



REPORT

Preliminary Geotechnical Data Report - Addendum 1
Interstate 95 Bridges 1427 and 5800 over Stillwater Avenue, Bangor, Maine
(WIN 027176.00)

Submitted to:

Maine Department of Transportation

Submitted by:

WSP USA, Inc.

428 Dow Highway Eliot, Maine 03903

207.865.4024

WIN 027176.00 / WSP US0025840.3905

January 30, 2025



Table of Contents

1.0 INTRODUCTION 1

2.0 BORING PROGRAM 1

3.0 LABORATORY TESTING PROGRAM..... 2

4.0 SUBSURFACE CONDITIONS 2

5.0 REPORT AND EXPLORATION LIMITATIONS 3

TABLES (embedded)

Table 3-1: Number and Type of Laboratory Tests Performed..... 2

Table 4-1: Summary of Subsurface Fill and Soil Encountered in 200-series Borings 2

TABLE (attached)

Table 1: Summary of Subsurface Explorations

FIGURES (attached)

Figure 1: Site Location Plan

Figure 2: Boring Location Plan

APPENDICES

APPENDIX A

Boring Logs

APPENDIX B

Laboratory Testing Results

1.0 INTRODUCTION

This Addendum 1 to the Preliminary Geotechnical Data Report (PGDR) summarizes the results of an additional geotechnical subsurface investigation and laboratory testing program of site soils that WSP USA Inc. (WSP) performed to support the replacement of Bridge No. 1427 & No. 5800 that carries Interstate 95 (I-95) over Stillwater Avenue in Bangor, Maine. Figure 1 (attached) shows the site location. The goal of this additional investigation was to identify the potential presence of compressible clays in areas not previously evaluated as discussed in the Preliminary Geotechnical Data Report.¹

2.0 BORING PROGRAM

WSP completed four (4) borings (BB-BSA-201, BB-BSA-202, BB-BSA-203, and BB-BSA-204) within the median of I-95 northbound and southbound on either side of Stillwater Avenue on December 16 and December 17, 2024. The boring locations with respect to existing site features are illustrated in the Boring Location Plan in Figure 2 (attached).

The boring program included Standard Penetration Testing (SPT) of fine-grained and coarse-grained soils. A WSP geotechnical engineer monitored drilling activities, selected sampling intervals, logged subsurface conditions encountered, and obtained soil samples for use in visual descriptions and subsequent laboratory testing and classification.

WSP subcontracted Seaboard Drilling, LLC (Seaboard) of Bangor, Maine, to complete the borings. Borings BB-BSA-201, -202, and -203 were advanced using hollow stem augers with continuous SPT sampling to a depth of 4.5 feet to 14.0 bgs. BB-BSA-204 was advanced using solid stem augers to a depth of 10 feet bgs and then with driven casing and wash boring methods to a depth of 19 feet bgs with continuous SPT sampling between 10 feet and 19 feet bgs.

SPT was performed using a calibrated automatic hammer system and standard 2-inch split spoon sampler in general accordance with American Society for Testing and Materials (ASTM) D1586. Sampling was conducted continuously, where split spoons were advanced 24 inches with a 140-pound hammer dropped 30 inches. WSP recorded the number of hammer blows required to advance the sampler through each 6-inch increment. Measured, uncorrected N-values, calculated as the sum of the hammer blows to advance the sampler during the 6-inch to 12-inch and 12-inch to 18-inch penetration intervals. WSP used a calibrated hammer energy transfer ratio of 98.5% provided by Seaboard² to convert the measured N-values to N_{60} values. Uncorrected N-values and N_{60} are shown on the boring logs (Appendix A). WSP collected and stored soil samples in sealed glass jars for later evaluation and laboratory testing.

The boring logs provided in Appendix A present details of the sampling methods used, field data obtained, and soil conditions encountered during the investigation. A description of the boring log symbols and terms used for the soil descriptions precedes the boring logs. A WSP geotechnical engineer monitored drilling activities, selected sampling intervals, logged subsurface conditions encountered, and obtained soil samples for use in visual descriptions and subsequent laboratory testing and classification. WSP field characterized the soils in general accordance with ASTM D2488.

¹ WSP USA, Inc., Preliminary Geotechnical Data Report REV01, Interstate 95 Bridges 1427 and 5800 over Stillwater Avenue, Bangor, Maine (WIN 027176.00), Submitted to Maine Department of Transportation, November 4, 2024.

² SPT Energy Calibration Report prepared for Seaboard Drilling, LLC by GRL Engineers, Inc., Dated October 23, 2024.

3.0 LABORATORY TESTING PROGRAM

After reviewing the collected samples in the office, WSP transferred select samples to GeoTesting Express (GTX) of Acton, Massachusetts for geotechnical laboratory testing in accordance with applicable AASHTO and ASTM testing procedures. The types and numbers of each of the laboratory tests conducted on soil samples are presented in Table 3-1. Soil testing results are included on the boring logs in Appendix A. Complete soil and rock laboratory testing results are provided in Appendix B.

Table 3-1: Number and Type of Laboratory Tests Performed

Laboratory Test	Test Standard	No. Tests Completed
Grain size analysis (sieve & hydrometer)	AASHTO T88, ASTM D6913 / ASTM D 7928	7
Atterberg limits	AASHTO T89 / T90, ASTM D4318	7

4.0 SUBSURFACE CONDITIONS

The boring logs in Appendix A provide detailed descriptions of the soil and measured groundwater conditions encountered in the borings.

Soils: The soils encountered in the borings generally consist of fill materials placed during construction of the bridge and roadway and naturally occurring sand deposits, clay deposits, and sand and gravel interpreted as glacial till. These units are discussed in more detail in the PGDR¹. Table 4-1 summarizes the major stratigraphic units, the range of thicknesses, and generalized material descriptions for soils encountered in this addendum to the preliminary geotechnical investigation.

Table 4-1: Summary of Subsurface Fill and Soil Encountered in 200-series Borings

Stratigraphic Unit	Approximate Range in Encountered Thickness (feet)	Generalized Description ¹
Topsoil	0.2 to 0.3	Topsoil (Encountered in all borings)
Sand	0.3 to 2.0	Brown, dry, medium dense, fine to medium silty SAND, little fine gravel. USCS: SM. AASHTO: A-2-4 (Encountered in BB-BSA-203)
Silt, Clay	4.3 to 11.7	Grey to brown to olive, wet to moist, very stiff to hard, Silty CLAY, trace fine sand USCS: CL. AASHTO: A-6 (13, 14, 15, 16, 17, 18) (Encountered in BB-BSA-201, -202, -203, and -204) Grey to brown to olive, wet to moist, very stiff to stiff, Clayey SILT, trace fine to medium sand (Encountered in BB-BSA-202 and -204)

Stratigraphic Unit	Approximate Range in Encountered Thickness (feet)	Generalized Description ¹
Glacial Till	6.0 to 7.0 ²	Grey to brown, wet, very dense to medium dense, fine to medium silty SAND, fine to coarse gravel, trace clay, interbedded with coarse sand seams. USCS: SM. AASHTO: A-4 <i>(Encountered in BB-BSA-201, -203, and -204)</i>

Notes:

1. USCS classification from laboratory testing in accordance with ASTM D2487. AASHTO classification from laboratory testing and includes Group Classification and Group Index in parentheses in accordance with AASHTO M145.
2. Borings terminated within this layer.

Groundwater: Groundwater was encountered at the ground surface in BB-BSA-201 and BB-BSA-202 (EL 139.8 feet and EL 140.2 feet, respectively). Groundwater levels were measured in BB-BSA-203 and BB-BSA-204 at 11.1 feet bgs (EL 125.6 feet) and 4.2 feet bgs (EL 122.6 feet), respectively. Groundwater was measured before the augers or casing was withdrawn at the time the boring was completed. Groundwater levels encountered at the time of drilling may have been influenced by the drilling methods used and will also fluctuate due to soil conditions and topography and seasonal variations in precipitation. Groundwater levels encountered during construction may differ from those recorded from the borings.

5.0 REPORT AND EXPLORATION LIMITATIONS

This Addendum to the Preliminary Geotechnical Data Report (PGDR) was prepared for the use of MaineDOT for the replacement of I-95 Bridge No. 1427 & Bridge No. 5800 over Stillwater Ave in Bangor, Maine. The professional services provided by WSP for this project include only the geotechnical aspects of the subsurface conditions at this site. The presence or implications of possible surface and/or subsurface contamination resulting from previous activities or uses of the site and/or resulting from the introduction onto the site of materials from off-site sources are outside the terms of reference for this report and have not been investigated or addressed.

Signature Page

WSP USA, Inc.



Melissa E. Landon, PhD, PE
Lead Consultant, Geotechnical Engineering



Jeffrey D. Lloyd, PE
Assistant Vice President, Geotechnical Engineering

DEB/MEL/JDL

[https://wspnlinenam.sharepoint.com/sites/us-win02609500/shared documents/06 deliverables/stillwater supplemental data report/hntb stillwater ave bangor win 027176.00 wsp pgdr addendum 1.docx](https://wspnlinenam.sharepoint.com/sites/us-win02609500/shared%20documents/06%20deliverables/stillwater%20supplemental%20data%20report/hntb%20stillwater%20ave%20bangor%20win%20027176.00%20wsp%20pgdr%20addendum%201.docx)

TABLE

**Table 1: Summary of Addendum Subsurface Exploration
Preliminary Geotechnical Data Report - Addendum 1
MaineDOT I-95 Bridge Over Stillwater Avenue, Bangor, Maine
MaineDOT WIN 027176.00**

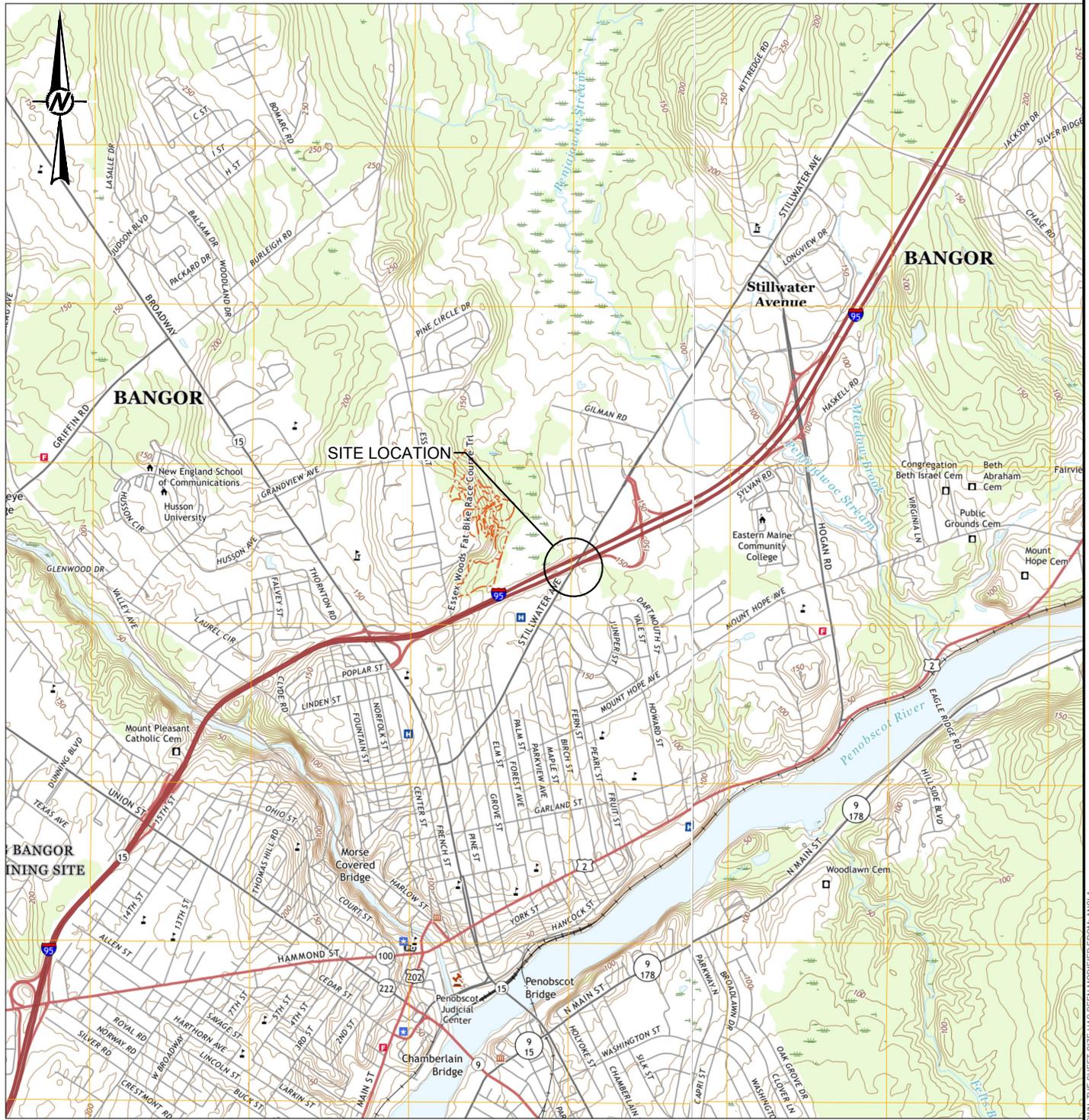
	As-Drilled Locations ⁴				Approximate Strata Thickness (feet)								Approximate Top of Bedrock Depth (feet bgs ⁵)	Approximate Elevation of Top of Bedrock (feet NAVD88)	Approximate Bottom of Exploration Depth (ft) (feet bgs ⁵)	Approximate Elevation of Bottom of Exploration (feet NAVD88)
	Test Boring No. ^{1,2,3}	Northing ⁴	Easting ⁴	Ground Surface Elevation ⁴ (feet NAVD88)	Asphalt	Top Soil	Fill	Sand	Silt, Clay	Glacial Till	Weathered Bedrock					
I-95 Median	BB-BSA-201	482953.13	1735654.60	139.8	NE ⁵	0.2	NR ⁶	NR ⁶	7.8	3.3	NR ⁶	11.3	128.5	11.3	128.5	
	BB-BSA-202	482904.38	1735517.56	140.2	NE ⁵	0.2	NR ⁶	NR ⁶	4.3	0.0	NR ⁶	4.5	135.7	4.5	135.7	
	BB-BSA-203	482750.75	1735245.03	136.7	NE ⁵	0.3	NR ⁶	1.7	6.0	6.0	NE ⁵	NE ⁵	NE ⁵	14.0	122.7	
	BB-BSA-204	482665.46	1735086.35	126.8	NE ⁵	0.3	NR ⁶	NR ⁶	11.7	7.0	NE ⁵	NE ⁵	NE ⁵	19.0	107.8	

