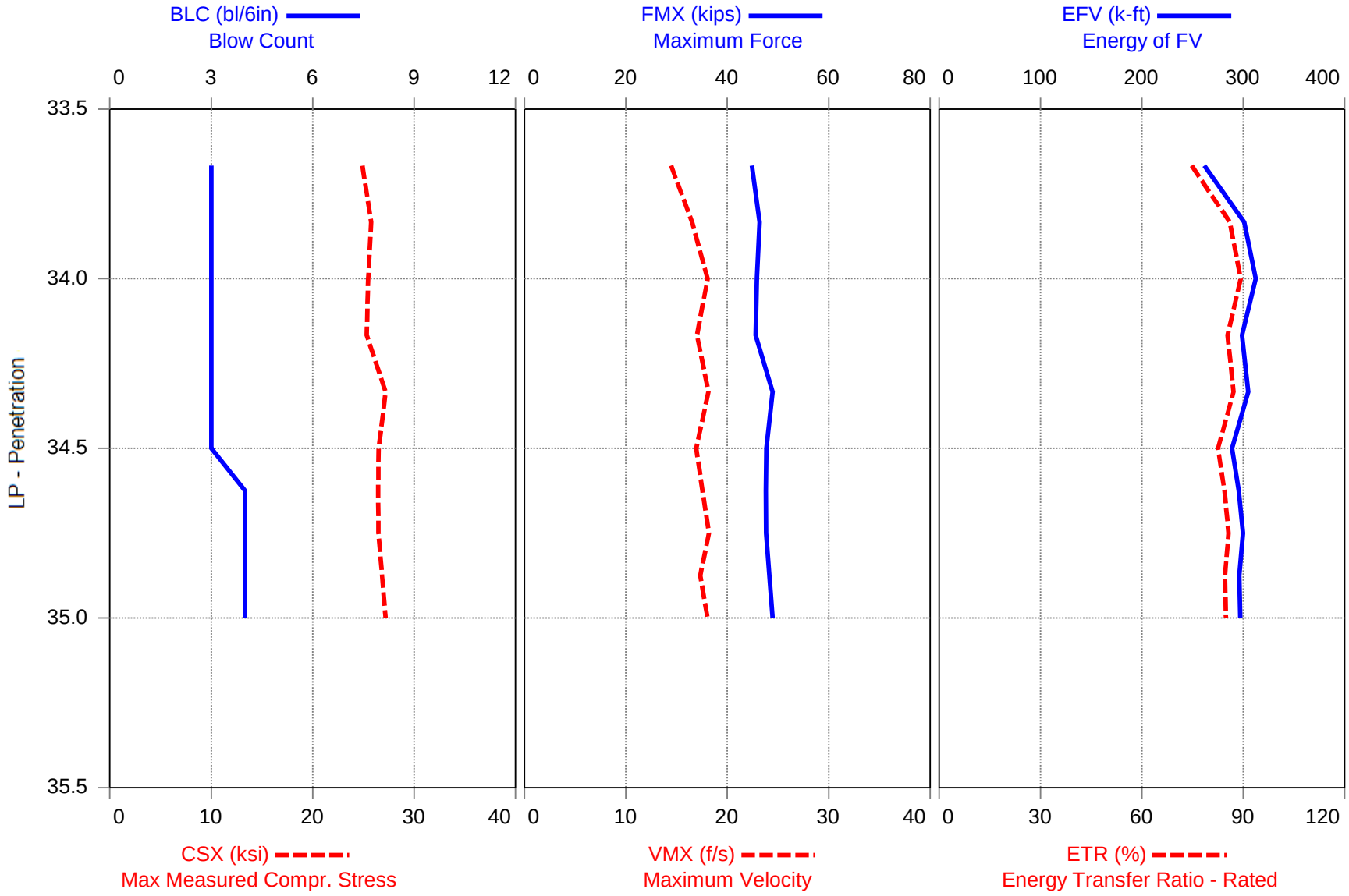
Instr. Length ft	Start Depth ft	Final Depth ft	Blows Applied /6"	**N Value**	**N60 Value**	Average BPM bpm	Average FMX kips	Average VMX ft/s	Average DMX in	Average CSX ksi	Average DFN in	Average EFV ft-lb	Average ETR (%)
38.62	33.50	35.00	**3-3-4**	**7**	**10**	41.5	48	17.6	1.72	26.6	1.71	297.2	84.9
43.62	38.50	40.00	**3-4-4**	**8**	**11**	41.6	46	17.6	1.52	25.7	1.50	297.0	84.9
48.62	43.50	45.00	**4-6-11**	**17**	**24**	41.5	44	17.8	0.83	24.7	0.71	303.8	86.8
53.62	48.50	50.00	**4-7-10**	**17**	**24**	41.6	42	17.3	0.81	23.2	0.71	307.0	87.7
				Overall Average Values:		41.6	44	17.6	1.06	24.6	0.98	302.9	86.5
				Standard Deviation:		0.2	2	0.4	0.41	1.4	0.45	7.9	2.3
				Overall Maximum Value:		41.9	49	18.3	2.00	27.2	2.00	320.4	91.5
				Overall Minimum Value:		41.1	41	16.6	0.56	22.7	0.55	282.2	80.6

