

Maine Department of Transportation
Highway Program

GEOTECHNICAL 100 SERIES REPORT

Route 2
Canaan, Maine

Prepared by:
Scott A. Hayden, C.G.
Soils Research Scientist

Somerset County

WIN 17885.00
Federal Number STP-1788(500)
March 28, 2012

Soils Report No. 2012-119

Highway Program

Brad Foley, Program Manager

Memorandum

DATE: March 28, 2012

TO: Scott Rollins

DEPT: Highway Program

FROM: Scott A. Hayden

DEPT: Highway Program

SUBJECT: Final Soils: 17885.00 Canaan Rte. 2, Report # 2012-119

Project Description

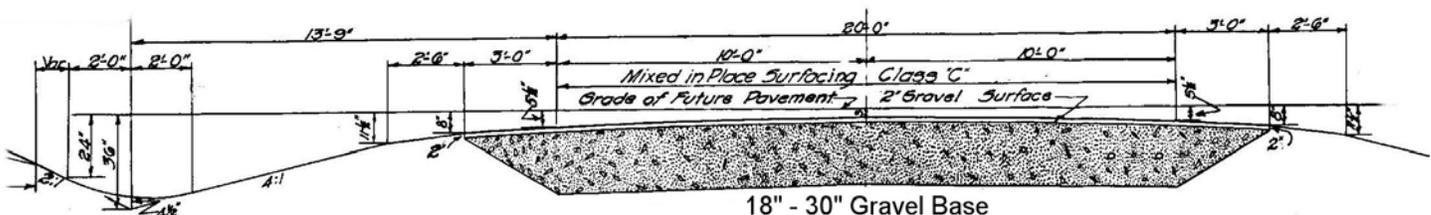
A subsurface investigation has been completed for a 1.67 mile portion of Route 2 in the town of Canaan. The project begins at the Skowhegan/Canaan town line (RLM 99.35) and extends easterly 1.67 miles to the easterly junction of Route 23. The investigation included the use of a drill rig, ground penetrating radar (GPR) and falling weight deflectometer (FWD). All station reference used for data collection was determined using a distance measuring instrument (DMI). All offsets were measured from the centerline of the existing roadway.

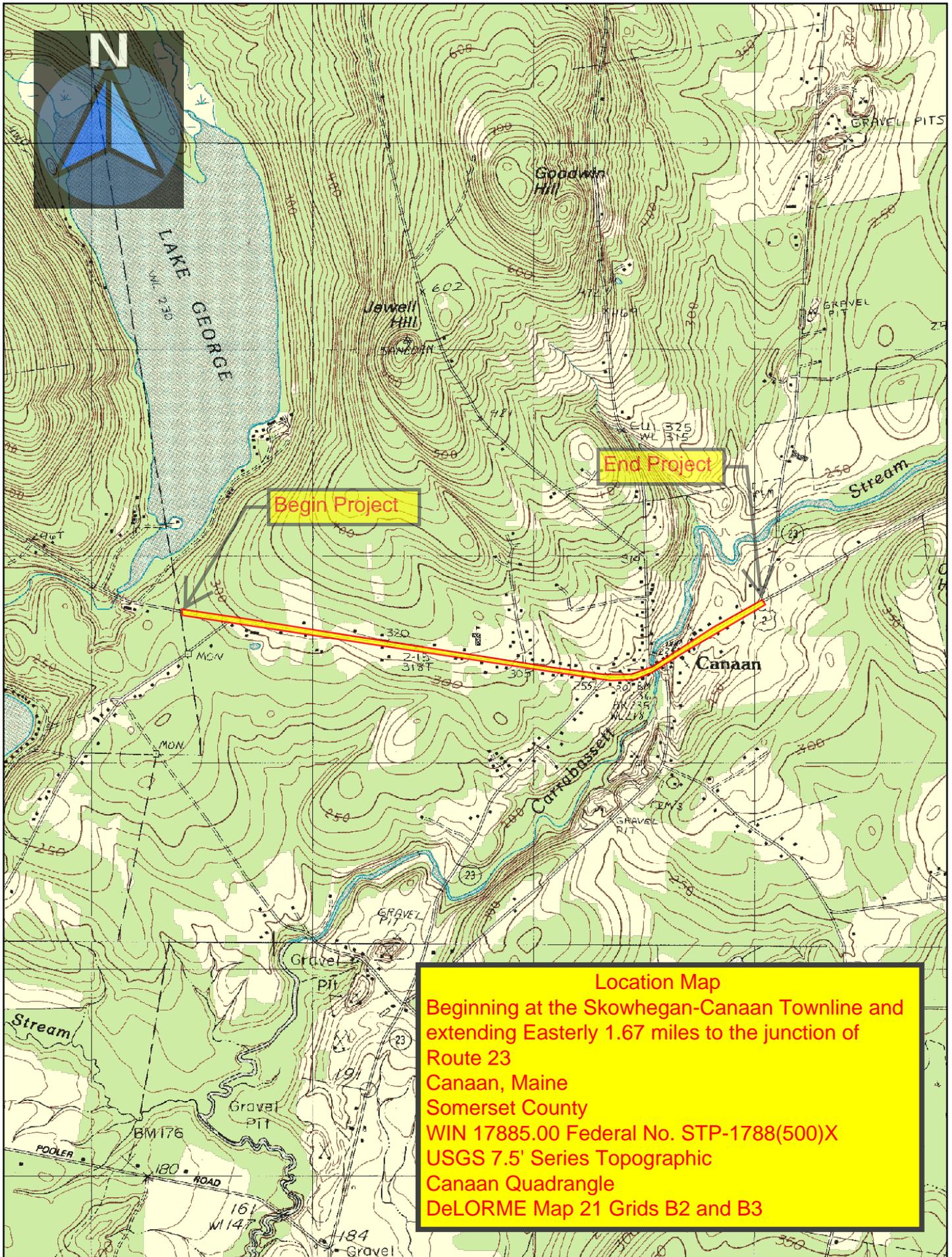
Existing Pavement Conditions

The existing roadway consists of two 12-foot travel lanes with 4-foot gravel shoulders. A maintenance surface treatment was applied to the roadway in 2007 (Pin 14556.22). Due to the overlay current pavement distress is minimal as indicated by the 2010 ARAN data (See ARAN Data). Pavement distress prior to the overlay was reported (Karen Gross, Maine DOT Memorandum, 12/18/2007) as "moderate in severity from RLM 99.57 to RLM 100.24, and is moderate to severe from RLM 100.24 to RLM 100.3"... "due to poor drainage conditions, truck/traffic loadings, thermal cracking, the lack of paved shoulders, fatigue, and frost effects".

As-built plans (Federal Aid Project No. 120-J (1), indicate the original highway was constructed in the 1940's with 10-foot travel lanes and 3-foot gravel shoulders. The pavement structure was built with 18" – 30" gravel base in the travel lanes that taper to the shoulders creating a bath tub section (See typical section below).

1940's As-Built Typical Section





Map Scale 1:24000

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

ARAN Data

ARAN data indicates pavement distress is slight. Rutting in the outside wheel path appears to be primary distress. A summary of 2010 ARAN data is presented in Table 1. A complete listing of the ARAN data is included at the back of this report.

Table 1: Summary of 2010 ARAN Pavement Data

ARAN Pavement Data	Range	Average
Pavement Condition Rating (PCR)	3.55 – 3.72	3.68
International Roughness Index (IRI)	107 - 129	120
Rut Depth (left)	0.1"	0.1"
Rut Depth (right)	0.2" – 0.4"	0.31"

Pavement Condition Rating (PCR)

PCR is defined as the composite condition of the pavement on a roadway. The PCR is compiled from the severity and extent of pavement distresses such as cracking, rutting, and ride quality. The rating system uses a scale of 5.00 (perfect) to 0.00 (fully deteriorated). The PCR is the condition of the pavement only, not necessarily a reflection of the condition of the roadway base structure (See Table 2).

Table 2: Pavement Condition Rating (PCR) Description

Scale Value	Scale Rating	Description
5	Excellent	New or nearly new pavements. Free of cracks, patches or rutting.
4	Good	Pavements exhibit little to no visible signs of surface deterioration. Evidence of initial cracking or rutting.
3	Fair	Visible defects including moderate cracking, distortion and rutting. Some patching may now be present.
2	Poor	Pavement deterioration consisting of advanced cracking and severe distortion. Extensive patching and rutting also present.
1	Very Poor	Extremely deteriorated pavements. Defects include severe cracking, distortion, rutting and typically very extensive patching.

The PCR rating for this project ranges from 3.55 – 3.72 with an average PCR of 3.68. The lowest PCR values (3.55) were encountered between stations 549+00 – 571+00.

International Roughness Index (IRI)

Ride quality is expressed in terms of International Roughness Index (IRI) and is measured in inches per mile. IRI is a measurement of the inches of vertical displacement experienced by a vehicle in a mile of roadway. The lower the IRI, the smoother the ride will be (See Table 3).

Table 3: IRI Rating Scale

IRI Value (In./mile)	Ride Rating
< 100	Good Ride
100 - 170	Fair Ride
> 170	Poor Ride

The IRI value for this project ranged between 107 - 129 in/mile with an average IRI value of 120 in/mile. The poorest IRI values were encountered between stations 549+00 – 571+00.

Wheel Path Rutting Values

Wheel path rutting values are measured in inches and are presented in the ARAN pavement data every 50 feet. Rutting depths of 0.1" was encountered in the inside wheel path throughout the project. Rutting depths ranged between 0.1" – 0.4" in the outside wheel path. The worse rutting was encountered in the outside wheel path between stations 518+00 – 549+00.

Boring/Coring/GPR Information

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

A total of 20 power auger borings were conducted along the project (See Boring Logs). Thirteen borings were conducted within the travel lane and 7 borings were conducted within the gravel shoulder area. Power auger borings were conducted using 5" solid stem augers. Boring locations were determined based upon FWD deflection results and visual observations made during an on-site visit. Soils were described and sampled from the auger flights.

A total of 15 soil samples were collected from the power auger borings and tested at the Maine DOT Materials and Testing laboratory, located in Bangor Maine. Grain size and water content testing was conducted on each sample. Based upon laboratory test results, soil samples were classified according to the Unified Classification System, AASHTO Soil Classification and Maine DOT Frost Susceptibility Rating. Testing results are summarized on the attached Laboratory Testing Summary Sheet.

Existing HMA Thickness

Existing pavement thickness estimates have been provided using power auger boring data and ground penetrating radar (GPR) data. See Table 4 for a summary comparison of existing pavement thickness estimates derived from boring data and GPR data.

Auger Data – Thirteen power auger borings were used to physically measure the existing pavement thickness.

GPR Data – GPR data was collected in the left and right wheel path and at the center of both the East and West bound travel lanes. This high speed data collection was conducted using an air launch antenna at 1 foot intervals along the entire project. Pavement thickness estimates were then developed using Geophysical Survey Systems Inc. (GSSI) RADAN GPR Data Processing Software. Boring data was used in developing these estimates when available. These results are consolidated and then presented as an average pavement thickness estimate per 100 feet along the full length of the project. See attached GPR Pavement Thickness Estimates.

Table 4: Pavement Thickness Summary/Comparison
(Auger data verses GPR Estimates)

Auger Data	
Range of Thickness	4.8" – 7.2"
Average Thickness	5.7"
GPR Data	
Range of Thickness	4.8" – 7.3"
Average Thickness	6.2"

Existing Base Material (Travel Lane & Shoulders)

Existing Base Material Type:	silty gravelly SAND
AASHTO Classification:	A-1-a, A-1-b
Unified Classification:	SW-SM, SM
Percent Passing #200:	11% - 24%
Range of Base Material Thickness:	16" – 40"
Average Thickness:	30"
Quality of Drainage (AASHTO):	poor
Permeability:	1' – 10' per day

The existing base material consists primarily of silty gravelly SAND. This material is classified (AASHTO) as A-1-a and A-1-b soils. These soils are relatively silty with 11% - 24% passing the # 200 sieve. Due to the high silt content the quality of drainage and permeability is poor. The base thickness beneath the travel lanes encountered in the 2011 power auger borings appears to be adequate and generally equals or exceeds the indicated thickness provided on the 1940's as-built plans. (See comparison chart on the following page). Borings conducted in the existing shoulders (15' offset) encountered similar material. The shoulder gravel thickness ranged between 10" - 60" with an average thickness of 32" suggesting the shoulders may have been reconstructed since the 1940 construction.

Canaan 17885.00

Boring Gravel Depth compared to 1940 Plans

Boring No.	Fed Proj	Fed Aid Proj	KEY	2011 Boring Data						Comments		
				Base			Subgrade					
				Material	Soils	Soil Type	200% Frost	AASHTO Sample #	200% Frost Moisture			
17885.00	2012	120-J(1)	1940?	Solid Pave Thick - SP	Unbound Pave - UP	Base Thickness (in)	Sample #	Moisture	AASHTO	Sample #	Moisture	
HB-CAN-101	507+06	187+69	4.8 SP	SiGSa	A-1-b	S1	15	II	SaSi	A-4	62	Note: Distinct difference between base material and underlying subgrade material
		18" gravel	29.4" Gravel				Damp		S2		Moist	
HB-CAN-103	515+06	195+69	6.6 SP	SiGSa	A-1-a	S3	11	0	SaSi	A-4	67	Note: Distinct difference between base material and underlying subgrade material
		24" gravel	34.2" Gravel				Damp		S4		Moist	
HB-CAN-105	521+06	201+69	7.2 SP	SiGSa	A-1-a	S3	11	0	GSiSa	A-1-b	24	Note: Underlying subgrade soil is granular
		24" gravel	19.2" Gravel				Damp		S5		Dry	
HB-CAN-106	525+06	205+69	4.8 SP	SiGSa	A-1-b	S6	15	II	SiSa	A-4	44	Note: Distinct difference between base material and underlying subgrade material
		18" gravel	31.8				Damp		S7		Moist	
HB-CAN-108	535+06	215+69	6.0 SP	SiGSa	A-1-b	S6	15	II	SiSa	A-4	44	Note: Distinct difference between base material and underlying subgrade material
		18" gravel	39.6" Gravel				Damp		S7		Moist	
HB-CAN-110	546+06	226+69	4.8 SP	SiGSa	A-1-b	S8	16	II	GSiSa	A-2-4	31	Note: Underlying subgrade soil is granular but twice as silty
		18" gravel	38.4" Gravel				Moist		S9		Damp	
HB-CAN-113	551+06	231+69	4.8 SP	GSiSa	A-1-b	S10	24	II	SaSi	A-4	56	Note: Distinct difference between base material and underlying subgrade material
		24" gravel	22.2" Gravel				Damp		S11		Moist	

Subgrade Soils

Based upon power auger boring data it is anticipated that the native subgrade soils will consist of silty SANDS and sandy SILTS. These moist to wet soils (glacial till) range widely in silt content from 24% - 76% and are highly frost susceptible. These soils are classified (AASHTO) as A-4 soils. With proper compaction and moisture control these soils can perform well as a subgrade soil. However, these soils will swell and lose much of their stability if not properly compacted and drained.

Bedrock

Based on power auger borings, power auger probes and FWD deflection data it is anticipated that bedrock will be relatively shallow at the locations listed below. Bedrock outcrops along the right between stations 567+50 – 568+50 and within the stream bed at the bridge crossing (573+00 – 573+50). The bedding of the Phyllite rock is near vertical and the strike is northeast. It is anticipated that blasting will be required for any substantial excavation of this bedrock surface.

