TN TDOT Department of Transportation

GEOTECHNICAL ENGINEERING SECTION
DIVISION OF MATERIALS AND TESTS

PRELIMINARY GEOTECHNICAL REPORT

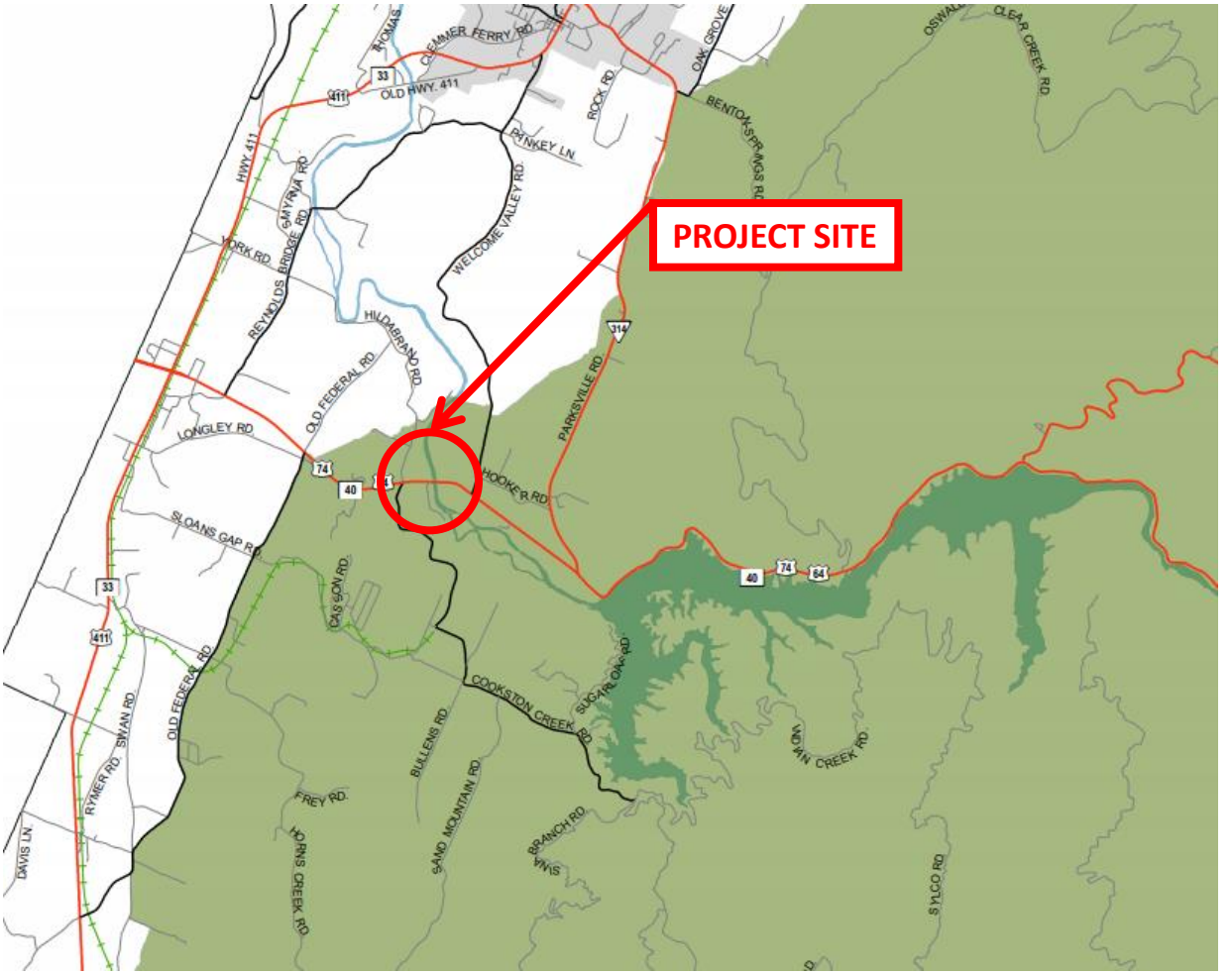
Design-Build Geotechnical Study

State Route 40 Bridge Over Ocoee River

Project No. 70068-0211-94

Pin No. 124102.00

Polk County



FILE NO. 7002718

PRELIMINARY GEOTECHNICAL REPORT
Design-Build Geotechnical Study
Sr 40 Bridge Over Ocoee River
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Introduction

The Tennessee Department of Transportation (TDOT) is planning to replace State Route 40 Bridge over Ocoee River for the referenced design-build project. The project is located in Polk County, Tennessee. The information presented herein is based on the geology, topography, and the information collected during subsurface exploration. This preliminary report is intended to aid the design build teams in the development of an appropriate scope for designing the geotechnical aspects of the project.

Geology, Soils, and Site Conditions

The project is located on the eastern edge of the Valley and Ridge Provinces. The area is underlain by Ordivician aged dolomite and limestone from the Knox group. The overburden soil is generally reddish-brown to brown clay.

Surface and Subsurface Investigation

A subsurface exploration was completed by the TDOT Geotechnical Engineering Section (GES). The purpose of the subsurface exploration was to explore and characterize the subsurface soils and underlying limestone bedrock conditions to provide the design build teams with a better understanding of the subsurface conditions.

Laboratory testing consisted of natural moisture contents, Atterberg limits, standard proctor testing, California Bearing Ratio (CBR) testing, compressive strength of rock, and net acid/base account testing for potential acidity of rock and soil. The summary and results of geotechnical drilling and lab testing performed on the samples obtained are attached in the appendix.

The subsurface exploration was conducted by advancing a total of 12 test borings, B-4 to B-15 (B-1 to B-3 were not drilled), in the general vicinity of the proposed alignment shown on the preliminary plans. The test borings generally encountered surface materials consisting of topsoil less than 6 inches thick. Beneath the topsoil the subsurface profile consists of moist reddish brown to brown clay (AASHTO Classification A-6, A-7-6) and brown sandy silt (AASHTO Classification A-4).

The borings depth ranged from 10 to 71.4 feet, below ground surface. Table 1 provides a summary of the stations, offsets, elevations, and depths of the borings for the bridge exploration. See the appendix for boring logs.

Table 1 Boring Summary

Hole No.	Station	Northing	Easting	Offset (ft.)	Surface Elevation (msl)	Auger Refusal Elevation (msl)	Bottom of Hole Elevation (msl)
B-4	115+19	286115.01	2363814.14	39 L	806.2	NR*	781.7
B-5	116+70	286172.53	2363963.06	82 L	761.7	NR*	730.2
B-6	119+89	286145.76	2364287.72	43 L	763.9	NR*	727.4
B-7	123+87	286098.91	2364685.31	7 L	741.4	714	713.9
B-8	124+37	286100.68	2364735.77	10 L	733.7	720	719.7
B-9	125+35	286108.27	2364834.49	21 L	721.9	711	690.9
B-10	128+72	286079.79	2365170.40	3 C	726.6	708	655.2
B-11	130+64	286070.11	2365361.79	C	731.3	711	676.0
B-12	133+44	286030.50	2365638.39	17 R	732.5	711	711.0
B-13	139+97	285812.45	2366256.62	57 L	780.2	NR*	759.2
B-14	141+83	285702.37	2366407.11	58 L	784.5	NR*	772.5
B-15	144+99	285501.85	2366649.77	43 L	777.9	NR*	767.9

*NR=No Refusal

A total of 8 samples were selected for unconfined compressive strength tests. Table 2 summarizes the laboratory results.

Table 2 Rock Compressive Strength Data

Boring No.	Depth of Sample (ft.)	Approximate Elevation (msl)	Compressive Strength (psi)
B-9	19.9-20.3	702	4,166
B-9	25.2-25.6	696.7	3,816
B-9	30.0-30.4	691.9	13,816
B-10	23.2-23.6	703.4	9,375
B-10	27.6-28.0	699	13,475
B-10	48.8-49.2	677.8	9,995
B-11	49.5-49.9	681.8	10,570
B-11	53.8-54.2	677.5	10,473

Due to the potential for acid producing materials in Polk County, acid/base accounting tests were performed on 19 soil and rock samples. The test results did not indicate the presence of potential acid producing materials at levels that would require remediation. While ***no*** acid producing materials (APM) were identified, there is potential to encounter APM during construction. Further testing may be required. Results of all laboratory testing can be found in the appendix.

Discussion

This report and the attached information should be sufficient information for the design-build teams to determine what level of additional geotechnical information would be required to complete the geotechnical aspects of this project. It *shall be noted* that a geotechnical investigation and report will be required prior to final design of roadway, bridge and other elements of this project.

If you have any questions, comments, and/or concerns, please contact the Geotechnical Engineering Section.

Besmir Zenelaku 11-7-18

Besmir Zenelaku, E.I.
Transportation Project Specialist

11-07-2018

Travis W. Smith, P.E.
CE Manager 1

APPENDIX

APPENDIX A

Boring Logs.

APPENDIX B

Soil Laboratory Results.

APPENDIX C

Acid Producing material Laboratory Results.

APPENDIX A

Boring Logs.

TN TDOT Department of Transportation

PROJECT DESCRIPTION SR 40 Over Ocoee River **COUNTY** Polk

PROJECT NUMBER 70068-0211-94 **GES FILE NUMBER** 7002718 **PROJECT PIN NO.** 124102.00

STATION 115+19 **OFFSET** 39 L **GROUND ELEV (ft)** 806.2 **ROCK ELEV (ft)** _____ **BOTTOM ELEV (ft)** _____

DRILLING METHOD _____ **LOGGED BY** Russell **WATER LEVEL (ft)** _____ **DRILL CREW CHIEF** Russell

NOTES _____ **DATE** 8/21/18

DEPTH (ft)	ELEVATION (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE DEPTH	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	CLASSIFICATION	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	MOISTURE CONTENT (%)
0.0	806.2		0.5 TOPSOIL 805.7 FAT CLAY (A-7-6), reddish brown, moist, firm to stiff									
				3 to 4.5	SS 1		6-7-10 (17)					
5.0	801.2											
				8 to 9.5	SS 2		4-6-9 (15)					
10.0	796.2											
				13 to 14.5	SS 3		4-5-8 (13)					
15.0	791.2											
				18 to 19.5	SS 4		3-4-6 (10)					
20.0	786.2											
				23 to 24.5	SS 5		3-3-4 (7)					
			24.5 781.7									

No Auger Refusal.
Boring Terminated at 24.5 feet.

TN TDOT Department of Transportation

PROJECT DESCRIPTION SR 40 Over Ocoee River **COUNTY** Polk

PROJECT NUMBER 70068-0211-94 **GES FILE NUMBER** 7002718 **PROJECT PIN NO.** 124102.00

STATION 116+70 **OFFSET** 82 L **GROUND ELEV (ft)** 761.7 **ROCK ELEV (ft)** _____ **BOTTOM ELEV (ft)** _____

DRILLING METHOD _____ **LOGGED BY** Russell **WATER LEVEL (ft)** _____ **DRILL CREW CHIEF** Russell

NOTES _____ **DATE** 8/22/18

DEPTH (ft)	ELEVATION (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE DEPTH	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	CLASSIFICATION	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	MOISTURE CONTENT (%)
0.0	761.7		0.5 TOPSOIL 761.2									
			FAT CLAY WITH SAND (A-7-6), reddish brown, moist, stiff									
5.0	756.7		5.0 756.7									
			LEAN CLAY (A-6), brown, moist, stiff	5 to 6.5	SS 1		2-6-6 (12)					
10.0	751.7		10.0 751.7									
			FAT CLAY (A-7-6), reddish brown, moist, firm	10 to 11.5	SS 2		2-5-6 (11)					
15.0	746.7			15 to 16.5	SS 3		1-2-4 (6)					
20.0	741.7			20 to 21.5	SS 4		1-2-2 (4)					
25.0	736.7			25 to 26.5	SS 5		1-2-3 (5)					
30.0	731.7			30 to 31.5	SS 6		1-2-4 (6)					
			31.5 730.2									

No Auger Refusal.
Boring Terminated at 31.5 feet.

TDOT BORING LOG V2 - GINT STD US LAB.GDT - 11/7/18 10:40 - N:\GEOTECH\FILES\REGION 2\70-POLK\FY2018\700271810\7-GEO REPORT\02-BORING LOGS\SR 40 BRIDGE OVER OCOEE RR 7002718.GPJ

TN TDOT Department of Transportation

PROJECT DESCRIPTION SR 40 Over Ocoee River **COUNTY** Polk

PROJECT NUMBER 70068-0211-94 **GES FILE NUMBER** 7002718 **PROJECT PIN NO.** 124102.00

STATION 119+89 **OFFSET** 43 L **GROUND ELEV (ft)** 763.9 **ROCK ELEV (ft)** _____ **BOTTOM ELEV (ft)** _____

DRILLING METHOD _____ **LOGGED BY** Russell **WATER LEVEL (ft)** _____ **DRILL CREW CHIEF** Russell

NOTES _____ **DATE** 8/22/18

DEPTH (ft)	ELEVATION (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE DEPTH	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	CLASSIFICATION	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	MOISTURE CONTENT (%)
0.0	763.9		0.5 TOPSOIL 763.4 FAT CLAY WITH SAND (A-7-6), reddish brown, moist, stiff									
5.0	758.9											
10.0	753.9			10 to 11.5	SS		2-5-6 (11)					
15.0	748.9			15 to 16.5	SS		2-3-5 (8)					
20.0	743.9			20 to 21.5	SS		2-3-4 (7)					
25.0	738.9		25.0 738.9 LEAN CLAY (A-7-6), reddish brown, moist, firm	25 to 26.5	SS		2-2-2 (4)					
30.0	733.9			30 to 31.5	SS		2-2-2 (4)					
35.0	728.9											

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TDOT Department of Transportation

PROJECT DESCRIPTION SR 40 Over Ocoee River **COUNTY** Polk

PROJECT NUMBER 70068-0211-94 **GES FILE NUMBER** 7002718 **PROJECT PIN NO.** 124102.00

DEPTH (ft)	ELEVATION (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE DEPTH	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	CLASSIFICATION	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	MOISTURE CONTENT (%)
35.0	728.9											
			36.5 727.4	35 to 36.5	SS		2-2-3 (5)					

No Auger Refusal.
Boring Terminated at 36.5 feet.

TN TDOT Department of Transportation

PROJECT DESCRIPTION SR 40 Over Ocoee River **COUNTY** Polk

PROJECT NUMBER 70068-0211-94 **GES FILE NUMBER** 7002718 **PROJECT PIN NO.** 124102.00

STATION 123+87 **OFFSET** 7 L **GROUND ELEV (ft)** 741.4 **ROCK ELEV (ft)** _____ **BOTTOM ELEV (ft)** _____

DRILLING METHOD _____ **LOGGED BY** Russell **WATER LEVEL (ft)** _____ **DRILL CREW CHIEF** Russell

NOTES _____ **DATE** 8/22/18

DEPTH (ft)	ELEVATION (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE DEPTH	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	CLASSIFICATION	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	MOISTURE CONTENT (%)
0.0	741.4		0.5 TOPSOIL 740.9 FAT CLAY WITH SAND (A-7-6), reddish brown, moist, stiff									
5.0	736.4											
10.0	731.4			10 to 11.5	SS 1		2-3-5 (8)					
15.0	726.4		15.0 726.4 CLAYEY SAND (A-7-6), reddish brown, moist, firm	15 to 16.5	SS 2		3-5-7 (12)					
20.0	721.4		20.0 721.4 FAT CLAY (A-7-6), reddish brown, moist, firm	20 to 21.5	SS 3		2-3-4 (7)					
25.0	716.4			25 to 26.5	SS 4		3-1-3 (4)					
			26.5 714.9 No Auger Refusal. Boring Terminated at 26.5 feet.									

TN TDOT Department of Transportation

PROJECT DESCRIPTION SR 40 Over Ocoee River **COUNTY** Polk

PROJECT NUMBER 70068-0211-94 **GES FILE NUMBER** 7002718 **PROJECT PIN NO.** 124102.00

STATION 124+37 **OFFSET** 10 L **GROUND ELEV (ft)** 733.7 **ROCK ELEV (ft)** _____ **BOTTOM ELEV (ft)** _____

DRILLING METHOD _____ **LOGGED BY** Russell **WATER LEVEL (ft)** _____ **DRILL CREW CHIEF** Russell

NOTES _____ **DATE** 8/28/18

DEPTH (ft)	ELEVATION (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE DEPTH	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	CLASSIFICATION	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	MOISTURE CONTENT (%)
0.0	733.7		0.5 TOPSOIL 733.2 LEAN CLAY WITH SAND (A-7-6), reddish brown, moist, soft									
5.0	728.7			4.5 to 6.5	ST 1	90						
10.0	723.7			9.5 to 11.0	SS 1		2-1-2 (3)					
			14.0 719.7									

No Auger Refusal.
Boring Terminated at 14 feet.

TN TDOT Department of Transportation

PROJECT DESCRIPTION SR 40 Over Ocoee River **COUNTY** Polk

PROJECT NUMBER 70068-0211-94 **GES FILE NUMBER** 7002718 **PROJECT PIN NO.** 124102.00

STATION 125+35 **OFFSET** 21 L **GROUND ELEV (ft)** 721.9 **ROCK ELEV (ft)** _____ **BOTTOM ELEV (ft)** _____

DRILLING METHOD _____ **LOGGED BY** Russell **WATER LEVEL (ft)** _____ **DRILL CREW CHIEF** Russell

NOTES _____ **DATE** 8/26/18

DEPTH (ft)	ELEVATION (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE DEPTH	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	CLASSIFICATION	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	MOISTURE CONTENT (%)
0.0	721.9		Samples were not taken at this interval. Advanced the casing through overburden soil.									
5.0	716.9											
10.0	711.9											
11.2	710.7		LIMESTONE gray, slightly weathered, fine to medium grained, thinly to thickly bedded, hard, medium fractured.	11.2 to 16.0	RC 1	75 (60)						
15.0	706.9			16 to 21.0	RC 2	98 (78)						
20.0	701.9			21 to 26.0	RC 3	100 (74)						
25.0	696.9			26 to 31.0	RC 4	100 (96)						
30.0	691.9											
31.0	690.9											

Boring Terminated at 31 feet.

TN TDOT Department of Transportation

PROJECT DESCRIPTION SR 40 Over Ocoee River **COUNTY** Polk

PROJECT NUMBER 70068-0211-94 **GES FILE NUMBER** 7002718 **PROJECT PIN NO.** 124102.00

STATION 128+72 **OFFSET** 3 C **GROUND ELEV (ft)** 726.6 **ROCK ELEV (ft)** _____ **BOTTOM ELEV (ft)** _____

DRILLING METHOD _____ **LOGGED BY** Russell **WATER LEVEL (ft)** _____ **DRILL CREW CHIEF** Russell

NOTES _____ **DATE** 8/28/18

DEPTH (ft)	ELEVATION (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE DEPTH	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	CLASSIFICATION	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	MOISTURE CONTENT (%)
0.0	726.6		Samples were not taken at this interval. Advanced the casing through overburden soil.									
5.0	721.6											
10.0	716.6											
15.0	711.6											
18.6	708.0											
20.0	706.6		LIMESTONE, gray, slightly weathered to highly weathered, fine to medium grained, thinly to thickly bedded, highly fractured.	18.6 to 21.4	RC 1	96 (75)						
25.0	701.6			21.4 to 26.4	RC 2	92 (92)						
30.0	696.6			26.4 to 31.4	RC 3	84 (78)						
35.0	691.6		*30.6' to 38.2 mud fill cavity	31.4 to 36.4	RC 4	0 (0)						

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TDOT Department of Transportation

PROJECT DESCRIPTION SR 40 Over Ocoee River **COUNTY** Polk

PROJECT NUMBER 70068-0211-94 **GES FILE NUMBER** 7002718 **PROJECT PIN NO.** 124102.00

DEPTH (ft)	ELEVATION (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE DEPTH	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	CLASSIFICATION	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	MOISTURE CONTENT (%)
35.0	691.6		LIMESTONE, gray, slightly weathered to highly weathered, fine to medium grained, thinly to thickly bedded, highly fractured. *(continued)*									
				36.4 to 41.4	RC 5	30 (26)						
40.0	686.6		*39.7 to 45.2 mud fill cavity									
				41.4 to 46.4	RC 6	24 (22)						
45.0	681.6											
				46.4 to 51.4	RC 7	88 (82)						
50.0	676.6											
				51.4 to 56.4	RC 8	58 (18)						
55.0	671.6											
				56.4 to 61.4	RC 9	8 (0)						
60.0	666.6											
				61.4 to 66.4	RC 10	18 (8)						
65.0	661.6											
				66.4 to 71.4	RC 11	8 (0)						
70.0	656.6											
71.4	655.2											

Boring terminated at 71.4 feet.

TN TDOT Department of Transportation

PROJECT DESCRIPTION SR 40 Over Ocoee River **COUNTY** Polk

PROJECT NUMBER 70068-0211-94 **GES FILE NUMBER** 7002718 **PROJECT PIN NO.** 124102.00

STATION 130+64 **OFFSET** C **GROUND ELEV (ft)** 731.3 **ROCK ELEV (ft)** **BOTTOM ELEV (ft)**

DRILLING METHOD **LOGGED BY** Russell **WATER LEVEL (ft)** **DRILL CREW CHIEF** Russell

NOTES **DATE** 8/29/18

DEPTH (ft)	ELEVATION (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE DEPTH	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	CLASSIFICATION	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	MOISTURE CONTENT (%)
0.0	731.3		0.5 TOPSOIL 730.8 SILT WITH SAND (A-4) brown, moist, medium dense									
5.0	726.3			4.5 to 6.0	SS 1		4-6-5 (11)					
10.0	721.3			9.5 to 11.0	SS 2		5-4-4 (8)					
15.0	716.3			14.5 to 16.0	SS 3		6-6-3 (9)					
20.0	711.3		20.3 711.0 LIMESTONE gray, moderately weathered to highly weathered, fine to medium grained, thinly to thickly bedded, highly fractured.	19.5 to 21.0	SS 4		7-9-5 (14)					
25.0	706.3			20.3 to 25.3	RC 1	16 (0)						
30.0	701.3			25.3 to 30.3	RC 2	0 (0)						
35.0	696.3			30.5 to 35.5	RC 3	56 (30)						

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TDOT Department of Transportation

PROJECT DESCRIPTION SR 40 Over Ocoee River **COUNTY** Polk

PROJECT NUMBER 70068-0211-94 **GES FILE NUMBER** 7002718 **PROJECT PIN NO.** 124102.00

DEPTH (ft)	ELEVATION (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE DEPTH	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	CLASSIFICATION	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	MOISTURE CONTENT (%)
35.0	696.3		LIMESTONE gray, moderately weathered to highly weathered, fine to medium grained, thinly to thickly bedded, highly fractured. *(continued)*	35.3 to 40.3	RC 4	0 (0)						
40.0	691.3		*@ 40 feet Mud fill cavity	40.3 to 45.3	RC 5	0 (0)						
45.0	686.3			45.3 to 50.3	RC 6	80 (70)						
50.0	681.3			50.3 to 55.3	RC 7	90 (90)						
55.0	676.3		55.3 676.0									

Boring Terminated at 71.4 feet.

TN TDOT Department of Transportation

PROJECT DESCRIPTION SR 40 Over Ocoee River **COUNTY** Polk

PROJECT NUMBER 70068-0211-94 **GES FILE NUMBER** 7002718 **PROJECT PIN NO.** 124102.00

STATION 133+44 **OFFSET** 17 R **GROUND ELEV (ft)** 732.5 **ROCK ELEV (ft)** _____ **BOTTOM ELEV (ft)** _____

DRILLING METHOD _____ **LOGGED BY** Russell **WATER LEVEL (ft)** _____ **DRILL CREW CHIEF** Russell

NOTES _____ **DATE** 8/28/18

DEPTH (ft)	ELEVATION (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE DEPTH	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	CLASSIFICATION	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	MOISTURE CONTENT (%)
0.0	732.5		TOPSOIL									
			1.5 731.0									
			SILT WITH SAND (A-4), reddish brown, moist, loose to very dense	4 to 5.5	SS 1		2-3-5 (8)					
5.0	727.5											
				9 to 10.5	SS 2		2-3-6 (9)					
10.0	722.5											
				14 to 15.5	SS 3		3-3-4 (7)					
15.0	717.5											
				19 to 20.5	SS 4		2-7-54 (61)					
20.0	712.5											
			21.5 711.0									

Auger refusal at 21.5
Boring Terminated at 21.5

TN TDOT Department of Transportation

PROJECT DESCRIPTION SR 40 Over Ocoee River **COUNTY** Polk

PROJECT NUMBER 70068-0211-94 **GES FILE NUMBER** 7002718 **PROJECT PIN NO.** 124102.00

STATION 139+97 **OFFSET** 57 L **GROUND ELEV (ft)** 780.2 **ROCK ELEV (ft)** _____ **BOTTOM ELEV (ft)** _____

DRILLING METHOD _____ **LOGGED BY** Russell **WATER LEVEL (ft)** _____ **DRILL CREW CHIEF** Russell

NOTES _____ **DATE** 8/29/18

DEPTH (ft)	ELEVATION (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE DEPTH	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	CLASSIFICATION	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	MOISTURE CONTENT (%)
0.0	780.2											
			1.0 TOPSOIL 779.2									
			LEAN CLAY (A-7-6), reddish brown, moist, stiff to very stiff	4.5 to 5.5	SS 1		2-4-6/0"					
5.0	775.2											
10.0	770.2		*Bulk sample from 10 to 15 feet.	9.5 to 10.5	SS 2		5-10-11/0"					
15.0	765.2		15.0 765.2 CLAYEY SAND (A-7-6), reddish brown, moist, stiff	14.5 to 15.5	SS 3		4-7-7/0"					
20.0	760.2			19.5 to 20.5	SS 4		3-4-9/0"					
			21.0 759.2									

No auger refusal.
Boring Terminated at 21 feet.

TN TDOT Department of Transportation

PROJECT DESCRIPTION SR 40 Over Ocoee River **COUNTY** Polk

PROJECT NUMBER 70068-0211-94 **GES FILE NUMBER** 7002718 **PROJECT PIN NO.** 124102.00

STATION 141+83 **OFFSET** 58 L **GROUND ELEV (ft)** 784.5 **ROCK ELEV (ft)** _____ **BOTTOM ELEV (ft)** _____

DRILLING METHOD _____ **LOGGED BY** Russell **WATER LEVEL (ft)** _____ **DRILL CREW CHIEF** Russell

NOTES _____ **DATE** 8/30/18

DEPTH (ft)	ELEVATION (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE DEPTH	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	CLASSIFICATION	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	MOISTURE CONTENT (%)
0.0	784.5		0.5 TOPSOIL 784.0 FAT CLAY WITH SAND (A-7-6), reddish brown, moist									
5.0	779.5		*Bulk Sample from 8 to 12 feet.									
10.0	774.5		12.0 772.5									

No auger refusal.
Boring Terminated at 12 feet.

TN TDOT Department of Transportation

PROJECT DESCRIPTION SR 40 Over Ocoee River **COUNTY** Polk

PROJECT NUMBER 70068-0211-94 **GES FILE NUMBER** 7002718 **PROJECT PIN NO.** 124102.00

STATION 144+99 **OFFSET** 43 L **GROUND ELEV (ft)** 777.9 **ROCK ELEV (ft)** _____ **BOTTOM ELEV (ft)** _____

DRILLING METHOD _____ **LOGGED BY** Russell **WATER LEVEL (ft)** _____ **DRILL CREW CHIEF** Russell

NOTES _____ **DATE** 8/30/18

DEPTH (ft)	ELEVATION (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE DEPTH	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	CLASSIFICATION	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	MOISTURE CONTENT (%)
0.0	777.9		0.5 TOPSOIL 777.4 LEAN CLAY(A-7-6), reddish to brown, moist									
5.0	772.9		Bulk Sample from 5 to 10 feet.	4.5 to 6.5	ST 1	85						
10.0	767.9		10.0 767.9									

No auger refusal.
Boring Terminated at 10 feet.

APPENDIX B

Soil Laboratory Results.

Wood Environment & Infrastructure Solutions, Inc.
3800 Ezell Road, Suite 100

Nashville, Tennessee 37211
T: 615-333-0630

www.woodplc.com

October 24, 2018

Mr. Travis W. Smith, PE
Civil Engineering Manager 1
Geotechnical Engineering Section
Tennessee Department of Transportation
6601 Centennial Blvd
Nashville, TN 37243

RE: Geotechnical Laboratory Testing Results
SR-40 Bridge Over Ocoee River
Polk County, Tennessee
TDOT Project No. 70068-0211-94
TDOT PIN No. 124102.00
GES File Number 7002718
Wood Project No. 5-7979-0003

Mr. Smith:

As authorized by Tennessee Department of Transportation (TDOT) under Work Order No. 04, Contract No. E1894, Wood Environment and Infrastructure Solutions, Inc. (Wood) has completed the requested geotechnical laboratory testing for the referenced project. We have attached the laboratory testing reports to this letter along with a summary table of the results. We appreciate the opportunity to be of continued service to TDOT. Please let us know if you have any questions concerning the laboratory testing results.

Sincerely,
Wood

Nathan Long, P.G., P.E.
Senior Geotechnical Engineer

Attached: Summary of Laboratory Testing Results
Laboratory Test Reports

Wood Environment and Infrastructure Solutions, Inc.
Geotechnical and Construction Materials Laboratory
5211 Linbar Drive, Suite 513, Nashville, Tennessee 37211 USA
(615) 831-9202

SUMMARY OF LABORATORY TEST RESULTS

PROJECT: SR-40 Bridge Over Ocoee River **PROJECT NO.:** 5-7979-0003 **DATE:** 5/24/2018

BORING NO.	SAMPLE TYPE - NUMBER	DEPTH (FT)	NATURAL MOISTURE (%)	PERCENT GRAVEL (%)	PERCENT SAND (%)	PERCENT SILT /CLAY (%)	ATTERBERG LIMITS			STANDARD PROCTOR		CBR AT 98% COMPACTION	UNCONFINED COMPRESSIVE STRENGTH (psi)	UNIFIED SOIL CLASSIFICATION	AASHTO CLASSIFICATION	SOIL DESCRIPTION
							LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	OPTIMUM MOISTURE CONTENT (%)	MAXIMUM DRY DENSITY (pcf)					
B-4	SS-1	3 - 4.5	26.9	0.3	28.2	71.5	62	27	35					CH	A-7-6(26)	Fat Clay, with sand, reddish brown
B-4	SS-2	8 - 9.5	34.8	0.9	4.7	94.4	69	29	40					CH	A-7-6(44)	Fat Clay, reddish brown
B-4	SS-3	13 - 14.5	37.1	0.1	3.5	96.4	67	27	40					CH	A-7-6(45)	Fat Clay, reddish brown
B-4	SS-4	18 - 19.5	43.1	0.3	8.7	91.0	79	32	47					CH	A-7-5(50)	Fat Clay, brown
B-4	SS-5	23 - 24.5	39.7	0.1	11.6	88.3	57	26	31					CH	A-7-6(30)	Fat Clay, brown
B-5	SS-1	5 - 6.5	17.2	14.7	27.5	57.8	32	16	16					CL	A-6(6)	Lean Clay, sandy, brown
B-5	SS-2	10 - 11.5	37.7	2.0	10.3	87.7	71	26	45					CH	A-7-6(44)	Fat Clay, reddish brown
B-5	SS-3	15 - 16.5	37.9	3.5	6.4	90.1	61	23	38					CH	A-7-6(38)	Fat Clay, reddish brown
B-5	SS-4	20 - 21.5	38.8	0.0	6.8	93.2	53	23	30					CH	A-7-6(31)	Fat Clay, reddish brown
B-5	SS-5	25 - 26.5	44.3	0.0	6.0	94.0	68	21	47					CH	A-7-6(49)	Fat Clay, orange brown
B-5	SS-6	30 - 31.5	29.7	0.6	12.1	87.3	43	21	22					CL	A-7-6(20)	Lean Clay, brown
B-6	ST-1	5 - 7	34.4	0.0	2.5	97.5	68	28	40				16.0	CH	A-7-6(46)	Fat Clay, orange brown
B-6	SS-1	10 - 11.5	41.5	2.3	14.8	82.9	64	30	34					CH	A-7-5(32)	Fat Clay, with sand, reddish brown
B-6	SS-2	15 - 16.5	32.9	2.8	19.2	78.0	65	24	41					CH	A-7-6(34)	Fat Clay, with sand, brown
B-6	SS-3	20 - 21.5	39.8	2.9	13.0	84.1	68	25	43					CH	A-7-6(39)	Fat Clay, with sand, brown
B-6	SS-4	25 - 26.5	43.2	0.2	12.8	87.0	49	24	25					CL	A-7-6(24)	Lean Clay, reddish brown

Wood Environment and Infrastructure Solutions, Inc.
Geotechnical and Construction Materials Laboratory
5211 Linbar Drive, Suite 513, Nashville, Tennessee 37211 USA
(615) 831-9202

BORING NO.	SAMPLE TYPE - NUMBER	DEPTH (FT)	NATURAL MOISTURE (%)	PERCENT GRAVEL (%)	PERCENT SAND (%)	PERCENT SILT /CLAY (%)	ATTERBERG LIMITS			STANDARD PROCTOR		CBR AT 98% COMPACTION	UNCONFINED COMPRESSIVE STRENGTH (psi)	UNIFIED SOIL CLASSIFICATION	AASHTO CLASSIFICATION	SOIL DESCRIPTION
							LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	OPTIMUM MOISTURE CONTENT (%)	MAXIMUM DRY DENSITY (pcf)					
B-6	SS-5	30 - 31.5	39.1	1.8	12.1	86.1	47	22	25					CL	A-7-6(23)	Lean Clay, reddish brown
B-6	SS-6	35 - 36.5	40.1	0.9	5.6	93.5	55	24	31					CH	A-7-6(33)	Fat Clay, reddish brown
B-7	SS-1	10 - 11.5	37.2	6.5	8.1	85.4	57	22	35					CH	A-7-6(32)	Fat Clay, with sand, reddish brown
B-7	SS-2	15 - 16.5	27.0	24.5	27.3	48.2	49	21	28					SC	A-7-6(9)	Clayey Sand, with gravel, reddish brown
B-7	SS-3	20 - 21.5	36.5	0.7	5.2	94.1	63	24	39					CH	A-7-6(41)	Fat Clay, reddish brown
B-7	SS-4	25 - 26.5	39.5	1.7	14.1	84.2	56	20	36					CH	A-7-6(32)	Fat Clay, with sand, reddish brown
B-8	ST-1	4.5 - 6.5	23.9	3.4	13.1	83.5	48	18	30				29.8	CL	A-7-6(26)	Lean Clay, with sand, reddish brown
B-8	SS-1	9.5 - 11	26.1	3.7	31.5	64.8	47	21	26					CL	A-7-6(15)	Lean Clay, sandy, reddish brown
B-11	SS-1	4.5 - 6	15.0	0.3	42.6	57.1	NV	NP	NP					ML	A-4(0)	Silt, sandy, brown
B-11	SS-3	14.5 - 16	18.6	3.4	45.2	51.4	NV	NP	NP					ML	A-4(0)	Silt, sandy, brown
B-12	SS-2	9 - 10.5	25.0	0.0	37.5	62.5	NV	NP	NP					ML	A-4(0)	Silt, sandy, reddish brown
B-12	SS-4	19 - 20.5	45.3	3.0	25.9	71.1	NV	NP	NP					ML	A-4(0)	Silt, with sand, reddish brown
B-13	Bulk 1A	10 - 15	21.1	2.8	32.1	65.1	40	18	22	19.1	107.7	8.3		CL	A-6(12)	Lean Clay, sandy, reddish brown
B-13	SS-3	14.5 - 16	26.5	5.3	51.5	43.2	44	25	19					SC	A-7-6(4)	Clayey Sand, reddish brown
B-13	SS-4	19.5 - 21	20.1	1.3	43.6	55.1	41	22	19					CL	A-7-6(8)	Lean Clay, sandy, reddish brown
B-14	ST-1	4.5 - 6.5	27.0	3.2	22.1	74.7	53	25	28				35.2	CH	A-7-6(21)	Fat Clay, with sand, reddish brown
B-14	Bulk 2	8 - 12	28.7	0.0	16.3	83.7	56	26	30					CH	A-7-6(28)	Fat Clay, with sand, reddish brown
B-15	Bulk 1	5 - 10	20.4	1.4	29.6	69.0	46	18	28	25.1	96.2	3.4		CL	A-7-6(18)	Lean Clay, sandy, reddish brown

Wood Environment and Infrastructure Solutions, Inc.
Geotechnical and Construction Materials Laboratory
5211 Linbar Drive, Suite 513, Nashville, Tennessee 37211 USA
(615) 831-9202

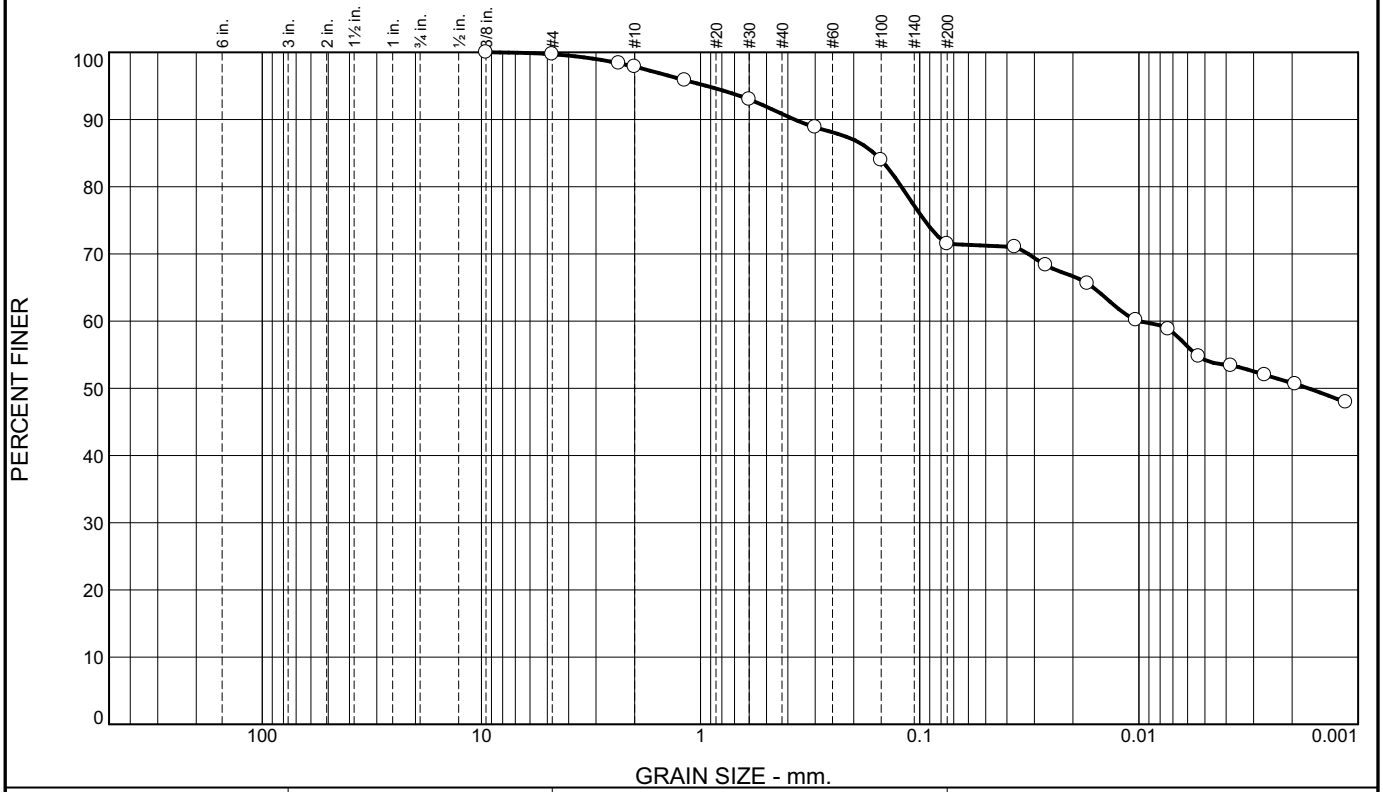
wood.

BORING NO.	SAMPLE TYPE - NUMBER	DEPTH (FT)	NATURAL MOISTURE (%)	PERCENT GRAVEL (%)	PERCENT SAND (%)	PERCENT SILT /CLAY (%)	ATTERBERG LIMITS			STANDARD PROCTOR		CBR AT 98% COMPACTION	UNCONFINED COMPRESSIVE STRENGTH (psi)	UNIFIED SOIL CLASSIFICATION	AASHTO CLASSIFICATION	SOIL DESCRIPTION
							LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	OPTIMUM MOISTURE CONTENT (%)	MAXIMUM DRY DENSITY (pcf)					
B-9	RC	19.9-20.3											4,166			Limestone
B-9	RC	25.2-25.6											3,816			Limestone
B-9	RC	30.0-30.4											13,822			Limestone
B-10	RC	23.2-23.6											9,375			Limestone
B-10	RC	27.6-28.0											13,475			Limestone
B-10	RC	48.8-49.2											9,995			Limestone
B-11	RC	49.5-49.9											10,570			Limestone
B-11	RC	53.8-54.2											10,473			Limestone

* ST-SHELBY TUBE, SS-SPLIT SPOON / SPLIT-BARREL SAMPLER, B-BAG / BULK, RC-CORE

DATA CHECKED BY *NCL*

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.3	1.9	7.0	19.3	17.3	54.2

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/8"	100.0		
#4	99.7		
#8	98.4		
#10	97.8		
#16	95.8		
#30	93.0		
#50	88.8		
#100	84.0		
#200	71.5		

* (no specification provided)

Material Description

fat clay with sand, red brown

Atterberg Limits

PL= 27 LL= 62 PI= 35

Coefficients

D_{90}= 0.3727 D_{85}= 0.1616 D_{60}= 0.0099
D_{50}= 0.0017 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CH AASHTO= A-7-6(26)

Remarks

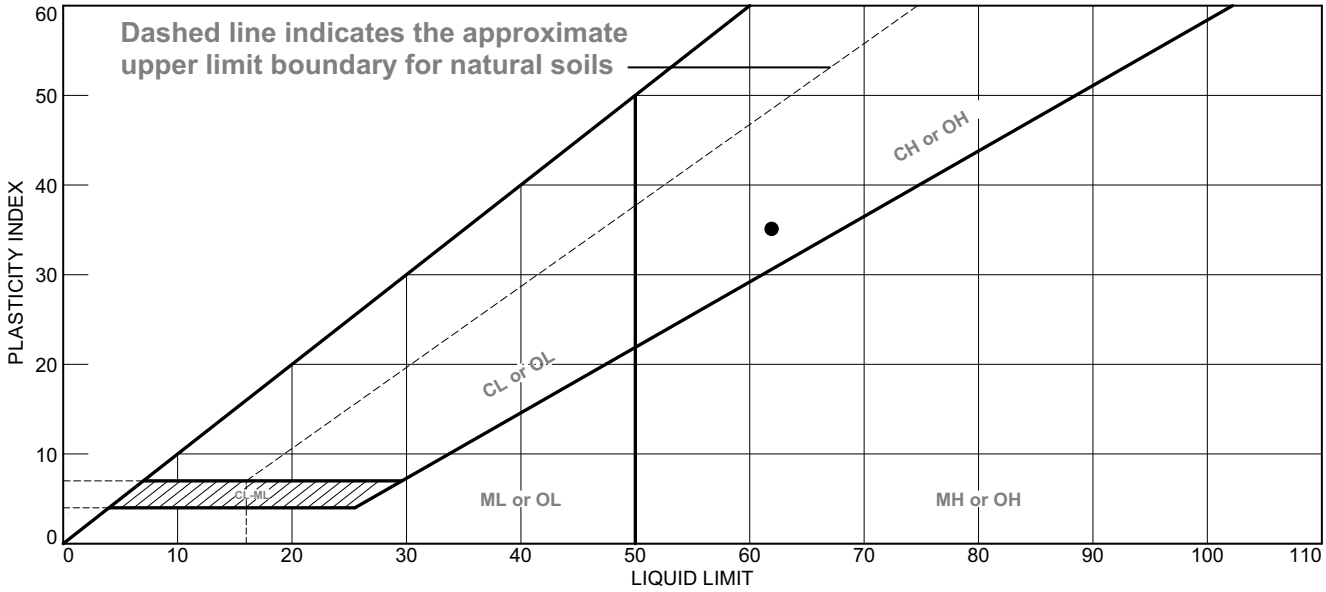
Source of Sample: B-4 **Depth:** 3.0'-4.5'
Sample Number: SS-1 **Date:** 10/9/18

Wood Environment and Infrastructure Solutions, Inc.
Nashville, Tennessee

Client: TDOT
Project: SR 40 over Ocoee
Project No: 579790003

Tested By: NB **Checked By:** MH

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	fat clay with sand, red brown	62	27	35	90.8	71.5	CH

Project No. 579790003 **Client:** TDOT

Project: SR 40 over Ocoee

Source of Sample: B-4 **Depth:** 3.0'-4.5'

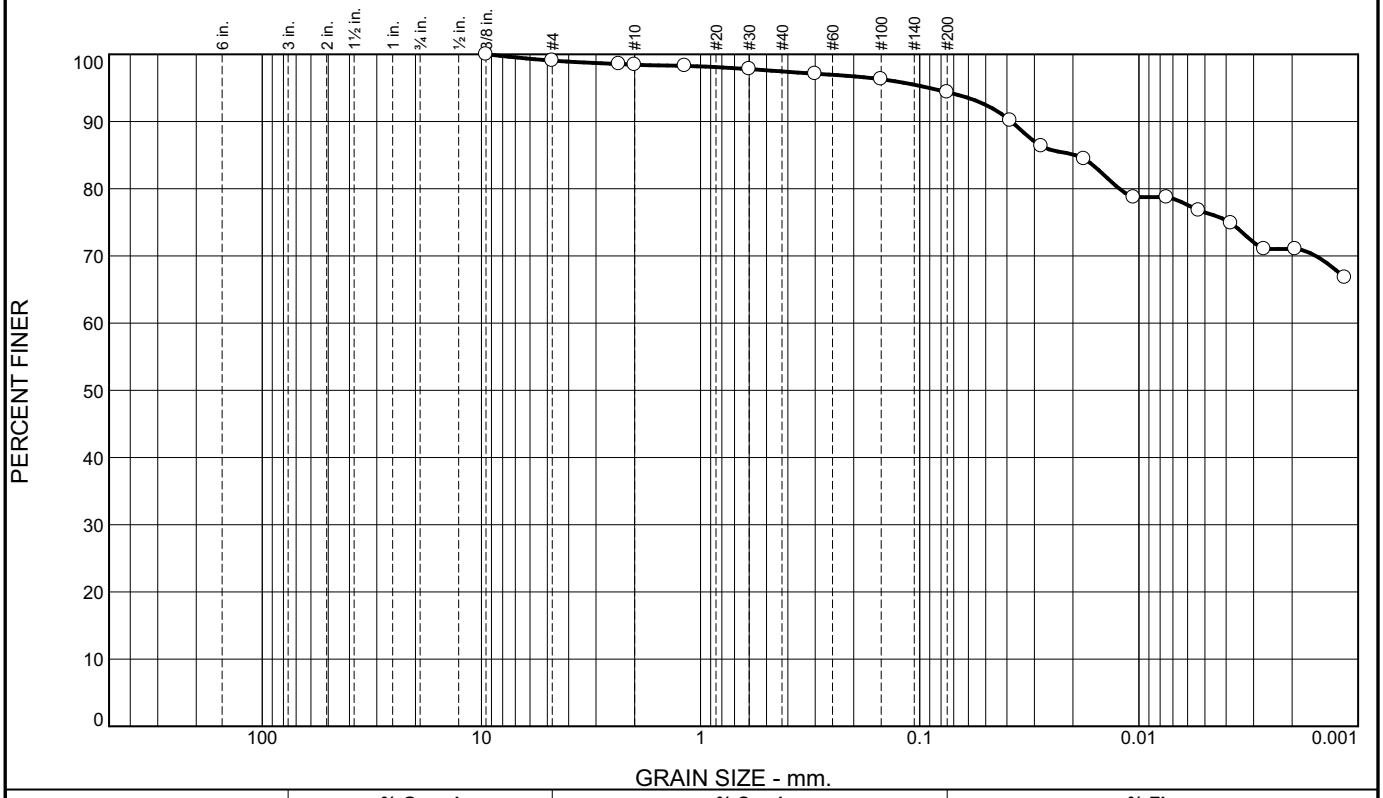
Sample Number: SS-1

Remarks:

Wood Environment and Infrastructure Solutions, Inc.
Nashville, Tennessee

Tested By: NB **Checked By:** MH

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.9	0.7	0.9	3.1	17.9	76.5

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/8"	100.0		
#4	99.1		
#8	98.5		
#10	98.4		
#16	98.3		
#30	97.8		
#50	97.1		
#100	96.3		
#200	94.4		

* (no specification provided)

Material Description

fat clay, red brown

Atterberg Limits

PL= 29 LL= 69 PI= 40

Coefficients

D_{90}= 0.0382 D_{85}= 0.0195 D_{60}=
D_{50}= D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CH AASHTO= A-7-6(44)

Remarks

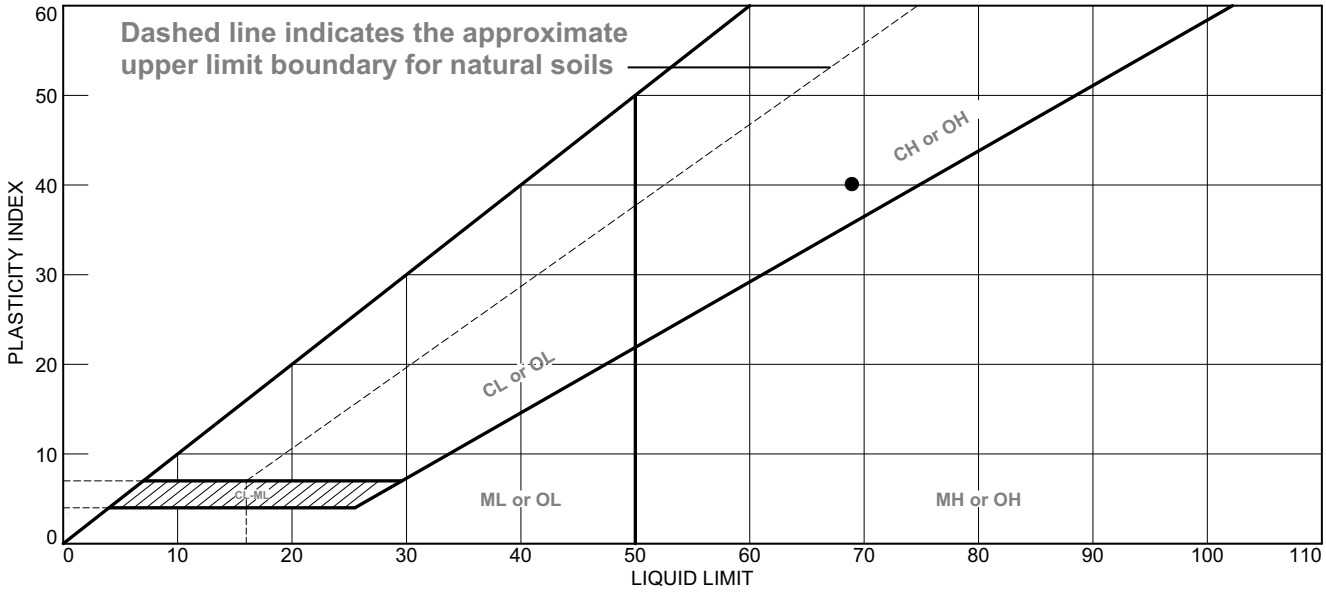
Source of Sample: B-4 **Depth:** 8.0'-9.5'
Sample Number: SS-2 **Date:** 10/5/18

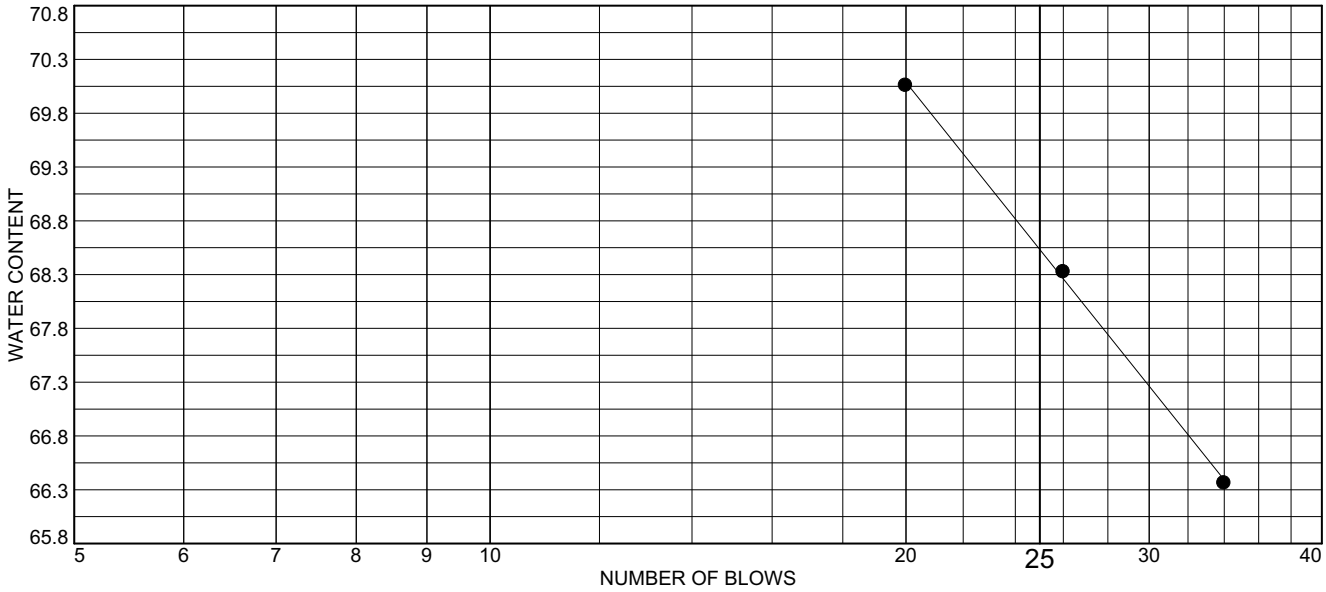
Wood Environment and Infrastructure Solutions, Inc.
Nashville, Tennessee

Client: TDOT
Project: SR 40 over Ocoee
Project No: 579790003

Tested By: NB **Checked By:** MH

LIQUID AND PLASTIC LIMITS TEST REPORT





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	fat clay, red brown	69	29	40	97.5	94.4	CH

Project No. 579790003 **Client:** TDOT

Project: SR 40 over Ocoee

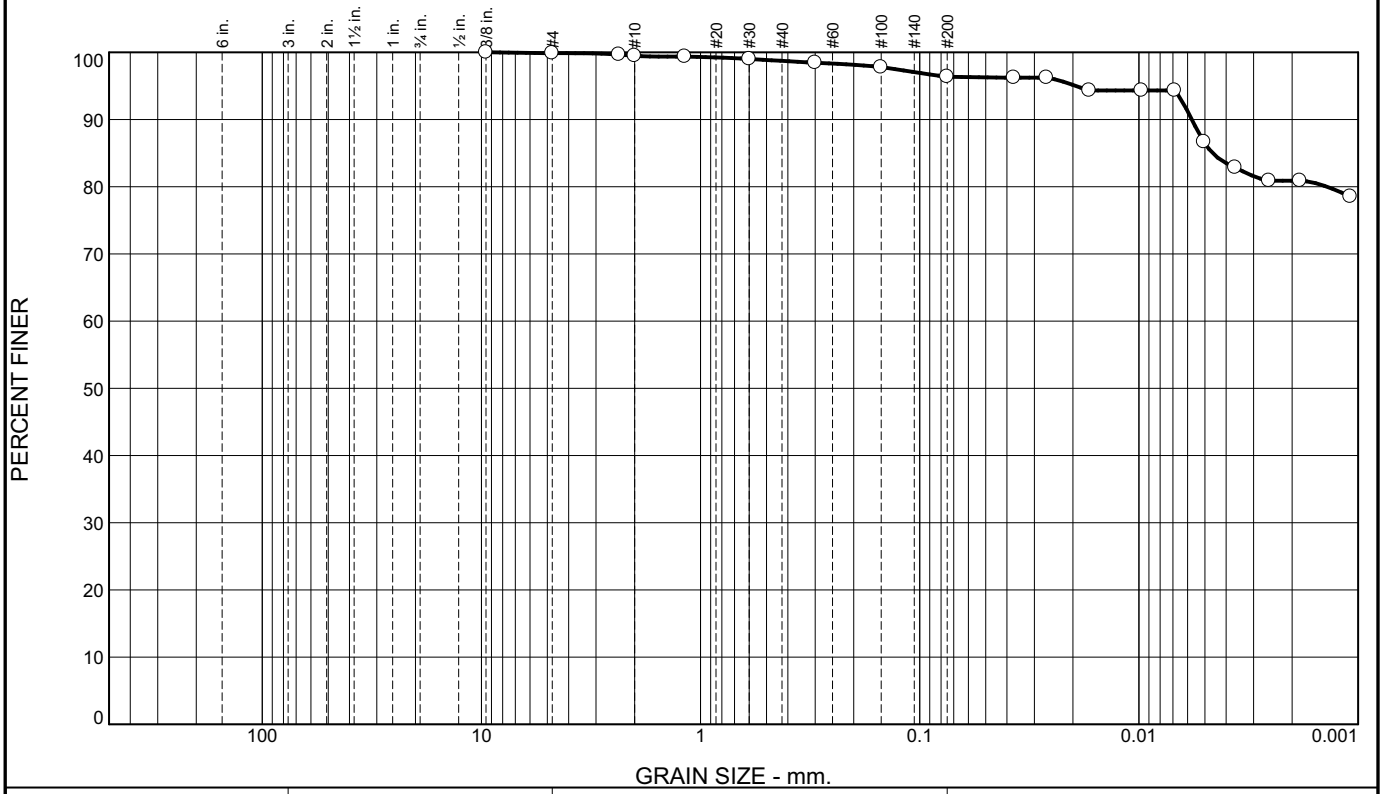
Source of Sample: B-4 **Depth:** 8.0'-9.5'
Sample Number: SS-2

Remarks:

Wood Environment and Infrastructure Solutions, Inc.
Nashville, Tennessee

Tested By: NB/KM **Checked By:** MH

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.1	0.4	0.8	2.3	10.0	86.4

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/8"	100.0		
#4	99.9		
#8	99.7		
#10	99.5		
#16	99.3		
#30	99.0		
#50	98.4		
#100	97.8		
#200	96.4		

* (no specification provided)

Material Description

fat clay, red brown

Atterberg Limits

PL= 27 LL= 67 PI= 40

Coefficients

D_{90}= 0.0057 D_{85}= 0.0046 D_{60}=
D_{50}= D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CH AASHTO= A-7-6(45)

Remarks

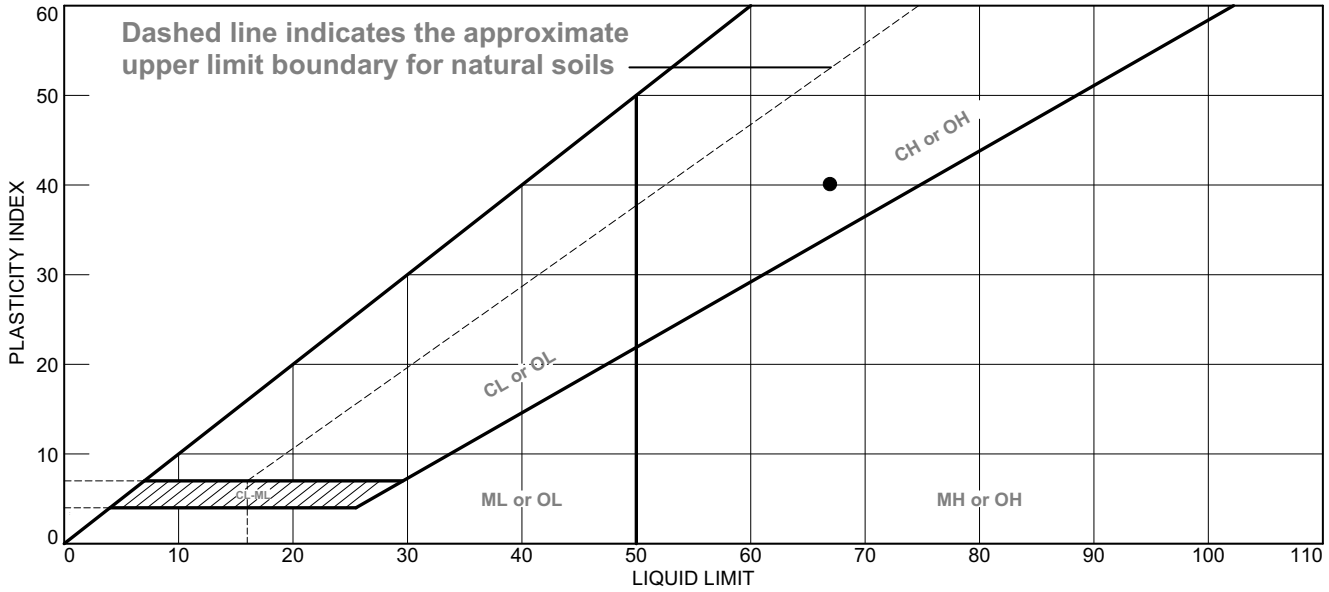
Source of Sample: B-4 **Depth:** 13.0'-14.5'
Sample Number: SS-3 **Date:** 10/5/18

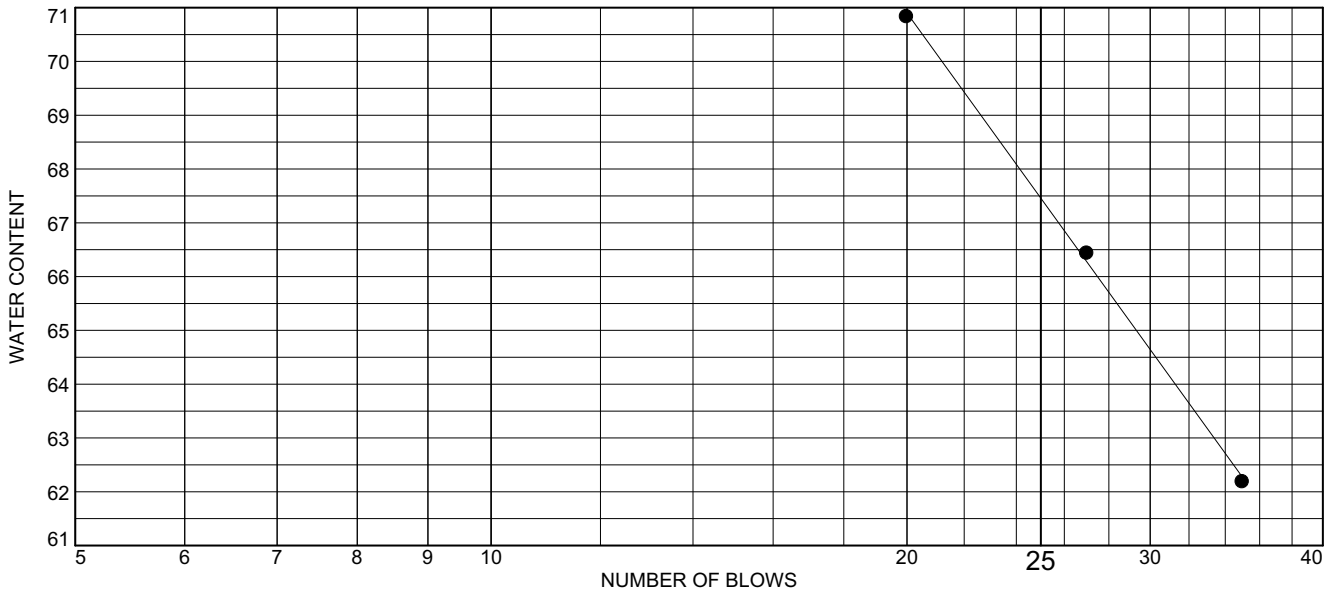
Wood Environment and Infrastructure Solutions, Inc.
Nashville, Tennessee

Client: TDOT
Project: SR 40 over Ocoee
Project No: 579790003

Tested By: NB **Checked By:** MH

LIQUID AND PLASTIC LIMITS TEST REPORT





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	fat clay, red brown	67	27	40	98.7	96.4	CH

Project No. 579790003 **Client:** TDOT

Project: SR 40 over Ocoee

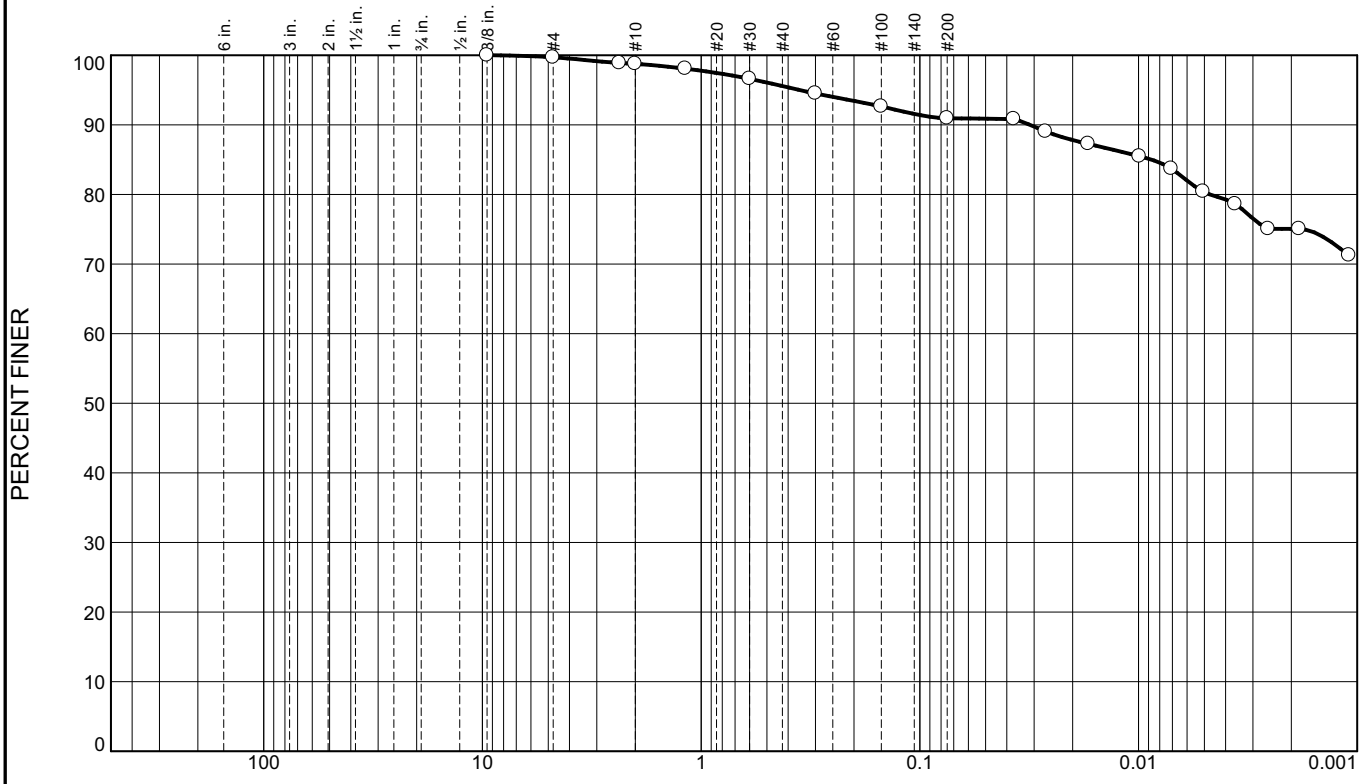
Source of Sample: B-4 **Depth:** 13.0'-14.5'
Sample Number: SS-3

Remarks:

Wood Environment and Infrastructure Solutions, Inc.
Nashville, Tennessee

Tested By: NB **Checked By:** MH

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.3	0.9	3.2	4.6	10.7	80.3

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/8"	100.0		
#4	99.7		
#8	98.9		
#10	98.8		
#16	98.1		
#30	96.6		
#50	94.5		
#100	92.6		
#200	91.0		

* (no specification provided)

Material Description

fat clay, brown

Atterberg Limits

PL= 32 LL= 79 PI= 47

Coefficients

D_{90}= 0.0313 D_{85}= 0.0087 D_{60}=
D_{50}= D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CH AASHTO= A-7-5(50)

Remarks

Source of Sample: B-4 **Depth:** 18.0'-19.5'
Sample Number: SS-4

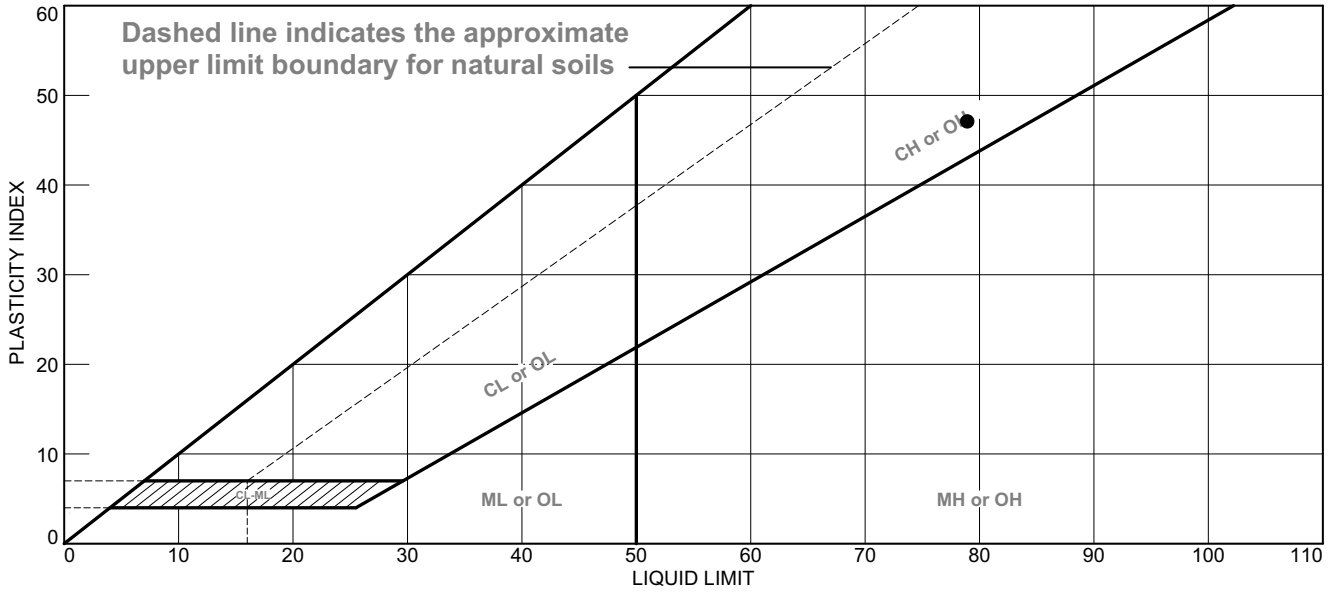
Date: 10/8/18

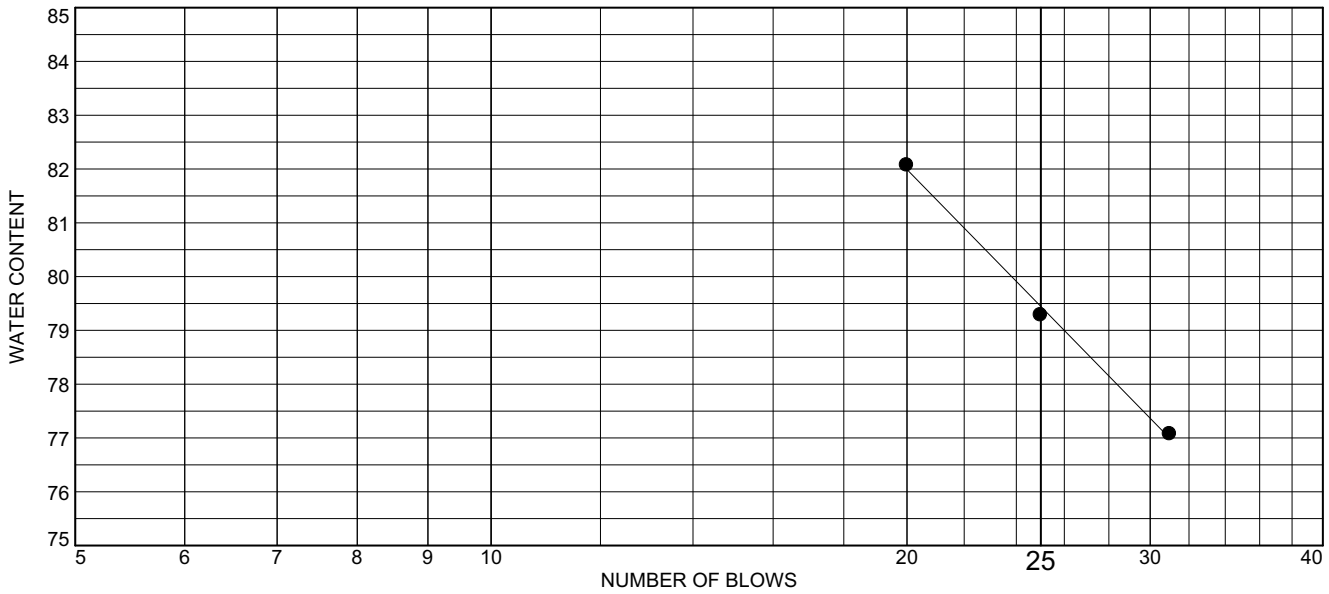
Wood Environment and Infrastructure Solutions, Inc.
Nashville, Tennessee

Client: TDOT
Project: SR 40 over Ocoee

Project No: 579790003

LIQUID AND PLASTIC LIMITS TEST REPORT





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	fat clay, brown	79	32	47	95.6	91.0	CH

Project No. 579790003 **Client:** TDOT

Project: SR 40 over Ocoee

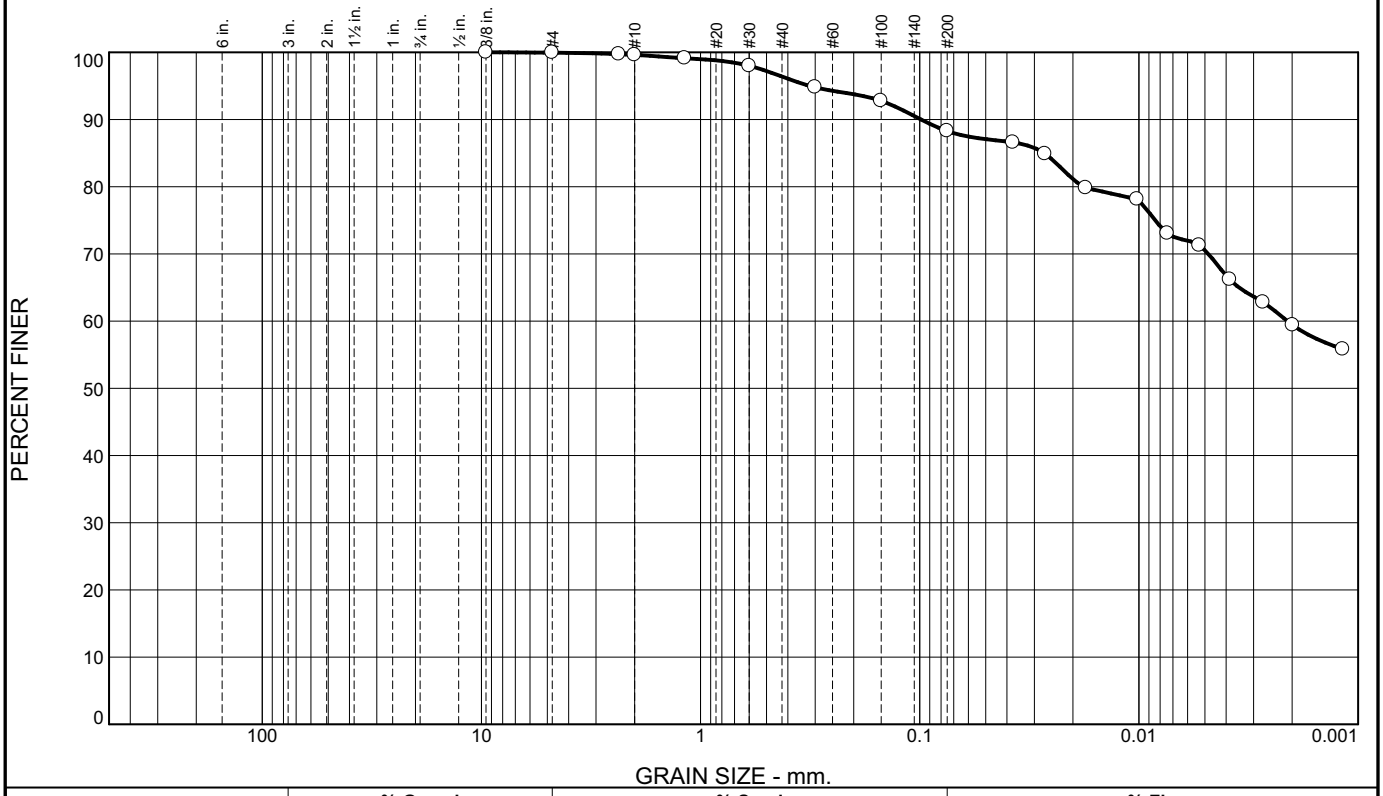
Source of Sample: B-4 **Depth:** 18.0'-19.5'
Sample Number: SS-4

Remarks:

Wood Environment and Infrastructure Solutions, Inc.
Nashville, Tennessee

Tested By: NB/KM **Checked By:** MH

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.1	0.3	3.2	8.1	17.8	70.5

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/8"	100.0		
#4	99.9		
#8	99.7		
#10	99.6		
#16	99.1		
#30	98.0		
#50	94.8		
#100	92.8		
#200	88.3		

* (no specification provided)

Material Description

fat clay, brown

Atterberg Limits

PL= 26 LL= 57 PI= 31

Coefficients

D_{90}= 0.0987 D_{85}= 0.0271 D_{60}= 0.0021
D_{50}= D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CH AASHTO= A-7-6(30)

Remarks

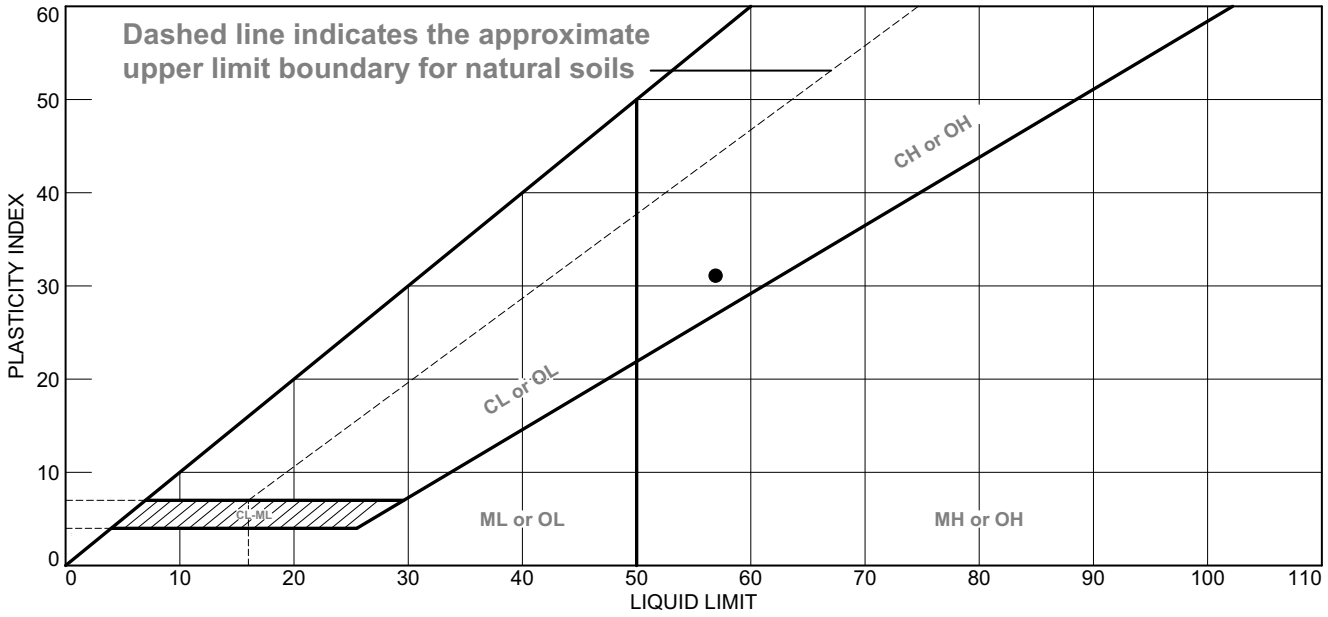
Source of Sample: B-4 **Depth:** 23.0'-24.5'
Sample Number: SS-5 **Date:** 10/5/18

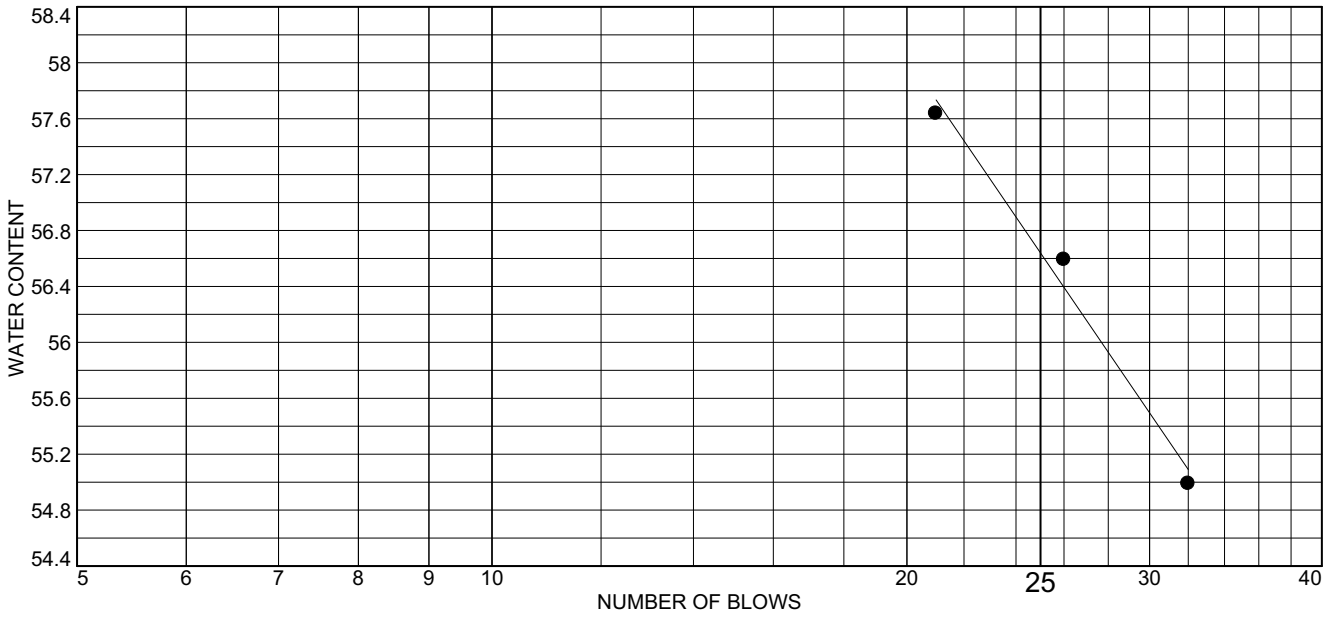
Wood Environment and Infrastructure Solutions, Inc.
Nashville, Tennessee

Client: TDOT
Project: SR 40 over Ocoee
Project No: 579790003

Tested By: NB **Checked By:** MH

LIQUID AND PLASTIC LIMITS TEST REPORT





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	fat clay, brown	57	26	31	96.4	88.3	CH

Project No. 579790003 **Client:** TDOT

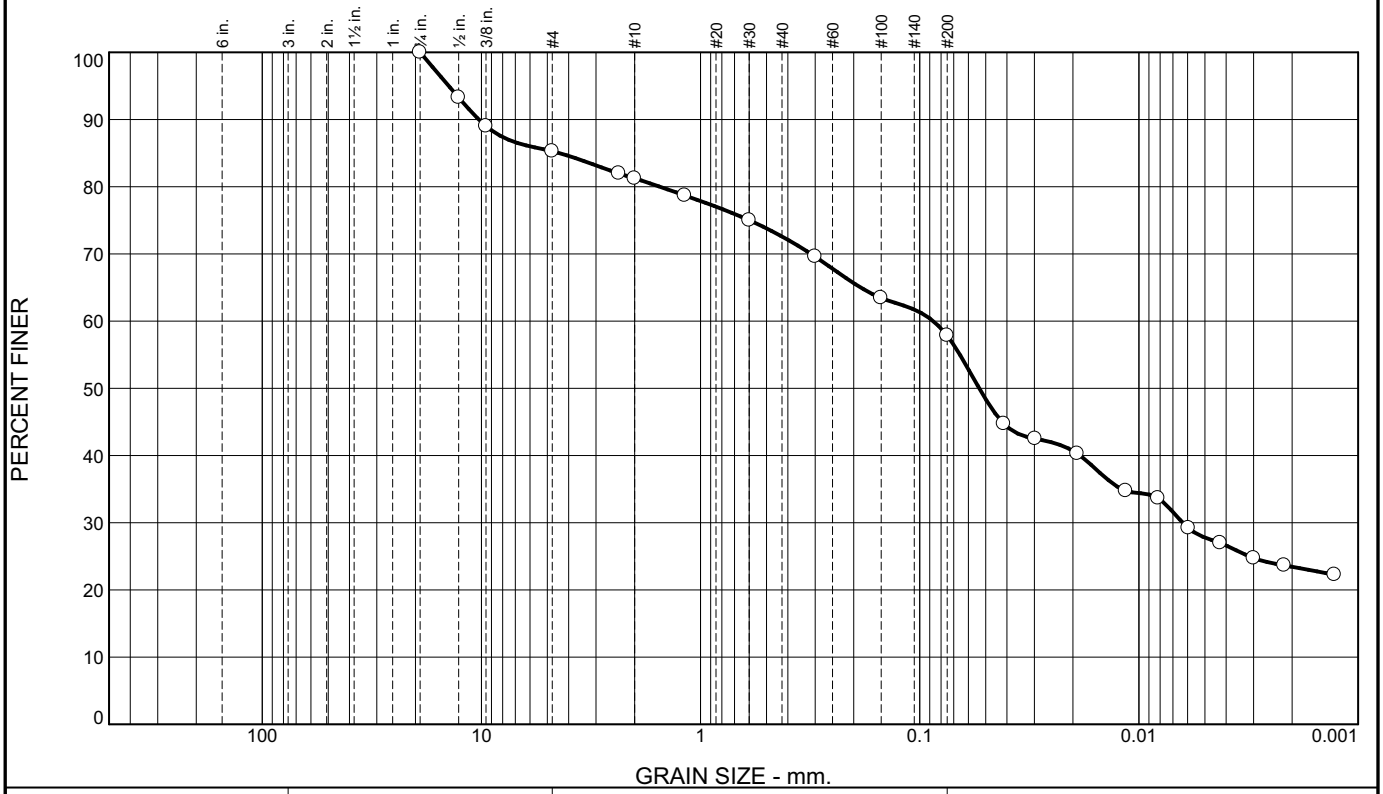
Project: SR 40 over Ocoee

Source of Sample: B-4 **Depth:** 23.0'-24.5'
Sample Number: SS-5

Remarks:

Wood Environment and Infrastructure Solutions, Inc.
Nashville, Tennessee

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	14.7	4.1	8.6	14.8	30.0	27.8

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/4"	100.0		
1/2"	93.3		
3/8"	89.0		
#4	85.3		
#8	82.0		
#10	81.2		
#16	78.7		
#30	75.0		
#50	69.6		
#100	63.4		
#200	57.8		

* (no specification provided)

Material Description

sandy lean clay, brown

Atterberg Limits

PL= 16 LL= 32 PI= 16

Coefficients

D_{90}= 10.2885 D_{85}= 4.4138 D_{60}= 0.0868
D_{50}= 0.0535 D_{30}= 0.0063 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CL AASHTO= A-6(6)

Remarks

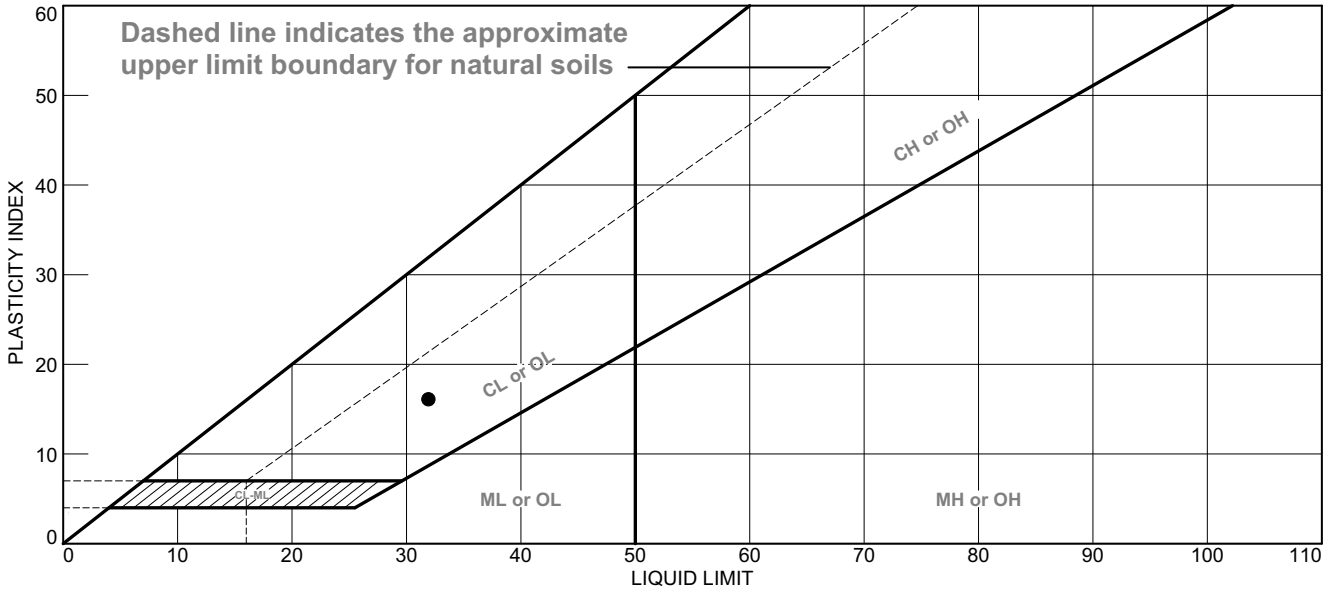
Source of Sample: B-5 **Depth:** 5.0'-6.5'
Sample Number: SS-1 **Date:** 10/5/18

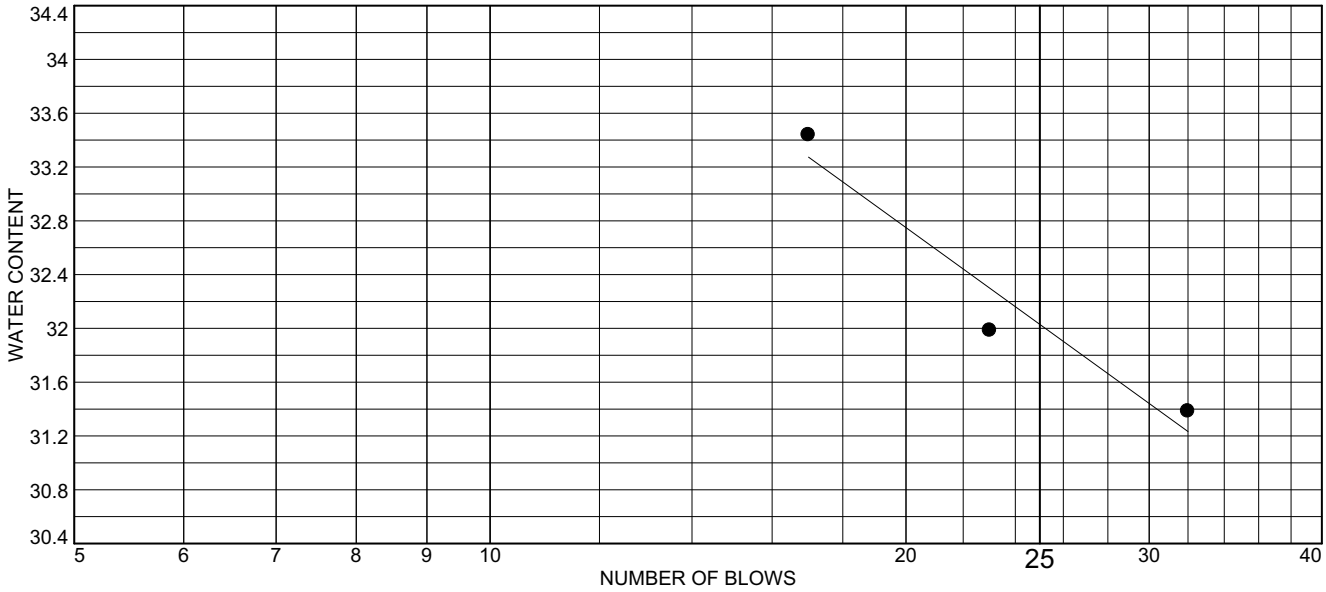
Wood Environment and Infrastructure Solutions, Inc.
Nashville, Tennessee

Client: TDOT
Project: SR 40 over Ocoee
Project No: 579790003

Tested By: NB **Checked By:** MH

LIQUID AND PLASTIC LIMITS TEST REPORT





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	sandy lean clay, brown	32	16	16	72.6	57.8	CL

Project No. 579790003 **Client:** TDOT

Project: SR 40 over Ocoee

Source of Sample: B-5 **Depth:** 5.0'-6.5'

