

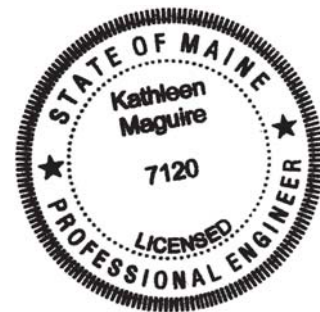
**MAINE DEPARTMENT OF TRANSPORTATION  
HIGHWAY PROGRAM  
GEOTECHNICAL SECTION  
AUGUSTA, MAINE**

**GEOTECHNICAL DATA REPORT**

*For Intersection Improvements:*

**ROUTE 1 AND BOOTHBAY ROAD  
EDGEComb, MAINE**

*Prepared by:*  
Kathleen Maguire, P.E.  
Senior Geotechnical Engineer



*Kathleen Maguire*

*Reviewed by:*  
Cody Russell, P.E.  
Geotechnical Engineer

Lincoln County  
WIN 21783.00

Soils Report 2020-37  
September 9, 2020

## **PROJECT DETAILS**

The purpose of this Geotechnical Data Report is to document subsurface information collected for proposed intersection improvements at the intersection of Route 1 and Boothbay Road in Edgecomb. The project location is shown on Sheet 1 – Location Map. This report presents the results of a limited geotechnical investigation and the results of a limited laboratory testing program conducted on soil samples recovered during the geotechnical investigation. Route 1 is a Highway Corridor Priority 1 road.

## **SUBSURFACE INVESTIGATION**

Subsurface conditions were explored by drilling two (2) test borings (HB-EDG-101 and HB-EDG-101A) at the location of the proposed roadway widening and one (1) boring (HB-EDG-102) and one (1) probe (HB-EDG-102A) at the location of a proposed sign structure. Exploration locations are shown on Sheet 2 - Boring Location Plan. The MaineDOT drill crew drilled the borings and probes on May 7, 2018. The details and sampling methods used, field data obtained, soil conditions encountered, and exploration locations are presented in the boring logs provided in Appendix A – Boring Logs.

An NETTCP certified Subsurface Inspector logged the subsurface conditions encountered. The MaineDOT geotechnical engineer selected the exploration locations and drilling methods, designated type and depth of sampling techniques, reviewed boring logs and identified field testing requirements. The borings and probes were located in the field using taped measurements at the completion of the drilling program.

## **LABORATORY TESTING**

A laboratory testing program was conducted on the soil samples recovered from the test borings to assist in soil classification and geologic assessment of the project site. Laboratory testing consisted of eight (8) standard grain size analysis with natural water content. The results of soil tests are included as Appendix B – Laboratory Test Results. Moisture content information and other soil test results are also shown on the boring logs provided in Appendix A – Boring Logs.