Pile Dynamics, Inc. - PDIPLOT2 Ver 2016.2.57.6 - Case Method & iCAP® Results

Printed: 31-August-2017

Test started: 22-August-2017

DIEDRICH D50 (SN382) - Y25ARPB_2200, 33.5 to 35

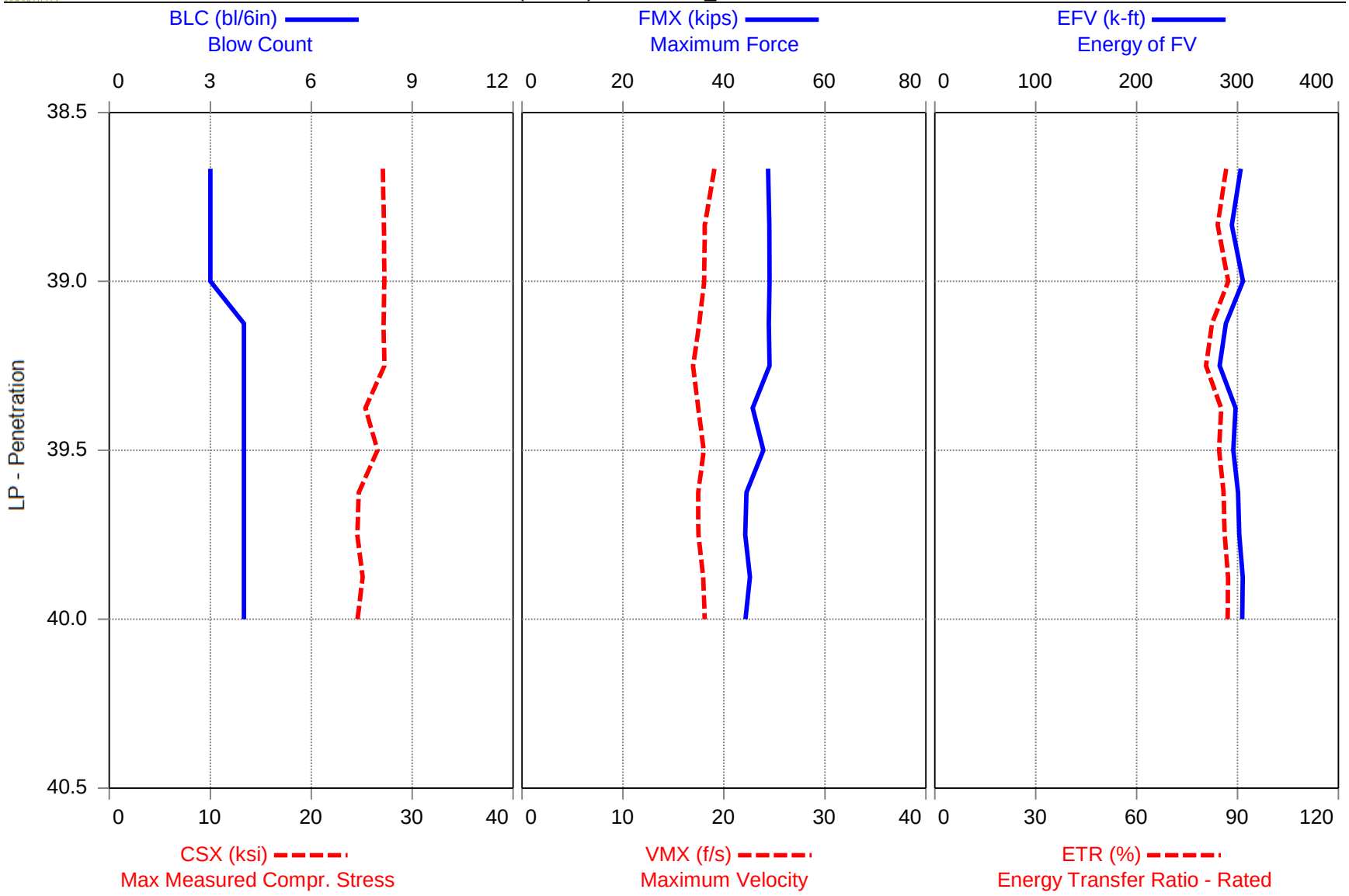


Pile Dynamics, Inc. - PDIPLOT2 Ver 2016.2.57.6 - Case Method & iCAP® Results

Printed: 31-August-2017

Test started: 22-August-2017

DIEDRICH D50 (SN382) - Y25ARPB_2200, 38.5 to 40