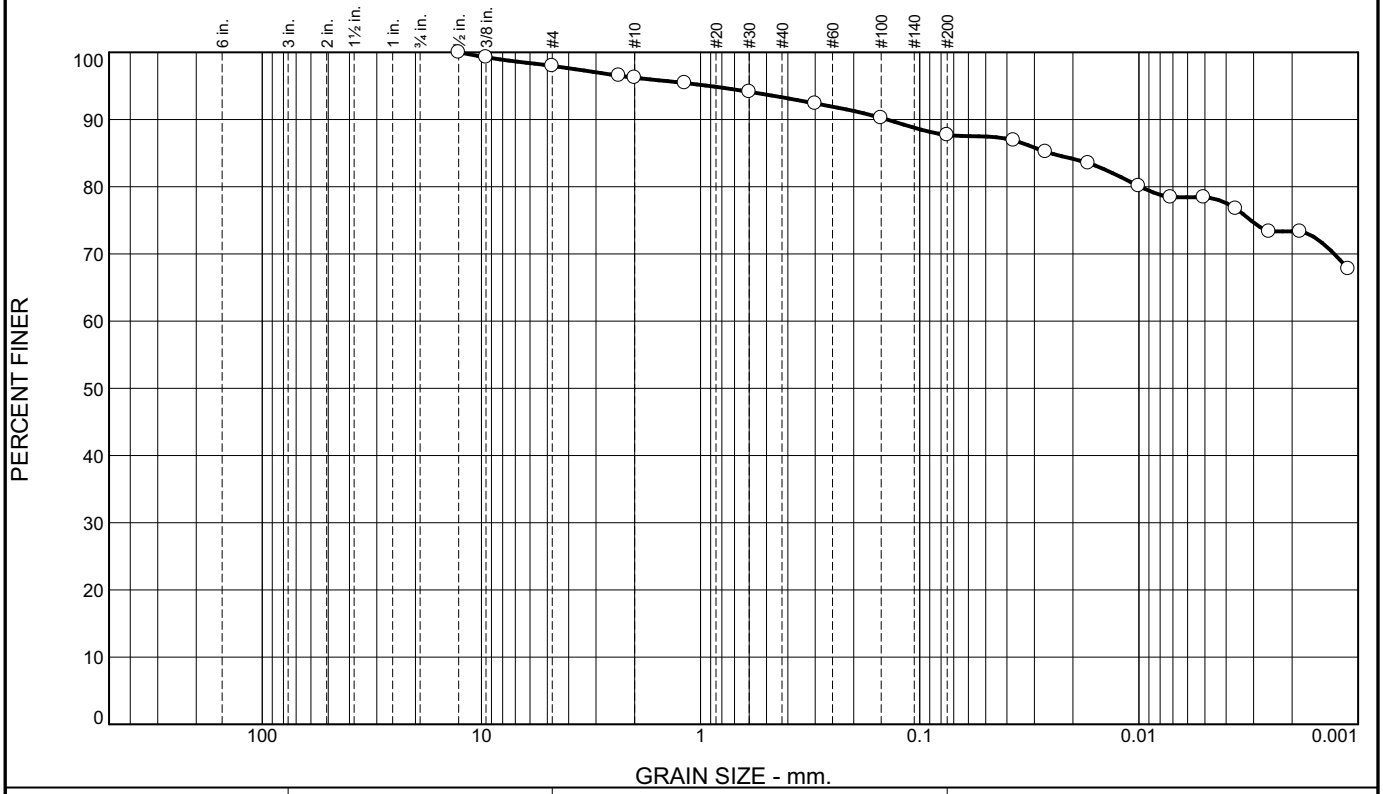
Sample Number: SS-1

Remarks:

Wood Environment and Infrastructure Solutions, Inc.
Nashville, Tennessee

Tested By: NB **Checked By:** MH

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	2.0	1.8	2.9	5.6	9.3	78.4

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1/2"	100.0		
3/8"	99.3		
#4	98.0		
#8	96.5		
#10	96.2		
#16	95.4		
#30	94.1		
#50	92.4		
#100	90.2		
#200	87.7		

* (no specification provided)

Material Description

fat clay, red brown

Atterberg Limits

PL= 26 LL= 71 PI= 45

Coefficients

D_{90}= 0.1412 D_{85}= 0.0255 D_{60}=
D_{50}= D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CH AASHTO= A-7-6(44)

Remarks

Source of Sample: B-5 **Depth:** 10.0'-11.5'
Sample Number: SS-2

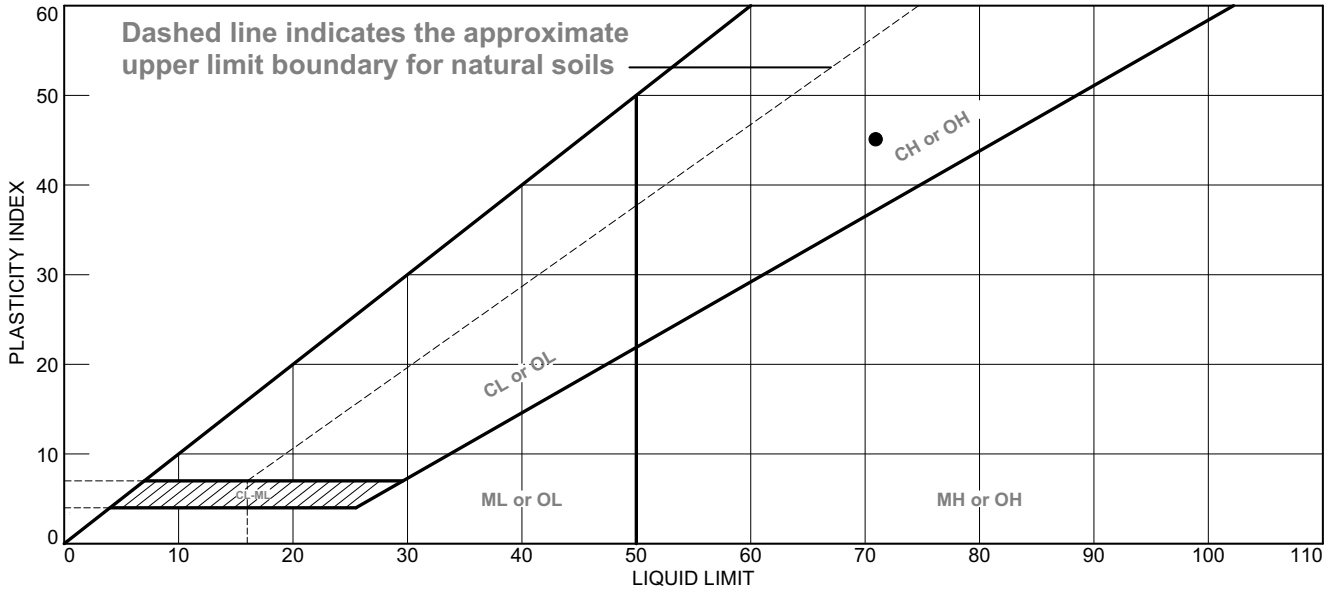
Date: 10/5/18

Wood Environment and Infrastructure Solutions, Inc.
Nashville, Tennessee

Client: TDOT
Project: SR 40 over Ocoee
Project No: 579790003

Tested By: KM **Checked By:** MH

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	fat clay, red brown	71	26	45	93.3	87.7	CH

Project No. 579790003 **Client:** TDOT

Project: SR 40 over Ocoee

Source of Sample: B-5 **Depth:** 10.0'-11.5'

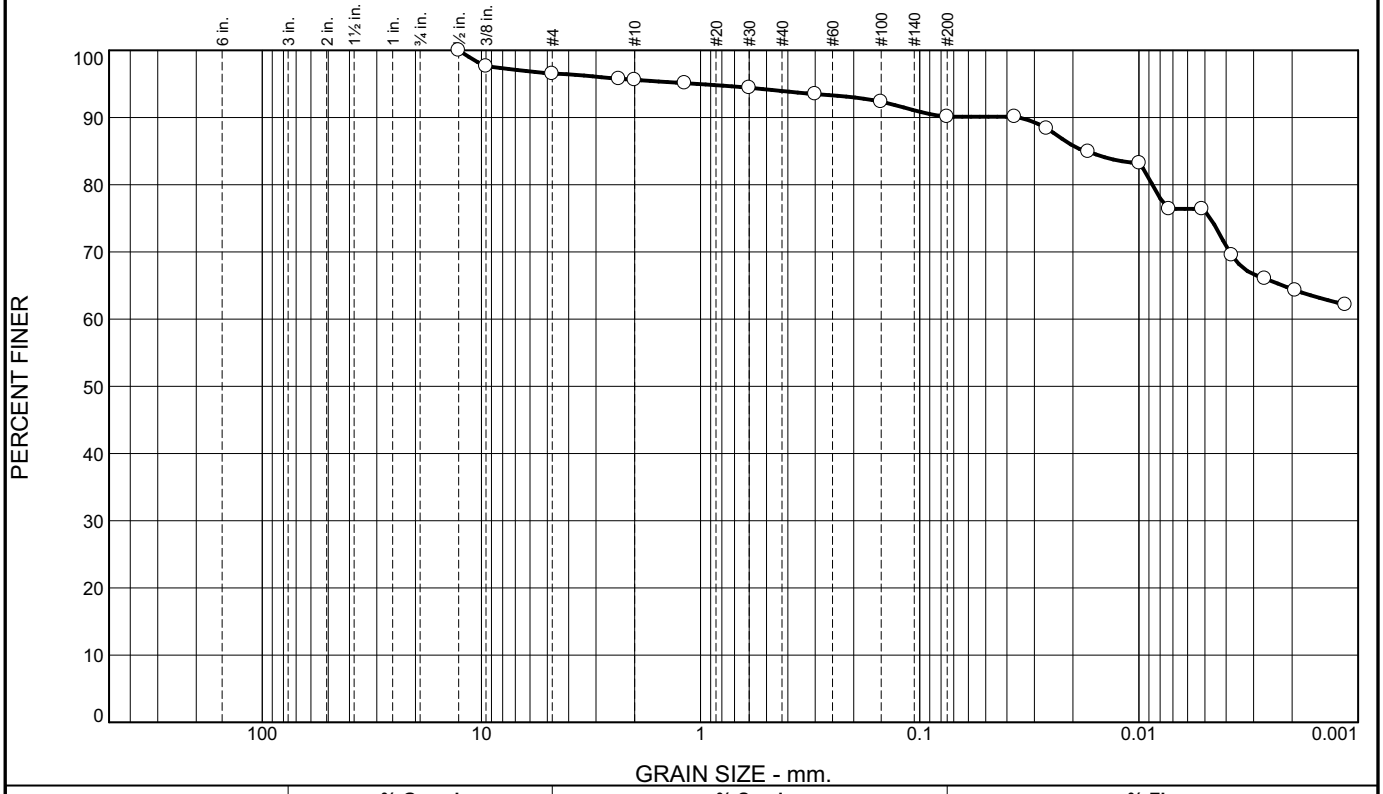
Sample Number: SS-2

Remarks:

Wood Environment and Infrastructure Solutions, Inc.
Nashville, Tennessee

Tested By: NB/KM **Checked By:** MH

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	3.5	0.9	1.7	3.8	14.1	76.0

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1/2"	100.0		
3/8"	97.6		
#4	96.5		
#8	95.8		
#10	95.6		
#16	95.1		
#30	94.4		
#50	93.5		
#100	92.3		
#200	90.1		

* (no specification provided)

Material Description

fat clay, red brown

Atterberg Limits

PL= 23 LL= 61 PI= 38

Coefficients

D_{90}= 0.0355 D_{85}= 0.0175 D_{60}=
D_{50}= D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CH AASHTO= A-7-6(38)

Remarks

Source of Sample: B-5 **Depth:** 15.0'-16.5'
Sample Number: SS-3

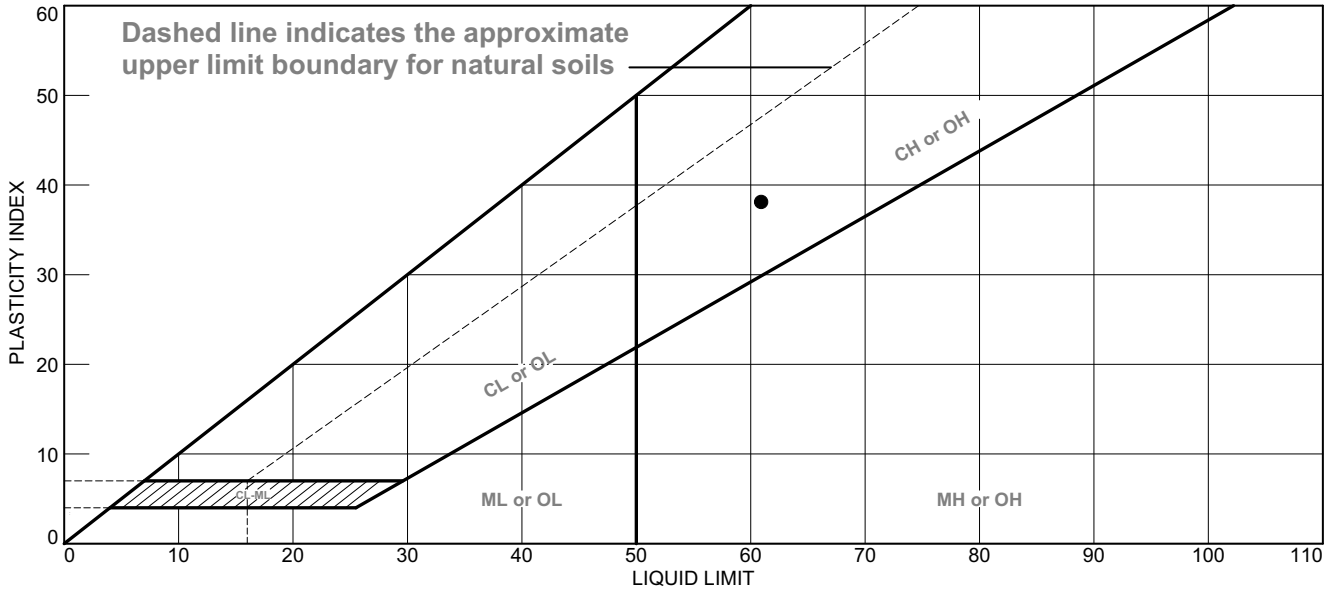
Date: 10/5/18

Wood Environment and Infrastructure Solutions, Inc.
Nashville, Tennessee

Client: TDOT
Project: SR 40 over Ocoee
Project No: 579790003

Tested By: NB/KM **Checked By:** MH

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	fat clay, red brown	61	23	38	93.9	90.1	CH

Project No. 579790003 **Client:** TDOT

Project: SR 40 over Ocoee

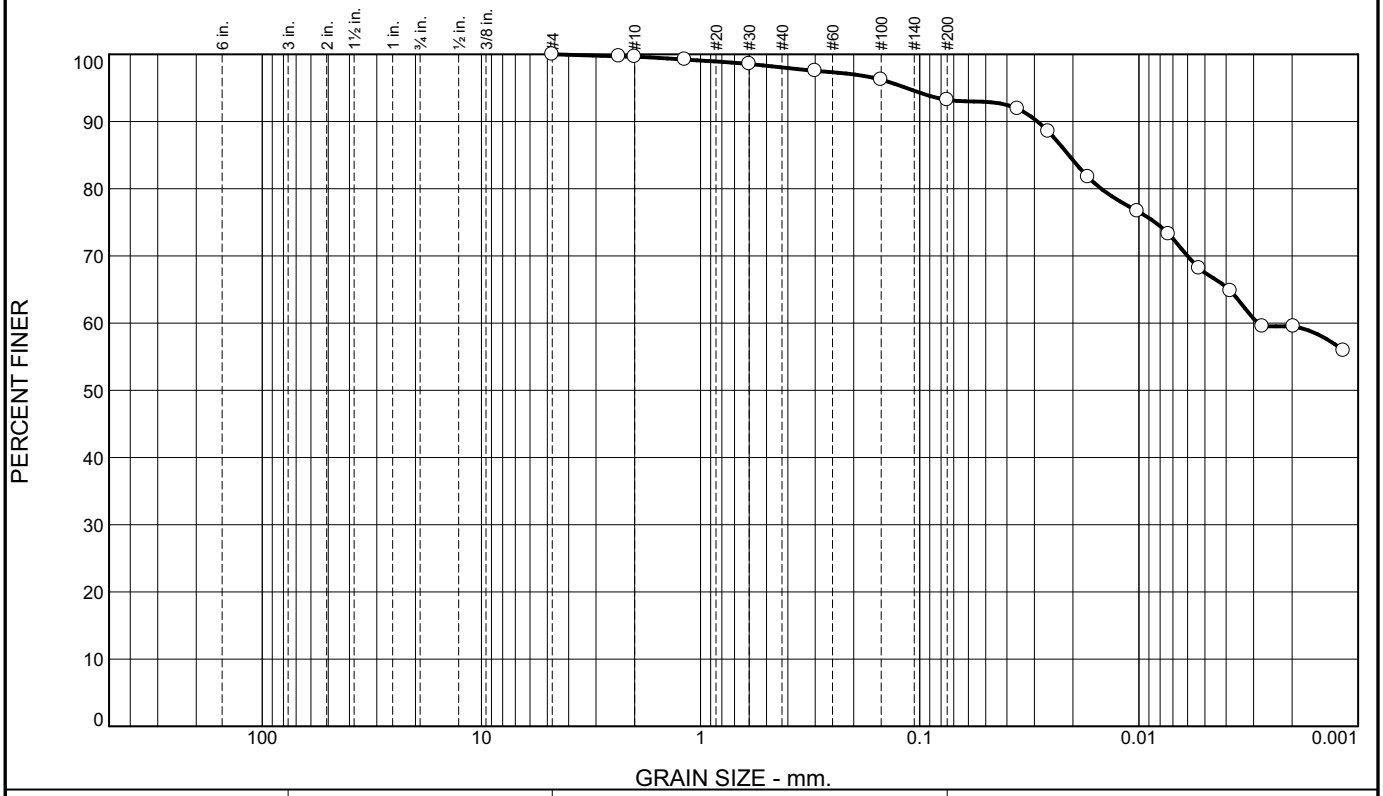
Source of Sample: B-5 **Depth:** 15.0'-16.5'
Sample Number: SS-3

Remarks:

Wood Environment and Infrastructure Solutions, Inc.
Nashville, Tennessee

Tested By: NB/KM **Checked By:** MH

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.4	1.6	4.8	25.7	67.5

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	100.0		
#8	99.7		
#10	99.6		
#16	99.2		
#30	98.5		
#50	97.5		
#100	96.2		
#200	93.2		

* (no specification provided)

Material Description

fat clay, red brown

Atterberg Limits

PL= 23 LL= 53 PI= 30

Coefficients

D_{90}= 0.0290 D_{85}= 0.0209 D_{60}= 0.0029
D_{50}= D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CH AASHTO= A-7-6(31)

Remarks

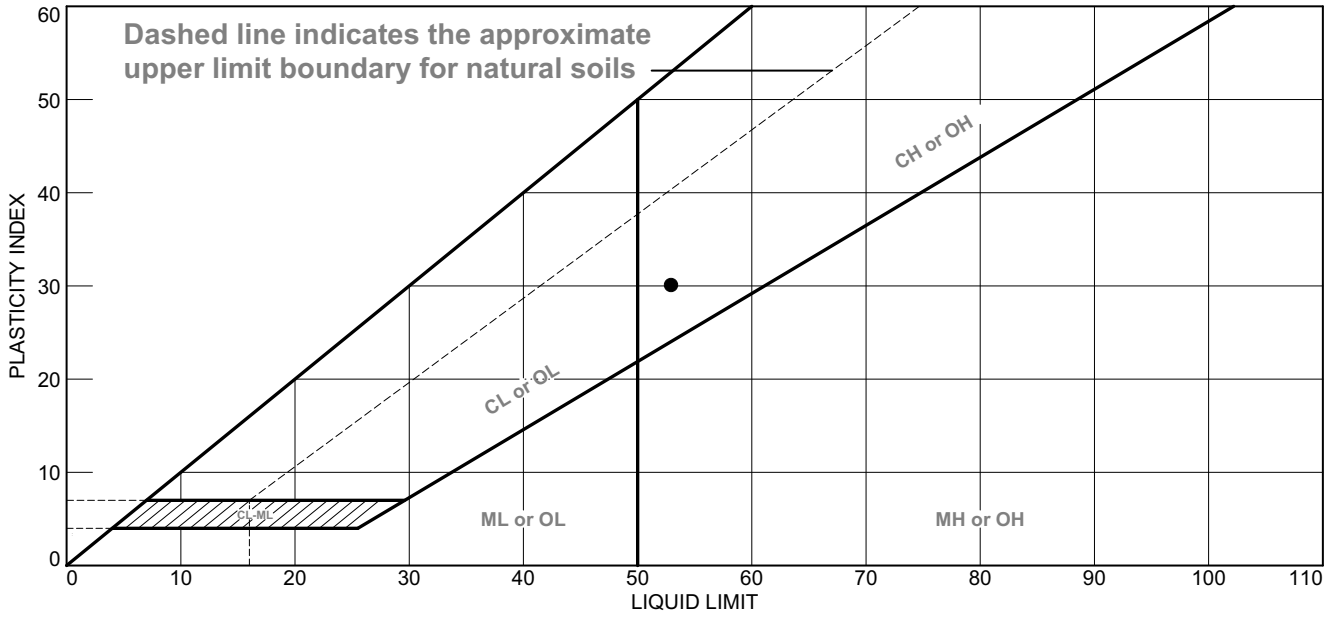
Source of Sample: B-5 **Depth:** 20.0'-21.5'
Sample Number: SS-4 **Date:** 10/6/18

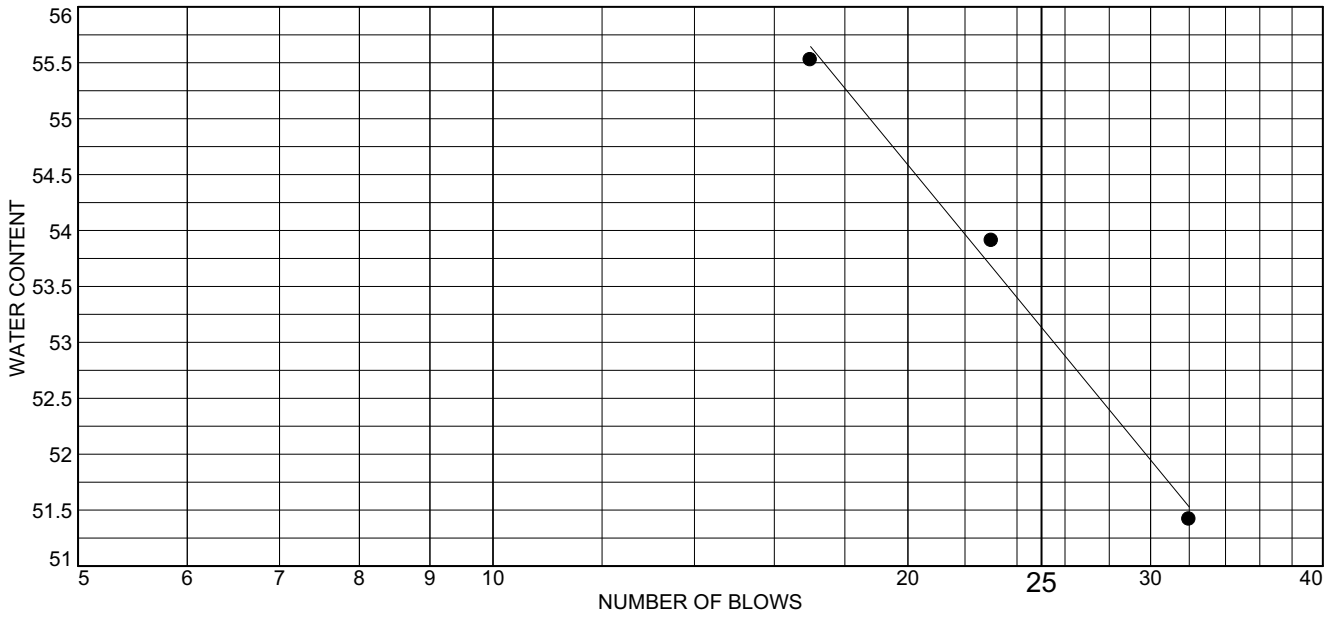
Wood Environment and Infrastructure Solutions, Inc.
Nashville, Tennessee

Client: TDOT
Project: SR 40 over Ocoee
Project No: 579790003

Tested By: NB **Checked By:** MH

LIQUID AND PLASTIC LIMITS TEST REPORT





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	fat clay, red brown	53	23	30	98.0	93.2	CH

Project No. 579790003 **Client:** TDOT

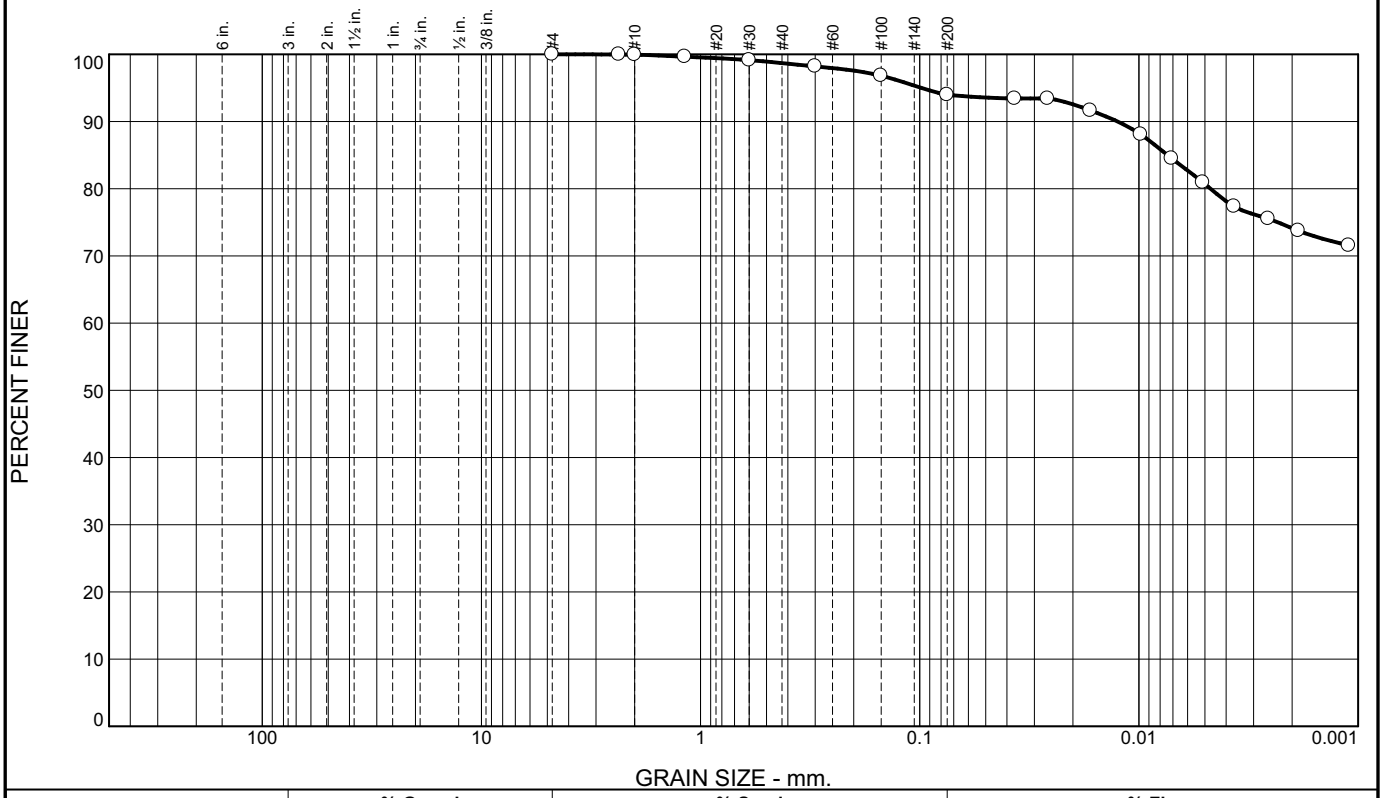
Project: SR 40 over Ocoee

Source of Sample: B-5 **Depth:** 20.0'-21.5'
Sample Number: SS-4

Remarks:

Wood Environment and Infrastructure Solutions, Inc.
Nashville, Tennessee

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.1	1.2	4.7	13.3	80.7

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	100.0		
#8	100.0		
#10	99.9		
#16	99.6		
#30	99.1		
#50	98.2		
#100	96.8		
#200	94.0		

* (no specification provided)

Material Description

fat clay, orange brown

Atterberg Limits

PL= 21 LL= 68 PI= 47

Coefficients

D_{90}= 0.0125 D_{85}= 0.0074 D_{60}=
D_{50}= D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CH AASHTO= A-7-6(49)

Remarks

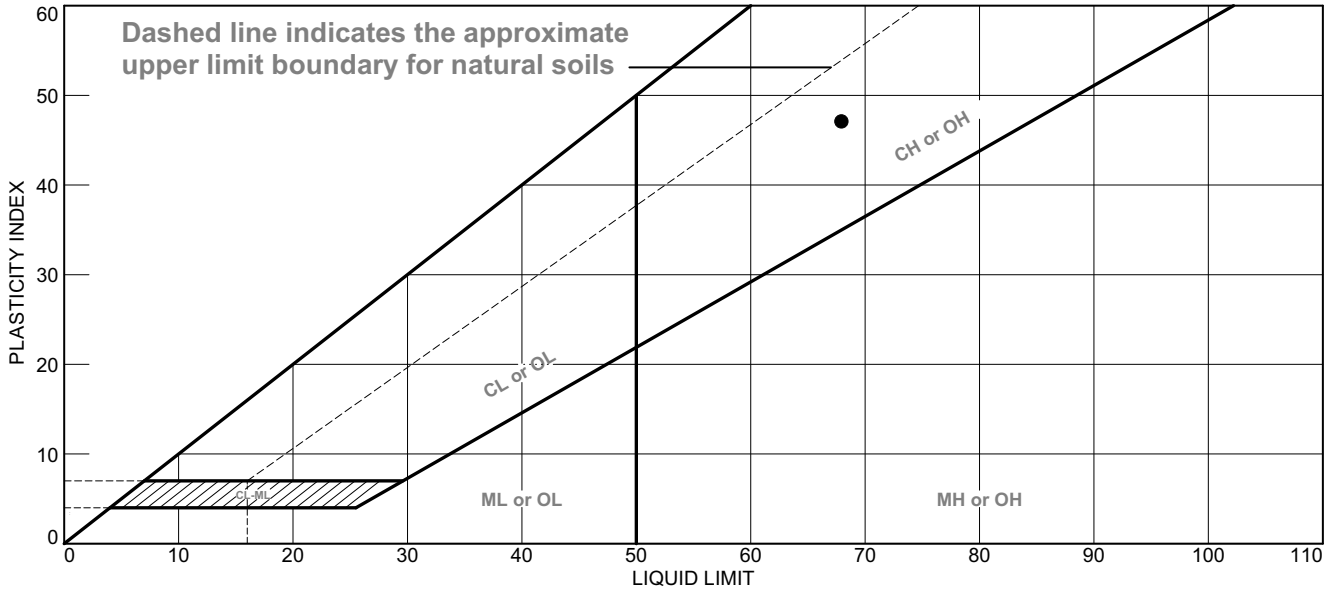
Source of Sample: B-5 **Depth:** 25.0'-26.5'
Sample Number: SS-5 **Date:** 10/4/18

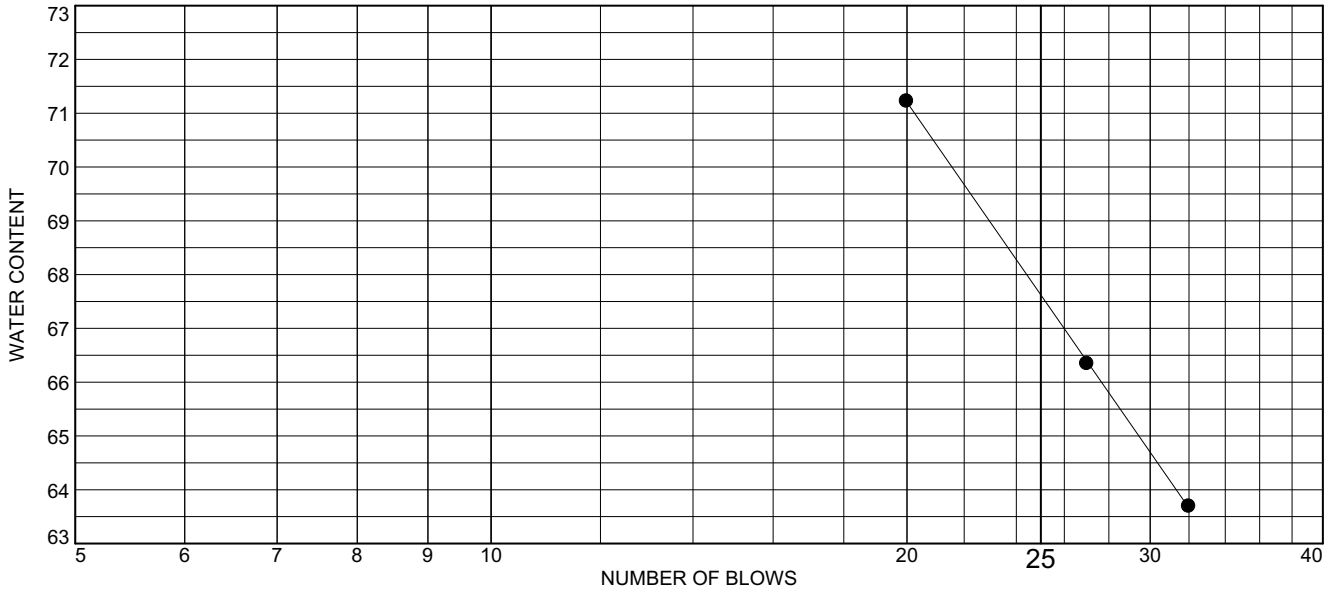
Wood Environment and Infrastructure Solutions, Inc.
Nashville, Tennessee

Client: TDOT
Project: SR 40 over Ocoee
Project No: 579790003

Tested By: NB/KM **Checked By:** MH

LIQUID AND PLASTIC LIMITS TEST REPORT





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	fat clay, orange brown	68	21	47	98.7	94.0	CH

Project No. 579790003 **Client:** TDOT

Project: SR 40 over Ocoee

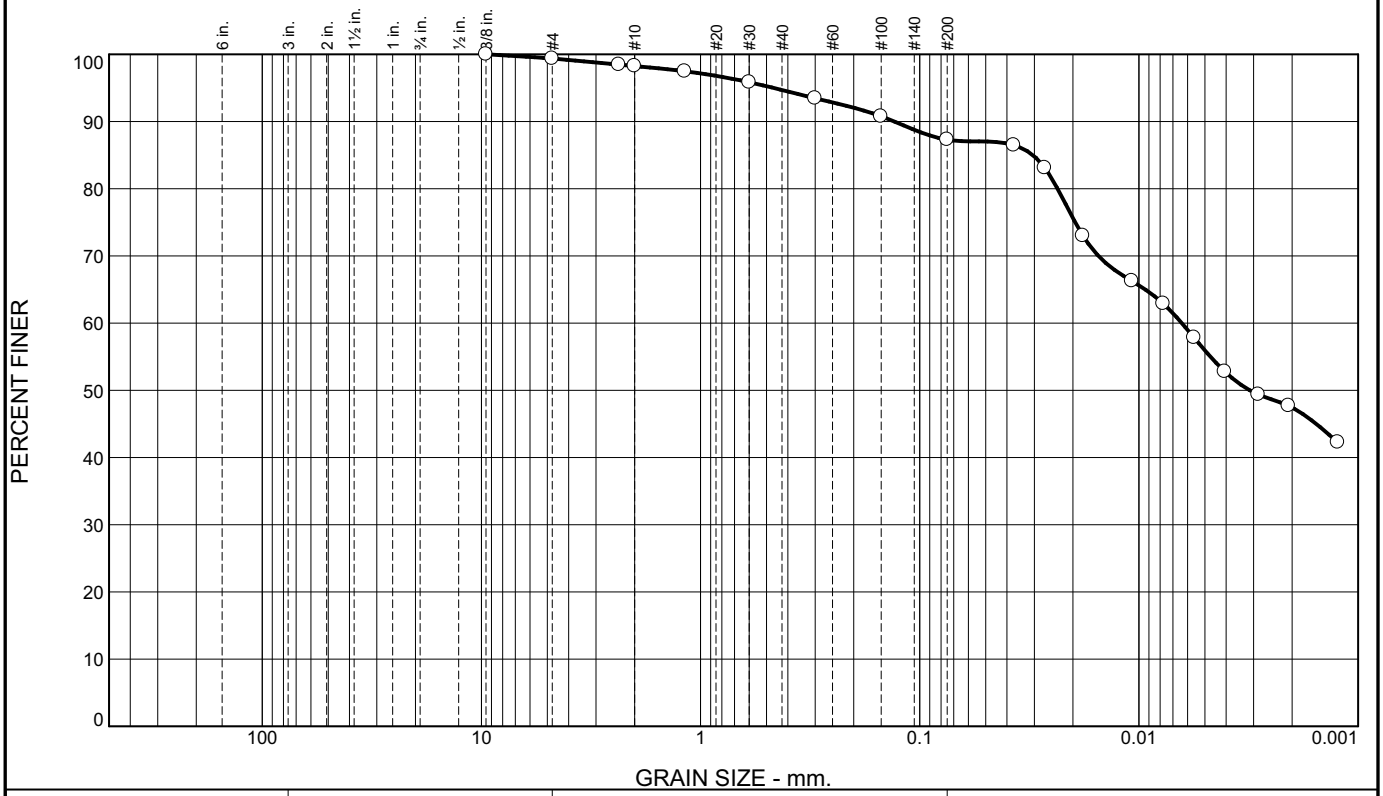
Source of Sample: B-5 **Depth:** 25.0'-26.5'
Sample Number: SS-5

Remarks:

Wood Environment and Infrastructure Solutions, Inc.
Nashville, Tennessee

Tested By: NB **Checked By:** MH

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.6	1.2	3.5	7.4	31.4	55.9

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/8"	100.0		
#4	99.4		
#8	98.5		
#10	98.2		
#16	97.5		
#30	95.8		
#50	93.5		
#100	90.8		
#200	87.3		

* (no specification provided)

Material Description

lean clay, brown

Atterberg Limits

PL= 21 LL= 43 PI= 22

Coefficients

D_{90}= 0.1309 D_{85}= 0.0305 D_{60}= 0.0064
D_{50}= 0.0031 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CL AASHTO= A-7-6(20)

Remarks

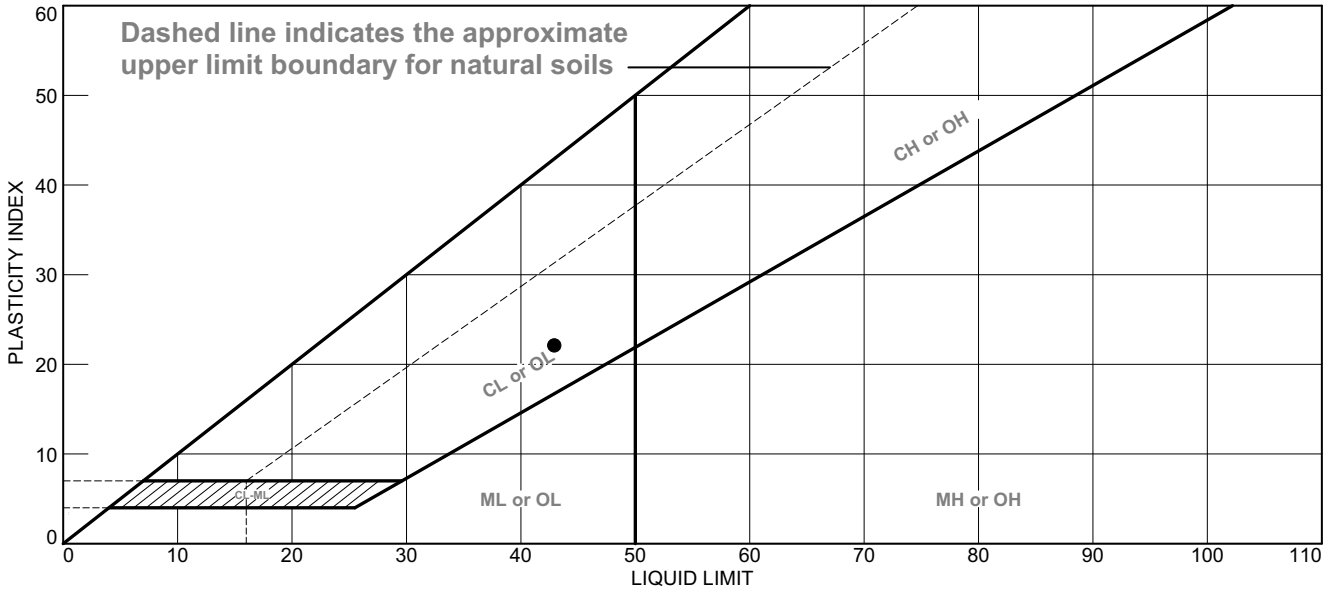
Source of Sample: B-5 **Depth:** 30.0'-31.5'
Sample Number: SS-6 **Date:** 10/5/18

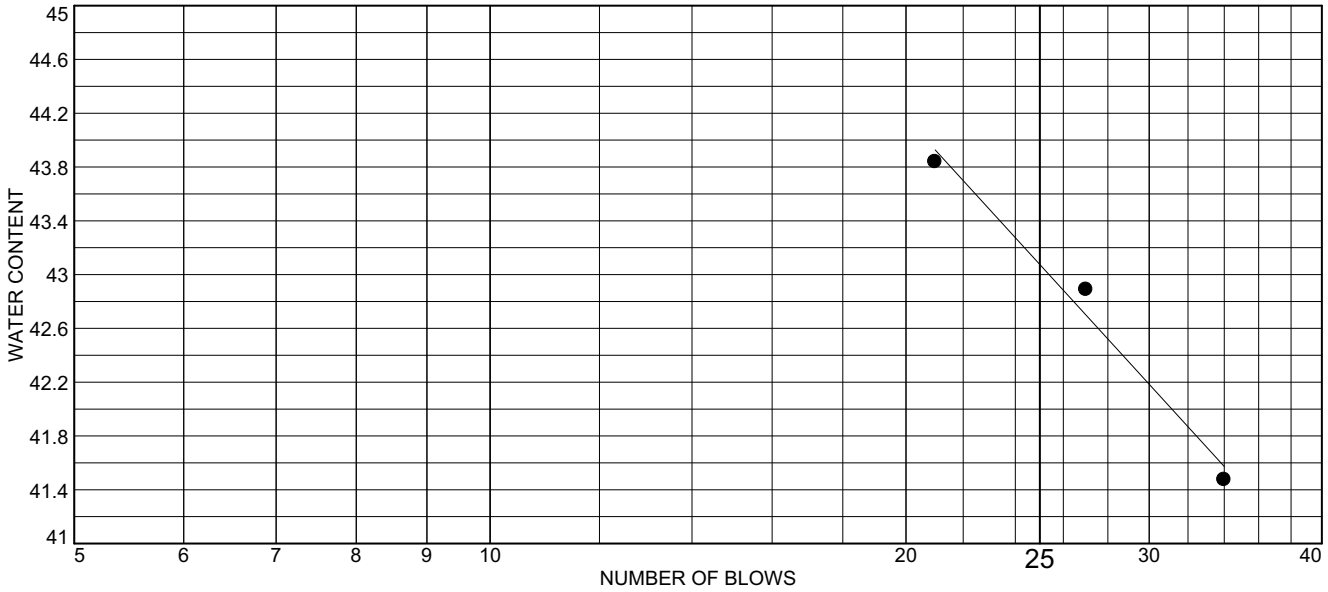
Wood Environment and Infrastructure Solutions, Inc.
Nashville, Tennessee

Client: TDOT
Project: SR 40 over Ocoee
Project No: 579790003

Tested By: NB **Checked By:** MH

LIQUID AND PLASTIC LIMITS TEST REPORT





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	lean clay, brown	43	21	22	94.7	87.3	CL

Project No. 579790003 **Client:** TDOT

Project: SR 40 over Ocoee

Source of Sample: B-5 **Depth:** 30.0'-31.5'

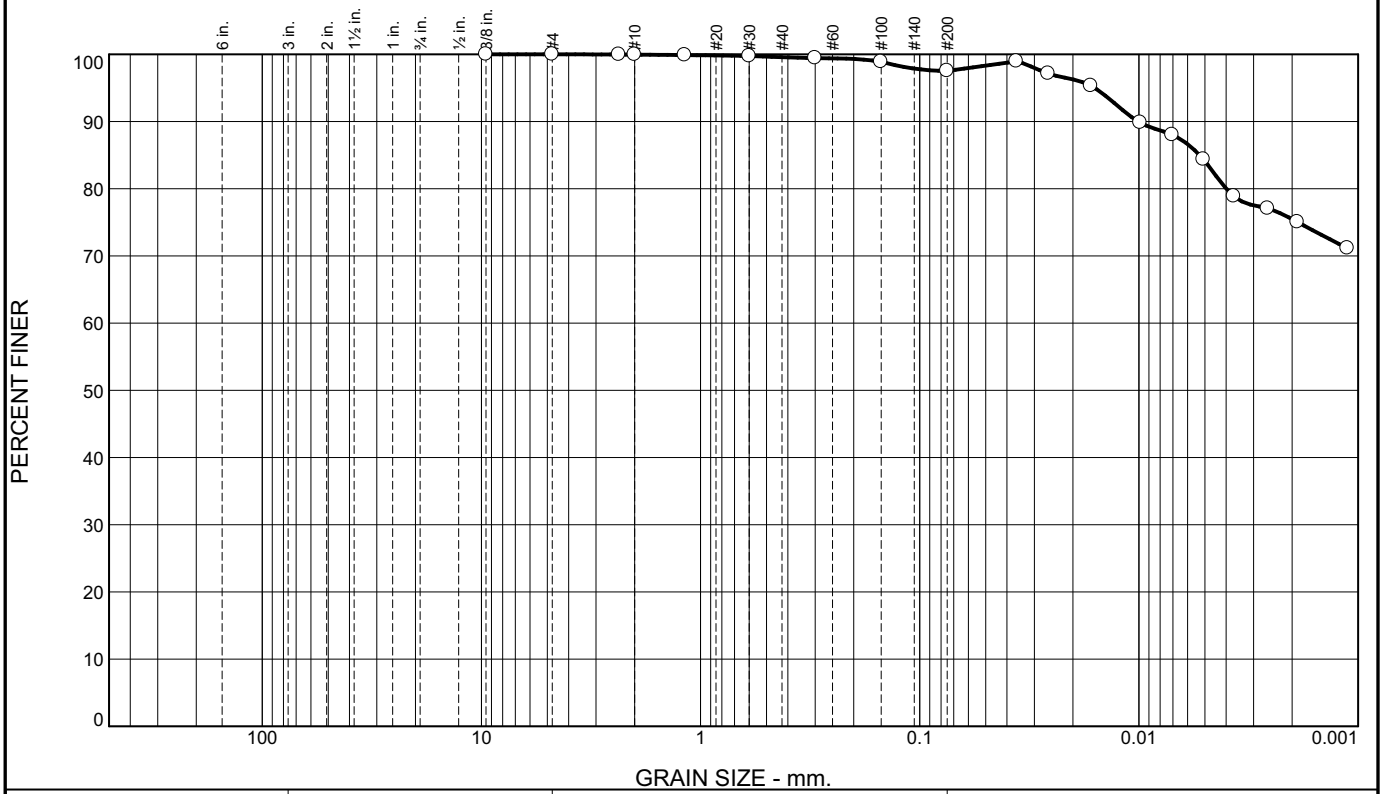
Sample Number: SS-6

Remarks:

Wood Environment and Infrastructure Solutions, Inc.
Nashville, Tennessee

Tested By: NB/KM **Checked By:** MH

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.1	0.3	2.1	13.4	84.1

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/8"	100.0		
#4	100.0		
#8	100.0		
#10	99.9		
#16	99.9		
#30	99.7		
#50	99.4		
#100	98.9		
#200	97.5		

* (no specification provided)

Material Description

fat clay, orange brown

Atterberg Limits

PL= 28 LL= 68 PI= 40

Coefficients

D_{90}= 0.0101 D_{85}= 0.0053 D_{60}=
D_{50}= D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CH AASHTO= A-7-6(46)