Table 5: Possible Shallow Bedrock Areas

Station	Offset (Feet)	Source (Feet)	Refusal (Feet)	No Refusal (Feet)
515+06	9.0 Rt	Boring		5.0
515+06	15.0 Rt	Boring	2.5	
519+00 – 523+00	9 Rt	FWD	< 6 ?	
521+06	9.0 Rt	Boring		8.0
535+06	9.0, 15.0 Rt	Boring		5.0
535+06	9 Rt	FWD	< 6 ?	
546+06	9.0, 15.0 Rt	Boring		5.0
548+88	9 Rt	FWD	< 6 ?	
567+50 – 568+50	Bedrock Outcrop Right – Phyllite			
567+06	9.5 Rt.	Probe	7.0	
567+06	12.0 Rt.	Probe	6.0	
568+06	9.0 Lt.	Probe	3.1	
568+06	11.5 Rt.	Probe	2.1	
568+56	11.5 Rt.	Probe	5.9	
569+06	10.5 Rt.	Probe	7.5	
570+06	10.0 Rt.	Probe		10.0
572+06	9.0 Lt.	Probe	6.4	
572+06	10.0 Rt.	Probe		10.0
573+06	10.0 Lt.	Probe	5.6	
575+06	11.0 Rt.	Probe	3.1	
575+26	10.0 Lt.	Probe	1.5	
576+41	9.0 Rt.	Probe	4.0	
577+06	9.0 Lt.	Probe	1.4	
577+36	10.0 Rt.	Probe	1.1	
578+06	9.0 Lt.	Probe	7.5	
578+06	9.5 Rt.	Probe	7.5	

FWD Analysis

FWD testing was conducted at an interval of 200' along the length of this project. Testing was conducted in the right wheel path in the eastbound travel lane. A summary of the FWD analysis is presented in Table 6. The full FWD analysis is attached at the back of this report.

Table 6: Summary of FWD Analysis

Design Variables	% Fail	Range	Average	75 Percentile
Existing SN Fails to Meet Future SN	16%			
Pavement Modulus (psi)		24,158 – 133,521	80,395	60,820
Subgrade Resilient Modulus (psi)		3,646 – 24,158	6,109	5,680

Note: Mr values greater than 8000 psi were eliminated in the calculation of the 75th percentile and average.

FWD Deflection Plots

FWD deflection data for the pavement layer are relatively high. FWD deflections in the lower layers are relatively low and uniform between stations 505+00 and 577+00. This likely indicates that the base and subgrade soil conditions are uniform and are providing adequate support. Lower layer deflections become very low between stations 569+00 and 577+00 indicating the presence of shallow bedrock. Between stations 578+00 and 584+00 the lower layer deflections increase to the highest values encountered along the project. These elevated deflections may be the result of an increase in subgrade moisture content and/or a change in subgrade soil type. See attached FWD deflection plots.

Structural Number - The existing structural number fails to meet the future traffic structural number for 16% of this project. These failing values are limited to between stations 578+00 and 592+00. See attached FWD summary sheets.

Subgrade Resilient Modulus – Subgrade Resilient Modulus (Mr) values range between 3,646 psi and 24,158 psi. Mr values greater than 8000 psi may indicate the presence of relatively shallow bedrock. The 75th percentile has been calculated to be 5,680 psi. Values greater than 8000 psi were eliminated when calculating this percentile. The lowest Mr values along this project were encountered between Stations 578+00 and 584+00. These lower values may indicate moist to wet subgrade soil conditions.

Drainage

Existing ditching is inadequate or non-existent throughout much of the project area. This has caused shoulder erosion and subsequent pavement deterioration. Subsurface drainage is also questionable. Power auger borings encountered moist to wet soil conditions. As-built plans (1940's) depict a "bath tub" design which prevents any drainage of the base and subgrade soils. Power auger borings conducted within the existing shoulders encountered granular material similar to the existing base material indicating that the shoulders may have been reconstructed since the original 1940 construction. However, the thickness of this shoulder material varies considerably and the exact lateral extent is unknown. Because of these factors and the lack of ditching, it is anticipated that these shoulders are still not free draining. This lack of drainage promotes subsurface saturation of the pavement structure and the underlying silty, frost

susceptible, subgrade soils. This causes a reduction in strength of each soil layer and increases the potential for frost heave development.

Design Considerations

1. The results from this subsurface investigation support the preliminary report and design considerations presented by Karen Gross in her 12/18/2007 Maine DOT Memorandum. This memorandum was provided to Scott Rollins and Vanasse, Hangen, Brustlin (VHB) representatives at the August 25, 2011 pre-proposal/initial team meeting.
2. Although the results of this investigation suggest that the current gravel shoulders have been reconstructed to some extent since the original 1940 bath tub design, boxing of the shoulders to promote drainage of the pavement structure is still recommended due to the variance in the shoulder material thickness and lack of day lighting.

Performance Data Summary

Canaan Route 2
Highway Reconstruction
17885.00

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 obtained from subsurface exploration data and falling weight deflectometer (FWD) data. The 4 minimal criteria are:

1. existing pavement thickness (power auger borings)
2. existing base thickness (power auger borings)
3. subgrade resilient modulus (falling weight deflectometer)
4. existing/future structural number comparison (falling weight deflectometer)

The FWD data is calculated using the existing pavement thickness and base thickness in order to determine the relative strength or weakness of the existing pavement structure.

The PDS sheets are color coded and should be printed in color to fully utilize the information. Green indicates the minimum performance criteria have been met. Red indicates the minimum performance criteria have failed to be met. The total number of failed performance criteria is presented in the deficient column (DEF) for each FWD test station.

If an area fails to meet 2 or more of the minimal performance criteria the area is shaded in the deficiency column (DEF). It is anticipated that existing pavement performance will be less in these shaded areas. In addition, the risk of future pavement failure could also be higher.

By identifying potential roadway performance disparities specific design and construction options can be potentially considered. This could provide greater design flexibility and reduce costs by eliminating the over design or under design of large portions of a project.

Based upon the following Performance Data Summary sheets, 14 % of the project fails to meet 2 or more of the four minimum performance data criteria. Unbound pavement, base thickness, base quality, and the lack of drainage are all concerns with respect to future performance expectations.

* SP = Solid Pavement Layer

* UP = Unbound Pavement Layer

SP+UP = Total Pavement Thickness

* Base Thickness = Red indicates presence of “treated base”

Performance Data Summary

Canaan Route 2
Highway Reconstruction
17885.00

Station (FWD)	D E F	Minimum Performance Data Criteria				Boring Location (Plan View)	Base Material		Subgrade Soils	
							AASHTO Class	% #200	AASHTO Class	% #200
					KEY					
Station		Red – Fail Green - Met				Solid Pave Thick Unbound Pave - UP Base Thickness (inches)	Soil Type AASHTO Sample #	% 200 Frost Moisture	Soil Type AASHTO Sample #	% 200 Frost Moisture
					CL					
503+06	0						Canaan/Skowhegan Town Line			
505+06	0									
507+25	0					4.8 SP 1.8 UP 29.4	SiGSa A-1-b S1	15 II Damp	SaSi A-4 S2	62 IV Moist
509+06	0									
511+06	0									
513+06	0									
515+06	0					6.6 SP - 34.2	SiGSa A-1-a S3	11 0 Damp	SaSi A-4 S4	67 IV Moist
517+33	0									
519+06	0									
521+06	0					7.2 SP - 19.2	SiGSa A-1-a S3	11 0 Damp	GSiSa A-1-b S5	24 II Dry
523+06	0									
525+06	0					4.8 SP 3.0 UB 31.8	SiGSa A-1-b S6	15 II Damp	SiSa A-4 S7	44 III Moist
527+06	0									
529+06	0									
531+06	0									
533+06	0									
535+06	0					6.0 SP - 39.6	SiGSa A-1-b S6	15 II Damp	SiSa A-4 S7	44 III Moist
537+06	0									
539+06	0									
541+06	0									
543+06	0									

- * SP = Solid Pavement Layer
- * UP = Unbound Pavement Layer
- SP+UP = Total Pavement Thickness
- * Base Thickness = Red indicates presence of “treated base”

Performance Data Summary

Canaan Route 2
Highway Reconstruction
17885.00

Station (FWD)	D E F	Minimum Performance Data Criteria				Boring Location (Plan View)	Base Material		Subgrade Soils	
							AASHTO Class	% #200	AASHTO Class	% #200
					KEY					
Station		Red – Fail Green - Met				Solid Pave Thick - SP Unbound Pave - UP Base Thickness (inches)	Soil Type AASHTO Sample #	% 200 Frost Moisture	Soil Type AASHTO Sample #	% 200 Frost Moisture
					CL					
545+27	0					4.8 SP 2.4 UP 38.4	SiGSa A-1-b S8	16 II Moist	GSiSa A-2-4 S9	31 II Damp
548+88	0									
550+88	0					4.8 SP - 22.2	GSiSa A-1-b S10	24 II Damp	SaSi A-4 S11	56 IV Moist
552+88	0									
554+88	0									
556+88	0									
558+88	0					6.0 SP - 20.4	GSiSa A-1-b S10	24 II Damp	GSiSa A-1-b S5	24 II Dry
560+89	0									
562+88	0									
564+89	0					6.0 SP - 36.0	SiGSa A-1-b S12	17 II Damp	SaSi A-4 S13	76 IV Wet 3.5'
566+88	0						Power Auger Probes encountered bedrock refusals. See Power Auger Probe Summary Sheet. High Subgrade Modulus due to shallow rock.			
568+88	0						Power Auger Probes encountered bedrock refusals. See Power Auger Probe Summary Sheet. High Subgrade Modulus due to shallow rock.			
570+91	0						Power Auger Probes encountered bedrock refusals. See Power Auger Probe Summary Sheet. High Subgrade Modulus due to shallow rock.			
572+88	0					6.0 SP - 45.6	SiGSa A-1-b S12	17 II Damp	Refusal 4.3'	
574+93	0						Power Auger Probes encountered bedrock refusals. See Power Auger Probe Summary Sheet. High Subgrade Modulus due to shallow rock.			
576+90	1						Power Auger Probes encountered bedrock refusals. See Power Auger Probe Summary Sheet. High Subgrade Modulus due to shallow rock.			
578+91	2						Power Auger Probes encountered bedrock refusals. See Power Auger Probe Summary Sheet. High Subgrade Modulus due to shallow rock.			
582+87	2					6.0 SP - 15.6	SiGSa A-1-b S14	19 II Damp	SaSi A-4 S15	54 IV Moist
584+91	2									
586+89	2									
588+89	2									
591+21	2									

- * SP = Solid Pavement Layer
- * UP = Unbound Pavement Layer
- SP+UP = Total Pavement Thickness
- * Base Thickness = Red indicates presence of "treated base"

ARAN DATA

Canaan Route 2
17885.00

Station	RLM	Inv	Yr	ARAN DATA			
				PCR < 3.5	IRI > 150	Rut Depth > 0.5"	
						Left (in.)	Right (in.)
503+06	99.35	2010	3.79	107	0.1	0.2	
503+59	99.36	2010	3.79	107	0.1	0.2	
510+98	99.5	2010	3.79	107	0.1	0.2	
517+32	99.62	2010	3.79	107	0.1	0.2	
518+37	99.64	2010	3.71	116	0.1	0.4	
527+35	99.81	2010	3.71	116	0.1	0.4	
537+38	100	2010	3.71	116	0.1	0.4	
540+55	100.06	2010	3.71	116	0.1	0.4	
542+66	100.1	2010	3.71	116	0.1	0.4	
544+24	100.13	2010	3.71	116	0.1	0.4	
548+47	100.21	2010	3.71	116	0.1	0.4	
549+52	100.23	2010	3.55	129	0.1	0.3	
551+64	100.27	2010	3.55	129	0.1	0.3	
554+28	100.32	2010	3.55	129	0.1	0.3	
558+50	100.4	2010	3.55	129	0.1	0.3	
559+03	100.41	2010	3.55	129	0.1	0.3	
561+14	100.45	2010	3.55	129	0.1	0.3	
563+25	100.49	2010	3.55	129	0.1	0.3	
566+95	100.56	2010	3.55	129	0.1	0.3	
570+64	100.63	2010	3.55	129	0.1	0.3	
571+70	100.65	2010	3.72	121	0.1	0.3	
572+76	100.67	2010	3.72	121	0.1	0.3	
573+81	100.69	2010	3.72	121	0.1	0.3	
575+92	100.73	2010	3.72	121	0.1	0.3	
576+98	100.75	2010	3.72	121	0.1	0.3	
580+68	100.82	2010	3.72	121	0.1	0.3	
587+01	100.94	2010	3.72	121	0.1	0.3	
589+12	100.98	2010	3.72	121	0.1	0.3	
590+18	101	2010	3.72	121	0.1	0.3	
591+24	101.02	2010	3.72	121	0.1	0.3	

AVERAGE

3.68

120

0.10

0.31

February 17, 2012

Falling Weight Deflectometer (FWD) Summary Sheet

Project #: 17885.00
Town(s): Canaan
Route(s): 2
Date Tested: 10/13/2010
Requested By: S. Hayden
Direction of Testing: West to East

# Of FWD tests: 43	# Of Power Augers/Spoons - 12
Design Life: 20 Yrs	Future 18-kip ESALs (Design Life): 5,686,700
Initial Serviceability: 4.5	Terminal Serviceability: 2.5
Reliability Level: 95	Overall Standard Deviation: .45

Locations

Station (Feet)

Description

Project Stationing

Comments:

Except for actual Geotechnical boring locations, pavement depths used for DARWin analysis were taken from Ground Penetrating Radar Summary sheets.

STATE OF MAINE

FILE: RTE 2

INTERDEPARTMENTAL MEMORANDUM

Date of Request: 9/29/2010 Return: 10/06/2010

Latest Date Needed By 12/3/2010

To: **Ed Hanscom**

Dept.: MDOT, Bureau of Planning

From: **Mark Shibles**

Dept.: Western Region

Subject: **Request for Traffic Information**

Project Manager: **Heath Cowan**

TOWN(S): Canaan

P.I.N. **17886.00**

Consultant Proj

COUNTY: Somerset

ROUTE: 2

LOCATION/
DESCRIPTION:

Beginning 0.71 of a mile easterly of Oak Pond Road and extending easterly 0.83 of a mile to the easterly junction of Route 23 (Hartland Road).

	Roadway Changes or Relocation (Attach Sketch)	Turning Movement needed (Provide Locations under Comments)	Other Please Describe Under Comments
Please Check Box if Applicable:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Prep By: MAM

Sec. 1

Sec. 1

Sec. 2

Sec. 2

Sec. 5

Description of Sections

Canaan - US 2
W/O SR 23

Canaan - US 2
W/O SR 23

Canaan - US 2
NE/O SR 23 (E.
Jct.)

Canaan - US 2
NE/O SR 23 (E.
Jct.)

