Maine Department of Transportation Highway Program

GEOTECHNICAL SERIES 100 REPORT

Route 137 Waldo – Belfast, Maine

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Highway Program

Brad Foley, Program Manager

Memorandum

DATE: March 30, 2010

TO: Shawn Smith **DEPT:** Region 2

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

SUBJECT: Final Soils – Belfast-Waldo Route 137, 17716.00

Report # 2010-105

Site Description

A subsurface investigation has been completed for a 6.2 mile portion of Route 137 in the towns of Waldo and Belfast. The project begins at the junction of Route 137 and Route 131 in the town of Waldo and extends 6.2 miles southeast to the junction of Marsh Road in Belfast.

The investigation included the use of a drill rig and falling weight deflectometer (FWD). Stationing for subsurface explorations was recorded using a distance measuring instrument (DMI). A beginning station of 180+00 was used for the intersection of Route 137 and Route 131.

FWD Results

A summary of the FWD results are included as a separate attachment to this memo. Eighty-Six percent of the project was found to be deficient based upon the existing structural number being less than the future traffic structural number. The subgrade resilient modulus values range between 2857 psi and 9886 psi (shallow rock) with an average value of 4689 psi. The 75th percentile is 5073 psi. A very low (< 3000 psi) subgrade resilient modulus value was encountered at stations 369+34 and 436+40 (See FWD Summary Sheet and Performance Data Summary Sheet). The low subgrade resilient modulus is likely due to the presence of moist to wet silty soils. These areas could be very soft especially during the spring months. Depending on the conditions at the time of construction the use of additional base material may be necessary to support traffic once the existing pavement surface has been removed. Construction operations should take this into consideration.

Note: The FWD results provided in this report have been calculated using the existing pavement thickness, base thickness and base quality as determined from boring information and sample data. The purpose of using the existing pavement and base information is to determine the relative strength or weakness of the existing pavement structure over the length of the project. By identifying significant disparities in the pavement structure, individual design/construction options can be considered if these areas extend for considerable distances. This can potentially provide greater design flexibility and reduce costs by eliminating the over design or under design of large portions of a project. See the attached FWD data and Performance Data Summary for potential performance differences.

Boring Information

A total of 14 power augers borings were conducted along the project (See Boring Logs). Boring locations were determined based upon FWD deflection results and visual observations made during an on-site visit. Soils were described and sampled in the field. Samples of the existing base material and subgrade soils were collected and analyzed in the Bangor lab. Testing results are summarized on the attached Laboratory Testing Summary Sheet.

Pavement Conditions

Pavement conditions are fair to good. However, power auger borings encountered an unbound or highly friable "unbound pavement" layer beneath a solid pavement layer. For a complete listing of pavement measurements refer to boring logs or Performance Data Summary included with this memo. A pavement thickness summary follows:

Range of Solid Pavement (SP) Thickness: 3.6" – 4.8" Average Solid Pavement Thickness: 4.2"

Range of Unbound Pavement UP) Thickness: 3.0" – 4.8" Average Unbound Pavement Thickness: 3.8"

Range of Combined (SP+UP) Pavement Thickness: 4.8" – 8.4" Average Combined Pavement Thickness: 7.2"

Note: Pavement thickness estimates are based upon 14 sample locations. Measurements were taken from sides of boring holes. The maximum sample spacing is 3800 feet. Actual pavement thickness may vary.

Existing Base Material

Existing Base Material Type: Gravelly Silty Sand

Percent Passing #200: 24% - 31% Range of Base Material Thickness: 7" - 51" Quality of Drainage (AASHTO): Poor

Permeability: 0.4' - 0.9' per day

The existing base generally consists of gravelly silty sand (granular borrow). Because of the high percentage of fines the quality of drainage is poor. An estimated permeability range of 0.4 - 0.9 feet/day has been calculated based upon grain size distribution data obtained from existing base samples. The poor 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.

Subgrade Soils

The subgrade soils underlying this project consist primarily of moist to wet stony sandy silts (till), and moist to wet clay silts (glacial marine). The till soils are very stony and are generally located along the higher elevation areas. Boulders greater than 2 cubic yards could be encountered. The glacial marine soils are extremely silty and are generally located in lower lying areas.

<u>Sandy Silt (Till):</u> The stony sandy silts along the project are represented by samples S2, S4, and S8. This material has 51% - 68 % passing the # 200 sieve. These soils are classified (AASHTO) as an A-4 soil. These soils are highly frost susceptible. These soils are not well drained and will swell and lose much of their stability unless properly compacted and drained. These soils were found to be wet in the vicinity of stations 271+66 and 287+71.

Clay Silt (Glacial Marine): The clay silt soils (S6, S12, S14) have 71% - 97% fines passing the #200 sieve. These soils are classified (AASHTO) as A-4 and A-7-5 soils. It is anticipated that these soils will be plastic and subject to considerable volume change with changing water content. These soils will lose much of their stability unless properly compacted and 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, 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 into the early summer months. These soils can be very soft in the spring and should be drained early in the construction process. A low subgrade resilient modulus was encountered in the vicinity of station 369+34. 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.

A summary of the anticipated subgrade soils is listed below based upon limited subsurface exploration and FWD deflection data. Actual field conditions may vary.

Table 1. Anticipated Subgrade Soil Conditions

Station	Soil	AASHTO /	Sample	%	Subgrade Modulus	Ave. RM
	Description	Unified		#200	x1000	x1000
180+00 - 230+00	SaSi (Till)	A-4 / ML	S2, S4	51-68	4.2 - 6.4	5.1
230+00 - 258+00	ClSi	A-7-5 / CL-ML	S6	97	3.7 - 4.5	4.0
258+00 - 277+00	SaSi (Till)	A-4 / ML	S 8	59	4.2 - 4.6	4.4
277+00 - 282+00	SaSi (Till)/Rock	A-4 / ML	S8	59	5.0	5.0
282+00 - 287+00	SaSi	A-4 / ML	S8	59	4.8	4.8
287+00 - 300+00	SaSi (Till)/Rock	A-4 / ML	S8	59	4.9 - 9.8	7.2
300+00 - 323+00	ClSi	A-4 / CL-ML	S12	71	3.7 - 4.1	3.9
323+00 - 328+00	SaSi (Till)	A-4 / ML	S 8	59	4.8	4.8
328+00 - 342+00	SaSi (Till)/Rock	A-4 / ML	S8	59	5.3 - 5.9	5.6
342+00 - 351+00	ClSi	A-7-5 / CL-ML	S14	89		
351+00 - 356+00	SaSi (Till)/Rock	A-4 / ML	S8	59	6.2	6.2
356+00 - 436+00	ClSi	A-7-5 / CL-ML	S14	89	2.8 - 4.6	3.9
436+00 - 507+00	SaSi (Till)	A-2-4 / SM	S15, S17	49	3.4 - 5.5	4.5

Bedrock

It is anticipated that bedrock could be encountered at several locations depending on the proposed vertical grade. At the time of the borings and this report no proposed vertical grade information was available.

Table II.
Possible Shallow Bedrock Areas (<6')

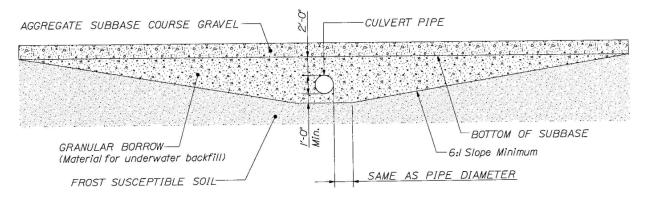
Station	Source of Information
277+00 - 282+00	FWD/Bedrock Outcrops
	Outcrops present left and right between stations 279+00 – 282+00
288+00 - 294+00	FWD/Boring/Bedrock Outcrops
	Outcrops present left and right between stations 289+00 – 292+00.
328+00 - 332+00	FWD/Boring/Possible Bedrock Outcrops
	Possible Outcrops present left and right between stations 328+50 –
	330+00. Some of the exposed rock could be large boulders.
337+50 - 340+00	FWD/ Field Observations
351+00 – 354+00 ?	FWD?/Field Observations ? (< 10')
443+00 - 444+00	FWD?/Possible outcrop on right between stations 443+00 – 444+00
499+50 - 500+50	Possible outcrop on right between stations 499+50 – 500+50

Artificially high subgrade resilient modulus values are common in shallow bedrock areas. Contrary to these high values, the pavement structure in shallow bedrock areas have a propensity to be weak due to several factors including limited base thickness, underlying frost susceptible soils, and moist to wet subgrade conditions. Many times, water becomes trapped along the bedrock surface weakening the overlying soils and pavement structure. It is critical that these possible shallow bedrock areas be well drained. An abundance of water was observed along the right shoulder between stations 288+00 and 294+00.

Depending on the vertical grade, bedrock could be encountered above subgrade within the areas listed above. Because of this, differential heaving could become problematic when entering or exiting shallow bedrock areas. Transition zones should be included in the design if bedrock is anticipated in the vicinity of subgrade. (See transition zone schematic in the Recommendation 7).

Recommendations

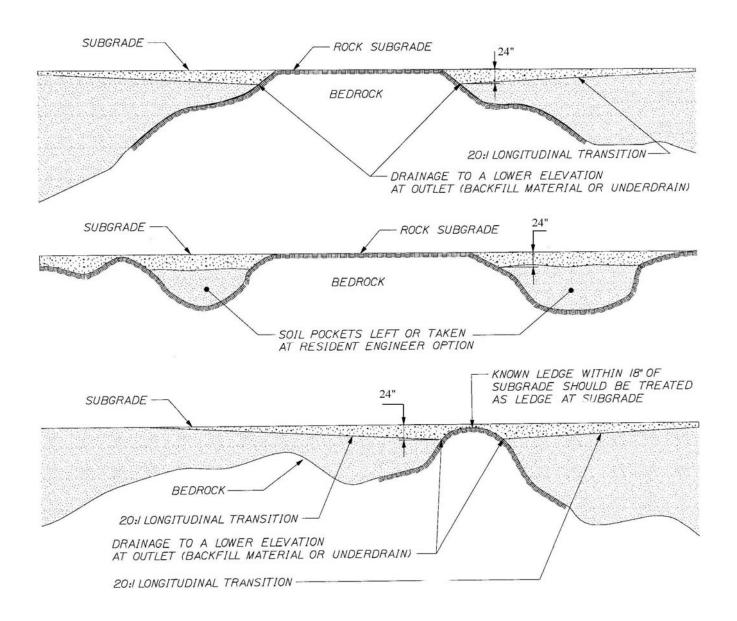
- 1. Due to the presence of moisture sensitive clay silt subgrade soils, poor existing base quality, and varying base thickness, rebasing and/or variable depth gravel placement is recommended throughout the entire length of this project. A minimum of 18 inches of base material (existing and/or new) is recommended within any area being constructed on clay silt soils.
- 2. If new base material is to be placed directly upon the clay silt, a 6 once, non-woven, needle punched separation geotextile could be placed at subgrade to prevent the intermixing of the base layer with the underlying claysilt subgrade layer.
- 3. The moist to wet sandy silts and clay silts 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. The new pavement surface should be placed as soon as possible. The areas of greatest concern are those where clay silt is anticipated to be the subgrade soil type (See Anticipated Subgrade Soil, Table I).
- 4. It is recommended that the entire project area be well drained utilizing deep ditching. Ditches should be constructed with a minimum depth of 3 feet below finished grade when possible. Deep ditching is most critical where clay silt soils are present at subgrade in order to draw down the water table (See Anticipated Subgrade Soil, Table I).
- 5. 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:



6. When till soils are encountered at subgrade, it is recommended that subgrade be scarified a minimum depth of 6 inches to dislodged and remove shallow cobbles that could potentially be pushed into the base member due to frost action. See Table I for a listing of till soil areas.

7. Shallow bedrock is present in several areas. Depending on the elevation of the proposed vertical grade bedrock could be encountered at or above subgrade (See Table II). 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



FROST SUSCEPTIBLE SOIL TO BE UNDERCUT AND REPLACED WITH NON FROST SUSCEPTIBLE MATERIAL

IF A SOIL SECTION BETWEEN LEDGE SUBGRADE IS OF SUCH LENGTH THAT THE TRANSITION FROM EACH EDGE WOULD MEET, IT SHOULD BE TREATED AS AN EARTH POCKET

Belfast – Waldo Route 137 CHIP 17716.00

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. Existing performance expectations for areas with two or more deficiencies are lower and the risk of failure is potentially higher.

Based upon the Performance Data Summary (PDS) sheet, 32% of the project fails to meet 2 or more of the four minimum performance data criteria. Unbound pavement, base quality, subgrade soil conditions, and the lack of drainage are all concerns with respect to future performance expectations.

Belfast – Waldo Route 137 CHIP 17716.00

Station	D E	Per	Mini forma			Bor Loca	_	Ba Mate		_	grade oils
(FWD)	F		Crit	eria		(Plan	View)	AASHTO Class	% #200	AASHTO Class	% #200
						KI	<u> </u>				
Station				– Fail - Met		Base Th	Pave - UP nickness hes)	Soil Type AASHTO Sample #	% 200 Frost Moisture	Soil Type AASHTO Sample #	% 200 Frost Moisture
105 11						С	L				
182+11	1										
189+77	1						2 (GP	GG:G	2.4	GG G:	51
197+69	1						3.6 SP 3.6 UP 28.8	GSiSa A-1-b S1	24 II Moist	GSaSi A-4 S2	51 IV Moist
205+87	1										
211+05	1										
219+07	1						3.6 SP 3.6 UP 19.2	GSiSa A-2-4 S3	31 II Moist	SaSi A-4 S4	68 IV Moist
226+89	2										
234+01	2		<u>~</u>								
242+52	1		(18 inches)) psi)	er		4.2 SP 3.0 UP 21.6	GSiSa A-2-4 S5	28 II Moist	ClSi A-7-5 S6	97 IV Moist
249+00	2	es)	18	00	_ du						
250+49	2	inches)		; (3							
257+00	1	7 ir 7	ane.	ılus	[] - -						
258+67	1	\sim	Thickness	odı	Structural Number						
260+00	2	nes		M	_ ruc						
263+90	2	avement Thickness	Base	Subgrade Modulus (3000 psi)	_ S	4.2 SP 3.0 UP 7.2		GSiSa A-2-4 S7	29 II Moist	SaSi A-4 S8	59 IV Moist
271+66	2	ment		Sub		5.4 SP - 7.8		GSiSa A-2-4 S7	29 II Moist	SaSi A-4 S8	59 IV Wet@2.5'
279+79	2	ave _							2.23200		
282+00	2	P ₂ —									
287+71	1						4.8 SP - 50.4	GSiSa A-2-4 S10	29 II Moist	GSiSa A-2-4 S10	29 Wet@4.0' Ref@4.6'
295+63	0										Bedrock
300+00	1										

* SP = Solid Pavement Layer

* UP = Unbound Pavement Layer

SP+UP = Total Pavement Thickness

^{*} Base Thickness = Red indicates presence of "treated base"