Notes:

- Boring locations are shown in Figure 2 - Boring Location Plan of the Preliminary Geotechnical Data Report Addendum 1
- 200-series Borings were performed by Seaboard Drilling, LLC in December, 2024.
- Boring logs are presented in Appendix A of the Preliminary Geotechnical Data Report Addendum 1
- Boring locations marked and recorded using cellular telephone mapping application with an on-site accuracy between 1 and 2 feet. Elevations were extrapolated from site survey data provided on the Boring Location Plan.
- bgs = below ground surface, NE = not encountered

Prepared by: LDN
Checked By: DEB
Reviewed By: MEL

FIGURES



REFERENCE(S)

1. BASE MAP TAKEN FROM U.S.G.S. 7.5 MINUTE QUADRANGLES OF BANGOR AND VEAZIE, MAINE DATED 2021



CLIENT
HNTB CORPORATION
 82 RUNNING HILL ROAD, SUITE 201
 SOUTH PORTLAND, ME 04106

PROJECT
DESIGN BUILD PHASE I
 I-95 BRIDGE NO. 1427 & 5800 OVER STILLWATER AVENUE
 BANGOR, ME (WIN 027176.00)

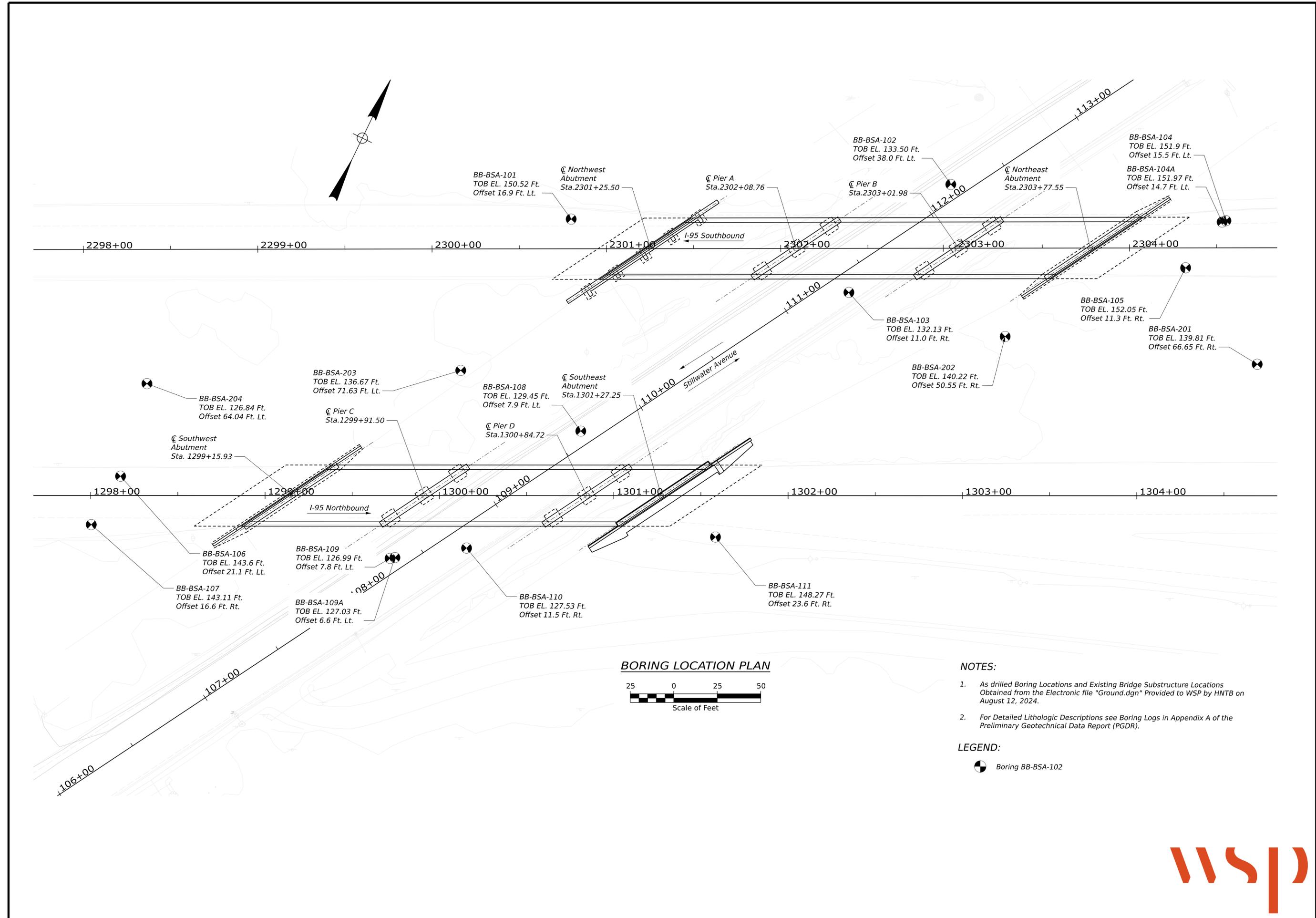
CONSULTANT	YYYY-MM-DD	2024-08-14
	DESIGNED	DEB
	PREPARED	AM
	REVIEWED	
	APPROVED	

TITLE	PROJECT NO.	CONTROL	REV.	FIGURE
SITE LOCATION MAP	US025840.3905	0001-001	0	1



Date: 1/13/2025

Username: gomeznl



STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

027176.00

WIN
027176.00
BRIDGE PLANS

PROJ. MANAGER	BY	DATE	SIGNATURE	P.E. NUMBER	DATE
DESIGN-DETAILED					
CHECKED-REVIEWED					
DESIGN-DET FILE 02					
DESIGN-DET FILE 03					
REVISIONS 1					
REVISIONS 2					
REVISIONS 3					
REVISIONS 4					
FIELD CHANGES					

BANGOR PENOBSKOT COUNTY
I-95 NB & SB OVER STILLWATER AVE

BORING LOCATION PLAN

SHEET NUMBER

02

OF 02



APPENDIX A

Boring Logs

UNIFIED SOIL CLASSIFICATION SYSTEM				MODIFIED BURMISTER SYSTEM																																											
MAJOR DIVISIONS		GROUP SYMBOLS	TYPICAL NAMES	Descriptive Term		Portion of Total (%)																																									
COARSE-GRAINED SOILS (more than half of material is larger than No. 200 sieve size)	GRAVELS (more than half of coarse fraction is larger than No. 4 sieve size)	CLEAN GRAVELS	GW Well-graded gravels, gravel-sand mixtures, little or no fines. GP Poorly-graded gravels, gravel sand mixtures, little or no fines.	trace	0 - 10																																										
		GRAVEL WITH FINES (Appreciable amount of fines)	GM Silty gravels, gravel-sand-silt mixtures. GC Clayey gravels, gravel-sand-clay mixtures.	little	11 - 20																																										
				some	21 - 35																																										
	SANDS (more than half of coarse fraction is smaller than No. 4 sieve size)	CLEAN SANDS	SW Well-graded sands, Gravelly sands, little or no fines SP Poorly-graded sands, Gravelly sand, little or no fines.	adjective (e.g. Sandy, Clayey)	36 - 50																																										
		SANDS WITH FINES (Appreciable amount of fines)	SM Silty sands, sand-silt mixtures SC Clayey sands, sand-clay mixtures.																																												
FINE-GRAINED SOILS (more than half of material is smaller than No. 200 sieve size)	SILTS AND CLAYS (liquid limit less than 50)	ML Inorganic silts and very fine sands, rock flour, Silty or Clayey fine sands, or Clayey silts with slight plasticity.		TERMS DESCRIBING DENSITY/CONSISTENCY Coarse-grained soils (more than half of material is larger than No. 200 sieve): Includes (1) clean gravels; (2) Silty or Clayey gravels; and (3) Silty, Clayey or Gravelly sands. Density is rated according to standard penetration resistance (N-value). <table border="1"> <thead> <tr> <th>Density of Cohesionless Soils</th> <th>Standard Penetration Resistance N₆₀-Value (blows per foot)</th> </tr> </thead> <tbody> <tr> <td>Very loose</td> <td>0 - 4</td> </tr> <tr> <td>Loose</td> <td>5 - 10</td> </tr> <tr> <td>Medium Dense</td> <td>11 - 30</td> </tr> <tr> <td>Dense</td> <td>31 - 50</td> </tr> <tr> <td>Very Dense</td> <td>> 50</td> </tr> </tbody> </table> Fine-grained soils (more than half of material is smaller than No. 200 sieve): Includes (1) inorganic and organic silts and clays; (2) Gravelly, Sandy or Silty clays; and (3) Clayey silts. Consistency is rated according to undrained shear strength as indicated. <table border="1"> <thead> <tr> <th>Consistency of Cohesive soils</th> <th>SPT N₆₀-Value (blows per foot)</th> <th>Approximate Undrained Shear Strength (psf)</th> <th>Field Guidelines</th> </tr> </thead> <tbody> <tr> <td>Very Soft</td> <td>WOH, WOR, WOP, <2</td> <td>0 - 250</td> <td>Fist easily penetrates</td> </tr> <tr> <td>Soft</td> <td>2 - 4</td> <td>250 - 500</td> <td>Thumb easily penetrates</td> </tr> <tr> <td>Medium Stiff</td> <td>5 - 8</td> <td>500 - 1000</td> <td>Thumb penetrates with moderate effort</td> </tr> <tr> <td>Stiff</td> <td>9 - 15</td> <td>1000 - 2000</td> <td>Indented by thumb with great effort</td> </tr> <tr> <td>Very Stiff</td> <td>16 - 30</td> <td>2000 - 4000</td> <td>Indented by thumbnail</td> </tr> <tr> <td>Hard</td> <td>>30</td> <td>over 4000</td> <td>Indented by thumbnail with difficulty</td> </tr> </tbody> </table>				Density of Cohesionless Soils	Standard Penetration Resistance N ₆₀ -Value (blows per foot)	Very loose	0 - 4	Loose	5 - 10	Medium Dense	11 - 30	Dense	31 - 50	Very Dense	> 50	Consistency of Cohesive soils	SPT N ₆₀ -Value (blows per foot)	Approximate Undrained Shear Strength (psf)	Field Guidelines	Very Soft	WOH, WOR, WOP, <2	0 - 250	Fist easily penetrates	Soft	2 - 4	250 - 500	Thumb easily penetrates	Medium Stiff	5 - 8	500 - 1000	Thumb penetrates with moderate effort	Stiff	9 - 15	1000 - 2000	Indented by thumb with great effort	Very Stiff	16 - 30	2000 - 4000	Indented by thumbnail	Hard	>30	over 4000	Indented by thumbnail with difficulty
		Density of Cohesionless Soils	Standard Penetration Resistance N ₆₀ -Value (blows per foot)																																												
		Very loose	0 - 4																																												
	Loose	5 - 10																																													
Medium Dense	11 - 30																																														
Dense	31 - 50																																														
Very Dense	> 50																																														
Consistency of Cohesive soils	SPT N ₆₀ -Value (blows per foot)	Approximate Undrained Shear Strength (psf)	Field Guidelines																																												
Very Soft	WOH, WOR, WOP, <2	0 - 250	Fist easily penetrates																																												
Soft	2 - 4	250 - 500	Thumb easily penetrates																																												
Medium Stiff	5 - 8	500 - 1000	Thumb penetrates with moderate effort																																												
Stiff	9 - 15	1000 - 2000	Indented by thumb with great effort																																												
Very Stiff	16 - 30	2000 - 4000	Indented by thumbnail																																												
Hard	>30	over 4000	Indented by thumbnail with difficulty																																												
CL Inorganic clays of low to medium plasticity, Gravelly clays, Sandy clays, Silty clays, lean clays.																																															
OL Organic silts and organic Silty clays of low plasticity.																																															
SILTS AND CLAYS (liquid limit greater than 50)	MH Inorganic silts, micaceous or diatomaceous fine Sandy or Silty soils, elastic silts.																																														
	CH Inorganic clays of high plasticity, fat clays.																																														
	OH Organic clays of medium to high plasticity, organic silts.																																														
	HIGHLY ORGANIC SOILS	Pt Peat and other highly organic soils.																																													
Desired Soil Observations (in this order, if applicable): Color (Munsell color chart) Moisture (dry, damp, moist, wet) Density/Consistency (from above right hand side) Texture (fine, medium, coarse, etc.) Name (Sand, Silty Sand, Clay, etc., including portions - trace, little, etc.) Gradation (well-graded, poorly-graded, uniform, etc.) Plasticity (non-plastic, slightly plastic, moderately plastic, highly plastic) Structure (layering, fractures, cracks, etc.) Bonding (well, moderately, loosely, etc.,) Cementation (weak, moderate, or strong) Geologic Origin (till, marine clay, alluvium, etc.) Groundwater level				Rock Quality Designation (RQD): RQD (%) = $\frac{\text{sum of the lengths of intact pieces of core}^* > 4 \text{ inches}}{\text{length of core advance}}$ *Minimum NQ rock core (1.88 in. OD of core) Rock Quality Based on RQD <table border="1"> <thead> <tr> <th>Rock Quality</th> <th>RQD (%)</th> </tr> </thead> <tbody> <tr> <td>Very Poor</td> <td>≤25</td> </tr> <tr> <td>Poor</td> <td>26 - 50</td> </tr> <tr> <td>Fair</td> <td>51 - 75</td> </tr> <tr> <td>Good</td> <td>76 - 90</td> </tr> <tr> <td>Excellent</td> <td>91 - 100</td> </tr> </tbody> </table> Desired Rock Observations (in this order, if applicable): Color (Munsell color chart) Texture (aphanitic, fine-grained, etc.) Rock Type (granite, schist, sandstone, etc.) Hardness (very hard, hard, mod. hard, etc.) Weathering (fresh, very slight, slight, moderate, mod. severe, severe, etc.) Geologic discontinuities/jointing: -dip (horiz - 0-5 deg., low angle - 5-35 deg., mod. dipping - 35-55 deg., steep - 55-85 deg., vertical - 85-90 deg.) -spacing (very close - <2 inch, close - 2-12 inch, mod. close - 1-3 feet, wide - 3-10 feet, very wide >10 feet) -tightness (tight, open, or healed) -infilling (grain size, color, etc.) Formation (Waterville, Ellsworth, Cape Elizabeth, etc.) RQD and correlation to rock quality (very poor, poor, etc.) ref: ASTM D6032 and FHWA NHI-16-072 GEC 5 - Geotechnical Site Characterization, Table 4-12 Recovery (inch/inch and percentage) Rock Core Rate (X.X ft - Y.Y ft (min:sec))				Rock Quality	RQD (%)	Very Poor	≤25	Poor	26 - 50	Fair	51 - 75	Good	76 - 90	Excellent	91 - 100																												
Rock Quality	RQD (%)																																														
Very Poor	≤25																																														
Poor	26 - 50																																														
Fair	51 - 75																																														
Good	76 - 90																																														
Excellent	91 - 100																																														
Maine Department of Transportation Geotechnical Section Key to Soil and Rock Descriptions and Terms Field Identification Information				Sample Container Labeling Requirements: WIN Blow Counts Bridge Name / Town Sample Recovery Boring Number Date Sample Number Personnel Initials Sample Depth																																											