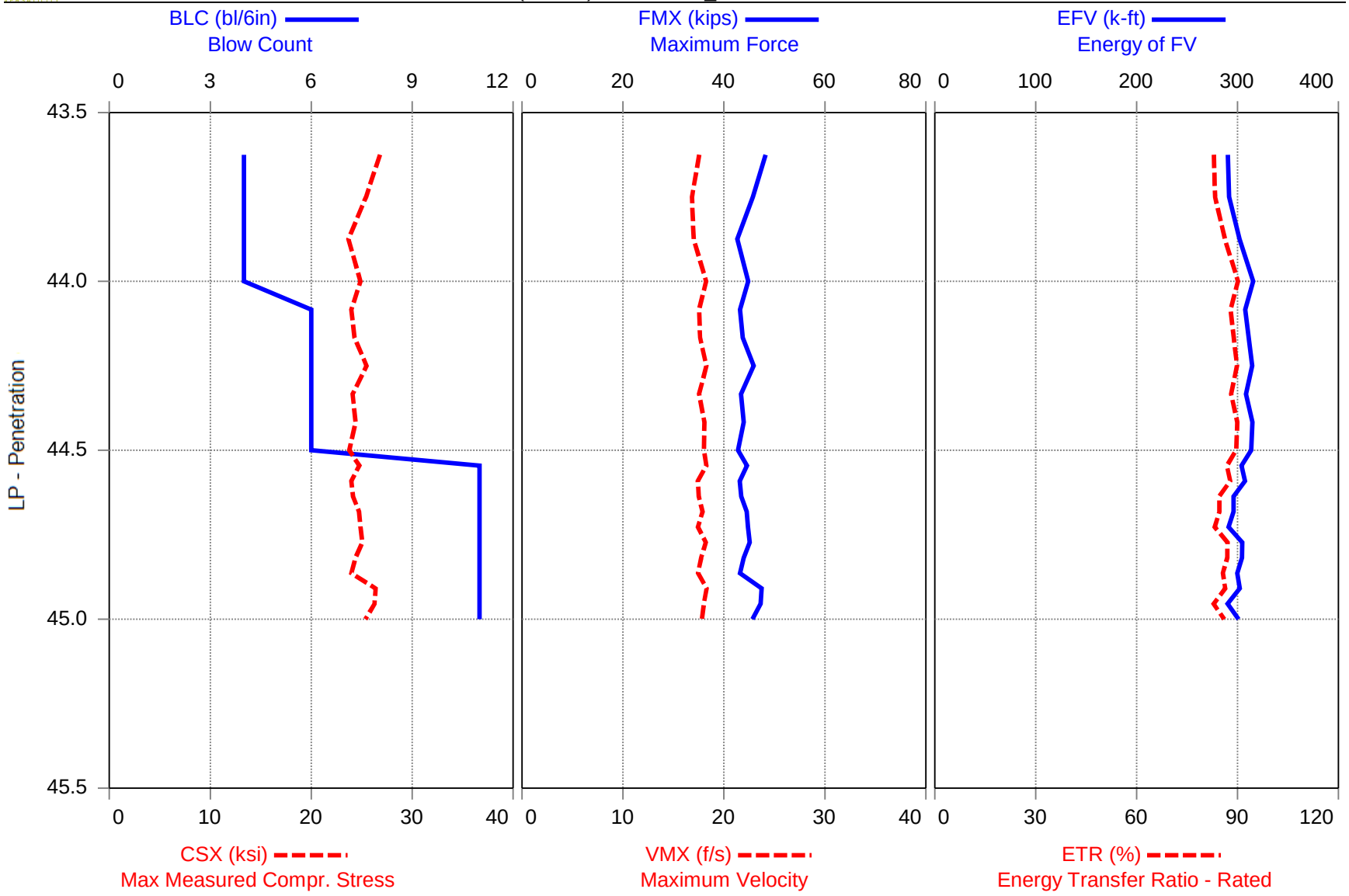


Pile Dynamics, Inc. - PDIPLOT2 Ver 2016.2.57.6 - Case Method & iCAP® Results

Printed: 31-August-2017

Test started: 22-August-2017

DIEDRICH D50 (SN382) - Y25ARPB_2200, 43.5 to 45

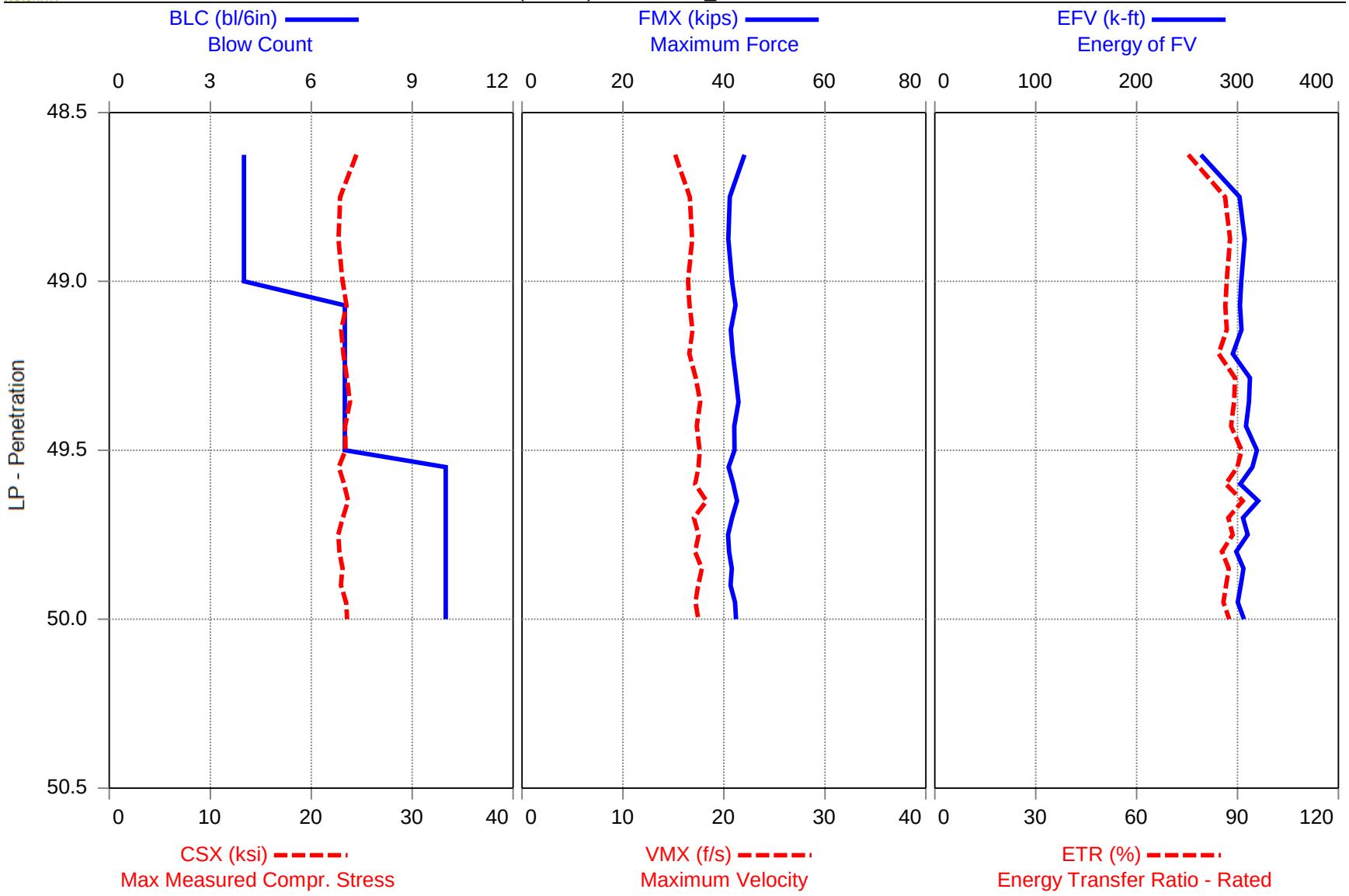


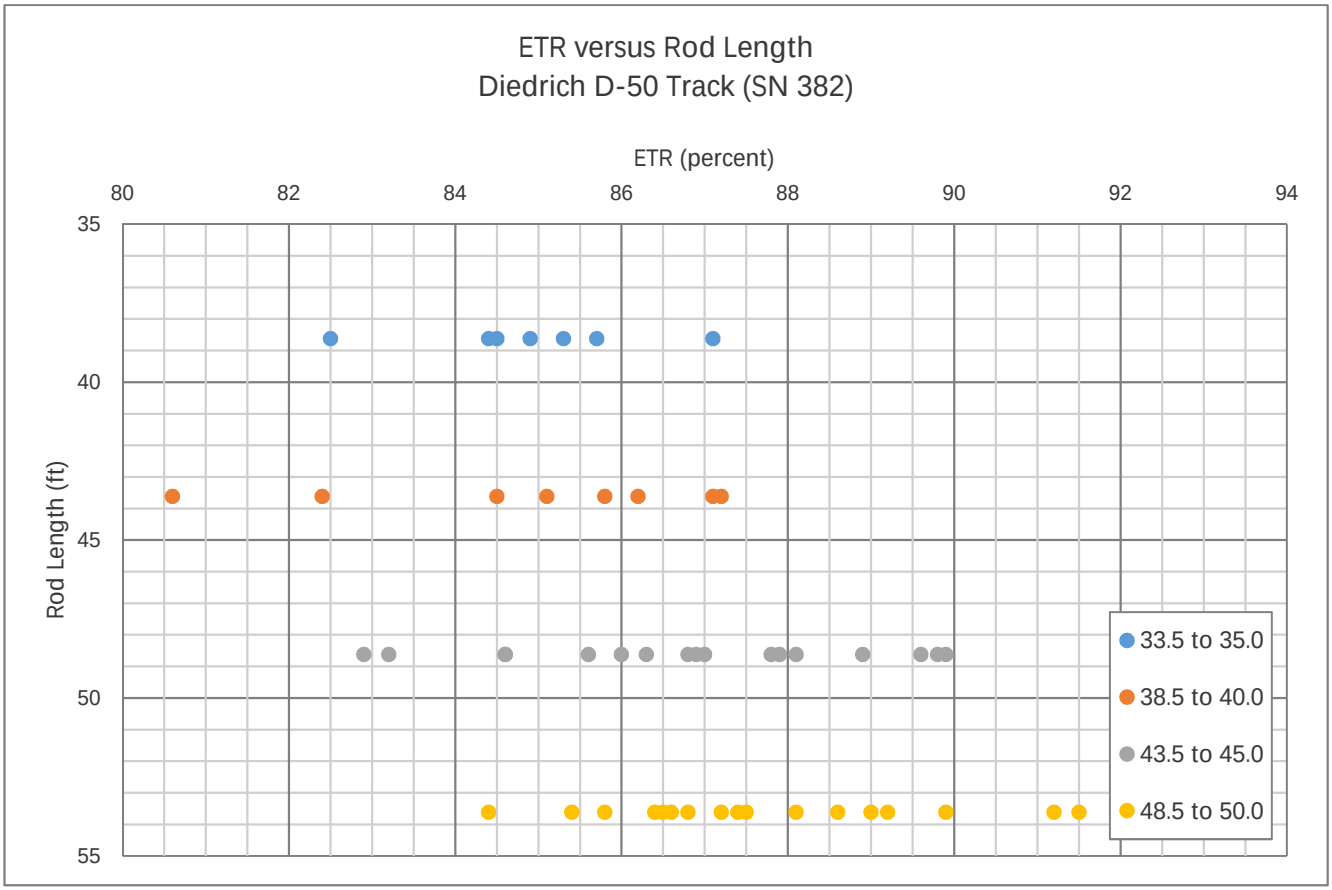
Pile Dynamics, Inc. - PDIPLOT2 Ver 2016.2.57.6 - Case Method & iCAP® Results

