## Maine Department of Transportation Highway Program

## **GEOTECHNICAL SERIES 100 REPORT**

Route 1 Dennysville – Pembroke

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Washington County

PIN 17774.10

Soils Report 2010-110

June 14, 2010

# **Highway Program**

#### Brad Foley, Program Manager Memorandum

**DATE:** June 14, 2010

**TO:** Dennis Lovely **DEPT:** Region 4

**FROM:** Scott A. Hayden **DEPT:** Highway Program

**SUBJECT:** Final Soils – Dennysville/Pembroke Route 1, 17774.10

Report # 2010-110

#### **Project Description**

A subsurface investigation has been completed for a 2.3 mile portion of Route 1 in the towns of Dennysville and Pembroke. The project begins in Dennysville, 0.03 miles south of the intersection of Cross Road, and extends 2.3 miles northeast ending in Pembroke.

The investigation included the use of a drill rig and falling weight deflectometer (FWD). Stationing was determined by using a distance measuring instrument (DMI). A beginning station of 10+00 was used as identified in the field by Region 4 personnel.

This project is located in the downeast coastal area. The topography undulates slightly with several relatively small knolls present. Depth to bedrock is relatively shallow (<15') throughout the project area but is very shallow (<5') beneath the knolls. Till soils are commonly encountered at the higher elevations associated with these knolls whereas marine clays are encountered in the lower lying areas.

#### **FWD Results**

The FWD results are detailed in an attachment following this memo.

The existing pavement performance and subgrade conditions are very poor along this project. The pavement is rough and heavily cracked. Many of these rough areas are associated with existing bedrock cut sections. Other areas along the project are severely rutted. The outside wheel path has been shimmed in many of these areas. This rutting is likely due to a bearing failure in the underlying, moisture sensitive, marine clay/silt. Due to the geologic conditions in this area it is anticipated that bedrock will be relatively shallow throughout the project area. This can result in abnormally high subgrade resilient modulus values ( $M_r$ ).

The subgrade soil conditions along this project consist of marine clay/silt and sandy silt (till). Based on other Maine highway projects, these soil conditions commonly have a  $M_r$  value between 2200psi - 3500psi and 4000psi - 4800psi respectively. However, FWD testing within existing bedrock cut sections produced  $M_r$  values as high as 28,557psi. It is obvious that extreme values like this are an indication of the bedrock surface and not the overlying till soil.

However, the affect of a relatively shallow bedrock surface on the subgrade resilient modulus value is not always this obvious. The existing pavement structure along this project generally consists of 4 inches of pavement and 24 inches of base material. This substantial pavement structure has failed (severe rutting) in many areas throughout the project. It would be reasonable to anticipate a  $M_r$  value in the range of 2200psi – 3200psi throughout most of these failed areas based upon the marine clay subgrade soil conditions. However, a much higher value, generally in the range of 3600psi-4200psi was encountered. It is anticipated that the presence of a relatively shallow bedrock surface has affected these values. Thus it is probable that the actual subgrade resilient modulus values for the overlying soils are lower than the values presented in the FWD analysis. This possibility should be taken into consideration during the design and construction process.

Lastly, very low (<3000psi) subgrade resilient modulus values were encountered at stations 23+07, 100+00, 105+00, and 110+00. However, these areas of very low subgrade resilent modulus are likely under represented in the FWD analysis due to the reasons described above. As a result it should be noted; any area along this project that is underlain by marine clay/silt or sandy silt could become problematic especially during spring and early summer. Depending on the conditions at the time of construction the use of additional base material and/or geosynthetics may be necessary to support traffic once the existing pavement surface has been removed. Areas of greatest concern are listed below:

Station	Soil Type	Sample #	Water Content	% Passing # 200
20+50 - 24+50	Clay	S2	26	96
61+00 - 65+00	Sandy Silt	S5	16	59
71+50 - 74+50	Till/Rock/Water	S5	16	59
78+00 - 115+00	Clay	S9, S11	20 - 23	88 - 94
120+00 - 122+75	Clay/Fill Pocket	S9, S11	20 - 23	88 - 94

Note: The FWD results provided in this memo are calculated using the existing pavement thickness, existing base thickness, and base quality as determined from boring information and sample data results. Thus the FWD results reflect the existing soil conditions and pavement structure.

The FWD information contained in this memo is used in conjunction with subsurface exploration data to identify potential performance disparities along the project area. These areas are determined and illustrated using the attached Performance Data Summary Sheet.

By identifying potential areas of differing performance, specific design and construction options can be considered and developed for each practical area. This can potentially provide greater design flexibility and reduce costs by eliminating the "one design fits all" approach which results in substantial areas being over designed or under designed. See the attached Performance Data Summary Sheet.

#### **Boring Information**

The purpose of the subsurface investigation was to obtain subsurface soil, bedrock, and ground water information. Subsurface explorations were conducted by Maine DOT using a CME 45C truck mounted drill rig. Bore hole logging was performed by Maine DOT.

A total of 15 power augers borings were conducted along the project (See Boring Logs). Power auger borings were conducted using 5" solid stem augers. Boring locations were determined based upon FWD deflection results and visual observations made during an on-site visit. Soils were described and sampled from the auger flights. Four test pits were dug in the shoulders by Region 4 personnel.

A total of 20 soil samples were collected from the power auger borings and test pits and tested at the Maine DOT Materials and Testing laboratory, located in Bangor Maine. Grain size and water content testing was conducted on each sample. Based upon laboratory test results, soil samples were classified according to the Unified Classification System, AASHTO Soil Classification and Maine DOT Frost Susceptibility Rating. Testing results are summarized on the attached Laboratory Testing Summary Sheet.

#### **Pavement Conditions**

Pavement conditions are poor to fair. Although the existing pavement is rough and relatively thin, no unbound or highly friable pavement layers were encountered. For a complete listing of pavement measurements refer to boring logs and pavement core summary sheet. A pavement thickness summary follows:

Range of Solid Pavement (SP) Thickness: 2.4" – 6.0" Average Solid Pavement Thickness: 3.8"

Note: Pavement thickness estimates are based upon 15 power auger borings and 4 pavement cores. The maximum sample spacing is 2000 feet with an average spacing of 832 feet. Actual pavement thickness may vary.

#### **Existing Base Material**

Existing Base Material Type: silty sandy Gravel

silty gravelly Sand

Percent Passing #200: 8% - 17% Range of Base Material Thickness: 20" - 27" Average Thickness: 24"

Quality of Drainage (AASHTO): Poor to Fair Permeability: 4' – 44' per day

The existing base generally consists of silty gravelly sand (gravel borrow). Because of the high percentage of fines the quality of drainage is limited. An estimated permeability range of 4-44 feet/day has been calculated based upon grain size distribution data obtained from existing base

samples. The marginal quality of the existing base must be taken into consideration when developing performance expectations related to strength and drainage. As a comparison, a base material meeting the "excellent quality of drainage" criteria (AASHTO Guide for Design of Pavement Structures) provides a minimum permeability of 1000 ft/day.

#### **Existing Shoulder Material**

Existing Base Material Type: silty gravelly Sand

gravelly silty Sand

Percent Passing #200: 8% - 33%

Average Thickness: 22"

Quality of Drainage (AASHTO): Poor to Fair

Permeability: 0.2' - 150' per day

Four test pits were dug by Region 4 personnel to examine the existing shoulder conditions. Tests pits were dug in the left and right shoulder at stations 50+70 and 84+60. The existing shoulder material consists of silty gravelly sand and gravelly silty sand. Because of the varying amount of fines the quality of drainage is limited and variable. Shoulder material with fewer fines will have better drainage characteristics. For instance, sample S5 (gravelly silty sand) has 33% passing the # 200 sieve with a corresponding water content of 20. Sample S4 has considerably less fines (8% passing the #200 sieve) and by comparison has a much lower water content of 1.

#### **Subgrade Soils**

The subgrade soils underlying this project consist primarily of moist marine silt/clay with areas of sandy silt (till/fill) and silty gravelly sand (fill).

Clay Silt (Glacial Marine): The clay silt soils (S2, S6, S9, S11, S14) have 75% - 96% fines passing the #200 sieve. These soils are classified (AASHTO) as A-4 and A-7-6 soils. The A-7-6 soils have high plasticity indexes in relation to liquid limit and are subject to extremely high volume changes with changing water content. Keeping these soils well drained is critical if these soils are to perform adequately as a subgrade soil. These soils will lose much of their stability if they are not well drained. In addition, these soils may absorb water by capillary action. Because of capillary action, moisture can be held above the ground water table against the force of gravity (capillary fringe). The only way to affect the height of the capillary fringe is by lowering the water table (i.e. deep ditch and/or underdrain) or by providing a capillary break. Due to surface infiltration and capillary action it is anticipated that these soils could be moist to wet well into the early summer months. The presence of these soils and their undesirable engineering characteristics must be considered during the design and construction process.

Depending on seasonal conditions, it is anticipated that these soils could be problematic throughout the construction season, especially in the spring and early summer. Additional base material and/or geosynthetics may be necessary to support traffic during construction if the existing pavement surface is removed while moist to wet subgrade conditions exist. The areas of greatest concern are between the following stations: 20+50-24+50, 78+00-115+00, and 120+00-122+75. Very low (<3000psi) subgrade resilient modulus values were encountered at stations 23+07, 100+00, 105+00, and 110+00.

<u>Sandy Silt (Till):</u> The sandy silts along this project are represented by sample S5. This material is classified (AASHTO) as an A-4 soil with 59% passing the # 200 sieve. These soils are highly frost susceptible. It is anticipated that the depth to bedrock will be shallow when these soils are encountered.

These soils can perform adequately as a subgrade soil if they are properly compacted and drained. However, these soils will swell and lose much of their stability if they are not properly compacted and drained.

If these soils are not well drained additional base material may be necessary to support traffic during construction once the existing pavement surface is removed. Currently, these soils may not be performing well between stations 61+00 and 74+50. This area could be problematic during construction in the spring and early summer. Additional base material may be necessary to support traffic during construction if the existing pavement surface is removed while moist to wet subgrade conditions exist. It is critical that this area be well drained.

It should be noted that bedrock is near or at subgrade between stations 71+50 - 74+50. In addition, there is an existing underdrain outlet on the right at station 72+60. The outlet is buried but water is percolating up through the soil. The origin of this water may be from spring activity exiting the shallow bedrock surface.

A summary of the anticipated subgrade soils is listed on the next page (Table I) based upon limited subsurface exploration and FWD deflection data. Actual field conditions may vary.

**Table 1. Anticipated Subgrade Soil Conditions** 

Station	Soil Description	AASHTO / Unified	Sample	% #200
10+00 - 19+00	ClSi	A-7-6 / CL	S2	96
19+00 - 22+50	ClSi / Rock	A-7-6 / CL	S2	96
22+50 - 28+00	ClSi	A-7-6 / CL	S2	96
28+00 - 34+50	Bedrock/Till/Fill	A-4 / ML	S5	59
34+50 - 38+00	ClSi	A-7-6 / CL	S2	96
38+00 - 48+00	Bedrock/Till	A-4/ML	S5	59
48+00 - 50+50	SaClSi / Fill	A-4 / CL-ML	S6	75
50+50-51+75	GSaSi (Till)	A-4/ML	S5	59
51+75 - 55+00	SaClSi	A-4 / CL-ML	S6	75
55+00 - 57+50	Bedrock/Till	A-4 / ML	S5	59
57+50 - 70+50	GSaSi (Till)	A-4/ML	S5	59
70+50 - 74+00	Bedrock/Till	A-4 / ML	S5	59
74+00 - 75+00	GSaSi (Till)	A-4 / ML	S5	59
75+00 - 76+50	ClSi	A-7-6 / CL	<b>S</b> 9	94
76+50 - 80+00	Bedrock/ClSi	A-7-6 / CL	<b>S</b> 9	94
80+00 - 91+50	ClSi	A-7-6 / CL	<b>S</b> 9	94
91+50 - 93+50	Bedrock/Till	A-4 / ML	S5	59
93+50 - 96+50	GSaSi (Till)	A-4 / ML	S5	59
96+50 - 99+50	Bedrock/Till	A-4 / ML	S5	59
99+50 - 102+00	ClSi	A-7-6 / CL	S11	88
102+00 - 104+00	Bedrock?/Till	A-4 / ML	S5	59
104+00 - 114+00	ClSi	A-7-6 / CL	S11	88
114+00 - 117+00	GSaSi (Till)	A-2-4 / SM	S13	26
117+00 - 120+50	Bedrock/Till	A-2-4 / SM	S13	26
120+50 - 122+75	ClSi / Fill	A-7-6 / CL	S11	88
122+75 - 127+00	Bedrock/Till	A-2-4 / SM	S13	26
127+00 - 132+00	ClSi	A-7-6 / CL	S14	78

#### **Bedrock**

Relatively shallow bedrock (< 15') is anticipated to underlie the entire project area. In many areas the bedrock will be less than < 5' below the existing ground surface. Multiple bedrock outcrops are present (See Table II). The bedrock in this area consists primarily of basalt belonging to the Edmunds formation. These volcanics vary slightly in texture and mineral assemblage varying from mafic to felsic. Blasting will be required for the removal of this bedrock. It should be noted that the soils in this region may be slightly acidic due to the presense of these volcanics. A pH test of the soils could be taken at different locations along the project if metal drainage structures are to be used.

Table II. Outcropping bedrock and anticipated shallow (< 5') bedrock areas

Station	Source of Information	
19+00 - 22+50	FWD, Outcrop@ 22+20	
28+00 - 30+70	FWD, Boring, Outcrop@ 28+50 – 30+70	
33+75 - 34+40	Outcrop@ 33+75 – 34+40	
38+00 - 48+00	FWD, Outcrop@ 39+50 – 42+00	
55+00 - 57+50	FWD, Outcrop@ 55+90 – 57+00	
70+50 - 74+00	FWD, Outcrop @71+50 – 73+00	
76+50 - 80+00	FWD, Outcrop @ 79+35	
91+50 - 93+00	FWD, Boring, Outcrop @ 92+00	
96+50 - 99+50	FWD	
117+00 - 120+50	FWD, Boring	
122+75 - 127+00	FWD, Boring, Outcrop @ 125+16 – 126+17	

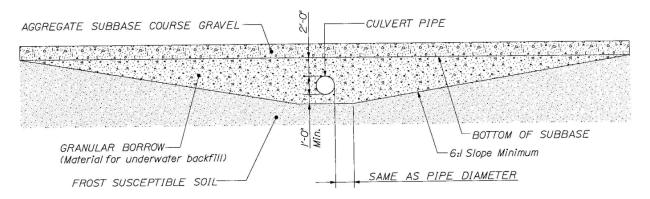
Existing pavement conditions within existing bedrock cut areas is fair to poor. It is anticipated that these poor conditions are due to a lack of drainage.

No design information was available prior to the subsurface investigation and subsequent writing of this memo. The Project Manager has indicated that the vertical grade is likely to remain unchanged. At the request of the Project Manager, no borings were conducted to determine the limits of shallow bedrock. However, due to the shallow nature of the bedrock in this region, it is anticipated that bedrock could be encountered at several locations depending on the proposed design and the elevation of the vertical grade.

According to maintenance personnel, differential heaving within existing bedrock cut areas is not a problem. However, if the vertical grade is lowered in any of area where the present depth to bedrock is suspected to be 5' or less, transition zones should be included in the design. (See transition zone schematic in the Recommendation 8).

#### Recommendations

- 1. It is recommended that the entire project area be well drained. It is anticipated that the poor pavement performance in existing bedrock cut areas is due to inadequate drainage. Ditching in these areas should be as deep as possible. Furthermore, failure (severe rutting) of the existing pavement structure is likely due to inadequate drainage of moisture sensitive marine clay/silts. Deep ditching is most critical in these areas where marine clay/silt soils are present in order to draw down the water table. In these areas, ditches should be constructed with a minimum depth of 3 feet below finished grade when possible. Refer to Table I for a listing of the anticipated subgrade soil conditions.
- 2. It is recommended that all cross pipes be lowered to allow for an adequate ditching depth. Cross pipes should be installed based upon the following design schematic:



3. Due to the presence of poorly drained moisture sensitive marine clay/silt and silty glacial till, several areas poise a higher risk of future premature pavement failure. In addition, these areas could become problematic throughout the construction season, especially in the spring and early summer. Additional base material may be necessary to support traffic during construction if the existing pavement surface is removed while moist to wet subgrade conditions exist. Furthermore, additional variable depth gravel placement or full construction should be considered in these areas if future pavement performance expectations are to be realized. The areas of greatest concern are between stations:

$$20+50-24+50$$
,  $61+00-74+50$ ,  $78+00-112+00$ ,  $120+00-122+75$ 

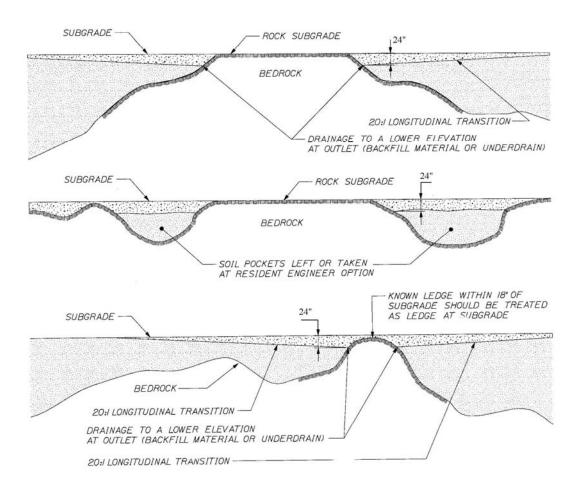
It is recommended that these areas be aggressively drained prior to removing the existing pavement structure.

- 4. If new base material is to be placed directly upon the marine clay/silt, a 6 once, non-woven, needle punched separation geotextile should utilized to prevent the intermixing of the new base layer with the underlying marine clay/silt.
- 5. In addition to the areas of concern listed above in Recommendation 3., any area containing marine clay/silt could become problematic during construction, especially during the spring. The existing pavement surface should not be removed until necessary or until the subgrade

soil conditions have stabilized. The roadway could become unstable or fail under loading if the existing pavement surface is removed during moist to wet subgrade conditions. Additional base material could be required to support traffic during construction if the subgrade soils become unstable. Refer to Table I for a listing of possible areas where marine clay/silt could be encountered.

- 6. Full reconstruction is recommended between stations 71+50 74+50 due to poor existing pavement performance, drainage, and the possible presence of a spring. It is recommended that the existing bedrock surface be exposed and examined for spring activity. An underdrain outlet (buried) is present on the right at station 72+60. At the time of this writing, water was seen percolating up through the surface in the vicinity of this buried UD outlet.
- 7. Full reconstruction or additional variable depth gravel placement over the existing pavement structure is recommended between stations 78+00 and 112+00 due to the presence of moisture sensitive marine clays, low subgrade resilient modulus values, inadequate drainage, and structural failure of the existing pavement structure.
- 8. Shallow bedrock is present in many areas along this project. Currently, differential heaving is not an issue according to maintenance personnel. However, if the vertical grade is lowered differential heaving could become an issue along soil/bedrock contacts. Transition zones should be constructed along soil/bedrock contacts to aid in the prevention of differential heaving. It is recommended that a 2 foot undercut be constructed with a 20:1 transition.

# PROFILE OF UNDERCUT OF FROST SUSCEPTIBLE SOILS OVER LEDGE



Pembroke Rte. 1 CIP 17774.10

#### **Performance Data Summary**

A Performance Data Summary (PDS) is included on the next pages. The purpose of the (PDS) is to identify potential performance differences by station based upon 4 minimal performance criteria (asphalt thickness, base thickness, subgrade resilient modulus, and existing/future structural number comparison. The PDS is color coded and should be printed in color to fully utilize the information

If an area fails to meet 2 or more of the minimal performance criteria the area will be shaded in the deficiency (DEF) column located next to the Station column. Areas having two or more deficiencies have a lower existing performance expectation and are at a higher risk of pavement structure failure.

The presence of shallow bedrock throughout much of this project has caused the subgrade resilient modulus to be abnormally high. In many cases these elevated values have caused the existing structural number to falsely meet or exceed the future structural number. In addition, these elevated values have resulted in fewer low subgrade modulus value (<3000psi) to be identified on the PDS. Because of this, the number in the deficiency column (DEF) on the Performance Data Summary Sheet (PDS) is under estimated. In many instances the value should be increased by one.