Driller: Seaboard	Elevation (ft.): 139.81	Auger ID/OD: 2-1/4 in I.D.
Operator: R. Hackett	Datum: Maine East Zone	Sampler: Standard Split Spoon
Logged By: D. Burgess	Rig Type: Diedrich D-50	Hammer Wt./Fall: 140lb/30in
Date Start/Finish: 12/17/24 (8:12); (8:50)	Drilling Method: HSA	Core Barrel:
Boring Location: N: 482953.126, E: 1735654.604	Casing ID/OD:	Water Level*: 0.0' 7:48 AM 12/17/24

Hammer Efficiency Factor: 0.985 **Hammer Type:** Automatic Hydraulic Rope & Cathead

Definitions: R = Rock Core Sample S_u = Peak/Remolded Field Vane Undrained Shear Strength (psf) LI = Liquidity Index
 D = Split Spoon Sample SSA = Solid Stem Auger S_u(lab) = Lab Vane Undrained Shear Strength (psf) WC = Water Content, percent
 MD = Unsuccessful Split Spoon Sample Attempt HSA = Hollow Stem Auger q_p = Unconfined Compressive Strength (ksf) LL = Liquid Limit
 U = Thin Wall Tube Sample RC = Roller Cone N-uncorrected = Raw Field SPT N-value PL = Plastic Limit
 MU = Unsuccessful Thin Wall Tube Sample Attempt WOH = Weight of 140lb. Hammer Hammer Efficiency Factor = Rig Specific Annual Calibration Value PI = Plasticity Index
 V = Field Vane Shear Test, PP = Pocket Penetrometer WOR/C = Weight of Rods or Casing N₆₀ = SPT N-uncorrected Corrected for Hammer Efficiency G = Grain Size Analysis
 MV = Unsuccessful Field Vane Shear Test Attempt T_v = Pocket Torvane Shear Strength (psf) N₆₀ = (Hammer Efficiency Factor/60%)*N-uncorrected C = Consolidation Test

Depth (ft.)	Sample Information								Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/AASHTO and Unified Class.
	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N ₆₀	Casing	Blows				
0	1D	24/2	0.00 - 2.00	1-6-6-8	12	20	HSA	139.6	2" Topsoil			
	2D	24/20	2.00 - 4.00	7-9-12-12	21	34			Grey to brown, wet, very stiff, Silty CLAY, trace fine sand, low plasticity [SILTY CLAY]. q _p = 3.0 to 5.0 tsf (pocket penetrometer)	0.2	WC = 26.0% Fines = 97.6% LL = 37 PL = 20 PI = 17 LI = 0.4	
5	3D	24/24	4.00 - 6.00	3-5-6-8	11	18			Brown, wet, very stiff, fine Sandy CLAY, low plasticity [SILTY CLAY].			A-6 (17), CL
	4D	24/24	6.00 - 8.00	8-11-11-13	22	36			Grey to brown, wet, hard, Silty CLAY, trace fine sand seams, low plasticity [SILTY CLAY]. q _p = 3.5 to 4.5 tsf (pocket penetrometer)	8.0	WC = 25.0% Fines = 96.3% LL = 33 PL 20	PI = 13 LI = 0.4 A-6 (13), CL
	5D	24/24	8.00 - 10.00	7-16-11-13	27	44		131.8	Brown, wet, dense, fine to medium Silty SAND, some fine to coarse gravel, trace clay [GLACIAL TILL].	8.0		
10	6D	14/10	10.00 - 11.17	6-34-50/2"	R			128.5	Brown, wet, medium dense, fine to medium Silty SAND, some fine to coarse gravel, trace clay [GLACIAL TILL].	11.3		
									Bottom of Exploration at 11.3 feet below ground surface. Boring backfilled with drill cuttings to surface.	11.3		
15												
20												
25												

Remarks:

- Hammer Efficiency factor provided by Seaboard and taken from "2024PA00175 - Seaboard - SPT Report" by GRL Engineers Inc., dated 10/23/2024
- As-drilled boring locations were marked by WSP with an accuracy of 1 to 2 feet and as-drilled ground surface elevations were obtained from electronic file "Ground.dgn" received from HNTB on August 12, 2024.
- Water level reading taken on 12/17/24 at 07:48 and was taken before drilling was started.

Driller: Seaboard	Elevation (ft.): 140.22	Auger ID/OD: 2-1/4 in I.D.
Operator: R. Hackett	Datum: Maine East Zone	Sampler: Standard Split Spoon
Logged By: D. Burgess	Rig Type: Diedrich D-50	Hammer Wt./Fall: 140lb/30in
Date Start/Finish: 12/17/24 (7:48); (8:07)	Drilling Method: HSA	Core Barrel:
Boring Location: N: 482904.381, E: 1735517.562	Casing ID/OD:	Water Level*: 0.0' 8:12 AM 12/17/24

Hammer Efficiency Factor: 0.985	Hammer Type: Automatic <input checked="" type="checkbox"/> Hydraulic <input type="checkbox"/> Rope & Cathead <input type="checkbox"/>	
Definitions: D = Split Spoon Sample MD = Unsuccessful Split Spoon Sample Attempt U = Thin Wall Tube Sample MU = Unsuccessful Thin Wall Tube Sample Attempt V = Field Vane Shear Test, PP = Pocket Penetrometer MV = Unsuccessful Field Vane Shear Test Attempt		
R = Rock Core Sample SSA = Solid Stem Auger HSA = Hollow Stem Auger RC = Roller Cone WOH = Weight of 140lb. Hammer WOR/C = Weight of Rods or Casing T _v = Pocket Torvane Shear Strength (psf)		
S _u = Peak/Remolded Field Vane Undrained Shear Strength (psf) S _u (lab) = Lab Vane Undrained Shear Strength (psf) q _p = Unconfined Compressive Strength (ksf) N-uncorrected = Raw Field SPT N-value Hammer Efficiency Factor = Rig Specific Annual Calibration Value N ₆₀ = SPT N-uncorrected Corrected for Hammer Efficiency N ₆₀ = (Hammer Efficiency Factor/60%)*N-uncorrected		
LI = Liquidity Index WC = Water Content, percent LL = Liquid Limit PL = Plastic Limit PI = Plasticity Index G = Grain Size Analysis C = Consolidation Test		

Depth (ft.)	Sample Information								Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/AASHTO and Unified Class.
	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N ₆₀	Casing	Blows				
0	1D	24/24	0.00 - 2.00	1-4-4-4	8	13	HSA	140.0		2" Topsoil.	WC = 23.0% Fines = 99.2% LL = 35 PL = 17 PI = 18 LI = 0.3 A-6 (18), CL	
	2D	14/10	2.00 - 3.17	6-43-50/2"	R			135.7		Grey to brown, wet, stiff, Silty CLAY, trace fine sand, low plasticity [SILTY CLAY]. q _p = 3.0 to 3.5 tsf (pocket penetrometer). Olive with brown mottled, wet, stiff, Clayey SILT, trace fine sand, low plasticity [SILTY CLAY]. q _p = 3.0 to 4.0 tsf (pocket penetrometer).		
5										Bottom of Exploration at 4.5 feet below ground surface. Boring backfilled with drill cuttings to surface.		
10												
15												
20												
25												

Remarks:

- Hammer Efficiency factor provided by Seaboard and taken from "2024PA00175 - Seaboard - SPT Report" by GRL Engineers Inc., dated 10/23/2024
- As-drilled boring locations were marked by WSP with an accuracy of 1 to 2 feet and as-drilled ground surface elevations were obtained from electronic file "Ground.dgn" received from HNTB on August 12, 2024.
- Water level reading taken on 12/17/24 at 08:12 and was taken before drilling was started.

Driller: Seaboard	Elevation (ft.): 136.7	Auger ID/OD: 4-1/2 in O.D.
Operator: R. Hackett	Datum: Maine East Zone	Sampler: Standard Split Spoon
Logged By: D. Burgess	Rig Type: Diedrich D-50	Hammer Wt./Fall: 140lb/30in
Date Start/Finish: 12/16/24 (10:30); (11:25)	Drilling Method: SSA	Core Barrel:
Boring Location: N: 482750.753, E: 1735245.028	Casing ID/OD:	Water Level*: 11.1' 11:05 AM 12/16/24

Hammer Efficiency Factor: 0.985 **Hammer Type:** Automatic Hydraulic Rope & Cathead

 Definitions: R = Rock Core Sample S_u = Peak/Remolded Field Vane Undrained Shear Strength (psf) LI = Liquidity Index
 D = Split Spoon Sample SSA = Solid Stem Auger S_u(lab) = Lab Vane Undrained Shear Strength (psf) WC = Water Content, percent
 MD = Unsuccessful Split Spoon Sample Attempt HSA = Hollow Stem Auger q_p = Unconfined Compressive Strength (ksf) LL = Liquid Limit
 U = Thin Wall Tube Sample RC = Roller Cone N-uncorrected = Raw Field SPT N-value PL = Plastic Limit
 MU = Unsuccessful Thin Wall Tube Sample Attempt WOH = Weight of 140lb. Hammer Hammer Efficiency Factor = Rig Specific Annual Calibration Value PI = Plasticity Index
 V = Field Vane Shear Test, PP = Pocket Penetrometer WOR/C = Weight of Rods or Casing N₆₀ = SPT N-uncorrected Corrected for Hammer Efficiency G = Grain Size Analysis
 MV = Unsuccessful Field Vane Shear Test Attempt T_v = Pocket Torvane Shear Strength (psf) N₆₀ = (Hammer Efficiency Factor/60%)*N-uncorrected C = Consolidation Test

Depth (ft.)	Sample Information								Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/AASHTO and Unified Class.
	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N ₆₀	Casing	Blows				
0	S-1	24/9	0.00 - 2.00	2-3-6-6	9	15	SSA		136.5	Top 3" Topsoil.		
										Brown, dry, medium dense, fine to medium silty SAND, little fine gravel [SAND].		
	S-2	24/20	2.00 - 4.00	15-15-15-14	30	49			134.7	Grey to brown, moist, hard, Silty CLAY, trace fine sand, low plasticity [SILTY CLAY].	WC = 15.0% Fines = 93.9%	
										Olive, wet, very stiff, Silty CLAY, trace fine sand, low plasticity [SILTY CLAY].	LL = 34 PL = 19	
5	S-3	24/24	4.00 - 6.00	6-7-7-6	14	23				q _p = 2.5 tsf (pocket penetrometer).	PI = 15 LI = 0.3	
										Brown with olive mottled, wet, very stiff, Silty CLAY, trace fine sand, low plasticity [SILTY CLAY].	A-6 (14), CL WC = 22.0%	
	S-4	24/24	6.00 - 8.00	9-10-11-18	21	34				q _p = 2.5 to 3.5 tsf (pocket penetrometer).	Fines = 98.4%	
											LL = 35 PL = 18	
	S-5	24/14	8.00 - 10.00	9-13-13-15	26	43			128.7	Brown, moist to wet, dense, fine to medium Silty SAND, little fine gravel [GLACIAL TILL].	PI = 17 LI = 0.3	
10	S-6	24/14	10.00 - 12.00	16-16-17-15	33	54				Brown, moist to wet, very dense, fine to medium Silty SAND, little fine to coarse gravel [GLACIAL TILL].	A-6 (17), CL	
	S-7	24/14	12.00 - 14.00	9-12-21-41	33	54				Silty SAND with gravel (SM). Brown, moist to wet, very dense, fine to medium Silty SAND, little fine to coarse gravel, with interbedded coarse sand seams [GLACIAL TILL].		
15									122.7	Bottom of Exploration at 14.0 feet below ground surface. Boring backfilled with drill cuttings to surface.		
20												
25												

Remarks:

- Hammer Efficiency factor provided by Seaboard and taken from "2024PA00175 - Seaboard - SPT Report" by GRL Engineers Inc., dated 10/23/2024
- As-drilled boring locations were marked by WSP with an accuracy of 1 to 2 feet and as-drilled ground surface elevations were obtained from electronic file "Ground.dgn" received from HNTB on August 12, 2024.
- Water level reading taken on 12/16/24 at 11:05 and was taken after drilling was completed.