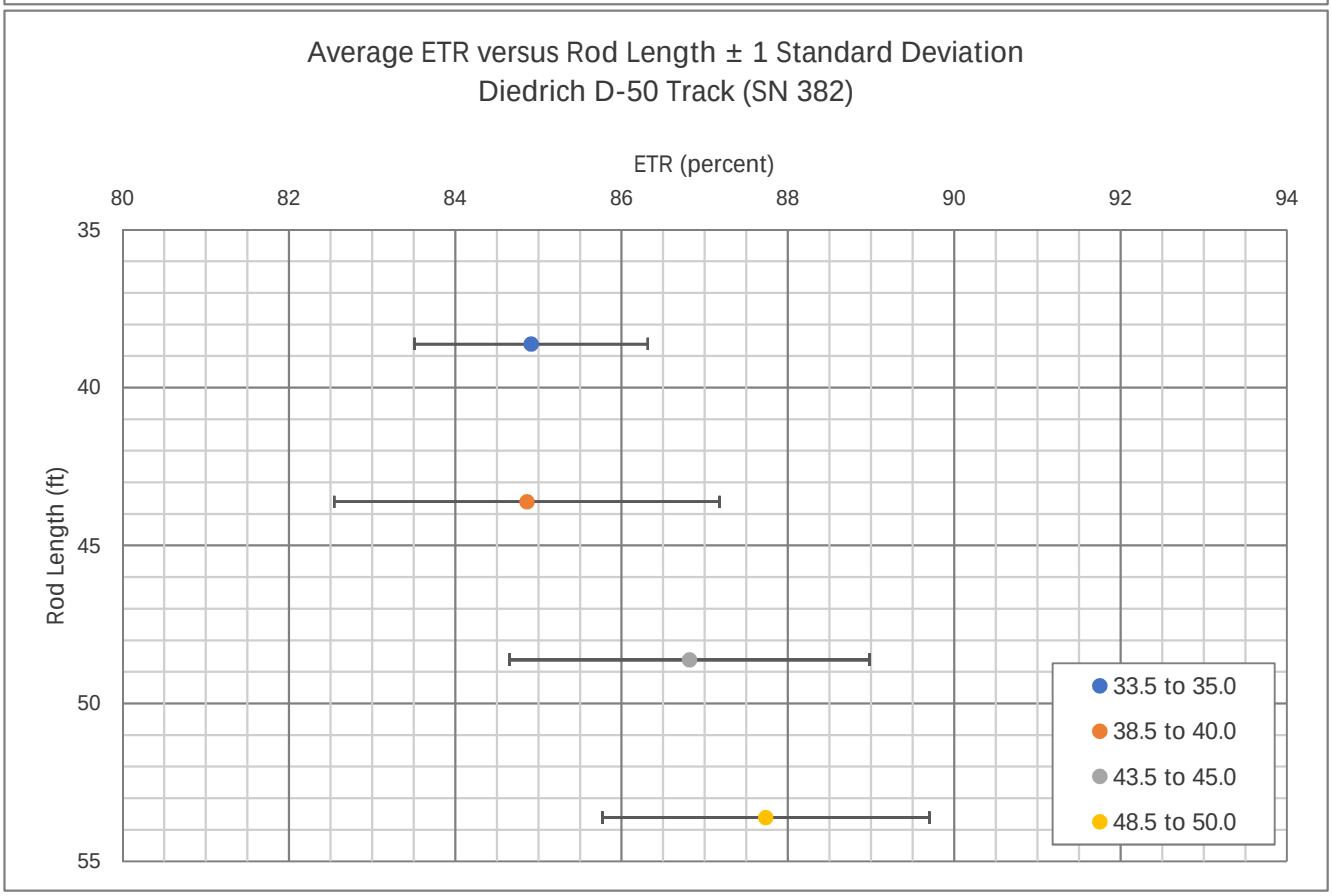
Printed: 31-August-2017

Test started: 22-August-2017

DIEDRICH D50 (SN382) - Y25ARPB_2200, 48.5 to 50




ETR versus Rod Length
Diedrich D-50 Track (SN 382)
ETR (percent)
80
82
84
86
88
90
92
94
Rod Length (ft)
35
40
45
50
55
33.5 to 35.0
38.5 to 40.0
43.5 to 45.0
48.5 to 50.0


Average ETR versus Rod Length ± 1 Standard Deviation
Diedrich D-50 Track (SN 382)
ETR (percent)
80
82
84
86
88
90
92
94
Rod Length (ft)
35
40
45
50
55
33.5 to 35.0
38.5 to 40.0
43.5 to 45.0
48.5 to 50.0

Appendix II

SPT Energy Evaluation Form

S&ME

Project: R-2247 **Date (s):** 8/22/17
Project No.: 6235-17-020 **Weather:** 90° SUNNY
Boring No.: Y25AR2B-2200 **Drill Rod Type:** BWJ

On-site Personnel

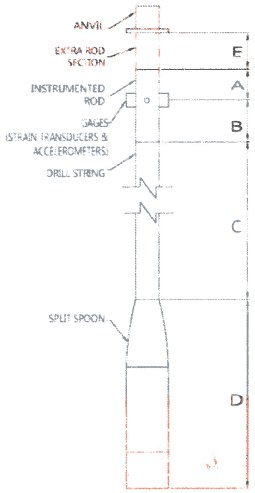
Drilling Company: S&ME, INC.
Rig Oper./Helper: JUSTIN MILLWOOD
Rig Engr/Geologist: FINLEY LLOYD
Analyzer Oper.: BOB KRAL

Rig/Hammer Info

Drill Rig Make/Model: DIEDRICH D-50
Carrier Type: TRACK (MST-8000)
Rig Serial No.: 382
Hammer Type/Model: DIEDRICH
Hammer Serial No.: 382
Hammer Drop System: AUTO
Lubrication Condition: PER MANUFACTURER
Manufacturer Recommended Operation Rate (bpm): 45
Drop Height ~~from Calibration Record~~ (in.): 30
Hammer Weight ~~from Calibration Record~~ (lbs): 140
Anvil Dimension (in.): 30
Drilling Method: HSA