## Pembroke Rte. 1 CIP 17774.10

Station	D E	Per	Mini forma			Boring Location		Base aterial	_	Subgrade Soils	
(FWD)	F			eria		(Plan View)	AASHT0 Class		AASHTO Class	% #200	
						KEY					
Station				– Fail - Met		Solid Pave Thick Unbound Pave - U Base Thickness (inches)	JP Soil Typ	O Frost	Soil Type AASHTO Sample #	% 200 Frost Moisture	
						CL					
12+50	1					4.8 S 20.4	A-1-a	12 0 Damp	ClSi A-7-6 S2	96 III Moist	
15+00	1					l l					
17+51	1										
20+00	2							Bedrock O	utcrop 22+20		
23+07	3					3.6 S - 25.2	A-1-a	12 0 Damp	ClSi A-7-6 S2	96 III Moist	
25+00	2					l I			~-	3,200	
27+51	2							Bedrock Outcro	op 28+50 – 30+	-70	
30+00	2	(4 inches)	(18 inches)	(isd (		3.6 S	A-1-a	8 0 Damp	Weathered Rock	Ref. 3.8'	
32+50	2	5 —	18	00				Bedrock Outcro	op 33+75 – 34+	-40	
35+00	2			(3)	- 등 -						
38+50	2	Thickness	Thickness	Subgrade Modulus (3000 psi)	Structural Number	3.6 S	A-1-b	9 0 Wet	SiGSa A-1-b S4	9 0 Wet	
40+00	2	- III	Th_	Ĭ	[]  -  -				- 42+00	· · ·	
42+50	2	ınt —	se	de	ıtı –		S	hallow and Ou	tcropping Bedr	ock	
43+07	2	- jii —	Base	gra	TIG —		I	Dennysville / Pe	mbroke Town	line	
45+00	1	Pavement		Sub	S –	2.4 S	A-1-a	8 0 Damp	GSaSi A-4 S5	59 IV Wet 2.5'	
47+50	1					27.0	33	Damp	33	WCt 2.3	
50+00	1					3.6 S	A-1-a	8 0 Damp	SaClSi A-4 S6	75 IV Moist	
52+50	1					25.2	33	Damp	30	IVIOISU	
55+00	1							Bedrock Outcro	Dp 55+90 – 57+	-00	
60+00	1							Carota Guion	F 55.70 571		
62+50	1					3.6 S	A-1-b	17 II Damp	GSaSi A-4 S5	59 IV Damp	

\* SP = Solid Pavement Layer

\* UP = Unbound Pavement Layer

SP+UP = Total Pavement Thickness

<sup>\*</sup> Base Thickness = Red indicates presence of "treated base"

Pembroke Rte. 1 CIP 17774.10

Station	D E	Per	Mini forma	mum ance l		Bor Loca		Ba Mate		Subgrade Soils	
(FWD)	F			teria	Julu	(Plan		AASHTO Class	% #200	AASHTO Class	% #200
						KF	EY				
Station				– Fail 1 - Met		Solid Pay Unbound I Base Th (incl	Pave - UP nickness	Soil Type AASHTO Sample #	% 200 Frost Moisture	Soil Type AASHTO Sample #	% 200 Frost Moisture
						C	L				
62+50	1						3.6 SP - 25.2	SiGSa A-1-b S7	17 II Damp	GSaSi A-4 S5	59 IV Damp
65+00	1										
67+50	1										
70+05	1										
71+50	1							Bed	lrock Outcrop	71+50 – 73+	00
72+65	1							Under	drain Present	– Possible Sp	ring?
76+05	1										
77+50	1		(S						Bedrock Ou	tcrop 79+35	
81+50	2	es)	he	Si.							
82+50	2	Thickness (4 inches)	(18 inches)	Subgrade Modulus (3000 psi)	nber		3.6 SP - 24.0	SiGSa A-1-b S8	13 II Damp	ClSi A-7-6 S9	94 III Moist
85+00	3	- y		3	– un}				•		
87+50	2	cknes	Thickness	snInpo			3.6 SP - 25.2	SiGSa A-1-b S8	13 II Damp	ClSi A-7-6 S9	94 III Moist
90+50	2	- <u>F</u>	TH.	ĬŽ -	nct –			20	Bedrock Ou		1110101
92+50	1	Pavement	Base	grade	Str		3.6 SP - 21.6	SiGSa A-1-b S8	13 II Damp	ClSi/Rock A-7-6 S9	94 III Ref 3.2'
95+00	1	- š		qn			21.0	50	Damp	57	RC1 3.2
97+75	1	- 52 —		$\infty$ -							
100+00	3						3.6 SP - 25.2	SiGSa A-1-b S10	15 II Damp	ClSi A-7-6 S11	88 III Damp
102+50	2								,		
105+00	3										
107+50	2						3.6 SP - 25.2	SiGSa A-1-b S10	15 II Damp	ClSi A-7-6 S11	88 III Damp

\* SP = Solid Pavement Layer \* UP = Unbound Pavement Layer

SP+UP = Total Pavement Thickness

<sup>\*</sup> Base Thickness = Red indicates presence of "treated base"

Pembroke Rte. 1 CIP 17774.10

Station	D E	Per	Mini forma	mum ance		Boring Location		Ba Mate		Subg Soi	
(FWD)	F			teria		(Plan View)		AASHTO Class	% #200	AASHTO Class	% #200
						KEY					
Station				– Fail 1 - Met		Solid Pave Thic Unbound Pave - I Base Thickness (inches)	UP	Soil Type AASHTO Sample #	% 200 Frost Moisture	Soil Type AASHTO Sample #	% 200 Frost Moisture
						CL					
107+50	2					3.6 \$		SiGSa A-1-b S10	15 II Damp	CISi A-7-6 S11	88 III Damp
110+00	3								•		
112+50	2										
115+00	1					3.6 S - 21.		SiGSa A-1-b S12	14 II Damp	GSiSa A-2-4 S13	26 II Moist
117+51	1					ı		5.12	zunp	515	1/10150
120+00	1					3.65		SiGSa A-1-b	14 II	GSa/Rock A-1-b	Ref 3.4'
122+50	1	- (S) —				37.	.2	S12	Damp	S12	
125+25	1	(4 inches)	- Jes	: <u>:</u>				Bedi	rock Outeron	125+16 – 126-	+17
127+50	2	- <u>.</u> ≝.–	- i2-	sd				Bedi	ock outerop	123   10   120	117
1		- <del>2</del> —	Thickness (18 inches)	<u> </u>	- per	3.6 \$	SP	SiGSa	14	ClSi	78
130+00	2	iess	s (1	(3(	mm	21.	6	A-1-b S12	II Damp	A-7-6 S14	III Damp
		- 참ㅡ	es —	- sn	Ź-	21.	.0	512	Damp	514	Danip
		† <u>:</u> ě	- 몽-	- qn	ıra] -						
		+ [	- <u>:</u> E-	†§ -	-   151    -						
				- de	Structural Number						
		Pavement Thickness	Base	Subgrade Modulus (3000 psi)	-						
		-a		†qn		•					
				\sqrt{\sigma} -							
						i					
						•					
	-										
L											

\* SP = Solid Pavement Layer

\* UP = Unbound Pavement Layer

SP+UP = Total Pavement Thickness

<sup>\*</sup> Base Thickness = Red indicates presence of "treated base"

# Falling Weight Deflectometer (FWD) Summary Sheet

Project #: 17774.10 Town(s): Pembroke

Route(s): 1

Date Tested: 05/11/2010 Requested By: S. Hayden

Direction of Testing: South to North

# Of FWD tests: 47 # Of Power Augers/Spoons - 15

Design Life: 12 Yrs Future 18-kip ESALs (Design Life): 819,060

Initial Serviceability: 4.5 Terminal Serviceability: 2.5 Reliability Level: 90 Overall Standard Deviation: .45

Functional Class: Minor Arterial

Locations

Station (meters) Description

**Project Stationing** 

Comments:

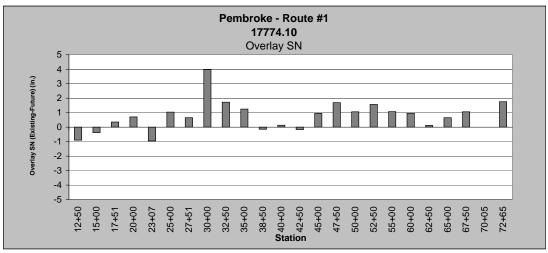
Pembroke - Route #1	
17774 10	

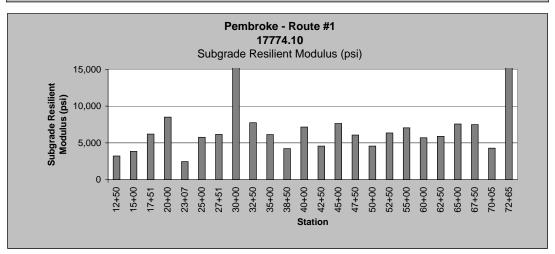
Station (Feet)	Existing Structural Number (in.)	Future Traffic Structural Number (in.)	Overlay Structural Number (Existing - Future)	Recommended Pavement Thickness (in.)	Pavement Modulus (psi)	Subgrade Resilient Modulus (psi)	Pavement Depth (in)	Combined Pavement/Gravel Depth Used for Calculation (in)
12+50	3.5	4.4	-0.9	2.05	29,492	3,208	4.8	25.2
15+00	3.76	4.14	-0.38	0.86	36,550	3,840	4.8	25.2
17+51	3.85	3.5	0.35	-	39,211	6,204	4.8	25.2
20+00	3.83	3.13	0.7	-	38,474	8,496	4.8	25.2
23+07	3.83	4.79	-0.96	2.18	25,907	2,467	3.6	28.8
25+00	4.62	3.59	1.03	-	45,172	5,771	3.6	28.8
27+51	4.16	3.51	0.65	-	33,150	6,163	3.6	28.8
30+00	5.96	1.99	3.97	-	97,489	28,557	3.6	28.8
32+50	4.95	3.23	1.72	-	55,573	7,748	3.6	28.8
35+00	4.76	3.52	1.24	-	49,557	6,133	3.6	28.8
38+50	3.86	4.01	-0.15	0.34	35,980	4,219	3.6	26
40+00	3.46	3.33	0.13	-	25,967	7,150	3.6	26
42+50	3.73	3.9	-0.17	0.39	32,476	4,565	3.6	26
45+00	4.19	3.25	0.94	-	29,822	7,631	2.4	30
47+50	5.22	3.53	1.69	-	57,903	6,056	2.4	30
50+00	4.96	3.9	1.06	-	55,901	4,575	3.6	28.8
52+50	5.03	3.47	1.56	-	58,319	6,358	3.6	28.8
55+00	4.42	3.35	1.07	-	39,662	7,042	3.6	28.8
60+00	4.57	3.61	0.96	-	43,834	5,701	3.6	28.8
62+50	3.69	3.57	0.12	-	33,955	5,896	3.6	25.3
65+00	3.91	3.26	0.65	-	40,484	7,558	3.6	25.3
67+50	4.34	3.28	1.06	-	55,406	7,473	3.6	25.3
70+05	3.99	3.99	0	-	42,970	4,273	3.6	25.3
72+65	4.27	2.52	1.75	-	52,929	15,401	3.6	25.3

Combined

Possible Weak Soils (<3000)
Possible Shallow Bedrock (>8000)

For actual Gravel Depths, see logdraft forms





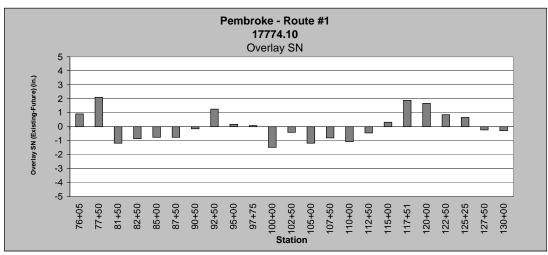
Pembroke - Route #1
17774 10

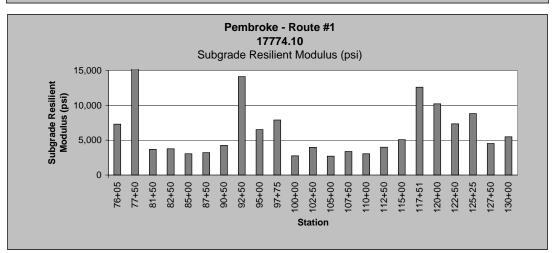
Station (Feet)	Existing Structural Number (in.)	Future Traffic Structural Number (in.)	Overlay Structural Number (Existing - Future)	Recommended Pavement Thickness (in.)	Pavement Modulus (psi)	Subgrade Resilient Modulus (psi)	Pavement Depth (in)	Pavement/Gravel Depth Used for Calculation (in)
76+05	4.21	3.3	0.91	-	50,492	7,298	3.6	25.3
77+50	4.49	2.39	2.1	-	61,480	17,712	3.6	25.3
81+50	3.01	4.2	-1.19	2.7	21,598	3,677	3.6	24
82+50	3.29	4.16	-0.87	1.98	28,244	3,775	3.6	24
85+00	3.71	4.47	-0.76	1.73	40,682	3,051	3.6	24
87+50	3.63	4.39	-0.76	1.73	33,683	3,225	3.6	25
90+50	3.85	4	-0.15	0.34	40,220	4,252	3.6	25
92+50	3.86	2.6	1.26	-	59,402	14,120	3.6	22
95+00	3.61	3.44	0.17	-	48,365	6,534	3.6	22
97+75	3.29	3.21	0.08	-	36,795	7,904	3.6	22
100+00	3.14	4.62	-1.48	3.36	21,658	2,763	3.6	25
102+50	3.68	4.09	-0.41	0.93	34,923	3,967	3.6	25
105+00	3.47	4.65	-1.18	2.68	29,322	2,714	3.6	25
107+50	3.51	4.32	-0.81	1.84	30,395	3,386	3.6	25
110+00	3.39	4.46	-1.07	2.43	27,348	3,066	3.6	25
112+50	3.63	4.08	-0.45	1.02	33,565	4,000	3.6	25
115+00	4.07	3.76	0.31	-	50,950	5,084	3.6	24.4
117+51	4.59	2.71	1.88	-	73,239	12,618	3.6	24.4
120+00	4.59	2.92	1.67	-	60,454	10,233	3.6	26
122+50	4.14	3.29	0.85	-	44,243	7,360	3.6	26
125+25	3.75	3.09	0.66	-	54,352	8,821	3.6	22
127+50	3.68	3.91	-0.23	0.52	51,488	4,529	3.6	22
130+00	3.37	3.66	-0.29	0.66	39,378	5,490	3.6	22

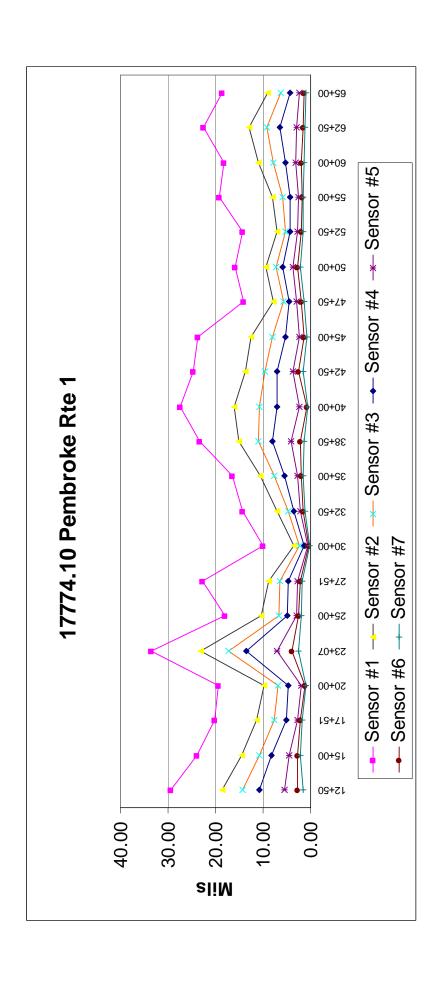
Combined

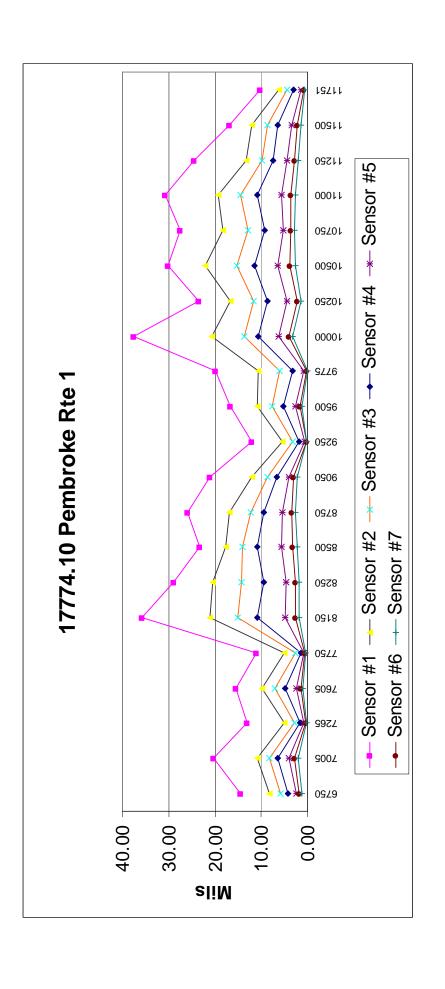
Possible Weak Soils (<3000)
Possible Shallow Bedrock (>8000)

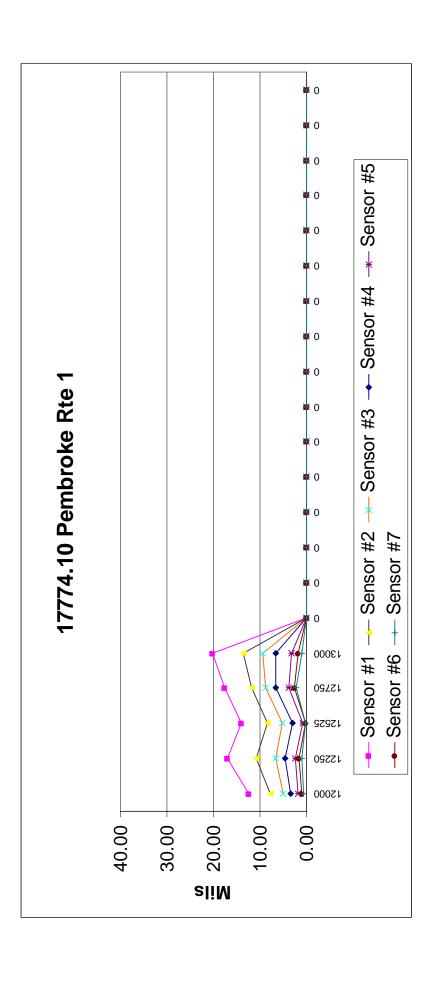
For actual Gravel Depths, see logdraft forms











## STATE OF MAINE

FILE: RTE 1

INTERDEPARTMENTAL MEMORANDUM

Date of Request: 4/27/2010

Return: 4/29/2010

Latest Date Needed By

ASAP

in the	
$T_{\alpha}$	
10.	

Mike Morgan

Dept.:

MDOT, Bureau of Planning

From:

**Carmen Forzetting** 

Dept.:

**Highway** 

Subject:

Request for Traffic Information

Project Manager: Denis Lovely

TOWN(S):

**PEMBROKE** 

P.I.N.

17774.00

Consultant Proj

COUNTY:

WASHINGTON

ROUTE:

U.S. Route 1

LOCATION/

Reconstruction on U.S. Route 1: Begin 0.03 miles S of the intersection of Cross Road and U.S. Route 1 and extends 2.49 miles to 0.02 miles S of the intersection of Old

**DESCRIPTION:** County Road and U.S. Route 1.

	Roadway Changes or Relocation (Attach Sketch)	Turning Mov (Provide Locations	ement needed	Other Please Descril	e Under Comments
Please Check Box if Applicable:					
Prep By: MAM	Sec. 1	Sec. 2	Sec. 3	Sec. 4	Sec. 5
Description of Sections	Pembroke - US 1 SW/O IR 1231 (Old County Rd)				
1 Latest AADT (Year)	2520 (2009)	· · · · · · · · · · · · · · · · · · ·			
2 Current <b>2010</b>	AADT <u>2520</u>	· .	************		
3 Future <b>2022</b>	AADT <u>2820</u>				
4 Future	AADT				
5 DHV - % of AADT	<u>11%</u>	%	%	<u></u> %	%
6 Design Hourly Volume	<u>310</u>				
7 % Heavy Trucks (AAD	T) <u>12%</u>	<u></u> %	<u></u> %	%	<u></u> %
8 % Heavy Trucks (DHV	12%	%	%	<u>%</u>	%
Direct.Dist. (DHV)	<u>53%</u>	%	%	%	%
0 18-KIP Equivalent P 2.	0 <u>196</u>		<del>~</del>	-	
1 18-KIP Equivalent P 2.	5 <u>187</u>			-	

Notes or Remarks:

18-Kip ESALS is based on 12 year life

PLEASE PROVIDE: (1) PIN NUMBER, (2) THE CURRENT & FUTURE YEARS FOR WHICH YOU WANT AADT CALCULATED, AND SEND TO MIKE MORGAN. (A LOCATION MAP IS NO LONGER NEEDED.) FRAFFIC REQUESTS WILL BE FILLED ON A FIRST COME / SERVE BASIS. PLEASE SEND WHEN PROJECT KICKS OFF!!!

**Need Only Data Items Numbered** 

ALL

Comments:

Reconstruction project.