Driller: Seaboard	Elevation (ft.): 126.8	Auger ID/OD: 4-1/2 in O.D.
Operator: R. Hackett	Datum: Maine East Zone	Sampler: Standard Split Spoon
Logged By: D. Burgess	Rig Type: Diedrich D-50	Hammer Wt./Fall: 140lb/30in
Date Start/Finish: 12/16/24 (7:53); (9:45)	Drilling Method: SSA, Driven casing and washed methods	Core Barrel:
Boring Location: N: 482665.455, E: 1735086.352	Casing ID/OD:	Water Level*: 4.2' 9:35 AM 12/16/24

Hammer Efficiency Factor: 0.985 **Hammer Type:** Automatic Hydraulic Rope & Cathead

Definitions: R = Rock Core Sample S_u = Peak/Remolded Field Vane Undrained Shear Strength (psf) LI = Liquidity Index
 D = Split Spoon Sample SSA = Solid Stem Auger S_u(lab) = Lab Vane Undrained Shear Strength (psf) WC = Water Content, percent
 MD = Unsuccessful Split Spoon Sample Attempt HSA = Hollow Stem Auger q_p = Unconfined Compressive Strength (ksf) LL = Liquid Limit
 U = Thin Wall Tube Sample RC = Roller Cone N-uncorrected = Raw Field SPT N-value PL = Plasticity Limit
 MU = Unsuccessful Thin Wall Tube Sample Attempt WOH = Weight of 140lb. Hammer Hammer Efficiency Factor = Rig Specific Annual Calibration Value PI = Plasticity Index
 V = Field Vane Shear Test, PP = Pocket Penetrometer WOR/C = Weight of Rods or Casing N₆₀ = SPT N-uncorrected Corrected for Hammer Efficiency G = Grain Size Analysis
 MV = Unsuccessful Field Vane Shear Test Attempt T_v = Pocket Torvane Shear Strength (psf) N₆₀ = (Hammer Efficiency Factor/60%)*N-uncorrected C = Consolidation Test

Depth (ft.)	Sample Information								Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/AASHTO and Unified Class.
	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N ₆₀	Casing Blows					
0	1D	24/9	0.00 - 2.00	2-3-4-4	7	11	SSA	126.6		Top 3" Topsoil.	WC = 27.0% Fines = 99.4% LL = 34 PL = 20 PI = 14 LI = 0.5 A-6 (14), CL WC = 25.0% Fine = 99.3% LL = 32 PL = 16 PI = 16 LI = 0.6 A-6 (15), CL	
	2D	24/24	2.00 - 4.00	5-5-4-5	9	15				1D: Grey to olive, moist, stiff, Clayey SILT, trace fine to medium sand, low plasticity [SILTY CLAY]. q _p = 3.0 to 3.5 tsf (pocket penetrometer)		
	3D	24/24	4.00 - 6.00	3-5-6-8	11	18				2D: Olive with grey and orange mottled, moist, stiff, Clayey SILT, trace fine to medium sand, low plasticity [SILTY CLAY]. q _p = 3.0 to 4.0 tsf (pocket penetrometer)		
5	4D	24/24	6.00 - 8.00	8-8-8-10	16	26				3D: Olive with grey and orange mottled, moist, very stiff, Clayey SILT, trace fine to medium sand, low plasticity [SILTY CLAY]. q _p = 2.0 to 2.5 tsf (pocket penetrometer)		
	5D	24/24	8.00 - 10.00	3-4-3-4	7	11				4D: Olive to grey, wet, very stiff, Silty CLAY, trace fine sand, low plasticity [SILTY CLAY]. q _p = 2.0 to 2.5 tsf (pocket penetrometer)		
10	6D	24/24	10.00 - 12.00	4-6-4-9	10	16				5D: Brown, wet, stiff, Silty CLAY, trace fine sand, low plasticity [SILTY CLAY]. q _p < 1.0 tsf (pocket penetrometer)		
	MV			Would Not Push								
	7D	24/12	12.00 - 14.00	16-14-8-10	22	36		114.8		6D: Olive to grey, wet, very stiff, Silty CLAY, trace fine sand, low plasticity [SILTY CLAY]. q _p < 1.0 tsf (pocket penetrometer)		
15	8D	24/12	15.00 - 17.00	8-13-13-20	26	43				Missed Field Vane at 12 feet bgs.		
	9D	24/5	17.00 - 19.00	19-20-13-18	33	54			7D: Grey, wet, dense, fine to medium Silty SAND, with fine rounded gravel [GLACIAL TILL]. 8D: Grey with brown, wet, dense, fine to medium Silty SAND, with fine rounded gravel [GLACIAL TILL]. 9D: Grey with brown, wet, dense, fine to medium Silty SAND, with fine rounded gravel [GLACIAL TILL].			
20								107.8		Bottom of Exploration at 19.0 feet below ground surface. Boring backfilled with drill cuttings to surface.		
25												

Remarks:

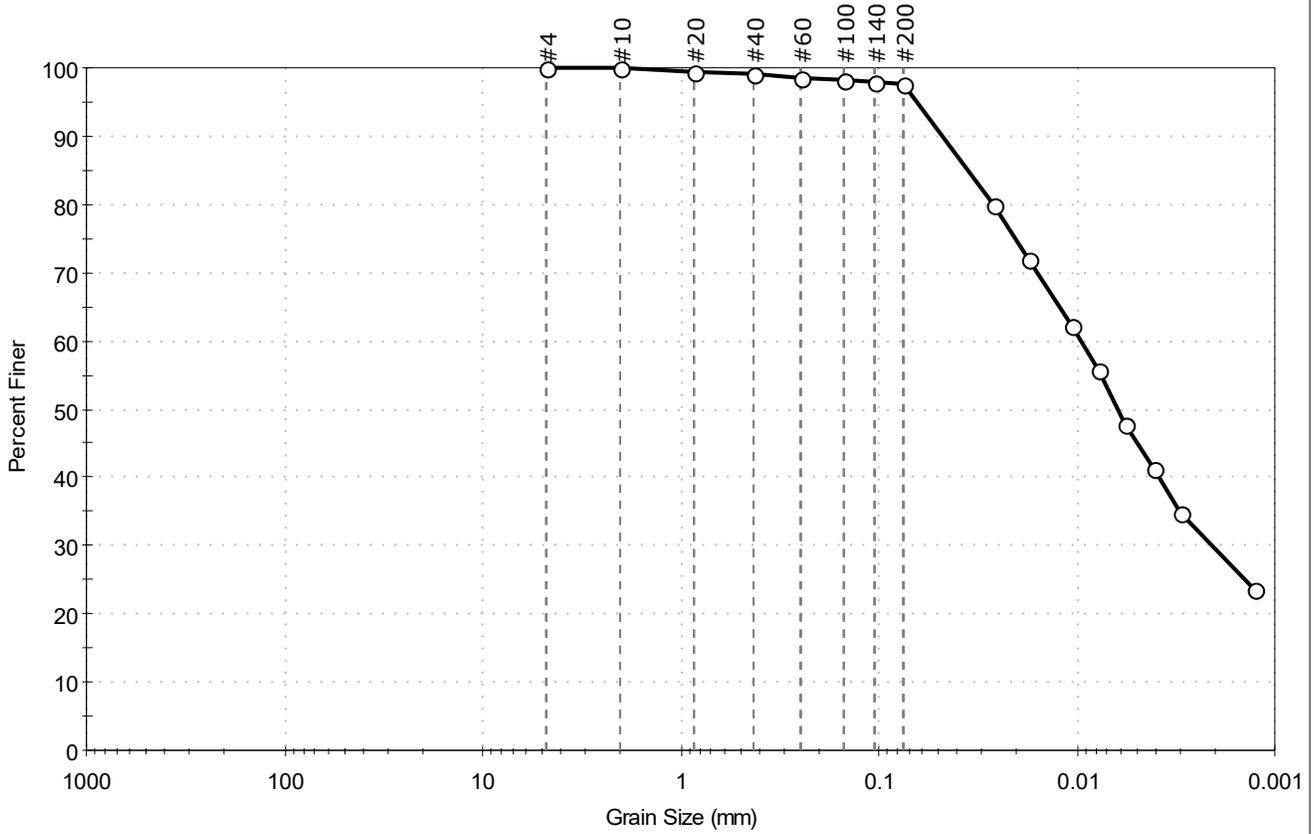
- Hammer Efficiency factor provided by Seaboard and taken from "2024PA00175 - Seaboard - SPT Report" by GRL Engineers Inc., dated 10/23/2024
- As-drilled boring locations were marked by WSP with an accuracy of 1 to 2 feet and as-drilled ground surface elevations were obtained from electronic file "Ground.dgn" recieved from HNTB on August 12, 2024.
- Water level reading taken on 12/16/24 at 09:35 and was taken after drilling was completed.

APPENDIX B

Laboratory Testing Results

Client: WSP USA, Inc.	Project No: GTX-319180
Project: MaineDOT I-95 Bridge over Stillwater	
Location: Merrimack, NH	
Boring ID: BB-BSA-201	Sample Type: Jar
Sample ID: 2D (S-2)	Test Date: 01/03/25
Depth: 2-4'	Test Id: 797951
Test Comment: ---	Tested By: ajl
Visual Description: Moist, grayish brown clay	Checked By: jsc
Sample Comment: ---	

Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	0.0	2.4	97.6

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	99		
#60	0.25	99		
#100	0.15	98		
#140	0.11	98		
#200	0.075	98		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
---	0.0266	80		
---	0.0175	72		
---	0.0106	62		
---	0.0077	56		
---	0.0057	48		
---	0.0041	41		
---	0.0030	35		
---	0.0013	23		

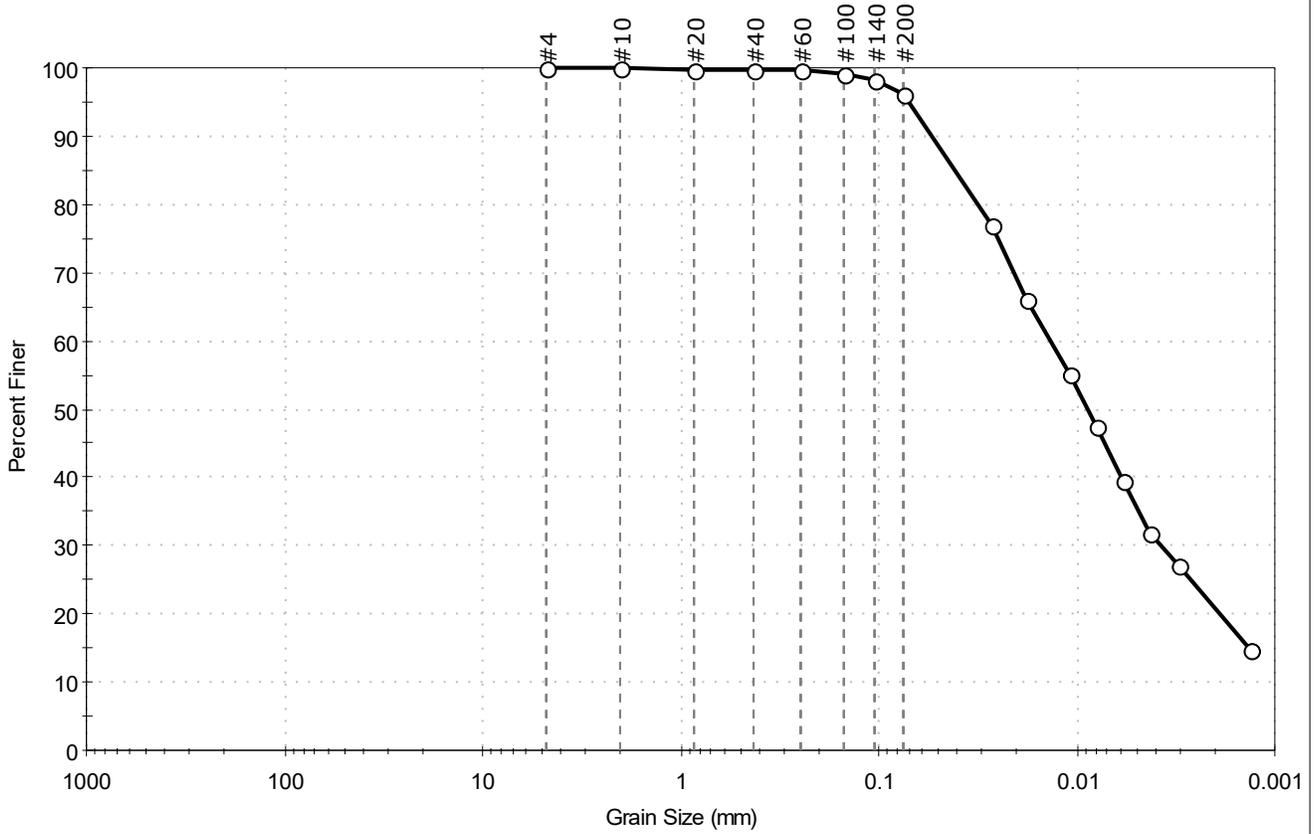
<u>Coefficients</u>	
D ₈₅ = 0.0357 mm	D ₃₀ = 0.0021 mm
D ₆₀ = 0.0095 mm	D ₁₅ = N/A
D ₅₀ = 0.0062 mm	D ₁₀ = N/A
C _u = N/A	C _c = N/A

<u>Classification</u>	
<u>ASTM</u>	Lean CLAY (CL)
<u>AASHTO</u>	Clayey Soils (A-6 (17))

<u>Sample/Test Description</u>
Sand/Gravel Particle Shape : ---
Sand/Gravel Hardness : ---
Dispersion Device : Apparatus A - Mech Mixer
Dispersion Period : 1 minute
Est. Specific Gravity : 2.65
Separation of Sample: #200 Sieve

Client: WSP USA, Inc.	Project No: GTX-319180
Project: MaineDOT I-95 Bridge over Stillwater	
Location: Merrimack, NH	
Boring ID: BB-BSA-201	Sample Type: Jar
Sample ID: 4D (S-4)	Test Date: 01/03/25
Depth: 6-8'	Test Id: 797952
Test Comment: ---	Tested By: ajl
Visual Description: Moist, grayish brown clay	Checked By: jsc
Sample Comment: ---	

Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	0.0	3.7	96.3

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	100		
#60	0.25	100		
#100	0.15	99		
#140	0.11	98		
#200	0.075	96		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
---	0.0267	77		
---	0.0178	66		
---	0.0109	55		
---	0.0080	47		
---	0.0058	40		
---	0.0043	32		
---	0.0031	27		
---	0.0013	15		