Rod Info

(A + E) Impact Surface to Gages Length: 1.67 ft
(B) Instr. Rod Length below Gages: 1.42 ft
(A) + (B) Instr. Rod Length: 2.67 ft
(D) Spoon Length: 2.95 ft
(E) Rod Length Above Instr. Rod (if applicable): 0.42 ft
Instr. Rod S/N: 102BW-2
Instr. Rod Outside Dia.: 2.125 in.
Instr. Rod Area: 1.80 in^2
PDA Make/Model: PAX
PDA Serial No.: 3733L
Calib. Pulse Test (y/n): Y



Gage Information

Gage		Serial No.	Calibration No.
Accel.	A3	5641	376
	A4	5642	320
Strain	F3	102BW-1	211.49
	F4	102BW-2	211.97

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)	
8/22	33.5 To 35.0	11:35 / 11:35	34	38.62	41	3	3	4	7	Y	SA. CL
8/22	38.5 To 40.0	11:44 / 11:44	39	43.62	41	3	4	4	8	Y	SA. SI
8/22	43.5 To 45.0	11:53 / 11:53	44	48.62	41	4	6	11	17	Y	SA. SI
8/22	48.5 To 50.0	12:00 / 12:01	49	53.62	41	4	7	10	17	Y	SA. SI

Comments: (1) **If there are any nonconformances or deficiencies identified during the testing, immediately pause the drilling and testing activities and notify the Site Manager** and describe them in the space below; (2) Note any unusual hammer operating conditions that affect the hammer performance, or changes in operating conditions (e.g. verticality, weather, or lubrication between trials). Drop height tolerance is ± 1 inch. Drop height verified by Rig Geologist/Engineer at time of SPT Energy measurement for CME hammers and at the beginning of the day for Diedrich hammers; (3) Note any changes in rod diameter along drill string and record locations of short rod sections; (4) Prepare a sketch or take a picture of the instrumented drill rod assembly and indicate the approximate relative location and orientation of the strain gauges, accelerometers, and LE Datum; (5) Note: Identify all attached pages, including photographs, with the Project No., Boring No., and date.

Prepared By (print/signature)
SPT Energy Lead

8/22/17
Date

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 34409.3.23	**TIP** R-2247	**COUNTY** FORSYTH	**GEOLOGIST** Lloyd, F.	
SITE DESCRIPTION US 421 / Peace Haven Road - R-2247 CD				**GROUND WTR (ft)**
BORING NO. Y25ARPB_2200	**STATION** 22+00	**OFFSET** 10 ft LT	**ALIGNMENT** Y25ARPB	**0 HR.** 47.5 FIAD
COLLAR ELEV. N/A	**TOTAL DEPTH** 50.0 ft	**NORTHING** N/A	**EASTING** N/A	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE SME382 DIEDRICH D50 86.5% 8/22/2017		**DRILL METHOD** H.S. Augers		**HAMMER TYPE** Automatic
DRILLER Millwood, J.	**START DATE** 08/22/17	**COMP. DATE** 08/22/17	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft)	DEPTH (ft)
										GROUND SURFACE	0.0
		1.0								**ROADWAY EMBANKMENT**	
			5	4	5	9	SS-2032	M		Gray and Tan, Silty Fine to Medium SAND with Mica	3.0
		3.5	2	3	4	7	SS-2033	M		Orange and Tan, Fine Sandy SILT with Mica, with Some Clay, Sparse Organics, and Rock Fragments at 14', with 2" Seam of Fine to Coarse Sand at 19.5'	
		6.0	2	3	4	7	SS-2034	M			
		8.5	3	3	5	8	SS-2035	M		Only 6" Recovery at 3.5'-5'	
		13.5	4	3	5	8	SS-2036	M			
		18.5	4	4	5	9	SS-2037	M			
		23.5	2	2	4	6	SS-2038	M		Red, Clayey SILT with Sand	24.0 25.0
		28.5								Tan Red, Fine Sandy SILT with Mica	
			2	2	4	6	SS-2039	W		Red Gray to Gray Tan, CLAY, Trace Organics at 33.5'	29.0
		33.5	3	3	4	7	SS-2040	W			
		38.5								**RESIDUAL**	37.0
			3	4	4	8	SS-2041	W		Gray SILT, Highly Micaceous	39.0
		43.5								Light Green and Tan, Clayey SILT, with Sand	42.0
			4	6	11	17	SS-2042	W		Gray Tan, Fine Sandy SILT, Trace Mica, with 2" White Silt Seam at 44'	
		48.5									
			4	7	10	17	SS-2043	W			50.0
										Boring Terminated at Depth 50.0 ft in Very Stiff Sandy SILT	

DRAFT

Appendix III

Pile Dynamics, Inc.

Quality Assurance for Deep Foundations

PDI Certificate of Calibration

PDI Accelerometer Calibration

Model PR-Kicher Serial # K5641

Cal Date: 27Feb17 Cal Due : 27Feb19

Temperature: 64.5 deg. F Humidity 30 %

Calibrated at
Pile Dynamics, Inc.
30725 Aurora Road
Cleveland, OH 44139

Manufactured by Pile Dynamics, Inc.

Procedure used: PDA Accelerometer Calibration Procedure 2016-6, Revision 20160422

Equipment was found to be

✓ in tolerance As Received _____ out of tolerance As Received

✓ in tolerance As Returned _____ out of tolerance As Returned

PDI Calibration: .0752 mv/5000g

Calibration Standards Utilized
Hopkinson Bar Force Calibration F2, verified on 25APR16