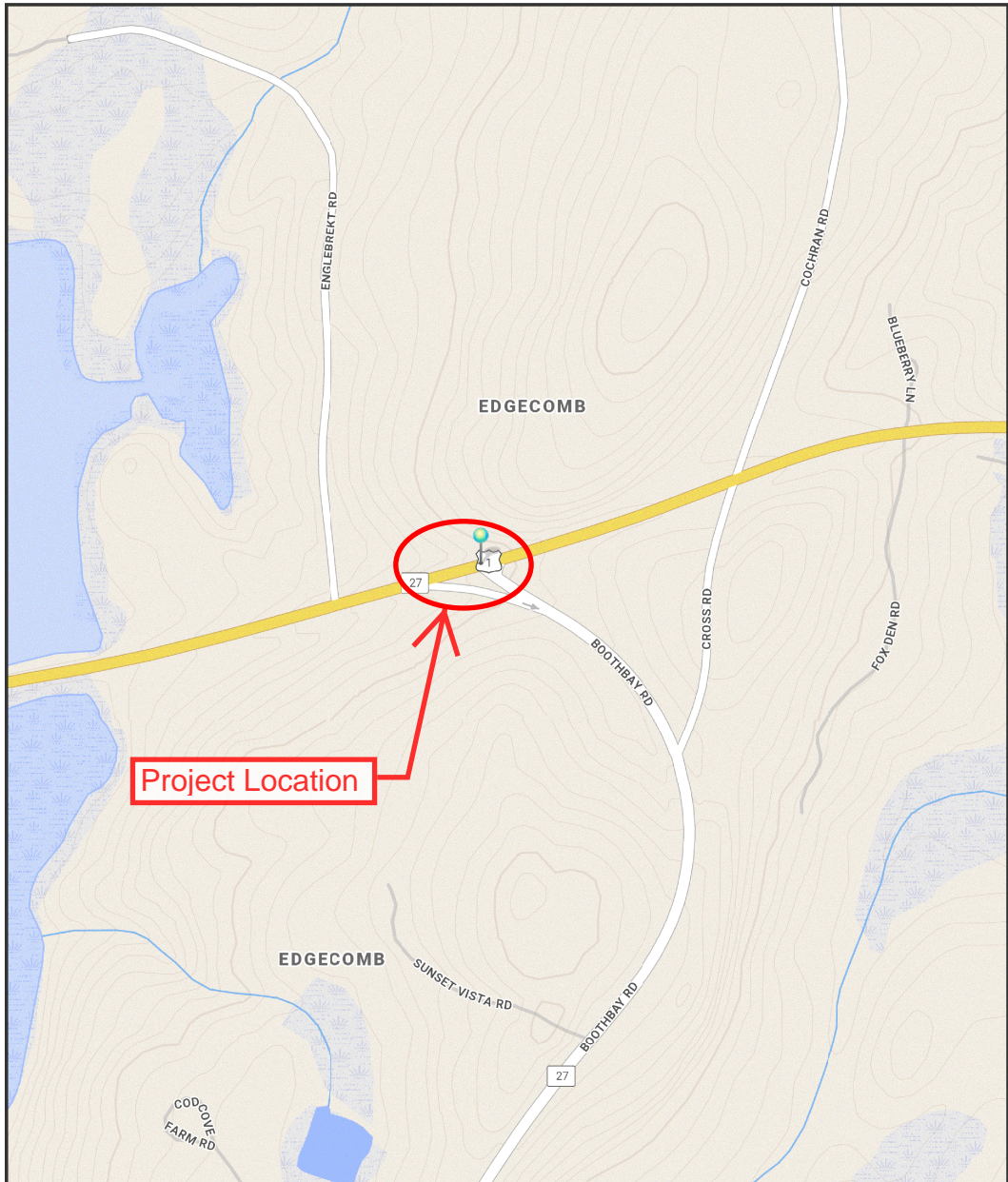
## **CLOSURE**

This Geotechnical Data Report has been prepared to document the geotechnical work conducted for the proposed intersection improvements at the intersection of Route 1 and Boothbay Road in Edgecomb in accordance with generally accepted geotechnical and foundation engineering practices. No other intended use or warranty is expressed or implied.

MaineDOT conducted a limited number of soil explorations at discrete locations at the culvert and a limited number of laboratory tests. No interpretations or conclusions have been derived from this geotechnical information. Data provided may not be representative of the subsurface conditions between boring locations.