### State of Maine - Department of Transportation **Laboratory Testing Summ**

Depth

(Feet)

Town(s): **Pembroke** 

Station

(Feet)

Offset

(Feet)

Boring & Sample

**Identification Number** 

Summa	<u>ry Snee</u>	<u>}t</u>				
	Proje	ect I	Numb	er: 17	7774	.10
Reference	G.S.D.C.	W.C.	% Passing	Cla	assificati	on
Number	Sheet		200 Sieve	Unified	AASHTO	Frost
237489	1	5.1	12.1	SW-SM	A-1-a	0
237490	1	25.7	95.8	CL	A-7-6	III
237491	1	3.0	8.0	GW-GM	A-1-a	0
237492	1	8.8	9.2	SW-SM	A-1-b	0
237493	1	16.4	59.4	ML	A-4	IV
237494	2	23.4	75.0	CL-ML	A-4	IV
237495	2	21	17 2	SM	Δ-1-h	II

HB-PEMB-101, S1	12+50	7.0 Rt.	0.35-2.1	237489	1	5.1	12.1	SW-SM	A-1-a	0
HB-PEMB-101, S2	12+50	7.0 Rt.	2.1-5.0	237490	1	25.7	95.8	CL	A-7-6	Ш
HB-PEMB-103, S3	30+00	8.5 Rt.	0.3-2.4	237491	1	3.0	8.0	GW-GM	A-1-a	0
HB-PEMB-104, S4	38+50	8.0 Rt.	0.3-4.5	237492	1	8.8	9.2	SW-SM	A-1-b	0
HB-PEMB-105, S5	45+00	8.0 Rt.	2.5-5.0	237493	1	16.4	59.4	ML	A-4	IV
HB-PEMB-106, S6	48+50	8.0 Rt.	2.4-5.0	237494	2	23.4	75.0	CL-ML	A-4	IV
HB-PEMB-107, S7	62+50	8.0 Rt.	0.3-2.4	237495	2	2.1	17.2	SM	A-1-b	II
HB-PEMB-108, S8	82+50	8.0 Rt.	0.25-2.3	237496	2	5.4	13.3	SM	A-1-b	II
HB-PEMB-108, S9	82+50	8.0 Rt.	2.3-5.0	237497	2	23.0	94.1	CL	A-7-6	Ш
HB-PEMB-111, S10	101+00	8.0 Rt.	0.3-2.4	237498	2	5.7	15.4	SM	A-1-b	П
HB-PEMB-111, S11	101+00	8.0 Rt.	2.4-5.0	237499	2	20.2	87.8	CL	A-7-6	Ш
HB-PEMB-113, S12	114+00	7.5 Rt.	0.25-2.1	237500	3	4.9	13.7	SM	A-1-b	П
HB-PEMB-113, S13	114+00	7.5 Rt.	2.1-5.0	237526	3	1.0	26.1	SM	A-2-4	П
HB-PEMB-115, S14	129+00	8.0 Rt.	2.1-5.0	237527	3	22.3	78.1	CL	A-6	Ш
TP-1, S3	50+70	14.0 Lt.	0.17-2.0	238249	4	0.6	4.7	SW	A-1-a	0
TP-2, S2	50+70	14.0 Rt.	0.17-2.0	238248	4	1.3	8.2	SW-SM		0
TP-2, S1	50+70	14.0 Rt.	2.0	238247	4	24.2	79.6	CL-ML	A-4	IV
TP-3, S6	84+60	14.0 Lt.	0.17-2.0	238211	4	1.6	11.6	SW-SM		0
TP-3, S5	84+60	14.0 Lt.	2.0	238210	4	20.1	32.5	SC-SM	A-2-4	П
TP-4, S4	84+60	14.0 Rt.	0.17-2.0	238250	4	1.4	8.2	SW-SM	A-1-a	0

Classification of these soil samples is in accordance with AASHTO Classification System M-145-40. This classification is followed by the "Frost Susceptibility Rating" from zero (non-frost susceptible) to Class IV (highly frost susceptible). The "Frost Susceptibility Rating" is based upon the MDOT and Corps of Engineers Classification Systems.

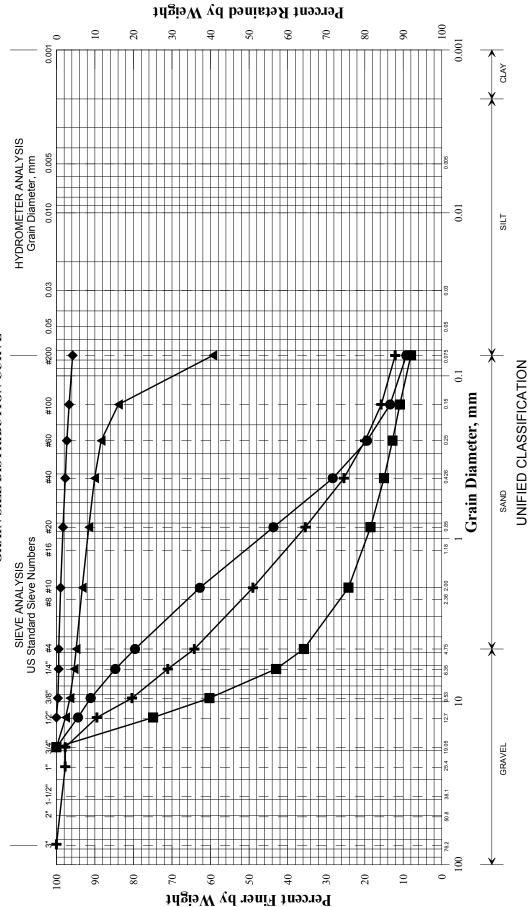
GSDC = Grain Size Distribution Curve as determined by AASHTO T 88-93 (1996) and/or ASTM D 422-63 (Reapproved 1998)

WC = water content as determined by AASHTO T 265-93 and/or ASTM D 2216-98

LL = Liquid limit as determined by AASHTO T 89-96 and/or ASTM D 4318-98

PI = Plasticity Index as determined by AASHTO 90-96 and/or ASTM D4318-98

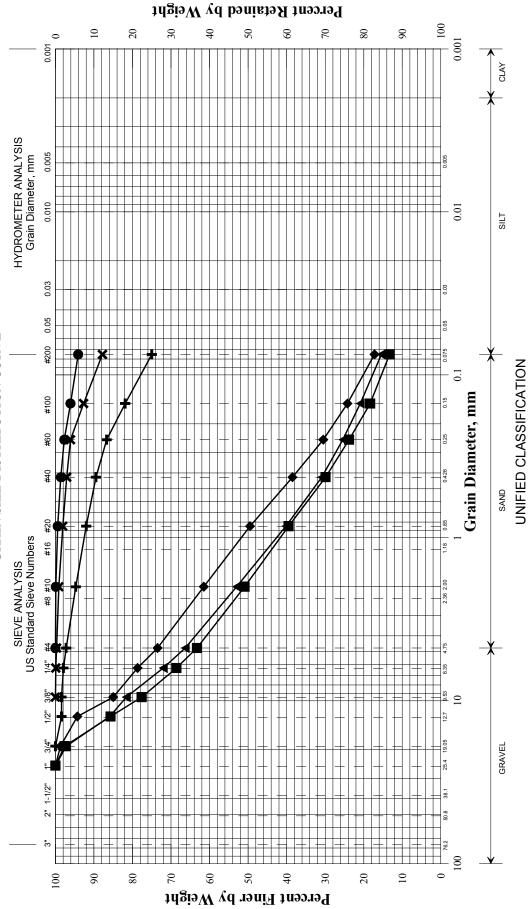




	Boring/Sample No.	Station	Offset, ft Depth, ft	Depth, ft	Description	W, %	W, % LL PL	굽		
+	HB-PEMB-101/S1	12+50	7.0 RT	0.35-2.1	Gravelly SAND, little silt.	5.1				17774.10
<b>♦</b>	HB-PEMB-101/S2	12+50	7.0 RT	2.1-5.0	SILT with clay, trace sand, trace gravel.	25.7	25.7 45 22	22	23	
	HB-PEMB-103/S3	30+00	8.5 RT	0.3-2.4	GRAVEL, some sand, trace silt.	3.0				Department Dep
•	HB-PEMB-104/S4	38+50	8.0 RT	0.3-4.5	SAND, some gravel, trace silt.	8.8				Delliyaville, re
•	HB-PEMB-105/S5	45+00	8.0 RT	2.5-5.0	Sandy SILT, trace gravel.	16.4				Керог
×										WHITE, TERRY

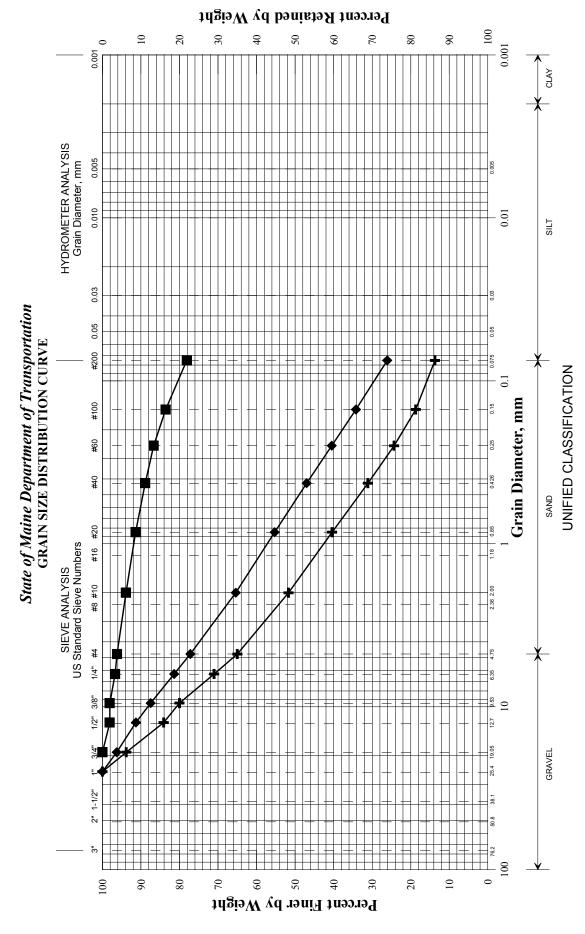
<b>L</b>	PIN
17774.10	
Tc	Town
Dennysville, Pembroke, Whiting	oke,Whiting
Reporte	Reported by/Date
WHITE, TERRY A	6/3/2010

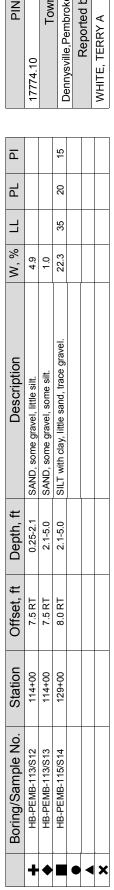




	Boring/Sample No.	Station	Offset, ft Depth, ft	Depth, ft	Description	W, % LL PL PI		Z		
+	HB-PEMB-106/S6	48+50	8.0 RT	2.4-5.0	2.4-5.0 SILT with clay, some sand, trace gravel.	23.4				17774.10
<b>♦</b>	HB-PEMB-107/S7	62+50	8.0 RT	2.4-5.0	SAND, some gravel, little silt.	2.1				
	HB-PEMB-108/S8	82+50	8.0 RT	0.25-2.3	Gravelly SAND, little silt.	5.4				Alivavado
•	HB-PEMB-108/S9	82+50	8.0 RT	2.3-5.0	SILT, with clay, trace sand.	23.0 47 24 23	47	24	23	
•	HB-PEMB-111/S10	101+00	8.0 RT	0.3-2.4	SAND, some gravel, little silt.	2.2				_
×	HB-PEMB-11/S11	101+00	8.0 RT	2.4-5.0	SILT with clay, little sand, trace gravel.	20.2 44 21	44	21	23	WHITE, TE

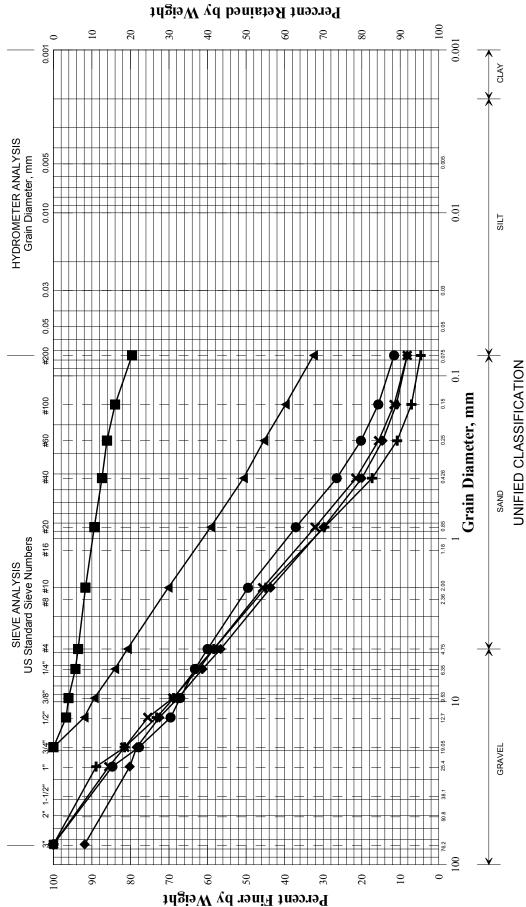
PIN PIN	17774.10 Town	Dennysville, Pembroke, Whiting	Reported by/Date	WHITE, TERRY A 6/3/2010
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PIN 17774.10 Town	Dennysville, Pembroke, Whiting Reported by/Date	WHITE, TERRY A 6/3/2010
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State of Maine Department of Transportation GRAIN SIZE DISTRIBUTION CURVE



	17774.10		Dennyayille Dem	Deliniyaville,r el	Подеж	WHITE, TERRY
⊒						
W, % LL PL						
岀						
W, %	9.0	1.3	24.2	1.6	20.1	1.4
Description	Gravelly SAND, trace silt.	Gravelly SAND, trace silt.	SILT with clay, little sand, trace gravel.	Gravelly SAND, little silt.	SAND, some silt with clay, little gravel.	Gravelly SAND, trace silt.
Depth, ft	0.17-2.0	0.17-2.0	2	0.17-2.0	2	0.17-2.0
Offset, ft	14.0 LT	14.0 RT	14.0 RT	14.0 LT	14.0 LT	14.0 RT
Station	20+20	20+20	20+20	84+60	84+60	84+60
Boring/Sample No.	TP-1/S3	TP-2/S2	TP-2/S1	TP-3/S6	TP-3/S5	TP-4/S4
	+	<b>•</b>		•	4	×

NIA
17774.10
Town
Dennysville, Pembroke, Whiting
Reported by/Date
WHITE, TERRY A 6/3/2010

	Main	e Dep	artment	of Transport	ation	1	Proje	ect:	Route	1		Boring No.:	HB-PE	MB-101
		_	Soil/Rock Exp US CUSTOM	loration Log						broke, I	<b>1</b> aine	PIN:	177	74.10
Drille			MaineDOT		I EIO	vation	/## \					Auger ID/OD:	5" Dia.	
					_	tum:	(11.)		NI A I	VD88		Sampler:		
	ator:		Giguere/Giles		-							<u> </u>	Off Flights	
	ed By:		B. Wilder	10	_	Type				E 45C		Hammer Wt./Fall:	N/A	
	Start/Fi		5/17/10-5/17/1			lling M				d Stem	Auger	Core Barrel:	N/A	
	ng Loca		12+50, 7.0 Rt.			sing ID			N/A		4 40	Water Level*:	None Observed	1
Ham Definit		ciency Fa	actor:	R = Rock	Core Sar	mmer '	Гуре		Automa		Hydraulic ☐ u Field Vane Shear Strength (psf)	Rope & Cathead	= Lah Vane Shear S	trenath (nsf)
D = Sp MD = U = Th MU = V = Ins	olit Spoon S Unsuccess nin Wall Tu Unsuccess situ Vane S	ful Split Spo be Sample ful Thin Wal Shear Test,	on Sample attemp I Tube Sample att PP = Pocket Per ne Shear Test atte	SSA = Si that HSA = H RC = Ro empt WOH = v verterometer WOR/C = empt WO1P =	olid Stem ollow Ster	Auger m Auger 140lb. ha of rods or	casing	J		$T_V = Poole q_p = Uncorr Hammer N_{60} = SI$	their valle officer Sternight (psf) cet Torvane Shear Strength (psf) onfined Compressive Strength (ksf) octed = Raw field SPT N-value Efficiency Factor = Annual Calibrati T N-uncorrected corrected for ham ammer Efficiency Factor/60%)*N-ur	$\begin{array}{ccc} LL = Lic \\ PL = Pl \\ \\ \text{on Value} & Pl = Pl \\ \\ \text{mer efficiency} & G = Gra \\ \end{array}$	= Lab Vane Shear S vater content, percen quid Limit astic Limit asticity Index ain Size Analysis nsolidation Test	t
				Sample Information			_			-				Laboratory
Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	09 <sub>N</sub>	Casing	Blows	Elevation (ft.)	Graphic Log	Visual De	scription and Remarks		Testing Results/ AASHTO and Unified Clas
0	S1		0.35 - 2.10				SS	SA	-0.35		PAVEMENT.		0.35	G#237489
											Brown, damp, gravelly fine	to coarse SAND, little silt.	0.55	A-1-a, SW-SI WC=5.1%
	S2		2.10 - 5.00						-2.10		Olive-brown, moist, clayey-	SILT.	2.10	G#237490 A-7-6, CL
														WC=25.7% LL=45
- 5 -								_	-5.00				5.00	PL=22 PI=23
											Bottom of Exploration NO REFUSAL	n at 5.00 feet below groun	id surface.	
10 -														
- 15 -														
- 20 -														
25														

All Offsets are form Existing Roadway CL.

Stratification lines represent approximate boundaries between soil types; transitions may be gradual.

\* Water level readings have been made at times and under conditions stated. Groundwater fluctuations may occur due to conditions other than those present at the time measurements were made.

Page 1 of 1

]	Main	e Dep	artment	of Transporta	tion		Projec	t: Rou	ıte 1		Boring No.: HB-PEN	MB-102
			Soil/Rock Exp US CUSTOM				Locati	on: P	emb	roke, N	PIN: 1777	4.10
Drille	er:		MaineDOT		Eleva	tion	(ft.)				Auger ID/OD: 5" Dia.	
Oper	ator:		Giguere/Giles		Datun	n:		N	AV	D88	Sampler: Off Flights	
Logg	jed By:		B. Wilder		Rig Ty	ype:		C	ME	45C	Hammer Wt./Fall: N/A	
Date	Start/Fi	nish:	5/17/10-5/17/	10	Drillin	ng M	ethod:	S	olid	Stem A	Auger Core Barrel: N/A	
Boriı	ng Locat	tion:	23+00, 6.0 Rt		Casin	ng ID	/OD:	N	/A		Water Level*: None Observed	
		ciency Fa	ctor:		Hamn		Гуре:	Auto			Hydraulic □ Rope & Cathead □	
MD = 1 U = Th MU = 1 V = Ins	olit Spoon S Unsuccess in Wall Tul Unsuccess situ Vane S	ful Split Spo be Sample ful Thin Wall shear Test,	on Sample attem Tube Sample at PP = Pocket Pei ne Shear Test att	SSA = Sol	Core Samplid Stem Aug llow Stem A er Cone eight of 140l weight of ro Veight of on	ger Auger Ib. hai ods or	casing		T 9 N H	V = Poo p = Und I-uncorr Iammer I <sub>60</sub> = SI	u Field Vane Shear Strength (psf)  vet Torvane Shear Strength (psf)  vet Torvane Shear Strength (psf)  votinined Compressive Strength (ksf)  voted = Raw field SPT N-value  Efficiency Factor = Annual Calibration Value  ver T N-uncorrected corrected for hammer efficiency  ammer Efficiency Factor/60%)*N-uncorrected  Su(lab) = Lab Vane Shear Str  WC = water content, percent  LL = Liquid Limit  PL = Plastic Limit  PI = Plasticity Index  G = Grain Size Analysis  C = Consolidation Test	ength (pst)
				Sample Information								Laboratory
Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N <sub>60</sub>	Casing	Elevation	(ft.)	Graphic Log		Testing Results/ AASHTO and Unified Class
0							SSA	-0.	.30		PAVEMENT. 0.30-	
									ŀ		Brown, damp, gravelly fine to coarse SAND, little silt, occasional cobbles. ≅S1	
								-2.	.40		Olive-brown, moist, clayey-SILT.≅S2	
								/				
- 5 -									.00		Bottom of Exploration at 5.00 feet below ground surface.  NO REFUSAL	
- 10 -												
- 15 -												
- 20 -												
								_				
2.5												
_ 25		l	1									

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Page 1 of 1

	Main	e Depa	artment	of Transporta	tion	1	Proj	ect:	Route	1	Boring No.: HB-PE	MB-103
		_	Soil/Rock Exp US CUSTOM				Loc	atio	n: Pem	broke, l	Maine PIN:	74.10
Drille	er:		MaineDOT		Ele	vation	(ft.)				Auger ID/OD: 5" Dia.	
Oper	ator:		Giguere/Giles		Dat	tum:			NA'	VD88	Sampler: Off Flights	
Logo	ed By:		B. Wilder		Rig	Type:			CM	E 45C	Hammer Wt./Fall: N/A	
	Start/Fi	nish:	5/17/10-5/17/	10	<del></del>	illing M		d:	Soli	d Stem		
	ng Loca		30+00, 8.5 Rt.		_	sing ID			N/A		Water Level*: None Observed	i
		ciency Fa			_	mmer '			Autom		Hydraulic □ Rope & Cathead □	
Definit D = Sp MD = I U = Th MU = I V = Ins	ions: olit Spoon S Jnsuccess in Wall Tu Jnsuccess situ Vane S	Sample sful Split Spoo be Sample sful Thin Wall Shear Test,	on Sample attem Tube Sample att PP = Pocket Per le Shear Test atte	RC = Roll tempt WOH = w netrometer WOR/C =	Core Sa lid Stem ollow Ster er Cone eight of 1	mple Auger m Auger 140lb. ha of rods or	mmer casin			$S_u = Ins$ $T_v = Poole$ $q_p = Une$ N-uncon Hammer $N_{60} = S$	tu Field Vane Shear Strength (psf)  ket Torvane Shear Strength (psf)  sonfined Compressive Strength (ksf)  cetted = Raw field SPT N-value  Efficiency Factor = Annual Calibration Value  PT N-uncorrected corrected for hammer efficiency  lammer Efficiency Factor/60%)*N-uncorrected  Su(lab) = Lab Vane Shear S  WC = water content, percent  LL = Liquid Limit  PL = Plastic Limit  PI = Plasticity Index  G = Grain Size Analysis  Lammer Efficiency Factor/60%)*N-uncorrected  C = Consolidation Test	trength (psf)
Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N <sub>60</sub>	Casing	Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Clas
0	S3		0.30 - 2.40					SA	-0.30		PAVEMENT.	G#237491
			0.30 2.10						-		Brown, damp, gravelly fine to coarse SAND, little silt.	A-1-a, GW-G WC=3.0%
								/	-2.40		Weathered ROCK.	
- 5 -								•	-3.80		Bottom of Exploration at 3.80 feet below ground surface. REFUSAL	
- 10 -												
· 15 -												
- 20 -												
									-			
25 <b>Pom</b>												