Remarks

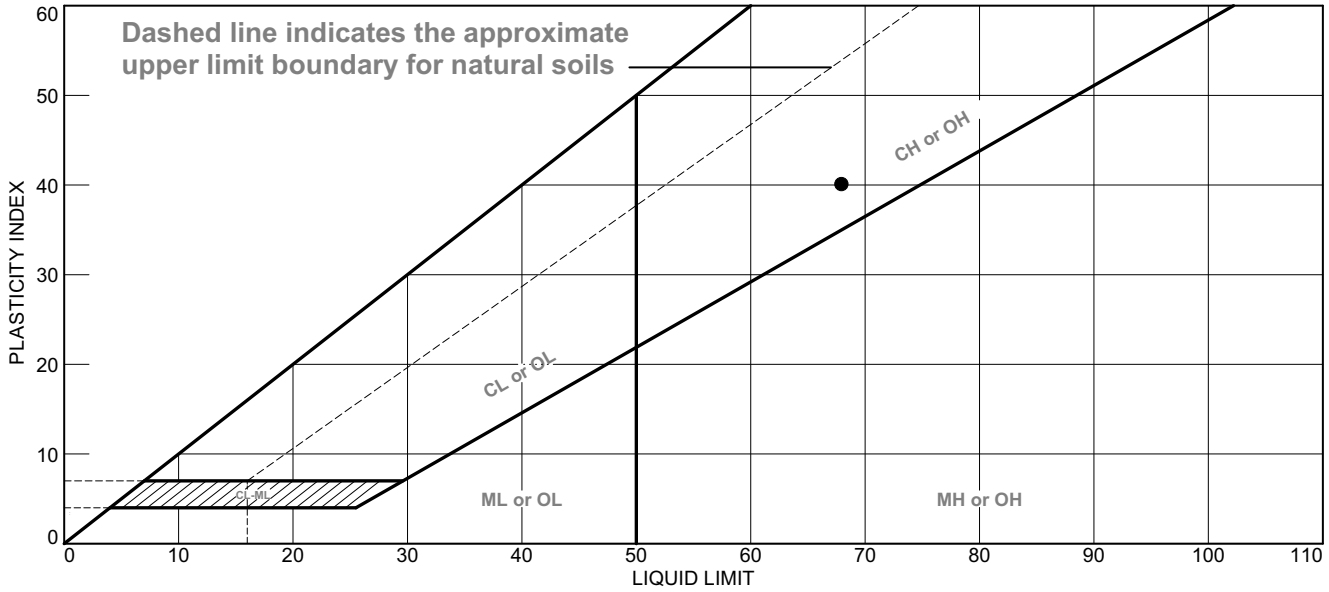
Source of Sample: B-6 **Depth:** 5.0'-7.0'
Sample Number: ST-1 **Date:** 10/12/18

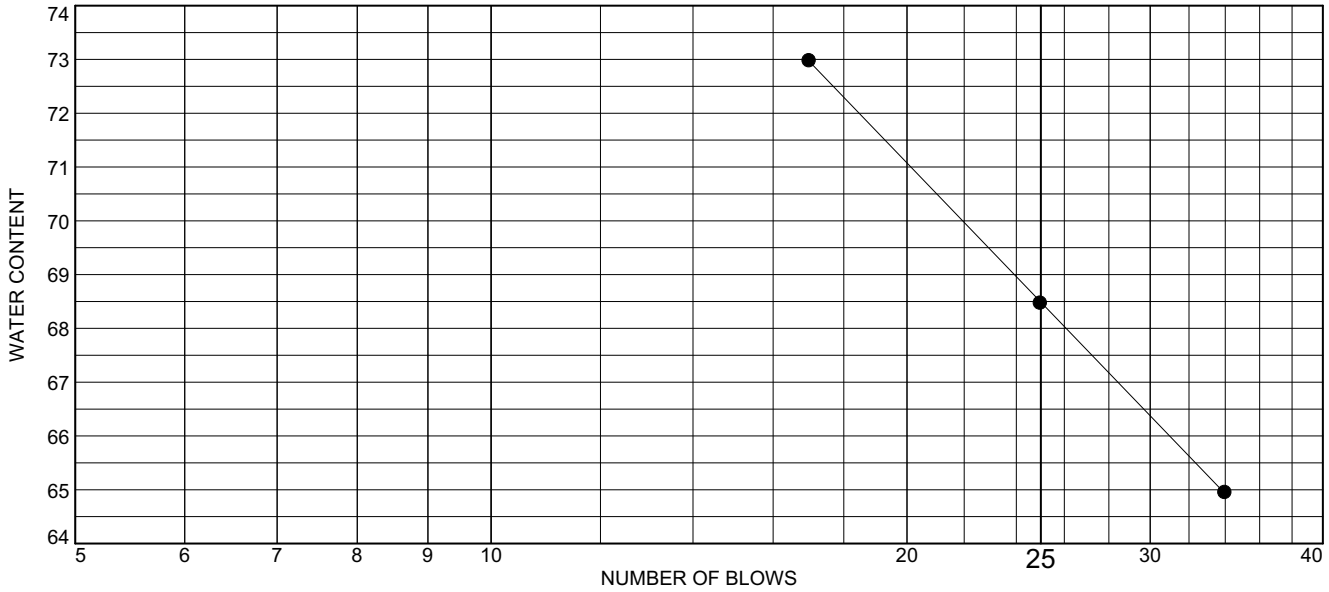
Wood Environment and Infrastructure Solutions, Inc.
Nashville, Tennessee

Client: TDOT
Project: SR 40 over Ocoee
Project No: 579790003

Tested By: MH

LIQUID AND PLASTIC LIMITS TEST REPORT





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	fat clay, orange brown	68	28	40	99.6	97.5	CH

Project No. 579790003 **Client:** TDOT

Project: SR 40 over Ocoee

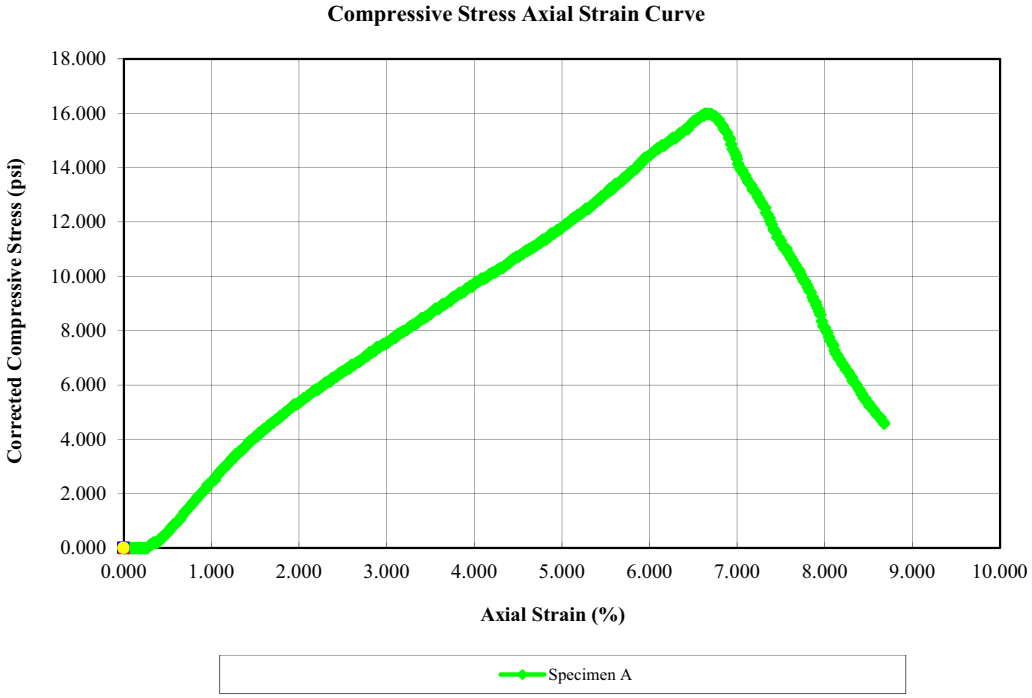
Source of Sample: B-6 **Depth:** 5.0'-7.0'
Sample Number: ST-1

Remarks:

Wood Environment and Infrastructure Solutions, Inc.
Nashville, Tennessee

Tested By: NB **Checked By:** MH

Unconfined Compression Test Report (ASTM D2166)



Before Test	Specimen A	FAILURE PHOTO
Water Content (%)	34.79	
Dry Density (pcf)	90.400	
Saturation (%)	111.15	
Void Ratio	0.83	
Diameter (in)	2.873	
Height (in)	7.168	
Test Data	**A**	
Unconfined Strength (psi)	15.978	
Undrained Shear Strength (tsf)	0.575	
Undrained Shear Strength (psi)	7.989	
Rate of Strain (in/min)	0.071100	
Strain at Failure (%)		

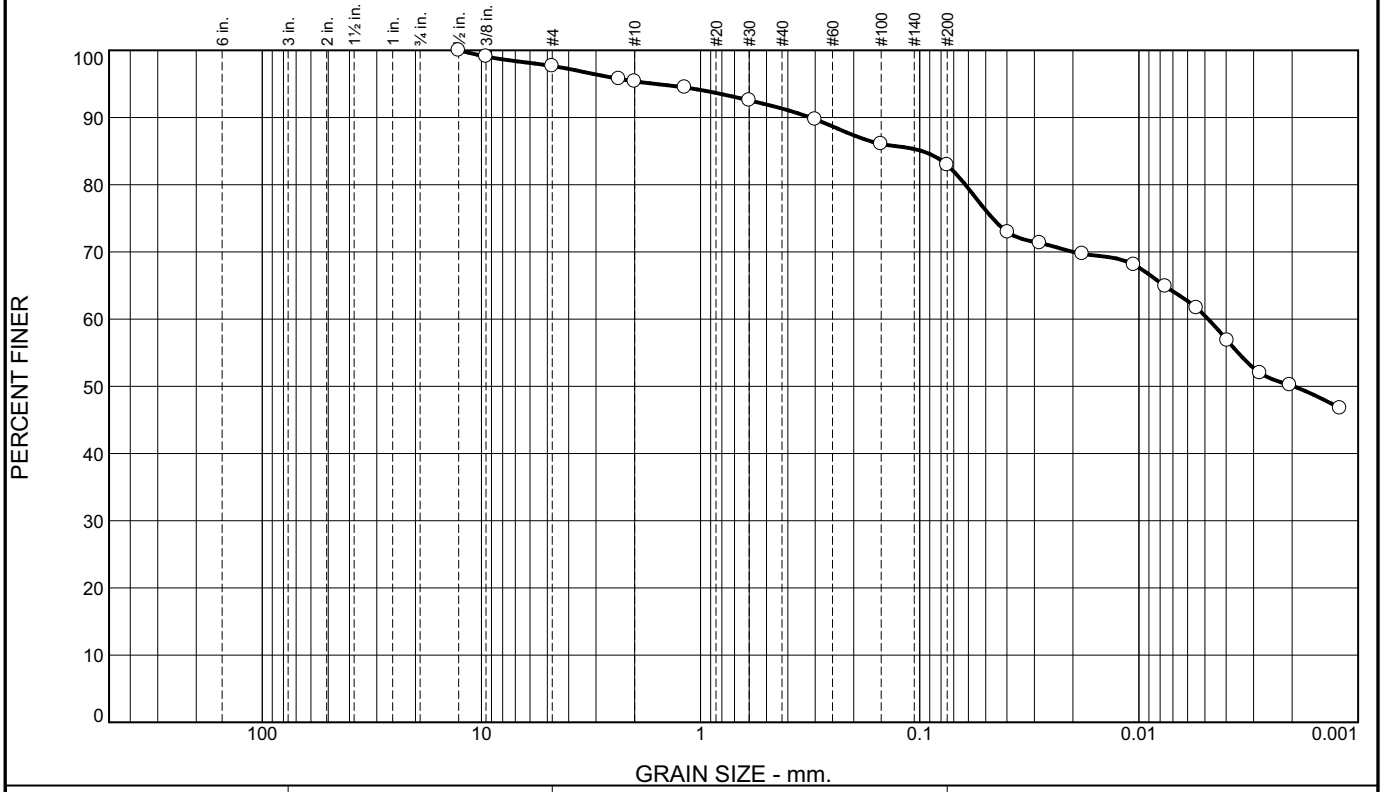
Project Information		Specimen Description
Client	TDOT	Specimen A
Project	TDOT SR 40 Ocoee	
Project No.	579790003	
Boring No.	B-6 ST-1 5.0'-7.0'	

Sample Description	fat clay, orange brown	Test Variables	
		Specific Gravity	2.65
		Liquid Limit:	68.0
		Plastic Limit:	28.0

Remarks

Tested By: M. Haley Reviewed By: _____

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	2.3	2.3	4.1	8.4	22.4	60.5

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1/2"	100.0		
3/8"	99.1		
#4	97.7		
#8	95.7		
#10	95.4		
#16	94.5		
#30	92.6		
#50	89.7		
#100	86.1		
#200	82.9		

* (no specification provided)

Material Description

fat clay with sand, red brown

Atterberg Limits

PL= 30 LL= 64 PI= 34

Coefficients

D_{90}= 0.3160 D_{85}= 0.0974 D_{60}= 0.0048
D_{50}= 0.0020 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CH AASHTO= A-7-5(32)

Remarks

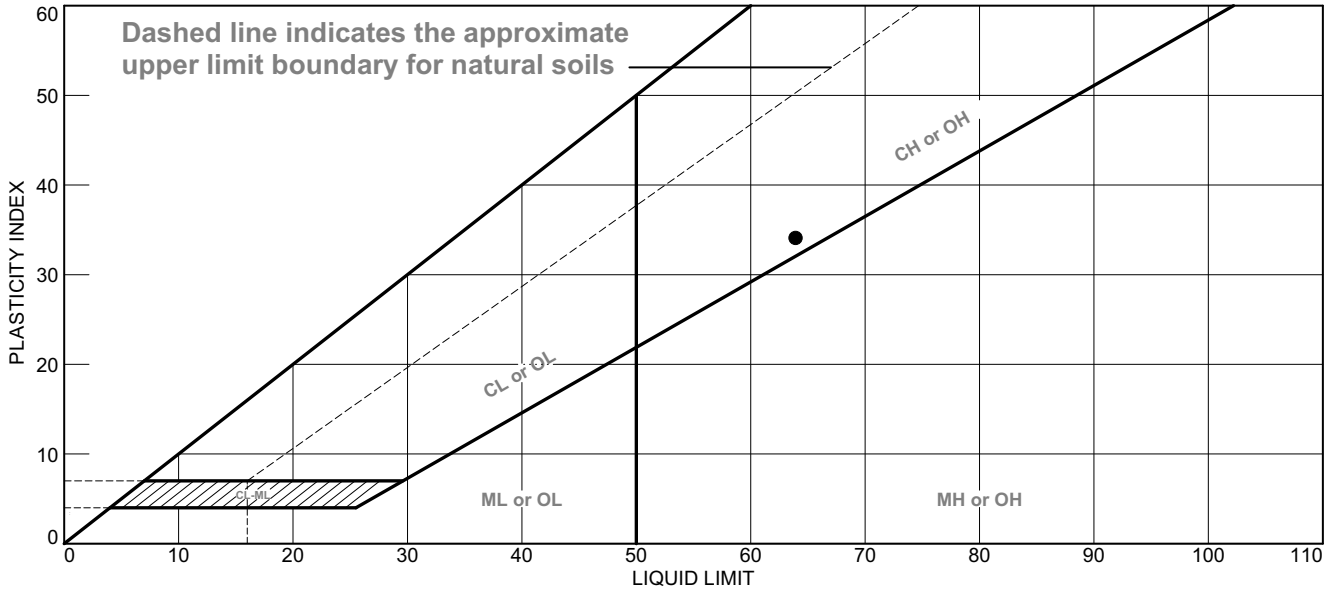
Source of Sample: B-6 **Depth:** 10.0'-11.5'
Sample Number: SS-1 **Date:** 10/8/18

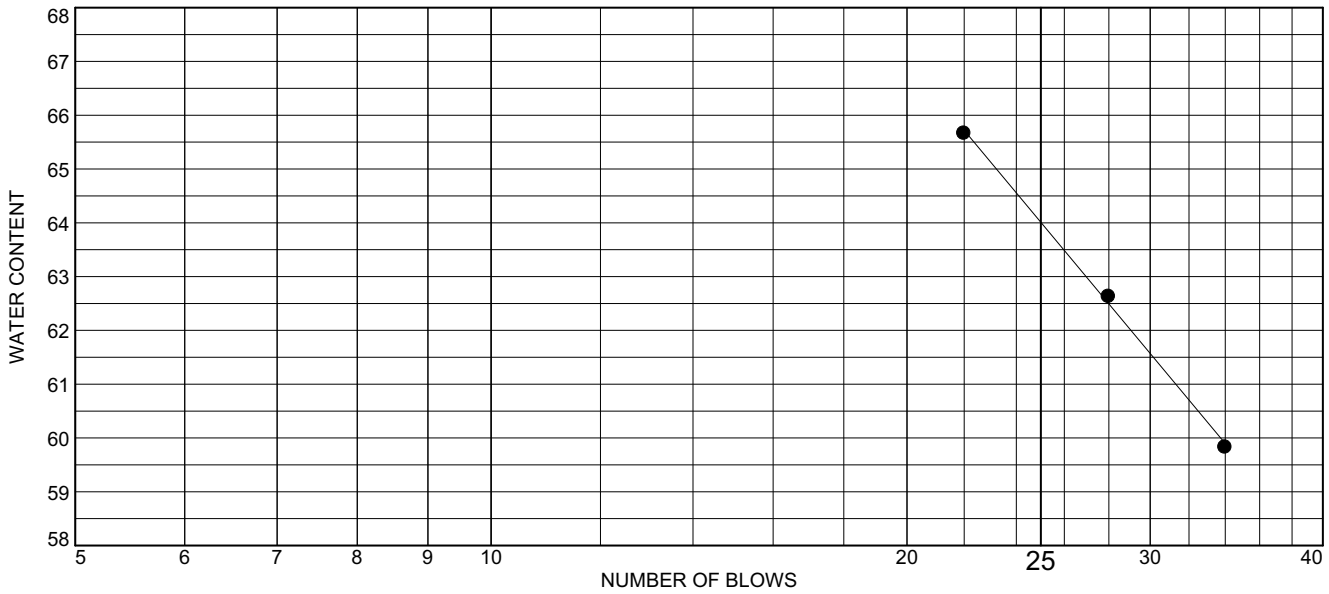
Wood Environment and Infrastructure Solutions, Inc.
Nashville, Tennessee

Client: TDOT
Project: SR 40 over Ocoee
Project No: 579790003

Tested By: NB **Checked By:** MH

LIQUID AND PLASTIC LIMITS TEST REPORT





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	fat clay with sand, red brown	64	30	34	91.3	82.9	CH

Project No. 579790003 **Client:** TDOT

Project: SR 40 over Ocoee

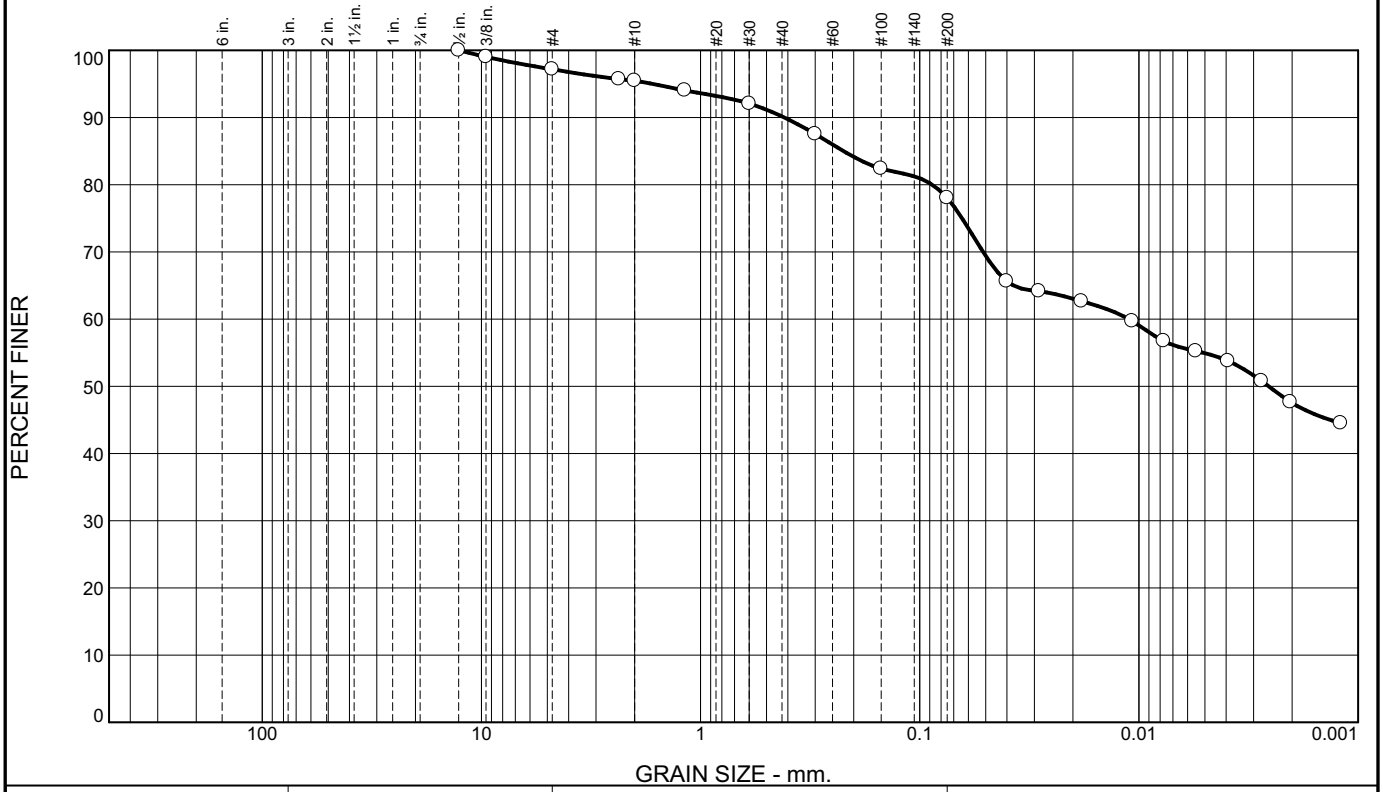
Source of Sample: B-6 **Depth:** 10.0'-11.5'
Sample Number: SS-1

Remarks:

Wood Environment and Infrastructure Solutions, Inc.
Nashville, Tennessee

Tested By: NB/KM **Checked By:** MH

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	2.8	1.7	5.3	12.2	23.1	54.9

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1/2"	100.0		
3/8"	99.0		
#4	97.2		
#8	95.7		
#10	95.5		
#16	94.0		
#30	92.1		
#50	87.5		
#100	82.4		
#200	78.0		

* (no specification provided)

Material Description

fat clay with sand, brown

Atterberg Limits

PL= 24 LL= 65 PI= 41

Coefficients

D_{90}= 0.4148 D_{85}= 0.2228 D_{60}= 0.0111
D_{50}= 0.0026 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CH AASHTO= A-7-6(34)

Remarks

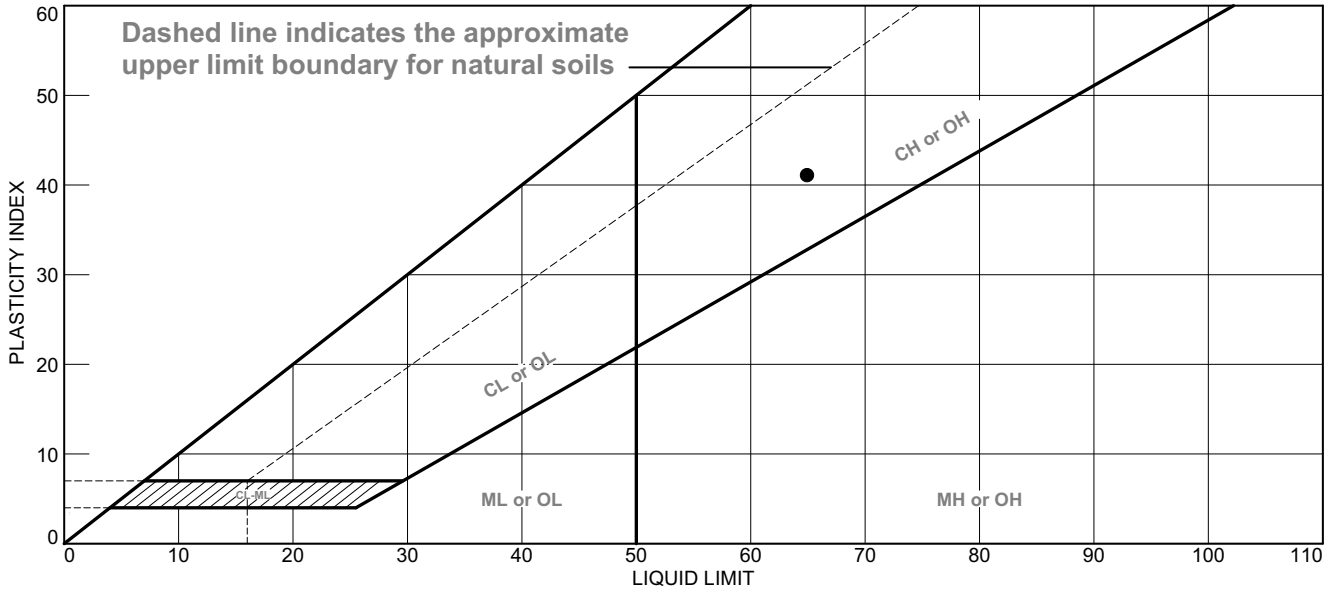
Source of Sample: B-6 **Depth:** 15.0'-16.5'
Sample Number: SS-2 **Date:** 10/8/18

Wood Environment and Infrastructure Solutions, Inc.
Nashville, Tennessee

Client: TDOT
Project: SR 40 over Ocoee
Project No: 579790003

Tested By: NB/KM **Checked By:** MH

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	fat clay with sand, brown	65	24	41	90.2	78.0	CH

Project No. 579790003 **Client:** TDOT

Project: SR 40 over Ocoee

Source of Sample: B-6 **Depth:** 15.0'-16.5'

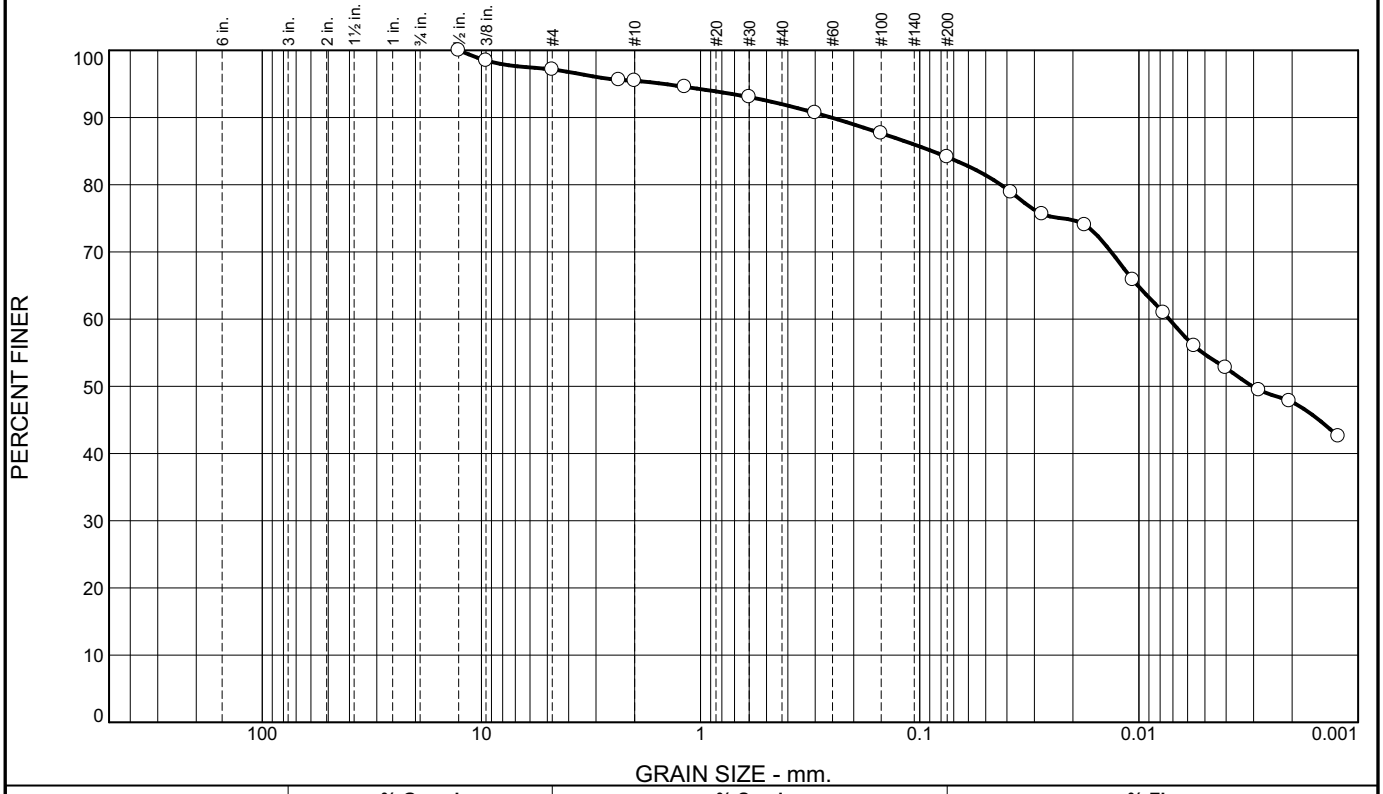
Sample Number: SS-2

Remarks:

Wood Environment and Infrastructure Solutions, Inc.
Nashville, Tennessee

Tested By: NB **Checked By:** MH

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	2.9	1.6	3.5	7.9	29.4	54.7

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1/2"	100.0		
3/8"	98.5		
#4	97.1		
#8	95.6		
#10	95.5		
#16	94.6		
#30	93.0		
#50	90.7		
#100	87.6		
#200	84.1		

* (no specification provided)

Material Description

fat clay with sand, brown

Atterberg Limits

PL= 25 LL= 68 PI= 43

Coefficients

D_{90}= 0.2537 D_{85}= 0.0879 D_{60}= 0.0073
D_{50}= 0.0030 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CH AASHTO= A-7-6(39)

Remarks

Source of Sample: B-6 **Depth:** 20.0'-21.5'
Sample Number: SS-3

Date: 10/5/18

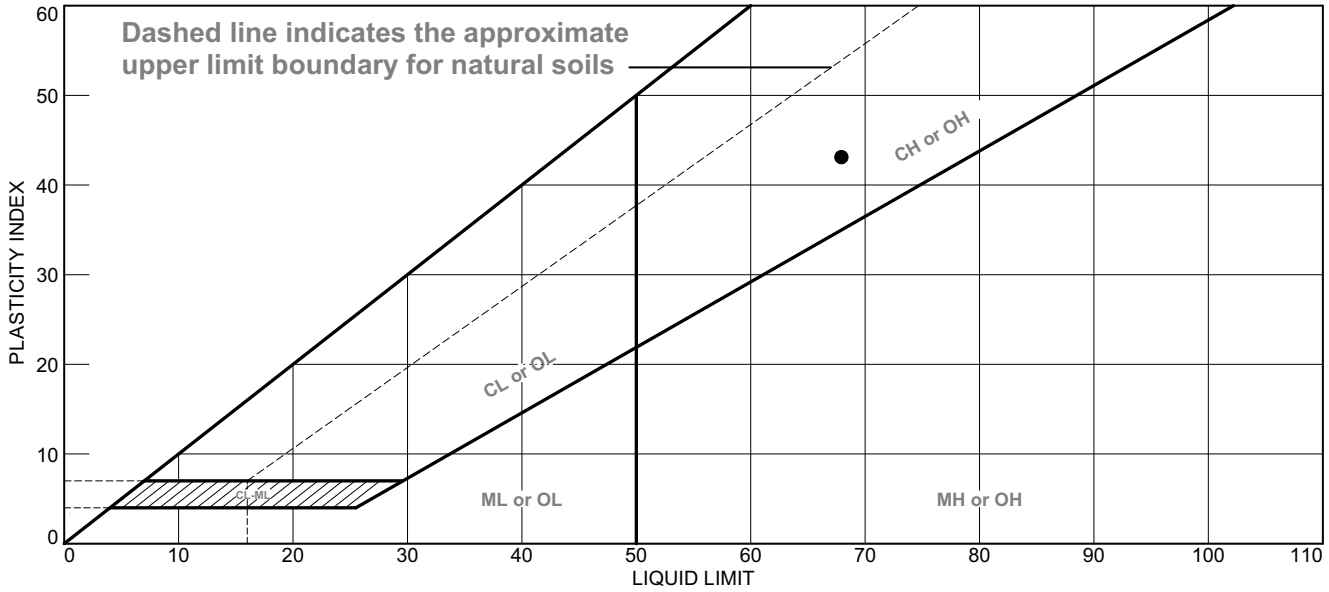
Wood Environment and Infrastructure Solutions, Inc.
Nashville, Tennessee

Client: TDOT
Project: SR 40 over Ocoee

Project No: 579790003

Tested By: NB **Checked By:** MH

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	fat clay with sand, brown	68	25	43	92.0	84.1	CH

Project No. 579790003 **Client:** TDOT

Project: SR 40 over Ocoee

Source of Sample: B-6 **Depth:** 20.0'-21.5'

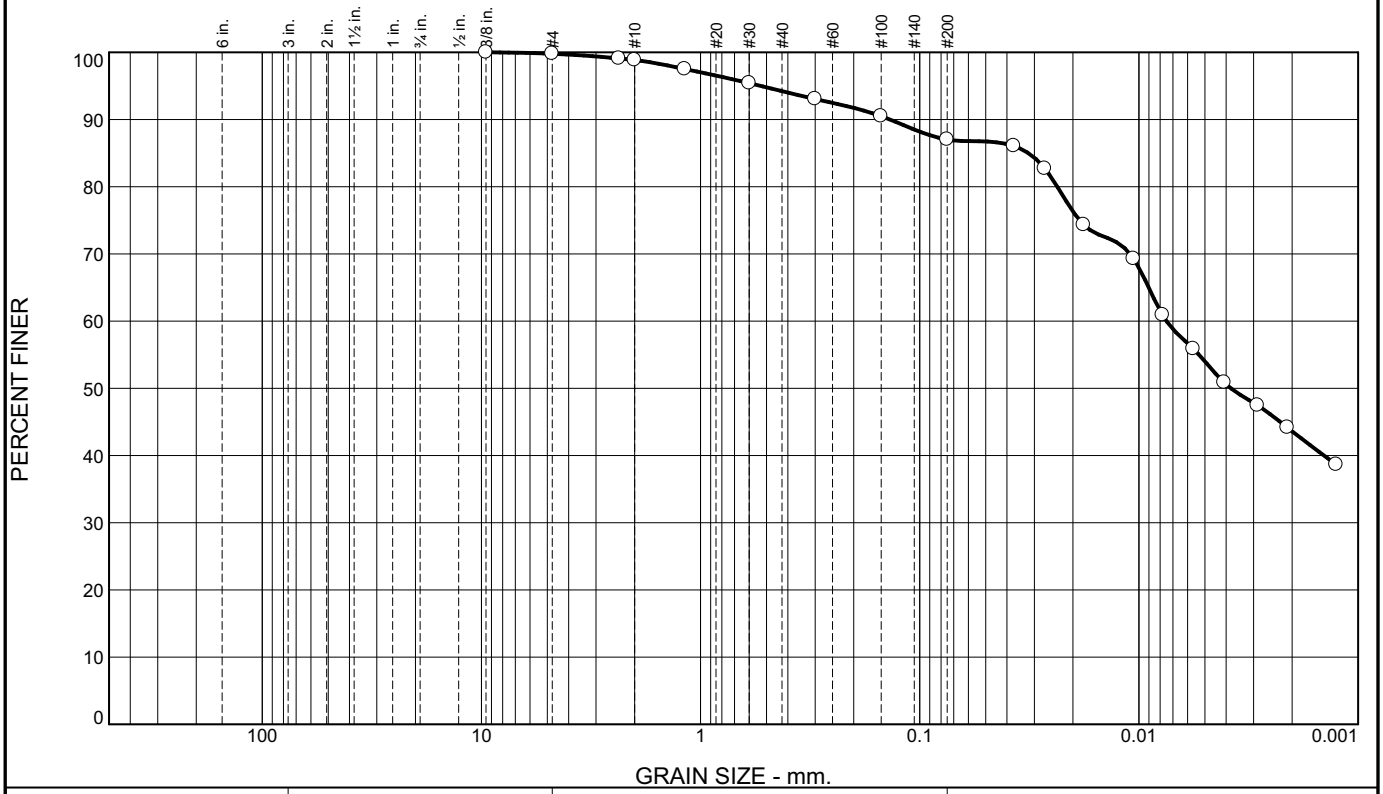
Sample Number: SS-3

Remarks:

Wood Environment and Infrastructure Solutions, Inc.
Nashville, Tennessee

Tested By: NB **Checked By:** MH

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.2	1.0	4.6	7.2	33.0	54.0

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/8"	100.0		
#4	99.8		
#8	99.1		
#10	98.8		
#16	97.5		
#30	95.4		
#50	93.0		
#100	90.5		
#200	87.0		

* (no specification provided)

Material Description

lean clay, red brown

Atterberg Limits

PL= 24 LL= 49 PI= 25

Coefficients

D_{90}= 0.1371 D_{85}= 0.0319 D_{60}= 0.0075
D_{50}= 0.0038 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CL AASHTO= A-7-6(24)

Remarks

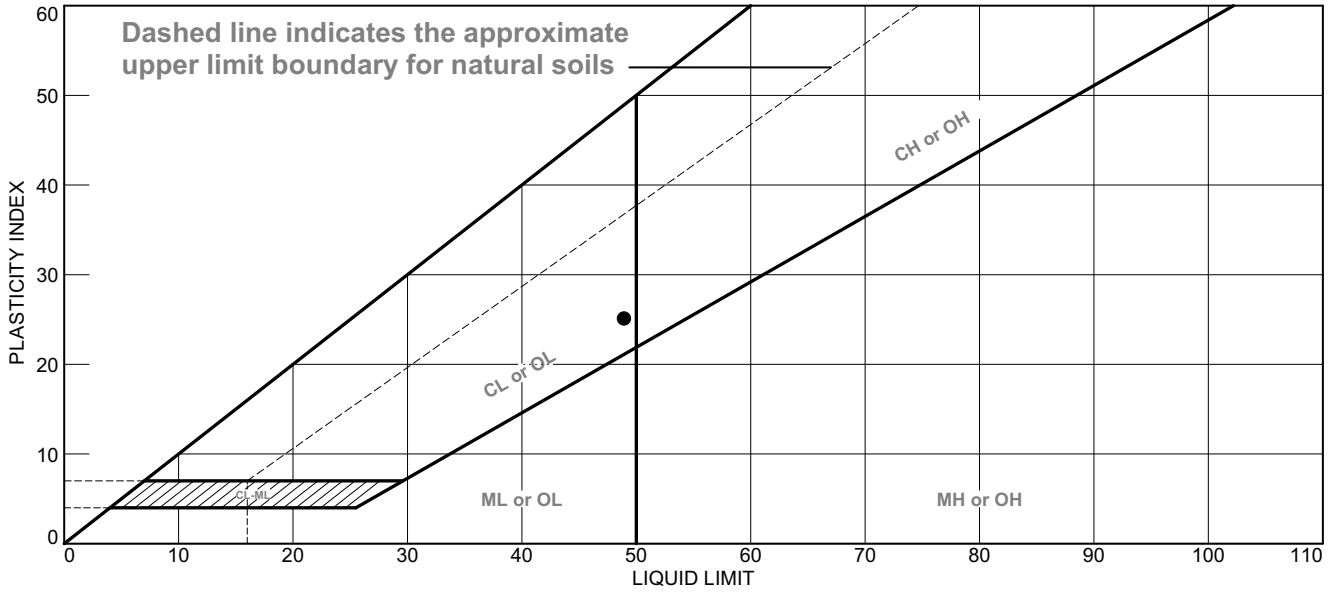
Source of Sample: B-6 **Depth:** 25.0'-26.5'
Sample Number: SS-4 **Date:** 10/4/18

Wood Environment and Infrastructure Solutions, Inc.
Nashville, Tennessee

Client: TDOT
Project: SR 40 over Ocoee
Project No: 579790003

Tested By: NB **Checked By:** MH

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	lean clay, red brown	49	24	25	94.2	87.0	CL

Project No. 579790003 **Client:** TDOT

Project: SR 40 over Ocoee

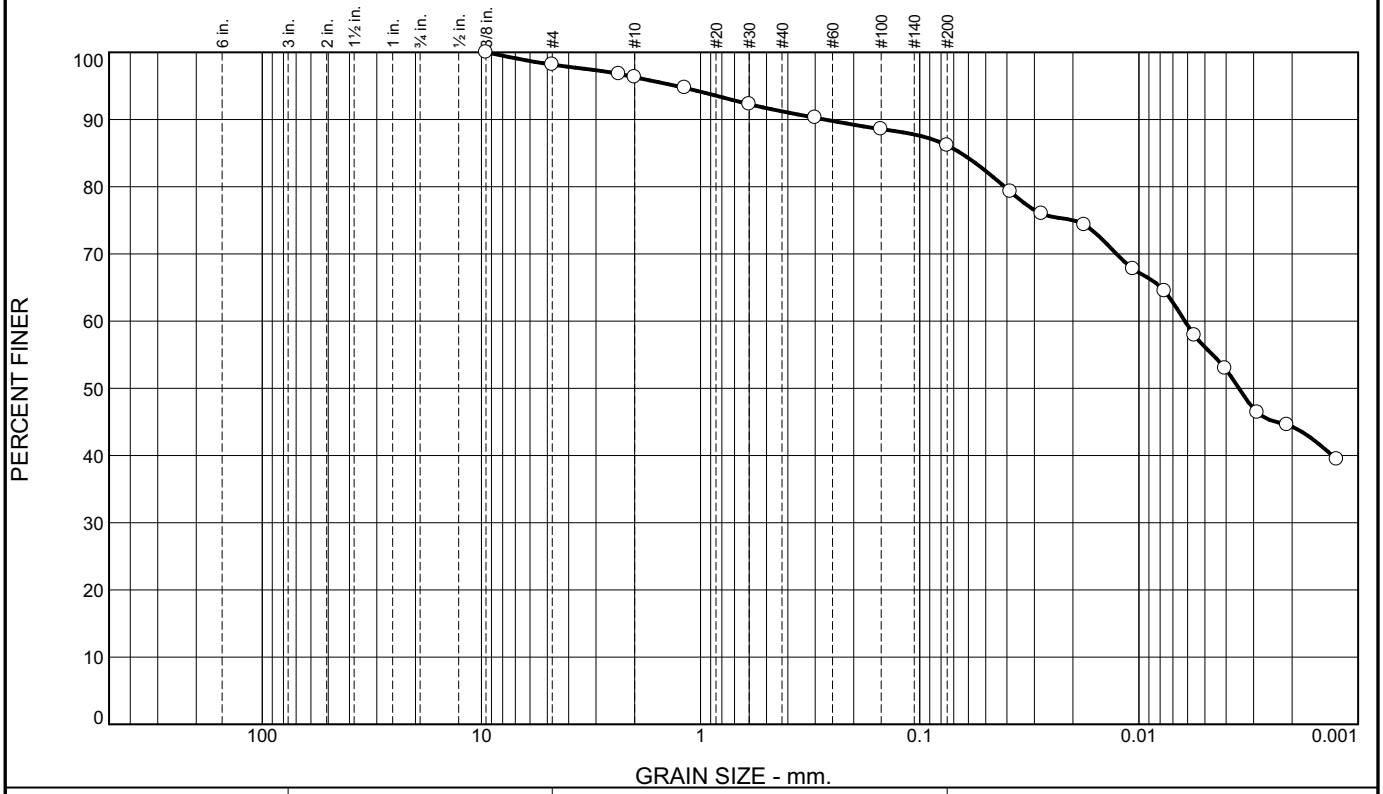
Source of Sample: B-6 **Depth:** 25.0'-26.5'
Sample Number: SS-4

Remarks:

Wood Environment and Infrastructure Solutions, Inc.
Nashville, Tennessee

Tested By: NB **Checked By:** MH

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	1.8	1.9	5.1	5.1	30.0	56.1

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/8"	100.0		
#4	98.2		
#8	96.8		
#10	96.3		
#16	94.7		
#30	92.3		
#50	90.3		
#100	88.6		
#200	86.1		

* (no specification provided)

Material Description

lean clay, red brown

Atterberg Limits

PL= 22 LL= 47 PI= 25

Coefficients

D_{90}= 0.2719 D_{85}= 0.0649 D_{60}= 0.0062
D_{50}= 0.0035 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CL AASHTO= A-7-6(23)

Remarks

Source of Sample: B-6 **Depth:** 30.0'-31.5'
Sample Number: SS-5

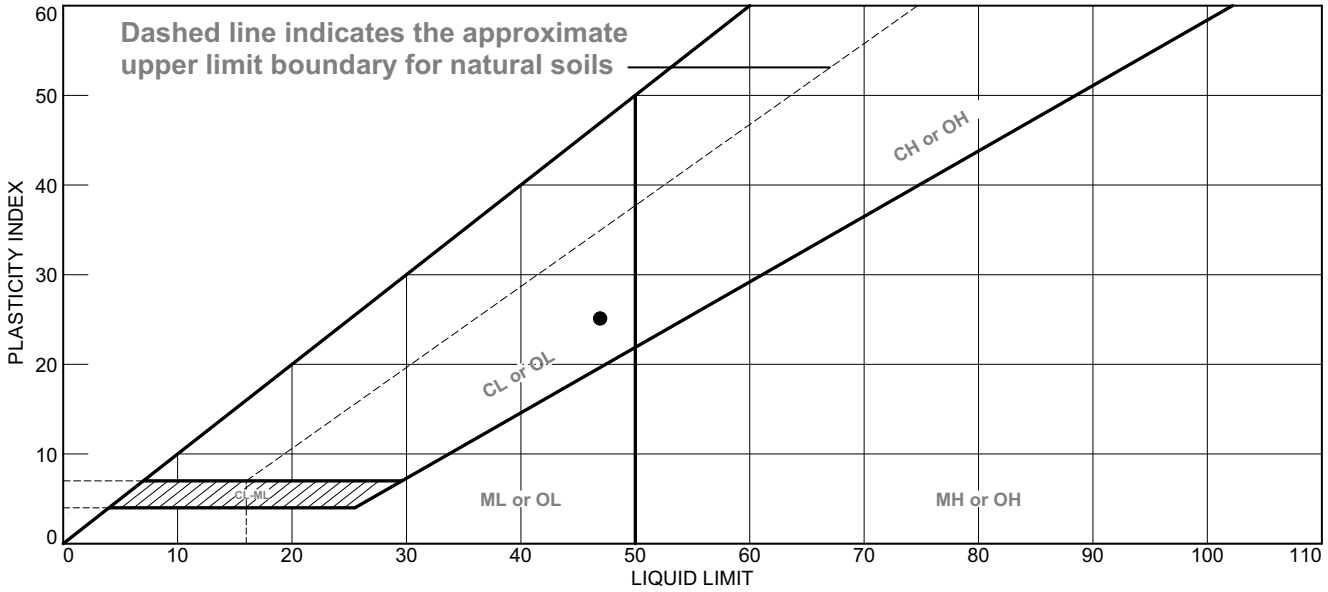
Date: 10/12/18

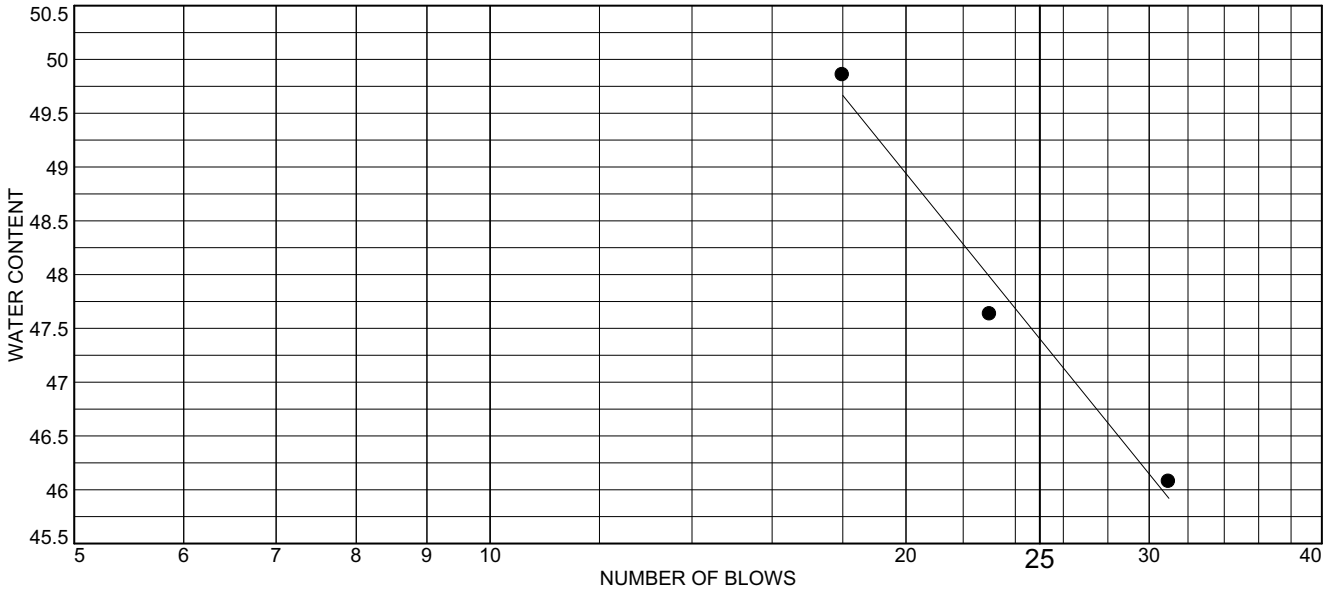
Wood Environment and Infrastructure Solutions, Inc.
Nashville, Tennessee