1 Latest AADT (Year)	<u>6950 (2008)</u>	<u>6950 (2008)</u>	<u>4980 (2008)</u>	<u>4980 (2008)</u>	<u> </u>
2 Current 2011 AADT	<u>6950</u>	<u>6950</u>	<u>4980</u>	<u>4980</u>	<u> </u>
3 Future 2031 AADT	<u>7780</u>	<u> </u>	<u>5580</u>	<u> </u>	<u> </u>
4 Future <u> </u> AADT	<u> </u>	<u>8340</u>	<u> </u>	<u>5980</u>	<u> </u>
5 DHV - % of AADT	<u>10%</u>	<u>10%</u>	<u>10%</u>	<u>10%</u>	<u> %</u>
6 Design Hourly Volume	<u>778</u>	<u>834</u>	<u>558</u>	<u>598</u>	<u> </u>
7 % Heavy Trucks (AADT)	<u>12%</u>	<u>12%</u>	<u>15%</u>	<u>15%</u>	<u> %</u>
8 % Heavy Trucks (DHV)	<u>10%</u>	<u>10%</u>	<u>12%</u>	<u>12%</u>	<u> %</u>
9 Direct.Dist. (DHV)	<u>55%</u>	<u>55%</u>	<u>55%</u>	<u>55%</u>	<u> %</u>
10 18-KIP Equivalent P 2.0	<u>796</u>	<u>900</u>	<u>1129</u>	<u>1274</u>	<u> </u>
11 18-KIP Equivalent P 2.5	<u>758</u>	<u>857</u>	<u>1075</u>	<u>1213</u>	<u> </u>

Notes or Remarks: 18-Kip ESALS is based on 12 & 20 year life

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

Need Only Data Items Numbered

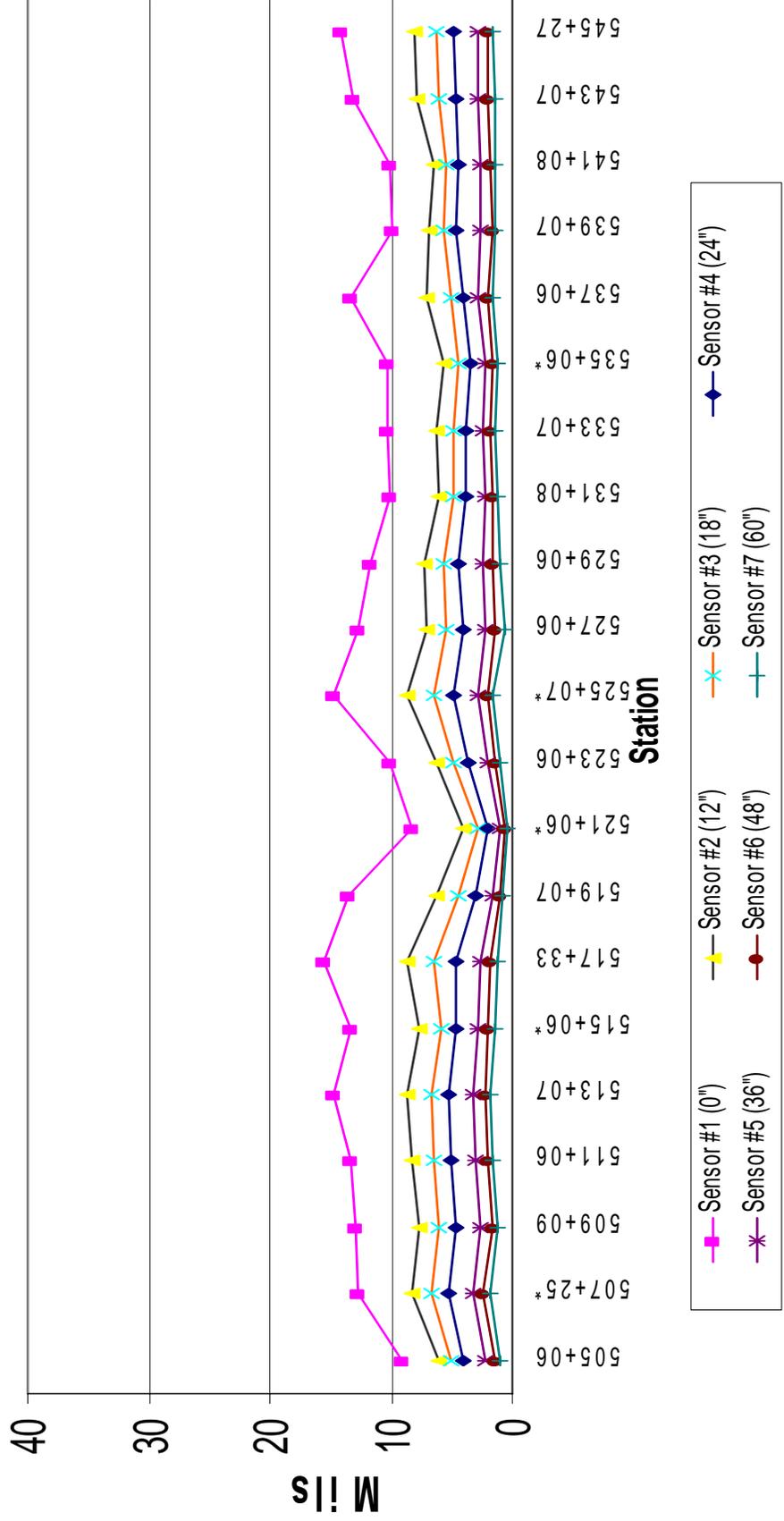
2,3,5,6,7,8,9,10,11

Comments:

Please use the esal values for Section 1 W/O SR 23(West Jct.)
and Section 2 esal values E/O SR 23 (East Jct.)

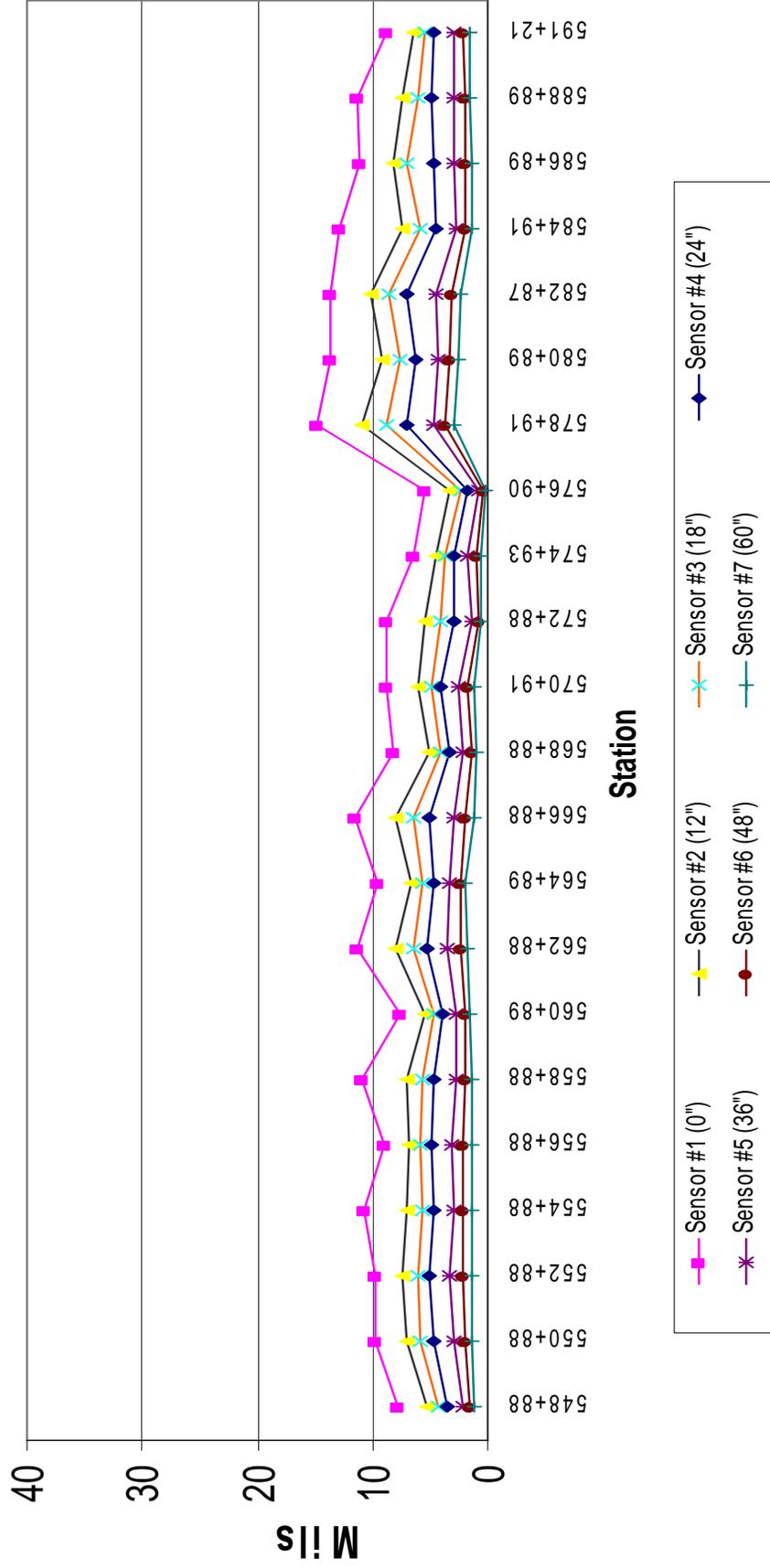
FWD Deflection Plots

17885.00 Canaan



FWD Deflection Plots

17885.00 Canaan



**Canaan Route #2
17885.00**

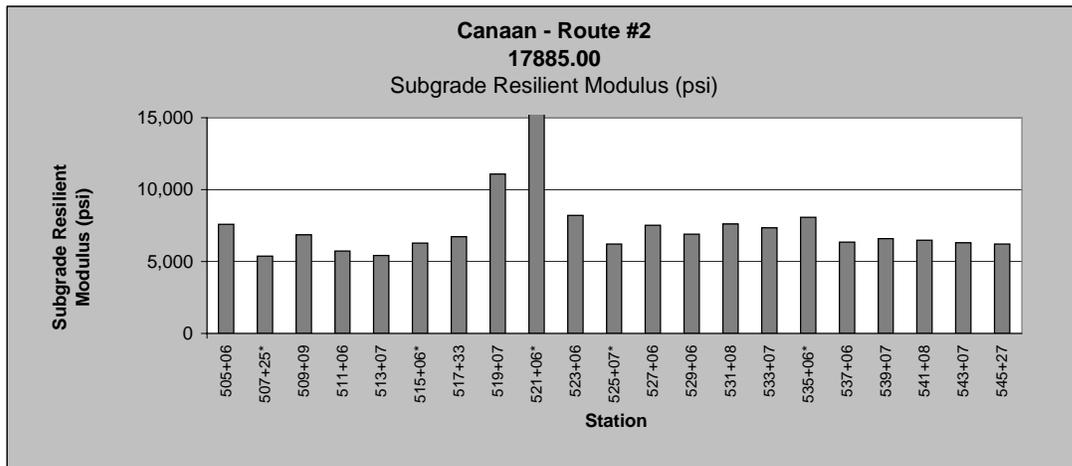
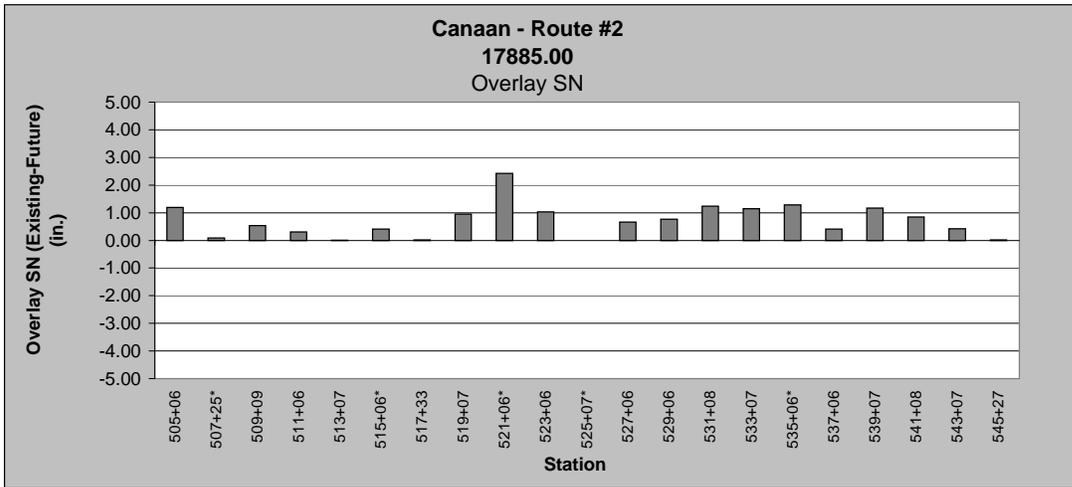
March 7, 2012

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)
505+06	5.79	4.60	1.19	-	79,076	7,585	5.4	30.0
507+25*	5.23	5.14	0.09	-	58,127	5,380	4.8	30.0
509+09	5.29	4.76	0.53	-	60,297	6,857	5.5	30.0
511+06	5.34	5.03	0.31	-	61,828	5,741	5.6	30.0
513+07	5.14	5.13	0.01	-	55,276	5,422	5.9	30.0
515+06*	5.30	4.89	0.41	-	60,594	6,283	6.6	30.0
517+33	4.81	4.79	0.02	-	45,261	6,720	6.2	30.0
519+07	5.00	4.05	0.95	-	50,669	11,076	6.3	30.0
521+06*	5.83	3.41	2.42	-	80,403	18,076	7.2	30.0
523+06	5.51	4.48	1.03	-	68,176	8,215	6.6	30.0
525+07*	4.91	4.91	0.00	-	48,239	6,227	4.8	30.0
527+06	5.27	4.61	0.66	-	59,503	7,524	6.3	30.0
529+06	5.51	4.74	0.77	-	68,064	6,902	6.1	30.0
531+08	5.84	4.60	1.24	-	81,024	7,605	6.2	30.0
533+07	5.80	4.65	1.15	-	79,224	7,356	6.3	30.0
535+06*	5.79	4.51	1.28	-	79,025	8,069	6.0	30.0
537+06	5.28	4.87	0.41	-	59,768	6,357	6.1	30.0
539+07	5.99	4.82	1.17	-	87,467	6,583	6.2	30.0
541+08	5.69	4.84	0.85	-	74,809	6,482	6.1	30.0
543+07	5.31	4.89	0.42	-	60,897	6,300	6.2	30.0
545+27	4.93	4.91	0.02	-	48,829	6,211	6.3	30.0

* Boring Location

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

For actual Gravel Depths, see logdraft forms - Except for actual boring locations (*), pavement depths were taken from Ground Penetrating Radar Summa



**Canaan Route #2
17885.00**

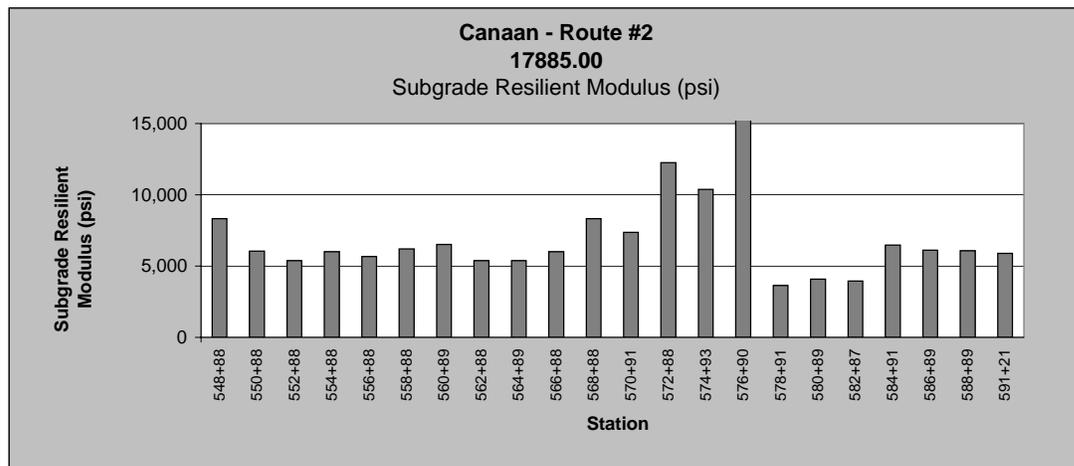
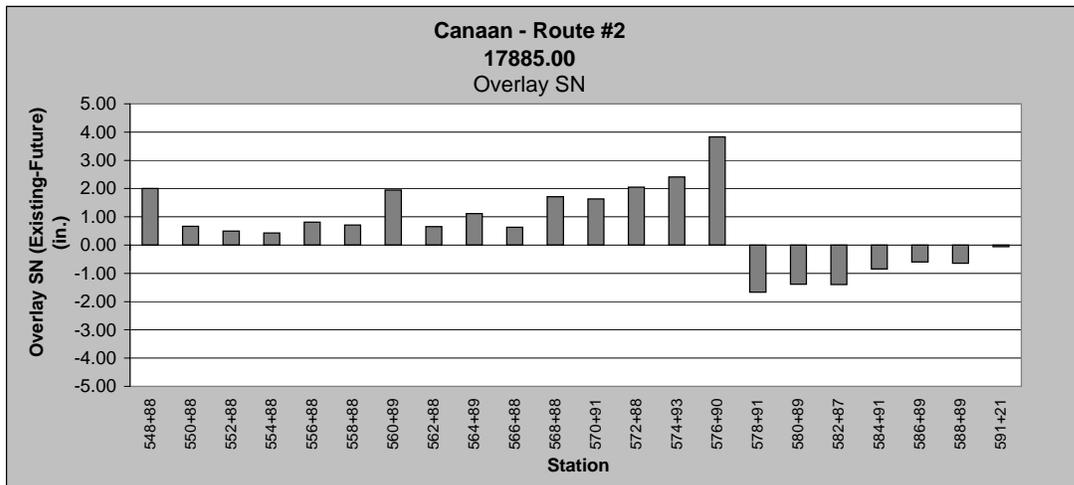
March 7, 2012