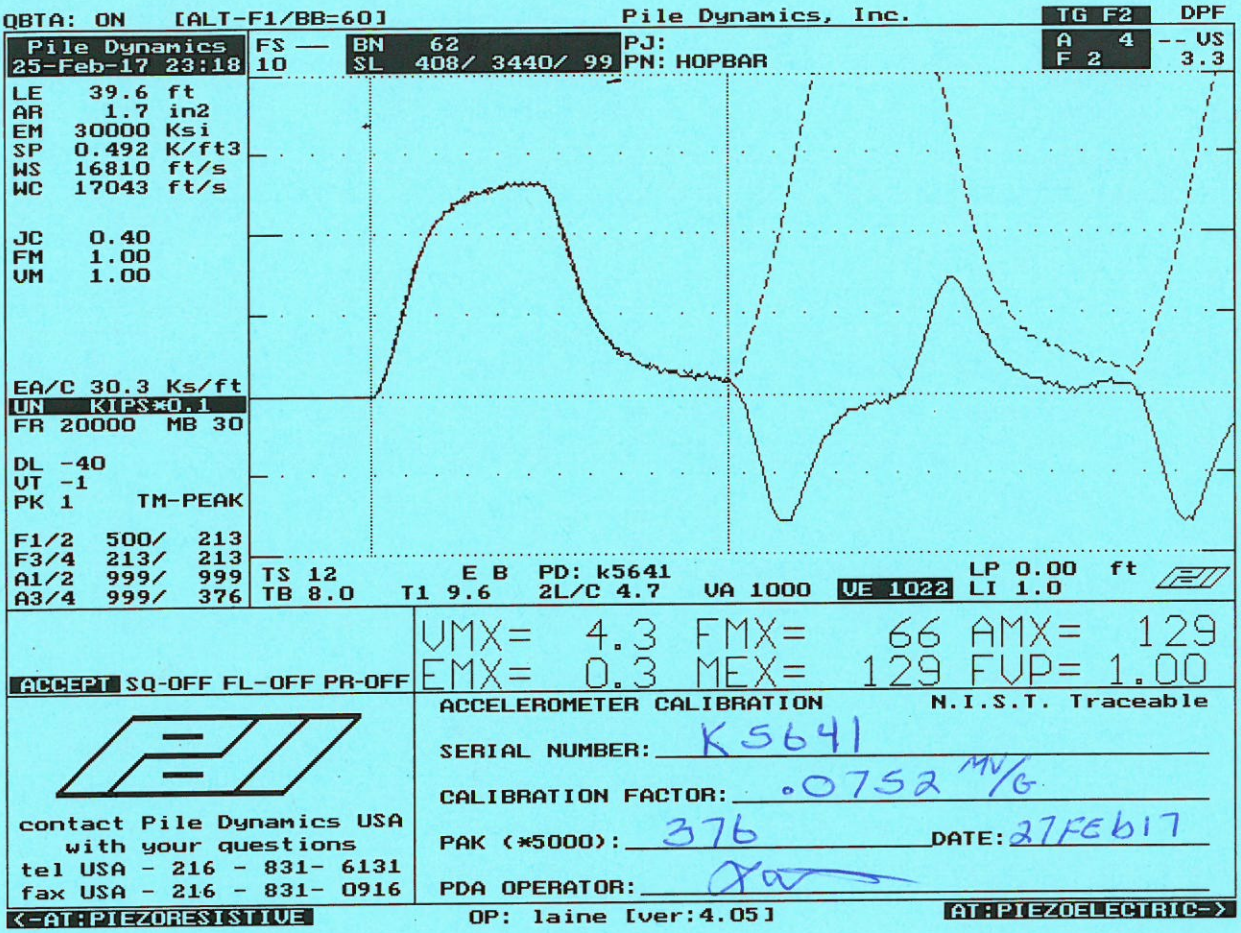
PDI HopBar DOS PAK, serial number 1273K, verified on 25 APR 16

Calibration performed by: L. M. Wright
Laine Wright, Technician

Reviewed by: Robert Sprenger
Robert Sprenger, Production Manager

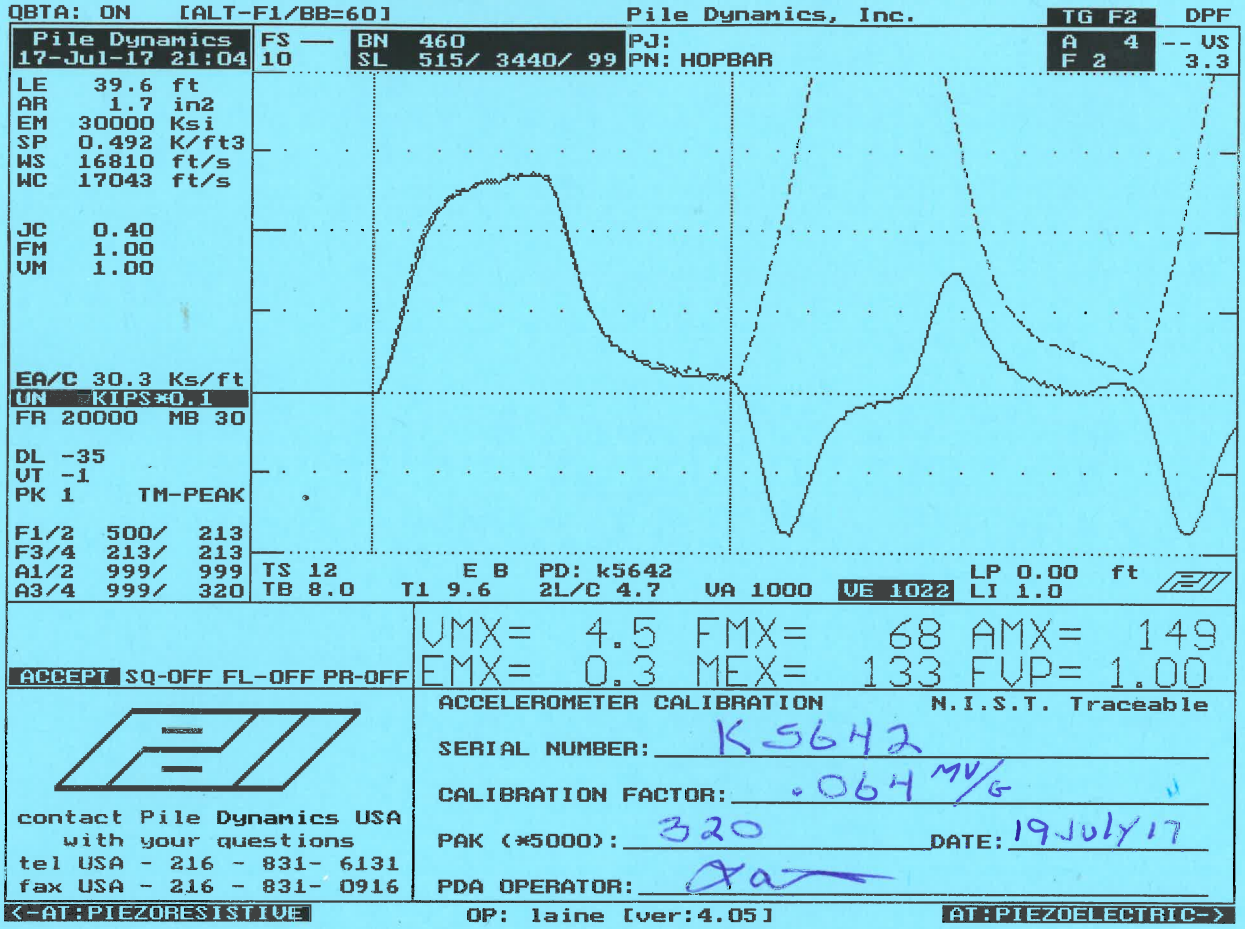
Accelerometer CC-5 Issued 20160426

30725 Aurora Road • Cleveland, Ohio 44139 USA • +1-216-831-6131 • Fax +1-216-831-0916
E-mail: info@pile.com • www.pile.com



Smart Sensor

Smart Chip Programmed By RMW **on** 27FEB17 **CRC Value** 3C62



Smart Sensor

Smart Chip Programmed By A.M.W. **on** 19July17 **CRC Value** 73CE

Pile Dynamics, Inc.