Client: TDOT
Project: SR 40 over Ocoee
Project No: 579790003

Tested By: KM **Checked By:** MH

LIQUID AND PLASTIC LIMITS TEST REPORT





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	lean clay, red brown	47	22	25	91.2	86.1	CL

Project No. 579790003 **Client:** TDOT

Project: SR 40 over Ocoee

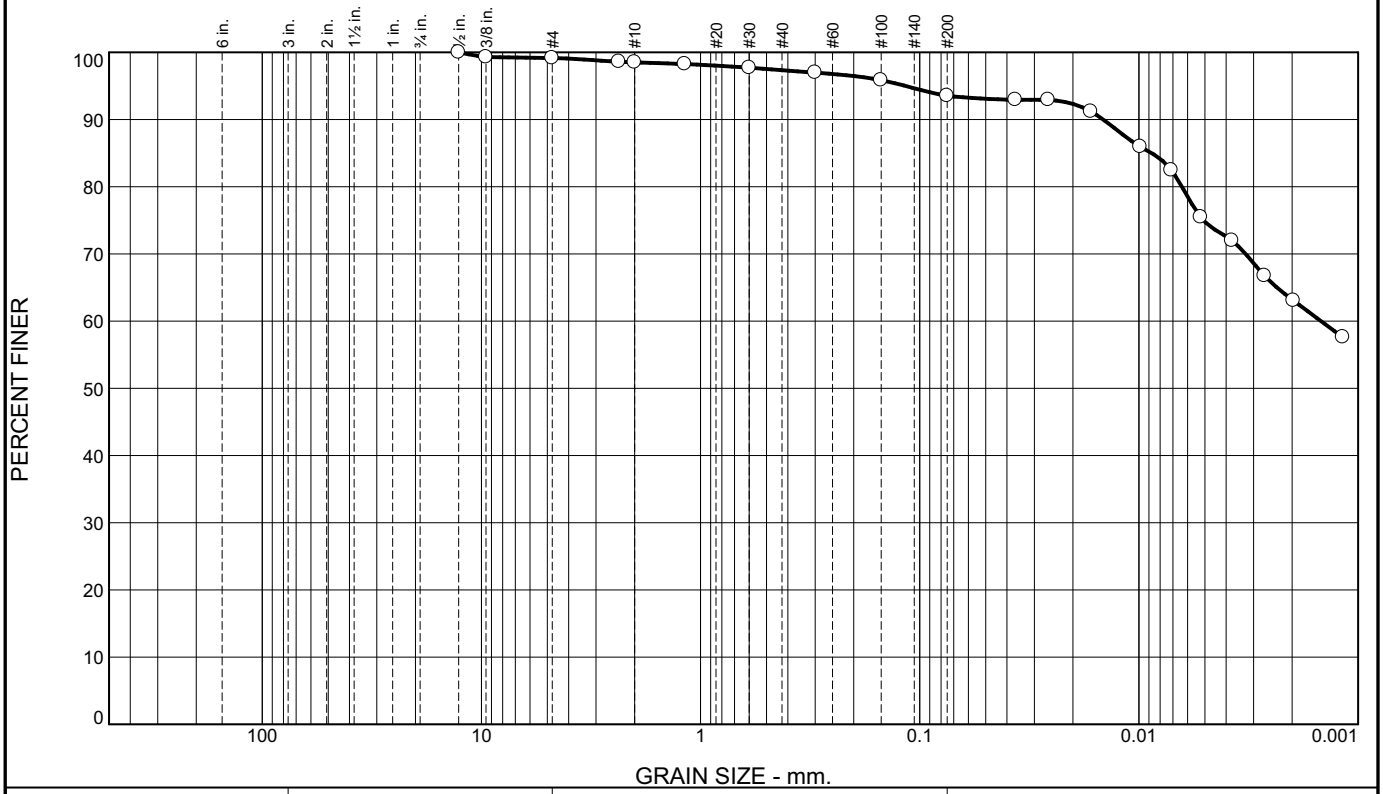
Source of Sample: B-6 **Depth:** 30.0'-31.5'
Sample Number: SS-5

Remarks:

Wood Environment and Infrastructure Solutions, Inc.
Nashville, Tennessee

Tested By: NB **Checked By:** MH

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.9	0.6	1.2	3.8	18.7	74.8

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1/2"	100.0		
3/8"	99.3		
#4	99.1		
#8	98.6		
#10	98.5		
#16	98.2		
#30	97.7		
#50	97.0		
#100	95.8		
#200	93.5		

* (no specification provided)

Material Description

fat clay, red brown

Atterberg Limits

PL= 24 LL= 55 PI= 31

Coefficients

D_{90}= 0.0146 D_{85}= 0.0088 D_{60}= 0.0015
D_{50}= D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CH AASHTO= A-7-6(33)

Remarks

Source of Sample: B-6 **Depth:** 35.0'-36.5'
Sample Number: SS-6

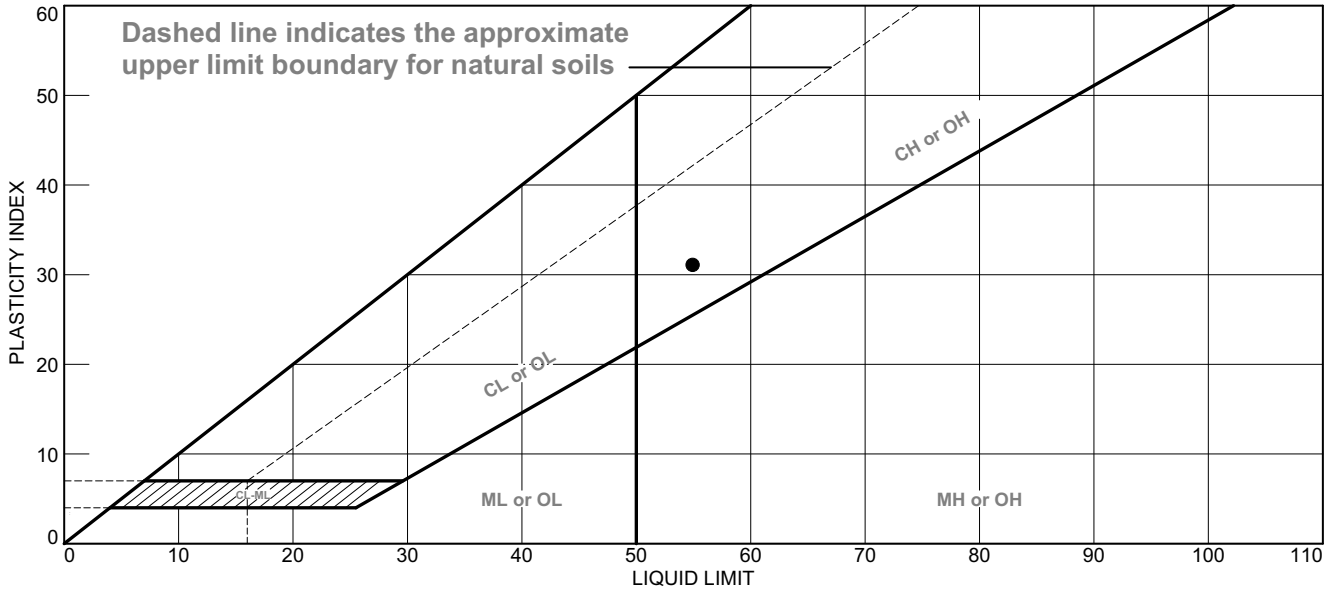
Date: 10/8/18

Wood Environment and Infrastructure Solutions, Inc.
Nashville, Tennessee

Client: TDOT
Project: SR 40 over Ocoee
Project No: 579790003

Tested By: NB **Checked By:** MH

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	fat clay, red brown	55	24	31	97.3	93.5	CH

Project No. 579790003 **Client:** TDOT

Project: SR 40 over Ocoee

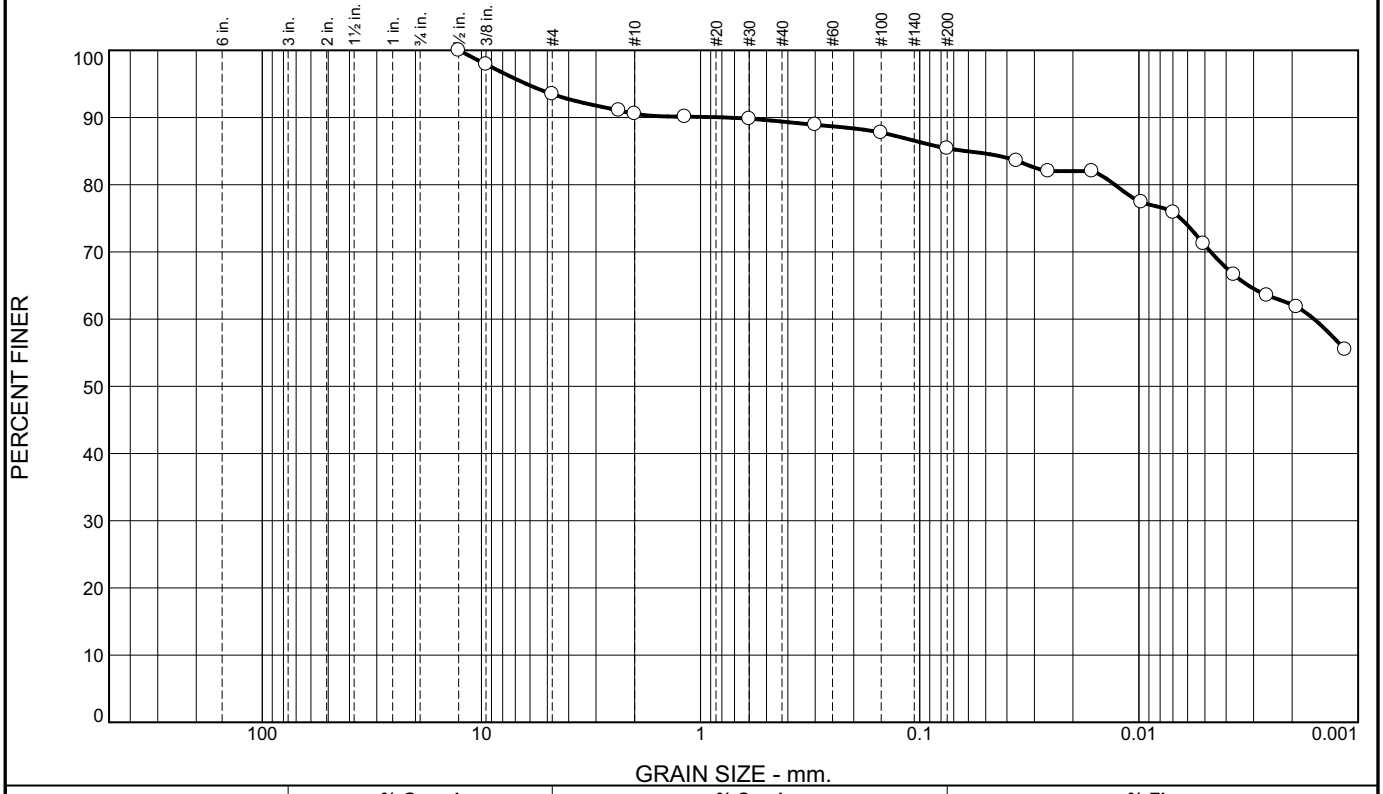
Source of Sample: B-6 **Depth:** 35.0'-36.5'
Sample Number: SS-6

Remarks:

Wood Environment and Infrastructure Solutions, Inc.
Nashville, Tennessee

Tested By: NB/KM **Checked By:** MH

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	6.5	2.9	1.2	4.0	14.4	71.0

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1/2"	100.0		
3/8"	97.9		
#4	93.5		
#8	91.0		
#10	90.6		
#16	90.1		
#30	89.8		
#50	88.9		
#100	87.7		
#200	85.4		

* (no specification provided)

Material Description

fat clay with sand, red brown

Atterberg Limits

PL= 22 LL= 57 PI= 35

Coefficients

D_{90}= 0.7811 D_{85}= 0.0613 D_{60}= 0.0016
D_{50}= D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CH AASHTO= A-7-6(32)

Remarks

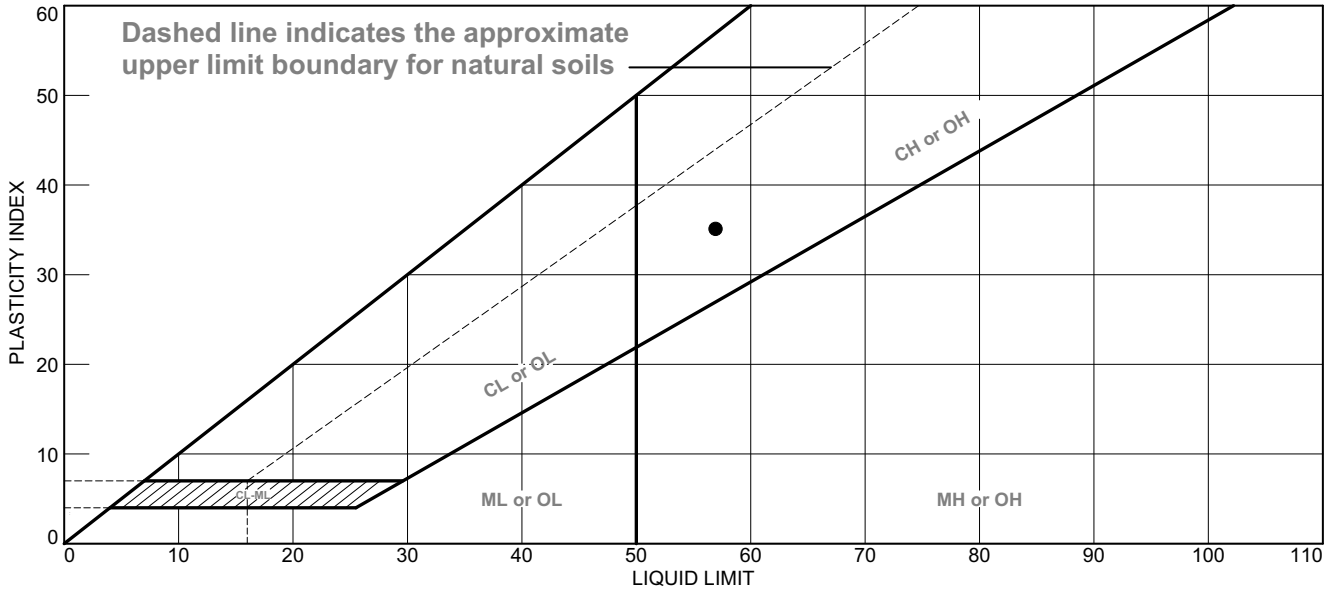
Source of Sample: B-7 **Depth:** 10.0'-11.5'
Sample Number: SS-1 **Date:** 10/12/18

Wood Environment and Infrastructure Solutions, Inc.
Nashville, Tennessee

Client: TDOT
Project: SR 40 over Ocoee
Project No: 579790003

Tested By: KM/NB **Checked By:** MH

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	fat clay with sand, red brown	57	22	35	89.4	85.4	CH

Project No. 579790003 **Client:** TDOT

Project: SR 40 over Ocoee

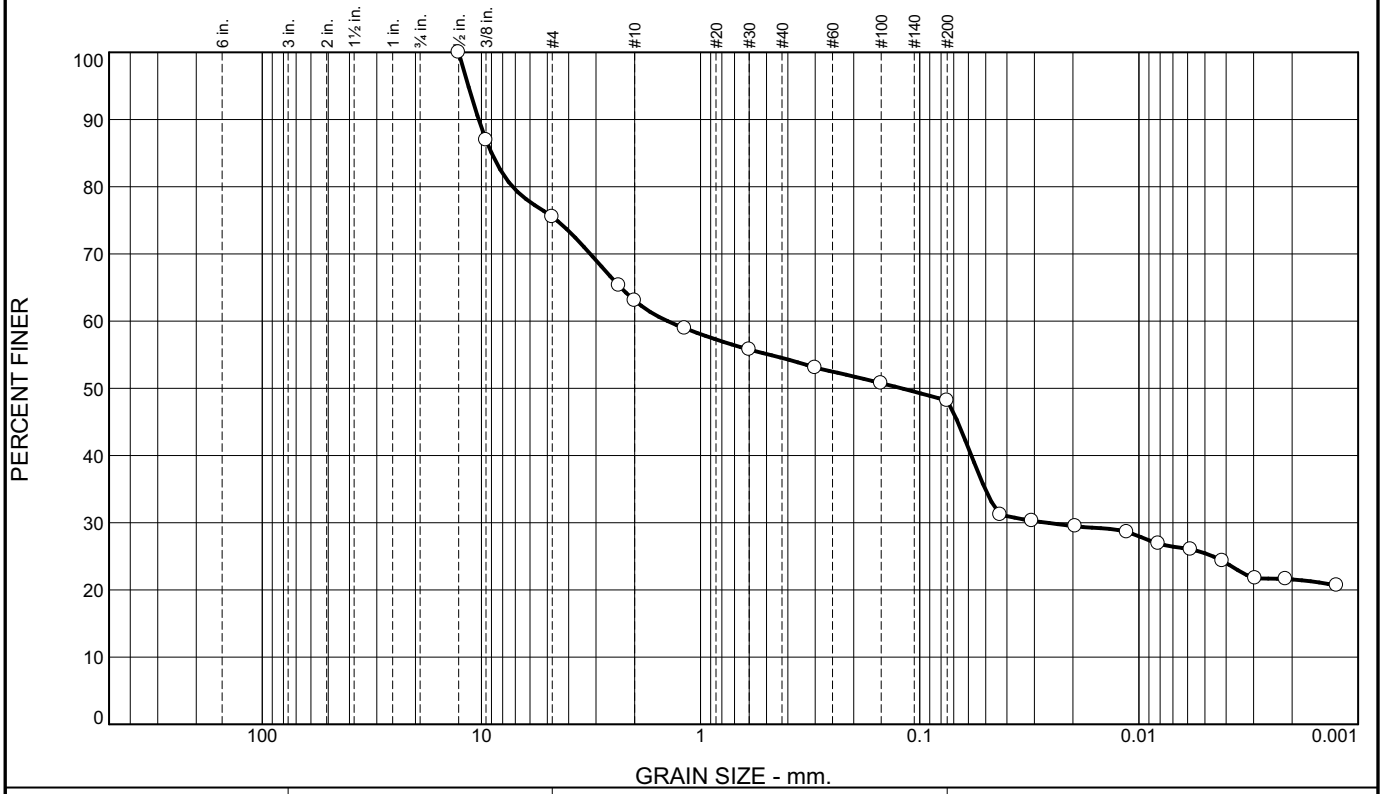
Source of Sample: B-7 **Depth:** 10.0'-11.5'
Sample Number: SS-1

Remarks:

Wood Environment and Infrastructure Solutions, Inc.
Nashville, Tennessee

Tested By: KM **Checked By:** MH

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	24.5	12.4	8.6	6.3	22.7	25.5

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1/2"	100.0		
3/8"	86.9		
#4	75.5		
#8	65.3		
#10	63.1		
#16	58.9		
#30	55.8		
#50	53.0		
#100	50.8		
#200	48.2		

* (no specification provided)

Material Description

clayey sand with gravel, red brown

Atterberg Limits

PL= 21 LL= 49 PI= 28

Coefficients

D_{90}= 10.2901 D_{85}= 8.9864 D_{60}= 1.4155
D_{50}= 0.1213 D_{30}= 0.0264 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= SC AASHTO= A-7-6(9)

Remarks

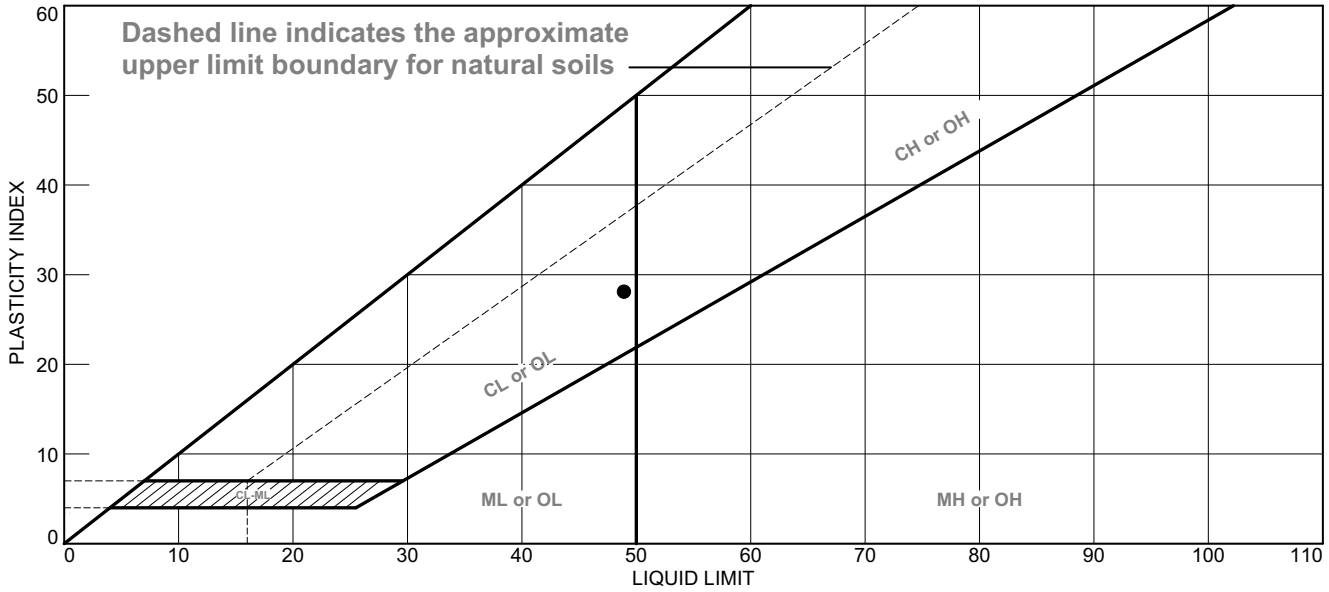
Source of Sample: B-7 **Depth:** 15.0'-16.5'
Sample Number: SS-2 **Date:** 10/12/18

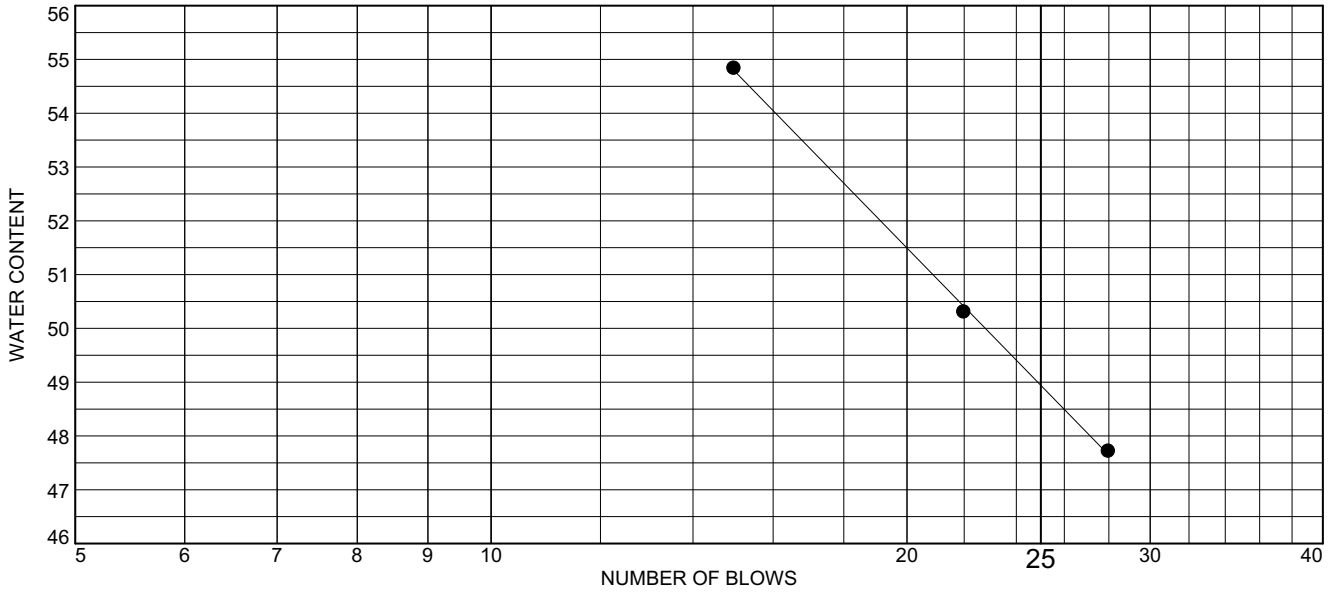
Wood Environment and Infrastructure Solutions, Inc.
Nashville, Tennessee

Client: TDOT
Project: SR 40 over Ocoee
Project No: 579790003

Tested By: MH/KM **Checked By:** MH

LIQUID AND PLASTIC LIMITS TEST REPORT





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	clayey sand with gravel, red brown	49	21	28	54.5	48.2	SC

Project No. 579790003 **Client:** TDOT

Project: SR 40 over Ocoee

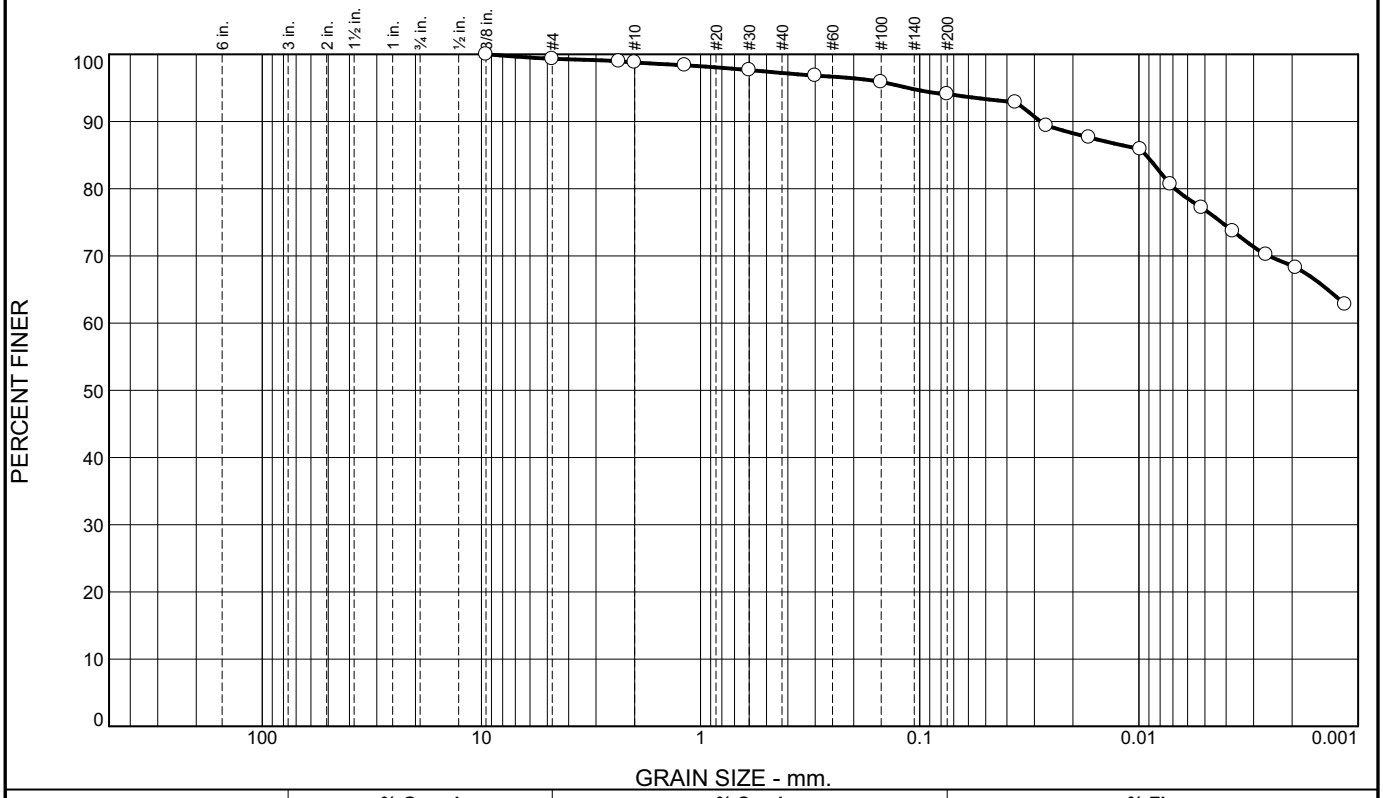
Source of Sample: B-7 **Depth:** 15.0'-16.5'
Sample Number: SS-2

Remarks:

Wood Environment and Infrastructure Solutions, Inc.
Nashville, Tennessee

Tested By: KM/MH **Checked By:** MH

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.7	0.5	1.6	3.1	17.3	76.8

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/8"	100.0		
#4	99.3		
#8	99.0		
#10	98.8		
#16	98.4		
#30	97.6		
#50	96.8		
#100	95.9		
#200	94.1		

* (no specification provided)

Material Description

fat clay, red brown

Atterberg Limits

PL= 24 LL= 63 PI= 39

Coefficients

D_{90}= 0.0281 D_{85}= 0.0093 D_{60}=
D_{50}= D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CH AASHTO= A-7-6(41)

Remarks

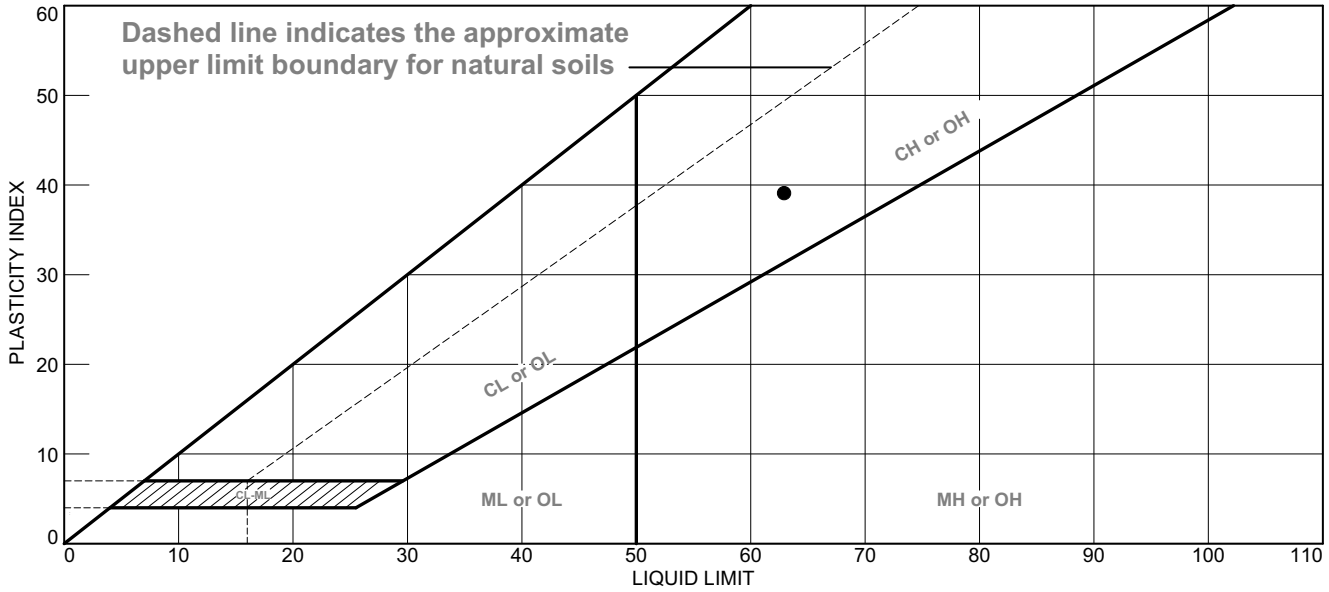
Source of Sample: B-7 **Depth:** 20.0'-21.5'
Sample Number: SS-3 **Date:** 10/8/18

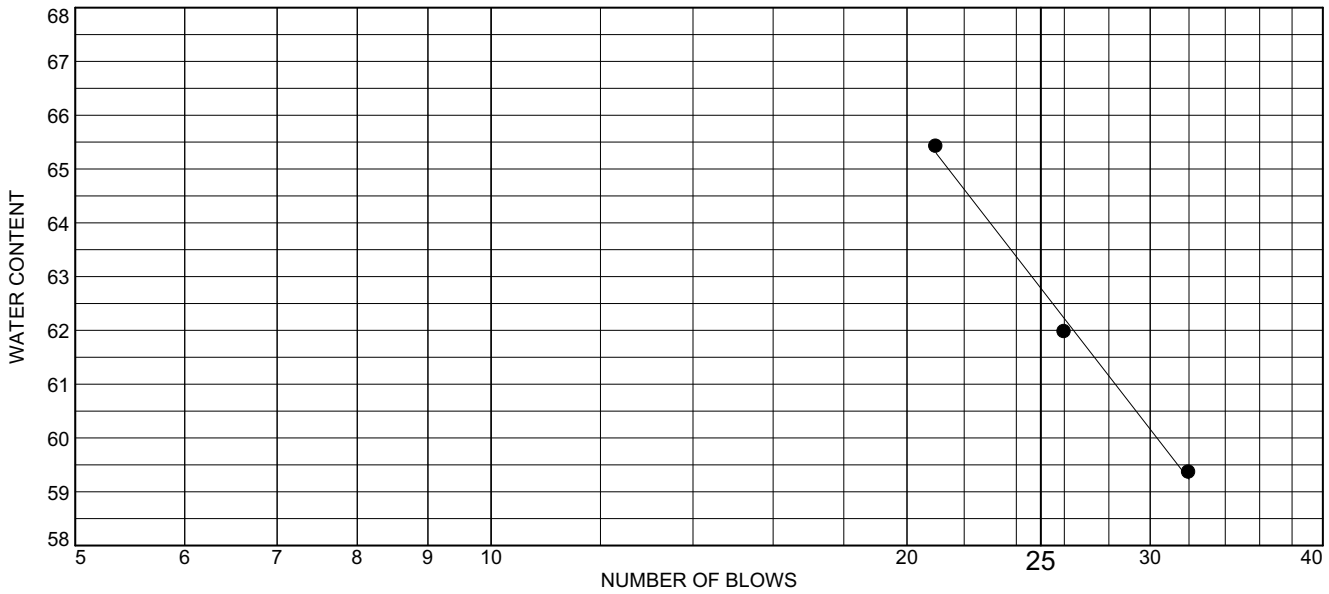
Wood Environment and Infrastructure Solutions, Inc.
Nashville, Tennessee

Client: TDOT
Project: SR 40 over Ocoee
Project No: 579790003

Tested By: NB **Checked By:** MH

LIQUID AND PLASTIC LIMITS TEST REPORT





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	fat clay, red brown	63	24	39	97.2	94.1	CH

Project No. 579790003 **Client:** TDOT

Project: SR 40 over Ocoee

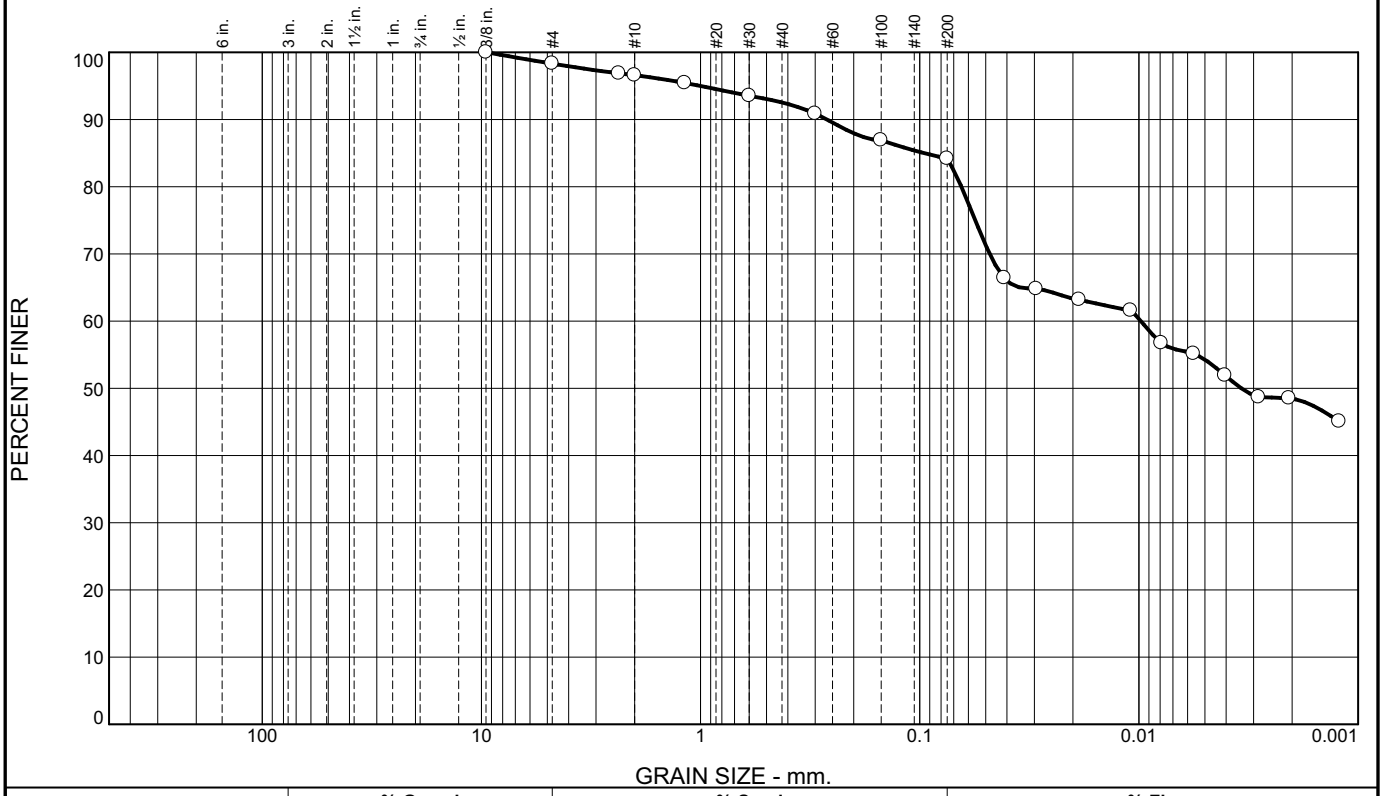
Source of Sample: B-7 **Depth:** 20.0'-21.5'
Sample Number: SS-3

Remarks:

Wood Environment and Infrastructure Solutions, Inc.
Nashville, Tennessee

Tested By: NB/KM **Checked By:** MH

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	1.7	1.7	4.1	8.3	29.9	54.3

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/8"	100.0		
#4	98.3		
#8	96.9		
#10	96.6		
#16	95.4		
#30	93.5		
#50	90.9		
#100	86.9		
#200	84.2		

* (no specification provided)

Material Description

fat clay with sand, red brown

Atterberg Limits

PL= 20 LL= 56 PI= 36

Coefficients

D_{90}= 0.2654 D_{85}= 0.0956 D_{60}= 0.0098
D_{50}= 0.0034 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CH AASHTO= A-7-6(32)

Remarks

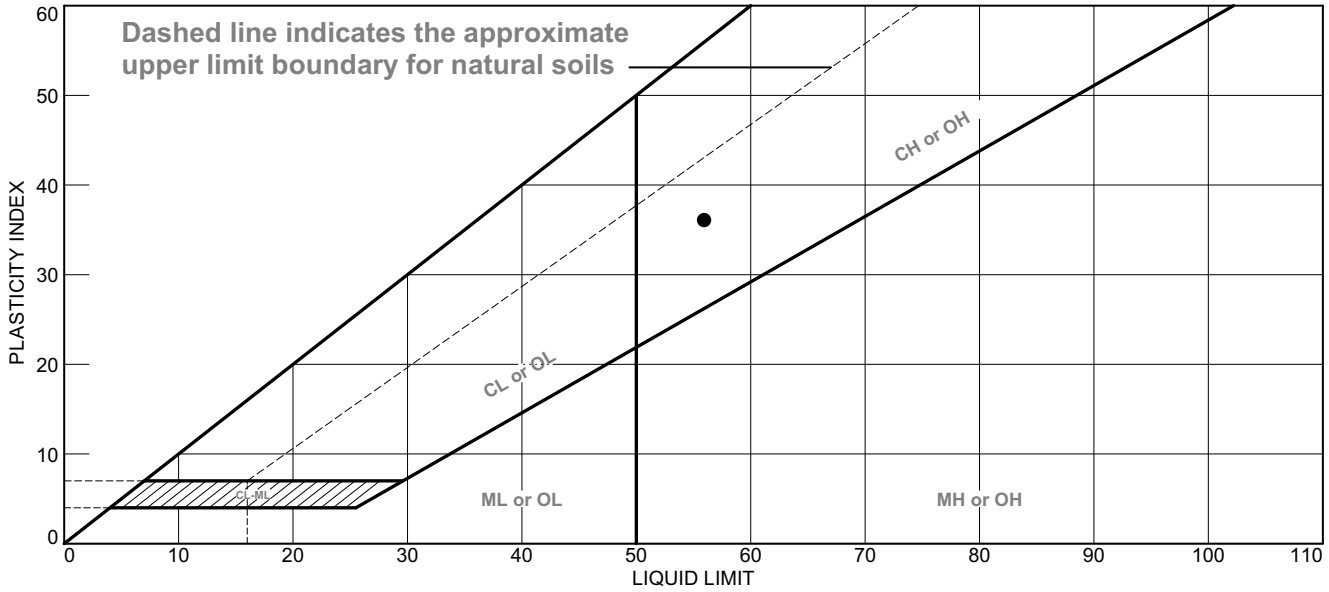
Source of Sample: B-7 **Depth:** 25.0'-26.5'
Sample Number: SS-4 **Date:** 10/9/18

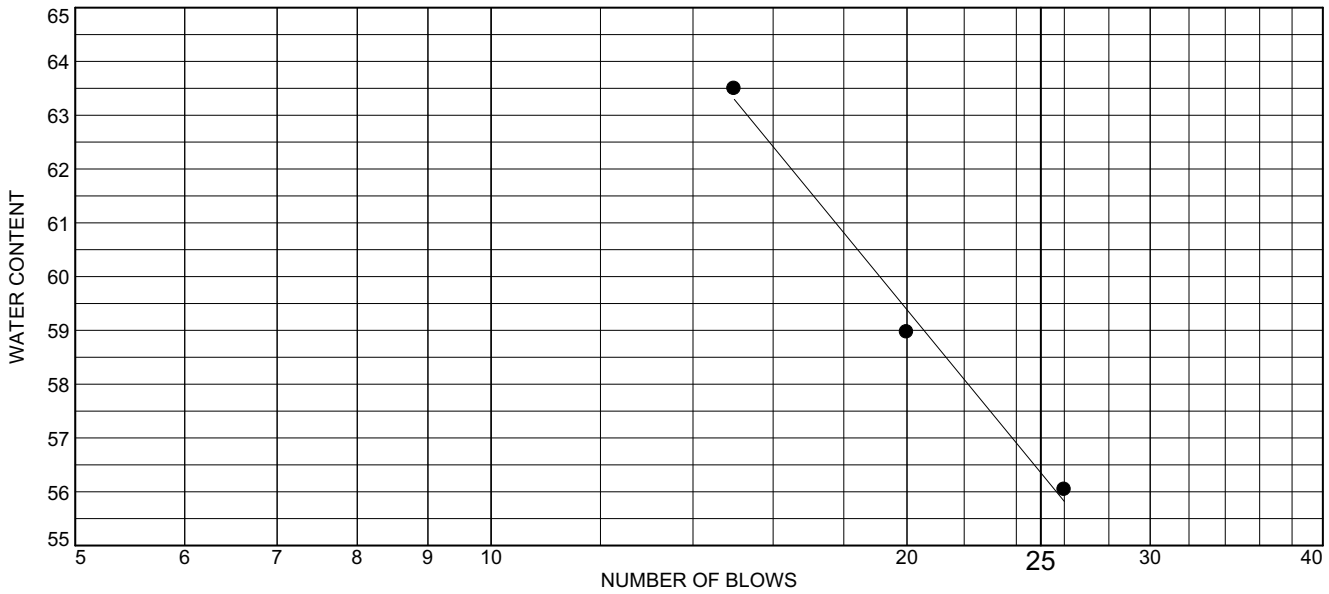
Wood Environment and Infrastructure Solutions, Inc.
Nashville, Tennessee

Client: TDOT
Project: SR 40 over Ocoee
Project No: 579790003

Tested By: MH/NB **Checked By:** MH

LIQUID AND PLASTIC LIMITS TEST REPORT





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	fat clay with sand, red brown	56	20	36	92.5	84.2	CH

Project No. 579790003 **Client:** TDOT

Project: SR 40 over Ocoee

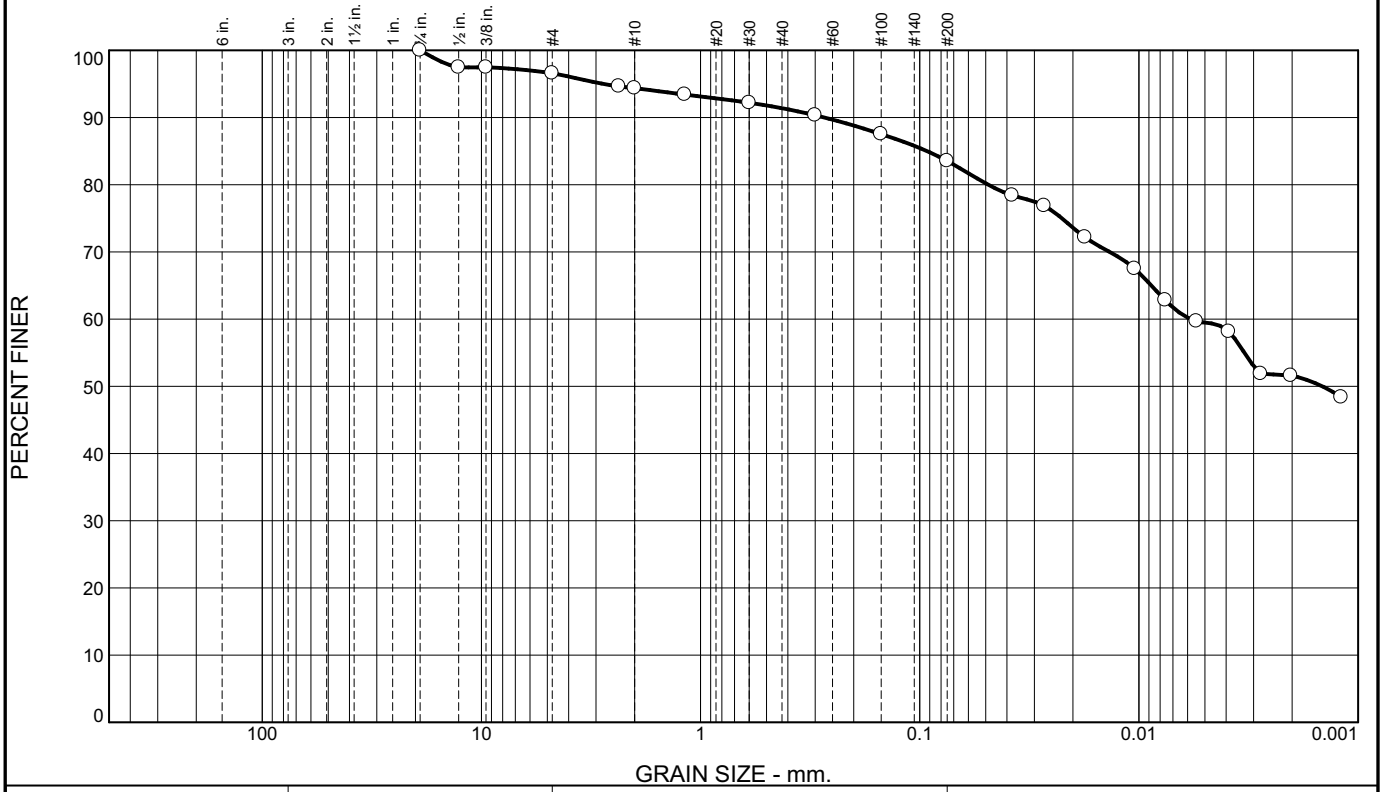
Source of Sample: B-7 **Depth:** 25.0'-26.5'
Sample Number: SS-4