# EDGECOMB

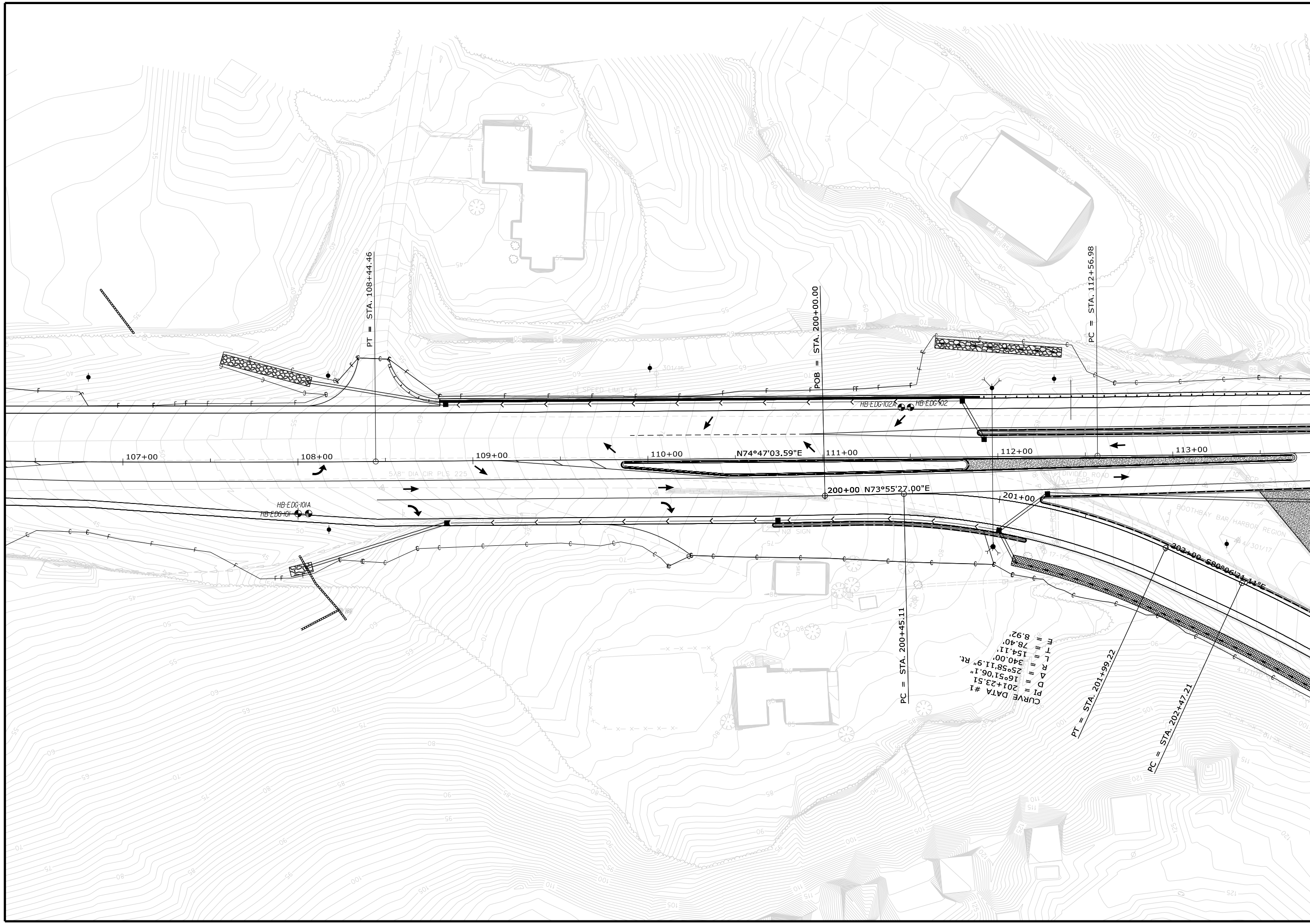


The Maine Department of Transportation provides this publication for information only. Reliance upon this information is at user risk. It is subject to revision and may be incomplete depending upon changing conditions. The Department assumes no liability if injuries or damages result from this information. This map is not intended to support emergency dispatch.

**0.1** Miles  
1 inch = 0.11 miles

Date: 9/8/2020  
Time: 7:21:30 AM

SHEET NUMBER  <b>1</b>  OF 2	EDGECOMB ROUTE 1	STATE OF MAINE DEPARTMENT OF TRANSPORTATION
	LOCATION MAP	HSIP-2178(300)  WIN 21783.00 HIGHWAY PLANS



STATE OF MAINE  
DEPARTMENT OF TRANSPORTATION  
HSIP-2178(300)

PROJ. MANAGER	BY	DATE
Ernie Morin	Matt Phibbrick	

DESIGN-DETAILED	CHECKED-REVIEWED	DESIGN-DETAILED	DESIGN-DETAILED	REVISIONS 1	REVISIONS 2	REVISIONS 3	REVISIONS 4	FIELD CHANGES
Matt Phibbrick		C. RUSSELL	T. WHITE					
		M. DELOS	M. DELOS					