Belfast – Waldo Route 137 CHIP 17716.00

Station	D E	Per	Mini forma	mum ince l		Bor Loca		Ba Mate		Subg So	
(FWD)	F			teria		(Plan		AASHTO Class	% #200	AASHTO Class	% #200
						KI					
Station				– Fail 1 - Met	T	Solid Par Unbound Base Th (incl	Pave - UP nickness hes)	Soil Type AASHTO Sample #	% 200 Frost Moisture	Soil Type AASHTO Sample #	% 200 Frost Moisture
						C	L				
303+50	1							4.2 SP 3.0 UP 34.8	GSiSa A-2-4 S11	28 II Moist	ClSi A-7-5 S12
311+42	1										
316+75	1										
323+51	1										
332+33	0						4.8 SP - 25.2	GSiSa A-2-4 S11	28 II Moist	Bedi Refusal	
340+51	0										
348+43	0										
356+30	1										
363+90	2										
369+34	3						3.6 SP 4.8 UP 27.6	GSiSa A-2-4 S11	28 II Moist	ClSi A-7-5 S14	89 IV Moist
376+73	2						27.0	511	Wioist	511	Wolst
385+39	0		inches)	(3000 psi)			4.2 SP 4.2 UP 27.6	GSiSa A-2-4 S11	28 II Moist	CISi A-7-5 S14	89 IV Moist
390+00	1		- dol	30						~~.	
393+10	1	es)	8 1.								
401+23	0	(4 inches)	Thickness (18	Subgrade Modulus	Structural Number		4.8 SP 3.6 UP 26.4	GSiSa A-2-4 S15	25 II Moist	CISi A-7-5 S14	89 IV Moist
409+10	1		ckn	le N	_ lun_						
420+77	1	ness 	[hij_	rad	- Z -						
428+64	1	ick _		gqr	ura						
430+00	2	LT.	Base	Sı	uct -						
436+40	2	Pavement Thick			Stı		4.2 SP 4.2 UP 33.6	GSiSa A-2-4 S15	25 II Moist	GSiSa A-2-4 S15	25 II Moist
444+53	1	ave 									
452+45	1	<u> </u>									

* SP = Solid Pavement Layer

* UP = Unbound Pavement Layer

SP+UP = Total Pavement Thickness

^{*} Base Thickness = Red indicates presence of "treated base"

Belfast – Waldo Route 137 CHIP 17716.00

D E	Per				Boring Location				
F		Cri	teria		(Plan View)	AASHTO Class	% #200	AASHTO Class	% #200
					KEY				
				T	Unbound Pave - UP Base Thickness (inches)	Soil Type AASHTO Sample #	% 200 Frost Moisture	Soil Type AASHTO Sample #	% 200 Frost Moisture
					CL				
					I				
2						95:2	a -		
2					3.6 SP 4.8 UP 51.6	GSiSa A-2-4 S15	25 II Moist	GSiSa A-2-4 S15	25 II Moist
2									
2									
1		es)			ı				
1		ch							
1	es)	(18 in	00 psi)	er	4.2 SP 4.2 UP 27.6	GSiSa A-1-b S16	26 II Moist	SiSa A-4 S17	49 IV Moist
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	1 1 2 2 2 2 1 1	E Per F	Performa F Performa Crit	Performance I Criteria Red - Fail Green - Met 1	E Performance Data Criteria Red - Fail Green - Met 1	E Performance Data Criteria Coation (Plan View)	Criteria Criteria Location (Plan View) AASHTO Class	Performance Data Criteria Location (Plan View) Material	Company Comp

* SP = Solid Pavement Layer

* UP = Unbound Pavement Layer SP+UP = Total Pavement Thickness

^{*} Base Thickness = Red indicates presence of "treated base"

			1771	6.00				
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)
182+11	6.09	3.71	2.38	-	126,000	5,438	3.6	27
189+77	5.19	3.89	1.3	-	77,869	4,754	3.6	27
197+69	4.77	3.83	0.94	=	60,341	4,943	3.6	27
205+87	5.4	3.83	1.57	=	87,784	4,943	3.6	27
211+05	4.8	3.49	1.31	-	61,550	6,421	3.6	27
219+07	4.19	4.03	0.16	=	164,039	4,286	3.6	17
226+89	3.59	4.18	-0.59	1.34	102,952	3,833	3.6	17
234+01	3.41	3.96	-0.55	1.25	88,756	4,508	3.6	17
242+52	3.11	4.21	-1.1	2.5	56,767	3,750	4.2	18
250+49	3.22	4.13	-0.91	2.07	62,754	3,985	4.2	18
258+67	3.96	3.92	0.04	-	116,968	4,628	4.2	18
263+90	2.36	4.03	-1.67	3.8	108,339	4,280	4.8	11
271+66	2.76	3.79	-1.03	2.34	317,657	5,095	5.4	9
279+79	2.37	3.86	-1.49	3.39	199,723	4,827	5.4	9
287+71	3.09	3.39	-0.3	0.68	147,097	7,016	5.4	13
295+63	4.7	2.99	1.71	-	195,682	9,886	4.2	18

0.82

0.93

79,342

105,128

4.2

4.2

4,906

3,718

18

18

Belfast-Waldo Route 137

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

303+50

311+42

For actual Gravel Depths, see logdraft forms

3.48

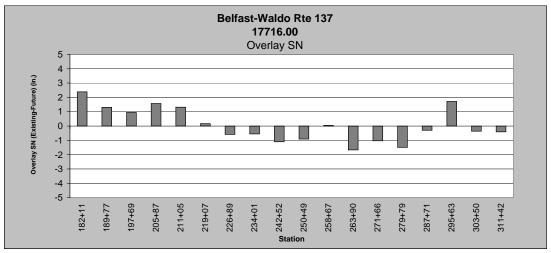
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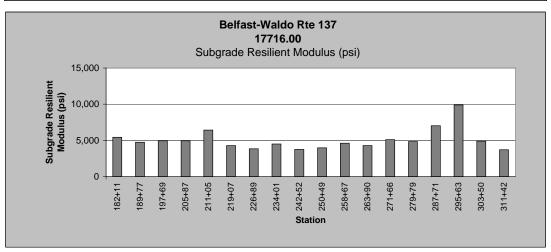
3.84

4.23

-0.36

-0.41



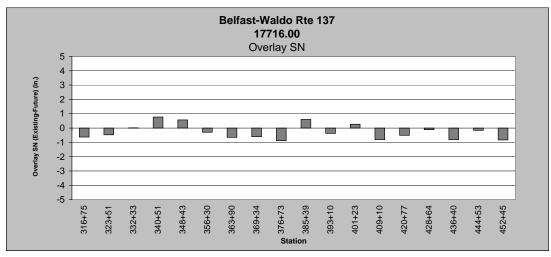


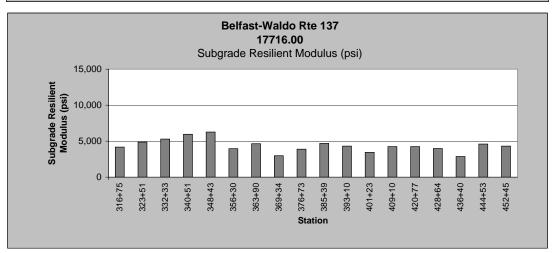
Belfast-Waldo Route 137	
17716.00	

				0.00				
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)
316+75	3.43	4.06	-0.63	1.43	76,259	4,173	4.2	18
323+51	3.37	3.85	-0.48	1.09	71,933	4,874	4.2	18
332+33	3.75	3.74	0.01	-	99,128	5,294	4.2	18
340+51	4.36	3.59	0.77	-	132,329	5,959	3.6	19
348+43	4.09	3.53	0.56	-	109,856	6,259	3.6	19
356+30	3.84	4.14	-0.3	0.68	90,273	3,955	3.6	19
363+90	3.26	3.91	-0.65	1.48	55,508	4,652	3.6	19
369+34	3.94	4.55	-0.61	1.39	98,089	2,969	3.6	19
376+73	3.27	4.16	-0.89	2.02	55,714	3,884	3.6	19
385+39	4.5	3.9	0.6	-	145,553	4,690	4.2	19
393+10	3.65	4.02	-0.37	0.84	77,568	4,318	4.2	19
401+23	4.59	4.33	0.26	-	154,762	3,452	4.8	19
409+10	3.23	4.04	-0.81	1.84	53,723	4,234	4.8	19
420+77	3.71	4.22	-0.51	1.16	81,951	4,244	4.8	19
428+64	4.19	4.31	-0.12	0.27	118,082	3,973	4.8	19
436+40	4	4.81	-0.81	1.84	102,365	2,857	4.2	19
444+53	3.95	4.11	-0.16	0.36	98,470	4,591	4.2	19
452+45	3.37	4.2	-0.83	1.89	61,188	4,307	4.2	19

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

For actual Gravel Depths, see logdraft forms

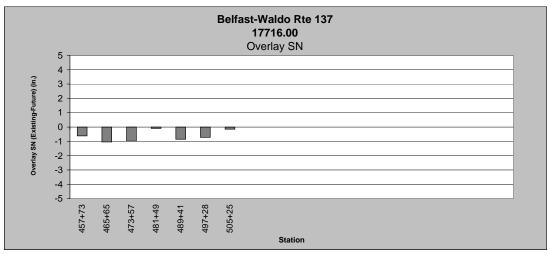


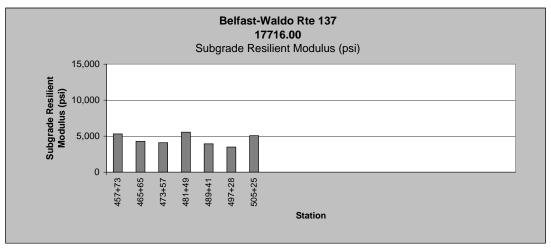


			Belfast-Wald					
Station (Feet)	Existing Structural Number (in.)	Future Traffic Structural Number (in.)	Overlay Structural Number (Existing - Future)	Recommended Pavement Thickness (in.)	Pavement Modulus (psi)	Subgrade Resilient Modulus (psi)	Pavement Depth (in)	Combined Pavement/Gravel Depth Used for Calculation (in)
457+73	3.29	3.91	-0.62	1.41	56,823	5,316	4.2	19
465+65	3.16	4.2	-1.04	2.36	50,477	4,293	4.2	19
473+57	3.28	4.27	-0.99	2.25	56,338	4,085	3.6	19
481+49	3.75	3.85	-0.1	0.23	84,064	5,553	3.6	19
489+41	3.47	4.33	-0.86	1.95	66,616	3,943	3.6	19
497+28	3.79	4.51	-0.72	1.64	87,360	3,480	3.6	19
505+25	3.82	3.97	-0.15	0.34	89,038	5,073	4.2	19

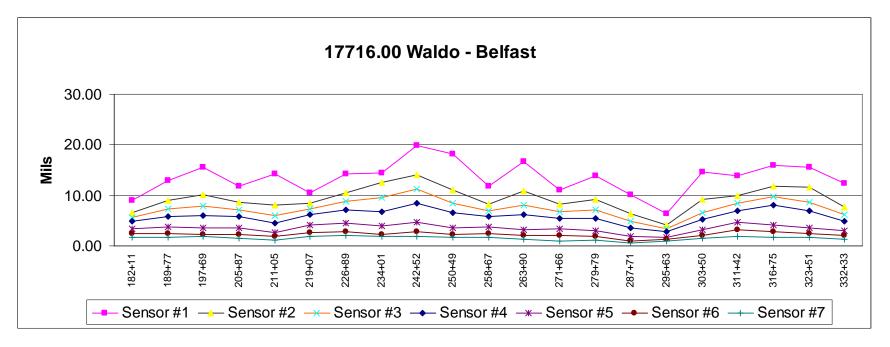
Possible Weak Soils (<3000)
Possible Shallow Bedrock (>8000)

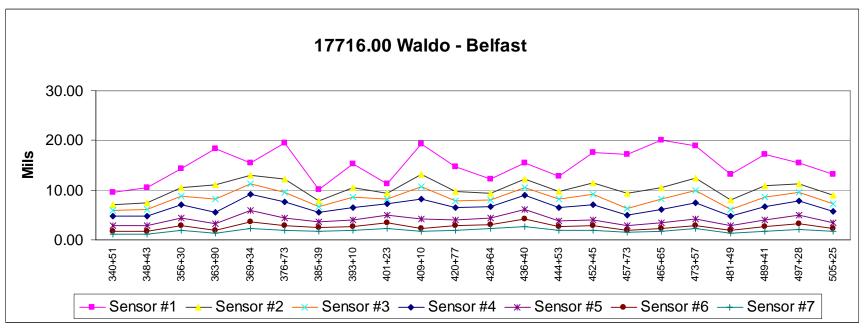
For actual Gravel Depths, see logdraft forms





FWD Deflection Plots





			Ш	xisting	Pavem	ent/Ba	se Con	Existing Pavement/Base Conditions Worksheet	Vorksh	eet		
						Key			SiSaG	Silty Sandy Gravel	sravel	
Town: Waldo - Belfast Route	ast Route 1	137			A-1-a		100%		SiGSa	Silty Gravelly Sand	, Sand	
Pin : 17716.00					A-1-b		85%		GSiSa	Gravelly Si Sand	and	
					A-2-4		20%		SiSa	Silty Sandy		
					A-4		25%		SaSi	Sandy Silt		
											- V Pag 600	1000
Boring Data	ta			Base and	Base and Thickness Calculations	s Calcula	tions				rwo base and Aspnait Calculations	pnait
Power Auger#	FWD Station	Soil Description	Classification	Pave + Base	Base	% Weight	Wt. Base Thickness	Unbound Thickness	Asphalt Thickness	Total Base (WtB+UP)	Asphalt (SP)	Total Thickness
HB-WABE-101	196+00	GSiSa	A-1-b	30	22.8	0.85	19.4	3.6	3.6 SP	23	3.6	26.6
									3.6 UP			
									7.2			
HB-WARE-102	215+00	GSiSa	A-2-4	26.4	19.2	0.5	9 6	3.6	3.6.SP	13.2	3.6	16.8
-	5	5	-	-	1	2	2	5	3.6 UP	1	2	9
									7.2			
HB-WABE-103	239+00	GSiSa	A-2-4	28.8	21.6	0.5	10.8	3.0	4.2 SP	13.8	4.2	18
									3.0 UP			
									7.7			
HB-WABE-104	265+00	GSiSa	A-2-4	14.4	7.2	0.5	3.6	3.0	4.2 SP	9.9	4.8	11.4
									3.0 UP			
									7.2			
HB-WABE-105	273+50	GSiSa	A-2-4	13.2	7.8	0.5	3.9		5.4 SP	3.9	5.4	9.3
HR-WARE-106	291±00	Sicsa	Δ-2-4	30	25.2	7	12.6		4 8 SP	126		126
WAL-100	23.100	, 000000000000000000000000000000000000	t-2-V	3	2.03	2.	0.7		5	0.3		7.7
HB-WABE-107	304+00	GSiSa	A-2-4	30	22.8	0.5	11.4	3.0	4.2 SP	14.4	4.2	18.6
									3.0 UP			
									7.2			
HB-WABE-108	331+00	GSiSa	A-2-4	30	25.2	0.5	12.6		4.8 SP	12.6	4.8	17.4