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	Main	e Dep	artment	tion		Project:	Route	1		Boring No.:	HB-PE	MB-104	
			Soil/Rock Exp US CUSTOM.	-			Locatio	n: Pem	broke, l	Maine	PIN:	177′	74.10
Drille	er:		MaineDOT		Elev	ation	(ft.)				Auger ID/OD:	5" Dia.	
Ope	ator:		Giguere/Giles		Datu	ım:		NAV	VD88		Sampler:	Off Flights	
Logg	ged By:		B. Wilder		Rig	Type:		CMI	E 45C		Hammer Wt./Fall:	N/A	
	Start/Fi	nish:	5/17/10-5/17/	10	Drilli	ing M	ethod:	Soli	d Stem	Auger	Core Barrel:	N/A	
Bori	ng Loca	tion:	38+50, 8.0 Rt.		Casi	ing ID	/OD:	N/A			Water Level*:	None Observed	1
Ham	mer Effi	ciency Fa	actor:		Ham	mer	Гуре:	Automa	atic 🗆	Hydraulic □	Rope & Cathead □		
Definitions:         R = Rock Cr.           D = Split Spoon Sample         SSA = Solid           MD = Unsuccessful Split Spoon Sample attempt         HSA = Hollo           U = Thin Wall Tube Sample         RC = Roller           MU = Unsuccessful Thin Wall Tube Sample attempt         WOH = weig           V = Insitu Vane Shear Test, PP = Pocket Penetrometer         WOR/C = w           MV = Unsuccessful Insitu Vane Shear Test attempt         WO1P = Weig						Auger Auger Olb. ha rods or	casing		$T_V = Poole q_p = Une N-uncon Hammer N_{60} = S$	tu Field Vane Shear Strength (psf) ket Torvane Shear Strength (psf) onfined Compressive Strength (ksf) ected = Raw field SPT N-value Efficiency Factor = Annual Calibrative PT N-uncorrected corrected for hamma ammer Efficiency Factor/60%)*N-un	WC = w LL = Lic PL = Pl on Value PI = Pla mer efficiency G = Gra	= Lab Vane Shear S vater content, percen quid Limit astic Limit usticity Index ain Size Analysis asolidation Test	trength (psf) t
				Sample Information			<u> </u>	1	-				Laboratory
Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N <sub>60</sub>	Casing Blows	Elevation (ft.)	Graphic Log	Visual De	scription and Remarks		Testing Results/ AASHTO and Unified Class
0	S4		0.30 - 4.45				SSA	-0.30		_PAVEMENT.		0.30-	G#237492
								-		Brown, wet, gravelly fine to	coarse SAND, little silt.	0.50	A-1-b, SW-SN WC=8.8%
								-					11 0.070
									( ·				
							$\forall$	-4.50				4.50	
- 5 -								-4.30			at 4.50 feet below groun		
										REFUSAL			
- 10 -								1					
					-+								
								1					
- 15 -								-					
								1					
					+			-					
- 20 -								1					
					+								
		-			+			-					
25													
Rem	arks:												

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I	Main	e Depa	artment	of Transporta	tion	tion Project: Route 1						Boring No.: HI	B-PE	MB-105
		<u> </u>			Loc	atio	n: Pen	ıbroke,	Ma	PIN:	177	74.10		
Drille	r:		MaineDOT		Ele	vation	(ft.)					Auger ID/OD: 5" Dia.		
Oper	ator:		Giguere/Giles		Dat	tum:			NA	VD88		Sampler: Off Fligh	nts	
Logg	ed By:		B. Wilder		Rig	Type:			CM	E 45C		Hammer Wt./Fall: N/A		
Date	Start/Fi	nish:	5/17/10-5/17/	10	Dri	lling M	etho	od:	Soli	d Stem	Αι	uger Core Barrel: N/A		
Borir	ıg Loca	tion:	45+00, 8.0 Rt	-	Cas	sing ID	/OD	:	N/A	L		Water Level*: None Of	serve	i
Hamı	ner Effi	ciency Fa	ctor:		Hai	mmer '	Туре	<b>)</b> :	Autom	atic 🗆		Hydraulic □ Rope & Cathead □		
Definitions:         R = Rock Co           D = Split Spoon Sample         SSA = Solid           MD = Unsuccessful Split Spoon Sample attempt         HSA = Hollo           U = Thin Wall Tube Sample         RC = Roller f           MU = Unsuccessful Thin Wall Tube Sample attempt         WOH = weig           V = Insitu Vane Shear Test, PP = Pocket Penetrometer         WOR/C = we           MV = Unsuccessful Insitu Vane Shear Test attempt         WO1P = Weig						Auger n Auger 40lb. ha of rods or	casin			$T_V = Pe$ $q_p = Ue$ $N$ -unco $Hamme$ $N_{60} = 3$	ocke rrec er E SPT	I Field Vane Shear Strength (psf)  et Torvane Shear Strength (psf)  et Torvane Shear Strength (psf)  finied Compressive Strength (ksf)  cted = Raw field SPT N-value  fificiency Factor = Annual Calibration Value  T N-uncorrected corrected for hammer efficiency  mmer Efficiency Factor/60%)*N-uncorrected  C = Consolidation Telegraph	percen	trength (psf) t
ł				Sample Information	_		_			-				Laboratory
Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N <sub>60</sub>	Casing	Blows	Elevation (ft.)			Visual Description and Remarks		Testing Results/ AASHTO and Unified Clas
0							s	SA	-0.20		:	PAVEMENT.	-0.20	
ŀ									1		2	Brown, damp, gravelly fine to coarse SAND, little silt. $\cong$ S3		
ŀ							$\vdash$		-			Cobbles from 2.0-2.4' bgs.		
	S5		2.50 - 5.00						-2.50	)	╫	Brown, wet, silty fine to medium SAND.	-2.50	0257 175
											ı	Blown, wet, sitty fine to inequal SAND.		A-4. ML WC=16.4%
l							+	/	1					
- 5							$\vdash$	$\checkmark$	-5.00		+		<b>-</b> 5.00	
												Bottom of Exploration at 5.00 feet below ground surface. NO REFUSAL $$		
ŀ														
- }							╀		-					
10									1					
ŀ							+							
l									1					
ŀ														
. 15							_							
Ī														
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25			1							1				1

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Page 1 of 1

	Main	e Dep	artment	of Transporta	tion		Project:	Route	1	Boring No.: HB-P	EMB-106
		-	Soil/Rock Exp US CUSTOM				Location	n: Pem	broke, l	faine PIN:	774.10
Drille	er:		MaineDOT		Elev	ation	(ft.)			Auger ID/OD: 5" Dia.	
Ope	rator:		Giguere/Giles		Datu	ım:		NAV	VD88	Sampler: Off Flights	
Logg	ged By:		B. Wilder		Rig	Type:		CMI	E 45C	Hammer Wt./Fall: N/A	
Date	Start/Fi	nish:	5/17/10-5/17/	10	Drilli	ing M	ethod:	Soli	d Stem	Auger Core Barrel: N/A	
Bori	ng Locat	tion:	48+50, 8.0 Rt		Casi	ing ID	/OD:	N/A		Water Level*: None Observ	ed
Ham	mer Effi	ciency Fa	ctor:		Ham	mer '	Гуре:	Automa	atic 🗆	Hydraulic ☐ Rope & Cathead ☐	
Definitions:         R = Rock Co           D = Split Spoon Sample         SSA = Solid:           MD = Unsuccessful Split Spoon Sample attempt         HSA = Hollow           U = Thin Wall Tube Sample         RC = Roller (           MU = Unsuccessful Thin Wall Tube Sample attempt         WOH = weigt           V = Insitu Vane Shear Test, PP = Pocket Penetrometer         WOR/C = we           MV = Unsuccessful Insitu Vane Shear Test attempt         WOIP = Wei					d Stem Ai low Stem r Cone ight of 14 weight of i	Auger Auger 10lb. ha rods or	casing		$T_V = Poole q_p = Une N-uncon Hammer N_{60} = S$	ur Field Vane Shear Strength (psf) ket Torvane Shear Strength (psf) ket Torvane Shear Strength (psf) onfined Compressive Strength (ksf) ceted = Raw field SPT N-value Efficiency Factor = Annual Calibration Value PT N-uncorrected corrected for hammer efficiency sammer Efficiency Factor/60%)*N-uncorrected C = Consolidation Test	Strength (psf) ent
		<u> </u>		Sample Information			T		-		Laboratory
Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N <sub>60</sub>	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Testing Results/ AASHTO and Unified Class
0							SSA	-0.25		PAVEMENT. 0.3	25-
										Brown, damp, gravelly fine to coarse SAND, little silt. ≅S3	
	S6		2.40 - 5.00					-2.40		Grey, moist, silty fine SAND, some clay.	G#237494
- 5 -								-5.00	HHHH	Bottom of Exploration at 5.00 feet below ground surface. NO REFUSAL	00-
10											
- 10 -											
								-			
- 15 -											
- 20 -											
25 <b>Pom</b>	Ļ										

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I	Main	e Dep	artment	of Transporta	tion Project: Route 1						Boring No.: HB-PE	MB-107
			Soil/Rock Exp US CUSTOM			Lo	catio	n: Pe	mbro	oke, N	PIN: 1777	74.10
Drille	r:		MaineDOT		Elevation	n (ft.	)				Auger ID/OD: 5" Dia.	
Oper	ator:		Giguere/Giles		Datum:		<u>,                                     </u>	N/	VD	88	Sampler: Off Flights	
Logg	ed By:		B. Wilder		Rig Typ	e:		CN	ΛΕ 4:	5C	Hammer Wt./Fall: N/A	
	Start/Fi	inish:	5/17/10-5/17/2	10	Drilling		od:	So	lid S	tem A	Auger Core Barrel: N/A	
	ng Loca		62+50, 8.0 Rt.		Casing			N/			Water Level*: None Observed	
		iciency Fa			Hamme			Autor		: 🗆	Hydraulic ☐ Rope & Cathead ☐	
Definiti D = Sp MD = U U = Th MU = U V = Ins	ons: dit Spoon s Jnsuccess in Wall Tu Jnsuccess situ Vane S		Core Sample id Stem Auger low Stem Auger Cone eight of 140lb. weight of rods	er hamme or casi			S <sub>u</sub> T <sub>v</sub> q <sub>p</sub> N-u Har N <sub>6</sub> (	= Insit = Poc = Unc uncorre mmer 0 = SF	u Field Vane Shear Strength (psf)  ket Torvane Shear Strength (psf)  ket Torvane Shear Strength (psf)  wC = water content, percen  portion of the content of	trength (psf)		
ŀ		Π 🦳		Sample Information	7	$\top$			-			Laboratory
Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	8	Casing Blows	Elevation	(11:7)	Graphic Log	Visual Description and Remarks	Testing Results/ AASHTO and Unified Clas
0	S7		0.30 - 2.40				SSA	-0.3	0	111	PAVEMENT. 0.30	G#237495
											Brown, damp, gravelly fine to coarse SAND, little silt.	A-1-b, SM WC=2.1%
						+		-2.4	0		Brown, damp, silty fine to medium SAND. ≘S5	
٠						+		<u> </u>				
- 5								-5.0	00 مند	LILILO D	5.00 Bottom of Exploration at 5.00 feet below ground surface.	1
						+		-			NO REFUSAL	
								1				
10						$\top$						
ŀ						+						
						+		1				
								1				
15												
						+		1				
						$\perp$		1				
						+		1				
- 20						$\perp$						
								1				
						+		1				
						$\perp$		1				
						$\top$		1				
25 Rema	aulta i								$\perp$			

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	Main	e Dep	artment	of Transporta	ation	1	Proj	ect:	Route	1			Boring No.:	HB-PE	MB-108
			Soil/Rock Exp US CUSTOM	loration Log			Loca	atior	n: Pem	ibroke,	Maine		PIN:	177	74.10
Drille	er:		MaineDOT		Ele	vation	(ft.)						Auger ID/OD:	5" Dia.	
Opei	ator:		Giguere/Giles						NA'	VD88			Sampler:	Off Flights	
	jed By:		B. Wilder			Туре	:			E 45C			Hammer Wt./Fall:	N/A	
	Start/Fi	inish:	5/17/10-5/17/	10	+	Iling N		d:		d Stem	Auger		Core Barrel:	N/A	
	ng Loca		82+50, 8.0 Rt.		_	sing IC			N/A		ruger		Water Level*:	None Observed	1
		ciency Fa		•	_	mmer			Autom		Hyd	draulic □	Rope & Cathead □	Trone Observed	•
Definit D = Sp MD = U = Th MU =	Definitions:         R = Rock C           D = Split Spoon Sample         SSA = Soli           MD = Unsuccessful Split Spoon Sample attempt         HSA = Holl           U = Thin Wall Tube Sample         RC = Rolle           MU = Unsuccessful Thin Wall Tube Sample attempt         WOH = we           V = Insitu Vane Shear Test,         PP = Pocket Penetrometer         WOR/C = v						ımmer		raton	$S_u = Ins$ $T_v = Po$ $q_p = Ur$ N-uncom M-uncom	tu Field Vane ket Torvane S confined Comp ected = Raw f Efficiency Fa	shear Strength (psf) Shear Strength (psf) pressive Strength (ksf field SPT N-value ictor = Annual Calibrat cted corrected for ham	S <sub>U(lat</sub> WC = ) LL = L PL = I ion Value PI = F	<ul> <li>a) = Lab Vane Shear S water content, percen iquid Limit</li> <li>Plastic Limit</li> <li>Ilasticity Index rain Size Analysis</li> </ul>	trength (psf) t
			ne Shear Test atte	empt WO1P =						N <sub>60</sub> = (	ammer Efficie	ency Factor/60%)*N-u	ncorrected C = C	onsolidation Test	1
				Sample Information		<u> </u>	_			1					Laboratory
Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N <sub>60</sub>	Casing	Blows	Elevation (ft.)	Graphic Log		Visual De	escription and Remarks		Testing Results/ AASHTO and Unified Clas
0	S8		0.25 - 2.30				SS	SA	-0.25		√PAVEMI	ENT.		0.25	G#237496
											Brown, d	lamp, gravelly fine	to coarse SAND, little silt	0.25	A-1-b, SM WC=5.4%
	S9		2.30 - 5.00						-2.30		Olive-bro	own, damp, SILT, t	race fine sand, trace clay.	2.30	G#237497 A-7-6, CL
								/							WC=23.0% LL=47 PL=24
- 5 -								<i>V</i>	-5.00		Bot NO REF		n at 5.00 feet below grou	nd surface.	PI=23
							_								
- 10 -															
							+								
									-						
· 15 -															
13															
							<u> </u>								
- 20 -															
							-								
							+								
25															

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Subject   Subj		Main	e Dep	artment	of Transporta	tion	Р	roject	Route	e 1		Boring No.:	HB-PE	MB-109
Openstrox   Grant Grant   Openstrox   Grant Grant   Openstrox							L	ocatio	<b>n:</b> Per	nbrok	e, N	PIN:	1777	74.10
Deposit State   Property   Style   Martine	Drille	er:		MaineDOT		Elevation	on (f	t.)				Auger ID/OD:	5" Dia.	
Date   Sart/Finisht   School (1974	Ope	ator:		Giguere/Giles		Datum:			NA	.VD88	3	Sampler:	Off Flights	
Section   Sect	Logo	ged By:		B. Wilder		Rig Typ	e:		CM	IE 450	С	Hammer Wt./Fal	I: N/A	
Hammer Type:   Automatic   Type:   T	Date	Start/Fi	nish:	5/17/10-5/17/	10	Drilling	Met	thod:	Sol	id Ste	m A	uger Core Barrel:	N/A	
Section   Sect	Bori	ng Locat	tion:	86+50, 7.5 Rt	-	Casing	ID/C	DD:	N/A	A		Water Level*:	None Observed	l
De Significance Stargies  1. Septiminate Starg	Ham	mer Effi	ciency Fa	ictor:			r Ty	pe:	Auton			,		
Column   C	D = S <sub>I</sub> MD = U = TI MU = V = In:	olit Spoon S Unsuccess nin Wall Tul Unsuccess situ Vane S	ful Split Spo be Sample ful Thin Wall Shear Test,	d Stem Auger ow Stem Augor r Cone ight of 140lb. I veight of rods	er hamr or ca	asing		T <sub>V</sub> = 1 q <sub>p</sub> = 1 N-und Hamr	Pock Unco corre mer l = SP	et Torvane Shear Strength (psf)  onfined Compressive Strength (ksf)  cted = Raw field SPT N-value  Efficiency Factor = Annual Calibration Value  T N-uncorrected corrected for hammer efficiency	WC = water content, percent LL = Liquid Limit PL = Plastic Limit PI = Plasticity Index G = Grain Size Analysis	trength (psf)		
SSA   -0.30   PAVEMENT.   -0.30   Brown, damp, gravelly fine to coarse SAND, little silt.   SS8   -2.40   Olive-brown, moist, SILT, trace fine sand, trace clay.   SS9   -5.00   No REI USAL   SS9							$\overline{}$		1	-				
- 5 Say Say Brown, damp, gravelly fine to course SAND, little silt. ±88  2.40 Olive-brown, moist, SILT, trace fine sand, trace clay ±89  - 5 Say		Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	20	Casing Blows	Elevation (ft.)	Graphic Lod	Glapline Log	Visual Description and Rem	arks	Results/ AASHTO and
Bottom of Exploration at 5.00 feet below ground surface.  Solution of Exploration at 5.00 feet below ground surface.  10  10  10  10  10  10  10  10  10  1	0							SSA	-0.3	0		PAVEMENT.	0 30-	
Olive-brown, moist, SILT, trace fine sand, trace clay, 259  Bottom of Exploration at \$.00 feet below ground surface.  NO REFUSAL  15  20  25  25  25  25  25  26  27  28  28  28  28  28  28  28  28  28												Brown, damp, gravelly fine to coarse SAND, litt	e silt. ≅S8	
Bottom of Exploration at 5.00 feet below ground surface.  NO REFUSAL  10  10  10  10  10  10  10  10  10  1							4		-2.4	0		Olive-brown, moist, SILT, trace fine sand, trace	2.40—2.40—2.40—2.40—2.40—2.40—2.40—2.40—	
Bottom of Exploration at 5.00 feet below ground surface.  NO REFUSAL  10  10  10  10  10  10  10  10  10  1							+	\ /						
NO REFUSAL 7	- 5 -						+		-5.0	0 3333	an	Rottom of Evnlaration at 5 00 feet below		
- 20							_		_				ground surface.	
- 20														
- 20														
- 20							+							
- 20							4		4					
- 20	10													
25	- 10 -													
25							+							
25							_		4					
25														
25														
25							+		-					
	- 15 -						4		4					
							$\top$		1					
							+							
							$\perp$							
	20 -						+		1					
							+		-					
							$\perp$		]					
							$\top$		1					
							+		1					
		L												

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Page 1 of 1

]	Main	e Depa	artment	of Transporta	tion		Proje	ct:	Route	1		Boring No.: HB-P	EMB-110
			Soil/Rock Exp US CUSTOM				Loca	tio	n: Pem	broke,	, M	PIN:17	774.10
Drille	er:		MaineDOT		Elev	ation	(ft.)					Auger ID/OD: 5" Dia.	
Oper	ator:		Giguere/Giles		Datu					VD88		Sampler: Off Flights	
Logged By: B. Wilder Rig Ty				Type:			CM	E 45C		Hammer Wt./Fall: N/A			
Date	Start/Fi	nish:	5/17/10-5/17/	10	Drilli	ing M	letho	d:	Soli	d Sten	ı A	auger Core Barrel: N/A	
Boriı	ng Locat	tion:	92+00, 7.5 Rt		Casi	ing IC	/OD:		N/A			Water Level*: None Observ	ed
		ciency Fa	actor:				Type:		Autom			Hydraulic □ Rope & Cathead □	
Definitions:         R = Rock C           D = Split Spoon Sample         SSA = Solic           MD = Unsuccessful Split Spoon Sample attempt         HSA = Hollc           U = Thin Wall Tube Sample         RC = Roller           MU = Unsuccessful Thin Wall Tube Sample attempt         WOH = weit           V = Insitu Vane Shear Test, PP = Pocket Penetrometer         WOR/C = w           MV = Unsuccessful Insitu Vane Shear Test attempt         WO1P = Weit						Auger Auger IOIb. ha rods or	casing			$T_V = P$ $q_p = U$ N-unco Hamm $N_{60} =$	ock ncc orre er E SP	u Field Vane Shear Strength (psf) set Torvane Shear Strength (psf) white Torvane Shear Strength (psf) shifted Compressive Strength (ksf) sted = Raw field SPT N-value Efficiency Factor = Annual Calibration Value T N-uncorrected corrected for hammer efficiency sammer Efficiency Factor/60%)*N-uncorrected  Su(lab) = Lab Vane Shea WC = water content, perc LL = Liquid Limit PL = Plastic Limit Pl = Plastic Limit Pl = Plastic Limit G = Grain Size Analysis C = Consolidation Test	Strength (psf)
				Sample Information			Т			1			Laboratory
Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N <sub>60</sub>	Casing	Blows	Elevation (ft.)	Graphic Log		Visual Description and Remarks	Testing Results/ AASHTO and Unified Class
0							SS	A	-0.30		6	PAVEMENT. 0	s0-
												Brown, damp, gravelly fine to coarse SAND, little silt. ≅S8	
									-2.10	MMM)		Olive-brown, damp, SILT, trace fine sand, trace clay. ≅S9	
								_	-2.80 -3.20		┫	Weathered ROCK.	30-
											ľ	Bottom of Exploration at 3.20 feet below ground surface. REFUSAL	20-
- 5 -													
									1				
					+								
- 10 -													
									-		ĺ		
									1		١		
											ĺ		
- 15 -									1				
					+				-				
							_		-				
- 20 -									-		ĺ		
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							1		-				
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25											١		
			1	ı							_		