EDGECOMB  
ROUTE 1  
BORING LOCATION PLAN

SHEET NUMBER  
**2**  
OF 2

WIN  
21783.00  
HIGHWAY PLANS

## **Appendix A**

Boring Logs

UNIFIED SOIL CLASSIFICATION SYSTEM				MODIFIED BURMISTER SYSTEM		
MAJOR DIVISIONS		GROUP SYMBOLS	TYPICAL NAMES			
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.		
		(little or no fines)	GP	Poorly-graded gravels, gravel sand mixtures, little or no fines.		
	SANDS  (more than half of coarse fraction is smaller than No. 4 sieve size)	GRAVEL WITH FINES (Appreciable amount of fines)	GM	Silty gravels, gravel-sand-silt mixtures.		
		GC	Clayey gravels, gravel-sand-clay mixtures.			
	CLEAN SANDS  (little or no fines)	SW	Well-graded sands, Gravelly sands, little or no fines			
		SP	Poorly-graded sands, Gravelly sand, little or no fines.			
SANDS WITH FINES (Appreciable amount of fines)	SM	Silty sands, sand-silt mixtures				
	SC	Clayey sands, sand-clay mixtures.				
FINE-GRAINED SOILS  (more than 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.			
		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.				
<b>Desired Soil Observations (in this order, if applicable):</b>				<b>Desired Rock Observations (in this order, if applicable):</b>		
Color (Munsell color chart)				Color (Munsell color chart)		
Moisture (dry, damp, moist, wet)				Texture (aphanitic, fine-grained, etc.)		
Density/Consistency (from above right hand side)				Rock Type (granite, schist, sandstone, etc.)		
Texture (fine, medium, coarse, etc.)				Hardness (very hard, hard, mod. hard, etc.)		
Name (Sand, Silty Sand, Clay, etc., including portions - trace, little, etc.)				Weathering (fresh, very slight, slight, moderate, mod. severe, severe, etc.)		
Gradation (well-graded, poorly-graded, uniform, etc.)				Geologic discontinuities/jointing:		
Plasticity (non-plastic, slightly plastic, moderately plastic, highly plastic)				-dip (horiz - 0-5 deg., low angle - 5-35 deg., mod. dipping - 35-55 deg., steep - 55-85 deg., vertical - 85-90 deg.)		
Structure (layering, fractures, cracks, etc.)				-spacing (very close - <2 inch, close - 2-12 inch, mod. close - 1-3 feet, wide - 3-10 feet, very wide >10 feet)		
Bonding (well, moderately, loosely, etc.,)				-tightness (tight, open, or healed)		
Cementation (weak, moderate, or strong)				-infilling (grain size, color, etc.)		
Geologic Origin (till, marine clay, alluvium, etc.)				Formation (Waterville, Ellsworth, Cape Elizabeth, etc.)		
Groundwater level				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))		
<p align="center"><b>Maine Department of Transportation</b>  <b>Geotechnical Section</b>  <b>Key to Soil and Rock Descriptions and Terms</b>  Field Identification Information</p>				<b>Sample Container Labeling Requirements:</b>		
				WIN	Blow Counts	
				Bridge Name / Town	Sample Recovery	
				Boring Number	Date	
				Sample Number	Personnel Initials	
Sample Depth						

<b>Maine Department of Transportation</b> Soil/Rock Exploration Log US CUSTOMARY UNITS	<b>Project:</b> U.S. Route 1 Intersection Improvements  <b>Location:</b> Edgecomb, Maine	<b>Boring No.:</b> HB-EDG-101  <b>WIN:</b> 21783.00
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<b>Driller:</b> MaineDOT	<b>Elevation (ft.):</b> 53.1	<b>Auger ID/OD:</b> 5" Solid Stem
<b>Operator:</b> Daggett/Niles	<b>Datum:</b> NAVD88	<b>Sampler:</b> Standard Split Spoon
<b>Logged By:</b> C. Russell	<b>Rig Type:</b> CME 45C	<b>Hammer Wt./Fall:</b> 140#/30"
<b>Date Start/Finish:</b> 5/7/2018; 10:15-11:00	<b>Drilling Method:</b> Cased Wash Boring	<b>Core Barrel:</b> N/A
<b>Boring Location:</b> 108+00, 30.6 ft Rt.	<b>Casing ID/OD:</b> NW-3"	<b>Water Level*:</b> None Observed

<b>Hammer Efficiency Factor:</b> 0.854	<b>Hammer Type:</b> Automatic <input checked="" type="checkbox"/> Hydraulic <input type="checkbox"/> Rope & Cathead <input type="checkbox"/>	
<small>           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            WO1P = Weight of One Person            S<sub>u</sub> = Peak/Remolded Field Vane Undrained Shear Strength (psf)            S<sub>u(lab)</sub> = Lab Vane Undrained Shear Strength (psf)            q<sub>p</sub> = Unconfined Compressive Strength (ksf)            N-uncorrected = Raw Field SPT N-value            Hammer Efficiency Factor = Rig Specific Annual Calibration Value            N<sub>60</sub> = SPT N-uncorrected Corrected for Hammer Efficiency            N<sub>60</sub> = (Hammer Efficiency Factor/60%)*N-uncorrected            T<sub>v</sub> = Pocket Torvane Shear Strength (psf)            WC = Water Content, percent            LL = Liquid Limit            PL = Plastic Limit            PI = Plasticity Index            G = Grain Size Analysis            C = Consolidation Test         </small>		