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)
548+88	6.47	4.46	2.01	-	110,148	8,318	4.9	30.0
550+88	5.62	4.95	0.67	-	94,468	6,039	6.6	27.4
552+88	5.64	5.14	0.50	-	95,853	5,387	6.5	27.4
554+88	5.39	4.96	0.43	-	83,412	6,007	6.1	27.4
556+88	5.87	5.06	0.81	-	108,124	5,660	6.0	27.4
558+88	5.62	4.91	0.71	-	72,769	6,207	6.5	30.0
560+89	6.79	4.84	1.95	-	127,227	6,507	6.3	30.0
562+88	5.79	5.14	0.65	-	78,720	5,372	6.6	30.0
564+89	6.26	5.14	1.12	-	99,486	5,386	6.0	30.0
566+88	5.59	4.96	0.63	-	70,902	6,006	6.6	30.0
568+88	6.17	4.46	1.71	-	95,673	8,324	6.8	30.0
570+91	6.27	4.64	1.63	-	100,286	7,369	6.6	30.0
572+88	5.96	3.91	2.05	-	86,207	12,255	6.0	30.0
574+93	6.55	4.14	2.41	-	114,446	10,382	6.3	30.0
576+90	6.90	3.07	3.83	-	133,521	24,158	6.3	30.0
578+91	4.13	5.80	-1.67	3.80	76,451	3,646	6.6	21.6
580+89	4.21	5.60	-1.39	3.16	81,336	4,076	6.2	21.6
582+87	4.26	5.66	-1.40	3.18	84,072	3,947	7.0	21.6
584+91	4.00	4.85	-0.85	1.93	69,855	6,465	6.2	21.6
586+89	4.34	4.94	-0.60	1.36	89,192	6,110	5.8	21.6
588+89	4.31	4.95	-0.64	1.45	87,445	6,067	5.5	21.6
591+21	4.93	4.99	-0.06	0.14	130,829	5,904	7.1	21.6

* Boring Location

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

For actual Gravel Depths, see logdraft forms - Except for actual boring locations (*), pavement depths were taken from Ground Penetrating Radar Summa



17885.00 Canaan - Route #2
Estimated Pavement Thickness
Ground Penetrating Radar (GPR)

Explanation of Ground Penetrating Radar (GPR) Data Collection and Analysis:

For Project 17885.00 (Canaan), GPR data was collected in the left and right wheel path and at the center of both the East and West bound lanes. Data was collected at 1/2 foot intervals along the entire section. Pavement thickness estimates were developed using Geophysical Survey Systems Inc. (GSSI) RADAN GPR Data Processing Software. Where available, pavement thicknesses from pavement cores and Geotechnical borings collected by MaineDOT personnel were used in developing the estimated GPR pavement thicknesses.

GPR pavement thickness averages are to be considered for estimating purposes only.
Actual pavement thickness may vary.

Analysis Distance (ft) - 100

Overall Average Thickness (in.) 6.2

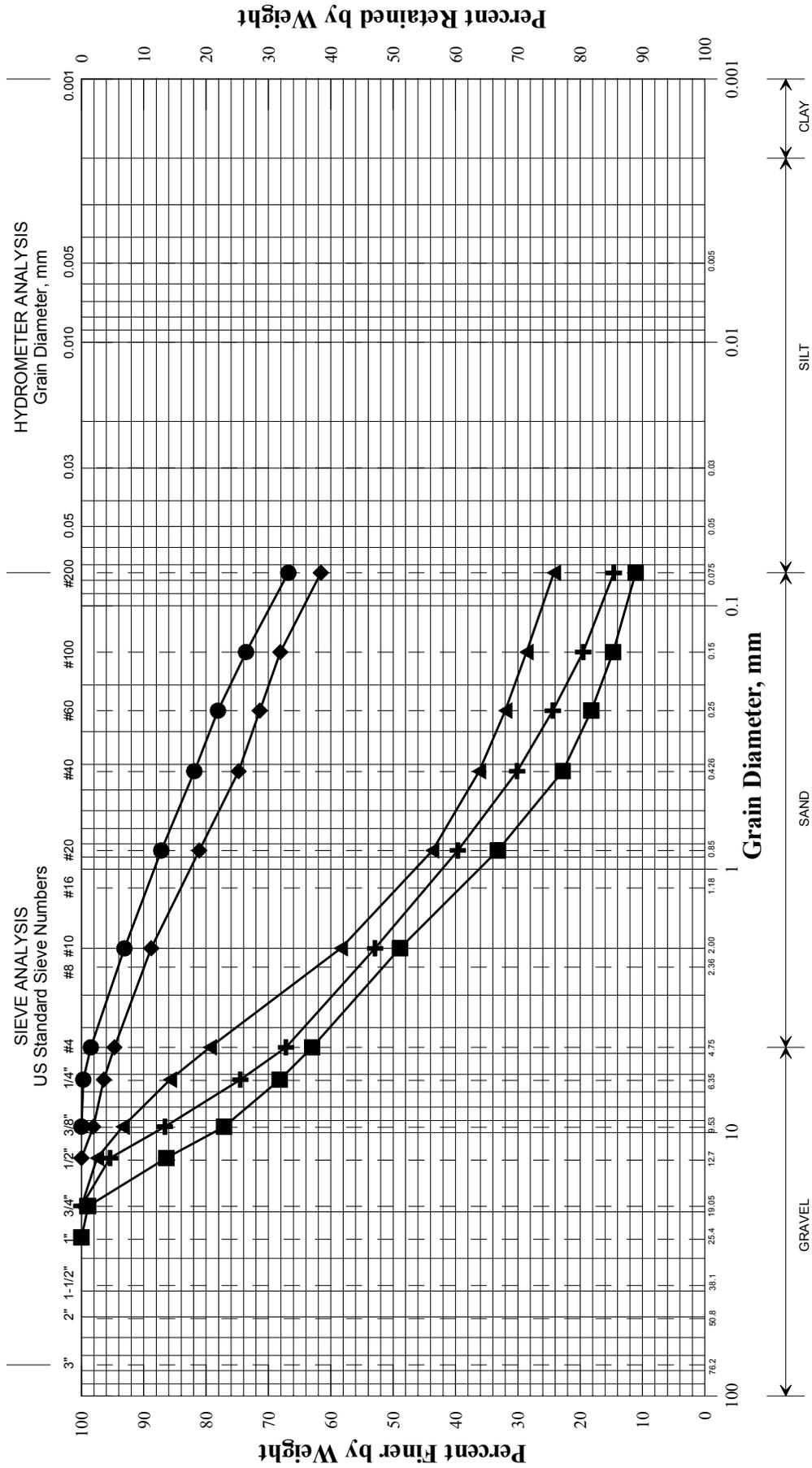
Overall Minimum Thickness (in.) 4.8

Overall Maximum Thickness (in.) 7.1

17885.00 Canaan - Route #2

Station Limits	Average Depth (in)						
503+06	5.3	518+06	6.2	533+06	6.4	548+06	4.8
504+06	5.8	519+06	6.2	534+06	6.3	549+06	5.0
505+06	5.5	520+06	6.3	535+06	6.1	550+06	5.8
506+06	6.0	521+06	6.5	536+06	6.1	551+06	6.5
507+06	5.5	522+06	6.6	537+06	6.4	552+06	6.6
508+06	5.1	523+06	6.8	538+06	6.1	553+06	6.3
509+06	6.1	524+06	6.6	539+06	6.4	554+06	6.2
510+06	5.6	525+06	6.4	540+06	6.0	555+06	5.9
511+06	5.3	526+06	6.5	541+06	5.9	556+06	5.7
512+06	5.7	527+06	6.5	542+06	6.2	557+06	6.0
513+06	5.7	528+06	6.1	543+06	6.5	558+06	6.5
514+06	6.2	529+06	6.4	544+06	6.3	559+06	6.2
515+06	5.9	530+06	6.3	545+06	6.3	560+06	6.3
516+06	5.9	531+06	6.0	546+06	6.2	561+06	6.5
517+06	6.1	532+06	6.2	547+06	5.1	562+06	6.6
518+06		533+06		548+06		563+06	

State of Maine Department of Transportation
GRAIN SIZE DISTRIBUTION CURVE

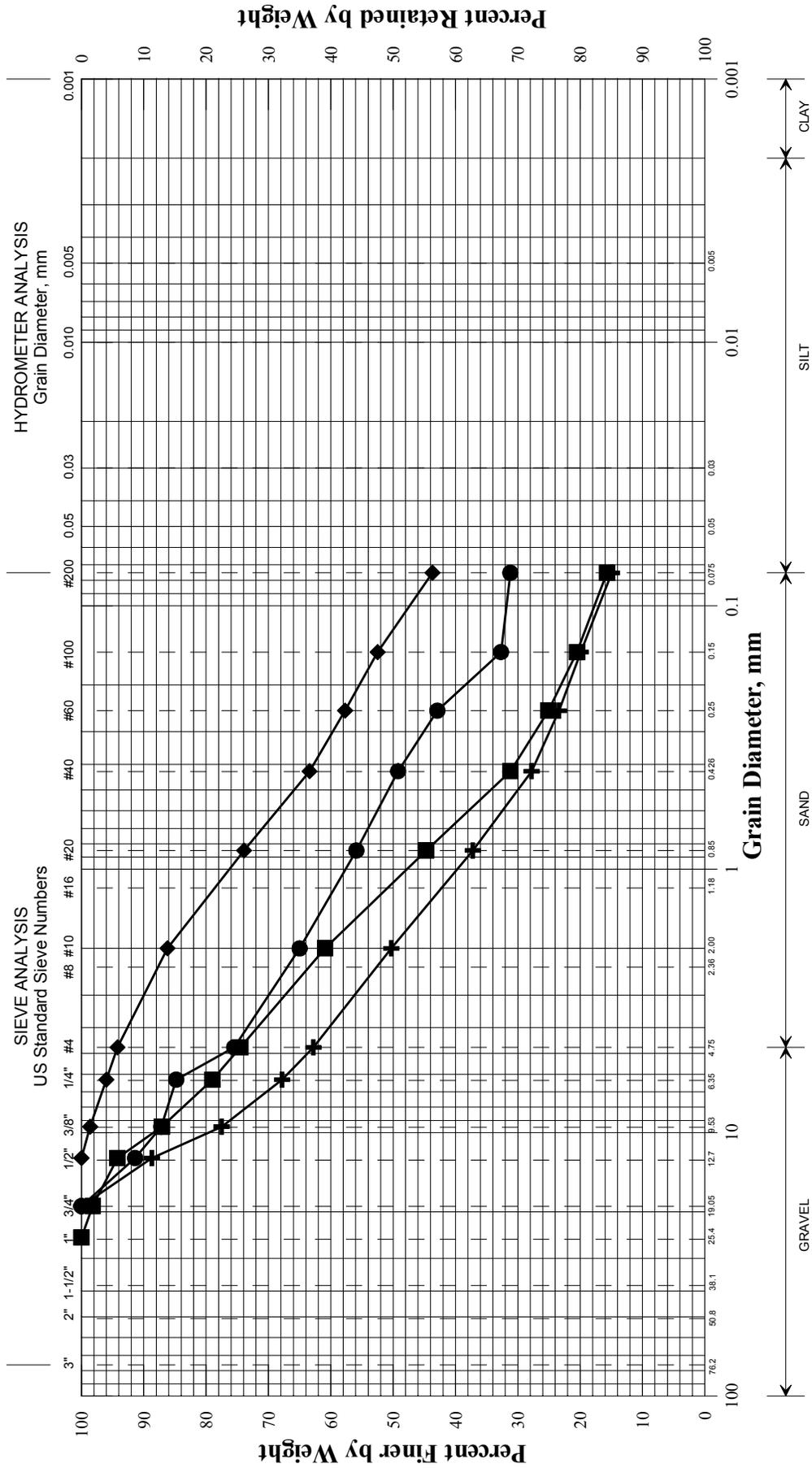


UNIFIED CLASSIFICATION

Boring/Sample No.	Station	Offset, ft	Depth, ft	Description	W, %	LL	PL	PI
+	507+06	9.0 RT	0.55-3.0	SAND, some gravel, little silt.	3.2			
◆	507+06	9.0 RT	3.0-5.0	SILT, some sand, trace gravel.	15.7			
■	515+06	9.0 RT	0.55-3.4	Gravelly SAND, little silt.	3.1			
●	515+06	9.0 RT	3.4-5.0	SILT, some sand, trace gravel.	14.7			
▲	521+06	9.0 RT	2.2-8.0	SAND, some silt, some gravel.	4.3			
×								

WIN	017885.00
Town	Canaan
Reported by/Date	WHITE, TERRY A 1/31/2011

State of Maine Department of Transportation
GRAIN SIZE DISTRIBUTION CURVE

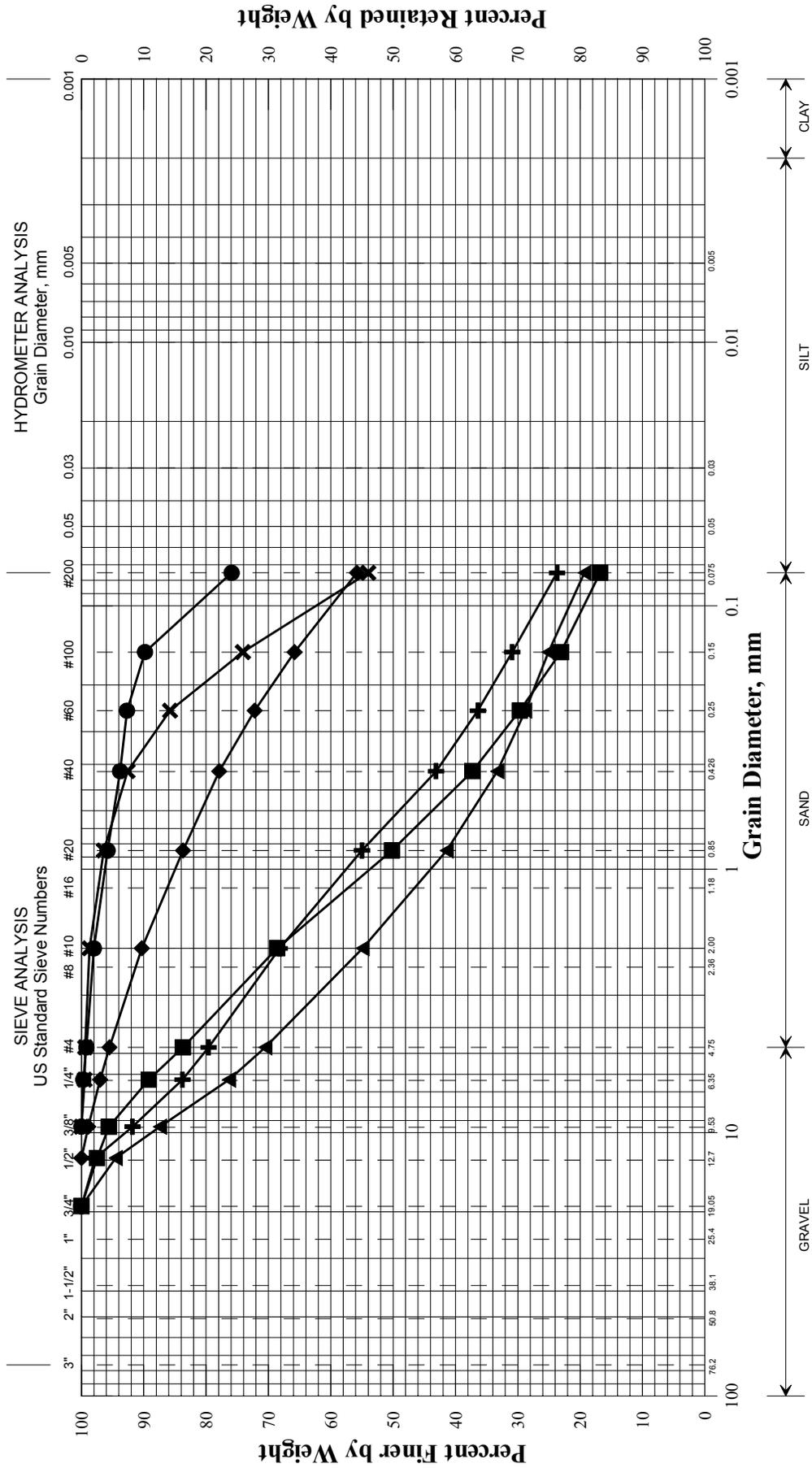


UNIFIED CLASSIFICATION

Boring/Sample No.	Station	Offset, ft	Depth, ft	Description	W, %	LL	PL	PI
+ HB-CAN-106/S6	525+06	9.0 RT	0.65-3.3	Gravelly SAND, little silt.	4.0			
◆ HB-CAN-106/S7	525+06	9.0 RT	3.3-5.0	Silty SAND, trace gravel.	13.3			
■ HB-CAN-110/S8	546+06	9.0 RT	0.6-3.8	SAND, some gravel, little silt.	5.0			
● HB-CAN-110/S9	546+06	9.0 RT	3.8-5.0	SAND, some silt, some gravel.	7.7			
▲								
×								