			Ш	xisting	Pavem	ent/Ba	Existing Pavement/Base Conditions Worksheet	ditions \	Vorksh	eet		
						3			C C			
Town: Waldo - Belfast Route	ast Route 1	137			A-1-a	Vey	100%		SiGSa	Silty Gravelly Sand	Sand	
Pin : 17716.00		3			A-1-b		85%		GSiSa	Gravelly Si S	Sand	
					A-2-4		20%		SiSa	Silty Sandy		
					A-4		25%		SaSi	Sandy Silt		
Boring Data	ta			Base and	Base and Thickness Calculations	s Calcula	tions			EWD	FWD Base and Asphalt	phalt
Power Auger #	FWD	Soil	Classification	Pave +	Base	% Weight	Wt. Base Thickness	Unbound	Asphalt Thickness	Total Base	Asphalt	Total
HR-WARE-109	367±20	Signal Signal	4-2-4	30	216	7 2	10.8	4.8	3 6 SP	156	36	19.2
מין - אמראי-מין	307 120	O O O O O	t-7-V	3	0.14	2.0	0.00	o F	4.8 UP	0.00	5.	7:61
									8.4			
C 4 4 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6	000			6	2	L	0		0.0	ľ		0 07
HB-WABE-110	382+00	GSISa	A-2-4	30	21.6	0.5	10.8	4.2	4.2 SP	15	4.2	19.2
									8.4			
HB-WABE-111	400+00	GSiSa	A-2-4	30	21.6	0.5	10.8	3.6	4.8 SP	14.4	4.8	19.2
									3.6 UP			
									8.4			
HB-WABE-112	436+50	GSiSa	A-2-4	30	21.6	0.5	10.8	4.2	4.2 SP	15	4.2	19.2
									4.2 UP			
									8.4			
HB-WABE-113	474+00	GSiSa	A-2-4	30	21.6	0.5	10.8	4.2	3.6 SP	15.6	3.6	19.2
								!	4.8 UP			
									8.4			
	0.40	Ċ		CC	0	L	0	0.4	ט מ	7		70.0
HB-WABE-114	204+0	GSISA	A-Z-4	_ک	0.12	0.0	2.0.Z	4.2	4.2 SP	CI.	4.2	7.61
									4.2 UP 8.4			

				STATE C	OF MAINE		FILE: SR 137
			INTERI	DEPARTMENT	TAL MEMORAN		COPY: SR 7
					Date of Request: Latest Date Neede	01/12/2010 ed By: 05/01/10	Return: 02/26/10
To:	Ed Hans	<u>scom</u>			Dept.:	MDOT, Burea	au of Planning
From:	Sterling	Paul Paul			Dept.:	Region 2 High	way Program
Subject:	Request	for Traf	fic Information		Project Manager:	Shawn Smith	
TOWN(S):	Belfast-	Waldo_			P.I.N.	017716.00	Consultant Proj
COUNTY:	Waldo				ROUTE:	SR 137	
LOCA					ting pavement, grav		•
DESCRI	PTION:				sh Rd, Belfast, 6.23	3 mi N to SR 131	in Waldo.
		-	Changes or Relocation Attach Sketch)	C	vement needed ns under Comments)	Other Please Descri	be Under Comments
Please Ch Applie							
Prep By	: JG	_	<u>Sec. 1</u>	<u>Sec. 2</u>	Sec. 3	<u>Sec. 4</u>	<u>Sec. 5</u>
Description	n of Section	<u>ns</u>	SR 7 / 137 (Waldo Av.) SE/O Doak Rd., Belfast PROJECT HIGH	SR 137 (Waterville Rd) SE/O SR 131 (Waldo Rd) Waldo PROJECT LOW			
1 Latest AAI	OT (Year)		4880 (2005)	2190 (2008)			
2 Current	2010	AADT	<u>4880</u>	<u>2190</u>			
3 Future	2022	AADT	<u>5470</u>	<u>2450</u>			
4 Future		AADT					
5 DHV - % o	f AADT	_	<u>10%</u>	<u>9%</u>	%	<u></u> %	<u></u>
6 Design Hou	ırly Volum	ie	<u>547</u>	<u>221</u>			
7 % Heavy T	rucks (AAl	DT)	<u>8%</u>	<u>9%</u>	<u>%</u>	%	<u>%</u>
8 % Heavy T	rucks (DH	V)	<u>7%</u>	<u>5%</u>	%	%	<u></u>
9 Direct.Dist.	(DHV)		<u>61%</u>	<u>—</u> <u>61%</u>	<u> </u>	<u> </u>	<u></u>
10 18-KIP Eqt		2.0	<u>282</u>	<u>152</u>			
11 18-KIP Equ	iivalent P 2	2.5	<u>269</u>	<u>145</u>			
Notes or Re	emarks:	18-Kip E	ESALs based on	12 year life			
PLEASE PR	ROVIDE: (1 CULATED, EQUESTS V	PIN NUM AND SEN	MBER, (2) THE C D TO MIKE MOR ILLED ON A FIR	CURRENT & FUTU GAN. (A LOCAT	JRE YEARS FOR W TON MAP IS NO LO E BASIS. PLEASE	NGER NEEDED.	
Comn	nents:						

State of Maine - Department of Transportation <u>Laboratory Testing Summary Sheet</u>

Town(s): Belfast-Waldo Project Number: 17716.00

10111(0).	Bolla						Tallio			
Boring & Sample	Station	Offset	Depth	Reference	G.S.D.C.	W.C.	% Passing	Cla	ssificatio	1
Identification Number	(Feet)	(Feet)	(Feet)	Number	Sheet		200 Sieve	Unified	AASHTO	Frost
HB-WABE-101, S1	196+00	9.5 Rt.	0.6-3.0	236976	1	6.6	23.5	SM	A-1-b	Ш
HB-WABE-101, S2	196+00	9.5 Rt.	3.0-5.0	236977	1	24.4	51.2	ML	A-4	IV
HB-WABE-102, S3	215+00	9.0 Rt.	0.6-2.2	236978	1	10.9	31.3	SM	A-2-4	II
HB-WABE-102, S4	215+00	9.0 Rt.	2.2-5.0	236979	1	15.5	68.3	ML	A-4	IV
HB-WABE-103, S5	239+00	7.6 Lt.	0.6-2.4	236980	1	7.4	27.5	SM	A-2-4	Ш
HB-WABE-103, S6	239+00	7.6 Lt.	2.4-5.0	236981	1	20.9	96.6	CL-ML	A-4	IV
HB-WABE-104, S7	265+00	7.8 Lt.	0.6-1.2	236982	2	7.7	29.0	SM	A-2-4	Ш
HB-WABE-104, S8	265+00	7.8 Lt.	1.2-5.0	236983	2	14.6	58.8	ML	A-4	IV
HB-WABE-105, S9	273+50	2.0 Lt.	5.5-8.9	236984	2	13.8	25.6	SM	A-2-4	Ш
HB-WABE-106, S10	291+00	7.0 Rt.	0.4-4.6	236985	2	9.0	29.2	SM	A-2-4	П
HB-WABE-107, S11	304+00	9.0 Rt.	0.6-3.5	236986	2	10.2	28.3	SM	A-2-4	П
HB-WABE-107, S12	304.+00	9.0 Rt.	3.5-5.0	236987	2	21.6	70.6	CL-ML	A-4	IV
HB-WABE-109, S13	367+20	8.0 Rt.	0.3-0.7	236988	3	6.6	7.5	SW-SM	A-1-b	0
HB-WABE-109, S14		8.0 Rt.	3.0-5.0	236989	3	21.3	88.5	CL-ML	A-4	IV
HB-WABE-111, S15	400+00	8.5 Rt.	0.7-2.9	236990	3	8.3	25.2	SM	A-2-4	Ш
HB-WABE-114, S16	504+00	9.5 Rt.	0.7-3.0	236991	3	6.3	25.9	SM	A-2-4	Ш
HB-WABE-114, S17	504+00	9.5 Rt.	3.0-5.0	236992	3	23.6	48.6	SM	A-4	Ш

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.

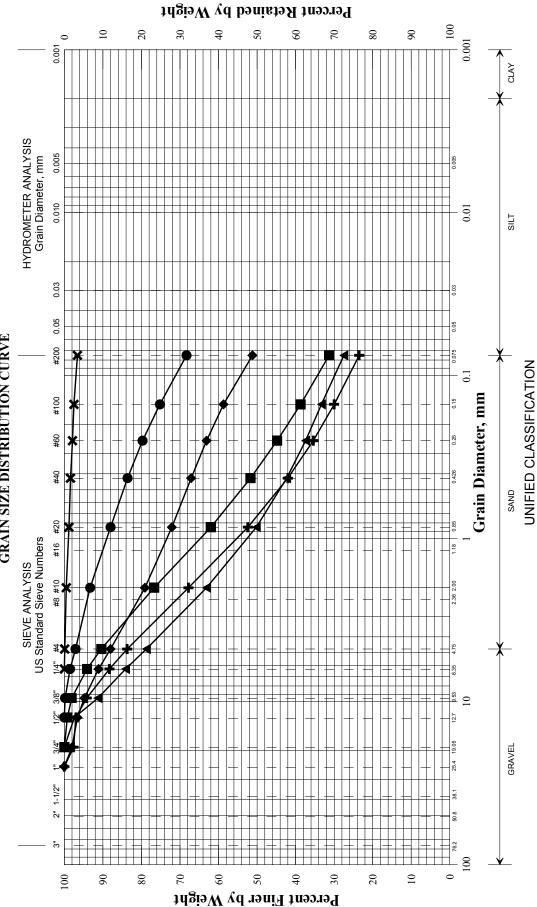
GSDC = Grain Size Distribution Curve as determined by AASHTO T 88-93 (1996) and/or ASTM D 422-63 (Reapproved 1998)

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

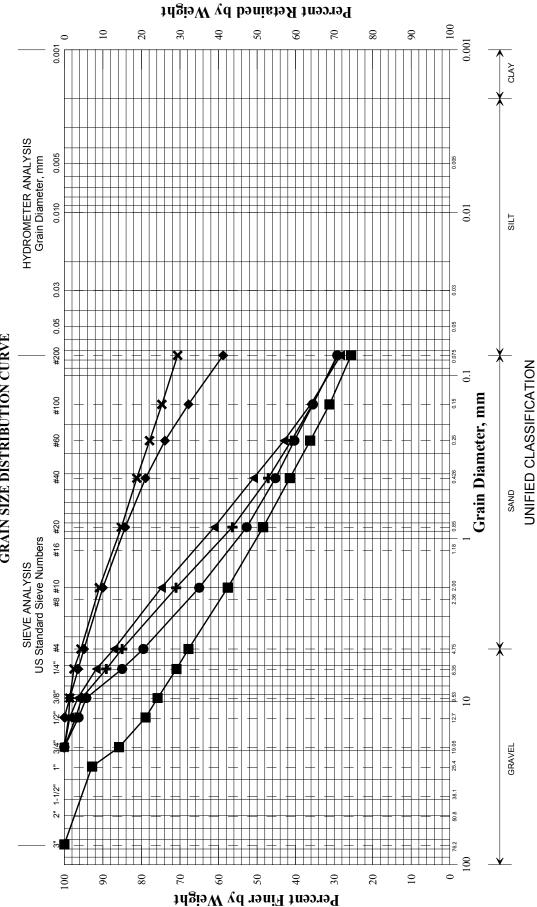




	017716.00		Bolfact Wolde	Deliast, Waldo	Керог	WHITE, TERRY
Ы						
PL						
W, % LL PL	9.9	24.4	10.9	15.5	7.4	20.9
Description	SAND, some silt, little gravel.	Sandy SILT, little gravel.	SAND, some silt, trace gravel.	SILT, some sand, trace gravel.	SAND, some silt, some gravel.	2.4-5.0 SILT, trace sand.
Depth, ft	0.6-3.0	3.0-5.0	0.6-2.2	2.2-5.0	0.6-2.4	2.4-5.0
Offset, ft Depth, ft	9.5 RT	9.5 RT	9.0 RT	9.0 RT	7.6 LT	7.6 LT
Station	196+00	196+00	215+00	215+00	239+00	239+00
Boring/Sample No.	HB-WABE-101/S1	HB-WABE-101/S2	HB-WABE-102/S3	HB-WABE-102/S4	HB-WABE-103/S5	HB-WABE-103/S6
	+	♦		•	•	×

PIN 017716.00	Belfast, Waldo	Reported by/Date	WHITE, TERRY A 3/17/2010
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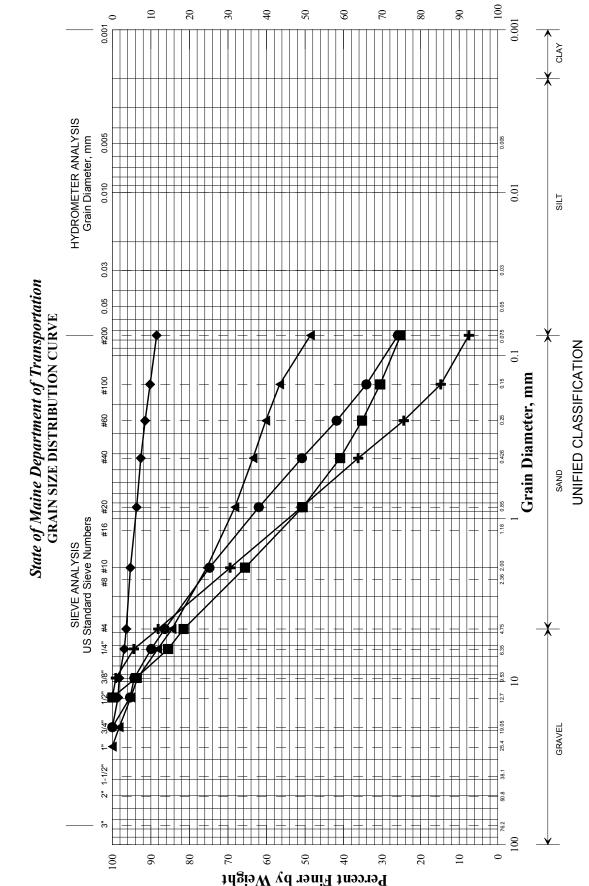
State of Maine Department of Transportation GRAIN SIZE DISTRIBUTION CURVE



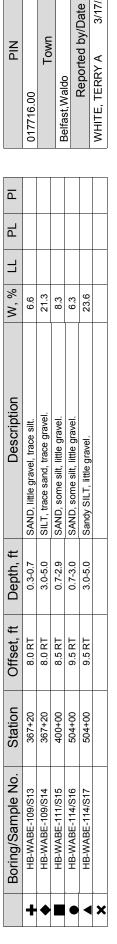
- Id	017716.00		Belfact Wolds	Dellast, Waldo	Kebo	WHITE, TERRY
L L						
77						
W, % LL PL	7.7	14.6	13.8	0.6	10.2	21.6
Description	0.6-1.2 SAND, some silt, little gravel.	1.2-5.0 Sandy SILT, trace gravel.	5.5-8.9 SAND, some gravel, some silt.	SAND, some silt, little gravel.	SAND, some silt, little gravel.	3.5-5.0 SILT, some sand, trace gravel.
Depth, ft	0.6-1.2	1.2-5.0	5.5-8.9	0.4-4.6	0.6-3.5	3.5-5.0
Offset, ft Depth, ft	7.8 LT	7.8 LT	2.0 LT	7.0 RT	9.0 RT	9.0 RT
Station	265+00	265+00	273+50	291+00	304+00	304+00
Boring/Sample No.	HB-WABE-104/S7	HB-WABE-104/S8	HB-WABE-105/S9	HB-WABE-106/S10	HB-WABE-107/S11	HB-WABE-107/S12
	+	•		•	•	×