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Page 1 of 1

]	Main	e Dep	artment	of Transporta	ation	l	Proj	ect:	Route	1	Boring No.: HB-P	EMB-111
		_	Soil/Rock Exp	loration Log						broke, l	PIN: 17	774.10
Drille					LEIS	votion	/£4 \				Augus ID/OD: 5" Di-	
			MaineDOT		-	vation	(11.)		NIA I	7000	Auger ID/OD: 5" Dia.	
_	ator:		Giguere/Giles		-	tum:				VD88	Sampler: Off Flights	
	ed By:		B. Wilder		-	Type		_		E 45C	Hammer Wt./Fall: N/A	
	Start/Fi		5/17/10-5/17/1		_	lling M				d Stem		
Borii	ng Loca	tion:	101+00, 8.0 R	t.	Cas	sing ID	OOD:		N/A		Water Level*: None Observ	ed
		ciency F	actor:			mmer '	Type	:	Automa		Hydraulic ☐ Rope & Cathead ☐	
MD = 1 U = Th MU = 1 V = Ins	olit Spoon S Unsuccess nin Wall Tu Unsuccess situ Vane S	ful Split Spo be Sample ful Thin Wal Shear Test,	oon Sample attemp I Tube Sample att PP = Pocket Per ne Shear Test atte	RC = Rol   empt   WOH = v   netrometer   WOR/C =   empt   WO1P =	olid Stem ollow Ster ler Cone reight of 1 weight o	Auger n Auger 40lb. ha of rods or	casing	3		$T_V = Poole q_p = Und N-uncorr Hammer N_{60} = SI$	tu Field Vane Shear Strength (psf) ket Torvane Shear Strength (psf) ket Torvane Shear Strength (psf) ket Torvane Shear Strength (psf) confined Compressive Strength (ksf) ceted = Raw field SPT N-value Efficiency Factor = Annual Calibration Value PT N-uncorrected corrected for hammer efficiency ammer Efficiency Factor/60%)*N-uncorrected  Su(lab) = Lab Vane Shear WC = water content, perco	Strength (pst)
				Sample Information			_			-		Laboratory
Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	09 <sub>N</sub>	Casing	Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Testing Results/ AASHTO and Unified Clas
0	S10		0.30 - 2.40				SS	SA	-0.30		PAVEMENT. 0.3	G#237498
											Brown, damp, gravelly fine to coarse SAND, trace silt.	A-1-b, SM WC=5.7%
	S11		2.40 - 5.00						-2.40		Olive-brown, damp, SILT, little fine sand, little clay.	G#237499 A-7-6, CL
												WC=20.2% LL=44 PL=21
- 5 -								_	-5.00		Bottom of Exploration at 5.00 feet below ground surface.	
											NO REFUSAL	
- 10 -												
- 15 -												
							-					
- 20 -												
20 7												
25												

Remarks:

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Page 1 of 1

	Main	e Dep	artment	of Transporta	tion	Pro	oject:	Route	: 1	Boring No.: HB-PE	MB-112
			Soil/Rock Exp US CUSTOM			Loc	catio	n: Pen	ibroke,	Maine <b>PIN</b> : 1777	74.10
Drille	er:		MaineDOT		Elevatio	n (ft.	)			Auger ID/OD: 5" Dia.	
Ope	ator:		Giguere/Giles		Datum:		-	NA	VD88	Sampler: Off Flights	
Logg	jed By:		B. Wilder		Rig Typ	e:		CM	E 45C	Hammer Wt./Fall: N/A	
	Start/Fi	inish:	5/17/10-5/17/	10	Drilling	Meth	od:	Soli	d Stem	Auger Core Barrel: N/A	
Bori	ng Loca	tion:	107+50, 8.5 R	t.	Casing	D/OE	<b>)</b> :	N/A	ı	Water Level*: None Observed	
Ham	mer Effi	iciency F	actor:		Hamme	r Typ	e:	Autom	atic 🗆	Hydraulic ☐ Rope & Cathead ☐	
MD = U = TI MU = V = In	olit Spoon S Unsuccess in Wall Tu Unsuccess situ Vane S	sful Split Spo ube Sample sful Thin Wa Shear Test,	oon Sample attem II Tube Sample att PP = Pocket Per ne Shear Test atte	SSA = Soli   Dot	Core Sample d Stem Auger low Stem Auge er Cone eight of 140lb. It weight of rods /eight of one p	namme or casi			$T_V = Pc$ $q_p = Ur$ $N$ -unco $Hamme$ $N_{60} = S$	itu Field Vane Shear Strength (psf)  ket Torvane Shear Strength (psf)  confined Compressive Strength (ksf)  rected = Raw field SPT N-value  r Efficiency Factor = Annual Calibration Value  PT N-uncorrected corrected for hammer efficiency  lammer Efficiency Factor/60%)*N-uncorrected  Su(lab) = Lab Vane Shear St  WC = water content, percent  LL = Liquid Limit  PL = Plastic Limit  PI = Plastic Limit  PI = Plasticity Index  G = Grain Size Analysis  C = Consolidation Test	rength (psf)
		Τ 🦳		Sample Information					1		Laboratory
Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	3 3	Gasing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Testing Results/ AASHTO and Unified Clas
0						5	SSA	-0.30		PAVEMENT. 0.30-	
										Brown, damp, gravelly fine to coarse SAND, trace silt. ≘S10	
								-2.40		Olive-brown, damp, SILT, little fine sand, little clay. ≅S11	
- 5 -								-5.00		5.00-	
										Bottom of Exploration at 5.00 feet below ground surface. NO REFUSAL	
- 10 -											
10 -											
								_			
- 15 -											
								_			
- 20 -											
	aulca i										

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Page 1 of 1

	Main	e Dep	artment	of Transporta	tion		Proj	ect:	Route	1		Boring No.:	HB-PE	MB-113
		· ·	Soil/Rock Exp US CUSTOM				Loc	atior	n: Pen	ibroke,	Maine	PIN:	177′	74.10
Drille	er:		MaineDOT		Ele	vation	(ft.)					Auger ID/OD:	5" Dia.	
Ope	rator:		Giguere/Giles		Dat	tum:			NA	VD88		Sampler:	Off Flights	
Logo	ged By:		B. Wilder		Rig	Type:			CM	E 45C		Hammer Wt./Fall:	N/A	
	Start/F	inish:	5/17/10-5/17/	10	+	lling M		d:		d Stem	Auger	Core Barrel:	N/A	
	ng Loca		114+00, 7.5 R			sing ID			N/A			Water Level*:	None Observed	i
		iciency Fa			_	mmer '			Autom		Hydraulic □	Rope & Cathead □		
Definit D = SI MD = U = TI MU = V = In:	tions: olit Spoon Unsuccess nin Wall Tu Unsuccess situ Vane S	Sample sful Split Spo ube Sample sful Thin Wall Shear Test,	on Sample attem Tube Sample att PP = Pocket Per ne Shear Test atte	RC = Rollicempt   WOH = with the trometer   WOR/C = work   WO1P = WO1P = WO1P = WO1P = WO1P   WO1P = WO1P   WO1P	Core Sar lid Stem A ollow Sten er Cone eight of 1 weight of	mple Auger n Auger 40lb. ha of rods or	mmer casin			$T_V = Po$ $q_p = Un$ $N$ -uncon $Hamme$ $N_{60} = S$	situ Field Vane Shear Strength (p cket Torvane Shear Strength (ps confined Compressive Strength rected = Raw field SPT N-value r Efficiency Factor = Annual Cali SPT N-uncorrected corrected for I Hammer Efficiency Factor/60%)*	sf)		Strength (psf) t
				Sample Information			Т			-				Laboratory
Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N <sub>60</sub>	Casing	Blows	Elevation (ft.)			Description and Remarks		Testing Results/ AASHTO and Unified Clas
0	S12		0.25 - 2.10				S	SA	-0.25		PAVEMENT.		0.25	G#237500
											Brown, damp, gravelly fi	ne to coarse SAND, trace silt.		A-1-b, SM WC=4.9%
	S13		2.10 - 5.00						-2.10	08 80	Light brown, moist, silty	fine to coarse SAND, litle grave	2.10 el.	G#237526 A-2-4, SM WC=1.0%
							<u> </u>	,			C			WC-1.0%
- 5 -								<u> </u>	-5.00			tion at 5.00 feet below ground	surface.	_
											NO REFUSAL			
							_							
10 -							-							
							H							
- 15 -							$\vdash$							
							+							
- 20 -									-					
							$\perp$							
25 _														

Remarks:

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Page 1 of 1

- 10	I	Main	e Dep	artment	of Transporta	tion		Proje	ect:	Route	1	Boring No.: HB-PEM	B-114
Operator:   Gigarca Gains   Off Filiphis								Loca	tion	ı: Pem	broke, l	PIN: 17774.	.10
Operation:   Gigard System   Sample   Off Highs	Drille	r:		MaineDOT		Elevat	ion	(ft.)				Auger ID/OD: 5" Dia.	
Date SarVirsiants: \$1710-1517/10   Drilling Methods: Said Soon Auger   Core Barriet: N.A    Name of Core Control   N.A   Water Level': N.A   Water Level': N.A    Name of Core Control   N.A   Water Level': N.A   Water Level': N.A    Name of Core C	Oper	ator:		Giguere/Giles		Datum	1:			NA'	VD88	Sampler: Off Flights	
Bering Location: 130-103, 10 PK.   Casing DiOD: N.A.   Water Level*: Note Obsarved Hammer Efficiency Factors:	Logg	ed By:		B. Wilder		Rig Ty	pe:			CM	E 45C	Hammer Wt./Fall: N/A	
Hammer Type:  Reput & Cathod T			nish:	5/17/10-5/17/	10	Drilling	g Me	etho	d:	Soli	d Stem	Auger Core Barrel: N/A	
Section   Sect	Borin	g Loca	tion:	120+00, 8.0 R	t.	+	_						
Definitions of the property of the control of the property of the property of the control of the property of the property of the control of the property of t	Hamr	ner Effi	ciency F	actor:		Hamm	er T	ype:		Autom	atic 🗆	Hydraulic ☐ Rope & Cathead ☐	
Company   Comp	D = Sp MD = U U = Th MU = U V = Ins	lit Spoon S Jnsuccess in Wall Tu Jnsuccess itu Vane S	sful Split Spo be Sample sful Thin Wa Shear Test,	Il Tube Sample att PP = Pocket Per ne Shear Test atte	SSA = Sol	id Stem Aug llow Stem Au er Cone eight of 140lb weight of rod	Auto Sample Mayor Hammer Type: Auto Sample Mayor Hammer Type: Auto Sample Mayor Hammer			$T_V = Poole q_p = Uncorr Hammer N_{60} = SI$	ket Torvane Shear Strength (psf)  onfined Compressive Strength (ksf)  ected = Raw field SPT N-value  Efficiency Factor = Annual Calibration Value  'T N-uncorrected corrected for hammer efficiency  G = Grain Size Analysis	ngth (psf)	
25 Search	ł							<u> </u>			┨		
Brown, damp, gravelly fine to course SAND, trace sitt, occasional cobbles. s812  Bottom of Exploration at 3.40 feet below ground surface.  3.40  Bettom of Exploration at 3.40 feet below ground surface.  10  10  20  20		Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	09 <sub>N</sub>	Casing	Blows		_	Visual Description and Remarks Un	Results/ AASHTO and
Bottom of Exploration at 3.40 feet below ground surface.  3.40  REFUSAL  10  20  25	۱							SS	Α	-0.25		0.25	
Bottom of Exploration at 3.40 feet below ground surface.  REFUSAL  10  20  25	-												
10										-3.40		Bottom of Exploration at 3.40 feet below ground surface.	
20	- 5											KLI USAL	
20	-												
20													
20	-												
20	10												
20	-												
20	-					+							
20	15												
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	ł												
25 Remarks:	20												
25 Remarks:													
25 Remarks:													
25	-												
	25 <b>Re</b> ma	arks:		1									

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I	Main	e Dep	artment	of Transporta	tion		Proj	ect:	Route	1	Boring No.: HB-PE	MB-115
			Soil/Rock Exp JS CUSTOM				Loc	atior	n: Pem	broke,	PIN: <u>177</u>	74.10
Drille	r:		MaineDOT		Elev	ation	(ft.)				Auger ID/OD: 5" Dia.	
Oper	ator:		Giguere/Giles		Datu	ım:			NA'	VD88	Sampler: Off Flights	
Logg	ed By:		B. Wilder		Rig	Type:			CM	E 45C	Hammer Wt./Fall: N/A	
	Start/Fi	inish:	5/17/10-5/17/	10	+ ·	ing M		d:		d Stem		
	ng Loca		129+00, 8.0 R		_	ing ID			N/A		Water Level*: None Observed	i
		iciency Fa				mer -			Autom		Hydraulic ☐ Rope & Cathead ☐	
Definiti D = Sp MD = U U = Th MU = U V = Ins	ons: dit Spoon s Jnsuccess in Wall Tu Jnsuccess situ Vane S	Sample sful Split Spo lbe Sample sful Thin Wall Shear Test,	on Sample attem Tube Sample att PP = Pocket Per e Shear Test atte	RC = Roll   WOH = w   work = w	Core Samplid Stem And Illow Stem er Cone eight of 14 weight of 1	uger Auger Auger 10lb. ha rods or	mmer			$T_V = Po$ $q_p = Un$ N-uncor Hamme $N_{60} = S$	tu Field Vane Shear Strength (psf)  ket Torvane Shear Strength (psf)  ket Torvane Shear Strength (psf)  wC = water content, percen  onfined Compressive Strength (ksf)  ected = Raw field SPT N-value  Efficiency Factor = Annual Calibration Value  PT N-uncorrected corrected for hammer efficiency  ammer Efficiency Factor/60%)*N-uncorrected  C = Consolidation Test	Strength (psf) t
H				Sample Information			_			┨		Laboratory
Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N <sub>60</sub>	Casing	Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Testing Results/ AASHTO and Unified Clas
0							SS	SA	-0.25		PAVEMENT. 0.25	
											Brown, damp, gravelly fine to coarse SAND, trace silt. ≅S12	
	S14		2.10 - 5.00						-2.10		Olive-brown, damp, SILT, little fine sand, little clay.	G#237527 A-6, CL WC=22.3%
								/				LL=35 PL=20
- 5 -								<u>/</u>	-5.00		Bottom of Exploration at 5.00 feet below ground surface.  NO REFUSAL	PI=15
											NO REFUSAL	
									-			
- 10 -												
- 15 -												
- 20 -												
					_							
25 Bom:			<u> </u>									L

Remarks:

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Test Pit Log US CUSTOMARY UNITS  Contractor: N/A	М	oino l	Donortr	nont of Trans	nort	otior		Bustanta Busta		Test Pit No.:	T	P-1
Contraction: NA   Regularizations   Na   Regularizations   Na   Regularization   Na   Regularizations   Na   Reg	171	aine	Departi		port	ativi	l	Project: Route 1				
Operator: N/A   Sampling Method: C. Towarding   Data mr. NAVID NS			<u>US C</u>					Location: Pemb	roke, Maine	PIN:	177	74.10
Total Depth (17)	Contrac	ctor:	N/A			Eq	uipme	ent Type:	N/A	Elevation (ft.)		
Date Start/Finish: 4-05-2010   Value / Deptitive   D	Operato	or:	N/A			Sa	mplin	g Method:	C. Forzetting	Datum:	NAVD 88	
December   Solve   S	Logged	Ву:	C. Fo	rzetting		Te	st Pit	Dimensions (ft):	Unknown			
Definition:  I comp Sample Information  Visual Description and Remarks  Laboratory Testing Results' AASHTO  AASHTO  Sample Information  NO REFUSAL  NO REFUSAL  Sample Information  Test Pit at 2.0 feet below ground surface.	Date St	art/Finis	<b>h:</b> 4/26/2	2010					2.0			
a - Circa Assignor  Vir - Thirt Mark Tour George  Sample Information  Information  Sample Information  Informati			50+70	0, 14.0 Lt.				evel* (ft):	None Observed	Definition		
Company   Comp	S = Grab : V = Insitu	Sample Vane Shea				S <sub>u</sub> T <sub>v</sub> :	= Insitu = Pocke	fined Compressive Stre	nath (ksf)	WC = water content, percent LL = Liquid Limit PL = Plastic Limit PI = Plasticity Index		
Testing   Pesulist				mple Information								Laboratory
S3	Depth (ft.)	Sample No.	Sample Depth (ft.)	Shear Strength (psf)	Elevation (ft.)	Graphic Log			Visual Desc	cription and Remarks		Testing Results/ AASHTO and
Bottom of Test Pit at 2.0 feet below ground surface.  NO REFUSAL  NO REFUSAL  NO REFUSAL  15  15  20  20  25	0	S3			-0.17	0000	Sand	ly Surface.			0.2	C#229240
Bottom of Test Pit at 2.0 feet below ground surface.  NO REFUSAL  NO REFUSAL  NO REFUSAL  15  15  20  20  25					1	8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	Grav	elly Material.				A-1-a, SW
- 10 - 15 - 20 - 20 - 25					-2.00	-00	NO I	DEELICAL	Bottom of Test Pit at	2.0 feet below ground surface.	2.0	
- 10					1		NO	REFUSAL				
- 10					1							
	- 5 -				-							
					1							
					1							
	- 10 -				_							
					1							
					-							
	- 15 -											
	15											
					1							
					1							
	20											
	20											
					1							
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		( <u>s:</u>		<u> </u>								<u> </u>

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Page 1 of 1

Location: Pembroke, Maine   PIN: 17774.10	M	[aine]	 Departi	nent of Trans	port	ation	l	Project: Route 1		Test Pit No.:	T	P-2
Contractor: NA			_	Test Pit Log	1				oke, Maine	PIN:	177	74 10
Coperation: N/A	0 1	-4		DSTOWART UNITS		T ==			31/4			, 0
Legady   C   Forestring						_					NAVD 99	
Date   Service   10	<u> </u>			rzetting		_				Datum:	NAVD 66	
Secondary   Seco						_						
Continue												
Control   Cont	S = Grab V = Insitu	Sample Vane Shea				Def S <sub>u</sub> : T <sub>V</sub> :	nitions: Insitu Pocke	Field Vane Shear Strengt t Torvane Shear Strengt fined Compressive Stren	th (psf) n (psf) noth (ksf)	WC = water content, percent LL = Liquid Limit PL = Plastic Limit PI = Plasticity Index		
S   S   S   S   S   S   S   S   S   S				mple Information								Laboratory
S2	Depth (ft.)	Sample No.	Sample Depth (ft.)	Shear Strength (psf)	Elevation (ft.)	Graphic Log			Visual Desc	pription and Remarks		Testing Results/ AASHTO
S1	0	S2			-0.17	00000	Sand	ly Surface.			0.2	C#229249
SI						8000	Grav	elly Material.			0.2	A-1-a, SW-SI
S1					-2.00	888					2.0	
10		S1					Tan	colored Clay at base	Bottom of Test Pit at a of test pit.	2.0 feet below ground surface.		A-4, CL-ML
- 10 - 15 - 20 - 25							NO I	REFUSAL				WC=24.2%
- 10 - 15 - 20 - 25					1							
20	- 5 -				1							
20					-							
20												
20												
20					1							
20												
	- 10 -											
					1							
	- 15 -											
	13											
					1							
					1							
	20				1							
					1							
					-							
					1							
		(e. 										<u> </u>

Stratification lines represent approximate boundaries between soil types; transitions may be gradual.

otratification lines represent approximate boundaries between soil types, transitions may be gradual.

\* Water level readings have been made at times and under conditions stated. Groundwater fluctuations may occur due to conditions other than those present at the time measurements were made.

Page 1 of 1

M	[aine]	 Departi	nent of Trans	port	ation	1	Project: Route 1		Test Pit No.:	T	P-3
		_	Test Pit Log	I a a a			Location: Pemb		PIN:	177	74.10
			JSTOMARY UNITS				ļ				74.10
Contra		N/A			-		ent Type:	N/A	Elevation (ft.)	NAME 00	
Operat		N/A			-		g Method:	C. Forzetting	Datum:	NAVD 88	
Logged	а ву: tart/Finis		rzetting				Dimensions (ft):	Unknown 2.0			
Location			0, 14.0 Lt.				pth (ft): evel* (ft):	See Remarks			
Definition S = Grab	s:	84+00	υ, 14.0 Ει.		Def	nitions:			Definitions: WC = water content, percent		
V = Insitu	Vane Shea				an :	<ul><li>Uncon</li></ul>	Field Vane Shear Streng t Torvane Shear Streng fined Compressive Stre ab Vane Shear Strength	nath (ksf)	LL = Liquid Limit PL = Plastic Limit PI = Plasticity Index G = Grain Size Analysis		
			mple Information								Laboratory
Depth (ft.)	Sample No.	Sample Depth (ft.)	Shear Strength (psf)	Elevation (ft.)	Graphic Log			Visual Des	cription and Remarks		Testing Results/ AASHTO and Unified Class
0	S6			-0.17	0 0 0	Sand	ly Surface.			0.2	G#229211
				1	8 % % % % % % % % % % % % % % % % % % %	GRA	VEL.			0.2-	A-1-a, SW-SI
	S5			-2.00	888			Rottom of Test Pit at	t 2.0 feet below ground surface.	2.0	G#236210
	- 55			1			brown-grey clay at REFUSAL	base of test pit.	c 210 rece below ground surrace		A-2-4, SC-SN WC=20.1%
				1							
- 5				1							
				1							
- 10				1							
				1							
				1							
- 15											
				1							
				1							
				1							
				-							
- 20											
	L										
				1							
				1							
25 Remar	ke.										