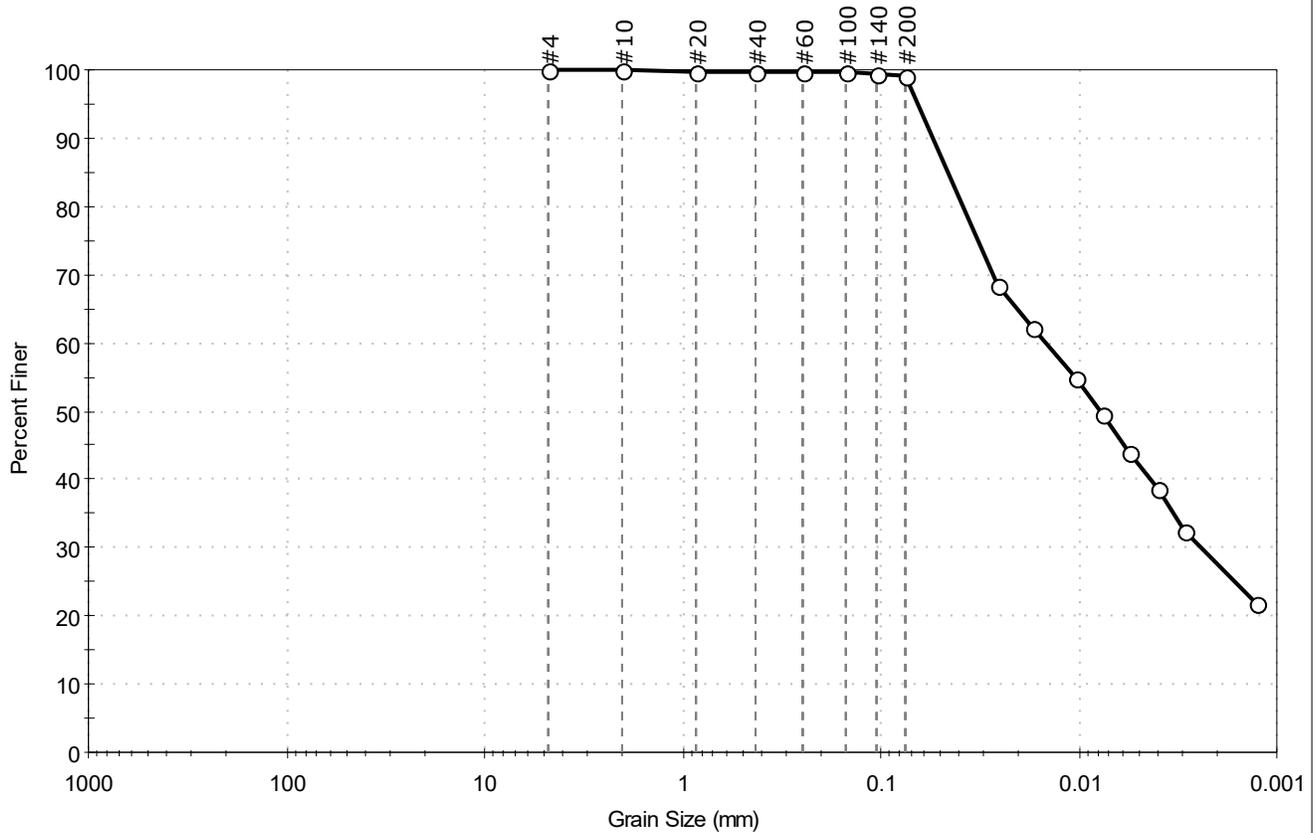
Coefficients	
D ₈₅ = 0.0412 mm	D ₃₀ = 0.0037 mm
D ₆₀ = 0.0135 mm	D ₁₅ = 0.0013 mm
D ₅₀ = 0.0088 mm	D ₁₀ = N/A
C _u = N/A	C _c = N/A

Classification	
ASTM	Lean CLAY (CL)
AASHTO	Clayey Soils (A-6 (13))

Sample/Test Description
Sand/Gravel Particle Shape : ---
Sand/Gravel Hardness : ---
Dispersion Device : Apparatus A - Mech Mixer
Dispersion Period : 1 minute
Est. Specific Gravity : 2.65
Separation of Sample: #200 Sieve

Client: WSP USA, Inc.	Project No: GTX-319180
Project: MaineDOT I-95 Bridge over Stillwater	
Location: Merrimack, NH	
Boring ID: BB-BSA-202	Sample Type: Jar
Sample ID: 1D (S-1)	Test Date: 01/03/25
Depth: 0-2'	Test Id: 797950
Test Comment: ---	Tested By: ajl
Visual Description: Moist, grayish brown clay	Checked By: jsc
Sample Comment: ---	

Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	0.0	0.8	99.2

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	100		
#60	0.25	100		
#100	0.15	100		
#140	0.11	99		
#200	0.075	99		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
---	0.0258	68		
---	0.0171	62		
---	0.0104	55		
---	0.0076	50		
---	0.0055	44		
---	0.0040	39		
---	0.0029	33		
---	0.0013	22		

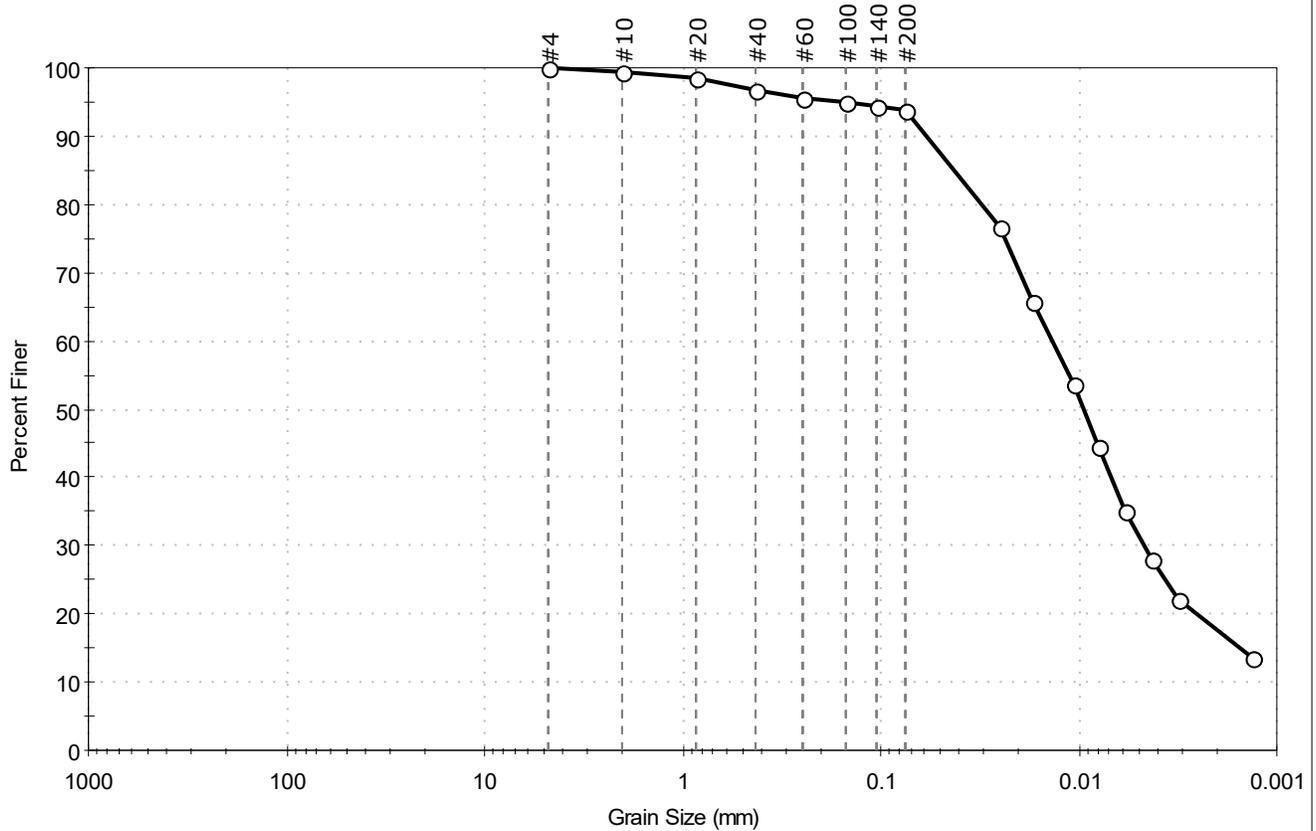
Coefficients	
D ₈₅ = 0.0458 mm	D ₃₀ = 0.0024 mm
D ₆₀ = 0.0146 mm	D ₁₅ = N/A
D ₅₀ = 0.0078 mm	D ₁₀ = N/A
C _u = N/A	C _c = N/A

Classification	
ASTM	Lean CLAY (CL)
AASHTO	Clayey Soils (A-6 (18))

Sample/Test Description
Sand/Gravel Particle Shape : ---
Sand/Gravel Hardness : ---
Dispersion Device : Apparatus A - Mech Mixer
Dispersion Period : 1 minute
Est. Specific Gravity : 2.65
Separation of Sample: #200 Sieve

Client: WSP USA, Inc.	Project No: GTX-319180
Project: MaineDOT I-95 Bridge over Stillwater	
Location: Merrimack, NH	
Boring ID: BB-BSA-203	Sample Type: Jar
Sample ID: 2D (S-2)	Test Date: 01/03/25
Depth: 2-4'	Test Id: 797948
Test Comment: ---	Tested By: ajl
Visual Description: Moist, grayish brown clay	Checked By: jsc
Sample Comment: ---	

Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	0.0	6.1	93.9

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	98		
#40	0.42	97		
#60	0.25	96		
#100	0.15	95		
#140	0.11	94		
#200	0.075	94		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
---	0.0251	77		
---	0.0171	66		
---	0.0107	54		
---	0.0079	44		
---	0.0059	35		
---	0.0043	28		
---	0.0031	22		
---	0.0013	14		

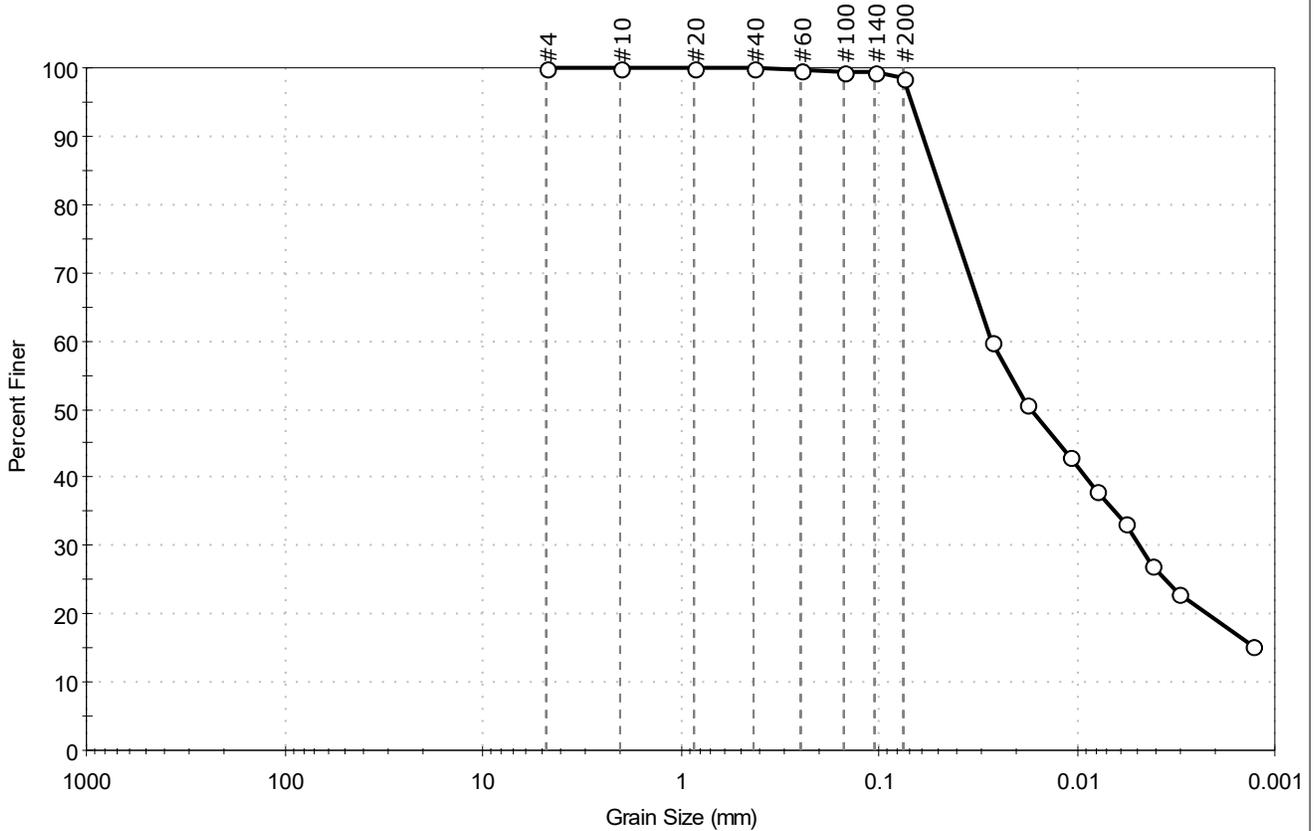
Coefficients	
D ₈₅ = 0.0427 mm	D ₃₀ = 0.0047 mm
D ₆₀ = 0.0136 mm	D ₁₅ = 0.0015 mm
D ₅₀ = 0.0095 mm	D ₁₀ = N/A
C _u = N/A	C _c = N/A

Classification	
ASTM	Lean CLAY (CL)
AASHTO	Clayey Soils (A-6 (14))

Sample/Test Description	
Sand/Gravel Particle Shape : ---	
Sand/Gravel Hardness : ---	
Dispersion Device : Apparatus A - Mech Mixer	
Dispersion Period : 1 minute	
Est. Specific Gravity : 2.65	
Separation of Sample: #200 Sieve	

Client: WSP USA, Inc.	Project No: GTX-319180	
Project: MaineDOT I-95 Bridge over Stillwater		
Location: Merrimack, NH	Boring ID: BB-BSA-203	Sample Type: Jar
	Sample ID: 3D (S-3)	Test Date: 01/03/25
	Depth: 4-6'	Test Id: 797949
Test Comment: ---	Visual Description: Moist, olive clay	Checked By: jsc
Sample Comment: ---		

Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	0.0	1.6	98.4

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	100		
#60	0.25	100		
#100	0.15	99		
#140	0.11	99		
#200	0.075	98		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
---	0.0267	60		
---	0.0179	51		
---	0.0109	43		
---	0.0079	38		
---	0.0058	33		
---	0.0042	27		
---	0.0030	23		
---	0.0013	15		

Coefficients

D ₈₅ = 0.0523 mm	D ₃₀ = 0.0048 mm
D ₆₀ = 0.0268 mm	D ₁₅ = N/A
D ₅₀ = 0.0170 mm	D ₁₀ = N/A
C _u = N/A	C _c = N/A

Classification

ASTM Lean CLAY (CL)

AASHTO Clayey Soils (A-6 (17))

Sample/Test Description

Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness : ---

Dispersion Device : Apparatus A - Mech Mixer

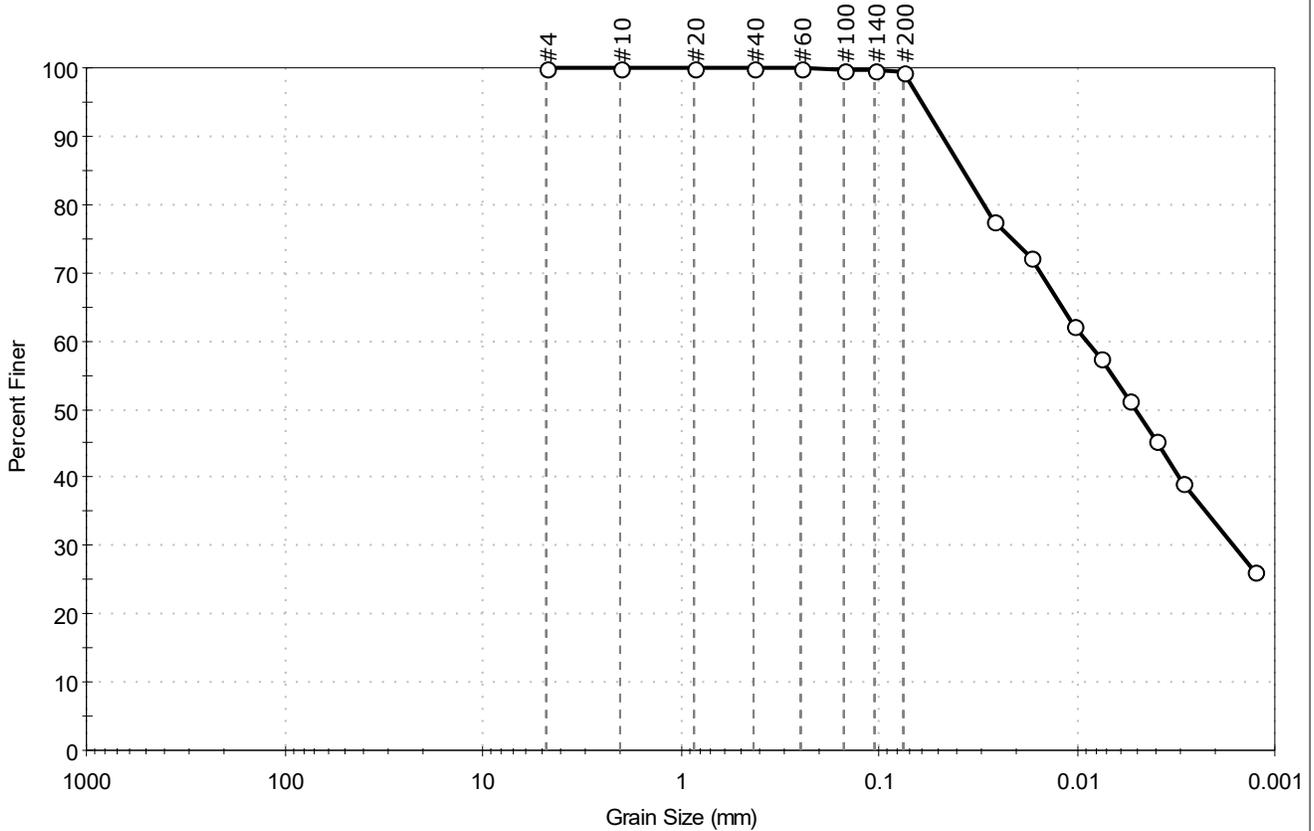
Dispersion Period : 1 minute

Est. Specific Gravity : 2.65

Separation of Sample: #200 Sieve

Client: WSP USA, Inc.	Project: MaineDOT I-95 Bridge over Stillwater	Location: Merrimack, NH	Project No: GTX-319180
Boring ID: BB-BSA-204	Sample Type: Jar	Tested By: ajl	
Sample ID: 4D (S-4)	Test Date: 01/03/25	Checked By: jsc	
Depth: 6-8'	Test Id: 797946		
Test Comment: ---			
Visual Description: Moist, olive gray clay			
Sample Comment: ---			

Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	0.0	0.6	99.4

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	100		
#60	0.25	100		
#100	0.15	100		
#140	0.11	100		
#200	0.075	99		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
---	0.0264	78		
---	0.0171	72		
---	0.0104	62		
---	0.0075	58		
---	0.0055	51		
---	0.0040	45		
---	0.0029	39		
---	0.0013	26		

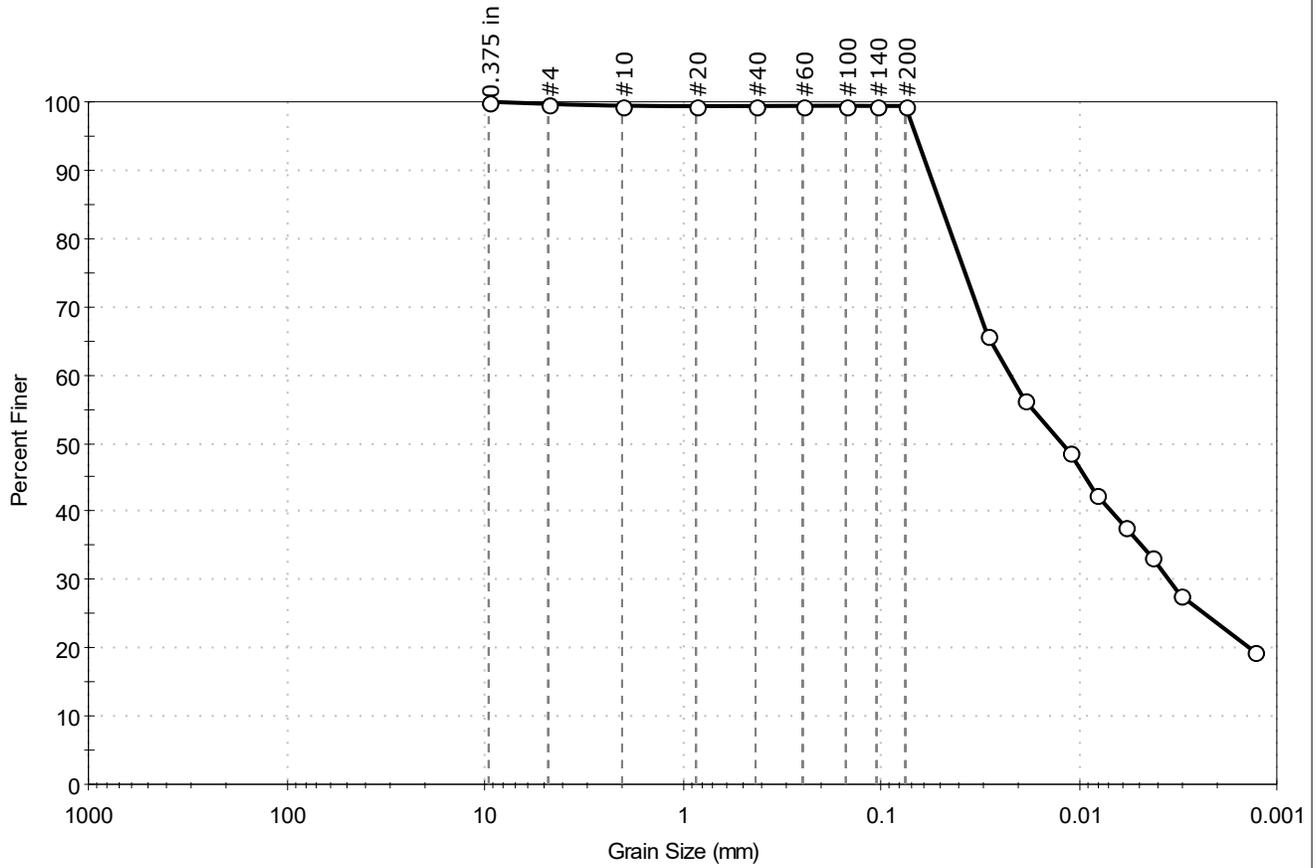
Coefficients	
D ₈₅ = 0.0377 mm	D ₃₀ = 0.0016 mm
D ₆₀ = 0.0089 mm	D ₁₅ = N/A
D ₅₀ = 0.0051 mm	D ₁₀ = N/A
C _u = N/A	C _c = N/A

Classification	
ASTM	Lean CLAY (CL)
AASHTO	Clayey Soils (A-6 (14))

Sample/Test Description
Sand/Gravel Particle Shape : ---
Sand/Gravel Hardness : ---
Dispersion Device : Apparatus A - Mech Mixer
Dispersion Period : 1 minute
Est. Specific Gravity : 2.65
Separation of Sample: #200 Sieve

Client: WSP USA, Inc.	Project No: GTX-319180
Project: MaineDOT I-95 Bridge over Stillwater	
Location: Merrimack, NH	
Boring ID: BB-BSA-204	Sample Type: Jar
Sample ID: 6D (S-6)	Test Date: 01/03/25
Depth: 10-12'	Test Id: 797947
Test Comment: ---	Tested By: ajl
Visual Description: Moist, dark greenish gray clay	Checked By: jsc
Sample Comment: ---	

Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	0.4	0.3	99.3

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.375 in	9.50	100		
#4	4.75	100		
#10	2.00	100		
#20	0.85	99		
#40	0.42	99		
#60	0.25	99		
#100	0.15	99		
#140	0.11	99		
#200	0.075	99		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
---	0.0289	66		
---	0.0187	56		
---	0.0112	49		
---	0.0082	43		
---	0.0059	38		
---	0.0042	33		
---	0.0031	28		
---	0.0013	19		

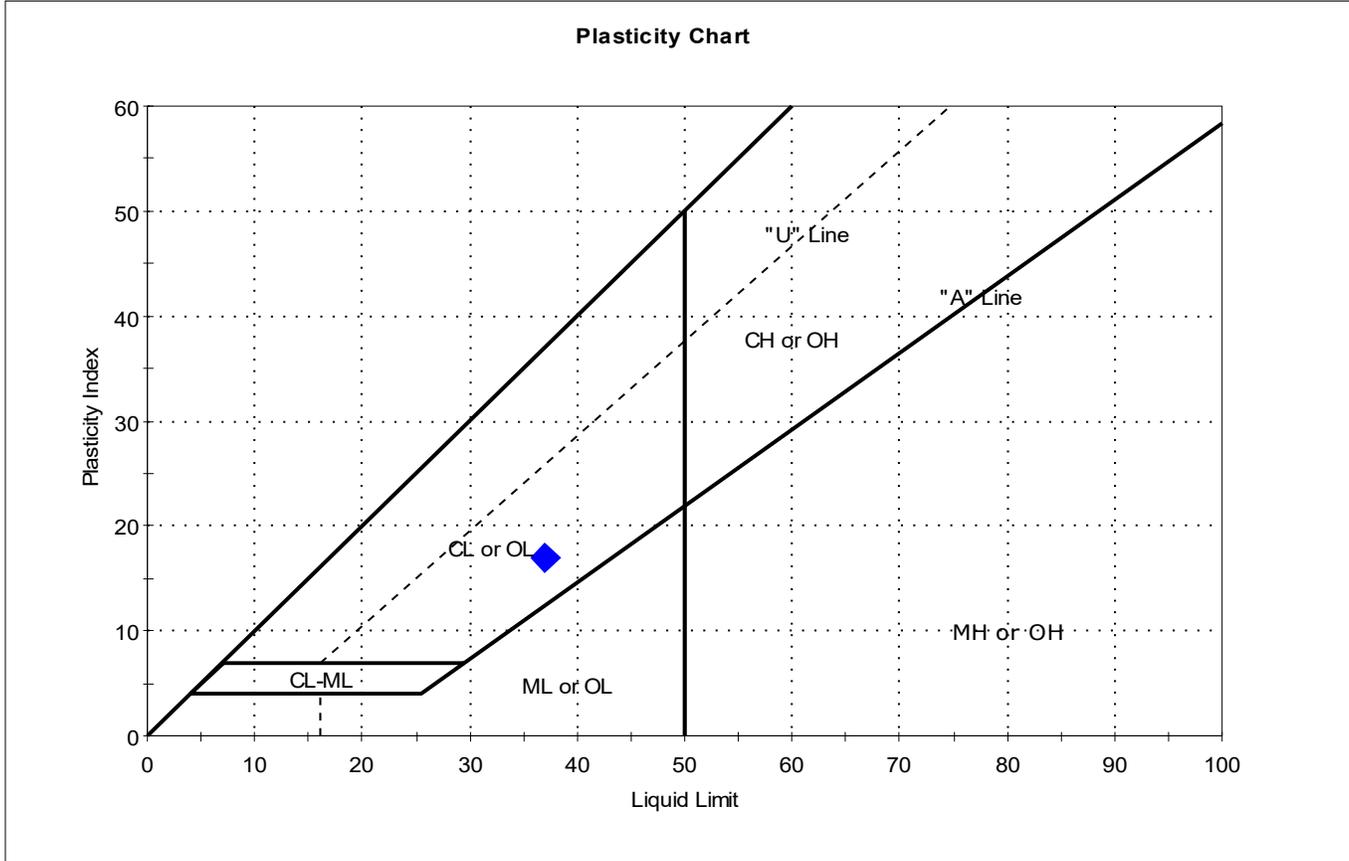
Coefficients	
D ₈₅ = 0.0500 mm	D ₃₀ = 0.0035 mm
D ₆₀ = 0.0222 mm	D ₁₅ = N/A
D ₅₀ = 0.0122 mm	D ₁₀ = N/A
C _u = N/A	C _c = N/A