PIN 017716.00 Town Belfast, Waldo	Reported by/Date	WHITE, TERRY A 3/17/2010
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3/17/2010



Percent Retained by Weight



I	Main	e Depa	artment	of Transporta	tion		Proj	ect:	State 1	Route	137	7	Boring No.:	_HB-WA	ABE-101
		3	Soil/Rock Exp US CUSTOM	loration Log			Loca	atior	1: Belf	ast-Wa	ald	lo, Maine	PIN:	177	16.00
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	nish:	2/4/10-2/4/10		+	ing M		d:		d Stem	A	Auger	Core Barrel:	N/A	
	ng Loca		196+00, 9.5 R	t.	_	ing ID			N/A				Water Level*:	None Observed	1
		ciency Fa			_	mer 1			Automa			Hydraulic □	Rope & Cathead □		
Definiti D = Sp MD = U U = Th MU = U V = Ins	ons: lit Spoon S Jnsuccess in Wall Tu Jnsuccess itu Vane S	Sample Iful Split Spood be Sample Iful Thin Wall Shear Test,	on Sample attem Tube Sample att PP = Pocket Per e Shear Test atte	RC = Rolling RC = Rolling RC Rolling RC RC RC RC RC RC RC R	Core Sam id Stem A llow Stem er Cone eight of 14 weight of	uger Auger Auger 10lb. hai rods or	mmer			$T_V = P_0$ $q_p = U$ N-unco Hamm $N_{60} = 1$	ock nco rred er E SP1	u Field Vane Shear Strength (psf) ket 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	Su(lab) :	= Lab Vane Shear S ater content, perceni uid Limit istic Limit sticity Index in Size Analysis solidation Test	trength (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 ₆₀	Casing	Blows	Elevation (ft.)	Graphic Log		Visual De	scription and Remarks		Testing Results/ AASHTO and Unified Clas
0	S1		0.60 - 3.00				SS	SA	-0.30 -0.60			PAVEMENT.		0.30-	G#236976
ŀ									-0.00	000	Š	Unbound Pavement.		0.60-	A-2-b, SM
											ŝ	Brown, moist, fine to coarse	SAND, some gravel, little		WC=6.6%
	S2		3.00 - 5.00						-3.00			Olive-brown, moist, fine san	dy SILT.	3.00	G#236977
								/							A-4, ML WC=24.4%
- 5								V	-5.00	1111111			n at 5.00 feet below ground	5.00- d surface.	
												NO REFUSAL			
- 10															
10															
15 -															
- 20 -															
25															
25 Bom :			1							1	_				

Offsets are from Existing CL of Roadway.

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

I	Main	e Dep	artment	of Transporta	tion	1	Proj	ect:	State	Route 1	Boring No.: HB-W	ABE-102
			Soil/Rock Exp US CUSTOM				Loc	atior	n: Beli	ast-Wa	ldo, Maine PIN: 177	16.00
Drille	ır.		MaineDOT		Fle	vation	/ft)				Auger ID/OD: 5" Dia.	
Oper			Giguere/Giles		$\overline{}$	tum:	(11.7)		NΔ	VD88	Sampler: Off Flights	
	ed By:		B. Wilder		_	Type				E 45C	Hammer Wt./Fall: N/A	
	Start/Fi	inich:	2/4/10-2/4/10		_	lling N		٠d٠		d Stem		
	ng Loca		2/4/10-2/4/10 215+00, 9.0 R	+	_	sing IC			N/A		Water Level*: None Observe	.d
					+-	mmer						·u
Definiti		iciency Fa	actor.	R = Rock	Core Sar	mple	Type	-	Autom		Hydraulic ☐ Rope & Cathead ☐ itu Field Vane Shear Strength (psf) S _{U(lab)} = Lab Vane Shear cket Torvane Shear Strength (psf) WC = water content, perce	Strength (psf)
MD = U U = Th MU = U V = Ins	in Wall Tu Jnsuccess situ Vane S	sful Split Spo lbe Sample sful Thin Wal Shear Test,	on Sample attemple I Tube Sample att PP = Pocket Per	RC = Rolle rempt WOH = we netrometer WOR/C =	llow Ster er Cone eight of 1 weight o	m Auger 140lb. ha of rods or	casin	g		q _p = Un N-uncor Hamme N ₆₀ = S	confined Compressive Strength (ksf) LL = Liquid Limit rected = Raw field SPT N-value Ffficiency Factor = Annual Calibration Value PT N-uncorrected corrected for hammer efficiency G = Grain Size Analysis	nt
MV = U	Jnsuccess	sful Insitu Va	ne Shear Test atte	Sample Information	Veight of	f one per	rson			N ₆₀ = (Hammer Efficiency Factor/60%)*N-uncorrected C = Consolidation Test	1
Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (pst) or RQD (%)	N-uncorrected	N ₆₀	Casing	Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Clas
0	S3		0.60 - 2.20	_ , , , , ,				SA	-0.30		PAVEMENT.	
	33		0.00 - 2.20				130)A	-0.60		Unbound Pavement.	A 2.4 SM
											Brown, moist, fine to medium SAND, some gravel, little silt.	WC=10.9%
	S4		2.20 - 5.00						-2.20		Light brown, moist, silty, fine to medium SAND, trace gravel.	0.1230777
									ł		Light brown, moist, sitty, fine to medium SAND, trace graver.	A-4, ML WC=15.5%
												1 13.570
								/				
- 5 -							+	<i>V</i>	-5.00		Bottom of Exploration at 5.00 feet below ground surface.)
											NO REFUSAL	
									1			
10												
l									1			
- 15									1			
									1			
20												
									1			
							-		l			
									1			
							-		l			
25		<u>L</u>							L	L		<u>L</u>
Rema	orko:										·	

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

I	Main	e Dep	artment	of Transporta	tion	1	Pro	ject:	State	Route 1	37		Boring No.:	HB-WA	ABE-103
		-	Soil/Rock Exp	loration Log			Loc	atio	n: Bel	fast-Wa	ıldo,	Maine	PIN:	177	16.00
Drille	r.		MaineDOT		Fle	vation	(ft)						Auger ID/OD:	5" Dia.	
Oper			Giguere/Giles		+-	tum:	· (14.)		NΔ	VD88			Sampler:	Off Flights	
	ed By:		B. Wilder		_	Type				E 45C			Hammer Wt./Fall:	N/A	
	Start/Fi	nich	2/4/10-2/4/10		+	lling N		.d.			A 110	TOP.	Core Barrel:	N/A	
	ig Loca			<u> </u>	_	sing IC			N/A	d Stem	Aug	gei	Water Level*:	None Observed	1
			239+00, 7.6 L	ι.	_							Hydraulic □		None Observed	1
Definiti		ciency F	actor.	R = Rock		mmer mple	туре	-	Autom		situ Fi	Field Vane Shear Strength (psf)	Rope & Cathead ☐ Su(lab)	= Lab Vane Shear S	trength (psf)
D = Sp MD = U U = Th MU = U V = Ins	lit Spoon S Jnsuccess in Wall Tu Jnsuccess itu Vane S	iful Split Sp be Sample iful Thin Wa Shear Test,	oon Sample attemp all Tube Sample att PP = Pocket Per ane Shear Test atte	SSA = Sol th HSA = Ho RC = Roll empt WOH = w hetrometer WOR/C = empt W01P = W	lid Stem Illow Ster er Cone eight of 1 weight o	Auger m Auger 140lb. ha of rods or	ammer r casin			$T_V = Po$ $q_p = Ur$ N -unco $Hamme$ $N_{60} = S$	ocket inconfinence rrecte er Effic SPT N	Torvane Shear Strength (psf) ined Compressive Strength (ksf) ed = Raw field SPT N-value ciciency Factor = Annual Calibratic N-uncorrected corrected for hammer Efficiency Factor/60%)*N-un	WC = \(\) LL = Li PL = Pi on Value PI = PI mer efficiency G = Gr	water content, percen quid Limit lastic Limit asticity Index ain Size Analysis nsolidation Test	t
ŀ				Sample Information		ı	_		_	-					Laboratory
Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N ₆₀	Casing	Blows	Elevation (ft.)	Graphic Log		Visual De	scription and Remarks		Testing Results/ AASHTO and Unified Clas
0	S5		0.60 - 2.40				S	SA	-0.35	; <u></u>	P	PAVEMENT.		0.35	G# 22 (200
ŀ							+		-0.60	'l	Ţ	Unbound Pavement.			A-2-4 SM
							╄				В	Brown, moist, gravelly, fine	to coarse SAND, little silt	. 0.60	WC=7.4%
	S6		2.40 - 5.00						-2.40)	6	Olive, moist, fine sandy SILT	Γ trace clay	2.40	G#236981
l											1	onve, moisi, ime sanay one	, trace eray.		A-4, CL-MI WC=20.9%
ŀ							+	١.	-						
. 5							\perp	\checkmark	-5.00		4			5.00	
											١,	Bottom of Exploration NO REFUSAL	at 5.00 feet below groun		
Ì							\dagger		1		IN	NO REPUSAL			
ŀ							+								
ŀ							+								
. 10							\bot								
ı															
ŀ							+								
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j									1						
· 15							+		ł						
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25 I										1					l

Offsets are from Existing CL of Roadway.

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

I	Main	e Dep	artment	of Transporta	tion		Proj	ect:	State	Route 1	37	Boring No.:	HB-WA	ABE-104
		_	Soil/Rock Exp US CUSTOM	loration Log							ldo, Maine	PIN:	177	16.00
Drille	ır.		MaineDOT		Flox	/ation	/ft \					Auger ID/OD:	5" Dia.	
Oper			Giguere/Giles		Dati		(11.)		NIA.	VD88		Sampler:	Off Flights	
			B. Wilder		_	Туре				E 45C		Hammer Wt./Fall:	N/A	
	ed By: Start/Fi	iniah:	2/4/10-2/4/10		-			. d .			A	Core Barrel:		
					_	ling N				d Stem	Auger	Water Level*:	N/A	1
	ng Loca		265+00, 7.8 L	·l.	_	ing IE			N/A		II 1 1		None Observed	!
Definiti		iciency Fa	actor:	R = Rock (nmer	туре	:	Autom		Hydraulic ☐ itu Field Vane Shear Strength (psf)	Rope & Cathead Su(lab) =	Lab Vane Shear S	trenath (psf)
D = Sp MD = U U = Th MU = U V = Ins	lit Spoon S Jnsuccess in Wall Tu Jnsuccess situ Vane S	sful Split Spo ibe Sample sful Thin Wal Shear Test,	on Sample attem I Tube Sample att PP = Pocket Per ne Shear Test atte	SSA = Sol pt	id Stem A llow Stem er Cone eight of 14 weight of	Auger n Auger 40lb. ha	casin	g		$T_V = Pc$ $q_p = Ur$ N -unco $Hamme$ $N_{60} = S$	cket Torvane Shear Strength (psf) confined Compressive Strength (ksf rected = Raw field SPT N-value r Efficiency Factor = Annual Calibral PT N-uncorrected corrected for han lammer Efficiency Factor/60%) N-u)		i , , , ,
IVIV - C	JIISUCCESS	siui iiisitu vai		Sample Information	veignt or	one per	5011			1460 - 1	laminer Emclericy Factor/00/0/ N-u	incorrected 0 - cons	olidation rest	
Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	09 _N	Casing	Blows	Elevation (ft.)	Graphic Log	Visual De	escription and Remarks		Laboratory Testing Results/ AASHTO and Unified Clas
0	S7		0.60 - 1.20				S	SA	-0.35		PAVEMENT.		0.35-	G#22.6002
			1.20 5.00						-0.60 -1.20		Unbound Pavement.			G#236982 A-2-4, SM
	S8		1.20 - 5.00								Brown, moist, gravelly, fine	e to coarse SAND, little silt.	0.60-	WC=7.7% G#236983
											Brown, moist, silty, fine to	medium SAND.	1.20-	A-4, ML
											, , , , , , , , , , , , , , , , , , , ,			WC=14.6%
ا ۔									5.00				5.00	
- 5 -								¥	-5.00		Bottom of Exploration	on at 5.00 feet below ground	surface.	
											NO REFUSAL	8		
l														
10									-					
									-					
l														
- 15														
							L							
							1		1					
									-					
20														
									1					
							-							
									1					
ŀ							-		-					
25										1				
Rema	arke:	_								•	-			-

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

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Page 1 of 1

	Main	e Dep	artment	of Transporta	tion	Projec	t: State	Route 1	37	Boring No.:	HB-WA	ABE-105
		_	Soil/Rock Exp US CUSTOM	oloration Log		Locati	on: Be	lfast-Wa	ldo, Maine	PIN:	177	16.00
Drille	er:		MaineDOT		Elevation	n (ft.)				Auger ID/OD:	5" Dia.	
Ope	ator:		Giguere/Giles	3	Datum:		N/	VD88		Sampler:	Off Flights	
Log	ged By:		B. Wilder		Rig Type):	CN	1E 45C		Hammer Wt./Fall:	N/A	
Date	Start/F	inish:	2/4/10-2/4/10		Drilling I	Method:	So	lid Stem	Auger	Core Barrel:	N/A	
Bori	ng Loca	ation:	273+50, 2.0 L	ıt.	Casing I	D/OD:	N/.	4		Water Level*:	2.5' bgs.	
Ham	mer Eff	iciency Fa	actor:		Hammer	Type:	Autor	natic 🗆	Hydraulic □	Rope & Cathead □		
MD = U = TI MU = V = In	olit Spoon Unsuccess nin Wall Tu Unsuccess situ Vane S	sful Split Spo ube Sample sful Thin Wal Shear Test,	on Sample attem I Tube Sample at PP = Pocket Pei ne Shear Test att	SSA = Soli pt	Core Sample d Stem Auger low Stem Auge r Cone ight of 140lb. h weight of rods o /eight of one pe	ammer or casing		$T_V = Pc$ $q_p = Ur$ N -uncol $Hamme$ $N_{60} = S$	itu Field Vane Shear Strength (psf) cket Torvane Shear Strength (psf) confined Compressive Strength (ksf) rected = Raw field SPT N-value r Efficiency Factor = Annual Calibrati PT N-uncorrected corrected for ham lammer Efficiency Factor/60%)*N-ur	WC = v LL = Li PL = P on Value PI = PI mer efficiency G = Gr	= Lab Vane Shear S water content, perceni quid Limit lastic Limit asticity Index ain Size Analysis nsolidation Test	trength (psf)
		_		Sample Information			<u> </u>					Laboratory
Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected N60	Casing	Elevation (#)	Graphic Log	Visual De	scription and Remarks		Testing Results/ AASHTO and Unified Class
0						SSA	-0.4	5	PAVEMENT.		0.45-	
			+				-1.1		Brown, moist, gravelly, fine	to coarse SAND, little silt	. ≅S7	
									Brown, moist, silty, fine to n	nedium SAND. ≅S8	1.10-	
5 -	S9		5.50 - 8.90				-5.5	0 888	Brown, saturated, silty, fine	to coarse SAND, little gra	-5.50- vel, (Till?)	G#236984 A-2-4, SM
							-8.9	0		n at 8.90 feet below grou	8.90	WC=13.8%
10 -									REFUSAL			
15 -			1				_					
-												
		+										
20 -												
20												
			+									
			+									
			1									
				T								
25 Rem	arke:	1							1			