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 <sub>60</sub>	Casing Blows					
0	1D	24/12	0.00 - 2.00	4/6/5/6	11	16	SSA			Reddish-brown, damp, medium dense, fine to coarse SAND, little silt, trace gravel, (Fill).	G#336726 A-2-4, SM WC=7.7%	
5	2D	24/18	5.00 - 7.00	5/3/5/11	8	11		47.6		Grey, moist, medium dense, fine to coarse SAND, some silt, little gravel.	G#336727 A-2-4, SM WC=10.6%	
10	3D	24/6	10.00 - 12.00	2/4/12/17	16	23		41.6		Grey, moist, medium dense, fine to coarse SAND, some silt, little gravel.	G#336728 A-2-4, SM WC=13.3%	
										<b>Bottom of Exploration at 11.5 feet below ground surface.</b> Boulder REFUSAL, moved to HB-EDG-101A.		

**Remarks:**  
 Hole caved at 11.0 ft bgs, drove NW Casing to 11.5 ft bgs, Boulder Refusal at 11.5 ft bgs.

<b>Maine Department of Transportation</b> Soil/Rock Exploration Log US CUSTOMARY UNITS	<b>Project:</b> U.S. Route 1 Intersection Improvements  <b>Location:</b> Edgecomb, Maine	<b>Boring No.:</b> HB-EDG-101A  <b>WIN:</b> 21783.00
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<b>Driller:</b> MaineDOT	<b>Elevation (ft.):</b> 53.3	<b>Auger ID/OD:</b> 5" Dia.
<b>Operator:</b> Daggett/Niles	<b>Datum:</b> NAVD88	<b>Sampler:</b> Standard Split Spoon
<b>Logged By:</b> C. Russell	<b>Rig Type:</b> CME 45C	<b>Hammer Wt./Fall:</b> 140#/30"
<b>Date Start/Finish:</b> 5/7/2018; 11:10-11:40	<b>Drilling Method:</b> Solid Stem Auger	<b>Core Barrel:</b> N/A
<b>Boring Location:</b> 108+05.9, 30.7 ft Rt.	<b>Casing ID/OD:</b> N/A	<b>Water Level*:</b> None Observed

<b>Hammer Efficiency Factor:</b> 0.854	<b>Hammer Type:</b> 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 WO1P = Weight of One Person	S <sub>u</sub> = Peak/Remolded Field Vane Undrained Shear Strength (psf) S <sub>u(lab)</sub> = Lab Vane Undrained Shear Strength (psf) q <sub>p</sub> = Unconfined Compressive Strength (ksf) N-uncorrected = Raw Field SPT N-value Hammer Efficiency Factor = Rig Specific Annual Calibration Value N <sub>60</sub> = SPT N-uncorrected Corrected for Hammer Efficiency N <sub>60</sub> = (Hammer Efficiency Factor/60%)*N-uncorrected
T <sub>v</sub> = Pocket Torvane Shear Strength (psf) 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 <sub>60</sub>	Casing Blows						
0												Similar Soils as HB-EDG-101.	
5													
10													
15	1D	24/24	15.00 - 17.00	10/9/8/8	17	24				38.3		Grey, wet, medium dense, Silty fine to coarse SAND, trace gravel.	G#336729 A-4, SM WC=14.9%
17.0										36.3		<b>Bottom of Exploration at 17.0 feet below ground surface.</b> NO REFUSAL	
20													
25													

**Remarks:**

<b>Maine Department of Transportation</b> Soil/Rock Exploration Log US CUSTOMARY UNITS	Project: U.S. Route 1 Intersection Improvements Location: Edgecomb, Maine	Boring No.: HB-EDG-102 WIN: 21783.00
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Driller: MaineDOT	Elevation (ft.): 79.3	Auger ID/OD: 5" Dia.
Operator: Daggett/Niles	Datum: NAVD88	Sampler: Standard Split Spoon
Logged By: C. Russell	Rig Type: CME 45C	Hammer Wt./Fall: 140#/30"
Date Start/Finish: 5/7/2018; 12:00-13:00	Drilling Method: Solid Stem Auger	Core Barrel: N/A
Boring Location: 111+50.3, 27.1 ft Lt.	Casing ID/OD: N/A	Water Level*: None Observed