Remarks:

Wood Environment and Infrastructure Solutions, Inc.
Nashville, Tennessee

Tested By: MH/KM **Checked By:** MH

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	3.4	2.3	2.9	7.9	24.0	59.5

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/4"	100.0		
1/2"	97.5		
3/8"	97.5		
#4	96.6		
#8	94.6		
#10	94.3		
#16	93.4		
#30	92.2		
#50	90.3		
#100	87.5		
#200	83.5		

* (no specification provided)

Material Description

lean clay with sand, red brown

Atterberg Limits

PL= 18 LL= 48 PI= 30

Coefficients

D_{90}= 0.2729 D_{85}= 0.0927 D_{60}= 0.0058
D_{50}= 0.0015 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CL AASHTO= A-7-6(26)

Remarks

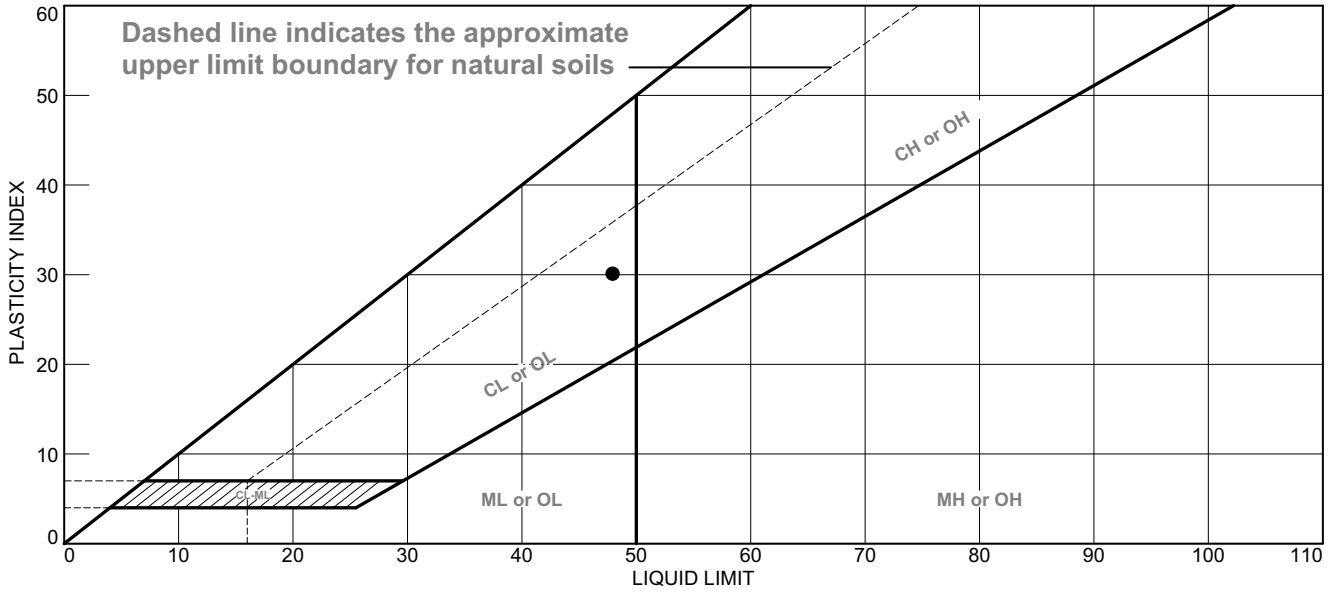
Source of Sample: B-8 **Depth:** 4.5'-6.5'
Sample Number: ST-1 **Date:** 10/12/18

Wood Environment and Infrastructure Solutions, Inc.
Nashville, Tennessee

Client: TDOT
Project: SR 40 over Ocoee
Project No: 579790003

Tested By: NB/MH **Checked By:** MH

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	lean clay with sand, red brown	48	18	30	91.4	83.5	CL

Project No. 579790003 **Client:** TDOT

Project: SR 40 over Ocoee

Source of Sample: B-8 **Depth:** 4.5'-6.5'

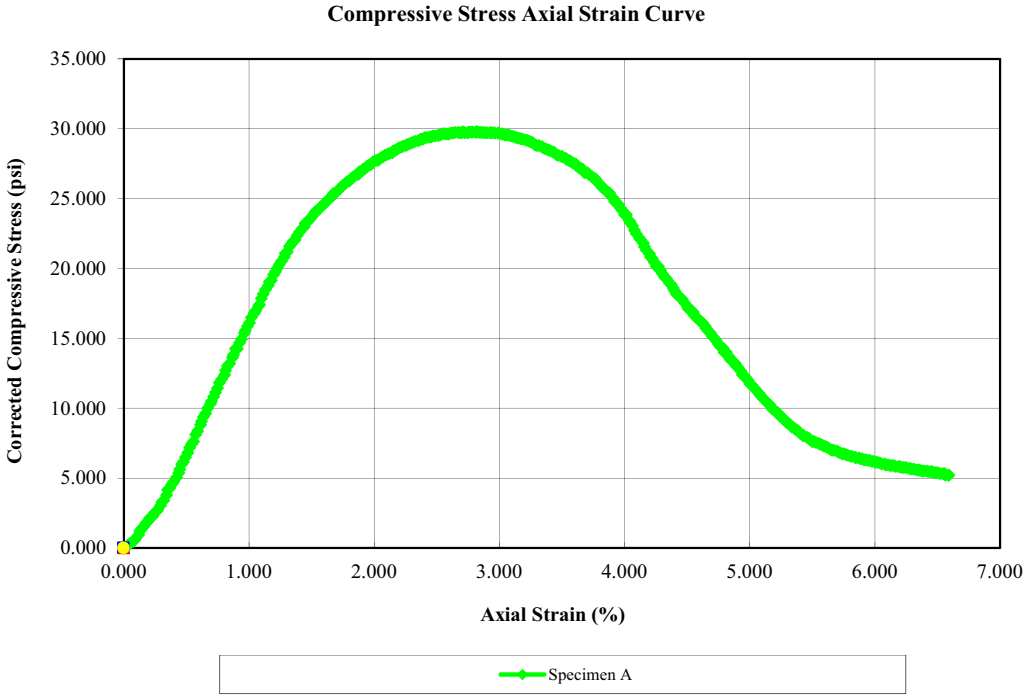
Sample Number: ST-1

Remarks:

Wood Environment and Infrastructure Solutions, Inc.
Nashville, Tennessee

Tested By: MH/JB **Checked By:** MH

Unconfined Compression Test Report (ASTM D2166)



Before Test	Specimen A	FAILURE PHOTO
Water Content (%)	27.29	
Dry Density (pcf)	95.800	
Saturation (%)	99.39	
Void Ratio	0.73	
Diameter (in)	2.873	
Height (in)	7.168	
Test Data	**A**	
Unconfined Strength (psi)	29.811	
Undrained Shear Strength (tsf)	1.073	
Undrained Shear Strength (psi)	14.905	
Rate of Strain (in/min)	0.071100	
Strain at Failure (%)		

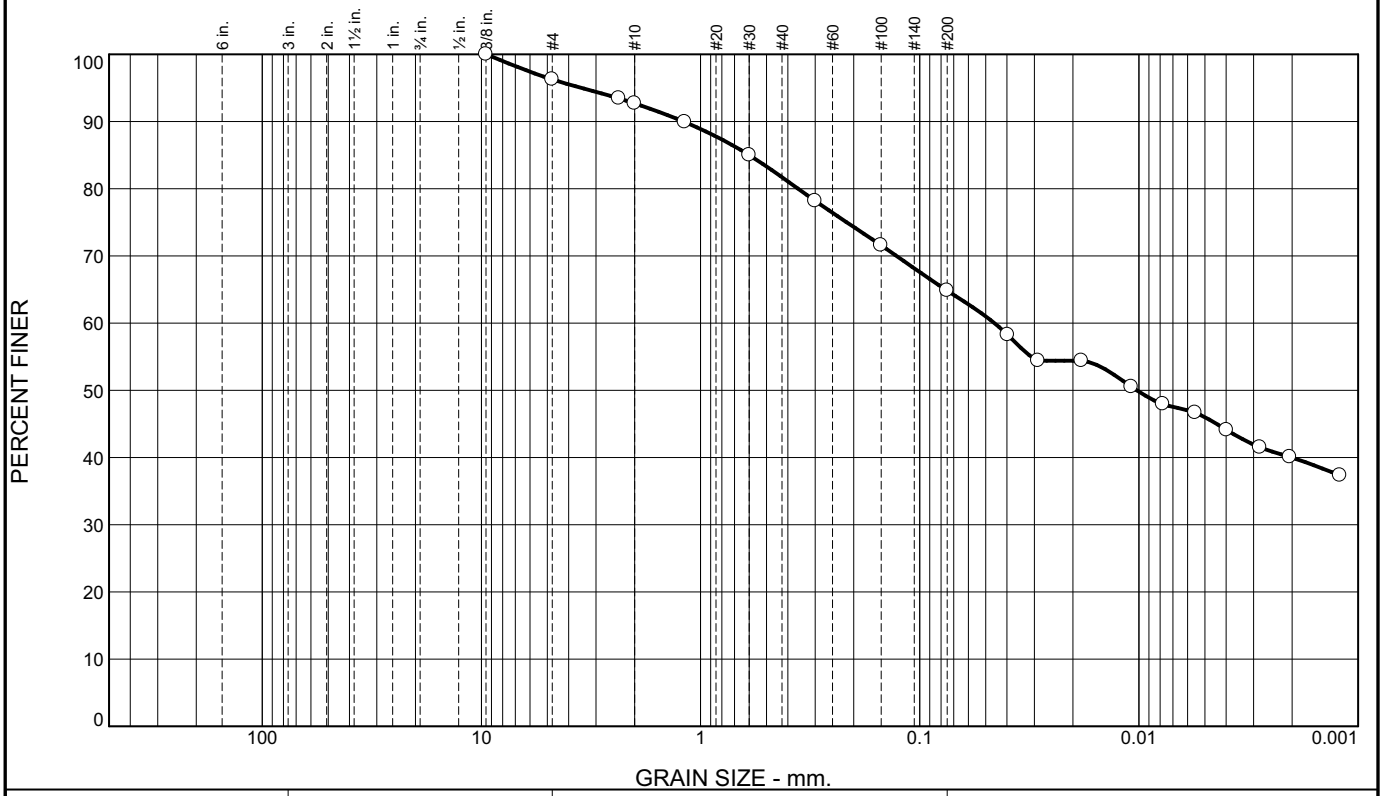
Project Information		Specimen Description
Client	TDOT	Specimen A
Project	TDOT SR 40 Ocoee	
Project No.	579790003	
Boring No.	B-8 ST-1 4.5'-6.5'	

Sample Description	lean clay with sand, red brown	Test Variables	
		Specific Gravity	2.65
		Liquid Limit:	48.0
		Plastic Limit:	18.0

Remarks

Tested By: M. Haley Reviewed By: _____

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	3.7	3.6	11.0	16.9	18.8	46.0

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/8"	100.0		
#4	96.3		
#8	93.4		
#10	92.7		
#16	89.9		
#30	85.0		
#50	78.2		
#100	71.6		
#200	64.8		

* (no specification provided)

Material Description

sandy lean clay, red brown

Atterberg Limits

PL= 21 LL= 47 PI= 26

Coefficients

D_{90}= 1.1979 D_{85}= 0.6004 D_{60}= 0.0457
D_{50}= 0.0102 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CL AASHTO= A-7-6(15)

Remarks

Source of Sample: B-8 **Depth:** 9.5'-11.0'
Sample Number: SS-1

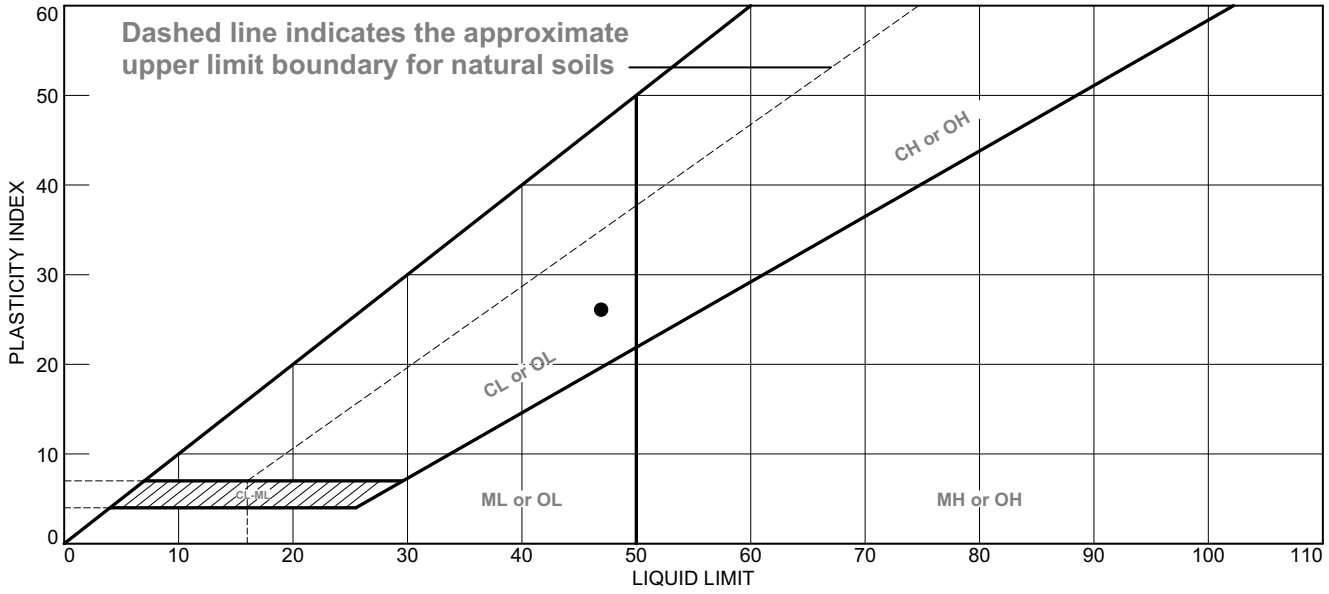
Date: 10/9/18

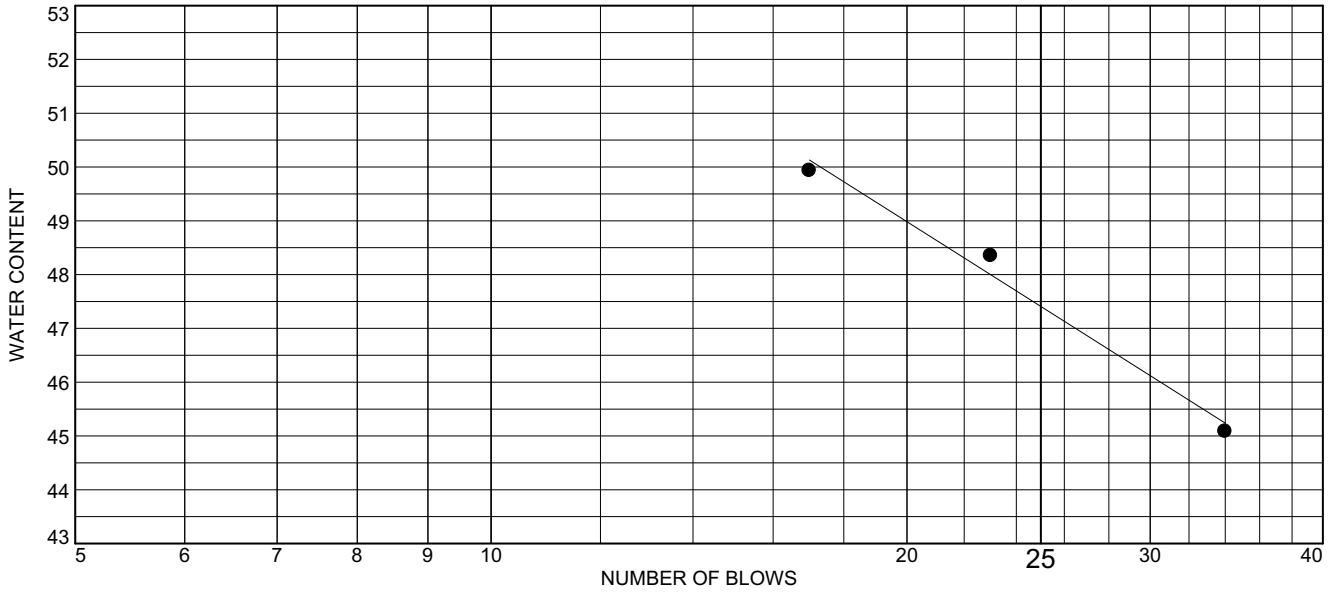
Wood Environment and Infrastructure Solutions, Inc.
Nashville, Tennessee

Client: TDOT
Project: SR 40 over Ocoee
Project No: 579790003

Tested By: MH/NB **Checked By:** MH

LIQUID AND PLASTIC LIMITS TEST REPORT





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	sandy lean clay, red brown	47	21	26	81.7	64.8	CL

Project No. 579790003 **Client:** TDOT

Project: SR 40 over Ocoee

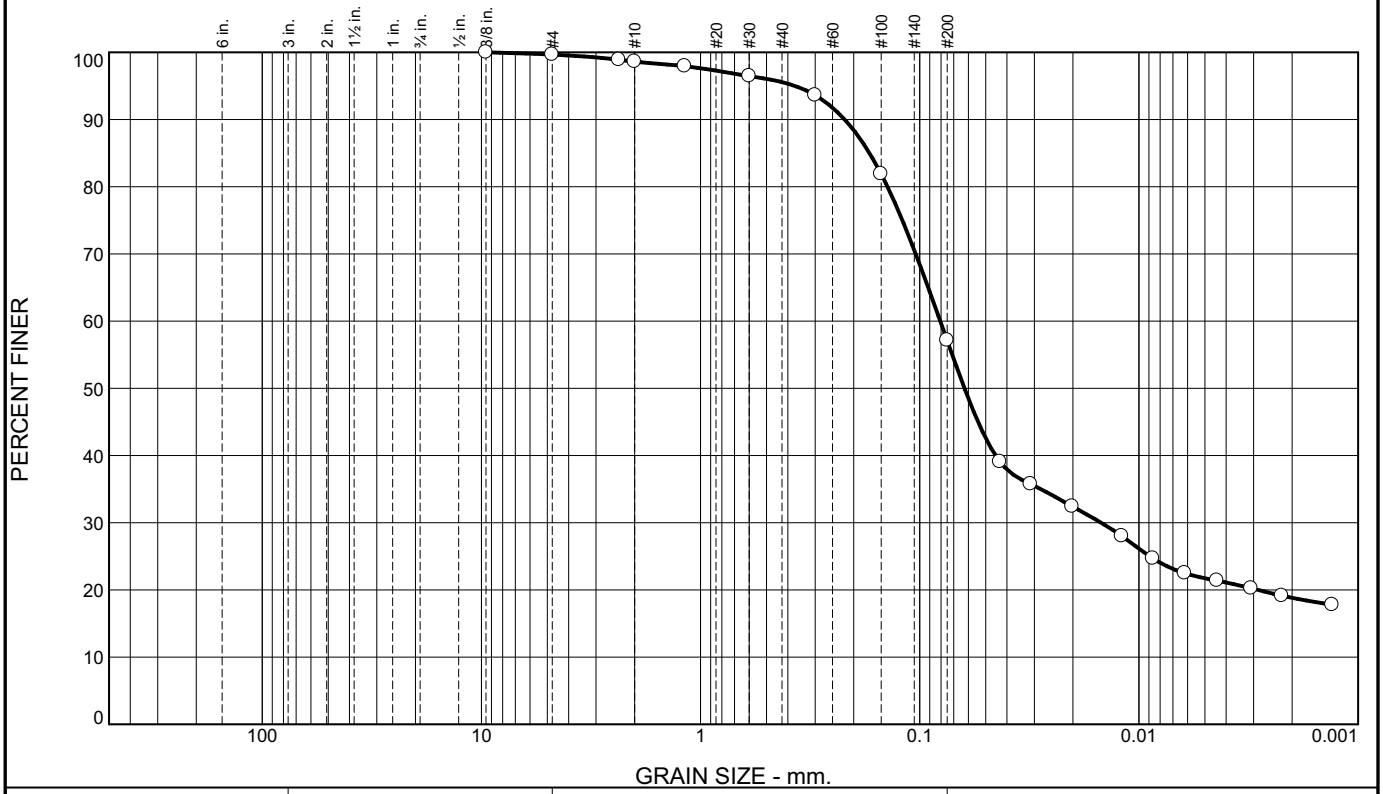
Source of Sample: B-8 **Depth:** 9.5'-11.0'
Sample Number: SS-1

Remarks:

Wood Environment and Infrastructure Solutions, Inc.
Nashville, Tennessee

Tested By: MH/JB **Checked By:** MH

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.3	1.1	3.0	38.5	35.4	21.7

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/8"	100.0		
#4	99.7		
#8	98.9		
#10	98.6		
#16	97.9		
#30	96.5		
#50	93.6		
#100	81.9		
#200	57.1		

* (no specification provided)

Material Description

sandy silt, brown

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D_{90}= 0.2201 D_{85}= 0.1696 D_{60}= 0.0806
D_{50}= 0.0625 D_{30}= 0.0149 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= ML AASHTO= A-4(0)

Remarks

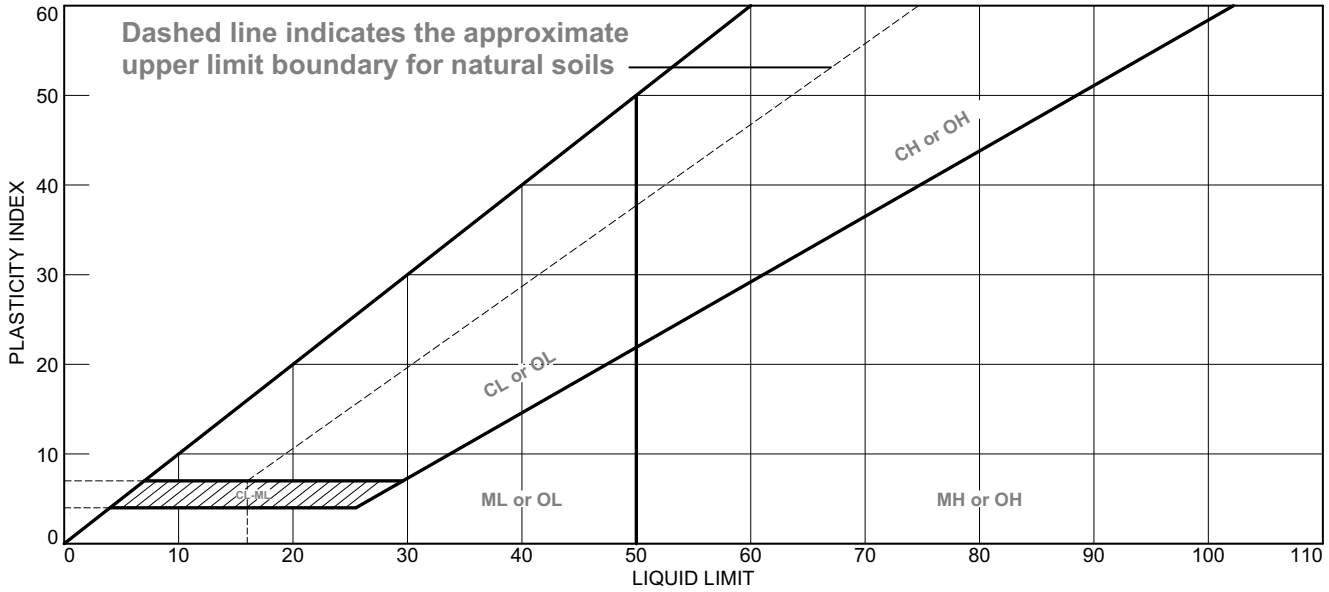
Source of Sample: B-11 **Depth:** 4.5'-6.0'
Sample Number: SS-1 **Date:** 10/5/18

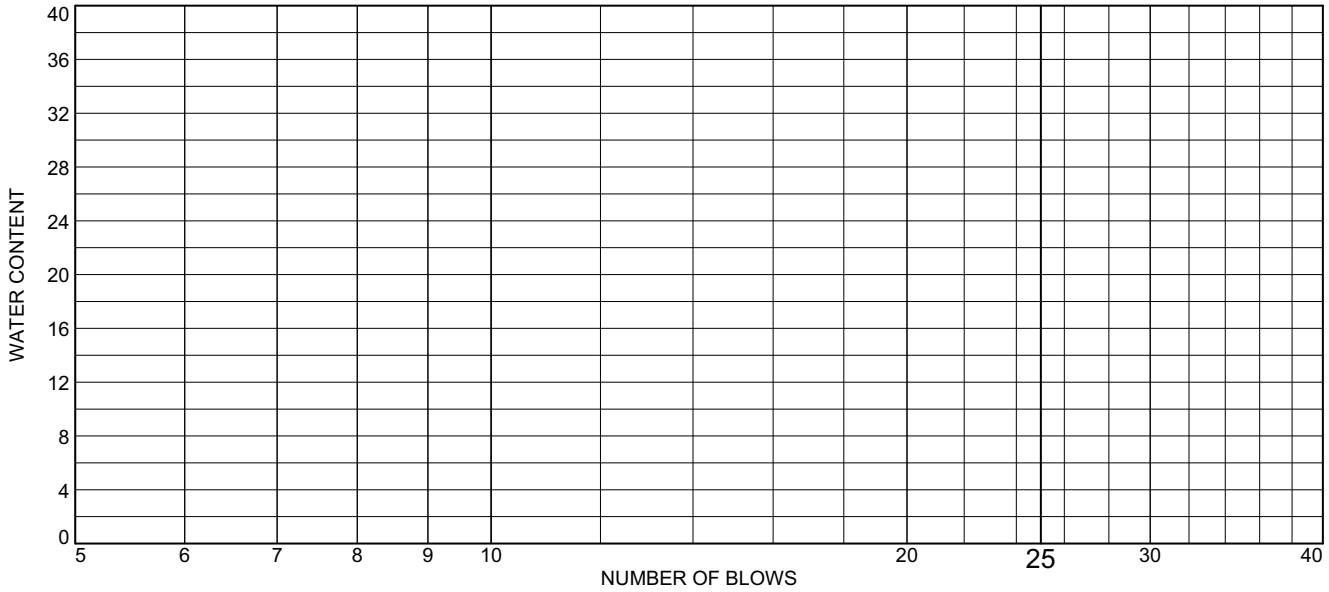
Wood Environment and Infrastructure Solutions, Inc.
Nashville, Tennessee

Client: TDOT
Project: SR 40 over Ocoee
Project No: 579790003

Tested By: NB **Checked By:** MH

LIQUID AND PLASTIC LIMITS TEST REPORT





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	sandy silt, brown	NV	NP	NP	95.6	57.1	ML

Project No. 579790003 **Client:** TDOT

Project: SR 40 over Ocoee

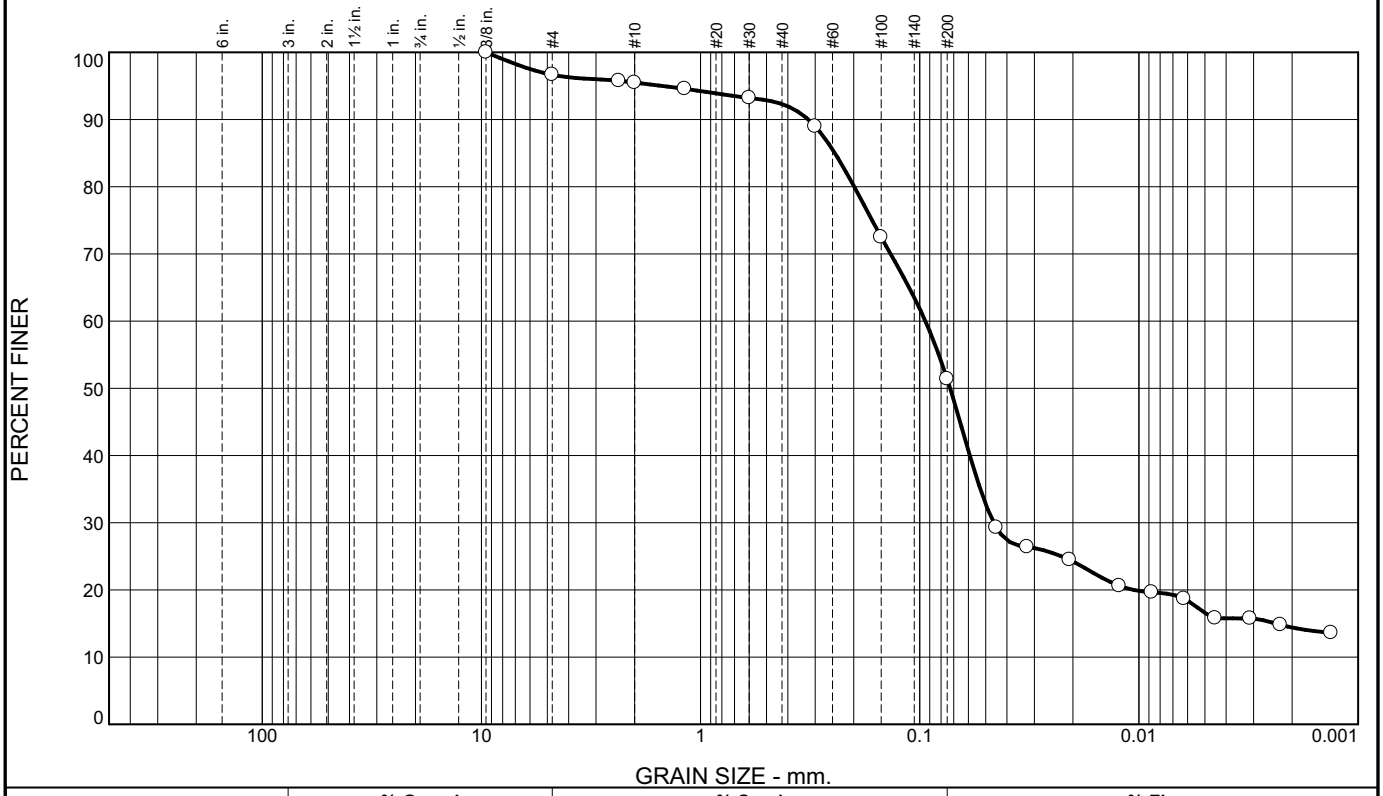
Source of Sample: B-11 **Depth:** 4.5'-6.0'
Sample Number: SS-1

Remarks:

Wood Environment and Infrastructure Solutions, Inc.
Nashville, Tennessee

Tested By: NB **Checked By:** MH

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	3.4	1.1	3.2	40.9	34.8	16.6

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/8"	100.0		
#4	96.6		
#8	95.8		
#10	95.5		
#16	94.6		
#30	93.2		
#50	89.0		
#100	72.5		
#200	51.4		

* (no specification provided)

Material Description

sandy silt, brown

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D_{90}= 0.3228 D_{85}= 0.2441 D_{60}= 0.0943
D_{50}= 0.0727 D_{30}= 0.0460 D_{15}= 0.0024
D_{10}= C_u= C_c=

Classification

USCS= ML AASHTO= A-4(0)

Remarks

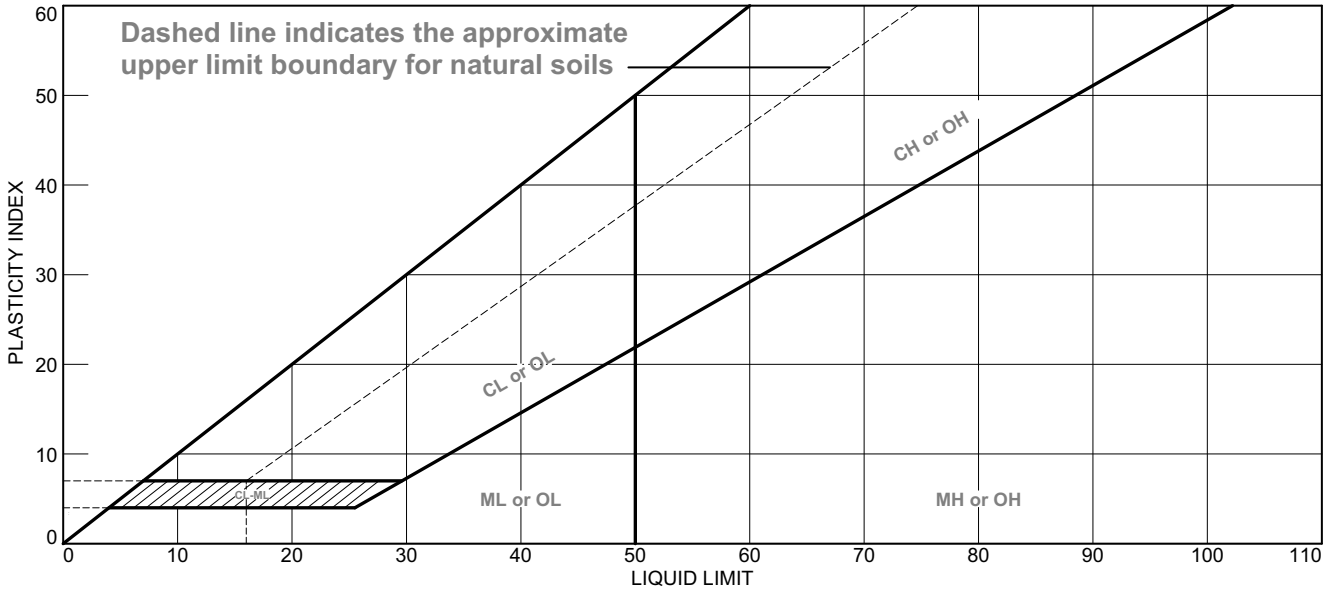
Source of Sample: B-11 **Depth:** 14.5'-16.0'
Sample Number: SS-3 **Date:** 10/6/18

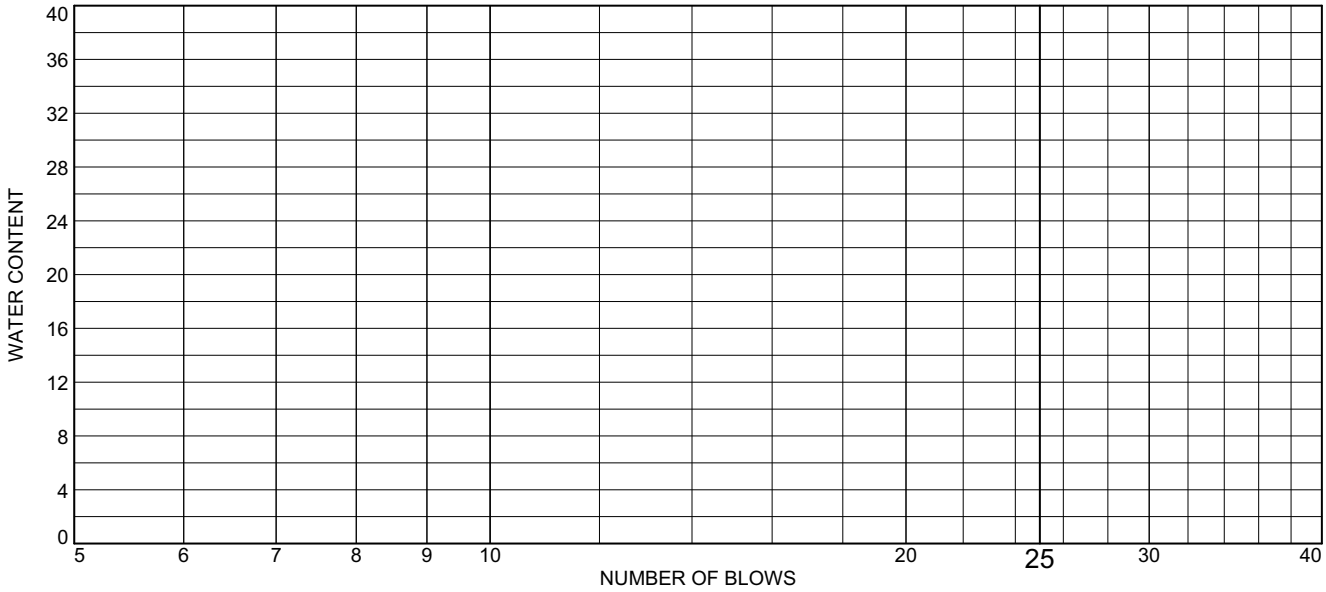
Wood Environment and Infrastructure Solutions, Inc.
Nashville, Tennessee

Client: TDOT
Project: SR 40 over Ocoee
Project No: 579790003

Tested By: NB **Checked By:** MH

LIQUID AND PLASTIC LIMITS TEST REPORT





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	sandy silt, brown	NV	NP	NP	92.3	51.4	ML

Project No. 579790003 **Client:** TDOT

Project: SR 40 over Ocoee

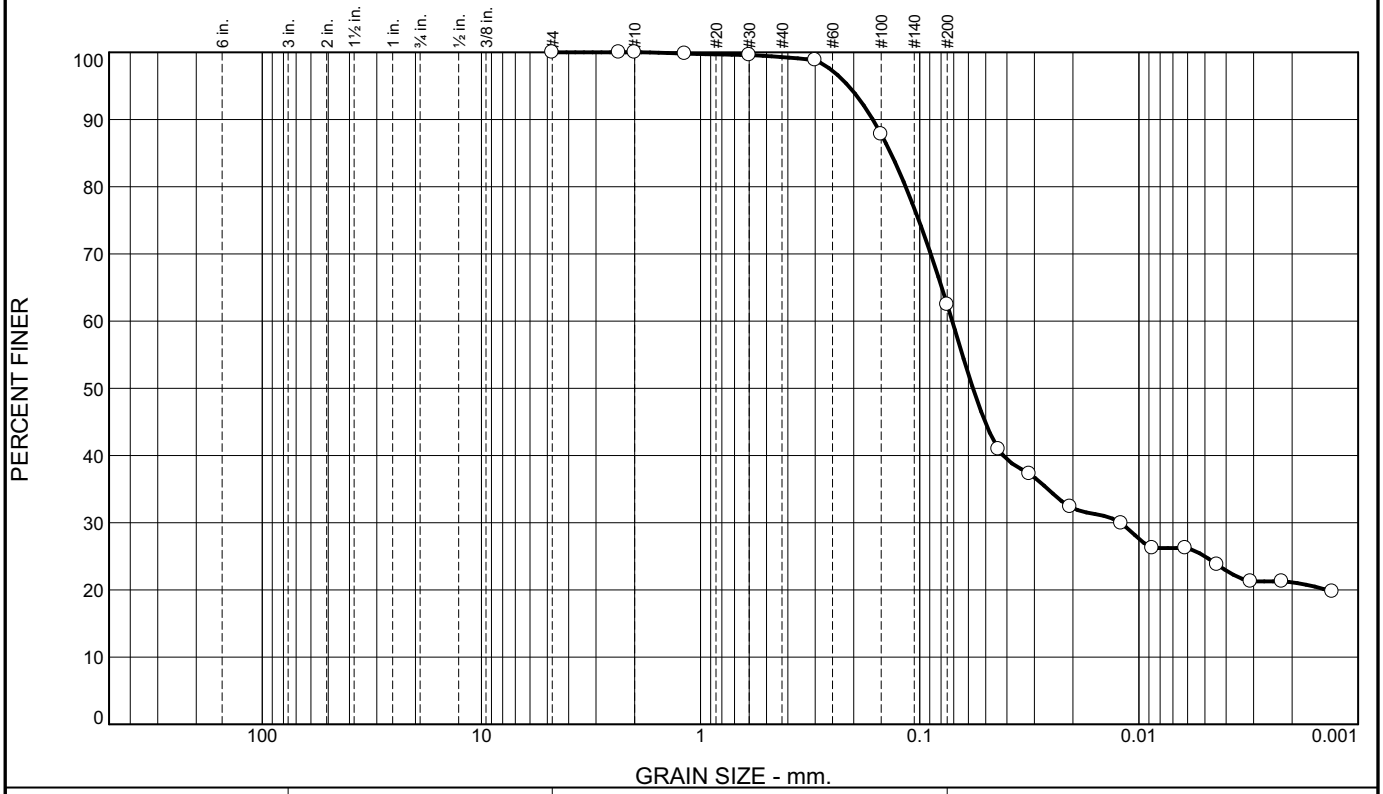
Source of Sample: B-11 **Depth:** 14.5'-16.0'
Sample Number: SS-3

Remarks:

Wood Environment and Infrastructure Solutions, Inc.
Nashville, Tennessee

Tested By: NB **Checked By:** MH

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.7	36.8	37.5	25.0

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	100.0		
#8	100.0		
#10	100.0		
#16	99.8		
#30	99.6		
#50	98.8		
#100	87.8		
#200	62.5		

* (no specification provided)

Material Description

sandy silt, red brown

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D_{90}= 0.1638 D_{85}= 0.1356 D_{60}= 0.0711
D_{50}= 0.0572 D_{30}= 0.0122 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= ML AASHTO= A-4(0)

Remarks

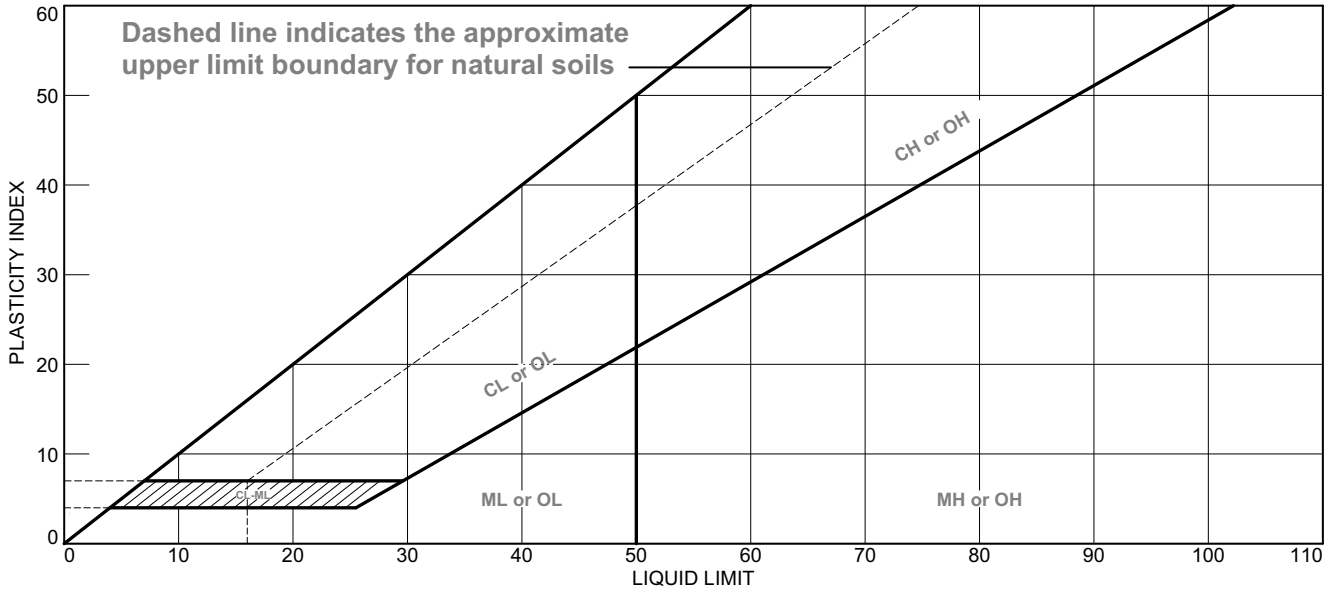
Source of Sample: B-12 **Depth:** 9.0'-10.5'
Sample Number: SS-2 **Date:** 10/6/18

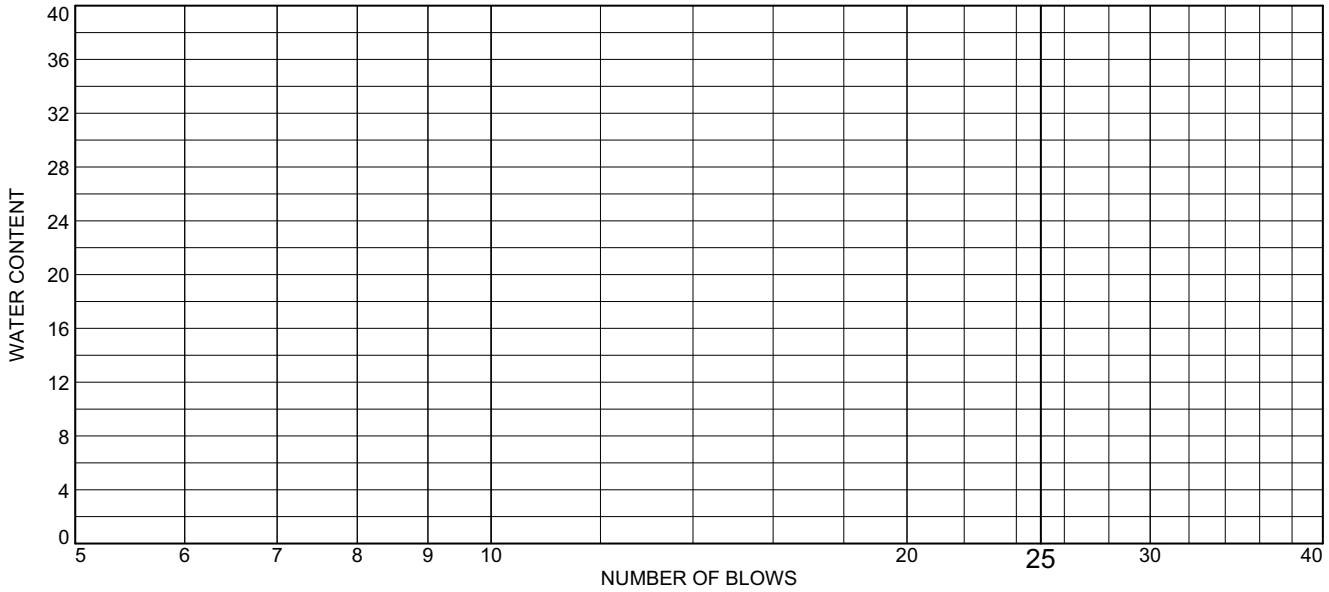
Wood Environment and Infrastructure Solutions, Inc.
Nashville, Tennessee