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		Proj	ect:	State	Route 1	Boring No.: HB-W.	ABE-106
		_ :	Soil/Rock Exp US CUSTOM	loration Log								16.00
Drille	\r.	•	MaineDOT		LEIO	vation	/ft \				Auger ID/OD: 5" Dia.	
Oper			Giguere/Giles		+	um:	(11.)		NIA.	VD88	Sampler: Off Flights	
_					-					E 45C	·	
	ed By:	in la la i	B. Wilder		_	Type:		al.				
	Start/Fi		2/4/10-2/4/10		_	lling M				d Stem		
	ng Loca		291+00, 7.0 R	t.	_	sing ID			N/A		Water Level*: 4.0' bgs.	
Definit D = Sp MD = 0 U = Th	ions: dit Spoon s Jnsuccess in Wall Tu	sful Split Spo be Sample	on Sample attem	RC = Rolle	Core San lid Stem A llow Stem er Cone	Auger n Auger		•	Autom	$S_u = In$ $T_v = Po$ $q_p = Ur$ N -unco	Hydraulic ☐ Rope & Cathead ☐ situ Field Vane Shear Strength (psf) Su((lab) = Lab Vane Shear Strength (psf) WC = water content, perceived = Raw field SPT N-value PL = Plastic Limit r Efficiency Factor = Annual Calibration Value PI = Plasticity Index	Strength (psf) nt
			PP = Pocket Per ne Shear Test atte					===		N ₆₀ = 3	PT N-uncorrected corrected for hammer efficiency Ammer Efficiency Factor/60%)*N-uncorrected	1
Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (pst) or RQD (%)	N-uncorrected	N ₆₀	Casing	Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Clas
0	S10		0.40 - 4.60					SA	-0.40	181858881	PAVEMENT.	G#236985
	510		0.10 1.00								Brown, moist, gravelly, fine to coarse SAND, little silt. Wetter with depth.	A-2-4, SM WC=9.0%
- 5 -									-4.60		4.60 Bottom of Exploration at 4.60 feet below ground surface.	<u> </u>
											REFUSAL	
- 10 -												
- 15 -												
- 20 -												
25 Rem	arks:											

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Page 1 of 1

	Main	e Dep	artment	of Transporta	tion	1	Proj	ect:	State	Route 1	137	r	Boring No.:	HB-WA	ABE-107
		•	Soil/Rock Exp	loration Log								o, Maine	PIN:	177	16.00
Drille	r.		MaineDOT		FIG	vation	/ft \						Auger ID/OD:	5" Dia.	
	ator:		Giguere/Giles			tum:	(11.)		NIA.	VD88			Sampler:	Off Flights	
					_								•		
	ed By:		B. Wilder		-	Туре		_		E 45C			Hammer Wt./Fall:	N/A	
	Start/Fi		2/4/10-2/4/10		_	lling M				d Stem	Au	uger	Core Barrel:	N/A	
Bori	ng Loca	tion:	304+00, 9.0 R	t.	$\overline{}$	sing ID			N/A				Water Level*:	None Observed	l
		iciency F	actor:	D. D. I		mmer	Type	:	Autom		- 11		Rope & Cathead	Lab Warra Observe	1
MD = U = Th MU = V = Ins	olit Spoon S Jnsuccess Jnsuccess Situ Vane S	sful Split Sp be Sample sful Thin Wa Shear Test,	all Tube Sample att PP = Pocket Per ane Shear Test atte	RC = Roll WOH = w work WOR/C = work wor	olid Stem ollow Ster er Cone eight of 1 weight o	Auger m Auger 140lb. ha of rods or	casing	3		$T_V = Po$ $q_p = Un$ N-uncor Hamme $N_{60} = S$	ocke ncon rrect er Ef SPT	Field Vane Shear Strength (psf) et Torvane Shear Strength (psf) nfined Compressive Strength (ksf) cted = Raw field SPT N-value fficiency Factor = Annual Calibratir N-uncorrected corrected for hammer Efficiency Factor/60%)*N-un	LL = Li PL = P on Value PI = PI mer efficiency G = Gr	= Lab Vane Shear S vater content, percen quid Limit lastic Limit asticity Index ain Size Analysis nsolidation Test	trengtn (psr)
				Sample Information			_			-					Laboratory
Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N ₆₀	Casing	Blows	Elevation (ft.)	Graphic Log		Visual De	scription and Remarks		Testing Results/ AASHTO and Unified Clas
0	S11		0.60 - 3.50				SS	SA	-0.35		<u>;</u>	PAVEMENT.		0.25	
							+		-0.60		\	Unbound Pavement.		0.35	G#236986 A-2-4, SM
												Brown, moist, gravelly, fine	to coarse SAND, little silt	0.60-	WC=10.2%
											2	, , , , , , , , , , , , , , , , , , , ,	,		
	S12		3.50 - 5.00						-3.50		Ĭ	Olive, wet, fine to medium sa	andy SILT, trace clay.	3.50	Gπ230987
								/				, ,	, ,		A-4, CL-MI WC=21.6%
- 5 -							\vdash	/	-5.00	13337555	+	Pottom of Evaluation	at 5.00 feet below groui	5.00	1
							_					NO REFUSAL	i at 5.00 feet below groun	iu suriace.	
- 10 -															
. 15							<u>L</u> _]	1					
15 -															
							+		-						
]	1	1				
- 20 -															
							_								
							+								
							\perp								
							+								
25															

Offsets are from Existing CL of Roadway.

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Page 1 of 1

	Main	e Dep	artment	of Transporta	tion		Project:	State I	Route 13	7	Boring No.:	HB-WA	ABE-108
		<u>_</u>	Soil/Rock Exp US CUSTOM	loration Log			Location	n: Belf	ast-Wal	do, Maine	PIN:	1771	16.00
Drill	er:		MaineDOT		Elev	vation	(ft.)				Auger ID/OD:	5" Dia.	
Ope	ator:		Giguere/Giles		Datı	um:		NAV	VD88		Sampler:	Off Flights	
Logg	ged By:		B. Wilder		Rig	Type:		CMI	E 45C		Hammer Wt./Fall:	N/A	
Date	Start/Fi	nish:	2/4/10-2/4/10		_		ethod:	Soli	d Stem A	Auger	Core Barrel:	N/A	
Bori	ng Locat	tion:	331+00, 8.0 R	t.	Cas	ing ID	/OD:	N/A			Water Level*:	None Observed	1
Ham	mer Effic	ciency Fa	actor:		Han	nmer ⁻	Туре:	Automa	atic 🗆	Hydraulic □	Rope & Cathead □		
MD = U = TI MU = V = In	olit Spoon S Unsuccesst nin Wall Tub Unsuccesst situ Vane S	ful Split Spoo be Sample ful Thin Wall thear Test,	on Sample attem	RC = Rolle tempt WOH = we netrometer WOR/C =	id Stem A llow Stem er Cone eight of 14 weight of	Auger n Auger 40lb. hai rods or	casing		$T_V = Poole q_p = Uncorr Hammer N_{60} = SF$	u Field Vane Shear Strength (psf) ket Torvane Shear Strength (psf) onfined Compressive Strength (ksf) ected = Raw field SPT N-value Efficiency Factor = Annual Calibrat PT N-uncorrected corrected for ham	WC = wat LL = Liqui PL = Plas ion Value Pl = Plast mer efficiency G = Grain	tic Limit icity Index Size Analysis	trength (psf) t
MV =	Unsuccessf	ful Insitu Var	ne Shear Test atte	$\frac{\text{empt} \qquad \qquad \text{WO1P = V}}{\text{Sample Information}}$	Veight of	one per	son		N ₆₀ = (H	ammer Efficiency Factor/60%)*N-ui	ncorrected C = Cons	olidation Test	1
Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Blows (/6 in.) Blows (/6 in.) Blows (pst) or RQD (%)	N-uncorrected	09 _N	Casing Blows	Elevation (ft.)	Graphic Log	Visual De	scription and Remarks		Laboratory Testing Results/ AASHTO and Unified Class
0							SSA	-0.40	THE HEALTH	_PAVEMENT.		0.40	
							5571			Brown, moist, gravelly, fine	to coarse SAND, little silt. ≅		
								-2.50			n at 2.50 feet below ground	surface.	
										REFUSAL			
- 5 -													
- 10 -													
- 15 -													
- 20 -													
25													

Offsets are from Existing CL of Roadway. Ledge outcrop in left ditch.

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

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Page 1 of 1

]	Main	e Dep	artment	of Transporta	tion	ì	Proj	ect:	State	Route 1	37	Boring No.:	HB-WA	ABE-109	
			Soil/Rock Exp US CUSTOM	oloration Log			Loc	atio	n: Bel	fast-Wa	ldo, Maine	PIN:	177	16.00	
Drille	er:		MaineDOT		Ele	vation	(ft.)					Auger ID/OD:	5" Dia.		
Oper	ator:		Giguere/Giles		+-	tum:	` '		NA	VD88		Sampler:	Off Flights		
	ged By:		B. Wilder		+	Type	:			E 45C		Hammer Wt./Fall:	N/A		
	Start/Fi	inish:	2/4/10-2/4/10			lling M		d:		d Stem	Auger	Core Barrel:	N/A		
	ng Loca		367+20, 8.0 R	t	_	sing IC			N/A			Water Level*:	None Observed	1	
		iciency Fa			+	mmer			Autom		Hydraulic □	Rope & Cathead □		-	
Definit D = Sp MD = I U = Th MU = I V = Ins	ions: olit Spoon S Unsuccess nin Wall Tu Unsuccess situ Vane S	Sample sful Split Spo lbe Sample sful Thin Wall Shear Test,	on Sample attem	RC = Rolle tempt WOH = we netrometer WOR/C =	Core Sar lid Stem llow Ster er Cone eight of 1 weight o	mple Auger m Auger 140lb. ha of rods or	mmer casin			$S_u = Ins$ $T_V = Po$ $q_p = Ur$ N-unco M-unco	situ Field Vane Shear Strength cket Torvane Shear Strength (confined Compressive Strength rected = Raw field SPT N-valu r Efficiency Factor = Annual Ca SPT N-uncorrected corrected Hammer Efficiency Factor/60%	(psf) Su(lab) psf) WC = w n (ksf) LL = Liq e PL = Pla ellibration Value PI = Pla r hammer efficiency G = Gra	= Lab Vane Shear S ater content, percen uid Limit ıstic Limit sticity Index in Size Analysis solidation Test	trength (psf) t	
				Sample Information						ľ				Laboratori	
Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N ₆₀	Casing	Blows	Elevation (ft.)	Graphic Log	Visua	al Description and Remarks		Laboratory Testing Results/ AASHTO and Unified Clas	
0	S13		0.30 - 0.70				S	SA	-0.30	, F	PAVEMENT.		0.30	G#236988	
									-0.70	·	Unbound Pavement.			A-1-b, SW-S	
							╙				Brown, moist, gravelly	fine to coarse SAND, little silt.	0.70- ≅S11	WC-0.076	
	S14		3.00 - 5.00						-3.00	'	Olive, moist, fine sandy	SILT, trace clay.	3.00	G#236989	
							+	<u> </u>	-					A-4, CL-MI WC=21.3%	
- 5 -							\perp		-5.00	,			5.00		
											Bottom of Explor NO REFUSAL	ration at 5.00 feet below ground			
									1		NO KEPUSAL				
							+								
- 10 -									-						
							-								
- 15 -							+		1						
									-						
							+								
							_								
- 20 -									1						
						-	-		-						
]						
							+		1						
							1		ł						
_25		<u>L</u> _				<u>L</u>			L	_					

Offsets are from Existing CL of Roadway.

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Page 1 of 1

	Main	ie Der	artment	of Transporta	tion	Proje	ect:	State I	Route 1	37	Boring No.:	_HB-WA	ABE-110
		•	Soil/Rock Exp	ploration Log		Loca	atio	n: Belf	ast-Wa	ldo, Maine	PIN:	1771	16.00
Drille	er:		MaineDOT		Elevatio	n (ft.)					Auger ID/OD:	5" Dia.	
Oper	ator:		Giguere/Giles	S	Datum:			NAV	VD88		Sampler:	Off Flights	
Logg	ged By:		B. Wilder		Rig Type	ə:		CMI	E 45C		Hammer Wt./Fall:	N/A	
	Start/F		2/4/10-2/4/10)	Drilling		d:	Soli	d Stem	Auger	Core Barrel:	N/A	
	ng Loca		382+00, 8.5 F		Casing I			N/A			Water Level*:	None Observed	
		ficiency F			Hammer			Automa		Hydraulic □	Rope & Cathead □		
Definit D = Sp MD = U = Th MU = V = Ins	ions: olit Spoon Unsucces nin Wall Ti Unsucces situ Vane	Sample ssful Split Sp ube Sample ssful Thin Wa Shear Test,	oon Sample attem	SSA = Sol PSA = Hol RC = Rolle ttempt WOH = we enetrometer WOR/C =	Core Sample id Stem Auger low Stem Auge	ammer			$S_u = Ins$ $T_V = Po$ $q_p = Un$ N-uncor Hamme $N_{60} = S$	itu Field Vane Shear Strength (psf) cket Torvane Shear Strength (psf) confined Compressive Strength (ksf) rected = Raw field SPT N-value r Efficiency Factor = Annual Calibrati PT N-uncorrected corrected for ham lammer Efficiency Factor/60%)*N-ur	S _u (la WC = LL = PL = on Value PI = I mer efficiency G = 0	b) = Lab Vane Shear S water content, percent Liquid Limit Plastic Limit Plasticity Index Grain Size Analysis Consolidation Test	trength (psf)
				Sample Information				1	4				Laboratory
Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected N ₆₀	Casing	Blows	Elevation (ft.)	Graphic Log	Visual De	scription and Remarks		Testing Results/ AASHTO and Unified Class
0						SS	A	-0.35		PAVEMENT.		0.35-	
						+ 1		-0.70		Unbound Pavement.			
]	M.	Brown, moist, gravelly, fine	to coarse SAND, little si	0.70- lt. ≅S11	
								-3.00		Olive, moist, fine sandy SIL	Γ, trace clay. ≅S14	3.00	
							/						
5 -						+		-5.00	.11414:111	Rottom of Evaloration	at 5.00 feet below grou	5.00-	
						+				NO REFUSAL	at 5.00 feet below grot	and surface.	
						+							
10 -		+				+							
						+		ļ					
								1					
15 -		1				+		\mathbf{I}					
			+					1					
			1			-							
			1					1					
20 -		+				-							
]					
			+			+							
			+	+		+		ł					
25													
	arks:	•		·		•			-	•			

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

ľ	Main	e Dep	artment	tion		Proj	ect:	State	Route :	137	7	Boring No.: HB-WAB		ABE-111	
		<u> </u>	Soil/Rock Exp US CUSTOM	loration Log			Loc	atio	n: Beli	fast-Wa	ald	lo, Maine	PIN:	1771	16.00
Drille	r:		MaineDOT		Ele	vation	(ft.)						Auger ID/OD:	5" Dia.	
Oper	ator:		Giguere/Giles		Dat	um:			NA	VD88			Sampler:	Off Flights	
Logg	ed By:		B. Wilder		Rig	Type:			CM	E 45C			Hammer Wt./Fall:	N/A	
	Start/Fi	nish:	2/4/10-2/4/10		+	lling M		d:		d Stem	A	uger	Core Barrel:	N/A	
	g Loca		400+00, 8.5 R	t.	_	sing ID			N/A				Water Level*:	None Observed	1
		ciency Fa			_	nmer			Autom			Hydraulic □	Rope & Cathead □		
Definiti D = Sp MD = U U = Th MU = U V = Ins		Core San id Stem / llow Sten er Cone eight of 1 weight of Veight of	mple Auger n Auger 40lb. hai f rods or	mmer			$T_V = Pe$ $q_p = Ue$ N -unco $Hamme$ $N_{60} = 3$	ock nco rred er E SP1	u Field Vane Shear Strength (psf) (et 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	S _u (lab) WC = w LL = Lic PL = Pl on Value Pl = Pla mer efficiency G = Gra	= Lab Vane Shear S ater content, perceni uid Limit astic Limit sticity Index in Size Analysis asolidation Test	trength (psf) t			
ŀ				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 ₆₀	Casing	Blows	Elevation (ft.)	Graphic Log		Visual De	scription and Remarks		Testing Results/ AASHTO and Unified Clas
0	S15		0.70 - 2.90				S	SA	-0.40		3	PAVEMENT.		0.40-	
ŀ									-0.70	, i i i i i	1	Unbound Pavement.		0.70-	G#236990 A-2-4, SM
-							<u> </u>				٠	Brown, moist, gravelly, fine	to coarse SAND, little silt.	0.70	WC=8.3%
									-2.90					2.90	
									-2.50			Olive, moist, fine sandy SIL	T, trace clay. ≅S14	2.70	
ŀ							\downarrow	/	-						
. 5								\bigvee	-5.00		4			5.00	
												Bottom of Exploration NO REFUSAL	n at 5.00 feet below groun	d surface.	
ŀ									-						
							\vdash								
10									1						
ŀ							-		-						
İ									-						
ŀ							╁								
. 15															
-															
									1						
ł							\vdash		1						
ı															
- 20							\vdash								
							_								
İ]						
ŀ							\vdash		1						
							_								
25										1					
Pom:	-		1				_			-	_				·

Offsets are from Existing CL of Roadway.