Hammer Efficiency Factor: 0.854	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 WO1P = Weight of One Person	S <sub>u</sub> = Peak/Remolded Field Vane Undrained Shear Strength (psf) S <sub>u(lab)</sub> = Lab Vane Undrained Shear Strength (psf) q <sub>p</sub> = Unconfined Compressive Strength (ksf) N-uncorrected = Raw Field SPT N-value Hammer Efficiency Factor = Rig Specific Annual Calibration Value N <sub>60</sub> = SPT N-uncorrected Corrected for Hammer Efficiency N <sub>60</sub> = (Hammer Efficiency Factor/60%)*N-uncorrected
		T <sub>v</sub> = Pocket Torvane Shear Strength (psf) 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 <sub>60</sub>	Casing Blows					
0												
	1D	24/10	1.00 - 3.00	4/6/4/3	10	14				SSA	Reddish-brown, dry, medium dense, fine to coarse SAND, little silt, trace gravel, (Fill).	G#336730 A-1-b, SW-SM WC=6.4%
5												
	2D	24/6	5.00 - 7.00	3/4/3/3	7	10					Brown, damp, loose, fine to coarse SAND, some gravel, little silt, (Fill).	G#336731 A-1-b, SM WC=9.0%
10												
	3D	24/10	10.00 - 12.00	24/16/20/18	36	51			69.3		Light brown, damp, very dense, Silty fine to coarse SAND, trace gravel.	G#336732 A-4, SM WC=11.9%
15												
	4D	9/9	15.00 - 15.75	9/50(3")	---				62.4		Light brown, moist, fine to coarse SAND, some silt, trace gravel. Spoon Refusal at 15.8 ft bgs.	G#336733 A-2-4, SM WC=11.9%
											<b>Bottom of Exploration at 16.9 feet below ground surface.</b> Auger REFUSAL	
20												
25												

**Remarks:**

<b>Maine Department of Transportation</b> Soil/Rock Exploration Log US CUSTOMARY UNITS	<b>Project:</b> U.S. Route 1 Intersection Improvements  <b>Location:</b> Edgecomb, Maine	<b>Boring No.:</b> HB-EDG-102A  <b>WIN:</b> 21783.00
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<b>Driller:</b> MaineDOT	<b>Elevation (ft.):</b> 78.9	<b>Auger ID/OD:</b> 5" Dia.
<b>Operator:</b> Daggett/Niles	<b>Datum:</b> NAVD88	<b>Sampler:</b> N/A
<b>Logged By:</b> C. Russell	<b>Rig Type:</b> CME 45C	<b>Hammer Wt./Fall:</b> N/A
<b>Date Start/Finish:</b> 5/7/2018; 13:00-13:20	<b>Drilling Method:</b> Solid Stem Auger	<b>Core Barrel:</b> N/A
<b>Boring Location:</b> 111+45.1, 27.1 ft Lt.	<b>Casing ID/OD:</b> N/A	<b>Water Level*:</b> None Observed

<b>Hammer Efficiency Factor:</b> 0.854	<b>Hammer Type:</b> 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 WO1P = Weight of One Person	S <sub>u</sub> = Peak/Remolded Field Vane Undrained Shear Strength (psf) S <sub>u(lab)</sub> = Lab Vane Undrained Shear Strength (psf) q <sub>p</sub> = Unconfined Compressive Strength (ksf) N-uncorrected = Raw Field SPT N-value Hammer Efficiency Factor = Rig Specific Annual Calibration Value N <sub>60</sub> = SPT N-uncorrected Corrected for Hammer Efficiency N <sub>60</sub> = (Hammer Efficiency Factor/60%)*N-uncorrected
T <sub>v</sub> = Pocket Torvane Shear Strength (psf) 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 <sub>60</sub>	Casing Blows						
0							SSA			78.9		Probe, no soil samples taken.	
5													
10													
15													
20										59.4		Bottom of Exploration at 19.5 feet below ground surface. NO REFUSAL	
25													