Client: TDOT
Project: SR 40 over Ocoee
Project No: 579790003

Tested By: KM **Checked By:** MH

LIQUID AND PLASTIC LIMITS TEST REPORT





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	sandy silt, red brown	NV	NP	NP	99.3	62.5	ML

Project No. 579790003 **Client:** TDOT

Project: SR 40 over Ocoee

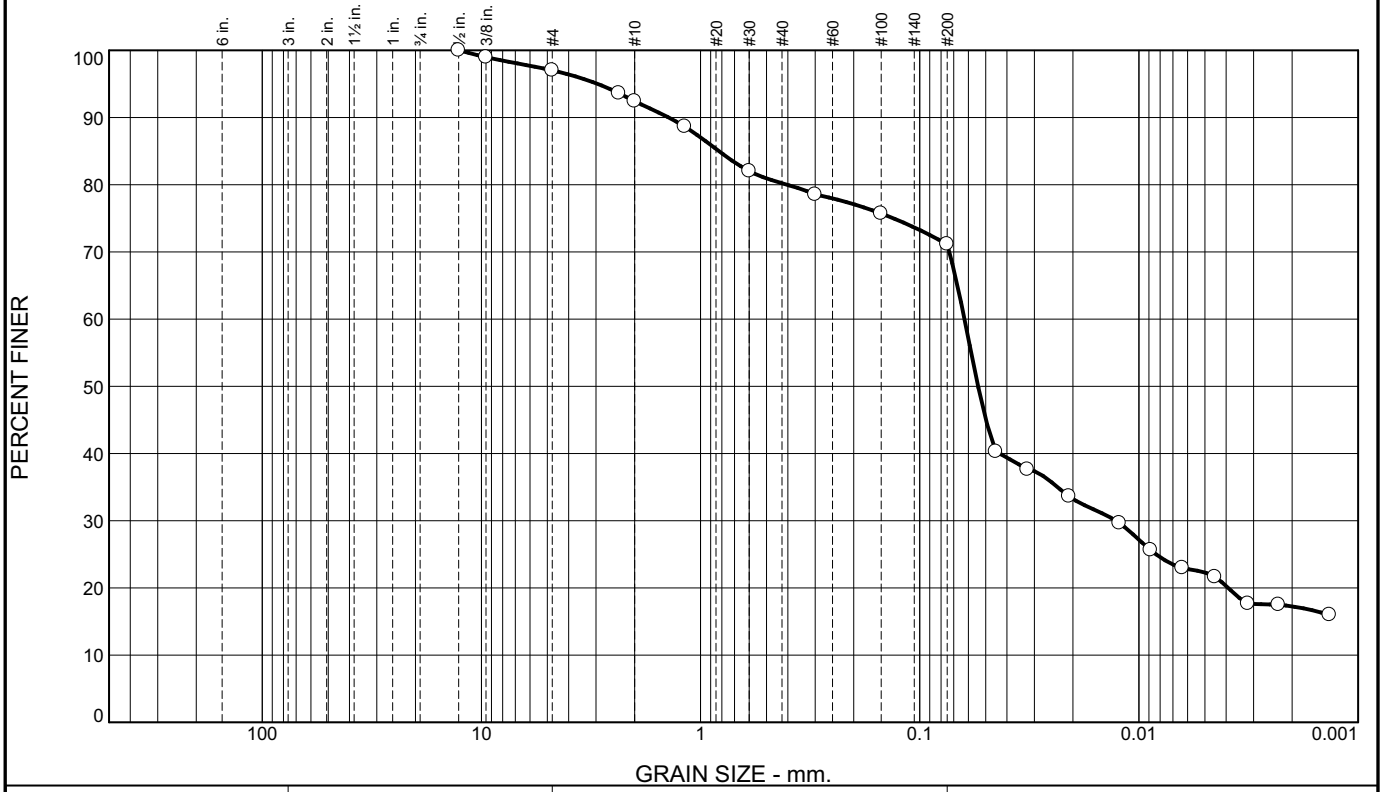
Source of Sample: B-12 **Depth:** 9.0'-10.5'
Sample Number: SS-2

Remarks:

Wood Environment and Infrastructure Solutions, Inc.
Nashville, Tennessee

Tested By: NB **Checked By:** MH

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	3.0	4.6	12.2	9.1	48.8	22.3

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1/2"	100.0		
3/8"	99.0		
#4	97.0		
#8	93.6		
#10	92.4		
#16	88.6		
#30	82.0		
#50	78.5		
#100	75.7		
#200	71.1		

* (no specification provided)

Material Description

silt with sand, red brown

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D_{90}= 1.3997 D_{85}= 0.8255 D_{60}= 0.0625
D_{50}= 0.0542 D_{30}= 0.0128 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= ML AASHTO= A-4(0)

Remarks

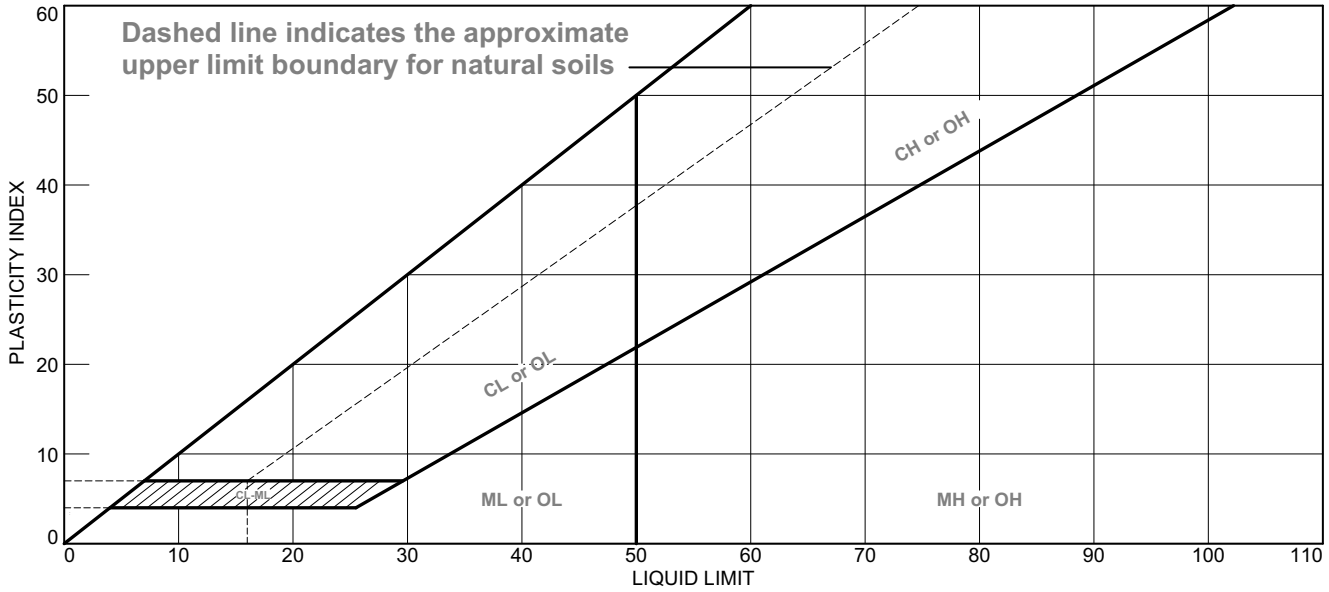
Source of Sample: B-12 **Depth:** 19.0'-20.5'
Sample Number: SS-4 **Date:** 10/12/18

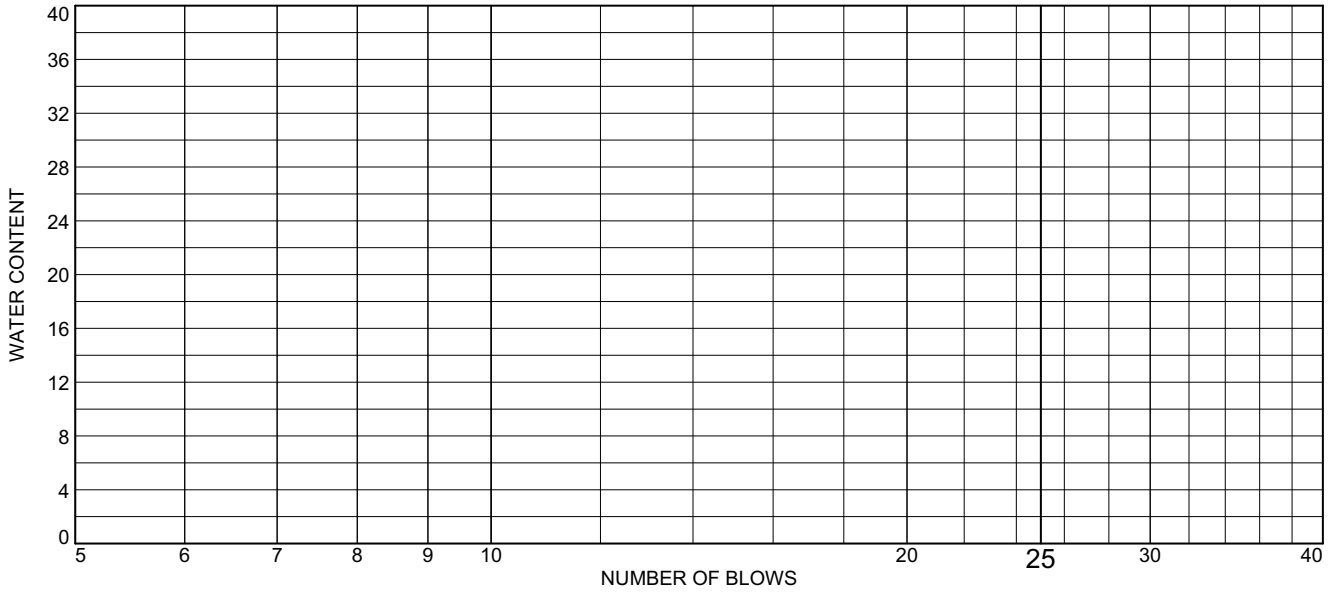
Wood Environment and Infrastructure Solutions, Inc.
Nashville, Tennessee

Client: TDOT
Project: SR 40 over Ocoee
Project No: 579790003

Tested By: KM **Checked By:** MH

LIQUID AND PLASTIC LIMITS TEST REPORT





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	silt with sand, red brown	NV	NP	NP	80.2	71.1	ML

Project No. 579790003 **Client:** TDOT

Project: SR 40 over Ocoee

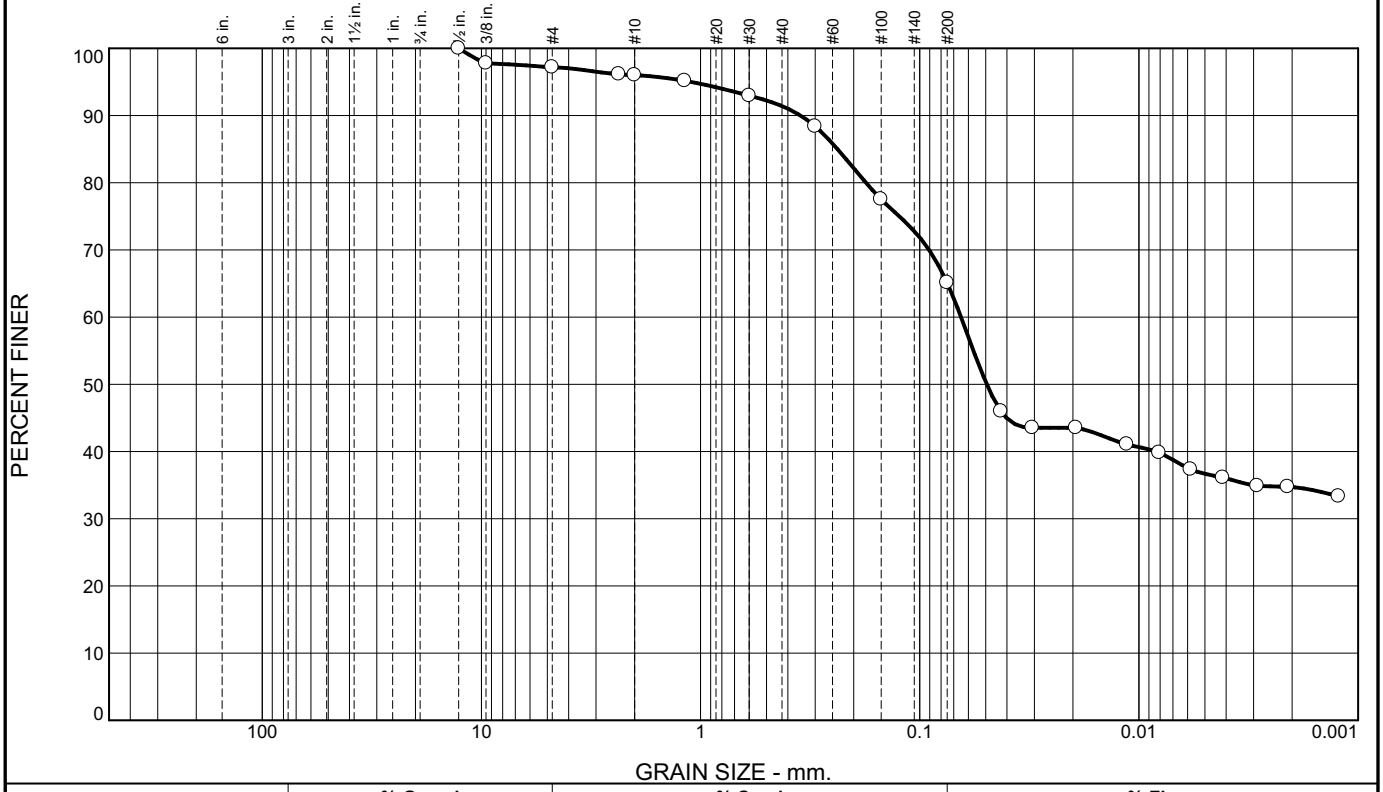
Source of Sample: B-12 **Depth:** 19.0'-20.5'
Sample Number: SS-4

Remarks:

Wood Environment and Infrastructure Solutions, Inc.
Nashville, Tennessee

Tested By: KM/NB **Checked By:** MH

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	2.8	1.2	4.6	26.3	28.4	36.7

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1/2"	100.0		
3/8"	97.8		
#4	97.2		
#8	96.1		
#10	96.0		
#16	95.2		
#30	92.9		
#50	88.4		
#100	77.5		
#200	65.1		

* (no specification provided)

Material Description

sandy lean clay, red brown

Atterberg Limits

PL= 18 LL= 40 PI= 22

Coefficients

D_{90}= 0.3506 D_{85}= 0.2374 D_{60}= 0.0648
D_{50}= 0.0495 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CL AASHTO= A-6(12)

Remarks

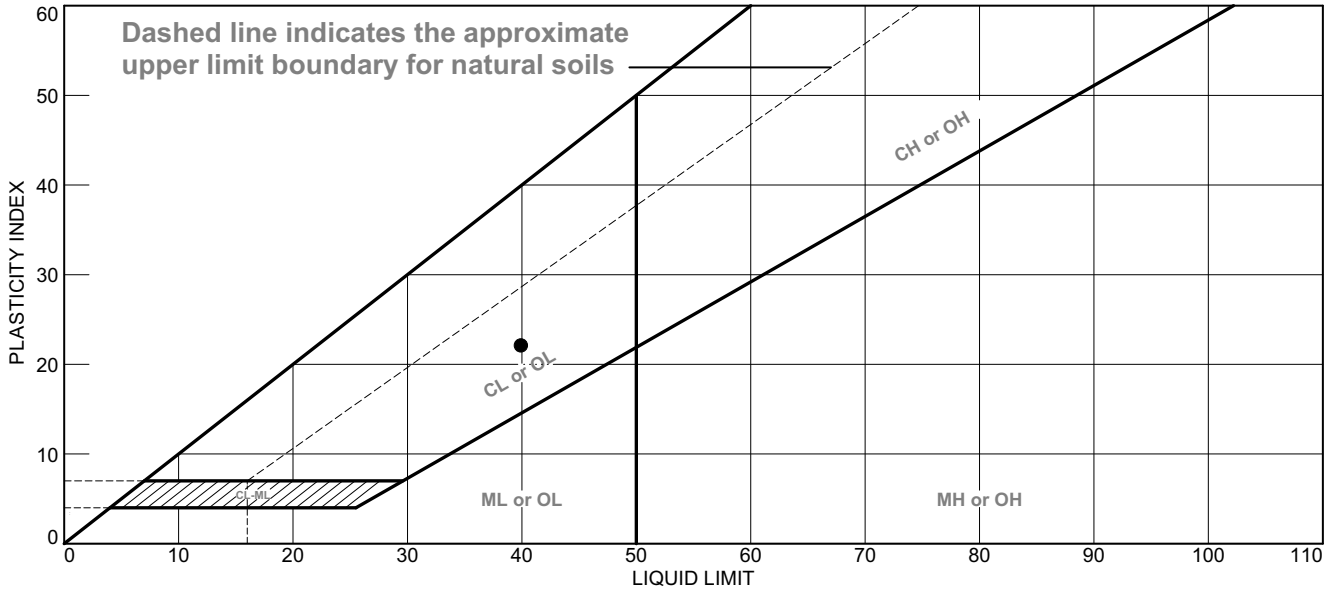
Source of Sample: B-13 **Depth:** 10.0'-15.0'
Sample Number: B-1A(Bulk) **Date:** 10/8/18

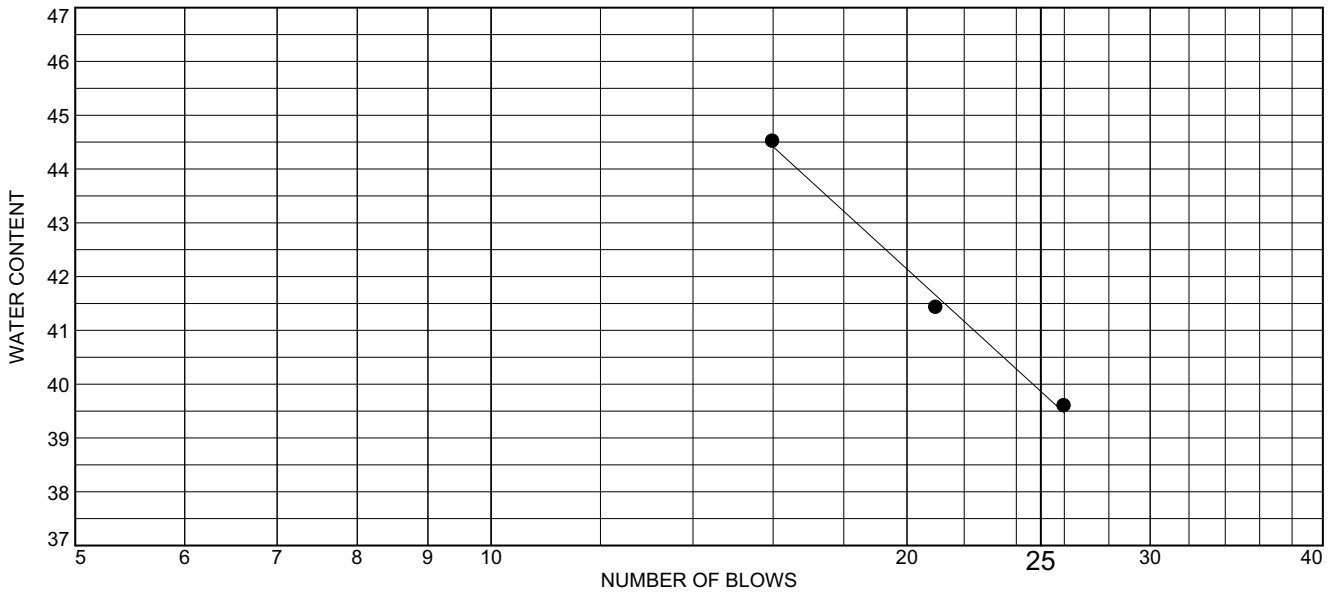
Wood Environment and Infrastructure Solutions, Inc.
Nashville, Tennessee

Client: TDOT
Project: SR 40 over Ocoee
Project No: 579790003

Tested By: NB/MH **Checked By:** MH

LIQUID AND PLASTIC LIMITS TEST REPORT





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	sandy lean clay, red brown	40	18	22	91.4	65.1	CL

Project No. 579790003 **Client:** TDOT

Project: SR 40 over Ocoee

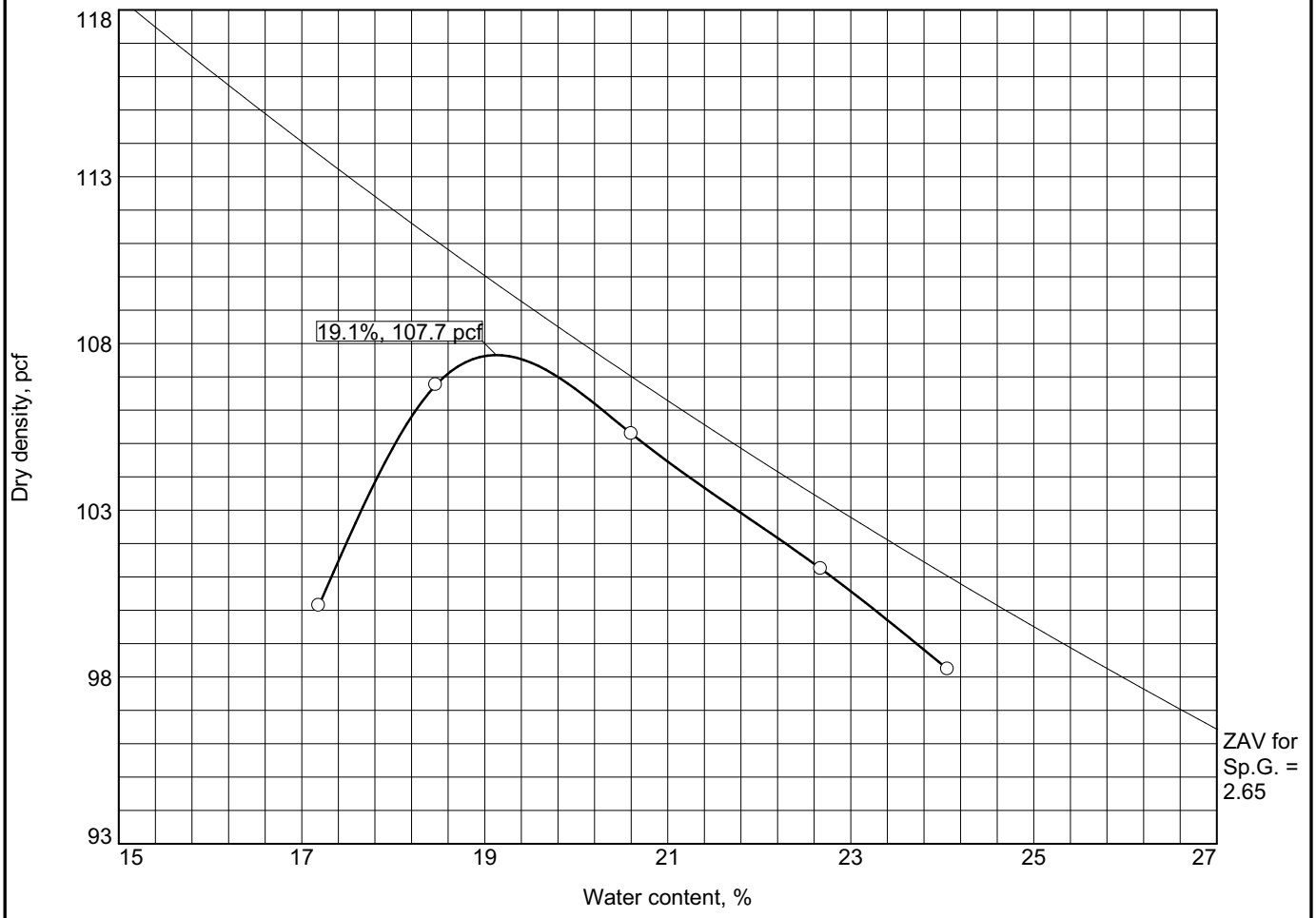
Source of Sample: B-13 **Depth:** 10.0'-15.0'
Sample Number: B-1A(Bulk)

Remarks:

Wood Environment and Infrastructure Solutions, Inc.
Nashville, Tennessee

Tested By: NB/KM **Checked By:** MH

COMPACTION TEST REPORT



Test specification: ASTM D 698-12 Method A Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > #4	% < No.200
	USCS	AASHTO						
10.0'-15.0'	CL	A-6(12)			40	22	2.8	65.1

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 107.7 pcf Optimum moisture = 19.1 %	sandy lean clay, red brown

Project No. 579790003 **Client:** TDOT
Project: SR 40 over Ocoee

○**Source of Sample:** B-13 **Sample Number:** B-1A(Bulk)

Remarks:

Wood Environment and Infrastructure Solutions, Inc.
Nashville, Tennessee

Tested By: KM/MH **Checked By:** MH

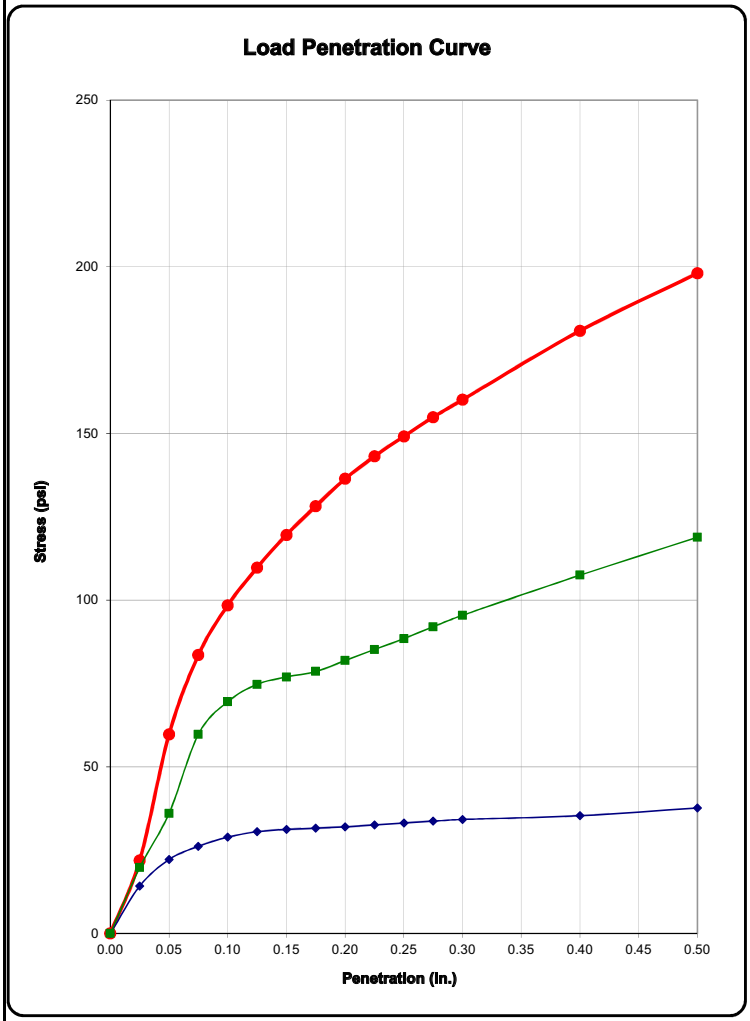
WOOD
ENVIRONMENT AND INFRASTRUCTURE SOLUTIONS, INC.
NASHVILLE, TN

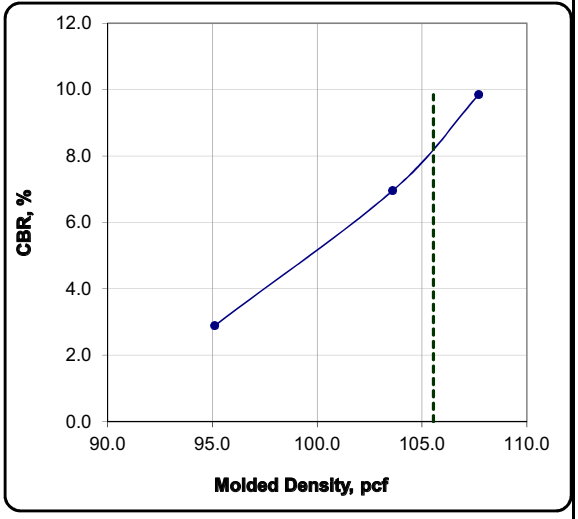
ASTM D1883 - STANDARD METHOD FOR CBR (CALIFORNIA BEARING RATIO) OF LABORATORY-COMPACTED SOILS

Project Name:	TDOT SR 40 Bridge over Ocoee	**Date of Preparation:**	October 16, 2018
Project Number:	579790003	**Date of Test:**	10/8-10/12/18
Reviewed By:		**Tested By:**	M. Haley
Sample ID: **Boring**	B-13	**Sample:** 1A(Bulk)	**Depth** 10.0'-15.0'
Remarks:	Specimens compacted to approximately 90%, 95%, and 100% of the maximum density near the optimum moisture content.		

Specimen /	PRE-TEST			POST-TEST			CBR, (%)		Line	Penetration	Swell
Mark	Density	% max	Moist. (%)	Density	% max	Moist. (%)	0.1"	0.2"	corr.	Surcharge	(%)
1 ◆	95.1	88.3	19.0	89.8	83.4	26.0%	2.9	2.1	0.000	10.0	0.03
2 ■	103.6	96.2	19.2	100.7	93.5	22.7%	7.0	5.5	0.000	10.0	0.03
3 ●	107.7	100.0	19.1	106.1	98.5	20.9%	9.8	9.1	0.000	10.0	0.00

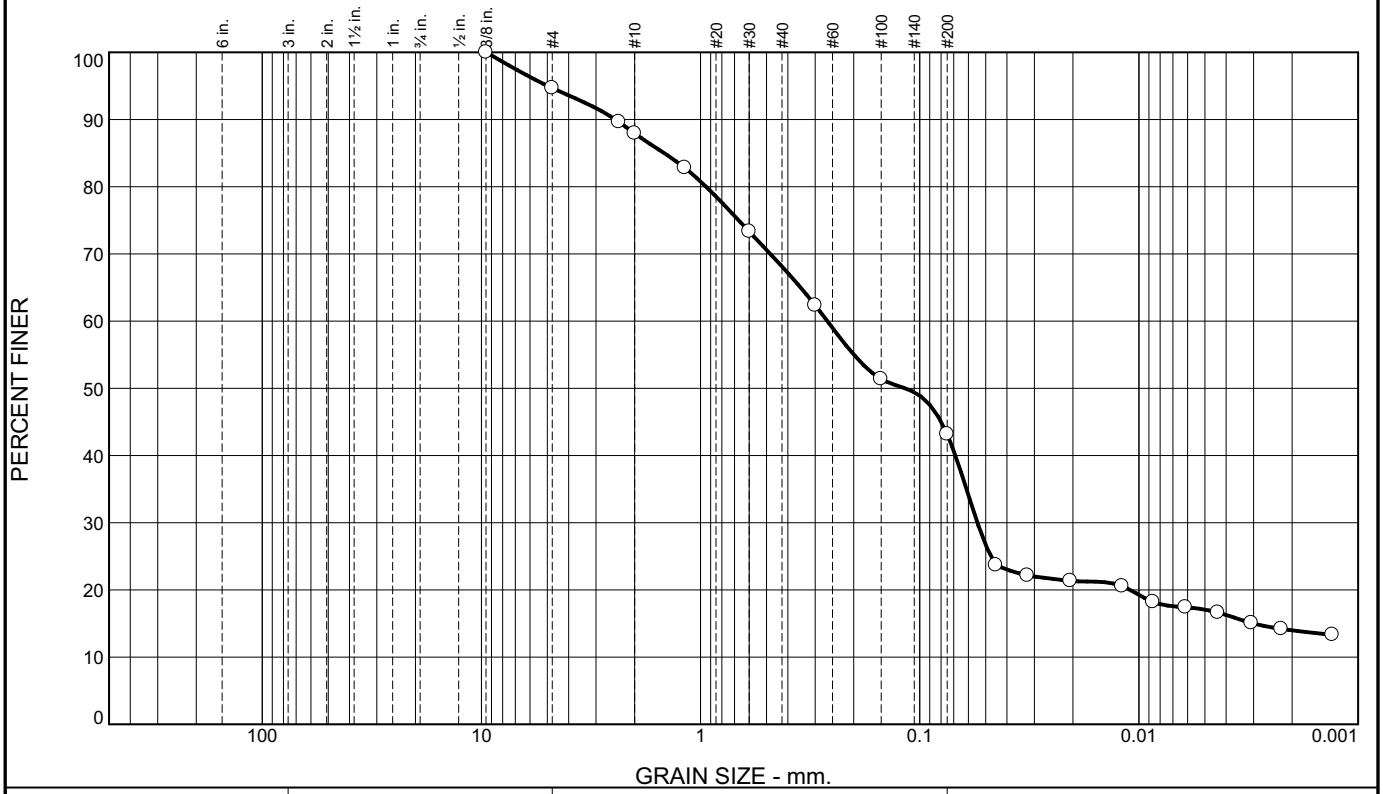
MATERIAL DESCRIPTION	USCS	MAX.DENS.	OPT. M%	LL	PI
sandy lean clay, red brown	CL	107.7	19.1	40	22





CBR @ 98.0% = 8.3
for 0.1 in. penetration

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	5.3	6.8	19.8	24.9	26.1	17.1

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/8"	100.0		
#4	94.7		
#8	89.6		
#10	87.9		
#16	82.8		
#30	73.3		
#50	62.3		
#100	51.4		
#200	43.2		

* (no specification provided)

Material Description

clayey sand, red brown

Atterberg Limits

PL= 25 LL= 44 PI= 19

Coefficients

D_{90}= 2.4481 D_{85}= 1.4679 D_{60}= 0.2641
D_{50}= 0.1166 D_{30}= 0.0546 D_{15}= 0.0030
D_{10}= C_u= C_c=

Classification

USCS= SC AASHTO= A-7-6(4)

Remarks

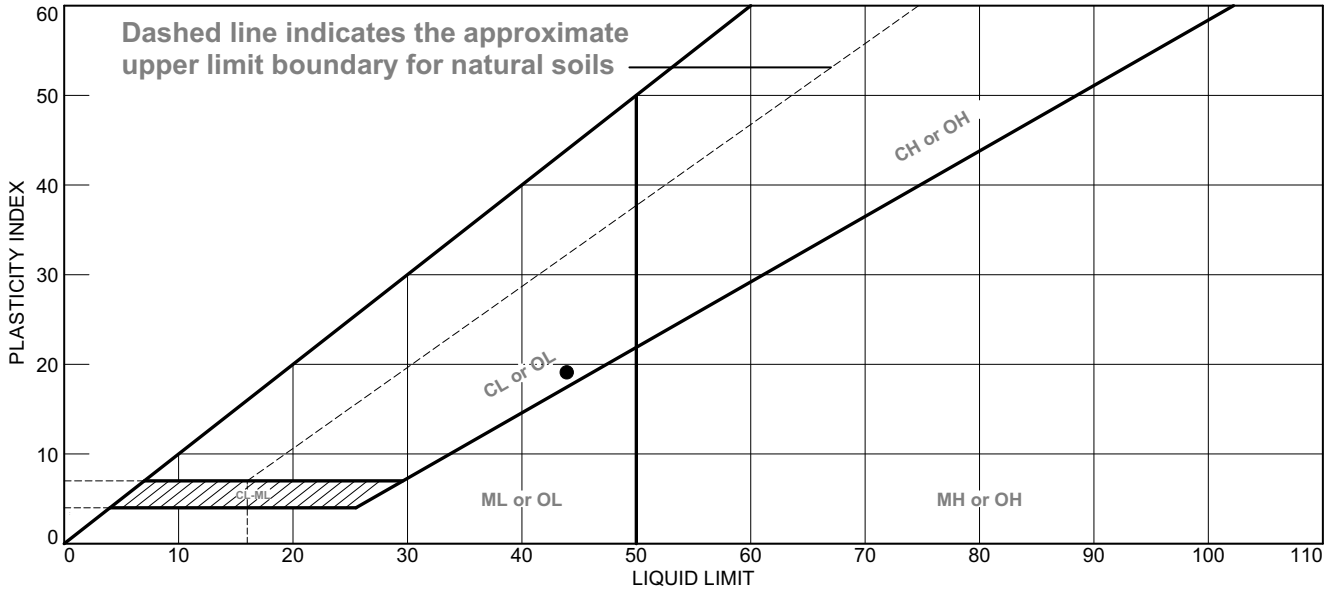
Source of Sample: B-13 **Depth:** 14.5'-16.0'
Sample Number: SS-3 **Date:** 10/12/18

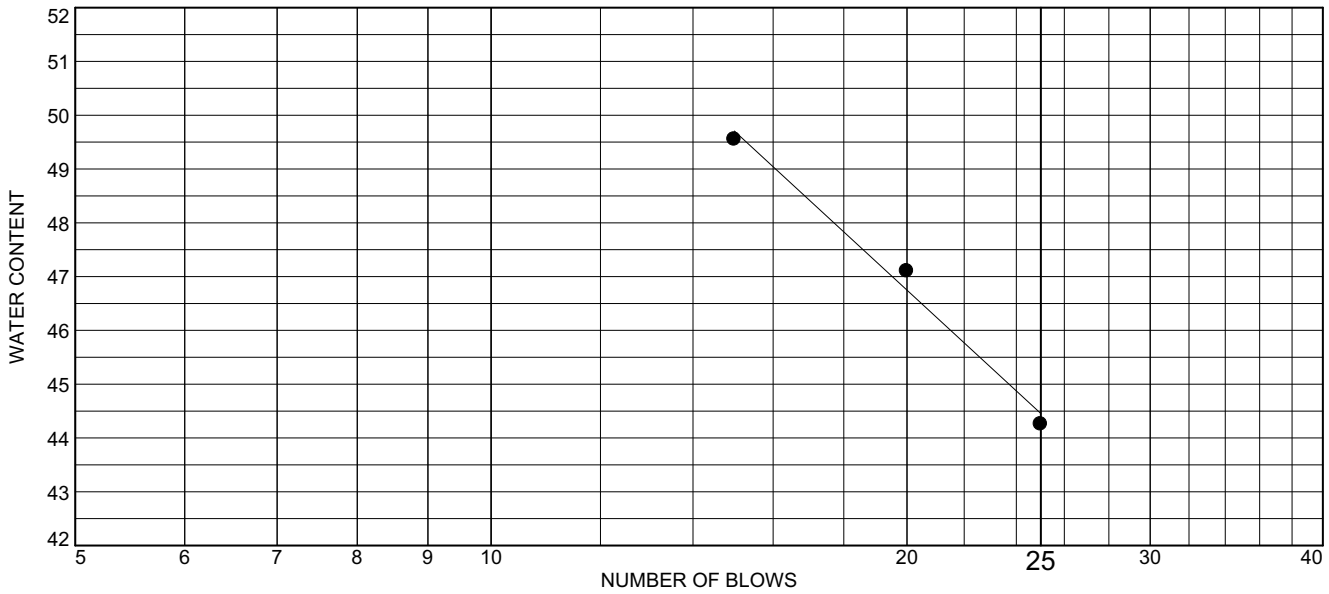
Wood Environment and Infrastructure Solutions, Inc.
Nashville, Tennessee

Client: TDOT
Project: SR 40 over Ocoee
Project No: 579790003

Tested By: MH/NB **Checked By:** MH

LIQUID AND PLASTIC LIMITS TEST REPORT





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	clayey sand, red brown	44	25	19	68.1	43.2	SC

Project No. 579790003 **Client:** TDOT

Project: SR 40 over Ocoee

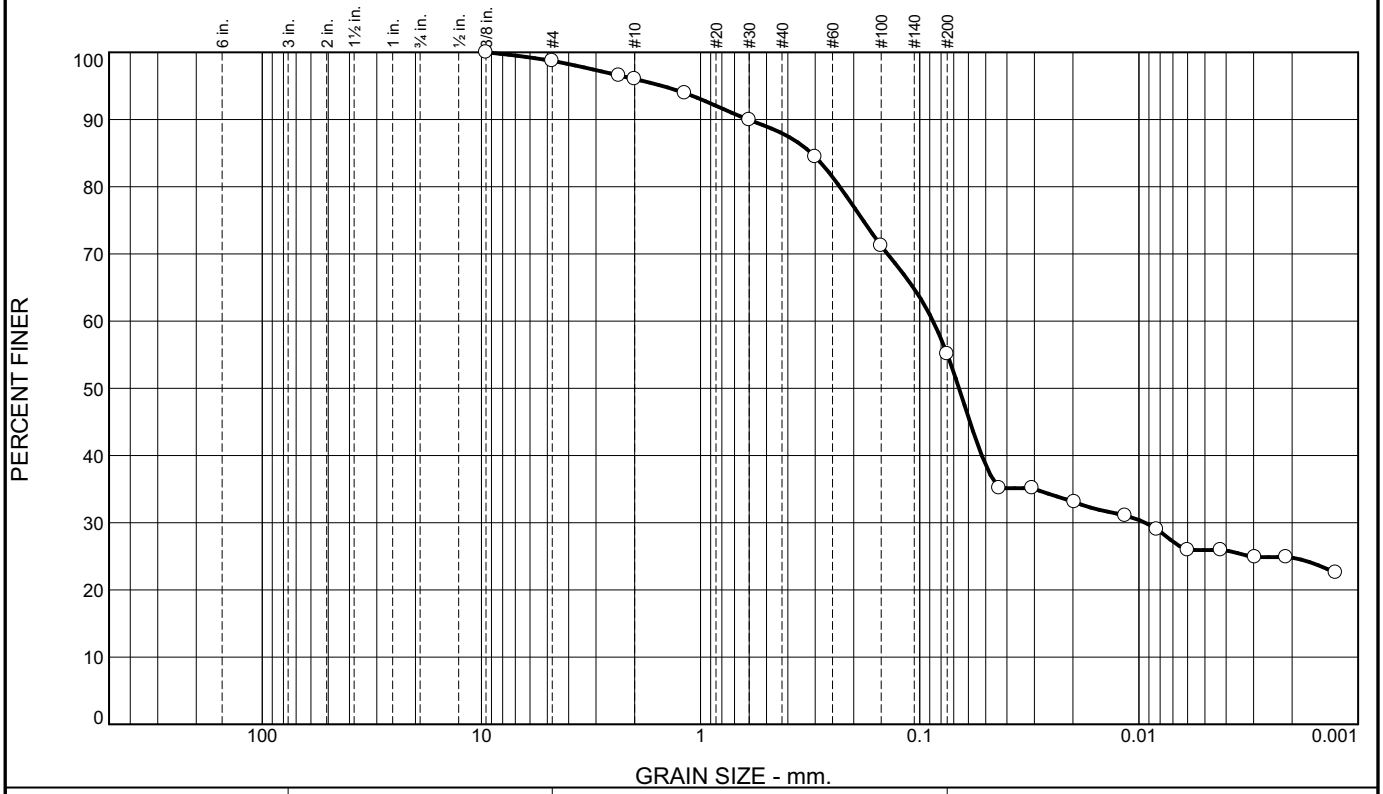
Source of Sample: B-13 **Depth:** 14.5'-16.0'
Sample Number: SS-3

Remarks:

Wood Environment and Infrastructure Solutions, Inc.
Nashville, Tennessee

Tested By: MH/JB **Checked By:** MH

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	1.3	2.7	8.1	32.8	29.2	25.9

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/8"	100.0		
#4	98.7		
#8	96.6		
#10	96.0		
#16	93.9		
#30	89.9		
#50	84.4		
#100	71.2		
#200	55.1		

* (no specification provided)

Material Description

sandy lean clay, red brown

Atterberg Limits

PL= 22 LL= 41 PI= 19

Coefficients

D_{90}= 0.6072 D_{85}= 0.3125 D_{60}= 0.0870
D_{50}= 0.0662 D_{30}= 0.0094 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CL AASHTO= A-7-6(8)

Remarks

Source of Sample: B-13 **Depth:** 19.5'-21.0'
Sample Number: SS-4

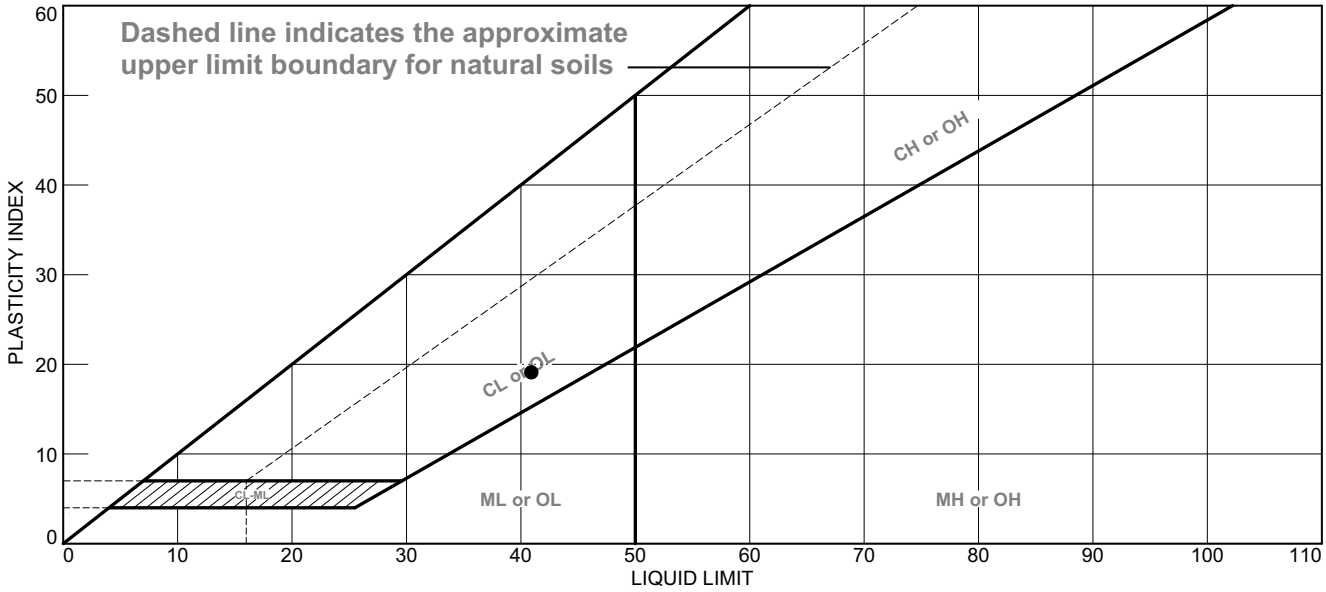
Date: 10/5/18

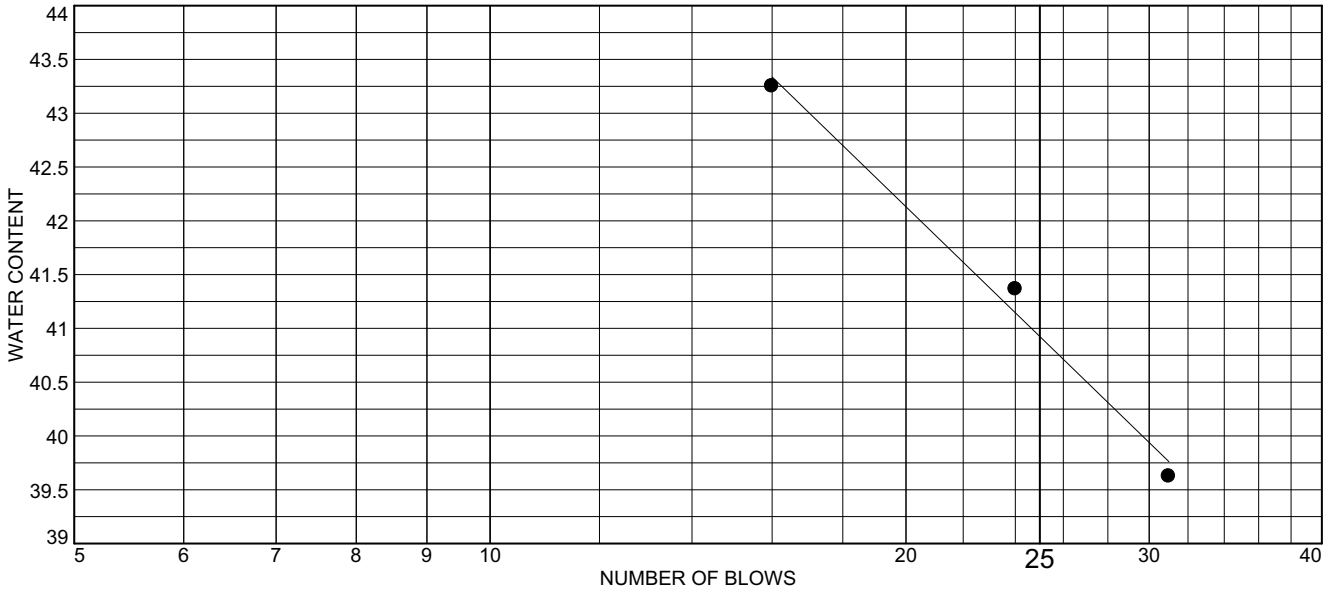
Wood Environment and Infrastructure Solutions, Inc.
Nashville, Tennessee