Classification	
ASTM	Lean CLAY (CL)
AASHTO	Clayey Soils (A-6 (15))

Sample/Test Description
Sand/Gravel Particle Shape : ---
Sand/Gravel Hardness : ---
Dispersion Device : Apparatus A - Mech Mixer
Dispersion Period : 1 minute
Est. Specific Gravity : 2.65
Separation of Sample: #200 Sieve

Client: WSP USA, Inc.	Project: MaineDOT I-95 Bridge over Stillwater	Location: Merrimack, NH	Project No: GTX-319180
Boring ID: BB-BSA-201	Sample Type: Jar	Tested By: cam	
Sample ID: 2D (S-2)	Test Date: 01/06/25	Checked By: jsc	
Depth: 2-4'	Test Id: 797940		
Test Comment: ---			
Visual Description: Moist, grayish brown clay			
Sample Comment: ---			

Atterberg Limits - ASTM D4318

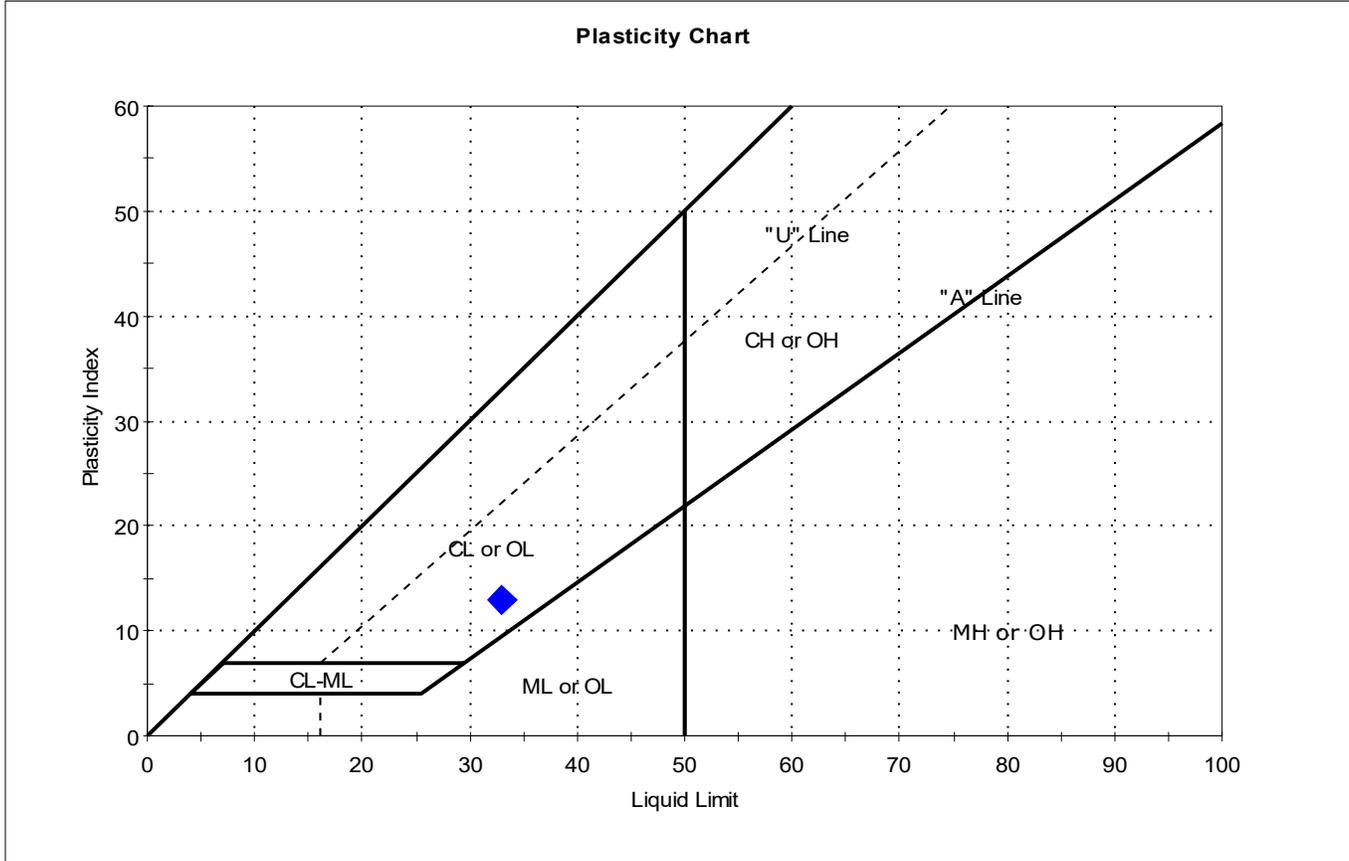


Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	2D (S-2)	B-BSA-20	2-4'	26	37	20	17	0.4	Lean CLAY (CL)

Sample Prepared using the WET method
 1% Retained on #40 Sieve
 Dry Strength: VERY HIGH
 Dilatancy: SLOW
 Toughness: LOW

Client:	WSP USA, Inc.		Project No:	GTX-319180	
Project:	MaineDOT I-95 Bridge over Stillwater				
Location:	Merrimack, NH	Sample Type:	Jar	Tested By:	cam
Boring ID:	BB-BSA-201	Test Date:	01/03/25	Checked By:	jsc
Sample ID:	4D (S-4)	Test Id:	797941		
Depth :	6-8'				
Test Comment:	---				
Visual Description:	Moist, grayish brown clay				
Sample Comment:	---				

Atterberg Limits - ASTM D4318

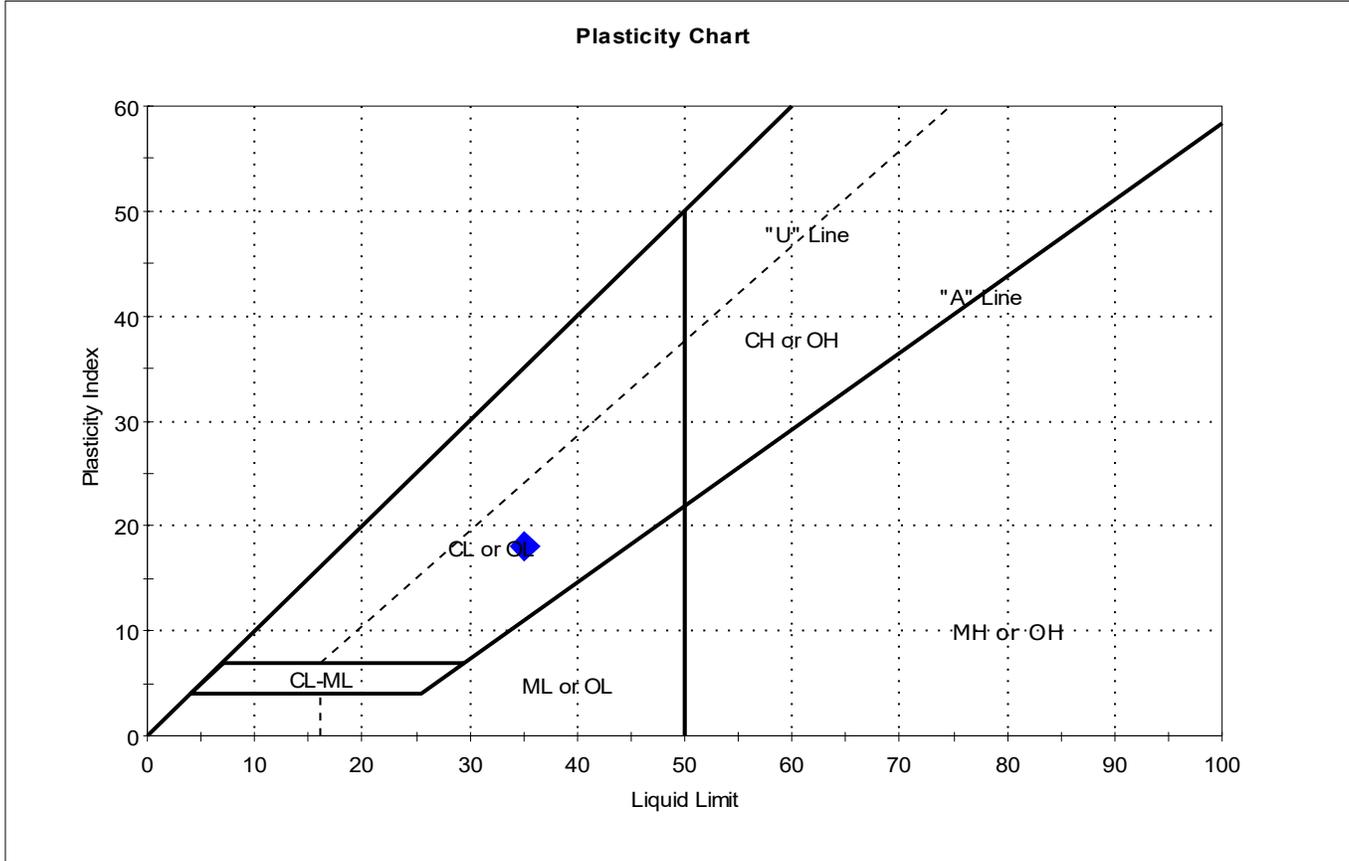


Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	4D (S-4)	B-BSA-20	6-8'	25	33	20	13	0.4	Lean CLAY (CL)

Sample Prepared using the WET method
 0% Retained on #40 Sieve
 Dry Strength: VERY HIGH
 Dilatancy: SLOW
 Toughness: LOW

Client:	WSP USA, Inc.		Project No:	GTX-319180	
Project:	MaineDOT I-95 Bridge over Stillwater		Tested By:	cam	
Location:	Merrimack, NH	Sample Type:	Jar	Checked By:	jsc
Boring ID:	BB-BSA-202	Test Date:	01/03/25	Test Id:	797939
Sample ID:	1D (S-1)				
Depth :	0-2'				
Test Comment:	---				
Visual Description:	Moist, grayish brown clay				
Sample Comment:	---				

Atterberg Limits - ASTM D4318

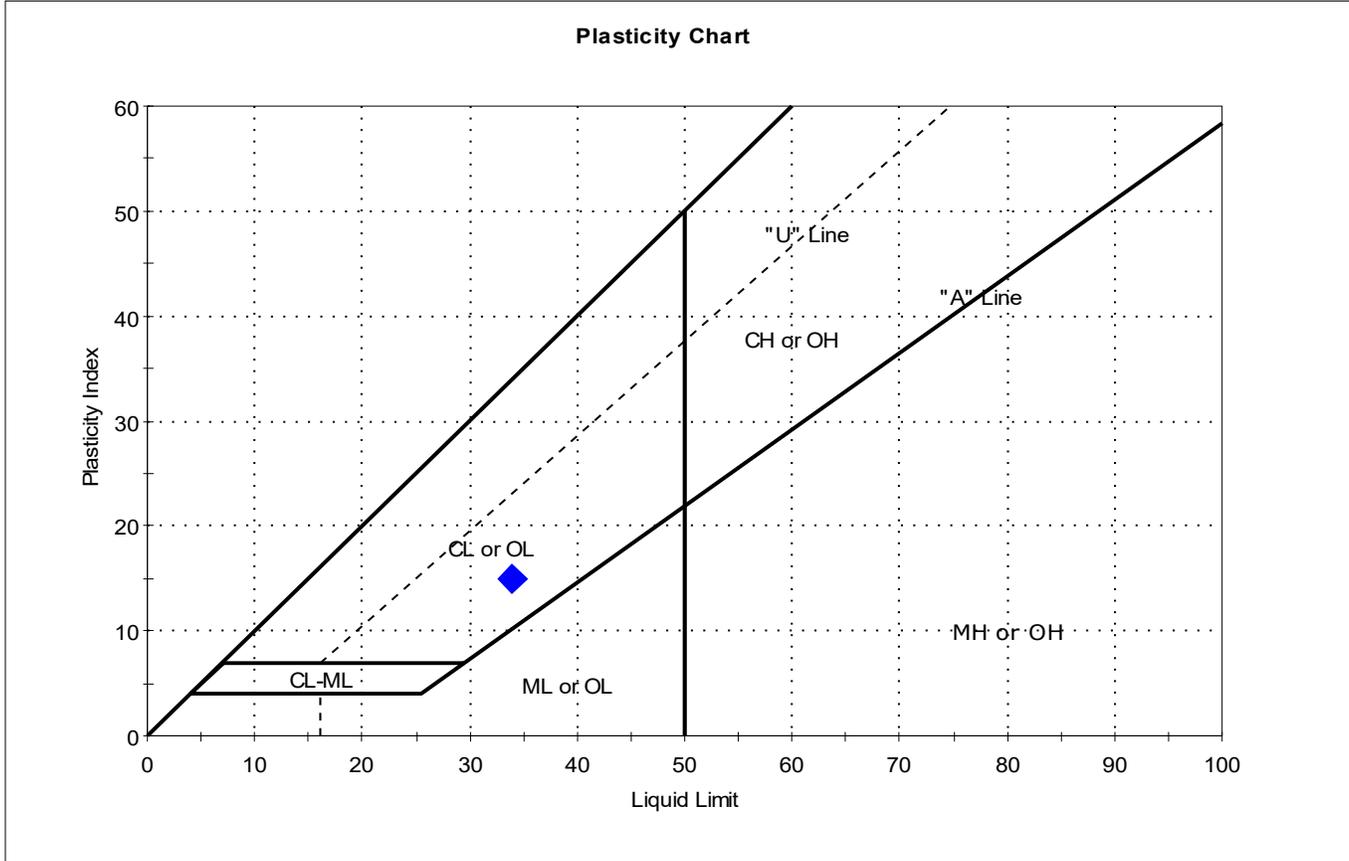


Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	1D (S-1)	B-BSA-20	0-2'	23	35	17	18	0.3	Lean CLAY (CL)

Sample Prepared using the WET method
 0% Retained on #40 Sieve
 Dry Strength: VERY HIGH
 Dilatancy: SLOW
 Toughness: LOW