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

Testing Results/ AASHTO and Various (%) (%) (%) (%) (%) (%) (%) (%) (%) (%)		Main	tion	F	Proje	ct:	State	Route 1	Boring No.: HB-W.	ABE-112			
Openior Cipper Office Optimity Navy 1988 Sampler Optimity Navy 1988 Sampler Optimity Optim							l	_ocat	tion	: Beli	ast-Wa	do, Maine PIN: 177	16.00
Depth Statistics Statisti	Drille	er:		MaineDOT		Elevati	on (ft.)				Auger ID/OD: 5" Dia.	
Date Start/Finisht 2-401-02-070 Core Barriel NA	Ope	ator:		Giguere/Giles		Datum:	:			NA.	VD88	Sampler: Off Flights	
Mariner Mari	Logg	ged By:		B. Wilder		Rig Ty	pe:			CM	E 45C	Hammer Wt./Fall: N/A	
	Date	Start/Fi	nish:	2/4/10-2/4/10		Drilling	ј Ме	thod	l:	Soli	d Stem	Auger Core Barrel: N/A	
Section Sect	Bori	ng Locat	tion:	436+50, 8.5 R	tt.	Casing	ID/	OD:		N/A		Water Level*: None Observe	d
100 - Universal dispers Sering element 160 - Filotion of the Nager 160 - Filotion	Ham	mer Effi	ciency Fa	actor:		Hamme	er T	ype:		Autom	atic 🗆	Hydraulic ☐ Rope & Cathead ☐	
Company Comp	D = S _I 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,	Tube Sample att PP = Pocket Per ne Shear Test atte	SSA = Soli	d Stem Auge ow Stem Aug r Cone ight of 140lb. veight of rods	ger . ham s or c	asing			$T_V = Po$ $q_p = Un$ N-uncor Hamme $N_{60} = S$	onfined Compressive Strength (ksf) LL = Liquid Limit PL = Plastic Limit Efficiency Factor = Annual Calibration Value T N-uncorrected corrected for hammer efficiency G = Grain Size Analysis	Strength (psf)
SSA 0.35 PAVEMENT. 0.35 0.70							$\overline{}$		_		1		Laboratory
SSA OP OP OP OP OP OP OP OP OP O		Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	09,1	Casing	Blows	Elevation (ft.)	Graphic Log		Results/ AASHTO
Layer of old Pavement at 3.3° bgs. Layer of old Pavement at 3.5° bgs. Layer of old Pavement at 5.00 feet below ground surface. NO REFUSAL 10 20 25 25 26 27 28 29 20 20 20 20 20 20 20 20 20	0							SSA	4	-0.35			
Brown, moist, gravelly, fine to course SAND, little silt, (Fill) sS15 Layer of old Pavement at 3.5° bgs. Solve Bottom of Exploration at 5.00 feet below ground surface. NO REFUSAL. 15 20 20 25 25 25 26 26 27 28 28 28 28 28 28 28 28 28										-0.70		\Unbound Pavement.	
- 5							\dashv						
- 5													
8 Solton of Exploration at 5.00 feet below ground surface. NO REFUSAL 10												Layer of old Pavement at 3.5' bgs.	
8 Solton of Exploration at 5.00 feet below ground surface. NO REFUSAL 10	- 5 -								/	-5.00	$\otimes \otimes$	5.00]
- 10	, 									5.00		Bottom of Exploration at 5.00 feet below ground surface.	
- 15												NO REPUSAL	
- 15							_						
- 15													
- 15													
- 15							1						
20	- 10 -						\dashv						
20													
20													
20							_						
20							_						
20													
20													
	- 15 -						\dashv		\dashv				
							_		\dashv				
							_						
							_						
	20												
	- 20 -												
							\dashv		\dashv				
							_		_				
							\dashv		\dashv				

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

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Page 1 of 1

]	Main	tion	Р	roje	ct:	State	Route 1	Boring No.: HB-WA	ABE-113			
			Soil/Rock Exp US CUSTOM			L	ocat	ion	: Belt	ast-Wa	do, Maine PIN: <u>177</u>	16.00
Drille	er:		MaineDOT		Elevation	on (f	ft.)				Auger ID/OD: 5" Dia.	
Oper	ator:		Giguere/Giles		Datum:				NA	VD88	Sampler: Off Flights	
Logg	ged By:		B. Wilder		Rig Typ	e:			CM	E 45C	Hammer Wt./Fall: N/A	
Date	Start/Fi	nish:	2/4/10-2/4/10		Drilling	Met	thod	:	Soli	d Stem	Auger Core Barrel: N/A	
Borii	ng Locat	tion:	474+00, 9.5 R	tt.	Casing	ID/C	DD:		N/A		Water Level*: None Observed	1
		ciency Factor: Hamme							Autom		Hydraulic ☐ Rope & Cathead ☐	
MD = 1 U = Th MU = 1 V = Ins	olit Spoon S Unsuccess nin Wall Tul Unsuccess situ Vane S	ful Split Spoo be Sample ful Thin Wall Shear Test,	on Sample attem Tube Sample att PP = Pocket Per	SSA = Sol pt	eight of 140lb. I weight of rods	er hamn or ca	asing			$T_V = Po$ $q_p = Un$ N-uncor Hamme $N_{60} = S$	ur Field Vane Shear Strength (psf) ket Torvane Shear Strength (psf) onfined Compressive Strength (ksf) ected = Raw field SPT N-value Efficiency Factor = Annual Calibration Value PT N-uncorrected corrected for hammer efficiency Su(lab) = Lab Vane Shear S WC = water content, percent LL = Liquid Limit PL = Plastic Limit PI = Plastictly Index G = Grain Size Analysis	trengtn (psr) t
MV = I	Unsuccess	ful Insitu Var	ne Shear Test atte	$\frac{\text{empt} \qquad \qquad \text{WO1P = V}}{\text{Sample Information}}$	Veight of one p	erso	n			N ₆₀ = (I	ammer Efficiency Factor/60%)*N-uncorrected C = Consolidation Test	İ
Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	8	Casing	BIOWS	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class
0							SSA		-0.30	-	PAVEMENT. 0.30	
									-0.70	'	\Unbound Pavement.	
						+					Brown, moist, gravelly, fine to coarse SAND, little silt, (Fill) ≘S15	
						\dagger						
- 5 -							\bigvee	/	-5.00		5.00	
						+					Bottom of Exploration at 5.00 feet below ground surface. NO REFUSAL	
						+						
- 10 -						\perp						
						+						
						+						
- 15 -						4						
						+		\dashv				
						+		_				
- 20 -												
20 7						\perp						
						4		_				
						+		4				
						_						
_ 25 _												
Rem	arks:											

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		Proj	ect:	State	Route 1	37	Boring No.:	HB-WA	HB-WABE-114	
		- !	Soil/Rock Exp US CUSTOM	loration Log			Loc	atio	n: Beli	fast-Wa	do, Maine	PIN:	177	16.00	
Drille	er:		MaineDOT		Ele	vation	(ft.)					Auger ID/OD:	5" Dia.		
Oper	ator:		Giguere/Giles		+	tum:	• ,		NA	VD88		Sampler: Off Flights			
	jed By:		B. Wilder		+	Type	:			E 45C		Hammer Wt./Fall:	N/A		
	Start/Fi	inish:	2/4/10-2/4/10		+	lling M		d:		d Stem	Auger	Core Barrel:	N/A		
	ng Loca		504+00, 9.5 R	t		sing IC			N/A		rugei	Water Level*:	None Observed	1	
		ciency Fa			_	mmer			Autom		Hydraulic □	Rope & Cathead □	Trone Observed	•	
Definit D = Sp MD = U = Th MU = V = Ins	ions: olit Spoon S Unsuccess in Wall Tu Unsuccess situ Vane S	Sample sful Split Spo be Sample sful Thin Wall Shear Test,	on Sample attem Tube Sample att PP = Pocket Pen the Shear Test atte	RC = Rolle rempt WOH = we netrometer WOR/C =	Core Sar id Stem . llow Ster er Cone eight of 1 weight o	mple Auger m Auger 140lb. ha of rods or	mmer casin		7141011	$S_u = In$ $T_V = Po$ $q_p = Ur$ N-unco Hamme $N_{60} = S$	itu Field Vane Shear Strength (psf) cket Torvane Shear Strength (psf) confined Compressive Strength (ksf) rected = Raw field SPT N-value Efficiency Factor = Annual Calibratic TN-uncorrected corrected for hammer Efficiency Factor/60%)*N-un	$ \begin{array}{c} S_{U}(lab) \\ WC = w \\ LL = L_{ic} \\ PL = P_{i} \\ DN Value \\ PI = Pla $	= Lab Vane Shear S ater content, percen uid Limit astic Limit sticity Index in Size Analysis asolidation Test	trength (psf) t	
				Sample Information										Laboratory	
Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N ₆₀	Casing	Blows	Elevation (ft.)	Graphic Log	Visual Des	scription and Remarks		Testing Results/ AASHTO and Unified Clas	
0	S16		0.70 - 3.00				S	SA	-0.35		PAVEMENT.		0.25		
							+		-0.70)	Unbound Pavement.		0.35	G#236991 A-2-4, SM	
							_				Brown, moist, gravelly, fine	to coarse SAND, little silt.	0.70	WC=6.3%	
	S17		3.00 - 5.00						-3.00	1	Brown, damp to moist, silty,	fine to medium SAND.	3.00	G#236992	
	017		3.00 2.00				+				, ,			A-4, SM WC=23.6%	
- 5 -									-5.00				5.00]	
5									-5.00	Ί		at 5.00 feet below groun			
							+				NO REFUSAL				
							-								
									1						
							+		ł						
- 10 -															
10															
							+		-						
							+								
15 -							+		-						
]						
							+		1						
							_								
									1						
- 20 -							+		1						
							+		1						
							1								
									1						
25															

Offsets are from Existing CL of Roadway.

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Page 1 of 1



SAMPLE INFORMATION

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

236976 HB-WABE-101/S1 GEOTECHNICAL (DISTURBED) 2/4/2010 3/1/2010

Sample Type: GEOTECHNICAL Location: ROADWAY Station: 196+00 Offset, ft: 9.5 RT Dbfg, ft: 0.6-3.0

PIN: 017716.00 Town: Belfast, Waldo Sampler: WILDER, BRUCE H

TEST RESULTS

Sieve Analysis (T 27, T 11)						
Wash Method	d					
Procedure A	١					
SIEVE SIZE U.S. [SI]	% Passing					
3 in. [75.0 mm]						
1 in. [25.0 mm]	100.0					
3/4 in. [19.0 mm]	97.6					
½ in. [12.5 mm]	97.0					
3/8 in. [9.5 mm]	94.2					
1/4 in. [6.3 mm]	88.3					
No. 4 [4.75 mm]	83.7					
No. 10 [2.00 mm]	67.8					
No. 20 [0.850 mm]	52.4					
No. 40 [0.425 mm]	42.0					
No. 60 [0.250 mm]	35.4					
No. 100 [0.150 mm]	30.0					
No. 200 [0.075 mm]	23.5					

Void Ratio

Saturation, %

	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	it (T 90), %
Dry Density, lbs/ft³							
Specimen Thicknes	s, in					Plasticity Inc	lex (T 90), %
С	Consolidation (T 216)					Specific Gravit	v. Corrected to
Trimmin	Trimmings, Water Content, %					T 100)	
	Initial	Final		Void Ratio	% Strain	Loss on Ign	ition (T 267)
Water Content, %			Pmin			Loss, %	<u>H2O, %</u>
Dry Density, lbs/ft3			Pp				

Vane Shear Test on Shelby Tubes (Maine DOT)							
Depth	3 In.				6 In.		
taken in	U. Shear	Remold	U. Shear	Remold	24	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), %

6.6

O -				
Co	m	m	₽r	ILG.
\sim	ш		v	ıω.