Small amount of standing water in ditch.

Stratification lines represent approximate boundaries between soil types; transitions may be gradual.

\*Water level readings have been made at times and under conditions stated. Groundwater fluctuations may occur due to conditions other than those present at the time measurements were made.

Page 1 of 1

M	[aine]	Departn	nent of Tran	sport	atio	1	Project: Route 1		Test Pit No.:	T	P-4
		-	Test Pit Log	-F			Location: Pemb		PIN:	177	74.10
<u> </u>			JSTOMARY UNITS							1//	/ <del>1</del> .1U
Contra		N/A			-		nt Type:	N/A	Elevation (ft.)	NIANTE OF	
Operat		N/A	44*		_		Method:	C. Forzetting	Datum:	NAVD 88	
Logged Date St	аву: tart/Finis		rzetting		_		Dimensions (ft):	Unknown 2.0	+		
Location			), 14.0 Rt.				oth (ft): vel* (ft):	See Remarks			
Definition: S = Grab V = Insitu	s:	r Test Sample			De S <sub>u</sub> T <sub>V</sub>	finitions: = Insitu F = Pocket = Unconf	Field Vane Shear Stren Torvane Shear Streng ined Compressive Stre b Vane Shear Strength	gth (psf) th (psf) noth (ksf)	Definitions: WC = water content, percent LL = Liquid Limit PL = Plastic Limit PI = Plasticity Index G = Grain Size Analysis		
			mple Information	1	1	ļ					Laborator
Depth (ft.)	Sample No.	Sample Depth (ft.)	Shear Strength (psf)	Elevation (ft.)	Graphic Log			Visual Descri	iption and Remarks		Testing Results/ AASHTO and Unified Clas
0	S4			-0.17	0 0 0	Sand	y Surface.			-0.2	G#238250
					0 00 00 00 00 00 00 00 00 00 00 00 00 0	GRA	VEL.			0.2	A-1-a, SW-S WC=1.4%
				-2.00	38		REFUSAL	Bottom of Test Pit at 2	.0 feet below ground surface.	2.0	WC-1.476
- 5 -				1							
- 10 -											
- 15 -											
- 20 -											
				$\dashv$							
				$\dashv$							
				+							
25 Remarl	ks:					]					<u> </u>
		standing wate	er in ditch								

Stratification lines represent approximate boundaries between soil types; transitions may be gradual.

Ottatilication lines represent approximate boundaries between soil types, transitions may be gradual.

\* Water level readings have been made at times and under conditions stated. Groundwater fluctuations may occur due to conditions other than those present at the time measurements were made.

Page 1 of 1

# State of Maine - Department of Transportation <u>Pavement Core Summary Sheet</u>

Town(s): Dennysville-Pembroke Project Number: 17774.10

						111DC1. 17777.10
Station	Offset	Pavement Depth	Unbound	PC-	Saved	Comments / Date
(Feet)	(Feet)	(Feet)	Pavement	Number	Core	5/17/2010
38+50	CL	0.50		1		
38+50	8.5 Lt.	0.40		2		
62+50	CL	0.35		3		
62+50	8.5 Lt.	0.30		4		
02+30	0.5 Lt.	0.30		4		
	+					
Ę		L				



# SAMPLE INFORMATION

Reference No. Boring No./Sample No. Sample Description Sampled Received

237489 HB-PEMB-101/S1 GEOTECHNICAL (DISTURBED) 5/17/2010 5/19/2010

Sample Type: GEOTECHNICAL Location: ROADWAY Station: 12+50 Offset, ft: 7.0 RT Dbfg, ft: 0.35-2.1

PIN: 017774.00 Town: Dennysville, Pembroke, Whiting Sampler: WILDER, BRUCE H

# TEST RESULTS

Sieve Analysis T 11)	(T 27,
Wash Method	d
Procedure A	\
SIEVE SIZE U.S. [SI]	% Passing
3 in. [75.0 mm]	100.0
1 in. [25.0 mm]	97.7
3/4 in. [19.0 mm]	97.7
½ in. [12.5 mm]	89.5
3/4 in. [9.5 mm]	80.4
1/4 in. [6.3 mm]	71.1
No. 4 [4.75 mm]	64.2
No. 10 [2.00 mm]	49.0
No. 20 [0.850 mm]	35.4
No. 40 [0.425 mm]	25.4
No. 60 [0.250 mm]	19.9
No. 100 [0.150 mm]	15.7
No. 200 [0.075 mm]	12.1

		Direct S	hear (1	Г 236)			Miscelland	eous Tests
	Shear Angle, °							@ 25 blows
	Initial Water Conten	t, %					(18	<u>9), %</u>
	Normal Stress, psi							
	Wet Density, lbs/ft3						Plastic Lim	<u>nit (T 90), %</u>
l	Dry Density, lbs/ft³							
	Specimen Thicknes	s, in					Plasticity Inc	dex (T 90), %
	C	onsolic	lation (	T 216\				
-		DIISOIIC	ומנוטוו (	1 210)			Specific Gravit	y, Corrected to
_	Trimmin	igs, Wate	er Conter	nt, %			20°C	(T 100)
		lusiti a l	Final		Void	%		
		Initial	Final		Ratio	Strain	Loss on Ign	ition (T 267)
						O. a		
	Water Content, %			Pmin		- Ctrum	Loss, %	H2O, %
	Water Content, % Dry Density, lbs/ft³			Pmin Pp		- Curami		

Vane Shear Test on Shelby Tubes (Maine DOT)							
Depth	3	n.	6 In.		Water		
taken in	U. Shear	Remold	U. Shear	Remold	Content,	Description of Material Sampled at the Various Tube Depths	
tube, ft	tons/ft²	tons/ft²	tons/ft²	tons/ft²	%	various rube Deptils	

5.1

Cc/C'c

Comments:

AUTHORIZATION AND DISTRIBUTION

Reported by: FOGG, BRIAN Date Reported: 5/24/2010

Paper Copy: Lab File; Project File; Geotech File

Saturation, %



# SAMPLE INFORMATION

Reference No. Boring No./Sample No. Sample Description Sampled Received

237490 HB-PEMB-101/S2 GEOTECHNICAL (DISTURBED) 5/17/2010 5/19/2010

Sample Type: GEOTECHNICAL Location: ROADWAY Station: 12+50 Offset, ft: 7.0 RT Dbfg, ft: 2.1-5.0

PIN: 017774.00 Town: Dennysville, Pembroke, Whiting Sampler: WILDER, BRUCE H

# TEST RESULTS

Sieve Analysis (T 27, T 11)				
Wash Method	d			
Procedure A	\			
SIEVE SIZE U.S. [SI]	% Passing			
	i assing			
3 in. [75.0 mm]				
1 in. [25.0 mm]				
3/4 in. [19.0 mm]				
½ in. [12.5 mm]	100.0			
3/8 in. [9.5 mm]	99.6			
1/4 in. [6.3 mm]	99.4			
No. 4 [4.75 mm]	99.4			
No. 10 [2.00 mm]	98.9			
No. 20 [0.850 mm]	98.3			
No. 40 [0.425 mm]	97.7			
No. 60 [0.250 mm]	97.3			
No. 100 [0.150 mm]	96.7			
No. 200 [0.075 mm]	95.8			

Direct Shear (T 236)					
Shear Angle, °					
Initial Water Content, %					
Normal Stress, psi					
Wet Density, lbs/ft3					
Dry Density, lbs/ft3					
Specimen Thickness, in					
Consolidation (T 216)					

Trimmings, Water Content, %							
	Initial	Final		Void Ratio	% Strain		
Water Content, %			Pmin				
Dry Density, lbs/ft³			Рр				
Void Ratio			Pmax				
Saturation, %			Cc/C'c				

Miscellane	eous Tests			
Liquid Limit	@ 25 blows			
(T 89	<u>9), %</u>			
4	5			
Plastic Lim	it (T 90), %			
22				
Plasticity Index (T 90), %				
2	23			
Specific Gravity	Specific Gravity, Corrected to			
<u>20°C (</u>	T 100)			
Loss on Ign	Loss on Ignition (T 267)			
Loss, %	<u>H2O, %</u>			
Water Conte	Water Content (T 265), %			
25	25.7			

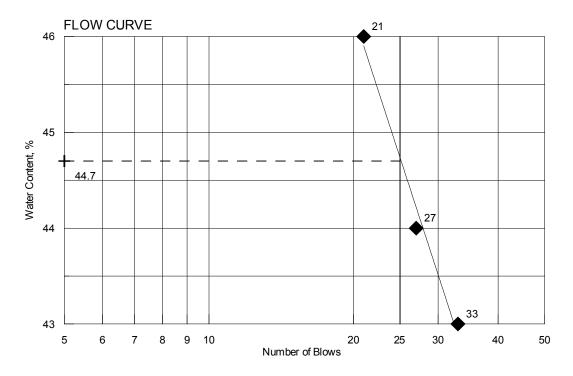
Vane Shear Test on Shelby Tubes (Maine DOT)								
Depth	3 I	n.	6 I	6 In.		December of Metadel Committed at the		
taken in	U. Shear	Remold	U. Shear	Remold	Content,	Description of Material Sampled at the Various Tube Depths		
tube, ft	tons/ft²	tons/ft²	tons/ft²	tons/ft²	%	Various Tube Deptils		

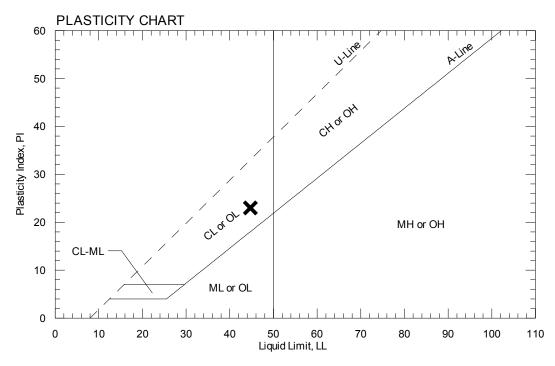
Comments:

AUTHORIZATION AND DISTRIBUTION

Reported by: FOGG, BRIAN Date Reported: 6/3/2010

TOWN	Dennysville,Pembroke,Whiting	Reference No.	237490
PIN	017774.00	Water Content, %	25.7
Sampled	5/17/2010	Plastic Limit	22
Boring No./Sample No.	HB-PEMB-101/S2	Liquid Limit	45
Station	12+50	Plasticity Index	23
Depth	2.1-5.0	Tested By	KDRES







#### INFORMATION SAMPLE

Reference No. Boring No./Sample No. Sample Description Sampled Received 5/17/2010 5/19/2010 237491 **HB-PEMB-103/S3 GEOTECHNICAL (DISTURBED)** 

Sample Type: **GEOTECHNICAL** Location: ROADWAY Station: 30+00 Offset, ft: 8.5 RT Dbfg, ft: 0.3-2.4

PIN: 017774.00 Town: Dennysville, Pembroke, Whiting Sampler: WILDER, BRUCE H

#### RESULTS TEST

Sieve Analysis (T 27, T 11)				
Wash Method	d			
Procedure A	\			
SIEVE SIZE U.S. [SI]	% Passing			
3 in. [75.0 mm]				
1 in. [25.0 mm]				
¾ in. [19.0 mm]	100.0			
½ in. [12.5 mm]	74.9			
3/4 in. [9.5 mm]	60.3			
1/4 in. [6.3 mm]	43.0			
No. 4 [4.75 mm]	35.8			
No. 10 [2.00 mm]	24.2			
No. 20 [0.850 mm]	18.5			
No. 40 [0.425 mm]	15.0			
No. 60 [0.250 mm]	12.8			
No. 100 [0.150 mm]	10.9			
No. 200 [0.075 mm]	8.0			

Direct	Miscellaneous Tests			
Shear Angle, °				Liquid Limit @ 25 blows
Initial Water Content, %				<u>(T 89), %</u>
Normal Stress, psi				
Wet Density, lbs/ft³				Plastic Limit (T 90), %
Dry Density, lbs/ft³				
Specimen Thickness, in				Plasticity Index (T 90), %
Consol	Specific Gravity, Corrected to			
Trimmings, Wa	<u>20°C (T 100)</u>			
Initia	Final	Void	%	

	Initial	Final		Void Ratio	% Strain	
Water Content, %			Pmin			
Dry Density, lbs/ft³			Рр			
Void Ratio			Pmax			
Saturation, %			Cc/C'c			

Loss on Ignition (T 267)				
Loss, %	<u>H2O, %</u>			
Water Content (T 265), %				
3.0				

Vane Shear Test on Shelby Tubes (Maine DOT)								
Depth	3	ln.	6 1	n.	Water Content,	Description of Materia Various Tube		
taken in	U. Shear	Remold	U. Shear	Remold				
tube, ft	tons/ft²	tons/ft²	tons/ft²	tons/ft²	%	various rube		

ription of Material Sampled at the **Various Tube Depths** 

Comments:

AUTHORIZATION A N D DISTRIBUTION

Reported by: FOGG, BRIAN Date Reported: 5/24/2010



#### INFORMATION SAMPLE

Reference No. Boring No./Sample No. Sample Description Sampled Received 5/17/2010 5/19/2010 237492 **HB-PEMB-104/S4 GEOTECHNICAL (DISTURBED)** 

Sample Type: **GEOTECHNICAL** Location: ROADWAY Station: 38+50 Offset, ft: 8.0 **RT** Dbfg, ft: **0.3-4.5** 

PIN: 017774.00 Town: Dennysville, Pembroke, Whiting Sampler: WILDER, BRUCE H

#### TEST RESULTS

Sieve Analysis (T 27,			Miscellane	eous Tests					
T 11)		Shear Angle, °			1				@ 25 blows
Wash Method	d	Initial Water Conten	t, %					(1.89	<u>9), %</u>
Procedure A	\	Normal Stress, psi							
SIEVE SIZE	%	Wet Density, lbs/ft3						Plastic Lim	<u>it (T 90), %</u>
U.S. [SI]	Passing	Dry Density, lbs/ft³							
3 in. [75.0 mm]		Specimen Thickness, in						Plasticity Inc	lex (T 90), %
1 in. [25.0 mm]		Spoomien (1)							
3/4 in. [19.0 mm]	100.0	C	Specific Gravit	v Corrected to					
½ in. [12.5 mm]	94.4	Trimmings Water Content 9/						-	<u>y, Corrected to </u> T 100)
3/8 in. [9.5 mm]	91.1	Trimmings, Water Content, %						2001	<u>1 100,</u>
1/4 in. [6.3 mm]	84.7		Initial	Final		Void	%		··· (T.00=)
No. 4 [4.75 mm]	79.6					Ratio	Strain		ition (T 267)
No. 10 [2.00 mm]	62.8	Water Content, %			Pmin			Loss, %	<u>H2O, %</u>
No. 20 [0.850 mm]	43.7	Dry Density, lbs/ft³			Pp				
No. 40 [0.425 mm]	28.3	Void Ratio			Pmax			Water Conte	nt (T 265), %
No. 60 [0.250 mm]	19.4	Saturation, % Cc/C'c				8	.8		
No. 100 [0.150 mm]	13.4		01	_	. 01			. DOT)	
No. 200 [0.075 mm]	9.2	Va	ine She	ear les	t on Sr	nelby T	ubes (N	laine DOT)	

	(1 69)	<u>), 70</u>							
	Plastic Limit (T 90), %								
	Plasticity Index (T 90), %								
	Specific Gravity, Corrected to								
	20°C (T 100)								
	Loss on Ignition (T 267)								
	Loss, %	<u>H2O, %</u>							
	Water Content (T 265), %								
	8.8								
_									

Vane Shear Test on Shelby Tubes (Maine DOT)								
Depth	3 I	n.	6 ln.		Water			
taken in	U. Shear	Remold	U. Shear	Remold	Content,	Description of Material Sampled at the Various Tube Depths		
tube, ft	tons/ft²	tons/ft²	tons/ft²	tons/ft²	%	various Tube Deptils		

Con	nm	en	ts:

A N D AUTHORIZATION DISTRIBUTION

Reported by: FOGG, BRIAN Date Reported: 6/1/2010



#### INFORMATION SAMPLE

Reference No. Boring No./Sample No. Sample Description Sampled Received 5/17/2010 5/19/2010 237493 **HB-PEMB-105/S5 GEOTECHNICAL (DISTURBED)** 

Sample Type: **GEOTECHNICAL** Offset, ft: 8.0 RT Dbfg, ft: 2.5-5.0 Location: ROADWAY Station: 45+00

PIN: 017774.00 Town: Dennysville, Pembroke, Whiting Sampler: WILDER, BRUCE H

#### TEST RESULTS

Sieve Analysis (T 27,		Г	Miscellaneous Tests					
T 11)		Shear Angle, °						<u>Liquid Limit @ 25 blows</u>
Wash Metho	d	Initial Water Conten	t, %					<u>(T 89), %</u>
Procedure A	4	Normal Stress, psi						
SIEVE SIZE	%	Wet Density, lbs/ft3						Plastic Limit (T 90), %
U.S. [SI]	Passing	Dry Density, lbs/ft³						
3 in. [75.0 mm]		Specimen Thicknes	s. in					Plasticity Index (T 90), %
1 in. [25.0 mm]								
3/4 in. [19.0 mm]	100.0	Consolidation (T 216)						Specific Gravity, Corrected to
½ in. [12.5 mm]	97.6	Trimmings, Water Content, %						20°C (T 100)
% in. [9.5 mm]	96.5	1111111111	gs, wan	or Corner	11, 70		1	== = (: ::=)
1/4 in. [6.3 mm]	95.4		Initial	Final		Void	%	
No. 4 [4.75 mm]	94.9					Ratio	Strain	Loss on Ignition (T 267)
No. 10 [2.00 mm]	93.3	Water Content, %			Pmin			<u>Loss, %</u> <u>H2O, %</u>
No. 20 [0.850 mm]	91.6	Dry Density, lbs/ft <sup>3</sup>			Pp			
No. 40 [0.425 mm]	90.1	Void Ratio			Pmax			Water Content (T 265), %
No. 60 [0.250 mm]	88.4	Saturation, % Cc/C'c				16.4		
No. 100 [0.150 mm]	83.9	\/-	Ob.	<b>T</b>	4 01	II T	la (B	Using DOT)
No. 200 [0.075 mm]	59.4	Va	ine Sne	ear res	t on Sr	neiby i	upes (I	Maine DOT)

Misochanicous rests								
Liquid Limit @ 25 blows								
<u>(T 89), %</u>								
Plastic Limit (T 90), %								
Plasticity Index (T 90), %								
Specific Gravity, Corrected to								
20°C (T 100)								
Loss on Ignition (T 267)								
Loss, % H2O, %								
Water Content (T 265), %								
16.4								

Vane Shear Test on Shelby Tubes (Maine DOT)								
Depth	Depth 3 In.		6 In.		Water			
taken in	U. Shear	Remold	U. Shear	Remold	Content,	Description of Material Sampled at the Various Tube Depths		
tube, ft	tons/ft²	tons/ft²	tons/ft²	tons/ft²	%	various Tube Deptils		

Co	mr	ner	าเร:

A N D AUTHORIZATION DISTRIBUTION

Reported by: FOGG, BRIAN Date Reported: 6/1/2010



# SAMPLE INFORMATION

Reference No. Boring No./Sample No. Sample Description Sampled Received

237494 HB-PEMB-106/S6 GEOTECHNICAL (DISTURBED) 5/17/2010 5/19/2010

Sample Type: GEOTECHNICAL Location: ROADWAY Station: 48+50 Offset, ft: 8.0 RT Dbfg, ft: 2.4-5.0

PIN: 017774.00 Town: Dennysville, Pembroke, Whiting Sampler: WILDER, BRUCE H

lbs/ft3

### TEST RESULTS

Sieve Analysis		
T 11)	Shear Angle	
Wash Metho	d	Initial Water
Procedure A	\	Normal Stres
SIEVE SIZE	_ %	Wet Density
U.S. [SI]	Passing	Dry Density,
3 in. [75.0 mm]		Specimen TI
1 in. [25.0 mm]		оресшиен н
¾ in. [19.0 mm]	100.0	
½ in. [12.5 mm]	98.4	
% in. [9.5 mm]	98.4	
½ in. [6.3 mm]	97.9	
No. 4 [4.75 mm]	97.2	
No. 10 [2.00 mm]	94.7	Water Conte
No. 20 [0.850 mm]	92.0	Dry Density,
No. 40 [0.425 mm]	89.5	Void Ratio
No. 60 [0.250 mm]	86.7	Saturation, %
No. 100 [0.150 mm]	81.9	
No. 200 [0.075 mm]	75.0	

	Miscellaneous Tests					
Shear Angle, °						Liquid Limit @ 25 blows
Initial Water Conten	ıt, %					<u>(T 89), %</u>
Normal Stress, psi						
Wet Density, lbs/ft³						Plastic Limit (T 90), %
Dry Density, lbs/ft³						
Specimen Thicknes	s, in					Plasticity Index (T 90), %
С	Consolidation (T 216)					Specific Gravity, Corrected to
Trimmings, Water Content, %						20°C (T 100)
	Initial	Final		Void	%	
	initiai	rinai		Ratio	Strain	Loss on Ignition (T 267)
Water Content %			Pmin			Loss. % H2O. %