WIN	017885.00
Town	Canaan
Reported by/Date	WHITE, TERRY A 1/31/2011

State of Maine Department of Transportation
GRAIN SIZE DISTRIBUTION CURVE



UNIFIED CLASSIFICATION

Boring/Sample No.	Station	Offset, ft	Depth, ft	Description	W, %	LL	PL	PI
+	551+06	9.0 RT	0.55-2.4	SAND, some silt, little gravel.	6.8			
◆	551+06	9.0 RT	2.4-5.0	Sandy SILT, trace gravel.	14.1			
■	565+06	8.0 RT	0.5-3.5	SAND, little silt, little gravel.	4.3			
●	565+06	8.0 RT	3.5-5.0	SILT, little silt, trace gravel.	20.3			
▲	582+06	9.0 RT	0.5-1.8	SAND, some gravel, little silt.	3.6			
×	582+06	9.0 RT	1.8-5.0	Sandy SILT, trace gravel.	23.6			

WIN	017885.00
Town	Canaan
Reported by/Date	WHITE, TERRY A 3/7/2012

Driller: MaineDOT	Elevation (ft.):	Auger ID/OD: 5" Dia.
Operator: Giguere/Giles	Datum: NAVD 88	Sampler: Off Flights
Logged By: B. Wilder	Rig Type: CME 45C	Hammer Wt./Fall: N/A
Date Start/Finish: 1/5/11-1/5/11	Drilling Method: Solid Stem Auger	Core Barrel: N/A
Boring Location: 507+06, 9.0 Rt.	Casing ID/OD: N/A	Water Level*: None Observed

Definitions: D = Split Spoon Sample MD = Unsuccessful Split Spoon Sample attempt U = Thin Wall Tube Sample R = Rock Core Sample V = Insitu Vane Shear Test SSA = Solid Stem Auger	Definitions: S _u = Insitu Field Vane Shear Strength (psf) T _v = Pocket Torvane Shear Strength (psf) q _p = Unconfined Compressive Strength (ksf) S _u (lab) = Lab Vane Shear Strength (psf) WOH = weight of 140lb. hammer WOR = weight of rods. WOC = weight of casing	Definitions: WC = water content, percent LL = Liquid Limit PL = Plastic Limit PI = Plasticity Index G = Grain Size Analysis C = Consolidation Test
---	--	--

Sample Information										Visual Description and Remarks	Laboratory Testing Results/AASHTO and Unified Class.
Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (6 in.) Shear Strength (psf) or RQD (%)	N-value	Casing Blows	Elevation (ft.)	Graphic Log			
0	S1		0.55 - 3.00			SSA	-0.40 -0.55		PAVEMENT. Unbound Pavement. Brown, damp, gravelly, fine to coarse SAND, trace silt.	G#245501 A-1-b, SM WC=3.2%	
							-3.00		Brown, moist, fine to medium Sandy-SILT.	G#245502 A-4, ML WC=15.7%	
5	S2		3.00 - 5.00				-5.00		Bottom of Exploration at 5.00 feet below ground surface. NO REFUSAL		
10											
15											
20											
25											

Remarks:
 Offsets are from CL of Existing Roadway.

Driller: MaineDOT	Elevation (ft.):	Auger ID/OD: 5" Dia.
Operator: Giguere/Giles	Datum: NAVD 88	Sampler: Off Flights
Logged By: B. Wilder	Rig Type: CME 45C	Hammer Wt./Fall: N/A
Date Start/Finish: 1/5/11-1/5/11	Drilling Method: Solid Stem Auger	Core Barrel: N/A
Boring Location: 507+06, 15.0 Rt.	Casing ID/OD: N/A	Water Level*: None Observed

Definitions: D = Split Spoon Sample MD = Unsuccessful Split Spoon Sample attempt U = Thin Wall Tube Sample R = Rock Core Sample V = Insitu Vane Shear Test SSA = Solid Stem Auger	Definitions: S _u = Insitu Field Vane Shear Strength (psf) T _v = Pocket Torvane Shear Strength (psf) q _p = Unconfined Compressive Strength (ksf) S _u (lab) = Lab Vane Shear Strength (psf) WOH = weight of 140lb. hammer WOR = weight of rods. WOC = weight of casing	Definitions: WC = water content, percent LL = Liquid Limit PL = Plastic Limit PI = Plasticity Index G = Grain Size Analysis C = Consolidation Test
---	--	--

Sample Information											Visual Description and Remarks	Laboratory Testing Results/AASHTO and Unified Class.
Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows ((6 in.) Shear Strength (psf) or RQD (%))	N-value	Casing Blows	Elevation (ft.)	Graphic Log				
0						SSA		[Graphic Log]			Brown, damp, gravelly, fine to coarse SAND, trace silt. ≈S1	
							-3.80				Brown, moist, fine to medium Sandy-SILT. ≈S2	-3.80
5							-5.00				Bottom of Exploration at 5.00 feet below ground surface. NO REFUSAL	-5.00
10												
15												
20												
25												

Remarks:
 Offsets are from CL of Existing Roadway.
 PC-1, Sta. 507+06, 9.0 ft Lt. 0.0-0.55

* 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.

Driller: MaineDOT	Elevation (ft.):	Auger ID/OD: 5" Dia.
Operator: Giguere/Giles	Datum: NAVD 88	Sampler: Off Flights
Logged By: B. Wilder	Rig Type: CME 45C	Hammer Wt./Fall: N/A
Date Start/Finish: 1/5/11-1/5/11	Drilling Method: Solid Stem Auger	Core Barrel: N/A
Boring Location: 515+06, 9.0 Rt.	Casing ID/OD: N/A	Water Level*: None Observed

Definitions: D = Split Spoon Sample MD = Unsuccessful Split Spoon Sample attempt U = Thin Wall Tube Sample R = Rock Core Sample V = Insitu Vane Shear Test SSA = Solid Stem Auger	Definitions: S _u = Insitu Field Vane Shear Strength (psf) T _v = Pocket Torvane Shear Strength (psf) q _p = Unconfined Compressive Strength (ksf) S _u (lab) = Lab Vane Shear Strength (psf) WOH = weight of 140lb. hammer WOR = weight of rods. WOC = weight of casing	Definitions: WC = water content, percent LL = Liquid Limit PL = Plastic Limit PI = Plasticity Index G = Grain Size Analysis C = Consolidation Test
---	--	--

Sample Information										Visual Description and Remarks	Laboratory Testing Results/AASHTO and Unified Class.
Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows ((6 in.) Shear Strength (psf) or RQD (%))	N-value	Casing Blows	Elevation (ft.)	Graphic Log			
0	S3		0.55 - 3.40			SSA	-0.55	[Graphic Log]	PAVEMENT. Brown, damp, gravelly, fine to coarse SAND, trace silt.	G#245503 A-1-a, SW-SM WC=3.1%	
	S4		3.40 - 5.00				-3.40	[Graphic Log]	Light brown, moist, silty, fine to medium SAND.	G#245504 A-4, ML WC=14.7%	
5							-5.00	[Graphic Log]	Bottom of Exploration at 5.00 feet below ground surface. NO REFUSAL		
10								[Graphic Log]			
15								[Graphic Log]			
20								[Graphic Log]			
25								[Graphic Log]			

Remarks:
 Offsets are from CL of Existing Roadway.

Driller: MaineDOT	Elevation (ft.):	Auger ID/OD: 5" Dia.
Operator: Giguere/Giles	Datum: NAVD 88	Sampler: Off Flights
Logged By: B. Wilder	Rig Type: CME 45C	Hammer Wt./Fall: N/A
Date Start/Finish: 1/5/11-1/5/11	Drilling Method: Solid Stem Auger	Core Barrel: N/A
Boring Location: 515+06, 15.0 Rt.	Casing ID/OD: N/A	Water Level*: None Observed

Definitions: D = Split Spoon Sample MD = Unsuccessful Split Spoon Sample attempt U = Thin Wall Tube Sample R = Rock Core Sample V = Insitu Vane Shear Test SSA = Solid Stem Auger	Definitions: S _u = Insitu Field Vane Shear Strength (psf) T _v = Pocket Torvane Shear Strength (psf) q _p = Unconfined Compressive Strength (ksf) S _u (lab) = Lab Vane Shear Strength (psf) WOH = weight of 140lb. hammer WOR = weight of rods. WOC = weight of casing	Definitions: WC = water content, percent LL = Liquid Limit PL = Plastic Limit PI = Plasticity Index G = Grain Size Analysis C = Consolidation Test
---	--	--

Sample Information										Visual Description and Remarks	Laboratory Testing Results/AASHTO and Unified Class.
Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows ((6 in.) Shear Strength (psf) or RQD (%))	N-value	Casing Blows	Elevation (ft.)	Graphic Log			
0						SSA				Brown, damp, gravelly, fine to coarse SAND, trace silt. ≈S3	
						↓	-1.40			Light brown, moist, silty, fine to medium SAND. ≈S4	-1.40
							-2.50			Bottom of Exploration at 2.50 feet below ground surface. REFUSAL	-2.50
5											
10											
15											
20											
25											

Remarks:
 Offsets are from CL of Existing Roadway.

Driller: MaineDOT	Elevation (ft.):	Auger ID/OD: 5" Dia.
Operator: Giguere/Giles	Datum: NAVD 88	Sampler: Off Flights
Logged By: B. Wilder	Rig Type: CME 45C	Hammer Wt./Fall: N/A
Date Start/Finish: 1/5/11-1/5/11	Drilling Method: Solid Stem Auger	Core Barrel: N/A
Boring Location: 525+06, 9.0 Rt.	Casing ID/OD: N/A	Water Level*: None Observed

Definitions: D = Split Spoon Sample MD = Unsuccessful Split Spoon Sample attempt U = Thin Wall Tube Sample R = Rock Core Sample V = Insitu Vane Shear Test SSA = Solid Stem Auger	Definitions: S _U = Insitu Field Vane Shear Strength (psf) T _V = Pocket Torvane Shear Strength (psf) q _p = Unconfined Compressive Strength (ksf) S _U (lab) = Lab Vane Shear Strength (psf) WOH = weight of 140lb. hammer WOR = weight of rods. WOC = weight of casing	Definitions: WC = water content, percent LL = Liquid Limit PL = Plastic Limit PI = Plasticity Index G = Grain Size Analysis C = Consolidation Test
---	--	--

Sample Information										Visual Description and Remarks	Laboratory Testing Results/AASHTO and Unified Class.
Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows ((6 in.) Shear Strength (psf) or RQD (%))	N-value	Casing Blows	Elevation (ft.)	Graphic Log			
0	S6		0.65 - 3.30			SSA	-0.40 -0.65		PAVEMENT. Unbound Pavement.	G#245506 A-1-b, SM WC=4.0%	
									Brown, damp, fine to coarse SAND, some gravel, trace silt.		
	S7		3.30 - 5.00				-3.30		Olive, moist, silty, fine to medium SAND, trace gravel.	G#245507 A-4, SM WC=13.3%	
5							-5.00		Bottom of Exploration at 5.00 feet below ground surface. NO REFUSAL		
10											
15											
20											
25											

Remarks:
Offsets are from CL of Existing Roadway.

Driller: MaineDOT	Elevation (ft.):	Auger ID/OD: 5" Dia.
Operator: Giguere/Giles	Datum: NAVD 88	Sampler: Off Flights
Logged By: B. Wilder	Rig Type: CME 45C	Hammer Wt./Fall: N/A
Date Start/Finish: 1/5/11-1/5/11	Drilling Method: Solid Stem Auger	Core Barrel: N/A
Boring Location: 525+06, 15.0 Rt.	Casing ID/OD: N/A	Water Level*: None Observed

Definitions: D = Split Spoon Sample MD = Unsuccessful Split Spoon Sample attempt U = Thin Wall Tube Sample R = Rock Core Sample V = Insitu Vane Shear Test SSA = Solid Stem Auger	Definitions: S _u = Insitu Field Vane Shear Strength (psf) T _v = Pocket Torvane Shear Strength (psf) q _p = Unconfined Compressive Strength (ksf) S _u (lab) = Lab Vane Shear Strength (psf) WOH = weight of 140lb. hammer WOR = weight of rods. WOC = weight of casing	Definitions: WC = water content, percent LL = Liquid Limit PL = Plastic Limit PI = Plasticity Index G = Grain Size Analysis C = Consolidation Test
---	--	--

Sample Information											Visual Description and Remarks	Laboratory Testing Results/AASHTO and Unified Class.
Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows ((6 in.) Shear Strength (psf) or RQD (%))	N-value	Casing Blows	Elevation (ft.)	Graphic Log				
0						SSA	-3.00		Brown, damp, fine to coarse SAND, some gravel, trace silt. ≈S6			
5						↓	-5.00		Olive, moist, silty, fine to medium SAND, trace gravel. ≈S7			
10									Bottom of Exploration at 5.00 feet below ground surface. NO REFUSAL			
15												
20												
25												

Remarks:
 Offsets are from CL of Existing Roadway.
 PC-2, Sta. 525+06, 9.0 ft Lt. 0.0-0.55 ft

Driller: MaineDOT	Elevation (ft.):	Auger ID/OD: 5" Dia.
Operator: Giguere/Giles	Datum: NAVD 88	Sampler: Off Flights
Logged By: B. Wilder	Rig Type: CME 45C	Hammer Wt./Fall: N/A
Date Start/Finish: 1/5/11-1/5/11	Drilling Method: Solid Stem Auger	Core Barrel: N/A
Boring Location: 535+06, 9.0 Rt.	Casing ID/OD: N/A	Water Level*: None Observed

Definitions: D = Split Spoon Sample MD = Unsuccessful Split Spoon Sample attempt U = Thin Wall Tube Sample R = Rock Core Sample V = Insitu Vane Shear Test SSA = Solid Stem Auger	Definitions: S _u = Insitu Field Vane Shear Strength (psf) T _v = Pocket Torvane Shear Strength (psf) q _p = Unconfined Compressive Strength (ksf) S _u (lab) = Lab Vane Shear Strength (psf) WOH = weight of 140lb. hammer WOR = weight of rods. WOC = weight of casing	Definitions: WC = water content, percent LL = Liquid Limit PL = Plastic Limit PI = Plasticity Index G = Grain Size Analysis C = Consolidation Test
---	--	--

Sample Information										Visual Description and Remarks	Laboratory Testing Results/AASHTO and Unified Class.
Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows ((6 in.) Shear Strength (psf) or RQD (%))	N-value	Casing Blows	Elevation (ft.)	Graphic Log			
0						SSA	-0.50		PAVEMENT. Brown, damp, fine to coarse SAND, some gravel, trace silt. ≈S6		
5						↙	-3.80 -5.00		Olive, moist, silty, fine to medium SAND, trace gravel. ≈S7 Bottom of Exploration at 5.00 feet below ground surface. NO REFUSAL		
10											
15											
20											
25											

Remarks:
 Offsets are from CL of Existing Roadway.