Quality Assurance for Deep Foundations

PDI Certificate of Calibration

PDI SPT Drill Rod Serial # 102 BW

Cal Date: 2-27-17 Cal Due : 2-27-19

Temperature: 69.2 deg. F Humidity 42 %

Manufactured by Pile Dynamics, Inc.
Calibrated at: Pile Dynamics, Inc., 30725 Aurora Road, Cleveland, OH 44139
Procedure used: SPT Drill Rod Calibration Procedure 2016-4, Revision 20160422
Calibration Data: Attach SPT Rod Data Sheet DS-17

Equipment was found to be
✓ in tolerance As Received _____ out of tolerance As Received

✓ in tolerance As Returned _____ out of tolerance As Returned

Calibration Standards Utilized

1. PDI SPT Calibration Signal Conditioning Unit #000001, verified on 20160302
2. PDI Load Cell #75, Certificate #3482090006
3. Capacitec Displacement Sensor #2034, Certificate #3482090004
4. Capacitec Displacement Sensor #2040, Certificate #3482090004
5. Capacitec Displacement Mainframe #4004-671, Certificate #3482090004
6. Brown & Sharpe Digital Caliper #8G028506, Certificate #3482090001
7. National Instruments USB-6210 DAQ serial number 159AFDE, Certificate #3482090002

Calibration performed by:

David Burrell Technician

Reviewed by:

Robert Sprenger, Production Manager

SPT CC-16 Issued 20160425

30725 Aurora Road • Cleveland, Ohio 44139 USA • +1-216-831-6131 • Fax +1-216-831-0916
E-mail: info@pile.com • www.pile.com

Pile Dynamics, Inc.

Quality Assurance for Deep Foundations

SPT Calibration Data Sheet Revision number 20160426
Use Calibration Procedure Number 2016-8, Revision 20160422

SPT Drill Rod Data

Serial Number: 102 BW Calibration Date: 2-27-17

Temperature: 69.2 °F Humidity: 42 %

Calibration performed in accordance with PDI SPT Calibration Procedure 2016-4, Revision 20160422

As Received (circle one) : Operational - Malfunctioning - Damaged

Calibration data
Pre-Load: 1. 8032 2. 8103 3. 8051

Total Load: 1. 17944 2. 18025 3. 17918

Common typical theoretical EA values based on SPT Rod Type:
AW: 35400 NW: 43100 or 68100 N3: 70800 BW:52344

EA Theoretical 52344 EA Measured 53973.2 Error 3.11 %
Within 4% Tolerance: Y / N

Alternative EA verification: Measure wall thickness, calculate area and multiply by 30000. (use spreadsheet for calculation)

Calibration values
Channel 1: As Found: (last cal): 218.03 As Left: 211.49 Within 5% Tolerance: Y / N
Channel 2: As Found: (last cal): 216.99 As Left: 211.97 Within 5% Tolerance: Y / N
EA: As Found: (last cal): 52603.8 As Left: 53973.2 Difference: 2.6 %

Calibration performed by:

David Burrell, Technician

Reviewed by:

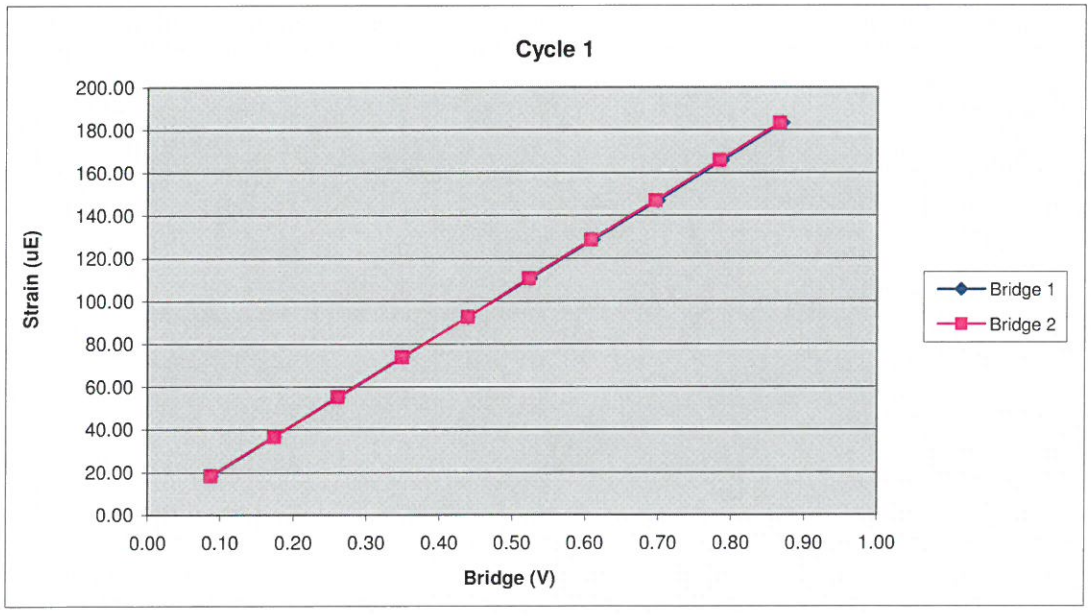
Robert Sprenger, Production Manager

30725 Aurora Road • Cleveland, Ohio 44139 USA • +1-216-831-6131 • Fax +1-216-831-0916
E-mail: info@pile.com • www.pile.com

102BW		Cycle 1		
Sample	**Force (lb)**	**Strain (µE)**	**Bridge 1 (V)**	**Bridge 2 (V)**
1	0.00	0.00	0.00	0.00
2	994.33	18.41	0.09	0.09
3	1984.92	36.66	0.17	0.17
4	2976.10	55.17	0.26	0.26
5	3978.50	73.79	0.35	0.35
6	4997.02	92.56	0.44	0.44
7	5967.75	110.67	0.52	0.52
8	6936.11	128.65	0.61	0.61
9	7949.72	147.12	0.70	0.70
10	8958.80	165.80	0.79	0.78
11	9912.81	183.41	0.87	0.87

Bridge 1		**Bridge 2**	
Force Calibration (lb/V)	**11383.56**	**Force Calibration (lb/V)**	**11443.76**
Offset	-3.84	Offset	-11.61
Correlation	0.999997	Correlation	0.999997
Strain Calibration (µE/V)	**210.68**	**Strain Calibration (µE/V)**	**211.79**
Offset	0.00	Offset	-0.14
Correlation	0.999996	Correlation	0.999998