Vane Shear Test on Shelby Tubes (Maine DOT)								
Depth 3 In.		n.	6 In.		Water			
taken in	U. Shear		Content,	Description of Material Sampled at the Various Tube Depths				
tube, ft	tons/ft²	tons/ft²	tons/ft²	tons/ft² tons/ft²		various Tube Deptils		

Water Content (T 265), %

23.4

Pр

Pmax Cc/C'c

Con	nm	en	ts:

AUTHORIZATION AND DISTRIBUTION

Reported by: FOGG, BRIAN Date Reported: 6/1/2010



# SAMPLE INFORMATION

Reference No. Boring No./Sample No. Sample Description Sampled Received

237495 HB-PEMB-107/S7 GEOTECHNICAL (DISTURBED) 5/17/2010 5/19/2010

Sample Type: GEOTECHNICAL Location: ROADWAY Station: 62+50 Offset, ft: 8.0 RT Dbfg, ft: 2.4-5.0

PIN: 017774.00 Town: Dennysville, Pembroke, Whiting Sampler: WILDER, BRUCE H

# TEST RESULTS

Sieve Analysis (T 27, T 11)				
Wash Method	b			
Procedure A	\			
SIEVE SIZE U.S. [SI]	% Passing			
3 in. [75.0 mm]				
1 in. [25.0 mm]	100.0			
3/4 in. [19.0 mm]	98.7			
½ in. [12.5 mm]	94.3			
3/4 in. [9.5 mm]	85.0			
1/4 in. [6.3 mm]	78.7			
No. 4 [4.75 mm]	73.5			
No. 10 [2.00 mm]	61.5			
No. 20 [0.850 mm]	49.5			
No. 40 [0.425 mm]	38.5			
No. 60 [0.250 mm]	30.5			
No. 100 [0.150 mm]	24.2			
No. 200 [0.075 mm]	17.2			

		Direct S	hear (1	Г 236)			Miscelland	eous Tests
	Shear Angle, °							@ 25 blows
	Initial Water Conten	t, %					(18	<u>9), %</u>
	Normal Stress, psi							
	Wet Density, lbs/ft³						Plastic Lim	nit (T 90), %
ı	Dry Density, lbs/ft³							
	Specimen Thicknes	s, in					Plasticity Inc	dex (T 90), %
_	C	oncolic	lation (	T 216\				
4		onsolic	iation (	1 210)			Specific Gravit	y, Corrected to
4	Trimmin	gs, Wate	er Conter	nt, %			20°C	(T 100)
_		1 141 - 1	F!I		Void	%		
1		Initial	Final		Ratio	Strain	Loss on Igr	ition (T 267)
1	Water Content, %			Pmin			Loss, %	<u>H2O, %</u>
1	Dry Density, lbs/ft³			Рр				
1	Void Ratio			Pmax			Water Conte	ent (T 265), %

Vane Shear Test on Shelby Tubes (Maine DOT)								
Depth	3	3 In.		6 In.				
taken in	U. Shear	Remold	U. Shear	Remold	Content,	Description of Material Sampled at the Various Tube Depths		
tube, ft	tons/ft²	tons/ft²	tons/ft²	tons/ft²	%	various Tube Deptils		

2.1

Cc/C'c

Comments:

AUTHORIZATION AND DISTRIBUTION

Reported by: FOGG, BRIAN Date Reported: 5/24/2010

Paper Copy: Lab File; Project File; Geotech File

Saturation, %



#### INFORMATION SAMPLE

Reference No. Boring No./Sample No. Sample Description Sampled Received 5/17/2010 5/19/2010 237496 **HB-PEMB-108/S8 GEOTECHNICAL (DISTURBED)** 

Sample Type: **GEOTECHNICAL** Location: ROADWAY Station: 82+50 Offset, ft: 8.0 RT Dbfg, ft: 0.25-2.3

PIN: 017774.00 Town: Dennysville, Pembroke, Whiting Sampler: WILDER, BRUCE H

#### TEST RESULTS

Sieve Analysis		
T 11)	Shear Angle, °	
Wash Method	d	Initial Water C
Procedure A	\	<b>Normal Stress</b>
SIEVE SIZE	_ %	Wet Density, II
U.S. [SI]	Passing	Dry Density, Ib
3 in. [75.0 mm]		Specimen Thic
1 in. [25.0 mm]	100.0	оресинен и
¾ in. [19.0 mm]	97.6	
½ in. [12.5 mm]	85.7	Tri
% in. [9.5 mm]	77.6	111
1/4 in. [6.3 mm]	68.6	
No. 4 [4.75 mm]	63.3	
No. 10 [2.00 mm]	50.9	Water Content
No. 20 [0.850 mm]	39.5	Dry Density, Ib
No. 40 [0.425 mm]	29.9	Void Ratio
No. 60 [0.250 mm]	23.8	Saturation, %
No. 100 [0.150 mm]	18.3	
No. 200 [0.075 mm]	13.3	

Direct Shear (T 236)						Miscelland	eous Tests
Shear Angle, °							@ 25 blows
Initial Water Conten	t, %					(1.8)	<u>9), %</u>
Normal Stress, psi							
Wet Density, lbs/ft3						Plastic Lim	<u>iit (T 90), %</u>
Dry Density, lbs/ft³							
Specimen Thicknes	s, in					Plasticity Inc	dex (T 90), %
Consolidation (T 216)  Trimmings, Water Content, %					-	y, Corrected to (T 100)	
	Initial	Final		Void Ratio	% Strain	Loss on Ign	ition (T 267)
Water Content, %			Pmin			Loss, %	<u>H2O, %</u>
Dry Density, lbs/ft³			Рр				
Void Ratio			Pmax			Water Conte	ent (T 265), %
Saturation, %			Cc/C'c			5	.4

Vane Shear Test on Shelby Tubes (Maine DOT)								
Depth	th 3 ln. 6 ln. Water							
taken in	U. Shear	Remold	U. Shear	Remold Content,	Content,	Description of Material Sampled at the Various Tube Depths		
tube, ft	tons/ft²	tons/ft²	tons/ft²	tons/ft²	%	various Tube Deptils		

Con	nm	en	ts:

A N D AUTHORIZATION DISTRIBUTION

Reported by: FOGG, BRIAN Date Reported: 5/24/2010



#### INFORMATION SAMPLE

Reference No. Boring No./Sample No. Sample Description Sampled Received 5/17/2010 5/19/2010 237497 **HB-PEMB-108/S9 GEOTECHNICAL (DISTURBED)** 

Sample Type: **GEOTECHNICAL** Location: ROADWAY Station: 82+50 Offset, ft: 8.0 RT Dbfg, ft: 2.3-5.0

PIN: 017774.00 Town: Dennysville, Pembroke, Whiting Sampler: WILDER, BRUCE H

#### RESULTS TEST

Sieve Analysis (T 27,					
T 11)					
b	<b>Initial Water Conte</b>				
\	Normal Stress, psi				
% Passing	Wet Density, lbs/ft3				
1 assing	Dry Density, lbs/ft³				
	Specimen Thickne				
	Trimmi				
100.0					
99.9	Water Content, %				
99.4	Dry Density, lbs/ft³				
98.6	Void Ratio				
97.7	Saturation, %				
96.1					
94.1	V				
	100.0 99.9 99.4 98.6 97.7 96.1				

Direc	Direct Shear (T 236)					
Shear Angle, °					Liquid Limit @ 25 blows	
Initial Water Content, %					<u>(T 89), %</u>	
Normal Stress, psi					47	
Wet Density, lbs/ft3					Plastic Limit (T 90), %	
Dry Density, lbs/ft³					24	
Specimen Thickness, in					Plasticity Index (T 90), %	
Conoc	lidation (	T 246\			23	
Consc	lidation (	1 210)			Specific Gravity, Corrected to	
Trimmings, W	ater Conter	nt, %			20°C (T 100)	
1141			Void	%		
Initi	al Final		Ratio	Strain	Loss on Ignition (T 267)	

Pmin Pр

**Pmax** 

Cc/C'c

Vane Shear Test on Shelby Tubes (Maine DOT)								
Depth 3 In. 6 In. V		Water						
taken in	U. Shear	Remold	U. Shear	Remold	Content,	Description of Material Sampled at the Various Tube Depths		
tube, ft	tons/ft²	tons/ft²	tons/ft²	tons/ft²	%	Various Tube Deptils		

Loss, %

Water Content (T 265), %

23.0

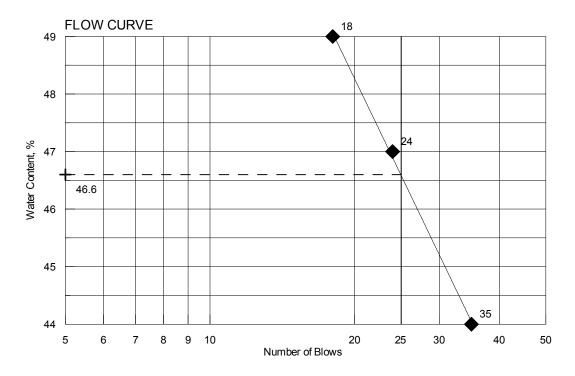
H2O, %

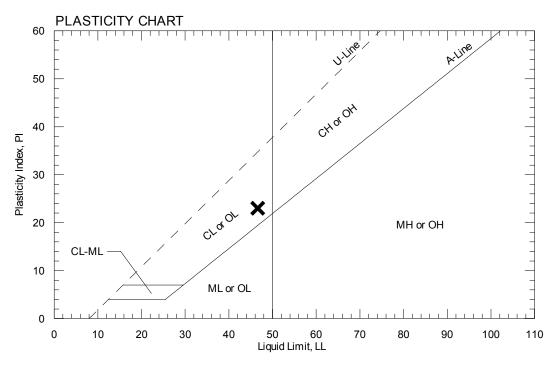
Co	mm	าen	Its:

A N D AUTHORIZATION DISTRIBUTION

Reported by: FOGG, BRIAN Date Reported: 6/3/2010

TOWN	Dennysville,Pembroke,Whiting	Reference No.	237497
PIN	017774.00	Water Content, %	23
Sampled	5/17/2010	Plastic Limit	24
Boring No./Sample No.	HB-PEMB-108/S9	Liquid Limit	47
Station	82+50	Plasticity Index	23
Depth	2.3-5.0	Tested By	KDRES







# SAMPLE INFORMATION

Reference No. Boring No./Sample No. Sample Description Sampled Received

237498 HB-PEMB-111/S10 GEOTECHNICAL (DISTURBED) 5/17/2010 5/19/2010

Sample Type: GEOTECHNICAL Location: ROADWAY Station: 101+00 Offset, ft: 8.0 RT Dbfg, ft: 0.3-2.4

PIN: 017774.00 Town: Dennysville, Pembroke, Whiting Sampler: WILDER, BRUCE H

# TEST RESULTS

Sieve Analysis (T 27, T 11)						
Wash Method	b					
Procedure A	\					
SIEVE SIZE U.S. [SI]	% Passing					
3 in. [75.0 mm]						
1 in. [25.0 mm]	100.0					
3/4 in. [19.0 mm]	97.2					
½ in. [12.5 mm]	85.9					
3/8 in. [9.5 mm]	81.6					
¼ in. [6.3 mm]	72.0					
No. 4 [4.75 mm]	66.3					
No. 10 [2.00 mm]	53.0					
No. 20 [0.850 mm]	40.2					
No. 40 [0.425 mm]	30.9					
No. 60 [0.250 mm]	25.4					
No. 100 [0.150 mm]	20.9					
No. 200 [0.075 mm]	15.4					

Void Ratio

Saturation, %

Direct Shear (T 236)						eous Tests
						@ 25 blows
%					(1.89	<u>9), %</u>
					Plastic Lim	<u>it (T 90), %</u>
in					Plasticity Inc	lex (T 90), %
nsolid	lation (	T 216)			Specific Gravit	v. Corrected to
Trimmings, Water Co		t, %				T 100)
nitial	Final		Void Ratio	% Strain	Loss on Ign	ition (T 267)
		Pmin			Loss, %	<u>H2O, %</u>
		Рр				
1	in solid	in solidation (	in solidation (T 216) , Water Content, %  hitial Final Pmin	in solidation (T 216) , Water Content, % Void Ratio	in solidation (T 216)  , Water Content, % Void Ratio Strain Pmin	Liquid Limit (T 89)  Plastic Lim  Plasticity Ind  Specific Gravit 20°C (  nitial Final Void Ratio Strain  Pmin Loss on Ign Loss, %

Vane Shear Test on Shelby Tubes (Maine DOT)								
Depth	3 1	n.	6 I	ln.	Water Content,			
taken in	U. Shear	Remold	U. Shear	Remold		Content,	mold Content,	Description of Material Sampled at the Various Tube Depths
tube, ft	tons/ft²	tons/ft²	tons/ft²	tons/ft²	%	various Tube Deptils		

Pmax

Cc/C'c

Water Content (T 265), %

5.7

Co	mm	าen	Its:

AUTHORIZATION AND DISTRIBUTION

Reported by: FOGG, BRIAN Date Reported: 6/1/2010



#### INFORMATION SAMPLE

Reference No. Boring No./Sample No. Sample Description Sampled Received 5/17/2010 5/19/2010 237499 HB-PEMB-111/S11 **GEOTECHNICAL (DISTURBED)** 

Sample Type: **GEOTECHNICAL** Location: ROADWAY Station: 101+00 Offset, ft: 8.0 RT Dbfg, ft: 2.4-5.0

PIN: 017774.00 Town: Dennysville, Pembroke, Whiting Sampler: WILDER, BRUCE H

#### RESULTS TEST

Sieve Analysis (T 27, T 11)						
Wash Method	d					
Procedure A	\					
SIEVE SIZE U.S. [SI]	% Passing					
3 in. [75.0 mm]						
1 in. [25.0 mm]						
3/4 in. [19.0 mm]						
½ in. [12.5 mm]						
3/4 in. [9.5 mm]	100.0					
1/4 in. [6.3 mm]	99.9					
No. 4 [4.75 mm]	99.7					
No. 10 [2.00 mm]	99.1					
No. 20 [0.850 mm]	98.1					
No. 40 [0.425 mm]	97.1					
No. 60 [0.250 mm]	96.1					
No. 100 [0.150 mm]	92.7					
No. 200 [0.075 mm]	87.8					

Direc	Direct Shear (T 236)			
Shear Angle, °		Liquid Limit @ 25 blows		
Initial Water Content, %		<u>(T 89), %</u>		
Normal Stress, psi		44		
Wet Density, lbs/ft³		Plastic Limit (T 90), %		
Dry Density, lbs/ft³		21		
Specimen Thickness, in		Plasticity Index (T 90), %		
Conoc	23			
Conso	Specific Gravity, Corrected to			

#### Trimmings, Water Content, % Void % Initial **Final** Ratio **Strain** Water Content, % Pmin Pр Dry Density, Ibs/ft3 Void Ratio Pmax Saturation, % Cc/C'c

Loss on Ign	ition (T 267)			
Loss, %	<u>H2O, %</u>			
Water Content (T 265), %				
20.2				

20°C (T 100)

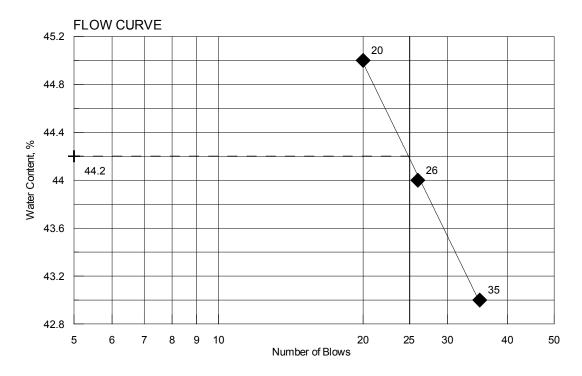
Vane Shear Test on Shelby Tubes (Maine DOT)								
Depth 3 In. 6 In. Water								
taken in	U. Shear	Remold	U. Shear	Remold	Content,	Description of Material Sampled at the Various Tube Depths		
tube, ft	tons/ft²	tons/ft²	tons/ft²	tons/ft²	%	various Tube Deptils		
					•			

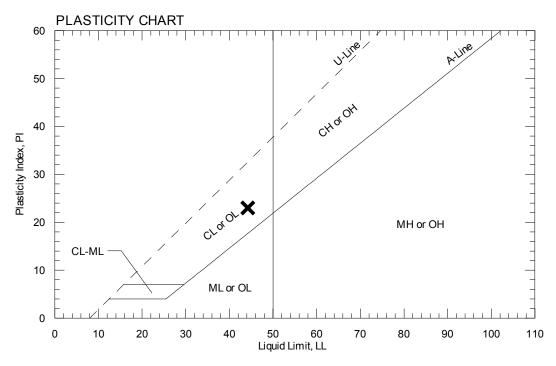
Comment	s:

AUTHORIZATION A N DDISTRIBUTION

Reported by: FOGG, BRIAN Date Reported: 6/3/2010

TOWN	Dennysville,Pembroke,Whiting	Reference No.	237499
PIN	017774.00	Water Content, %	20.2
Sampled	5/17/2010	Plastic Limit	21
Boring No./Sample No.	HB-PEMB-111/S11	Liquid Limit	44
Station	101+00	Plasticity Index	23
Depth	2.4-5.0	Tested By	KDRES







# SAMPLE INFORMATION

Reference No. Boring No./Sample No. Sample Description Sampled Received

237500 HB-PEMB-113/S12 GEOTECHNICAL (DISTURBED) 5/18/2010 5/19/2010

Sample Type: GEOTECHNICAL Location: ROADWAY Station: 114+00 Offset, ft: 7.5 RT Dbfg, ft: 0.25-2.1

PIN: 017774.00 Town: Dennysville, Pembroke, Whiting Sampler: WILDER, BRUCE H

# TEST RESULTS

	Sieve Analysis (T 27,		Direc	t S	hear (1	Γ
T 11)		Shear Angle, °				
Wash Method	b	Initial Water Conten	ıt, %			
Procedure A	\	Normal Stress, psi				
SIEVE SIZE	_ %	Wet Density, lbs/ft3				
U.S. [SI]	Passing	Dry Density, lbs/ft³				
3 in. [75.0 mm]		Specimen Thicknes	s. in			
1 in. [25.0 mm]	100.0		- ,			_
¾ in. [19.0 mm]	93.8	C	onsc	olid	ation (	T
½ in. [12.5 mm]	84.1	Trimmings, Water Conte			r Conter	nt
% in. [9.5 mm]	80.0		193, **	aic	Oonto	ιι,
¼ in. [6.3 mm]	71.0		Initi	al	Final	
No. 4 [4.75 mm]	65.0					
No. 10 [2.00 mm]	51.7	Water Content, %				F
No. 20 [0.850 mm]	40.4	Dry Density, lbs/ft³				F
No. 40 [0.425 mm]	31.1	Void Ratio				F
No. 60 [0.250 mm]	24.3	Saturation, %				C
No. 100 [0.150 mm]	18.7				_	_
No. 200 [0.075 mm]	13.7	Vane Shear Tes				t

Direct Shear (T 236)						Miscellaneous Tests	
Shear Angle, °						Liquid Limit @ 25 blows	
Initial Water Conten	t, %					<u>(T 89), %</u>	
Normal Stress, psi							
Wet Density, lbs/ft3						Plastic Limit (T 90), %	
Dry Density, lbs/ft3							
Specimen Thicknes	Specimen Thickness, in		Plasticity Index (T 90), %				
Consolidation (T 216)  Trimmings, Water Content, %		Specific Gravity, Corrected to 20°C (T 100)					
	Initia	I Final		Void Ratio	% Strain	Loss on Ignition (T 267)	
Water Content, %			Pmin			Loss, % H2O, %	
Dry Density, lbs/ft3			Рр				
Void Ratio			Pmax			Water Content (T 265), %	
Saturation, %			Cc/C'c			4.9	

Vane Shear Test on Shelby Tubes (Maine DOT)									
Depth	3 In.		6 In.		Water				
taken in	U. Shear	Remold	U. Shear	Remold	emold Content, Description of Material Various Tube I	Description of Material Sampled at the			
tube, ft	tons/ft²	tons/ft²	tons/ft²	tons/ft²		various Tube Deptils			

Con	nm	en	ts:

AUTHORIZATION AND DISTRIBUTION

Reported by: FOGG, BRIAN Date Reported: 6/1/2010



# SAMPLE INFORMATION

Reference No. Boring No./Sample No. Sample Description Sampled Received

237526 HB-PEMB-113/S13 GEOTECHNICAL (DISTURBED) 5/18/2010 5/19/2010

Sample Type: GEOTECHNICAL Location: ROADWAY Station: 114+00 Offset, ft: 7.5 RT Dbfg, ft: 2.1-5.0

PIN: 017774.00 Town: Dennysville, Pembroke, Whiting Sampler: WILDER, BRUCE H

# TEST RESULTS

Sieve Analysis (T 27, T 11)				
Wash Method	d			
Procedure A	\			
SIEVE SIZE U.S. [SI]	% Passing			
3 in. [75.0 mm]				
1 in. [25.0 mm]	100.0			
3/4 in. [19.0 mm]	96.3			
½ in. [12.5 mm]	91.3			
3/4 in. [9.5 mm]	87.5			
1/4 in. [6.3 mm]	81.4			
No. 4 [4.75 mm]	77.2			
No. 10 [2.00 mm]	65.4			
No. 20 [0.850 mm]	55.3			
No. 40 [0.425 mm]	47.0			
No. 60 [0.250 mm]	40.5			
No. 100 [0.150 mm]	34.2			
No. 200 [0.075 mm]	26.1			