AUTHORIZATION AND DISTRIBUTION

Reported by: FOGG, BRIAN Date Reported: 3/16/2010



SAMPLE INFORMATION

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

236977 HB-WABE-101/S2 GEOTECHNICAL (DISTURBED) 2/4/2010 3/1/2010

Sample Type: GEOTECHNICAL Location: ROADWAY Station: 196+00 Offset, ft: 9.5 RT Dbfg, ft: 3.0-5.0

PIN: 017716.00 Town: Belfast, Waldo Sampler: WILDER, BRUCE H

TEST RESULTS

Sieve Analysis		
T 11)	Shear Angle, ^c	
Wash Metho	d	Initial Water C
Procedure A	1	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]	100.0	
3/4 in. [19.0 mm]	98.0	
½ in. [12.5 mm]	96.6	Tri
3/8 in. [9.5 mm]	94.8	111
1/4 in. [6.3 mm]	91.1	
No. 4 [4.75 mm]	88.0	
No. 10 [2.00 mm]	79.1	Water Conten
No. 20 [0.850 mm]	72.1	Dry Density, Ib
No. 40 [0.425 mm]	67.1	Void Ratio
No. 60 [0.250 mm]	63.1	Saturation, %
No. 100 [0.150 mm]	58.7	
No. 200 [0.075 mm]	51.2	

	Direct S	hear (1	Г 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)						y, Corrected to	
Trimmin	gs, Wate	er Conter	nt, %			<u>20°C (</u>	(T 100)
	Initial	Final		Void Ratio	% Strain	Loss on Ign	nition (T 267)
Water Content, %			Pmin			Loss, %	<u>H2O, %</u>
Dry Density, lbs/ft³			Pp				

Vane Shear Test on Shelby Tubes (Maine DOT)											
Depth	Depth 3 In. 6 In. Water						3 ln.		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					

Pmax Cc/C'c Water Content (T 265), %

24.4

CO	mn	ner	ιts:

AUTHORIZATION AND DISTRIBUTION

Reported by: FOGG, BRIAN Date Reported: 3/16/2010



SAMPLE INFORMATION

Sample Type: GEOTECHNICAL Location: ROADWAY Station: 215+00 Offset, ft: 9.0 RT Dbfg, ft: 0.6-2.2

PIN: 017716.00 Town: Belfast, Waldo 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]	99.2					
3/8 in. [9.5 mm]	98.1					
1/4 in. [6.3 mm]	94.1					
No. 4 [4.75 mm]	90.4					
No. 10 [2.00 mm]	76.7					
No. 20 [0.850 mm]	62.0					
No. 40 [0.425 mm]	51.7					
No. 60 [0.250 mm]	44.8					
No. 100 [0.150 mm]	38.7					
No. 200 [0.075 mm]	31.3					

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	
	igs, wate	Conte	11, 70			200	<u>(1 100)</u>
	Initial	Final		Void Ratio	% Strain	Loss on Ign	ition (T 267)
Water Content, %			Pmin			Loss, %	<u>H2O, %</u>
Dry Density, lbs/ft³			Рр				
Void Ratio			Pmax			Water Conte	ent (T 265), %
Saturation, %			Cc/C'c			10	0.9

Vane Shear Test on Shelby Tubes (Maine DOT)								
Depth	Depth 3 In. 6 In. Water _							
taken in	U. Shear	Remold	U. Shear	Remold	2,	Id Content,	Description of Material Sampled at the Various Tube Depths	
tube, ft	tons/ft²	tons/ft²	tons/ft²	tons/ft²		various Tube Deptils		

Co	mı	ne	nts:

AUTHORIZATION AND DISTRIBUTION

Reported by: FOGG, BRIAN Date Reported: 3/16/2010



INFORMATION SAMPLE

Reference No. Boring No./Sample No. Sample Description Sampled Received 2/4/2010 3/1/2010 236979 **HB-WABE-102/S4 GEOTECHNICAL (DISTURBED)**

Sample Type: **GEOTECHNICAL** Offset, ft: 9.0 RT Dbfg, ft: 2.2-5.0 Location: ROADWAY Station: 215+00

PIN: 017716.00 Town: Belfast, Waldo Sampler: WILDER, BRUCE H

TEST RESULTS

Sieve Analysis (T 27,		С	Miscellane	eous Tests					
T 11)		Shear Angle, °							@ 25 blows
Wash Method	d	Initial Water Conten	t, %					<u>(T 8</u> 9	<u>9), %</u>
Procedure A	\	Normal Stress, psi							
SIEVE SIZE	_ %	Wet Density, lbs/ft³						Plastic Lim	it (T 90), %
U.S. [SI]	Passing	Dry Density, lbs/ft³							
3 in. [75.0 mm]		Specimen Thicknes	s. in					Plasticity Inc	lex (T 90), %
1 in. [25.0 mm]			·,						
3/4 in. [19.0 mm]		C	onsolid	dation (T 216)			Specific Gravit	y, Corrected to
½ in. [12.5 mm]	100.0	Trimmin	ne Wate	er Conter	nt %				<u>y, corrected to </u> (T 100)
3/4 in. [9.5 mm]	99.8		gs, wate	or Corner	11, 70			20 0 1	<u> ,</u>
1/4 in. [6.3 mm]	98.5		Initial	Final		Void	%		··· (T.00=)
No. 4 [4.75 mm]	97.1					Ratio	Strain		ition (T 267)
No. 10 [2.00 mm]	93.3	Water Content, %			Pmin			Loss, %	<u>H2O, %</u>
No. 20 [0.850 mm]	88.0	Dry Density, lbs/ft³			Рр				
No. 40 [0.425 mm]	83.6	Void Ratio			Pmax			Water Conte	ent (T 265), %
No. 60 [0.250 mm]	79.7	Saturation, %			Cc/C'c			15	5.5
No. 100 [0.150 mm]	75.2							I : DOT)	
No. 200 [0.075 mm]	68.3	Vane Shear Test on Shelby Tubes (Maine DOT)							

Liquid Limit @ 25 blows (T 89), %							
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), %							
15.5							

Vane Shear Test on Shelby Tubes (Maine DOT)							
Depth 3 I		In.		n.	Water	December of Metable Committee 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 rube beptilis	

Comments:

A N D AUTHORIZATION DISTRIBUTION

Reported by: FOGG, BRIAN Date Reported: 3/16/2010



SAMPLE INFORMATION

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

236980 HB-WABE-103/S5 GEOTECHNICAL (DISTURBED) 2/4/2010 3/1/2010

Sample Type: GEOTECHNICAL Location: ROADWAY Station: 239+00 Offset, ft: 7.6 LT Dbfg, ft: 0.6-2.4

PIN: 017716.00 Town: Belfast, Waldo Sampler: WILDER, BRUCE H

TEST RESULTS

Sieve Analysis		
T 11)	Shear Angle, ^c	
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]	97.4	Tri
3/8 in. [9.5 mm]	91.3	11
1/4 in. [6.3 mm]	84.1	
No. 4 [4.75 mm]	78.7	
No. 10 [2.00 mm]	63.1	Water Conten
No. 20 [0.850 mm]	50.2	Dry Density, Ib
No. 40 [0.425 mm]	42.3	Void Ratio
No. 60 [0.250 mm]	37.4	Saturation, %
No. 100 [0.150 mm]	33.3	
No. 200 [0.075 mm]	27.5	

	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), %
С	Consolidation (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				

Vane Shear Test on Shelby Tubes (Maine DOT)							
Depth 3 In.		6	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 rube Deptils	

Pmax

Cc/C'c

Water Content (T 265), %

7.4

<u>C0</u>	<u>mr</u>	<u>ner</u>	<u>าเร:</u>

AUTHORIZATION AND DISTRIBUTION

Reported by: FOGG, BRIAN Date Reported: 3/16/2010



SAMPLE INFORMATION

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

236981 HB-WABE-103/S6 GEOTECHNICAL (DISTURBED) 2/4/2010 3/1/2010

Sample Type: GEOTECHNICAL Location: ROADWAY Station: 239+00 Offset, ft: 7.6 LT Dbfg, ft: 2.4-5.0

PIN: 017716.00 Town: Belfast, Waldo Sampler: WILDER, BRUCE H

TEST RESULTS

Sieve Analysis		
T 11)	Shear Angle, ^c	
Wash Method	b	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 Thic
1 in. [25.0 mm]		оресинентельный и
3/4 in. [19.0 mm]		
½ in. [12.5 mm]		Tri
¾ in. [9.5 mm]		
1/4 in. [6.3 mm]	100.0	
No. 4 [4.75 mm]	99.9	
No. 10 [2.00 mm]	99.5	Water Conten
No. 20 [0.850 mm]	98.8	Dry Density, Ib
No. 40 [0.425 mm]	98.4	Void Ratio
No. 60 [0.250 mm]	97.9	Saturation, %
No. 100 [0.150 mm]	97.5	
No. 200 [0.075 mm]	96.6	

	D	irect S	hear (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	<u>iit (T 90), %</u>
J	Dry Density, lbs/ft³							
	Specimen Thickness	s, in					Plasticity Inc	lex (T 90), %
	Co	onsolio	dation ((T 216)			Specific Gravit	y, Corrected to
	Trimmin	gs, Wate	er Conter	nt, %				T 100)
		Initial	Final		Void Ratio	% Strain	Loss on lan	ition (T 267)
	Water Content, %			Pmin	3 10.0.0	30.0	Loss, %	H2O, %
	Dry Density, lbs/ft³			Pp				
_	•		l					

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	ft² %	various Tube Deptils			

Pmax

Cc/C'c

Water Content (T 265), %

20.9

Co	mm	าen	Its:

AUTHORIZATION AND DISTRIBUTION

Reported by: FOGG, BRIAN Date Reported: 3/16/2010



SAMPLE INFORMATION

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

236982 HB-WABE-104/S7 GEOTECHNICAL (DISTURBED) 2/4/2010 3/1/2010

Sample Type: GEOTECHNICAL Location: ROADWAY Station: 265+00 Offset, ft: 7.8 LT Dbfg, ft: 0.6-1.2

PIN: 017716.00 Town: Belfast, Waldo Sampler: WILDER, BRUCE H

TEST RESULTS

Sieve Analysis (T 27, T 11)					
Wash Method	d				
Procedure A	١				
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]	97.0				
3/8 in. [9.5 mm]	95.5				
1/4 in. [6.3 mm]	89.1				
No. 4 [4.75 mm]	85.0				
No. 10 [2.00 mm]	71.0				
No. 20 [0.850 mm]	56.4				
No. 40 [0.425 mm]	47.1				
No. 60 [0.250 mm]	41.1				
No. 100 [0.150 mm]	35.6				
No. 200 [0.075 mm]	29.0				

Void Ratio

Saturation, %

		Direct S	Shear (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>iit (T 90), %</u>
ı	Dry Density, lbs/ft³							
	Specimen Thicknes	s, in					Plasticity Inc	dex (T 90), %
	C	oneoli	dation (T 216\				
		Ulisuli	Jalion (1 210)			Specific Gravit	y, Corrected to
	Trimmin	gs, Wat	er Conter	nt, %			20°C	(<u>T 100)</u>
		1:4:1	Final		Void	%		
		Initial	Final		Ratio	Strain	Loss on Ign	ition (T 267)
	Water Content, %			Pmin			Loss, %	<u>H2O, %</u>
	Dry Density, lbs/ft3			Pp				

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						
tube, ft	tons/ft²	tons/ft²	tons/ft²	tons/ft²	%	Various Tube Depths						

Pmax

Cc/C'c

Water Content (T 265), %

7.7

<u>C0</u>	<u>mr</u>	<u>ner</u>	<u>าเร:</u>

AUTHORIZATION AND DISTRIBUTION

Reported by: FOGG, BRIAN Date Reported: 3/16/2010



SAMPLE INFORMATION

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

236983 HB-WABE-104/S8 GEOTECHNICAL (DISTURBED) 2/4/2010 3/1/2010

Sample Type: GEOTECHNICAL Location: ROADWAY Station: 265+00 Offset, ft: 7.8 LT Dbfg, ft: 1.2-5.0

PIN: 017716.00 Town: Belfast, Waldo Sampler: WILDER, BRUCE H

TEST RESULTS

	Sieve Analysis (T 27,)irec	t S	hear (
T 11)	Shear Angle	e, °				
Wash Metho	d	Initial Water	Conten	t, %		
Procedure A	1	Normal Stre	ess, psi			
SIEVE SIZE	%	Wet Density	/, lbs/ft³			
U.S. [SI]	Passing	Dry Density	, lbs/ft³			
3 in. [75.0 mm]		Specimen T	hicknes	s, in		
1 in. [25.0 mm]						
3/4 in. [19.0 mm]			C	onsc	olid	lation
½ in. [12.5 mm]	100.0	Trimmings, Water Conte				
% in. [9.5 mm]	98.6					
¼ in. [6.3 mm]	96.4			Initi	al	Final
No. 4 [4.75 mm]	94.9					
No. 10 [2.00 mm]	90.0	Water Cont	ent, %			
No. 20 [0.850 mm]	84.2	Dry Density	, lbs/ft³			
No. 40 [0.425 mm]	78.9	Void Ratio				
No. 60 [0.250 mm]	73.9	Saturation,	%			
No. 100 [0.150 mm]	67.8		\ 7	^	\ I -	
No. 200 [0.075 mm]	58.8	Vane Shear Tes				

	Direct	Shear (1	T 236)			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), %
		idation (Specific Gravity, Corrected to
Trimmin	ıgs, Wa	ter Conter	ıt, %			20°C (T 100)
	Initia	Final		Void Ratio	% Strain	Loss on Ignition (T 267)
Water Content, %			Pmin			<u>Loss, %</u> <u>H2O, %</u>
Dry Density, lbs/ft³			Рр			
Void Ratio			Pmax			Water Content (T 265), %
Saturation, %			Cc/C'c			14.6

Vane Shear Test on Shelby Tubes (Maine DOT)											
Depth	3 I	n.	6 I	ln.	Water	Description of Metarical Committee 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/ft²	tons/ft²	%	various rube beptils					

Comments:

AUTHORIZATION AND DISTRIBUTION

Reported by: FOGG, BRIAN Date Reported: 3/16/2010



SAMPLE INFORMATION

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

236984 HB-WABE-105/S9 GEOTECHNICAL (DISTURBED) 2/4/2010 3/1/2010

Sample Type: GEOTECHNICAL Location: ROADWAY Station: 273+50 Offset, ft: 2.0 LT Dbfg, ft: 5.5-8.9

PIN: 017716.00 Town: Belfast, Waldo 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]	100.0				
1 in. [25.0 mm]	92.8				
3/4 in. [19.0 mm]	85.8				
½ in. [12.5 mm]	78.9				
3/8 in. [9.5 mm]	75.8				
1/4 in. [6.3 mm]	70.9				
No. 4 [4.75 mm]	67.8				
No. 10 [2.00 mm]	57.6				
No. 20 [0.850 mm]	48.4				
No. 40 [0.425 mm]	41.5				
No. 60 [0.250 mm]	36.2				
No. 100 [0.150 mm]	31.2				
No. 200 [0.075 mm]	25.6				

	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	onsolic	dation (T 216)			Specific Gravity, Corrected to
Trimmin	gs, 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 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					

13.8

Cc/C'c

Co	mm	าen	Its:

AUTHORIZATION AND DISTRIBUTION

Reported by: FOGG, BRIAN Date Reported: 3/16/2010

Paper Copy: Lab File; Project File; Geotech File

Saturation, %



SAMPLE INFORMATION

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

236985 HB-WABE-106/S10 GEOTECHNICAL (DISTURBED) 2/4/2010 3/1/2010

Sample Type: GEOTECHNICAL Location: ROADWAY Station: 291+00 Offset, ft: 7.0 RT Dbfg, ft: 0.4-4.6

PIN: 017716.00 Town: Belfast, Waldo Sampler: WILDER, BRUCE H

TEST RESULTS

_	Sieve Analysis (T 27, T 11)		Direct	: Sh	near (1	Γ 2 3
T 11)						
Wash Method	b	Initial Water Conten	ıt, %			
Procedure A	\	Normal Stress, psi				
SIEVE SIZE	% Descine	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]			-,			
¾ in. [19.0 mm]	100.0	C	onso	lida	ation (T 2
½ in. [12.5 mm]	96.3	Trimmin	ac W	ator	Conter	nt 0,
% in. [9.5 mm]	94.3		igs, w	alci	Conte	ιι, /
¼ in. [6.3 mm]	85.0		Initia	al	Final	
No. 4 [4.75 mm]	79.5					
No. 10 [2.00 mm]	65.0	Water Content, %				Pn
No. 20 [0.850 mm]	52.7	Dry Density, lbs/ft³				Pp
No. 40 [0.425 mm]	45.2	Void Ratio				Pn
No. 60 [0.250 mm]	40.3	Saturation, %				Сс
No. 100 [0.150 mm]	35.5	\	0	.	—	
No. 200 [0.075 mm]	29.2			nea	ar Tes	το
		0.1				