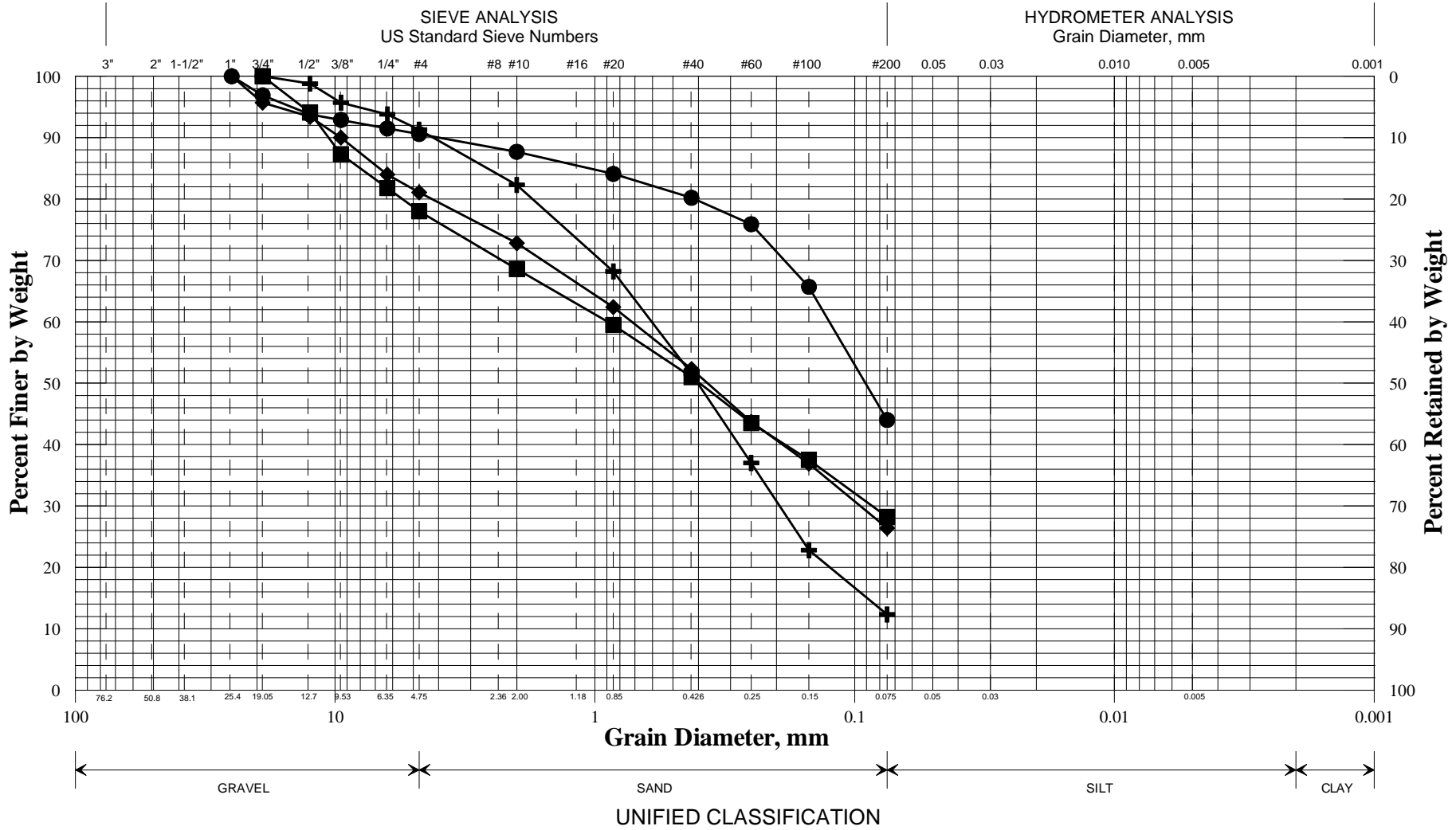
**Remarks:**

## **Appendix B**

Laboratory Test Results



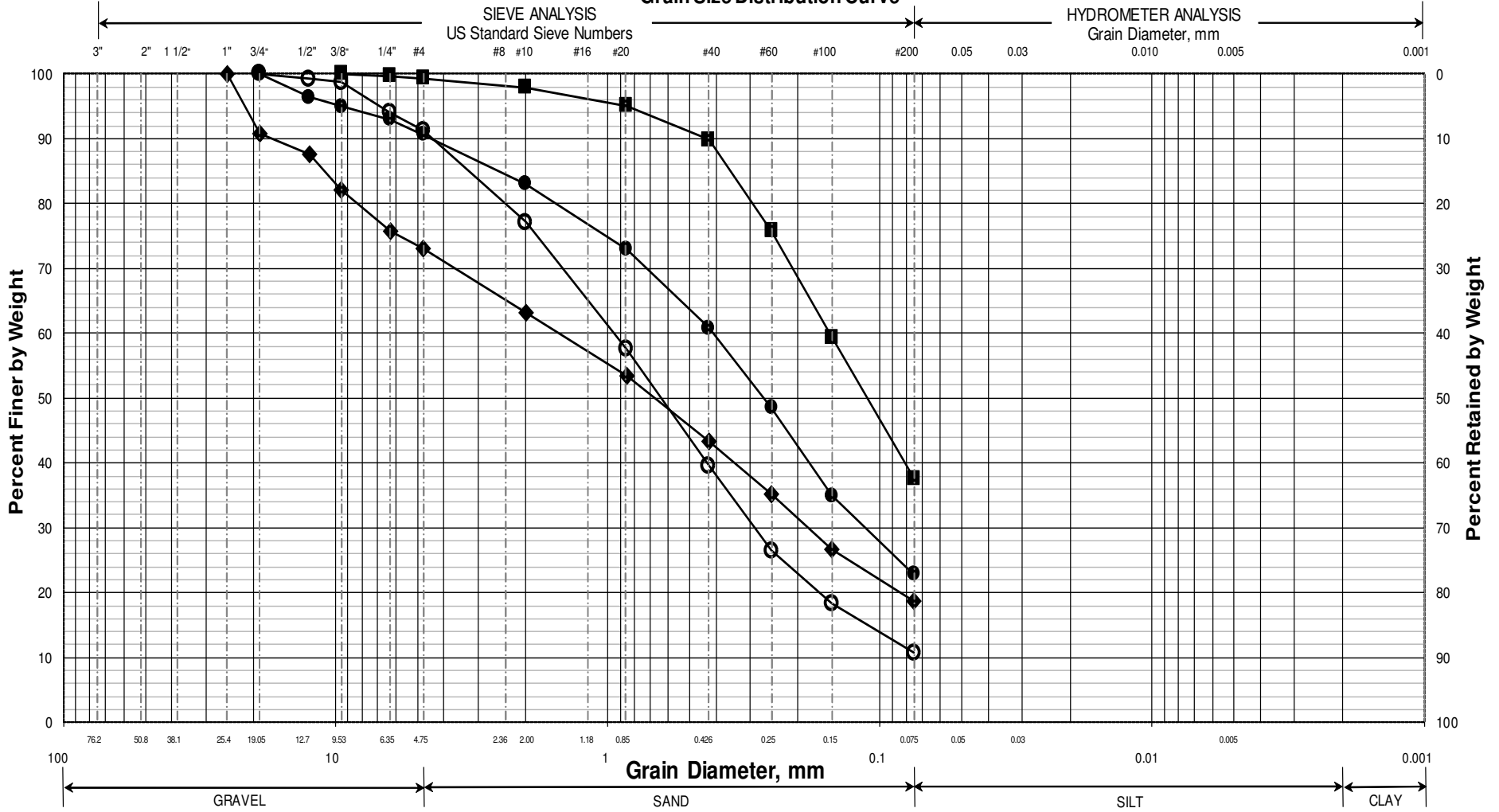
**State of Maine Department of Transportation**  
**GRAIN SIZE DISTRIBUTION CURVE**



	Boring/Sample No.	Station	Offset, ft	Depth, ft	Description	W, %	LL	PL	PI
+	HB-EDG-101/1D	108+00	30.6 RT	0.0-2.0	SAND, little silt, trace gravel.	7.7			
◆	HB-EDG-101/2D	108+00	30.6 RT	5.0-7.0	SAND, some silt, little gravel.	10.6			
■	HB-EDG-101/3D	108+00	30.6 RT	10.0-12.0	SAND, some silt, some gravel.	13.3			
●	HB-EDG-101A/1D	108+05.9	30.7 RT	15.0-17.0	Silty SAND, trace gravel.	14.9			
▲									
×									

WIN
021783.00
Town
Edgecomb
Reported by/Date
WHITE, TERRY A      6/8/2018

## Maine Department of Transportation Grain Size Distribution Curve



### UNIFIED CLASSIFICATION

	Boring/Sample No.	Station	Offset, ft	Depth, ft	Description	WC, %	LL	PL	PI
○	HB-EDG-102/1D	111+50.3	27.1 LT	1.0-3.0	SAND, little silt, trace gravel.	6.4			
◆	HB-EDG-102/2D	111+50.3	27.1 LT	5.0-7.0	SAND, some gravel, little silt.	9			
■	HB-EDG-102/3D	111+50.3	27.1 LT	10.0-12.0	Silty SAND, trace gravel.	11.9			
●	HB-EDG-102/4D	111+50.3	27.1 LT	15.0-15.75	SAND, some silt, trace gravel.	11.9			
▲									
X									

WIN
021783.00
Town
Edgecomb
Reported by/Date
WHITE, TERRY A      9/8/2020