	Direct S	hear (1	Г 236)			Miscellaneous Tests
Shear Angle, °						Liquid Limit @ 25 blows
Initial Water Conten	t, %					<u>(T 89), %</u>
Normal Stress, psi						
Wet Density, lbs/ft³						Plastic Limit (T 90), %
Dry Density, lbs/ft³						
Specimen Thicknes	s, in					Plasticity Index (T 90), %
С	Consolidation (T 216)					Specific Gravity, Corrected to
Trimmin	igs, Wate	er Conter	nt, %			20°C (T 100)
	Initial	Final		Void Ratio	% Strain	Loss on Ignition (T 267)
Water Content, %			Pmin			Loss, % H2O, %
Dry Density, lbs/ft³			Рр			
Void Ratio			Pmax			Water Content (T 265), %

Vane Shear Test on Shelby Tubes (Maine DOT)									
Depth	3 ln.		6 ln.		Water	Description of Material Sampled at the Various Tube Depths			
taken in		Remold	Content,						
tube, ft	tons/ft²	tons/ft²	tons/ft²	tons/ft²	%	various rube Deptils			

1.0

Cc/C'c

Cor	nn	າer	nts:

WHITING

AUTHORIZATION AND DISTRIBUTION

Reported by: FOGG, BRIAN Date Reported: 6/1/2010

Paper Copy: Lab File; Project File; Geotech File

Saturation, %



# SAMPLE INFORMATION

Reference No. Boring No./Sample No. Sample Description Sampled Received

237527 HB-PEMB-115/S14 GEOTECHNICAL (DISTURBED) 5/17/2010 5/19/2010

Sample Type: GEOTECHNICAL Location: ROADWAY Station: 129+00 Offset, ft: 8.0 RT Dbfg, ft: 2.1-5.0

PIN: 017774.00 Town: Dennysville, Pembroke, Whiting Sampler: WILDER, BRUCE H

# TEST RESULTS

Sieve Analysis (T 27, T 11)				
Wash Method	d			
Procedure A	\			
SIEVE SIZE U.S. [SI]	% Passing			
3 in. [75.0 mm]				
1 in. [25.0 mm]				
3/4 in. [19.0 mm]	100.0			
½ in. [12.5 mm]	98.1			
3/4 in. [9.5 mm]	98.1			
1/4 in. [6.3 mm]	96.7			
No. 4 [4.75 mm]	96.2			
No. 10 [2.00 mm]	93.9			
No. 20 [0.850 mm]	91.4			
No. 40 [0.425 mm]	88.9			
No. 60 [0.250 mm]	86.7			
No. 100 [0.150 mm]	83.6			
No. 200 [0.075 mm]	78.1			

Void Ratio

Saturation, %

	Direct S	hear (1	Г 236)			Miscellane	eous Tests
Shear Angle, °							@ 25 blows
Initial Water Conten	t, %						<u>9), %</u>
Normal Stress, psi						3	<b>35</b>
Wet Density, lbs/ft³						Plastic Lim	it (T 90), %
Dry Density, lbs/ft³						2	20
Specimen Thicknes	s, in					Plasticity Inc	lex (T 90), %
C	oncolic	lation /	T 246\			1	5
C	onsolio	iation (	1 210)			Specific Gravit	y, Corrected to
Trimmin	gs, Wate	er Conter	nt, %			20°C (	T 100)
	lasiti a l	Final		Void	%		
	Initial	Final		Ratio	Strain	Loss on Ign	ition (T 267)
Water Content, %			Pmin			Loss, %	<u>H2O, %</u>
Dry Density, lbs/ft³			Рр				

Vane Shear Test on Shelby Tubes (Maine DOT)								
Depth	3 ln.		6 In.		Water			
taken in tube, ft	U. Shear	Remold	U. Shear	Remold	Content,	Description of Material Sampled at the Various Tube Depths		
	tons/ft²	tons/ft²	tons/ft²	tons/ft²	%			

Pmax

Cc/C'c

Water Content (T 265), %

22.3

Co	mm	าen	Its:

AUTHORIZATION AND DISTRIBUTION

Reported by: FOGG, BRIAN Date Reported: 6/2/2010



# SAMPLE INFORMATION

Reference No. Boring No./Sample No. Sample Description Sampled Received

238249 TP-1/S3 GEOTECHNICAL (DISTURBED) 4/26/2010 4/27/2010

Sample Type: **GEOTECHNICAL** Location: **ROADWAY** Station: **50+70** Offset, ft: **14.0** LT Dbfg, ft: **0.17-2.0** PIN: **017774.00** Town: **Dennysville,Pembroke,Whiting** Sampler: **FORZETTING, CARMEN L** 

# TEST RESULTS

Sieve Analysis (T 27, T 11)				
Wash Method	d			
Procedure A	\			
SIEVE SIZE	%			
U.S. [SI]	Passing			
3 in. [75.0 mm]	100.0			
1 in. [25.0 mm]	88.9			
3/4 in. [19.0 mm]	81.5			
½ in. [12.5 mm]	73.2			
3/4 in. [9.5 mm]	68.8			
1/4 in. [6.3 mm]	63.0			
No. 4 [4.75 mm]	58.4			
No. 10 [2.00 mm]	44.9			
No. 20 [0.850 mm]	29.7			
No. 40 [0.425 mm]	17.3			
No. 60 [0.250 mm]	10.8			
No. 100 [0.150 mm]	7.1			
No. 200 [0.075 mm]	4.7			

Void Ratio

Saturation, %

	irect S	hear (1	T 236)			Miscellane	eous Tests
Shear Angle, °							@ 25 blows
Initial Water Conten	t, %					(18	<u>9), %</u>
Normal Stress, psi							
Wet Density, lbs/ft3						Plastic Lim	<u>iit (T 90), %</u>
Dry Density, lbs/ft³							
Specimen Thicknes	s, in					Plasticity Inc	lex (T 90), %
С	onsolic	dation (	T 216)			Specific Gravit	v. Corrected to
Trimmin	Trimmings, Water C					-	<u>(T 100)</u>
	Initial	Final		Void Ratio	% Strain	Loss on Ign	ition (T 267)
Water Content, %			Pmin			Loss, %	<u>H2O, %</u>
Dry Density, lbs/ft³			Рр				

Vane Shear Test on Shelby Tubes (Maine DOT)								
Depth	3 ln.		6 In.		Water			
taken in	U. Shear	Remold	U. Shear	Remold	Content,	Description of Material Sampled at the Various Tube Depths		
tube, ft	tons/ft²	tons/ft²	tons/ft²	tons/ft²	%			

Pmax

Cc/C'c

Water Content (T 265), %

0.6

Comments:

AUTHORIZATION AND DISTRIBUTION

Reported by: FOGG, BRIAN Date Reported: 5/6/2010



# SAMPLE INFORMATION

Reference No. Boring No./Sample No. Sample Description Sampled Received

238247 TP-2/S1 GEOTECHNICAL (DISTURBED) 4/26/2010 4/27/2010

Sample Type: GEOTECHNICAL Location: ROADWAY Station: 50+70 Offset, ft: 14.0 RT Dbfg, ft: 2.0

PIN: 017774.00 Town: Dennysville, Pembroke, Whiting Sampler: FORZETTING, CARMEN L

# TEST RESULTS

Sieve Analysis	(T 27,	
T 11)	Shear Angle, °	
Wash Method	d	Initial Water C
Procedure A	\	Normal Stress
SIEVE SIZE	_ %	Wet Density, I
U.S. [SI]	Passing	Dry Density, Ib
3 in. [75.0 mm]		Specimen Thi
1 in. [25.0 mm]		оросии от
3/4 in. [19.0 mm]	100.0	
½ in. [12.5 mm]	96.7	Tr
3/₃ in. [9.5 mm]	96.1	11
1/4 in. [6.3 mm]	94.3	
No. 4 [4.75 mm]	93.6	
No. 10 [2.00 mm]	91.7	Water Conten
No. 20 [0.850 mm]	89.4	Dry Density, Ib
No. 40 [0.425 mm]	87.4	Void Ratio
No. 60 [0.250 mm]	86.1	Saturation, %
No. 100 [0.150 mm]	84.0	
No. 200 [0.075 mm]	79.6	

	)irect	Shear (1	Г 236)			Miscellane	eous Tests
Shear Angle, °							@ 25 blows
Initial Water Conten	t, %					(1.8)	<u>9), %</u>
Normal Stress, psi							
Wet Density, lbs/ft3						Plastic Lim	it (T 90), %
Dry Density, lbs/ft³							
Specimen Thicknes	s, in					Plasticity Inc	lex (T 90), %
C	onsoli	dation (	T 216)			Specific Gravit	v. Corrected to
Trimmin	gs, Wat	ter Conter	nt, %				T 100)
	Initial	Final		Void Ratio	% Strain	Loss on Ign	ition (T 267)
Water Content, %			Pmin			Loss, %	<u>H2O, %</u>
Dry Density, lbs/ft³			Рр				
	Shear Angle, ° Initial Water Conten Normal Stress, psi Wet Density, lbs/ft³ Dry Density, lbs/ft³ Specimen Thicknes  Trimmin  Water Content, %	Shear Angle, ° Initial Water Content, % Normal Stress, psi Wet Density, lbs/ft³ Dry Density, lbs/ft³ Specimen Thickness, in  Consoli  Trimmings, Wat  Initial  Water Content, %	Shear Angle, ° Initial Water Content, % Normal Stress, psi Wet Density, lbs/ft³ Dry Density, lbs/ft³ Specimen Thickness, in  Consolidation ( Trimmings, Water Conter  Initial Final Water Content, %	Initial Water Content, % Normal Stress, psi Wet Density, lbs/ft³ Dry Density, lbs/ft³ Specimen Thickness, in  Consolidation (T 216)  Trimmings, Water Content, %  Initial Final Water Content, % Pmin	Shear Angle, ° Initial Water Content, % Normal Stress, psi Wet Density, lbs/ft³ Dry Density, lbs/ft³ Specimen Thickness, in  Consolidation (T 216)  Trimmings, Water Content, %  Initial Final Void Ratio Water Content, %	Shear Angle, ° Initial Water Content, % Normal Stress, psi Wet Density, lbs/ft³ Dry Density, lbs/ft³ Specimen Thickness, in  Consolidation (T 216)  Trimmings, Water Content, %  Initial Final Void Ratio Strain Water Content, %	Shear Angle, ° Initial Water Content, % Normal Stress, psi Wet Density, lbs/ft³ Dry Density, lbs/ft³ Specimen Thickness, in  Consolidation (T 216)  Trimmings, Water Content, %  Initial Final Void % Ratio Strain  Liquid Limit (T 8)  Plastic Lim  Plasticity Inc  Specific Gravit 20°C (1)  Loss on Ign Loss, %

Vane Shear Test on Shelby Tubes (Maine DOT)								
Depth taken in	3 In.		6 ln.		Water			
	U. Shear	Remold	U. Shear	Remold	Content,	Description of Material Sampled at the		
tube, ft	tons/ft²	tons/ft²	s/ft² tons/ft² tons/ft² %	%	Various Tube Depths			

Pmax

Cc/C'c

Water Content (T 265), %

24.2

Comments:

AUTHORIZATION AND DISTRIBUTION

Reported by: FOGG, BRIAN Date Reported: 5/3/2010



# SAMPLE INFORMATION

Reference No. Boring No./Sample No. Sample Description Sampled Received

238248 TP-2/S2 GEOTECHNICAL (DISTURBED) 4/26/2010 4/27/2010

Sample Type: **GEOTECHNICAL** Location: **ROADWAY** Station: **50+70** Offset, ft: **14.0** RT Dbfg, ft: **0.17-2.0** PIN: **017774.00** Town: **Dennysville,Pembroke,Whiting** Sampler: **FORZETTING, CARMEN L** 

# TEST RESULTS

Sieve Analysis (T 27, T 11)					
Wash Method	d				
Procedure A	\				
SIEVE SIZE	%				
U.S. [SI]	Passing				
3 in. [75.0 mm]	91.9				
1 in. [25.0 mm]	80.2				
3/4 in. [19.0 mm]	78.4				
½ in. [12.5 mm]	72.5				
% in. [9.5 mm]	67.7				
1/4 in. [6.3 mm]	61.3				
No. 4 [4.75 mm]	56.6				
No. 10 [2.00 mm]	43.6				
No. 20 [0.850 mm]	29.9				
No. 40 [0.425 mm]	20.0				
No. 60 [0.250 mm]	14.6				
No. 100 [0.150 mm]	11.0				
No. 200 [0.075 mm]	8.2				

_								
		Direct S	hear (	Г 236)			Miscellane	eous Tests
	Shear Angle, °			1				@ 25 blows
	Initial Water Conten	t, %					(1.89	<u>9), %</u>
	Normal Stress, psi							
	Wet Density, lbs/ft³						Plastic Lim	<u>it (T 90), %</u>
	Dry Density, lbs/ft³							
	Specimen Thicknes	s, in					Plasticity Inc	lex (T 90), %
	C	onsolio	dation (	(T 216)			Specific Gravit	y, Corrected to
	Trimmin	gs, Wate	er Conter	nt, %				T 100)
		Initial	Final		Void Ratio	% Strain	Loss on Ign	ition (T 267)
1	Water Content, %			Pmin			Loss, %	<u>H2O, %</u>
1	Dry Density, lbs/ft³			Рр				
	Void Ratio			Pmax			Water Conte	nt (T 265), %
	Saturation, %			Cc/C'c			1	.3

	vane Shear Test on Shelby Tubes (Maine DOT)							
Depth taken in	3 ln.		6 In.		Water			
	U. Shear	Remold	U. Shear	Remold	Content,	Description of Material Sampled at the Various Tube Depths		
tube, ft	tons/ft²	tons/ft²	tons/ft²	tons/ft² %		various Tube Deptils		

Comments:

AUTHORIZATION AND DISTRIBUTION

Reported by: FOGG, BRIAN Date Reported: 5/6/2010



# SAMPLE INFORMATION

Reference No. Boring No./Sample No. Sample Description Sampled Received

238210 TP-3/S5 GEOTECHNICAL (DISTURBED) 4/26/2010 4/27/2010

Sample Type: GEOTECHNICAL Location: ROADWAY Station: 84+60 Offset, ft: 14.0 LT Dbfg, ft: 2.0

PIN: 017774.00 Town: Dennysville, Pembroke, Whiting Sampler: FORZETTING, CARMEN L

# TEST RESULTS

Sieve Analysis	(T 27,	Direct Shear (T 236)				
T 11)		Shear Angle, °				
Wash Method	t	Initial Water Conten	ıt, %			
Procedure A	<b>L</b>	Normal Stress, psi				
SIEVE SIZE	%	Wet Density, lbs/ft3				
U.S. [SI]	Passing	Dry Density, lbs/ft³				
3 in. [75.0 mm]		Specimen Thicknes	s. in			
1 in. [25.0 mm]		оросино и померо	-,			
<sup>3</sup> / <sub>4</sub> in. [19.0 mm] <b>100.0</b>		Consolidation (T 216)				
½ in. [12.5 mm]	92.0	Trimmin	ngs, Water Content, %			
3/4 in. [9.5 mm]	89.4		igs, wat	Ci Conte	111, 70	
1/4 in. [6.3 mm]	84.1		Initial	Final		Void
No. 4 [4.75 mm]	80.8					Ratio
No. 10 [2.00 mm]	70.2	Water Content, %			Pmin	
No. 20 [0.850 mm]	59.2	Dry Density, lbs/ft³			Рр	
No. 40 [0.425 mm]	50.7	Void Ratio			Pmax	
No. 60 [0.250 mm]	45.4	Saturation, %			Cc/C'c	
No. 100 [0.150 mm]	39.8					
No. 200 [0.075 mm]	32.5	Va	ine Sh	ear Tes	t on Sh	nelby

Miscellaneous Tests								
Liquid Limit @ 25 blows								
<u>(T 89), %</u>								
Plastic Limit (T 90), %								
Plasticity Index (T 90), %								
Specific Gravity, Corrected to								
20°C (T 100)								
Loss on Ignition (T 267)								
Loss, % H2O, %								
Water Content (T 265), %								
20.1								

Vane Shear Test on Shelby Tubes (Maine DOT)								
Depth	3 ln.		6 In.		Water	5		
taken in	U. Shear	Remold	U. Shear	hear Remold Conten	Content,	Description of Material Sampled at the Various Tube Depths		
tube, ft	tons/ft²	tons/ft²	tons/ft²	tons/ft²	%	various rube Deptils		

% Strain

Con	ıme	nts:

AUTHORIZATION AND DISTRIBUTION

Reported by: FOGG, BRIAN Date Reported: 5/3/2010



# SAMPLE INFORMATION

Reference No. Boring No./Sample No. Sample Description Sampled Received

238211 TP-3/S6 GEOTECHNICAL (DISTURBED) 4/26/2010 4/27/2010

Sample Type: **GEOTECHNICAL** Location: **ROADWAY** Station: **84+60** Offset, ft: **14.0** LT Dbfg, ft: **0.17-2.0** PIN: **017774.00** Town: **Dennysville,Pembroke,Whiting** Sampler: **FORZETTING, CARMEN L** 

### TEST RESULTS

Sieve Analysis (T 27, T 11)					
Wash Method	b				
Procedure A	\				
SIEVE SIZE	%				
U.S. [SI]	Passing				
3 in. [75.0 mm]	100.0				
1 in. [25.0 mm]	84.7				
3/4 in. [19.0 mm]	77.8				
½ in. [12.5 mm]	69.6				
% in. [9.5 mm]	67.1				
1/4 in. [6.3 mm]	63.3				
No. 4 [4.75 mm]	60.0				
No. 10 [2.00 mm]	49.5				
No. 20 [0.850 mm]	37.1				
No. 40 [0.425 mm]	26.5				
No. 60 [0.250 mm]	20.2				
No. 100 [0.150 mm]	15.7				
No. 200 [0.075 mm]	11.6				

Void Ratio

Saturation, %

		Direct S	Shear (1	Г 236)			Miscellane	eous Tests
	Shear Angle, °			1				@ 25 blows
	Initial Water Conten	t, %					<u>(T 8</u>	<u>9), %</u>
	Normal Stress, psi							
	Wet Density, lbs/ft3						Plastic Lim	it (T 90), %
	Dry Density, lbs/ft³							
_	Specimen Thicknes	s, in					Plasticity Inc	lex (T 90), %
	C	onsoli	dation (	T 216)			Specific Gravit	v Corrected to
_	Trimmin	gs, Wat	er Conter	nt, %				(T 100)
		Initial	Final		Void Ratio	% Strain	Loss on Ign	ition (T 267)
	Water Content, %			Pmin			Loss, %	<u>H2O, %</u>
	Dry Density, lbs/ft³			Рр				

Pmax

Cc/C'c

Vane Shear Test on Shelby Tubes (Maine DOT)								
Depth	3 ln.		6 In.		Water	December of Material Council of the		
taken in	U. Shear	Remold	U. Shear	Remold	Content,	Description of Material Sampled at the Various Tube Depths		
tube, ft	tons/ft²	tons/ft² tons/	tons/ft²	tons/ft²	%			

Water Content (T 265), %

1.6

Comments:

AUTHORIZATION AND DISTRIBUTION

Reported by: FOGG, BRIAN Date Reported: 5/6/2010



#### INFORMATION SAMPLE

Reference No. Boring No./Sample No. Sample Description Sampled Received 4/26/2010 4/27/2010 238250 **TP-4/S4 GEOTECHNICAL (DISTURBED)** 

Sample Type: **GEOTECHNICAL** Location: ROADWAY Station: 84+60 Offset, ft: 14.0 RT Dbfg, ft: 0.17-2.0 PIN: 017774.00 Town: Dennysville, Pembroke, Whiting Sampler: FORZETTING, CARMEN L

#### RESULTS TEST

Sieve Analysis (T 27, T 11)					
Wash Method	d				
Procedure A	\				
SIEVE SIZE	%				
U.S. [SI]	Passing				
3 in. [75.0 mm]	100.0				
1 in. [25.0 mm]	85.6				
3/4 in. [19.0 mm]	81.5				
½ in. [12.5 mm]	75.5				
3/8 in. [9.5 mm]	69.0				
1/4 in. [6.3 mm]	62.3				
No. 4 [4.75 mm]	58.4				
No. 10 [2.00 mm]	45.7				
No. 20 [0.850 mm]	32.1				
No. 40 [0.425 mm]	21.5				
No. 60 [0.250 mm]	15.6				
No. 100 [0.150 mm]	11.6				
No. 200 [0.075 mm]	8.2				

Water Content, %

Dry Density, lbs/ft3

Void Ratio

Saturation, %

Direc	Miscellaneous Tests				
Shear Angle, °					Liquid Limit @ 25 blows
Initial Water Content, %					<u>(T 89), %</u>
Normal Stress, psi					
Wet Density, lbs/ft3					Plastic Limit (T 90), %
Dry Density, lbs/ft3					
Specimen Thickness, in					Plasticity Index (T 90), %
	olidation (				Specific Gravity, Corrected to
Trimmings, W	/ater Conter	ıt, %			<u>20°C (T 100)</u>
Initi	al Final		Void Ratio	% Strain	Loss on Ignition (T 267)

Pmin Pр

Pmax Cc/C'c H2O, %

Water Content (T 265), %

1.4

Loss, %

Vane Shear Test on Shelby Tubes (Maine DOT)								
Depth	3 I	n.	6 In.		Water			
taken in	U. Shear	Remold	U. Shear	Remold	Content,	Description of Material Sampled at the Various Tube Depths		
tube, ft	tons/ft²	tons/ft²	tons/ft²	tons/ft²		various Tube Deptils		

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A N D AUTHORIZATION DISTRIBUTION

Reported by: FOGG, BRIAN Date Reported: 5/6/2010