Driller: MaineDOT	Elevation (ft.):	Auger ID/OD: 5" Dia.
Operator: Giguere/Giles	Datum: NAVD 88	Sampler: Off Flights
Logged By: B. Wilder	Rig Type: CME 45C	Hammer Wt./Fall: N/A
Date Start/Finish: 1/5/11-1/5/11	Drilling Method: Solid Stem Auger	Core Barrel: N/A
Boring Location: 535+06, 15.0 Rt.	Casing ID/OD: N/A	Water Level*: None Observed

Definitions: D = Split Spoon Sample MD = Unsuccessful Split Spoon Sample attempt U = Thin Wall Tube Sample R = Rock Core Sample V = Insitu Vane Shear Test SSA = Solid Stem Auger	Definitions: S _u = Insitu Field Vane Shear Strength (psf) T _v = Pocket Torvane Shear Strength (psf) q _p = Unconfined Compressive Strength (ksf) S _u (lab) = Lab Vane Shear Strength (psf) WOH = weight of 140lb. hammer WOR = weight of rods. WOC = weight of casing	Definitions: WC = water content, percent LL = Liquid Limit PL = Plastic Limit PI = Plasticity Index G = Grain Size Analysis C = Consolidation Test
---	--	--

Sample Information											Visual Description and Remarks	Laboratory Testing Results/AASHTO and Unified Class.
Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows ((6 in.) Shear Strength (psf) or RQD (%))	N-value	Casing Blows	Elevation (ft.)	Graphic Log				
0						SSA	-2.60		Brown, damp, fine to coarse SAND, some gravel, trace silt. ≈S6			
							-2.60		Olive, moist, silty, fine to medium SAND, trace gravel. ≈S7		-2.60	
5						↓	-5.00		Bottom of Exploration at 5.00 feet below ground surface. NO REFUSAL		-5.00	
10												
15												
20												
25												

Remarks:
 Offsets are from CL of Existing Roadway.

Driller: MaineDOT	Elevation (ft.):	Auger ID/OD: 5" Dia.
Operator: Giguere/Giles	Datum: NAVD 88	Sampler: Off Flights
Logged By: B. Wilder	Rig Type: CME 45C	Hammer Wt./Fall: N/A
Date Start/Finish: 1/5/11-1/5/11	Drilling Method: Solid Stem Auger	Core Barrel: N/A
Boring Location: 546+06, 9.0 Rt.	Casing ID/OD: N/A	Water Level*: None Observed

Definitions: D = Split Spoon Sample MD = Unsuccessful Split Spoon Sample attempt U = Thin Wall Tube Sample R = Rock Core Sample V = Insitu Vane Shear Test SSA = Solid Stem Auger	Definitions: S_u = Insitu Field Vane Shear Strength (psf) T_v = Pocket Torvane Shear Strength (psf) q_p = Unconfined Compressive Strength (ksf) $S_u(\text{lab})$ = Lab Vane Shear Strength (psf) WOH = weight of 140lb. hammer WOR = weight of rods. WOC = weight of casing	Definitions: WC = water content, percent LL = Liquid Limit PL = Plastic Limit PI = Plasticity Index G = Grain Size Analysis C = Consolidation Test
---	--	--

Sample Information										Visual Description and Remarks	Laboratory Testing Results/AASHTO and Unified Class.
Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows ((6 in.) Shear Strength (psf) or RQD (%))	N-value	Casing Blows	Elevation (ft.)	Graphic Log			
0	S8		0.60 - 3.80			SSA	-0.40 -0.60		PAVEMENT. Unbound Pavement.	G#245508 A-1-b, SM WC=5.0%	
									Brown, moist, gravelly, fine to coarse SAND, trace silt.		
	S9		3.80 - 5.00				-3.80		Brown, damp, silty, fine to medium SAND.	G#245509 A-2-4, SM WC=7.7%	
5							-5.00		Bottom of Exploration at 5.00 feet below ground surface. NO REFUSAL		
10											
15											
20											
25											

Remarks:
 Offsets are from CL of Existing Roadway.

Maine Department of Transportation Soil/Rock Exploration Log US CUSTOMARY UNITS	Project: Route 2 Location: Canaan, Maine	Boring No.: HB-CAN-111 WIN: 17885.00
--	---	---

Driller: MaineDOT	Elevation (ft.):	Auger ID/OD: 5" Dia.
Operator: Giguere/Giles	Datum: NAVD 88	Sampler: Off Flights
Logged By: B. Wilder	Rig Type: CME 45C	Hammer Wt./Fall: N/A
Date Start/Finish: 1/5/11-1/5/11	Drilling Method: Solid Stem Auger	Core Barrel: N/A
Boring Location: 546+06, 14.0 Rt.	Casing ID/OD: N/A	Water Level*: None Observed

Definitions: D = Split Spoon Sample MD = Unsuccessful Split Spoon Sample attempt U = Thin Wall Tube Sample R = Rock Core Sample V = Insitu Vane Shear Test SSA = Solid Stem Auger	Definitions: S _u = Insitu Field Vane Shear Strength (psf) T _v = Pocket Torvane Shear Strength (psf) q _p = Unconfined Compressive Strength (ksf) S _u (lab) = Lab Vane Shear Strength (psf) WOH = weight of 140lb. hammer WOR = weight of rods. WOC = weight of casing	Definitions: WC = water content, percent LL = Liquid Limit PL = Plastic Limit PI = Plasticity Index G = Grain Size Analysis C = Consolidation Test
---	--	--

Depth (ft.)	Sample Information										Visual Description and Remarks	Laboratory Testing Results/AASHTO and Unified Class.
	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (6 in.) Shear Strength (psf) or RQD (%)	N-value	Casing Blows	Elevation (ft.)	Graphic Log				
0						SSA					Brown, moist, gravelly, fine to coarse SAND, trace silt. ≈S8	
						↓					-2.40	
											-2.40	
											Bottom of Exploration at 2.40 feet below ground surface. REFUSAL (?)	
5												
10												
15												
20												
25												

Remarks:
Offsets are from CL of Existing Roadway.

Maine Department of Transportation Soil/Rock Exploration Log US CUSTOMARY UNITS	Project: Route 2	Boring No.: HB-CAN-112
	Location: Canaan, Maine	WIN: 17885.00

Driller: MaineDOT	Elevation (ft.):	Auger ID/OD: 5" Dia.
Operator: Giguere/Giles	Datum: NAVD 88	Sampler: Off Flights
Logged By: B. Wilder	Rig Type: CME 45C	Hammer Wt./Fall: N/A
Date Start/Finish: 1/5/11-1/5/11	Drilling Method: Solid Stem Auger	Core Barrel: N/A
Boring Location: 550+06, 9.0 Rt.	Casing ID/OD: N/A	Water Level*: None Observed

Definitions: D = Split Spoon Sample MD = Unsuccessful Split Spoon Sample attempt U = Thin Wall Tube Sample R = Rock Core Sample V = Insitu Vane Shear Test SSA = Solid Stem Auger	Definitions: S_u = Insitu Field Vane Shear Strength (psf) T_v = Pocket Torvane Shear Strength (psf) q_p = Unconfined Compressive Strength (ksf) $S_u(\text{lab})$ = Lab Vane Shear Strength (psf) WOH = weight of 140lb. hammer WOR = weight of rods. WOC = weight of casing	Definitions: WC = water content, percent LL = Liquid Limit PL = Plastic Limit PI = Plasticity Index G = Grain Size Analysis C = Consolidation Test
---	--	--

Sample Information										Visual Description and Remarks	Laboratory Testing Results/AASHTO and Unified Class.
Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows ((6 in.) Shear Strength (psf) or RQD (%))	N-value	Casing Blows	Elevation (ft.)	Graphic Log			
0						SSA	-0.40		PAVEMENT.		
							-1.20		Brown, moist, gravelly, fine to coarse SAND, trace silt. (Oil Smell) \cong S8		
									Olive, damp, silty, fine to medium SAND.		
5							-5.00		Bottom of Exploration at 5.00 feet below ground surface. NO REFUSAL		
10											
15											
20											
25											

Remarks:
 Offsets are from CL of Existing Roadway.

Driller: MaineDOT	Elevation (ft.):	Auger ID/OD: 5" Dia.
Operator: Giguere/Giles	Datum: NAVD 88	Sampler: Off Flights
Logged By: B. Wilder	Rig Type: CME 45C	Hammer Wt./Fall: N/A
Date Start/Finish: 1/5/11-1/5/11	Drilling Method: Solid Stem Auger	Core Barrel: N/A
Boring Location: 551.06, 9.0 Rt.	Casing ID/OD: N/A	Water Level*: None Observed

Definitions: D = Split Spoon Sample MD = Unsuccessful Split Spoon Sample attempt U = Thin Wall Tube Sample R = Rock Core Sample V = Insitu Vane Shear Test SSA = Solid Stem Auger	Definitions: S _u = Insitu Field Vane Shear Strength (psf) T _v = Pocket Torvane Shear Strength (psf) q _p = Unconfined Compressive Strength (ksf) S _u (lab) = Lab Vane Shear Strength (psf) WOH = weight of 140lb. hammer WOR = weight of rods. WOC = weight of casing	Definitions: WC = water content, percent LL = Liquid Limit PL = Plastic Limit PI = Plasticity Index G = Grain Size Analysis C = Consolidation Test
---	--	--

Sample Information										Visual Description and Remarks	Laboratory Testing Results/AASHTO and Unified Class.
Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows ((6 in.) Shear Strength (psf) or RQD (%))	N-value	Casing Blows	Elevation (ft.)	Graphic Log			
0	S10		0.55 - 2.40			SSA	-0.55		PAVEMENT.		
									Brown, damp, fine to medium SAND, some gravel, some silt.	G#245510 A-1-b, SM WC=6.8%	
	S11		2.40 - 5.00				-2.40		Grey-brown, moist, silty, fine to medium SAND.	G#245511 A-4, ML WC=14.1%	
5							-5.00		Bottom of Exploration at 5.00 feet below ground surface. NO REFUSAL		
10											
15											
20											
25											

Remarks:
 Offsets are from CL of Existing Roadway.

Driller: MaineDOT	Elevation (ft.):	Auger ID/OD: 5" Dia.
Operator: Giguere/Giles	Datum: NAVD 88	Sampler: Off Flights
Logged By: B. Wilder	Rig Type: CME 45C	Hammer Wt./Fall: N/A
Date Start/Finish: 1/5/11-1/5/11	Drilling Method: Solid Stem Auger	Core Barrel: N/A
Boring Location: 551+06, 16.0 Rt.	Casing ID/OD: N/A	Water Level*: None Observed

Definitions: D = Split Spoon Sample MD = Unsuccessful Split Spoon Sample attempt U = Thin Wall Tube Sample R = Rock Core Sample V = Insitu Vane Shear Test SSA = Solid Stem Auger	Definitions: S _u = Insitu Field Vane Shear Strength (psf) T _v = Pocket Torvane Shear Strength (psf) q _p = Unconfined Compressive Strength (ksf) S _u (lab) = Lab Vane Shear Strength (psf) WOH = weight of 140lb. hammer WOR = weight of rods. WOC = weight of casing	Definitions: WC = water content, percent LL = Liquid Limit PL = Plastic Limit PI = Plasticity Index G = Grain Size Analysis C = Consolidation Test
---	--	--

Depth (ft.)	Sample Information										Visual Description and Remarks	Laboratory Testing Results/AASHTO and Unified Class.
	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (6 in.) Shear Strength (psf) or RQD (%)	N-value	Casing Blows	Elevation (ft.)	Graphic Log				
0											Brown, wet, fine to medium SAND, some gravel, some silt. ≈S10	
								-2.50			Grey-brown, wet, silty, fine to medium SAND. ≈S11	-2.50
5								-5.00			Bottom of Exploration at 5.00 feet below ground surface. NO REFUSAL	-5.00
10												
15												
20												
25												

Remarks:
 Offsets are from CL of Existing Roadway.
 PC-3, Sta. 58+00, 9.5 Lt. 0.0-5.0 ft.

* 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.

Driller: MaineDOT	Elevation (ft.):	Auger ID/OD: 5" Dia.
Operator: Giguere/Giles	Datum: NAVD 88	Sampler: Off Flights
Logged By: B. Wilder	Rig Type: CME 45C	Hammer Wt./Fall: N/A
Date Start/Finish: 1/5/11-1/5/11	Drilling Method: Solid Stem Auger	Core Barrel: N/A
Boring Location: 557+06, 9.0 Rt.	Casing ID/OD: N/A	Water Level*: None Observed

Definitions: D = Split Spoon Sample MD = Unsuccessful Split Spoon Sample attempt U = Thin Wall Tube Sample R = Rock Core Sample V = Insitu Vane Shear Test SSA = Solid Stem Auger	Definitions: S _u = Insitu Field Vane Shear Strength (psf) T _v = Pocket Torvane Shear Strength (psf) q _p = Unconfined Compressive Strength (ksf) S _u (lab) = Lab Vane Shear Strength (psf) WOH = weight of 140lb. hammer WOR = weight of rods. WOC = weight of casing	Definitions: WC = water content, percent LL = Liquid Limit PL = Plastic Limit PI = Plasticity Index G = Grain Size Analysis C = Consolidation Test
---	--	--

Sample Information										Visual Description and Remarks	Laboratory Testing Results/AASHTO and Unified Class.
Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows ((6 in.) Shear Strength (psf) or RQD (%))	N-value	Casing Blows	Elevation (ft.)	Graphic Log			
0						SSA	-0.50		PAVEMENT. Brown, damp, fine to medium SAND, some gravel, some silt. ≈S10		
							-2.20		Light brown, damp, silty, fine to medium SAND. ≈S5		
5						↓	-5.00		Bottom of Exploration at 5.00 feet below ground surface. NO REFUSAL		
10											
15											
20											
25											

Remarks:
 Offsets are from CL of Existing Roadway.

Driller: MaineDOT	Elevation (ft.):	Auger ID/OD: 5" Dia.
Operator: Giguere/Giles	Datum: NAVD 88	Sampler: Off Flights
Logged By: B. Wilder	Rig Type: CME 45C	Hammer Wt./Fall: N/A
Date Start/Finish: 1/5/11-1/5/11	Drilling Method: Solid Stem Auger	Core Barrel: N/A
Boring Location: 557+06, 15.0 Rt.	Casing ID/OD: N/A	Water Level*: None Observed

Definitions: D = Split Spoon Sample MD = Unsuccessful Split Spoon Sample attempt U = Thin Wall Tube Sample R = Rock Core Sample V = Insitu Vane Shear Test SSA = Solid Stem Auger	Definitions: S _u = Insitu Field Vane Shear Strength (psf) T _v = Pocket Torvane Shear Strength (psf) q _p = Unconfined Compressive Strength (ksf) S _u (lab) = Lab Vane Shear Strength (psf) WOH = weight of 140lb. hammer WOR = weight of rods. WOC = weight of casing	Definitions: WC = water content, percent LL = Liquid Limit PL = Plastic Limit PI = Plasticity Index G = Grain Size Analysis C = Consolidation Test
---	--	--

Sample Information											Visual Description and Remarks	Laboratory Testing Results/AASHTO and Unified Class.
Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows ((6 in.) Shear Strength (psf) or RQD (%))	N-value	Casing Blows	Elevation (ft.)	Graphic Log				
0						SSA	-1.40		Brown, damp, fine to medium SAND, some gravel, some silt. ≈S10			
							-1.40		Light brown, damp, silty, fine to medium SAND. ≈S5		-1.40	
5						↓	-5.00		Bottom of Exploration at 5.00 feet below ground surface. NO REFUSAL		-5.00	
10												
15												
20												
25												

Remarks:
 Offsets are from CL of Existing Roadway.

Driller: MaineDOT	Elevation (ft.):	Auger ID/OD: 5" Dia.
Operator: Giguere/Giles	Datum: NAVD 88	Sampler: Off Flights
Logged By: B. Wilder	Rig Type: CME 45C	Hammer Wt./Fall: N/A
Date Start/Finish: 1/5/11-1/5/11	Drilling Method: Solid Stem Auger	Core Barrel: N/A
Boring Location: 565+06, 8.0 Rt.	Casing ID/OD: N/A	Water Level*: None Observed

Definitions: D = Split Spoon Sample MD = Unsuccessful Split Spoon Sample attempt U = Thin Wall Tube Sample R = Rock Core Sample V = Insitu Vane Shear Test SSA = Solid Stem Auger	Definitions: S _u = Insitu Field Vane Shear Strength (psf) T _v = Pocket Torvane Shear Strength (psf) q _p = Unconfined Compressive Strength (ksf) S _u (lab) = Lab Vane Shear Strength (psf) WOH = weight of 140lb. hammer WOR = weight of rods. WOC = weight of casing	Definitions: WC = water content, percent LL = Liquid Limit PL = Plastic Limit PI = Plasticity Index G = Grain Size Analysis C = Consolidation Test
---	--	--

Sample Information										Visual Description and Remarks	Laboratory Testing Results/AASHTO and Unified Class.
Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (6 in.) Shear Strength (psf) or RQD (%)	N-value	Casing Blows	Elevation (ft.)	Graphic Log			
0	S12		0.50 - 3.50			SSA	-0.50		PAVEMENT. Brown, damp, fine to coarse SAND, some gravel, trace silt.	G#245512 A-1-b, SM WC=4.3%	
	S13		3.50 - 5.00				-3.50		Brown, wet, silty, fine to medium SAND.	G#245513 A-4, ML WC=20.3%	
5							-5.00		Bottom of Exploration at 5.00 feet below ground surface. NO REFUSAL		
10											
15											
20											
25											

Remarks:
 Offsets are from CL of Existing Roadway.