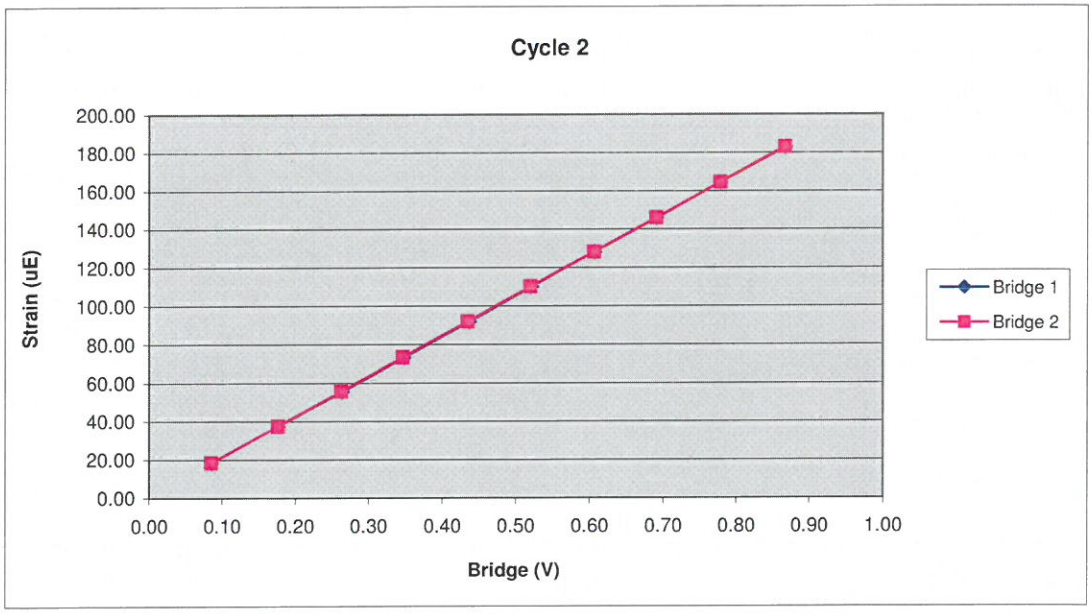
Force Strain Calibration	
EA (Kips)	**54033.05**
Offset	-3.88
Correlation	0.999998



102BW		Cycle 2		
Sample	**Force (lb)**	**Strain (µE)**	**Bridge 1 (V)**	**Bridge 2 (V)**
1	0.00	0.00	0.00	0.00
2	990.79	18.37	0.09	0.09
3	2024.07	37.45	0.18	0.18
4	3007.38	55.54	0.26	0.26
5	3968.86	73.37	0.35	0.35
6	4989.55	92.06	0.44	0.43
7	5960.67	110.16	0.52	0.52
8	6939.65	128.18	0.61	0.61
9	7913.13	145.93	0.69	0.69
10	8905.30	164.37	0.78	0.78
11	9922.44	182.88	0.87	0.87

Bridge 1		**Bridge 2**	
Force Calibration (lb/V)	**11435.73**	**Force Calibration (lb/V)**	**11435.98**
Offset	**0.17**	Offset	**9.08**
Correlation	**0.999999**	Correlation	**0.999999**
Strain Calibration (µE/V)	**210.77**	**Strain Calibration (µE/V)**	**210.77**
Offset	**0.16**	Offset	**0.33**
Correlation	**0.999997**	Correlation	**0.999998**

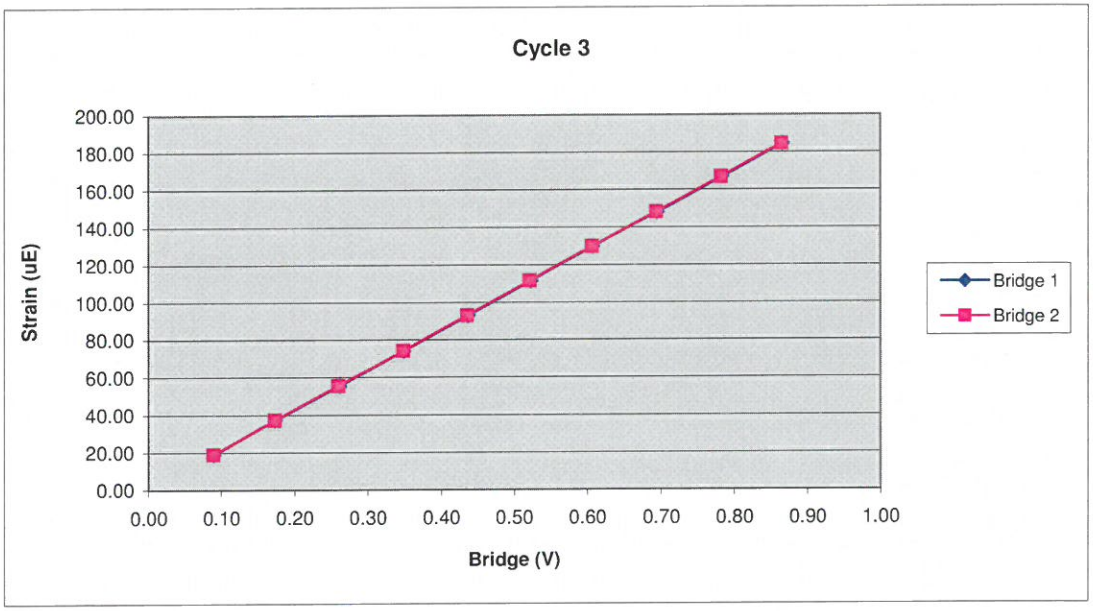
Force Strain Calibration	
EA (Kips)	**54256.99**
Offset	**-8.56**
Correlation	**0.999999**



102BW		Cycle 3		
Sample	**Force (lb)**	**Strain (µE)**	**Bridge 1 (V)**	**Bridge 2 (V)**
1	0.00	0.00	0.00	0.00
2	996.69	18.87	0.09	0.09
3	1961.32	37.18	0.17	0.17
4	2957.81	55.62	0.26	0.26
5	3966.89	74.24	0.35	0.35
6	4987.58	93.01	0.44	0.44
7	5947.49	111.39	0.52	0.52
8	6915.46	129.65	0.61	0.61
9	7914.71	148.00	0.70	0.69
10	8927.52	166.74	0.78	0.78
11	9867.37	184.37	0.87	0.86

Bridge 1		**Bridge 2**	
Force Calibration (lb/V)	**11424.35**	**Force Calibration (lb/V)**	**11442.09**
Offset	**-20.96**	Offset	**-14.35**
Correlation	**0.999998**	Correlation	**0.999997**
Strain Calibration (µE/V)	**213.02**	**Strain Calibration (µE/V)**	**213.35**
Offset	**0.00**	Offset	**0.12**
Correlation	**0.999995**	Correlation	**0.999996**

Force Strain Calibration	
EA (Kips)	**53629.74**
Offset	**-20.93**
Correlation	**0.999994**



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

Calibration Factors	102BW		
Bridge 1 (µE/V)	211.49	Bridge 2 (µE/V)	211.97
EA Factor (Kips)	53973.26	Area (in^2)	1.80

Calibrated by: David Brunell
Calibrated Date: 2/27/2017

Pile Dynamics Inc
30725 Aurora Rd
Solon, OH 44139

Traceable to N.I.S.T.

Appendix IV

PDCA
PILE DRIVING CONTRACTORS ASSOCIATION

Pile Dynamics, Inc.

This documents that

Robert E. Kral
S&ME, Inc.

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

SEAL

Garland Likins, Senior Partner
Pile Dynamics, Inc.

No. 2072