Client: TDOT
Project: SR 40 over Ocoee
Project No: 579790003

Tested By: NB **Checked By:** MH

LIQUID AND PLASTIC LIMITS TEST REPORT





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	sandy lean clay, red brown	41	22	19	87.9	55.1	CL

Project No. 579790003 **Client:** TDOT

Project: SR 40 over Ocoee

Source of Sample: B-13 **Depth:** 19.5'-21.0'
Sample Number: SS-4

Remarks:

Wood Environment and Infrastructure Solutions, Inc.
Nashville, Tennessee

Tested By: NB/KM **Checked By:** MH

Particle Size Distribution Report

% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	3.2	1.2	4.1	16.8	19.8	54.9

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1/2"	100.0		
3/8"	98.0		
#4	96.8		
#8	95.9		
#10	95.6		
#16	94.8		
#30	93.2		
#50	88.4		
#100	80.1		
#200	74.7		

* (no specification provided)

Material Description

fat clay with sand, red brown

Atterberg Limits

PL= 25 LL= 53 PI= 28

Coefficients

D_{90}= 0.3528 D_{85}= 0.2296 D_{60}= 0.0125
D_{50}= 0.0020 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CH AASHTO= A-7-6(21)

Remarks

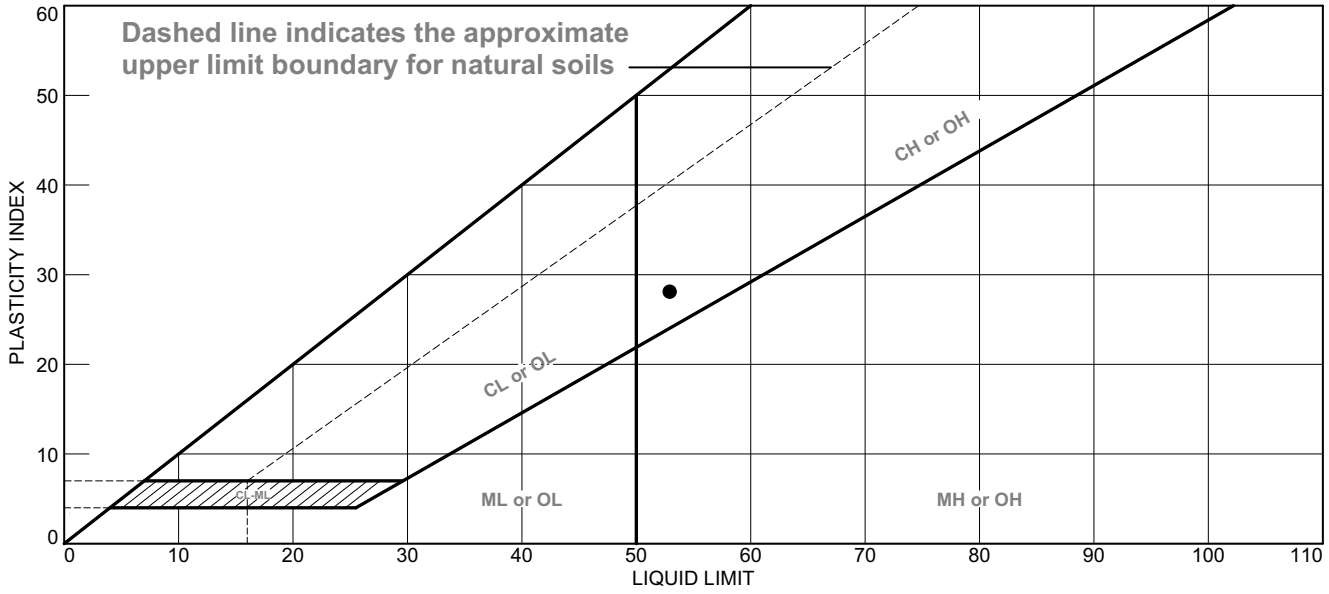
Source of Sample: B-14 **Depth:** 4.5'-6.5'
Sample Number: ST-1 **Date:** 10/11/18

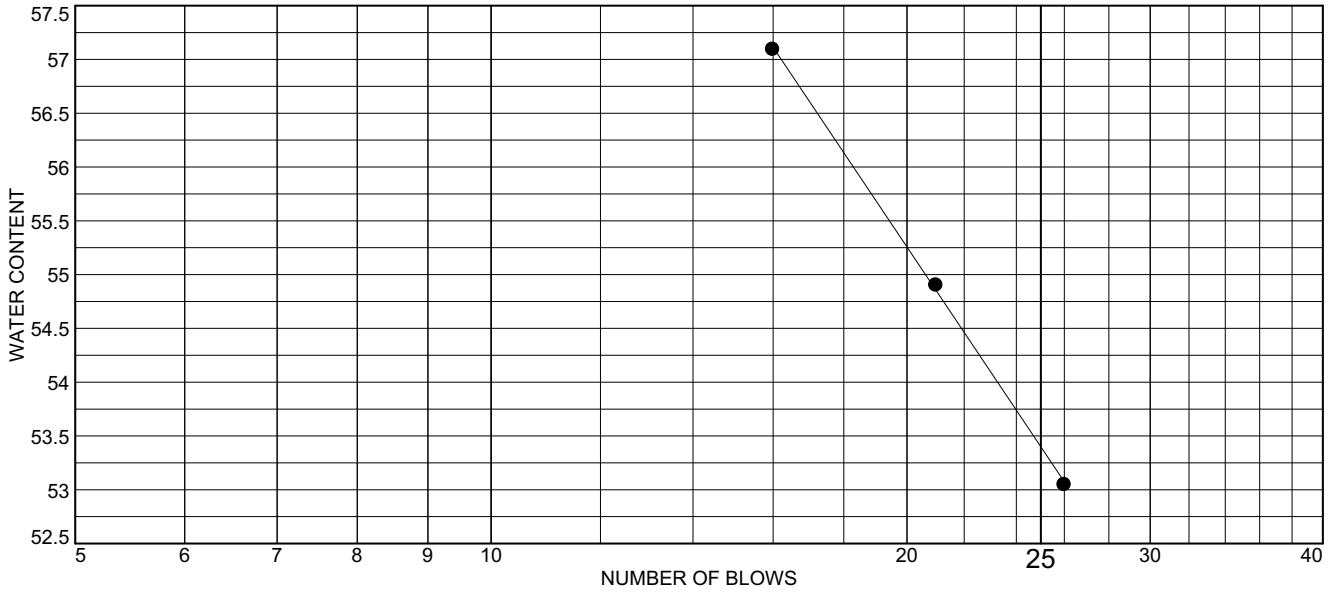
Wood Environment and Infrastructure Solutions, Inc.
Nashville, Tennessee

Client: TDOT
Project: SR 40 over Ocoee
Project No: 579790003

Tested By: MH/KM **Checked By:** MH

LIQUID AND PLASTIC LIMITS TEST REPORT





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	fat clay with sand, red brown	53	25	28	91.5	74.7	CH

Project No. 579790003 **Client:** TDOT

Project: SR 40 over Ocoee

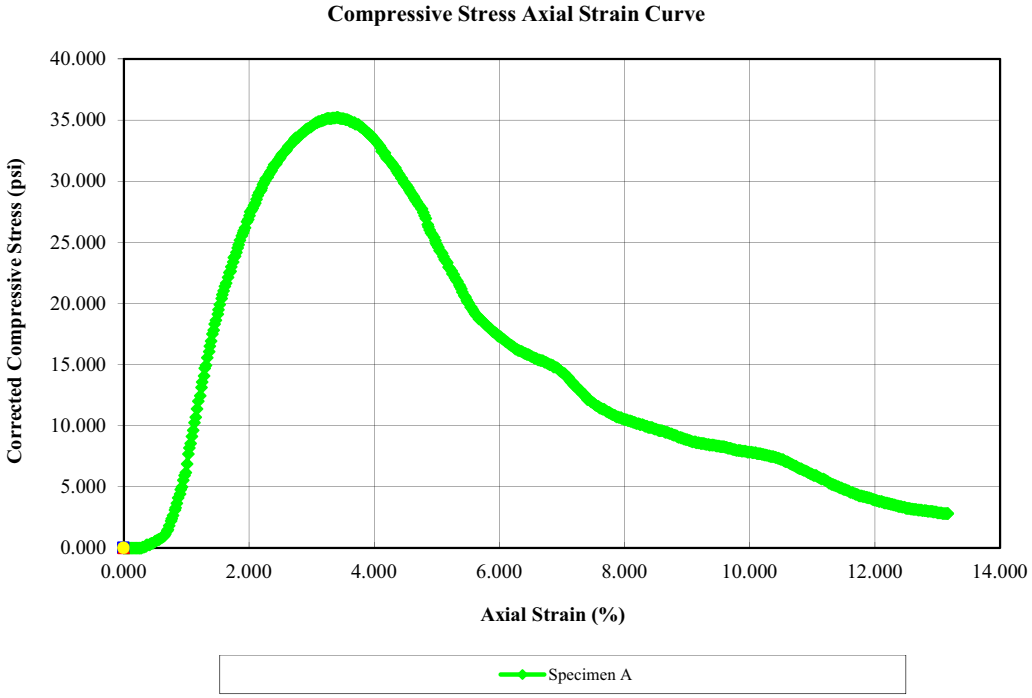
Source of Sample: B-14 **Depth:** 4.5'-6.5'
Sample Number: ST-1

Remarks:

Wood Environment and Infrastructure Solutions, Inc.
Nashville, Tennessee

Tested By: MH/JB **Checked By:** MH

Unconfined Compression Test Report (ASTM D2166)



Before Test	Specimen A	FAILURE PHOTO
Water Content (%)	24.10	
Dry Density (pcf)	96.400	
Saturation (%)	89.21	
Void Ratio	0.72	
Diameter (in)	2.868	
Height (in)	5.657	
Test Data	**A**	
Unconfined Strength (psi)	35.211	
Undrained Shear Strength (tsf)	1.268	
Undrained Shear Strength (psi)	17.606	
Rate of Strain (in/min)	0.071100	
Strain at Failure (%)		

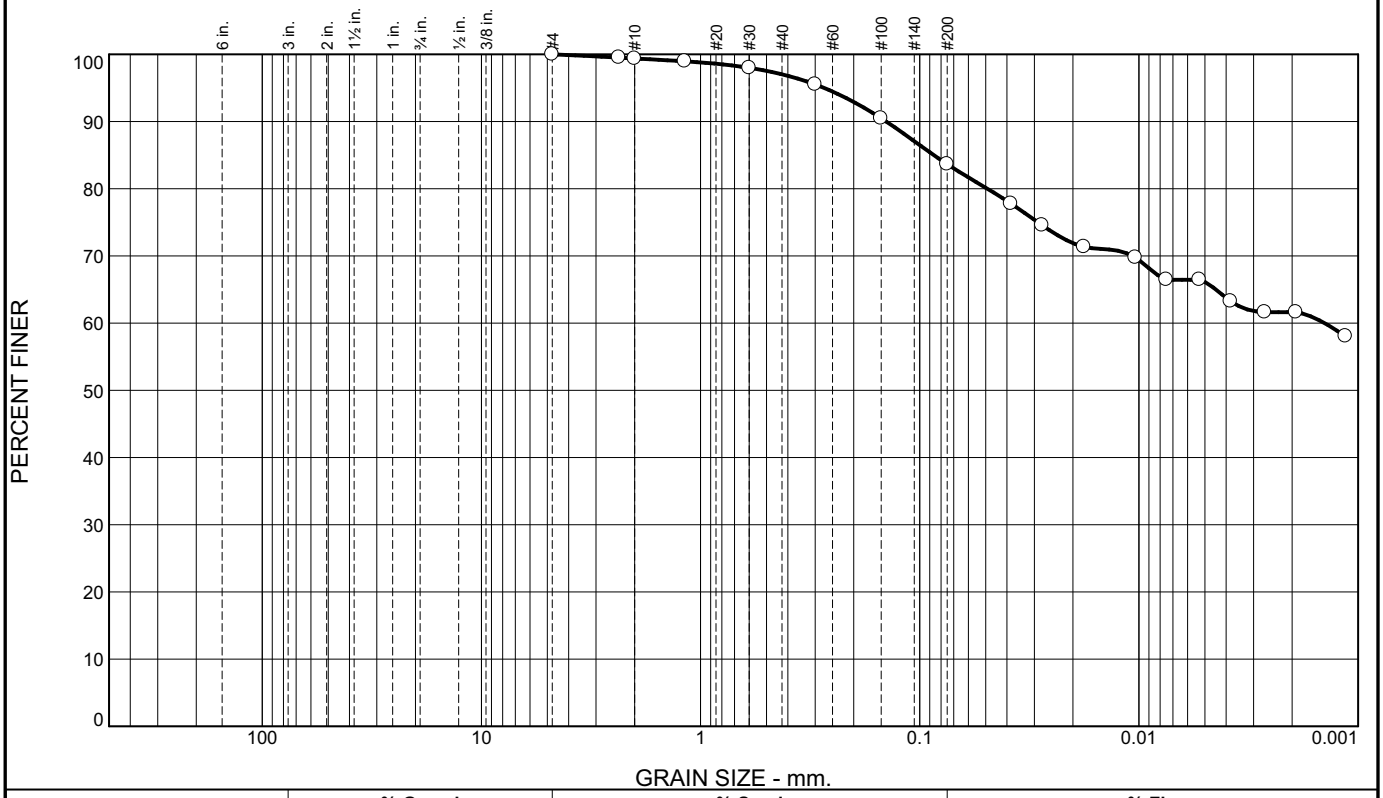
Project Information		Specimen Description
Client	TDOT	Specimen A
Project	TDOT SR 40 Ocoee	
Project No.	579790003	
Boring No.	B-14 ST-1 4.5'-6.5'	

Sample Description	fat clay with sand, red brown	Test Variables	
		Specific Gravity	2.65
		Liquid Limit:	53.0
		Plastic Limit:	25.0

Remarks

Tested By: M. Haley Reviewed By: _____

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.6	2.4	13.3	17.6	66.1

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	100.0		
#8	99.5		
#10	99.4		
#16	99.0		
#30	98.0		
#50	95.5		
#100	90.5		
#200	83.7		

* (no specification provided)

Material Description

fat clay with sand, red brown

Atterberg Limits

PL= 26 LL= 56 PI= 30

Coefficients

D_{90}= 0.1424 D_{85}= 0.0863 D_{60}= 0.0014
D_{50}= D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CH AASHTO= A-7-6(28)

Remarks

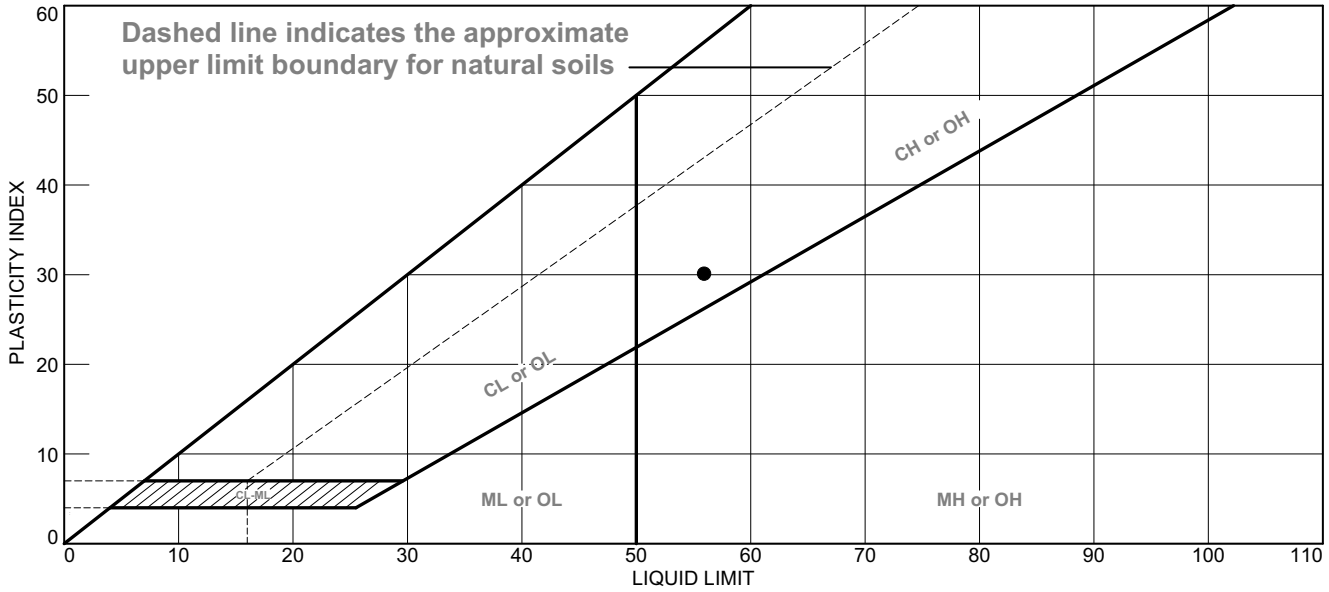
Source of Sample: B-14 **Depth:** 8.0'-12.0'
Sample Number: B-2 (Bulk) **Date:** 10/5/18

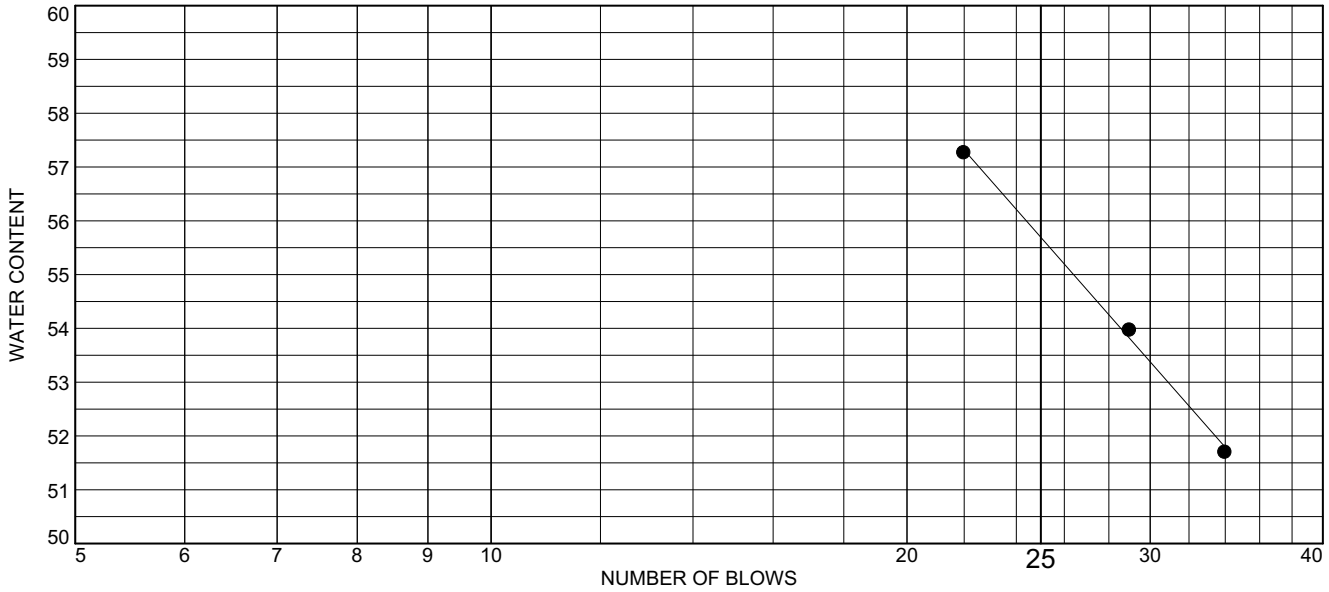
Wood Environment and Infrastructure Solutions, Inc.
Nashville, Tennessee

Client: TDOT
Project: SR 40 over Ocoee
Project No: 579790003

Tested By: NB **Checked By:** MH

LIQUID AND PLASTIC LIMITS TEST REPORT





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	fat clay with sand, red brown	56	26	30	97.0	83.7	CH

Project No. 579790003 **Client:** TDOT

Project: SR 40 over Ocoee

Source of Sample: B-14 **Depth:** 8.0'-12.0'
Sample Number: B-2 (Bulk)

Remarks:

Wood Environment and Infrastructure Solutions, Inc.
Nashville, Tennessee

Tested By: KM/NB **Checked By:** MH

Particle Size Distribution Report

% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	1.4	1.3	4.3	24.0	24.2	44.8

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1/2"	100.0		
3/8"	99.0		
#4	98.6		
#8	97.5		
#10	97.3		
#16	96.4		
#30	94.6		
#50	89.9		
#100	79.2		
#200	69.0		

* (no specification provided)

Material Description

sandy lean clay, red brown

Atterberg Limits

PL= 18 LL= 46 PI= 28

Coefficients

D_{90}= 0.3023 D_{85}= 0.2148 D_{60}= 0.0471
D_{50}= 0.0087 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CL AASHTO= A-7-6(18)

Remarks

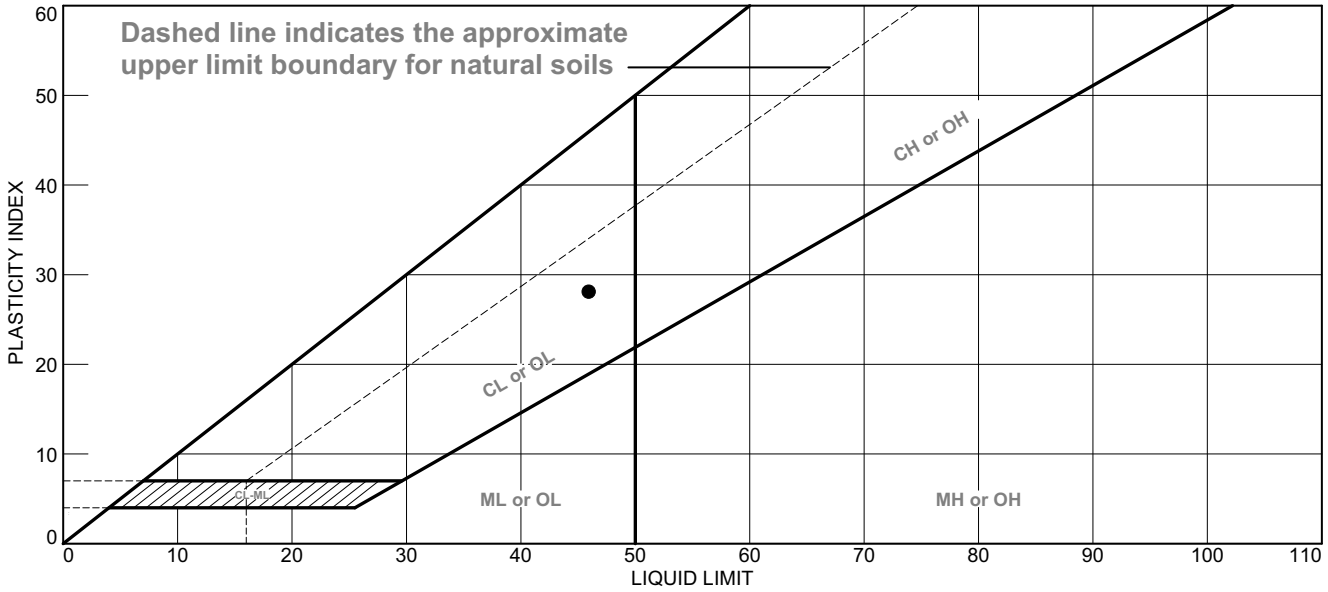
Source of Sample: B-15 **Depth:** 5.0'-10.0'
Sample Number: B-1 (Bulk) **Date:** 10/6/18

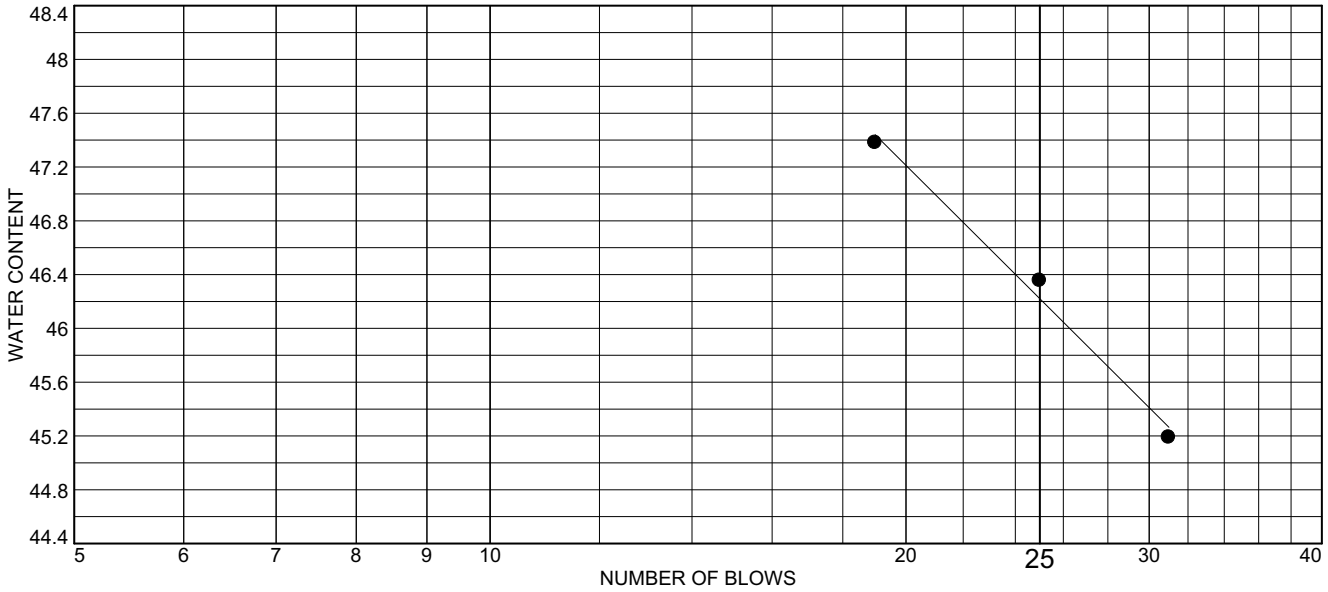
Wood Environment and Infrastructure Solutions, Inc.
Nashville, Tennessee

Client: TDOT
Project: SR 40 over Ocoee
Project No: 579790003

Tested By: NB **Checked By:** MH

LIQUID AND PLASTIC LIMITS TEST REPORT





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	sandy lean clay, red brown	46	18	28	93.0	69.0	CL

Project No. 579790003 **Client:** TDOT

Project: SR 40 over Ocoee

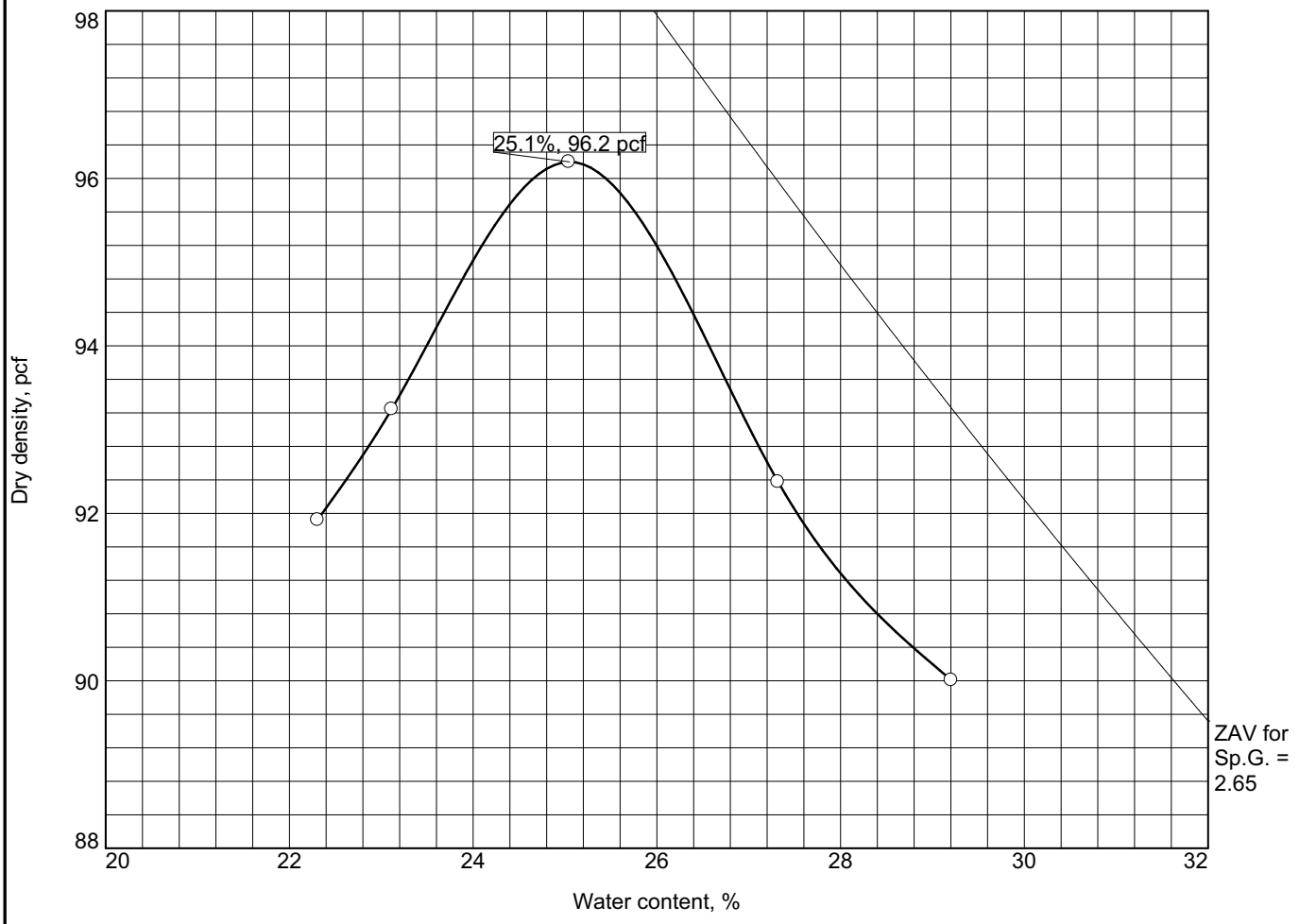
Source of Sample: B-15 **Depth:** 5.0'-10.0'
Sample Number: B-1 (Bulk)

Remarks:

Wood Environment and Infrastructure Solutions, Inc.
Nashville, Tennessee

Tested By: NB **Checked By:** MH

COMPACTION TEST REPORT



Test specification: ASTM D 698-12 Method A Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > #4	% < No.200
	USCS	AASHTO						
5.0'-10.0'	CL	A-7-6(18)		2.65	46	28	1.4	69.0

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 96.2 pcf Optimum moisture = 25.1 %	sandy lean clay, red brown

Project No. 579790003 **Client:** TDOT
Project: SR 40 over Ocoee

○**Source of Sample:** B-15 **Sample Number:** B-1 (Bulk)

Remarks:

Wood Environment and Infrastructure Solutions, Inc.
Nashville, Tennessee

Tested By: KM/MH **Checked By:** MH

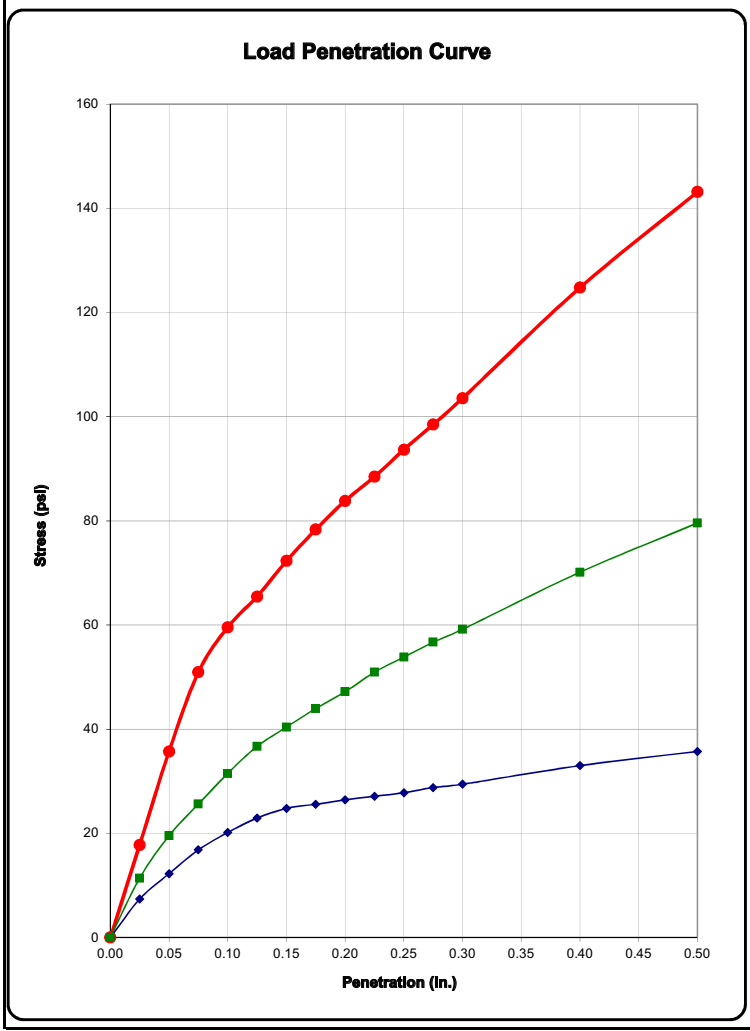
WOOD
ENVIRONMENT AND INFRASTRUCTURE SOLUTIONS, INC.
NASHVILLE, TN

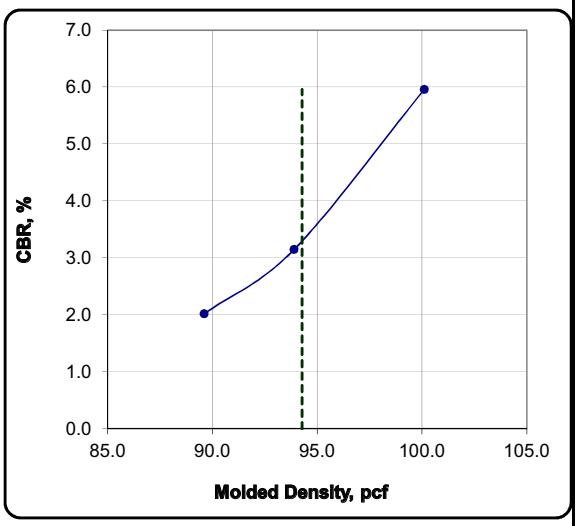
ASTM D1883 - STANDARD METHOD FOR CBR (CALIFORNIA BEARING RATIO) OF LABORATORY-COMPACTED SOILS

Project Name:	TDOT SR 40 Bridge over Ocoee	**Date of Preparation:**	October 16, 2018
Project Number:	579790003	**Date of Test:**	10/12-10/16/18
Reviewed By:		**Tested By:**	M. Haley
Sample ID: **Boring**	B-15	**Sample:** 1B(Bulk)	**Depth** 5.0'-10.0'
Remarks:	Specimens compacted to approximately 90%, 95%, and 100% of the maximum density near the optimum moisture content.		

Specimen /	PRE-TEST			POST-TEST			CBR, (%)		Line	Penetration	Swell
Mark	Density	% max	Moist. (%)	Density	% max	Moist. (%)	0.1"	0.2"	corr.	Surcharge	(%)
1 ◆	89.6	93.1	24.6	84.3	87.6	32.2%	2.0	1.8	0.000	10.0	0.15
2 ■	93.9	97.6	24.1	90.4	94.0	28.8%	3.2	3.1	0.000	10.0	0.12
3 ●	100.1	104.1	25.1	99.7	103.6	25.6%	6.0	5.6	0.000	10.0	0.04

MATERIAL DESCRIPTION	USCS	MAX.DENS.	OPT. M%	LL	PI
sandy lean clay, red brown	CL	96.2	25.1	46	28





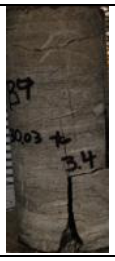
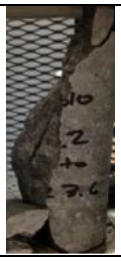
CBR @ 98.0% = 3.4
for 0.1 in. penetration

Project Name: TDOT SR 40 over Ocoee
Project Number: 579790003
Reviewed By:
Date of Preparation: October 20, 2018
Date of Test: October 23, 2018
Tested By: M. Haley

UNCONFINED COMPRESSIVE STRENGTH OF INTACT ROCK CORE
ASTM D7012-14, D4543-08

HOLE OR SAMPLE NO.	DEPTH (FT.)	LITHOLOGIC DESCRIPTION OF ROCK	LOAD DIRECTION*	MOISTURE CONDITION	DIA. (IN.)	LENGTH (IN.)	AREA (SQ.IN.)	L / D RATIO	Rock Core Weight (grams)	LOAD (LBS.)	MEASURED COMPRESS. STRENGTH (PSI)
B-9	19.9'-20.3'	Limestone	Vertical	Dry	1.865	4.580	2.73	2.46	561.6	11,380	4,166
B-9	25.2'-25.6'	Limestone	Vertical	Dry	1.865	3.910	2.73	2.10	485.1	10,425	3,816
B-9	30.0'-30.4'	Limestone	Vertical	Dry	1.865	4.600	2.73	2.47	570.5	37,760	13,822
B-10	23.2'-23.6'	Limestone	Vertical	Dry	1.865	4.810	2.73	2.58	603.2	25,610	9,375
B-10	27.6'28.0'	Limestone	Vertical	Dry	1.865	4.780	2.73	2.56	599.6	36,810	13,475
B-10	48.8'-49.2'	Limestone	Vertical	Dry	1.865	4.810	2.73	2.58	593.8	27,305	9,995

Failure Photos

B-9	B-9	B-9	B-10	B-10	B-10
19.9'-20.3'	25.2'-25.6'	30.0'-30.4'	23.2'-23.6'	27.6'28.0'	48.8'-49.2'
					
Unit Weight	**Unit Weight**	**Unit Weight**	**Unit Weight**	**Unit Weight**	**Unit Weight**
B-9	B-9	B-9	B-10	B-10	B-10
171.00	172.99	172.93	174.86	174.90	172.13

* NOTE: Loading direction given with respect to drilling.

REMARKS: Dry condition is as received

NOTE: Test results shown were derived from tests performed in accordance with the applicable test method(s), unless otherwise noted

Project Name: TDOT SR 40 over Ocoee
Project Number: 579790003
Reviewed By:
Date of Preparation: October 20, 2018
Date of Test: October 23, 2018
Tested By: M. Haley

UNCONFINED COMPRESSIVE STRENGTH OF INTACT ROCK CORE
ASTM D7012-14, D4543-08

HOLE OR SAMPLE NO.	DEPTH (FT.)	LITHOLOGIC DESCRIPTION OF ROCK	LOAD DIRECTION*	MOISTURE CONDITION	DIA. (IN.)	LENGTH (IN.)	AREA (SQ.IN.)	L / D RATIO	Rock Core Weight (grams)	LOAD (LBS.)	MEASURED COMPRESS. STRENGTH (PSI)
B-11	49.5'-49.9'	Limestone	Vertical	Dry	1.865	4.620	2.73	2.48	577.8	28,875	10,570
B-11	53.8'-54.2'	Limestone	Vertical	Dry	1.865	4.620	2.73	2.48	579.6	28,610	10,473

Failure Photos

B-11	B-11				
49.5'-49.9'	53.8'-54.2'				
					
Unit Weight	**Unit Weight**	**Unit Weight**	**Unit Weight**	**Unit Weight**	**Unit Weight**
B-11	B-11				
174.40	174.93				

* NOTE: Loading direction given with respect to drilling.

REMARKS:

NOTE: Test results shown were derived from tests performed in accordance with the applicable test method(s), unless otherwise noted

APPENDIX C

Acid Producing material Laboratory Results.

STATE OF TENNESSEE

TENNESSEE DEPARTMENT OF TRANSPORTATION

GEOTECHNICAL ENGINEERING SECTION
6601 CENTENNIAL BOULEVARD
NASHVILLE, TENNESSEE 37243-0360

Chain of Custody Record

For Acid-base accounting Test samples provided by Tennessee DOT and its agents and provided to Standard Laboratories. Testing conducted in accordance with Contract No. E1882:

Deliver Samples to:
ACES, LLC ,
159 Belk Way
Harlan, KY 40831
Phone: 606 573 6836

Sampling Delivery information:
Sampled by: _Besmir Zenelaku_____ Date:_8/21-30/18_____
Packed by: __Besmir Zenelaku_____ Date:_9/28/2018_____
Delivered by: _____ Date:_____

If by shipping carrier:
Carrier:_____
Method: _____
Date of Pickup:_____

PAGE 1
OF 2

Received at Lab by:_____ Date: 10/3/18 Time: 12:00

Results to be reported by: ☒email ☐fax ☒mail

TO:	Besmir.zenelaku@tn.gov
	Mike.Perkins@tn.gov
	Travis.w.smith@tn.gov
Project Information: SR-40 Bridge Over Ocoee River	
County: Polk	Description:
PE No. 70068-0211-94	Pin No. 124102.00 GES File No. 7002718
Construction Contract No.	Contractor:
Work Order No. 3	Sample Group No.

SAMPLE IDENTIFICATION *(Use additional page if necessary)

Boring No.	Station	CL Ref	Depth or Elevation	Type Sample *	Comments
B-9	125+35	21' L	14'-16'	Rock Core	63747
B-9	125+35	21' L	18'-19'	Rock Core	63748
B-9	125+35	21' L	21.9'-22.5'	Rock Core	63749
B-9	125+35	21' L	29'-31'	Rock Core	63750
B-10	128+72	3' L	24.8'- 26.4	Rock Core	63751
B-10	128+72	3' L	47.5- 48.7'	Rock Core	63752
B-10	128+72	3' L	54'- 55.4	Rock Core	63753
B-11	130+60	CL	9.5' – 11'	Soil	63754
B-11	130+60	CL	19.5' – 21'	Soil	63755
B-11	130+60	CL	28.8-29.8	Rock Core	63756
B-11	130+60	CL	33-35	Rock Core	63757
B-11	130+60	CL	46.6-48	Rock Core	63758
B-11	130+60	CL	50-52	Rock Core	63759
B-12	133+44	16' R	4-5.5	Soil	63760
B-12	139+95	16' R	14-15.5	Soil	63761
B-13	139+95	60' L	4.5-6	Soil	63762

*Chunk of rock, rock core, drill hole cuttings, soil matter or other
Note: Unless otherwise stated, sample is to be retained by Standard Labs for 60 days prior to disposal. Unless otherwise stated sample is suitable for disposable in sanitary landfill without treatment or packaging.

Work Order No.	Sample Group No.

SAMPLE IDENTIFICATION (Use additional page if necessary)

Boring No.	Station	CL Ref	Depth or Elevation	Type Sample *	Comments
B-13	139+95	60' L	9.5-10	Soil	63763
B-14	141+80	60' L	8-12	Soil	63764
B-15	144+98	42' L	5-10	Soil	63765

*Chunk of rock, rock core, drill hole cuttings, soil matter or other
Note: Unless otherwise stated, sample is to be retained by Standard Labs for 60 days prior to disposal. Unless otherwise stated sample is suitable for disposable in sanitary landfill without treatment or packaging.

Appalachian Construction & Environmental Services, LLC

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Client Tennessee Department of Transportation **County** Polk **Date** 10/4/2018
PE No. 70068-0211-94 **Pin No.** 124102.00
Sample Group # SR-40 Bridge Over Ocoee River **Sampled By:** Besmir Zenelaku

Table of Geochemical Testing Results

Boring ID Depth (Feet)	Station CL Ref	Lab Control #	Fizz	Paste pH	Neutralization Potential (Tons/1000 Tons Material)	Total Sulfur (%)	Potential Acidity (Tons/Acre)	+CaCO3 (Tons/1000 Tons Material)	Total Pyritic Sulfur (%)
B-9 14.0' - 16.0'	125+35 21' L	63747	Strong	7.8	502.50	0.029	0.91	501.59	0.00
B-9 18.0' - 19.0'	125+35 21' L	63748	Strong	8.5	592.50	0.026	0.81	591.69	0.01
B-9 21.9' - 22.5'	125+35 21' L	63749	Strong	8.5	460.00	0.025	0.78	459.22	-0.01
B-9 29.0' - 31.0'	125+35 21' L	63750	Strong	8.5	435.00	0.029	0.91	434.09	0.00
B-10 24.8' - 26.4'	128+72 3' L	63751	Strong	8.6	535.00	0.031	0.97	534.03	-0.01
B-10 47.5' - 48.7'	128+72 3' L	63752	Strong	8.9	488.75	0.019	0.59	488.16	0.01
B-10 54.0' - 55.4'	128+72 3' L	63753	Strong	9.1	471.25	0.025	0.78	470.47	0.00
B-11 9.5' - 11.0'	130+60 CL	63754	None	4.9	13.38	0.028	0.88	12.50	0.00
B-11 19.5' - 21.0'	130+60 CL	63755	None	4.9	16.18	0.026	0.81	15.37	0.01
B-11 28.8' - 29.8'	130+60 CL	63756	Strong	8.1	586.25	0.025	0.78	585.47	0.00
B-11 33.0' - 35.0'	130+60 CL	63757	Strong	8.6	468.75	0.026	0.81	467.94	0.00
B-11 46.6' - 48.0'	130+60 CL	63758	Strong	8.7	545.00	0.083	2.59	542.41	0.01
B-11 50.0' - 52.0'	130+60 CL	63759	Strong	9.0	478.75	0.019	0.59	478.16	-0.01
B-12 4.0' - 5.5'	133+44 16' R	63760	None	5.2	3.80	0.039	1.22	2.58	0.00
B-12 14.0' - 15.5'	139+95 16' R	63761	None	5.0	6.58	0.006	0.19	6.39	0.00

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Sample Group # SR-40 Bridge Over Ocoee River **Sampled By:** Besmir Zenelaku

Table of Geochemical Testing Results

Boring ID Depth (Feet)	Station CL Ref	Lab Control #	Fizz	Paste pH	Neutralization Potential (Tons/1000 Tons Material)	Total Sulfur (%)	Potential Acidity (Tons/Acre)	+CaCO3 (Tons/1000 Tons Material)	Total Pyritic Sulfur (%)
B-13 4.5' - 6.0'	139+95 60' L	63762	None	4.9	4.55	0.028	0.88	3.67	0.01
B-13 9.5' - 10.0'	139+95 60' L	63763	None	4.4	7.33	0.030	0.94	6.39	0.01
B-14 8.0' - 12.0'	141+80 60' L	63764	None	4.3	11.63	0.031	0.97	10.66	-0.01
B-15 5.0' - 10.0'	144+98 42' L	63765	None	4.3	8.85	0.035	1.09	7.76	0.00