Client: WSP USA, Inc.	Project: MaineDOT I-95 Bridge over Stillwater	Location: Merrimack, NH	Project No: GTX-319180
Boring ID: BB-BSA-203	Sample Type: Jar	Tested By: cam	
Sample ID: 2D (S-2)	Test Date: 01/03/25	Checked By: jsc	
Depth: 2-4'	Test Id: 797937		
Test Comment: ---			
Visual Description: Moist, grayish brown clay			
Sample Comment: ---			

Atterberg Limits - ASTM D4318

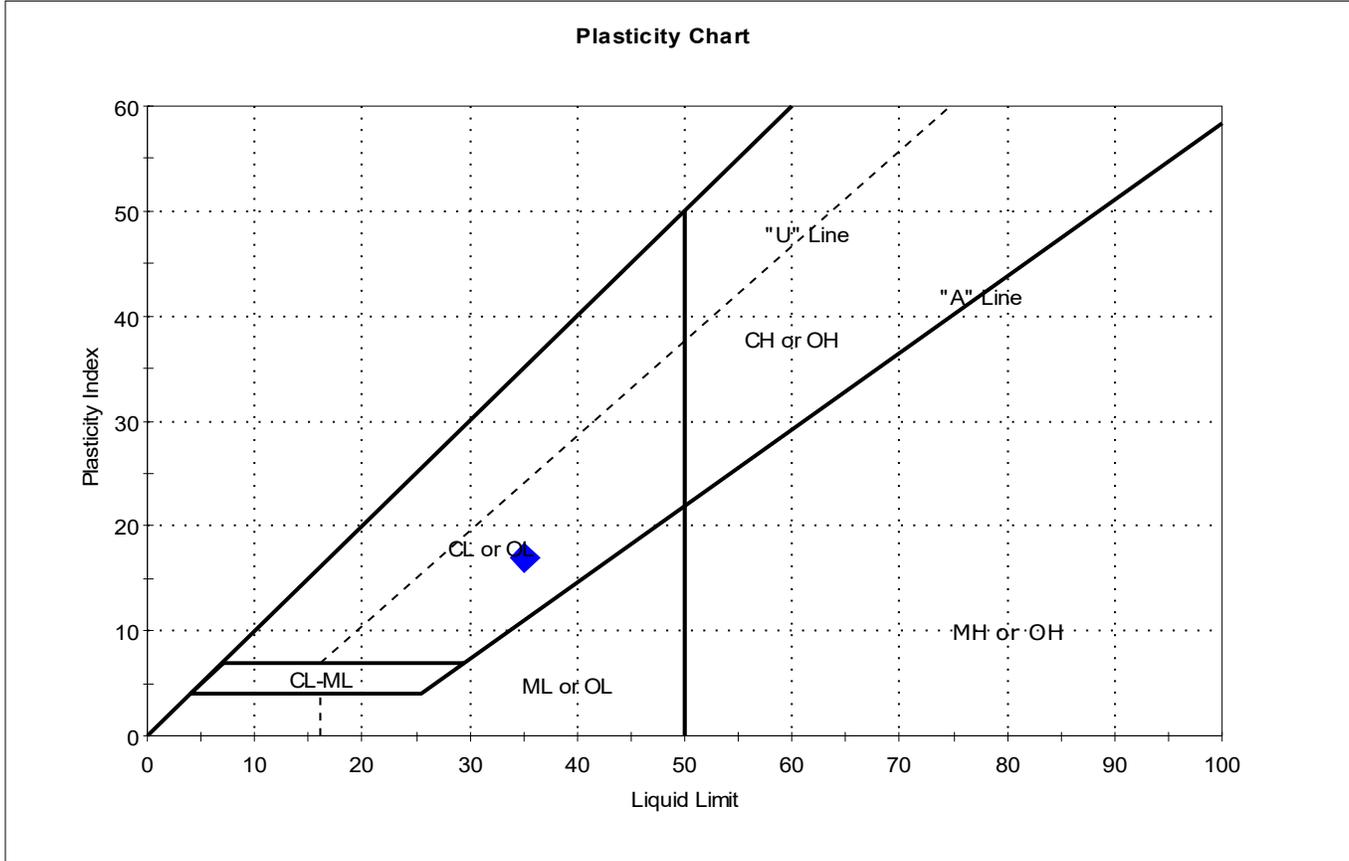


Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	2D (S-2)	B-BSA-20	2-4'	15	34	19	15	-0.3	Lean CLAY (CL)

Sample Prepared using the WET method
 3% Retained on #40 Sieve
 Dry Strength: VERY HIGH
 Dilatancy: SLOW
 Toughness: LOW

Client:	WSP USA, Inc.		Project No:	GTX-319180	
Project:	MaineDOT I-95 Bridge over Stillwater				
Location:	Merrimack, NH	Sample Type:	Jar	Tested By:	cam
Boring ID:	BB-BSA-203	Test Date:	01/03/25	Checked By:	jsc
Sample ID:	3D (S-3)	Test Id:	797938		
Depth :	4-6'				
Test Comment:	---				
Visual Description:	Moist, olive clay				
Sample Comment:	---				

Atterberg Limits - ASTM D4318

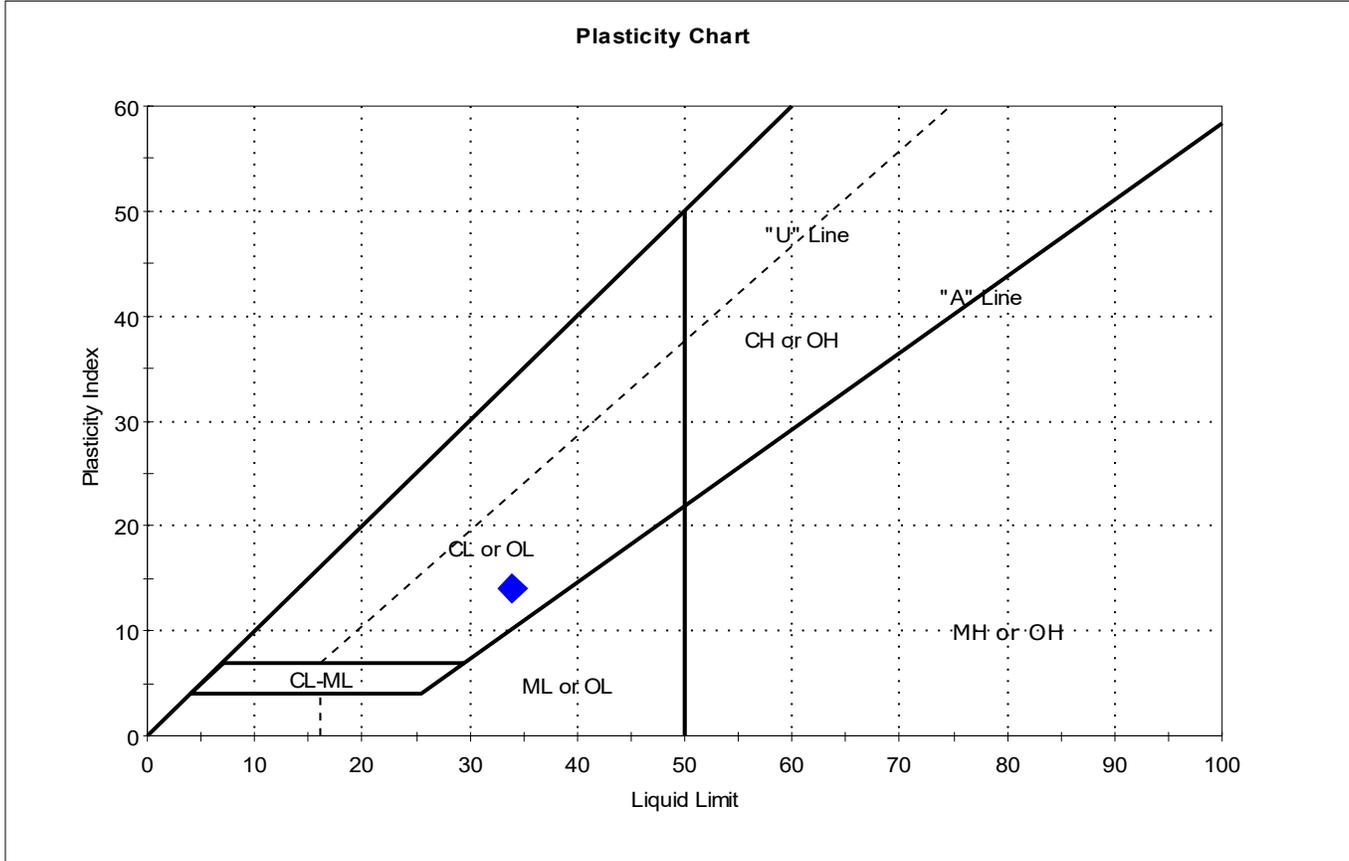


Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	3D (S-3)	B-BSA-20	4-6'	22	35	18	17	0.3	Lean CLAY (CL)

Sample Prepared using the WET method
 0% Retained on #40 Sieve
 Dry Strength: VERY HIGH
 Dilatancy: SLOW
 Toughness: LOW

Client: WSP USA, Inc.	Project No: GTX-319180
Project: MaineDOT I-95 Bridge over Stillwater	
Location: Merrimack, NH	
Boring ID: BB-BSA-204	Sample Type: Jar
Sample ID: 4D (S-4)	Test Date: 01/06/25
Depth: 6-8'	Test Id: 797935
Test Comment: ---	Tested By: cam
Visual Description: Moist, olive gray clay	Checked By: jsc
Sample Comment: ---	

Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	4D (S-4)	B-BSA-20	6-8'	27	34	20	14	0.5	Lean CLAY (CL)

Sample Prepared using the WET method

0% Retained on #40 Sieve

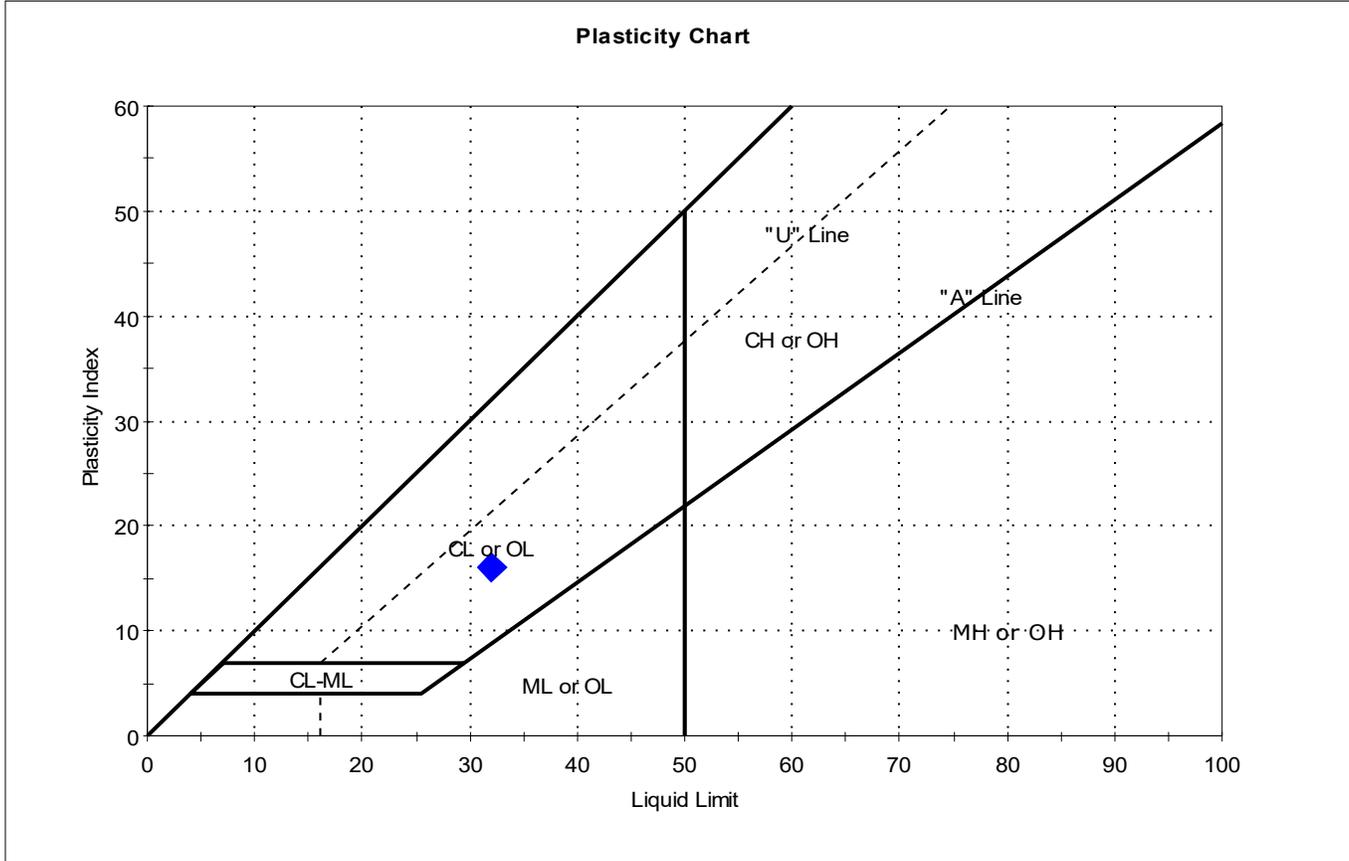
Dry Strength: VERY HIGH

Dilatancy: SLOW

Toughness: LOW

Client:	WSP USA, Inc.		
Project:	MaineDOT I-95 Bridge over Stillwater		
Location:	Merrimack, NH	Project No:	GTX-319180
Boring ID:	BB-BSA-204	Sample Type:	Jar
Sample ID:	6D (S-6)	Test Date:	01/03/25
Depth:	10-12'	Test Id:	797936
Test Comment:	---		
Visual Description:	Moist, dark greenish gray clay		
Sample Comment:	---		

Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	6D (S-6)	B-BSA-20	10-12'	25	32	16	16	0.6	Lean CLAY (CL)

Sample Prepared using the WET method
 1% Retained on #40 Sieve
 Dry Strength: VERY HIGH
 Dilatancy: SLOW
 Toughness: LOW