С	irect	Shear (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), %
		lidation (ater Conter				Specific Gravity, Corrected to 20°C (T 100)
	Initia	al Final		Void Ratio	% Strain	Loss on Ignition (T 267)
Water Content, %			Pmin			<u>Loss, %</u> <u>H2O, %</u>
Dry Density, lbs/ft³			Рр			
Void Ratio			Pmax			Water Content (T 265), %
Saturation, %			Cc/C'c			9.0

Vane Shear Test on Shelby Tubes (Maine DOT)								
Depth	3 ln.		6 In.		Water	December of Metaniel Committee 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/ft²	tons/ft²	%	various rube Deptils		

Comments:

AUTHORIZATION AND DISTRIBUTION

Reported by: FOGG, BRIAN Date Reported: 3/16/2010



SAMPLE INFORMATION

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

236986 HB-WABE-107/S11 GEOTECHNICAL (DISTURBED) 2/4/2010 3/1/2010

Sample Type: GEOTECHNICAL Location: ROADWAY Station: 304+00 Offset, ft: 9.0 RT Dbfg, ft: 0.6-3.5

PIN: 017716.00 Town: Belfast, Waldo Sampler: WILDER, BRUCE H

TEST RESULTS

Sieve Analysis	(T 27,	Direct Shear (T 236)					
T 11)		Shear Angle, °					
Wash Method	t	Initial Water Conter	nt, %				
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 Thickness	ss. in				
1 in. [25.0 mm]			,				
3/4 in. [19.0 mm]	100.0	Consolidation (T 216)					
½ in. [12.5 mm]	98.6	Trimmings, Water Content, %					
% in. [9.5 mm]	96.5						
1/4 in. [6.3 mm]	91.7		Initia	I Final		Void	
No. 4 [4.75 mm]	87.1					Ratio	
No. 10 [2.00 mm]	74.8	Water Content, %			Pmin		
No. 20 [0.850 mm]	61.1	Dry Density, lbs/ft³			Pp		
No. 40 [0.425 mm]	50.9	Void Ratio			Pmax		
No. 60 [0.250 mm]	43.0	Saturation, %			Cc/C'c		
No. 100 [0.150 mm]	36.1			_			
No. 200 [0.075 mm] 28.3		Vane Shear Test on Shelby T					

Miscellaneous Tests									
Liquid Limit @ 25 blows									
(T 89)	<u>), %</u>								
Plastic Limit	: (T 90), %								
Plasticity Index (T 90), %									
Specific Gravity	, Corrected to								
20°C (T									
Loss on Ignit	ion (T 267)								
Loss, % H2O, %									
Water Conten	t (T 265), %								
10.	2								
	Liquid Limit (

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	e, ft tons/ft² tons/ft² tons/ft² tons/ft² %	%	various rube Deptils						

%

Strain

CC	m	me	ents:
_			

AUTHORIZATION AND DISTRIBUTION

Reported by: FOGG, BRIAN Date Reported: 3/16/2010



SAMPLE INFORMATION

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

236987 HB-WABE-107/S12 GEOTECHNICAL (DISTURBED) 2/4/2010 3/1/2010

Sample Type: GEOTECHNICAL Location: ROADWAY Station: 304+00 Offset, ft: 9.0 RT Dbfg, ft: 3.5-5.0

PIN: 017716.00 Town: Belfast, Waldo 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]	98.9				
% in. [9.5 mm]	98.6				
1/4 in. [6.3 mm]	97.5				
No. 4 [4.75 mm]	95.7				
No. 10 [2.00 mm]	90.9				
No. 20 [0.850 mm]	85.2				
No. 40 [0.425 mm]	81.2				
No. 60 [0.250 mm]	77.9				
No. 100 [0.150 mm]	74.7				
No. 200 [0.075 mm]	70.6				

	Miscellaneous T	ests					
Shear Angle, °						Liquid Limit @ 25 bl	<u>ows</u>
Initial Water Conten	t, %					<u>(T 89), %</u>	
Normal Stress, psi							
Wet Density, lbs/ft3						Plastic Limit (T 90)	<u>, %</u>
Dry Density, lbs/ft³							
Specimen Thickness, in						Plasticity Index (T 90)), %
	Consolidation (T 216) Trimmings, Water Content, %						cted to
Initi		Final		Void Ratio	% Strain	Loss on Ignition (T 2	267)
Water Content, %			Pmin			Loss, % H2O	<u>, %</u>
Dry Density, lbs/ft³			Рр				
Void Ratio			Pmax			Water Content (T 26	<u>5), %</u>
Saturation, % Cc/0			Cc/C'c			21.6	

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	ons/ft² tons/ft² tons/ft² tons/ft² %	%	various rube Depuis				

Co	mm	าen	Its:

AUTHORIZATION AND DISTRIBUTION

Reported by: FOGG, BRIAN Date Reported: 3/16/2010



SAMPLE INFORMATION

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

236988 HB-WABE-109/S13 GEOTECHNICAL (DISTURBED) 2/4/2010 3/1/2010

Sample Type: GEOTECHNICAL Location: ROADWAY Station: 367+20 Offset, ft: 8.0 RT Dbfg, ft: 0.3-0.7

PIN: 017716.00 Town: Belfast, Waldo Sampler: WILDER, BRUCE H

TEST RESULTS

Sieve Analysis		
T 11)	Shear Angle, ^c	
Wash Metho	d	Initial Water C
Procedure A	4	Normal Stress
SIEVE SIZE	%	Wet Density, II
U.S. [SI]	Passing	Dry Density, Ib
3 in. [75.0 mm]		Specimen Thic
1 in. [25.0 mm]		оресинения и
3/4 in. [19.0 mm]		
½ in. [12.5 mm]	100.0	Tri
3/4 in. [9.5 mm]	99.1	111
1/4 in. [6.3 mm]	94.4	
No. 4 [4.75 mm]	88.1	
No. 10 [2.00 mm]	69.4	Water Conten
No. 20 [0.850 mm]	50.9	Dry Density, Ib
No. 40 [0.425 mm]	36.2	Void Ratio
No. 60 [0.250 mm]	24.4	Saturation, %
No. 100 [0.150 mm]	14.8	
No. 200 [0.075 mm]	7.5	

	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 Thickness, in					Plasticity Inc	lex (T 90), %	
С	Consolidation (T 216)					Specific Gravit	y, Corrected to
Trimmin	gs, Wate	er Conter	nt, %				<u>T 100)</u>
	Initial	Final		Void Ratio	% Strain	Loss on Ign	ition (T 267)
Water Content, %			Pmin			Loss, %	<u>H2O, %</u>
Drv Densitv. lbs/ft3			Pp				

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	%	various rube Deptils		

Pmax

Cc/C'c

Water Content (T 265), %

6.6

Co	mm	าen	Its:

AUTHORIZATION AND DISTRIBUTION

Reported by: FOGG, BRIAN Date Reported: 3/16/2010



SAMPLE INFORMATION

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

236989 HB-WABE-109/S14 GEOTECHNICAL (DISTURBED) 2/4/2010 3/1/2010

Sample Type: GEOTECHNICAL Location: ROADWAY Station: 367+20 Offset, ft: 8.0 RT Dbfg, ft: 3.0-5.0

PIN: 017716.00 Town: Belfast, Waldo Sampler: WILDER, BRUCE H

TEST RESULTS

Sieve	Sieve Analysis (T 27, T 11)		Direct Shear (T 236)							
			Shear Angle, °							
V	ash Metho	d	Initial Water Conten	t, %						
	Procedure A	4	Normal Stress, psi							
_	E SIZE	%	Wet Density, lbs/ft3							
U.S	S. [SI]	Passing	Dry Density, lbs/ft3							
3 in. [75.	0 mm]		Specimen Thicknes	s, in						
1 in. [25.	0 mm]			-,						
3/4 in. [19	.0 mm]	100.0	C	onsoli	olidation (T 216)					
½ in. [12	.5 mm]	98.5	Trimmin	ins Wat	ter Conten	ıt %				
3/s in. [9.5	5 mm]	98.2		gs, wa	ici Conici	11, 70				
1/4 in. [6.3	3 mm]	96.9		Initial	Final		Void	%		
No. 4 [4.	75 mm]	96.4					Ratio	Strain		
No. 10 [2	2.00 mm]	95.3	Water Content, %			Pmin				
No. 20 [0).850 mm]	93.7	Dry Density, lbs/ft³			Рр				
No. 40 [0).425 mm]	92.6	Void Ratio			Pmax				
No. 60 [0).250 mm]	91.5	Saturation, %			Cc/C'c				
No. 100	[0.150 mm]	90.2	37	0:		61				
No. 200	[0.075 mm]	88.5			ear Tes	t on Sr	nelby I	ubes (
			0.1							

	Liquid Limit @ 25 blows (T 89), %						
	Plastic Limit (T 90), %						
	Plasticity Index (T 90), %						
	Specific Gravity, Corrected to 20°C (T 100)						
	Loss on Ignition (T 267)						
-	<u>Loss, %</u> <u>H2O, %</u> Water Content (T 265), %						
	21	.3					

Miscellaneous Tests

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

Con	ımeı	าเร:

AUTHORIZATION AND DISTRIBUTION

Reported by: FOGG, BRIAN Date Reported: 3/16/2010



INFORMATION SAMPLE

Reference No. Boring No./Sample No. Sample Description Received Sampled 2/4/2010 3/1/2010 236990 HB-WABE-111/S15 **GEOTECHNICAL (DISTURBED)**

Offset, ft: 8.5 RT Dbfg, ft: 0.7-2.9 Sample Type: **GEOTECHNICAL** Location: ROADWAY Station: 400+00

PIN: 017716.00 Town: Belfast, Waldo Sampler: WILDER, BRUCE H

y Density, Ibs/ft3

Sieve Analysis					
T 11)	Shear Angle, ^c				
Wash Method	d	Initial Water C			
Procedure A	\	Normal Stress			
SIEVE SIZE	%	Wet Density, II			
U.S. [SI]	Passing	Dry Density, Ib			
3 in. [75.0 mm]	3 in. [75.0 mm]				
1 in. [25.0 mm]	1 in. [25.0 mm]				
3/4 in. [19.0 mm]					
½ in. [12.5 mm]	100.0	Tri			
3/4 in. [9.5 mm]	93.9	111			
1/4 in. [6.3 mm]	85.5				
No. 4 [4.75 mm]	81.5				
No. 10 [2.00 mm]	65.6	Water Conten			
No. 20 [0.850 mm]	50.6	Dry Density, Ib			
No. 40 [0.425 mm]	40.9	Void Ratio			
No. 60 [0.250 mm]	Saturation, %				
No. 100 [0.150 mm]	30.5				
No. 200 [0.075 mm]	25.2				

	Miscellane	eous Tests					
Shear Angle, °			1				@ 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 Thickness	s, in					Plasticity Inc	lex (T 90), %
Consolidation (T 216)						Specific Gravit	y, Corrected to
Trimmings, Water Content, %						20 0 (1 100)
	Initial	Final		Void Ratio	% Strain	Loss on Ign	ition (T 267)
Water Content. %			Pmin			Loss, %	H2O, %

Pр

Pmax

Cc/C'c

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		various Tube Deptils		

Water Content (T 265), %

8.3

Co	mm	าen	Its:

A N D AUTHORIZATION DISTRIBUTION

Reported by: FOGG, BRIAN Date Reported: 3/16/2010



INFORMATION SAMPLE

Reference No. Boring No./Sample No. Sample Description Sampled Received 2/4/2010 3/1/2010 236991 HB-WABE-114/S16 **GEOTECHNICAL (DISTURBED)**

Sample Type: GEOTECHNICAL Location: ROADWAY Offset, ft: 9.5 RT Dbfg, ft: 0.7-3.0 Station: 504+00

PIN: 017716.00 Town: Belfast, Waldo Sampler: WILDER, BRUCE H

TEST RESULTS

_	Sieve Analysis (T 27,			
T 11)	Shear Angle, °			
Wash Metho	d	Initial Water Conten	ıt, '	
Procedure A	1	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.	
1 in. [25.0 mm]			-,	
3/4 in. [19.0 mm]	100.0	C	or	
½ in. [12.5 mm]	95.4	Trimmin	าตร	
% in. [9.5 mm]	94.3			
1/4 in. [6.3 mm]	89.9		ı	
No. 4 [4.75 mm]	86.4			
No. 10 [2.00 mm]	74.8	Water Content, %		
No. 20 [0.850 mm]	62.0	Dry Density, lbs/ft³		
No. 40 [0.425 mm]	50.8	Void Ratio		
No. 60 [0.250 mm]	41.8	Saturation, %		
No. 100 [0.150 mm]	34.1			
No. 200 [0.075 mm]			ın	
		0.1		

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	s, in					Plasticity Index (T 90), %
Consolidation (T 216) Trimmings, Water Content, %				Specific Gravity, Corrected to 20°C (T 100)		
	Initial	Final		Void Ratio	% Strain	Loss on Ignition (T 267)
Water Content, %			Pmin			<u>Loss, %</u> <u>H2O, %</u>
Dry Density, lbs/ft³			Рр			
Void Ratio			Pmax			Water Content (T 265), %
Saturation, %			Cc/C'c			6.3

Vane Shear Test on Shelby Tubes (Maine DOT)							
Depth	3 I	3 ln. 6 ln.				5	
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	

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A N D AUTHORIZATION DISTRIBUTION

Reported by: FOGG, BRIAN Date Reported: 3/16/2010



SAMPLE INFORMATION

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

236992 HB-WABE-114/S17 GEOTECHNICAL (DISTURBED) 2/4/2010 3/1/2010

Sample Type: GEOTECHNICAL Location: ROADWAY Station: 504+00 Offset, ft: 9.5 RT Dbfg, ft: 3.0-5.0

PIN: 017716.00 Town: Belfast, Waldo Sampler: WILDER, BRUCE H

TEST RESULTS

Sieve Analysis (T 27, T 11)					
Wash Method	Wash Method				
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]	98.2				
½ in. [12.5 mm]	95.2				
3/8 in. [9.5 mm]	93.5				
1/4 in. [6.3 mm]	88.2				
No. 4 [4.75 mm]	84.5				
No. 10 [2.00 mm]	75.5				
No. 20 [0.850 mm]	68.2				
No. 40 [0.425 mm]	63.5				
No. 60 [0.250 mm]	60.2				
No. 100 [0.150 mm]	56.6				
No. 200 [0.075 mm]	48.6				

	Direct S	hear (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	/et Density, lbs/ft³		Plastic Lim	it (T 90), %			
Dry Density, lbs/ft³							
Specimen Thicknes	s, in					Plasticity Inc	lex (T 90), %
С	onsolio	dation ((T 216)			Specific Gravit	v Corrected to
Trimmin	gs, Wate	er Conter	nt, %			-	T 100)
	Initial	Final		Void Ratio	% Strain	Loss on Ign	ition (T 267)
Water Content, %			Pmin	110000	0.0.0	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 1	ln.	Water	December of Metaniel Committee of the	
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	
İ							

23.6

Cc/C'c

Con	ımeı	าเร:

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Reported by: FOGG, BRIAN Date Reported: 3/16/2010

Paper Copy: Lab File; Project File; Geotech File

Saturation, %