Driller: MaineDOT	Elevation (ft.):	Auger ID/OD: 5" Dia.
Operator: Giguere/Giles	Datum: NAVD 88	Sampler: Off Flights
Logged By: B. Wilder	Rig Type: CME 45C	Hammer Wt./Fall: N/A
Date Start/Finish: 1/5/11-1/5/11	Drilling Method: Solid Stem Auger	Core Barrel: N/A
Boring Location: 573+06, 9.0 Rt.	Casing ID/OD: N/A	Water Level*: None Observed

Definitions: D = Split Spoon Sample MD = Unsuccessful Split Spoon Sample attempt U = Thin Wall Tube Sample R = Rock Core Sample V = Insitu Vane Shear Test SSA = Solid Stem Auger	Definitions: S _u = Insitu Field Vane Shear Strength (psf) T _v = Pocket Torvane Shear Strength (psf) q _p = Unconfined Compressive Strength (ksf) S _u (lab) = Lab Vane Shear Strength (psf) WOH = weight of 140lb. hammer WOR = weight of rods. WOC = weight of casing	Definitions: WC = water content, percent LL = Liquid Limit PL = Plastic Limit PI = Plasticity Index G = Grain Size Analysis C = Consolidation Test
---	--	--

Sample Information										Visual Description and Remarks	Laboratory Testing Results/AASHTO and Unified Class.
Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows ((6 in.) Shear Strength (psf) or RQD (%))	N-value	Casing Blows	Elevation (ft.)	Graphic Log			
0						SSA	-0.50		PAVEMENT.		
									Brown, damp, fine to coarse SAND, some gravel, trace silt. ≈S12	-0.50	
						↓	-4.30		Bottom of Exploration at 4.30 feet below ground surface.	-4.30	
5									REFUSAL		
10											
15											
20											
25											

Remarks:

Offsets are from CL of Existing Roadway.
 PC-4, Sta. 80+00, 10.0 Lt. 0.0-0.5 ft.

Driller: MaineDOT	Elevation (ft.):	Auger ID/OD: 5" Dia.
Operator: Giguere/Giles	Datum: NAVD 88	Sampler: Off Flights
Logged By: B. Wilder	Rig Type: CME 45C	Hammer Wt./Fall: N/A
Date Start/Finish: 1/5/11-1/5/11	Drilling Method: Solid Stem Auger	Core Barrel: N/A
Boring Location: 582+06, 9.0 Rt.	Casing ID/OD: N/A	Water Level*: None Observed

Definitions: D = Split Spoon Sample MD = Unsuccessful Split Spoon Sample attempt U = Thin Wall Tube Sample R = Rock Core Sample V = Insitu Vane Shear Test SSA = Solid Stem Auger	Definitions: S _u = Insitu Field Vane Shear Strength (psf) T _v = Pocket Torvane Shear Strength (psf) q _p = Unconfined Compressive Strength (ksf) S _u (lab) = Lab Vane Shear Strength (psf) WOH = weight of 140lb. hammer WOR = weight of rods. WOC = weight of casing	Definitions: WC = water content, percent LL = Liquid Limit PL = Plastic Limit PI = Plasticity Index G = Grain Size Analysis C = Consolidation Test
---	--	--

Sample Information											Visual Description and Remarks	Laboratory Testing Results/AASHTO and Unified Class.
Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows ((6 in.) Shear Strength (psf) or RQD (%))	N-value	Casing Blows	Elevation (ft.)	Graphic Log				
0	S14		0.50 - 1.80			SSA	-0.50	[Graphic Log]		PAVEMENT.	G#245514 A-1-b, SM WC=3.6% G#245515 A-4, ML WC=23.6%	
	S15		1.80 - 5.00				-1.80			Brown, damp, gravelly, fine to coarse SAND, trace silt.		
										Dark brown, moist, silty, fine to medium SAND.		
5						↓	-5.00			Bottom of Exploration at 5.00 feet below ground surface. NO REFUSAL		
10												
15												
20												
25												

Remarks:
 Offsets are from CL of Existing Roadway.

Driller: MaineDOT	Elevation (ft.):	Auger ID/OD: 5" Dia.
Operator: Giguere/Giles	Datum: NAVD 88	Sampler: Off Flights
Logged By: B. Wilder	Rig Type: CME 45C	Hammer Wt./Fall: N/A
Date Start/Finish: 1/5/11-1/5/11	Drilling Method: Solid Stem Auger	Core Barrel: N/A
Boring Location: 582+06, 14.0 Rt.	Casing ID/OD: N/A	Water Level*: None Observed

Definitions: D = Split Spoon Sample MD = Unsuccessful Split Spoon Sample attempt U = Thin Wall Tube Sample R = Rock Core Sample V = Insitu Vane Shear Test SSA = Solid Stem Auger	Definitions: S _u = Insitu Field Vane Shear Strength (psf) T _v = Pocket Torvane Shear Strength (psf) q _p = Unconfined Compressive Strength (ksf) S _u (lab) = Lab Vane Shear Strength (psf) WOH = weight of 140lb. hammer WOR = weight of rods. WOC = weight of casing	Definitions: WC = water content, percent LL = Liquid Limit PL = Plastic Limit PI = Plasticity Index G = Grain Size Analysis C = Consolidation Test
---	--	--

Sample Information											Visual Description and Remarks	Laboratory Testing Results/AASHTO and Unified Class.
Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows ((6 in.) Shear Strength (psf) or RQD (%))	N-value	Casing Blows	Elevation (ft.)	Graphic Log				
0						SSA	-0.20		PAVEMENT.			
							-1.00		Brown, damp, gravelly, fine to coarse SAND, trace silt. ≈S14			
							-5.00		Dark brown, moist, silty, fine to medium SAND. ≈S15			
5						↓	-5.00		Bottom of Exploration at 5.00 feet below ground surface. NO REFUSAL			
10												
15												
20												
25												

Remarks:
 Offsets are from CL of Existing Roadway.



GEOTECHNICAL TEST REPORT

Central Laboratory

SAMPLE INFORMATION

Reference No.	Boring No./Sample No.	Sample Description	Sampled	Received
245501	HB-CAN-101/S1	<u>GEOTECHNICAL (DISTURBED)</u>	1/5/2011	1/13/2011
Sample Type: GEOTECHNICAL		Location: ROADWAY	Station: 507+06	Offset, ft: 9.0
WIN/Town 017885.00 - CANAAN		RT Dbfg, ft: 0.55-3.0		
				Sampler: WILDER, BRUCE H

TEST RESULTS

Sieve Analysis (T 27, T 11) Wash Method <b style="color: red;">Procedure A <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 70%;">SIEVE SIZE U.S. [SI]</th> <th style="width: 30%;">% Passing</th> </tr> </thead> <tbody> <tr><td>3 in. [75.0 mm]</td><td></td></tr> <tr><td>1 in. [25.0 mm]</td><td></td></tr> <tr><td>¾ in. [19.0 mm]</td><td style="text-align: center;">100.0</td></tr> <tr><td>½ in. [12.5 mm]</td><td style="text-align: center;">95.4</td></tr> <tr><td>⅜ in. [9.5 mm]</td><td style="text-align: center;">86.6</td></tr> <tr><td>¼ in. [6.3 mm]</td><td style="text-align: center;">74.5</td></tr> <tr><td>No. 4 [4.75 mm]</td><td style="text-align: center;">67.2</td></tr> <tr><td>No. 10 [2.00 mm]</td><td style="text-align: center;">52.9</td></tr> <tr><td>No. 20 [0.850 mm]</td><td style="text-align: center;">39.6</td></tr> <tr><td>No. 40 [0.425 mm]</td><td style="text-align: center;">30.1</td></tr> <tr><td>No. 60 [0.250 mm]</td><td style="text-align: center;">24.4</td></tr> <tr><td>No. 100 [0.150 mm]</td><td style="text-align: center;">19.5</td></tr> <tr><td>No. 200 [0.075 mm]</td><td style="text-align: center;">14.6</td></tr> </tbody> </table>	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]	95.4	⅜ in. [9.5 mm]	86.6	¼ in. [6.3 mm]	74.5	No. 4 [4.75 mm]	67.2	No. 10 [2.00 mm]	52.9	No. 20 [0.850 mm]	39.6	No. 40 [0.425 mm]	30.1	No. 60 [0.250 mm]	24.4	No. 100 [0.150 mm]	19.5	No. 200 [0.075 mm]	14.6	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr style="background-color: #cccccc;"> <th colspan="4" style="text-align: center;">Direct Shear (T 236)</th> </tr> </thead> <tbody> <tr><td>Shear Angle, °</td><td></td><td></td><td></td></tr> <tr><td>Initial Water Content, %</td><td></td><td></td><td></td></tr> <tr><td>Normal Stress, psi</td><td></td><td></td><td></td></tr> <tr><td>Wet Density, lbs/ft³</td><td></td><td></td><td></td></tr> <tr><td>Dry Density, lbs/ft³</td><td></td><td></td><td></td></tr> <tr><td>Specimen Thickness, in</td><td></td><td></td><td></td></tr> </tbody> </table> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr style="background-color: #cccccc;"> <th colspan="4" style="text-align: center;">Consolidation (T 216)</th> </tr> </thead> <tbody> <tr><td colspan="4" style="text-align: center;">Trimming, Water Content, %</td></tr> <tr> <td></td> <td style="text-align: center;">Initial</td> <td style="text-align: center;">Final</td> <td></td> </tr> <tr> <td>Water Content, %</td> <td></td> <td></td> <td style="text-align: center;">Pmin</td> </tr> <tr> <td>Dry Density, lbs/ft³</td> <td></td> <td></td> <td style="text-align: center;">Pp</td> </tr> <tr> <td>Void Ratio</td> <td></td> <td></td> <td style="text-align: center;">Pmax</td> </tr> <tr> <td>Saturation, %</td> <td></td> <td></td> <td style="text-align: center;">Cc/C'c</td> </tr> </tbody> </table> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr style="background-color: #cccccc;"> <th colspan="6" style="text-align: center;">Vane Shear Test on Shelby Tubes (Maine DOT)</th> </tr> <tr> <th rowspan="3" style="width: 10%;">Depth taken in tube, ft</th> <th colspan="2" style="width: 15%;">3 In.</th> <th colspan="2" style="width: 15%;">6 In.</th> <th rowspan="3" style="width: 10%;">Water Content, %</th> <th rowspan="3" style="width: 40%;">Description of Material Sampled at the Various Tube Depths</th> </tr> <tr> <th style="width: 5%;">U. Shear</th> <th style="width: 10%;">Remold</th> <th style="width: 5%;">U. Shear</th> <th style="width: 10%;">Remold</th> </tr> <tr> <th style="text-align: center;">tons/ft²</th> <th style="text-align: center;">tons/ft²</th> <th style="text-align: center;">tons/ft²</th> <th style="text-align: center;">tons/ft²</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </tbody> </table>	Direct Shear (T 236)				Shear Angle, °				Initial Water Content, %				Normal Stress, psi				Wet Density, lbs/ft³				Dry Density, lbs/ft³				Specimen Thickness, in				Consolidation (T 216)				Trimming, Water Content, %					Initial	Final		Water Content, %			Pmin	Dry Density, lbs/ft³			Pp	Void Ratio			Pmax	Saturation, %			Cc/C'c	Vane Shear Test on Shelby Tubes (Maine DOT)						Depth taken in tube, ft	3 In.		6 In.		Water Content, %	Description of Material Sampled at the Various Tube Depths	U. Shear	Remold	U. Shear	Remold	tons/ft²	tons/ft²	tons/ft²	tons/ft²																						<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr style="background-color: #cccccc;"> <th style="text-align: center;">Miscellaneous Tests</th> </tr> </thead> <tbody> <tr><td style="text-align: center;"><u>Liquid Limit @ 25 blows (T 89), %</u></td></tr> <tr><td> </td></tr> <tr><td style="text-align: center;"><u>Plastic Limit (T 90), %</u></td></tr> <tr><td> </td></tr> <tr><td style="text-align: center;"><u>Plasticity Index (T 90), %</u></td></tr> <tr><td> </td></tr> <tr><td style="text-align: center;"><u>Specific Gravity, Corrected to 20°C (T 100)</u></td></tr> <tr><td> </td></tr> <tr><td style="text-align: center;"><u>Loss on Ignition (T 267)</u></td></tr> <tr> <td style="text-align: center;"><u>Loss, %</u></td> <td style="text-align: center;"><u>H2O, %</u></td> </tr> <tr><td> </td><td> </td></tr> <tr><td style="text-align: center;"><u>Water Content (T 265), %</u></td></tr> <tr><td style="text-align: center;">3.2</td></tr> </tbody> </table>	Miscellaneous Tests	<u>Liquid Limit @ 25 blows (T 89), %</u>		<u>Plastic Limit (T 90), %</u>		<u>Plasticity Index (T 90), %</u>		<u>Specific Gravity, Corrected to 20°C (T 100)</u>		<u>Loss on Ignition (T 267)</u>	<u>Loss, %</u>	<u>H2O, %</u>			<u>Water Content (T 265), %</u>	3.2
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]	95.4																																																																																																																																															
⅜ in. [9.5 mm]	86.6																																																																																																																																															
¼ in. [6.3 mm]	74.5																																																																																																																																															
No. 4 [4.75 mm]	67.2																																																																																																																																															
No. 10 [2.00 mm]	52.9																																																																																																																																															
No. 20 [0.850 mm]	39.6																																																																																																																																															
No. 40 [0.425 mm]	30.1																																																																																																																																															
No. 60 [0.250 mm]	24.4																																																																																																																																															
No. 100 [0.150 mm]	19.5																																																																																																																																															
No. 200 [0.075 mm]	14.6																																																																																																																																															
Direct Shear (T 236)																																																																																																																																																
Shear Angle, °																																																																																																																																																
Initial Water Content, %																																																																																																																																																
Normal Stress, psi																																																																																																																																																
Wet Density, lbs/ft³																																																																																																																																																
Dry Density, lbs/ft³																																																																																																																																																
Specimen Thickness, in																																																																																																																																																
Consolidation (T 216)																																																																																																																																																
Trimming, Water Content, %																																																																																																																																																
	Initial	Final																																																																																																																																														
Water Content, %			Pmin																																																																																																																																													
Dry Density, lbs/ft³			Pp																																																																																																																																													
Void Ratio			Pmax																																																																																																																																													
Saturation, %			Cc/C'c																																																																																																																																													
Vane Shear Test on Shelby Tubes (Maine DOT)																																																																																																																																																
Depth taken in tube, ft	3 In.		6 In.		Water Content, %	Description of Material Sampled at the Various Tube Depths																																																																																																																																										
	U. Shear	Remold	U. Shear	Remold																																																																																																																																												
	tons/ft²	tons/ft²	tons/ft²	tons/ft²																																																																																																																																												
Miscellaneous Tests																																																																																																																																																
<u>Liquid Limit @ 25 blows (T 89), %</u>																																																																																																																																																
<u>Plastic Limit (T 90), %</u>																																																																																																																																																
<u>Plasticity Index (T 90), %</u>																																																																																																																																																
<u>Specific Gravity, Corrected to 20°C (T 100)</u>																																																																																																																																																
<u>Loss on Ignition (T 267)</u>																																																																																																																																																
<u>Loss, %</u>	<u>H2O, %</u>																																																																																																																																															
<u>Water Content (T 265), %</u>																																																																																																																																																
3.2																																																																																																																																																

Comments:

AUTHORIZATION AND DISTRIBUTION

Reported by: **FOGG, BRIAN** Date Reported: **1/24/2011**



GEOTECHNICAL TEST REPORT

Central Laboratory

SAMPLE INFORMATION

Reference No.	Boring No./Sample No.	Sample Description	Sampled	Received
245502	HB-CAN-101/S2	<u>GEOTECHNICAL (DISTURBED)</u>	1/5/2011	1/13/2011
Sample Type: GEOTECHNICAL		Location: ROADWAY	Station: 507+06	Offset, ft: 9.0
WIN/Town 017885.00 - CANAAN		Sampler: WILDER, BRUCE H		

TEST RESULTS

Sieve Analysis (T 27, T 11) Wash Method Procedure A <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 70%;">SIEVE SIZE U.S. [SI]</th> <th style="width: 30%;">% Passing</th> </tr> </thead> <tbody> <tr><td>3 in. [75.0 mm]</td><td></td></tr> <tr><td>1 in. [25.0 mm]</td><td></td></tr> <tr><td>¾ in. [19.0 mm]</td><td></td></tr> <tr><td>½ in. [12.5 mm]</td><td style="text-align: center;">100.0</td></tr> <tr><td>⅜ in. [9.5 mm]</td><td style="text-align: center;">98.1</td></tr> <tr><td>¼ in. [6.3 mm]</td><td style="text-align: center;">96.4</td></tr> <tr><td>No. 4 [4.75 mm]</td><td style="text-align: center;">94.7</td></tr> <tr><td>No. 10 [2.00 mm]</td><td style="text-align: center;">88.8</td></tr> <tr><td>No. 20 [0.850 mm]</td><td style="text-align: center;">81.1</td></tr> <tr><td>No. 40 [0.425 mm]</td><td style="text-align: center;">74.8</td></tr> <tr><td>No. 60 [0.250 mm]</td><td style="text-align: center;">71.4</td></tr> <tr><td>No. 100 [0.150 mm]</td><td style="text-align: center;">68.1</td></tr> <tr><td>No. 200 [0.075 mm]</td><td style="text-align: center;">61.6</td></tr> </tbody> </table>	SIEVE SIZE U.S. [SI]	% Passing	3 in. [75.0 mm]		1 in. [25.0 mm]		¾ in. [19.0 mm]		½ in. [12.5 mm]	100.0	⅜ in. [9.5 mm]	98.1	¼ in. [6.3 mm]	96.4	No. 4 [4.75 mm]	94.7	No. 10 [2.00 mm]	88.8	No. 20 [0.850 mm]	81.1	No. 40 [0.425 mm]	74.8	No. 60 [0.250 mm]	71.4	No. 100 [0.150 mm]	68.1	No. 200 [0.075 mm]	61.6	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="4" style="text-align: center;">Direct Shear (T 236)</th> </tr> </thead> <tbody> <tr><td>Shear Angle, °</td><td></td><td></td><td></td></tr> <tr><td>Initial Water Content, %</td><td></td><td></td><td></td></tr> <tr><td>Normal Stress, psi</td><td></td><td></td><td></td></tr> <tr><td>Wet Density, lbs/ft³</td><td></td><td></td><td></td></tr> <tr><td>Dry Density, lbs/ft³</td><td></td><td></td><td></td></tr> <tr><td>Specimen Thickness, in</td><td></td><td></td><td></td></tr> </tbody> </table> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="6" style="text-align: center;">Consolidation (T 216)</th> </tr> </thead> <tbody> <tr> <td colspan="6" style="text-align: center;">Trimming, Water Content, %</td> </tr> <tr> <td></td> <td style="text-align: center;">Initial</td> <td style="text-align: center;">Final</td> <td></td> <td style="text-align: center;">Void Ratio</td> <td style="text-align: center;">% Strain</td> </tr> <tr> <td>Water Content, %</td> <td></td> <td></td> <td>Pmin</td> <td></td> <td></td> </tr> <tr> <td>Dry Density, lbs/ft³</td> <td></td> <td></td> <td>Pp</td> <td></td> <td></td> </tr> <tr> <td>Void Ratio</td> <td></td> <td></td> <td>Pmax</td> <td></td> <td></td> </tr> <tr> <td>Saturation, %</td> <td></td> <td></td> <td>Cc/C'c</td> <td></td> <td></td> </tr> </tbody> </table> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="7" style="text-align: center;">Vane Shear Test on Shelby Tubes (Maine DOT)</th> </tr> <tr> <th rowspan="3" style="width: 10%;">Depth taken in tube, ft</th> <th colspan="2" style="width: 15%;">3 In.</th> <th colspan="2" style="width: 15%;">6 In.</th> <th rowspan="3" style="width: 10%;">Water Content, %</th> <th rowspan="3" style="width: 40%;">Description of Material Sampled at the Various Tube Depths</th> </tr> <tr> <th style="width: 5%;">U. Shear</th> <th style="width: 10%;">Remold</th> <th style="width: 5%;">U. Shear</th> <th style="width: 10%;">Remold</th> </tr> <tr> <th style="text-align: center;">tons/ft²</th> <th style="text-align: center;">tons/ft²</th> <th style="text-align: center;">tons/ft²</th> <th style="text-align: center;">tons/ft²</th> </tr> </thead> <tbody> <tr> <td> </td> </tr> </tbody> </table>	Direct Shear (T 236)				Shear Angle, °				Initial Water Content, %				Normal Stress, psi				Wet Density, lbs/ft³				Dry Density, lbs/ft³				Specimen Thickness, in				Consolidation (T 216)						Trimming, Water Content, %							Initial	Final		Void Ratio	% Strain	Water Content, %			Pmin			Dry Density, lbs/ft³			Pp			Void Ratio			Pmax			Saturation, %			Cc/C'c			Vane Shear Test on Shelby Tubes (Maine DOT)							Depth taken in tube, ft	3 In.		6 In.		Water Content, %	Description of Material Sampled at the Various Tube Depths	U. Shear	Remold	U. Shear	Remold	tons/ft²	tons/ft²	tons/ft²	tons/ft²								Miscellaneous Tests 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) <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; text-align: center;">Loss, %</td> <td style="width: 50%; text-align: center;">H2O, %</td> </tr> </table> Water Content (T 265), % <p style="text-align: center; font-weight: bold;">15.7</p>	Loss, %	H2O, %
SIEVE SIZE U.S. [SI]	% Passing																																																																																																																																		
3 in. [75.0 mm]																																																																																																																																			
1 in. [25.0 mm]																																																																																																																																			
¾ in. [19.0 mm]																																																																																																																																			
½ in. [12.5 mm]	100.0																																																																																																																																		
⅜ in. [9.5 mm]	98.1																																																																																																																																		
¼ in. [6.3 mm]	96.4																																																																																																																																		
No. 4 [4.75 mm]	94.7																																																																																																																																		
No. 10 [2.00 mm]	88.8																																																																																																																																		
No. 20 [0.850 mm]	81.1																																																																																																																																		
No. 40 [0.425 mm]	74.8																																																																																																																																		
No. 60 [0.250 mm]	71.4																																																																																																																																		
No. 100 [0.150 mm]	68.1																																																																																																																																		
No. 200 [0.075 mm]	61.6																																																																																																																																		
Direct Shear (T 236)																																																																																																																																			
Shear Angle, °																																																																																																																																			
Initial Water Content, %																																																																																																																																			
Normal Stress, psi																																																																																																																																			
Wet Density, lbs/ft³																																																																																																																																			
Dry Density, lbs/ft³																																																																																																																																			
Specimen Thickness, in																																																																																																																																			
Consolidation (T 216)																																																																																																																																			
Trimming, Water Content, %																																																																																																																																			
	Initial	Final		Void Ratio	% Strain																																																																																																																														
Water Content, %			Pmin																																																																																																																																
Dry Density, lbs/ft³			Pp																																																																																																																																
Void Ratio			Pmax																																																																																																																																
Saturation, %			Cc/C'c																																																																																																																																
Vane Shear Test on Shelby Tubes (Maine DOT)																																																																																																																																			
Depth taken in tube, ft	3 In.		6 In.		Water Content, %	Description of Material Sampled at the Various Tube Depths																																																																																																																													
	U. Shear	Remold	U. Shear	Remold																																																																																																																															
	tons/ft²	tons/ft²	tons/ft²	tons/ft²																																																																																																																															
Loss, %	H2O, %																																																																																																																																		

Comments:

AUTHORIZATION AND DISTRIBUTION

Reported by: **FOGG, BRIAN** Date Reported: **1/24/2011**



GEOTECHNICAL TEST REPORT

Central Laboratory

SAMPLE INFORMATION

Reference No.	Boring No./Sample No.	Sample Description	Sampled	Received
245503	HB-CAN-103/S3	GEOTECHNICAL (DISTURBED)	1/5/2011	1/13/2011
Sample Type: GEOTECHNICAL		Location: ROADWAY	Station: 515+06	Offset, ft: 9.0
WIN/Town 017885.00 - CANAAN		Sampler: WILDER, BRUCE H		

TEST RESULTS

Sieve Analysis (T 27, T 11) Wash Method Procedure A <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 70%;">SIEVE SIZE U.S. [SI]</th> <th style="width: 30%;">% Passing</th> </tr> </thead> <tbody> <tr><td>3 in. [75.0 mm]</td><td></td></tr> <tr><td>1 in. [25.0 mm]</td><td>100.0</td></tr> <tr><td>¾ in. [19.0 mm]</td><td>98.9</td></tr> <tr><td>½ in. [12.5 mm]</td><td>86.4</td></tr> <tr><td>⅜ in. [9.5 mm]</td><td>77.1</td></tr> <tr><td>¼ in. [6.3 mm]</td><td>68.2</td></tr> <tr><td>No. 4 [4.75 mm]</td><td>63.0</td></tr> <tr><td>No. 10 [2.00 mm]</td><td>48.9</td></tr> <tr><td>No. 20 [0.850 mm]</td><td>33.2</td></tr> <tr><td>No. 40 [0.425 mm]</td><td>22.8</td></tr> <tr><td>No. 60 [0.250 mm]</td><td>18.2</td></tr> <tr><td>No. 100 [0.150 mm]</td><td>14.7</td></tr> <tr><td>No. 200 [0.075 mm]</td><td>11.1</td></tr> </tbody> </table>	SIEVE SIZE U.S. [SI]	% Passing	3 in. [75.0 mm]		1 in. [25.0 mm]	100.0	¾ in. [19.0 mm]	98.9	½ in. [12.5 mm]	86.4	⅜ in. [9.5 mm]	77.1	¼ in. [6.3 mm]	68.2	No. 4 [4.75 mm]	63.0	No. 10 [2.00 mm]	48.9	No. 20 [0.850 mm]	33.2	No. 40 [0.425 mm]	22.8	No. 60 [0.250 mm]	18.2	No. 100 [0.150 mm]	14.7	No. 200 [0.075 mm]	11.1	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="4" style="text-align: center;">Direct Shear (T 236)</th> </tr> </thead> <tbody> <tr><td>Shear Angle, °</td><td></td><td></td><td></td></tr> <tr><td>Initial Water Content, %</td><td></td><td></td><td></td></tr> <tr><td>Normal Stress, psi</td><td></td><td></td><td></td></tr> <tr><td>Wet Density, lbs/ft³</td><td></td><td></td><td></td></tr> <tr><td>Dry Density, lbs/ft³</td><td></td><td></td><td></td></tr> <tr><td>Specimen Thickness, in</td><td></td><td></td><td></td></tr> </tbody> </table> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="6" style="text-align: center;">Consolidation (T 216)</th> </tr> </thead> <tbody> <tr> <td colspan="6" style="text-align: center;">Trimmings, Water Content, %</td> </tr> <tr> <td></td> <td style="text-align: center;">Initial</td> <td style="text-align: center;">Final</td> <td></td> <td style="text-align: center;">Void Ratio</td> <td style="text-align: center;">% Strain</td> </tr> <tr> <td>Water Content, %</td> <td></td> <td></td> <td>Pmin</td> <td></td> <td></td> </tr> <tr> <td>Dry Density, lbs/ft³</td> <td></td> <td></td> <td>Pp</td> <td></td> <td></td> </tr> <tr> <td>Void Ratio</td> <td></td> <td></td> <td>Pmax</td> <td></td> <td></td> </tr> <tr> <td>Saturation, %</td> <td></td> <td></td> <td>Cc/C'c</td> <td></td> <td></td> </tr> </tbody> </table> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="7" style="text-align: center;">Vane Shear Test on Shelby Tubes (Maine DOT)</th> </tr> <tr> <th rowspan="3" style="width: 10%;">Depth taken in tube, ft</th> <th colspan="2" style="width: 15%;">3 In.</th> <th colspan="2" style="width: 15%;">6 In.</th> <th rowspan="3" style="width: 10%;">Water Content, %</th> <th rowspan="3" style="width: 40%;">Description of Material Sampled at the Various Tube Depths</th> </tr> <tr> <th style="width: 5%;">U. Shear</th> <th style="width: 10%;">Remold</th> <th style="width: 5%;">U. Shear</th> <th style="width: 10%;">Remold</th> </tr> <tr> <th style="text-align: center;">tons/ft²</th> <th style="text-align: center;">tons/ft²</th> <th style="text-align: center;">tons/ft²</th> <th style="text-align: center;">tons/ft²</th> </tr> </thead> <tbody> <tr> <td> </td> </tr> </tbody> </table>	Direct Shear (T 236)				Shear Angle, °				Initial Water Content, %				Normal Stress, psi				Wet Density, lbs/ft³				Dry Density, lbs/ft³				Specimen Thickness, in				Consolidation (T 216)						Trimmings, Water Content, %							Initial	Final		Void Ratio	% Strain	Water Content, %			Pmin			Dry Density, lbs/ft³			Pp			Void Ratio			Pmax			Saturation, %			Cc/C'c			Vane Shear Test on Shelby Tubes (Maine DOT)							Depth taken in tube, ft	3 In.		6 In.		Water Content, %	Description of Material Sampled at the Various Tube Depths	U. Shear	Remold	U. Shear	Remold	tons/ft²	tons/ft²	tons/ft²	tons/ft²								Miscellaneous Tests 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) <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; text-align: center;">Loss, %</td> <td style="width: 50%; text-align: center;">H2O, %</td> </tr> </table> Water Content (T 265), % <p style="text-align: center; font-weight: bold;">3.1</p>	Loss, %	H2O, %
SIEVE SIZE U.S. [SI]	% Passing																																																																																																																																		
3 in. [75.0 mm]																																																																																																																																			
1 in. [25.0 mm]	100.0																																																																																																																																		
¾ in. [19.0 mm]	98.9																																																																																																																																		
½ in. [12.5 mm]	86.4																																																																																																																																		
⅜ in. [9.5 mm]	77.1																																																																																																																																		
¼ in. [6.3 mm]	68.2																																																																																																																																		
No. 4 [4.75 mm]	63.0																																																																																																																																		
No. 10 [2.00 mm]	48.9																																																																																																																																		
No. 20 [0.850 mm]	33.2																																																																																																																																		
No. 40 [0.425 mm]	22.8																																																																																																																																		
No. 60 [0.250 mm]	18.2																																																																																																																																		
No. 100 [0.150 mm]	14.7																																																																																																																																		
No. 200 [0.075 mm]	11.1																																																																																																																																		
Direct Shear (T 236)																																																																																																																																			
Shear Angle, °																																																																																																																																			
Initial Water Content, %																																																																																																																																			
Normal Stress, psi																																																																																																																																			
Wet Density, lbs/ft³																																																																																																																																			
Dry Density, lbs/ft³																																																																																																																																			
Specimen Thickness, in																																																																																																																																			
Consolidation (T 216)																																																																																																																																			
Trimmings, Water Content, %																																																																																																																																			
	Initial	Final		Void Ratio	% Strain																																																																																																																														
Water Content, %			Pmin																																																																																																																																
Dry Density, lbs/ft³			Pp																																																																																																																																
Void Ratio			Pmax																																																																																																																																
Saturation, %			Cc/C'c																																																																																																																																
Vane Shear Test on Shelby Tubes (Maine DOT)																																																																																																																																			
Depth taken in tube, ft	3 In.		6 In.		Water Content, %	Description of Material Sampled at the Various Tube Depths																																																																																																																													
	U. Shear	Remold	U. Shear	Remold																																																																																																																															
	tons/ft²	tons/ft²	tons/ft²	tons/ft²																																																																																																																															
Loss, %	H2O, %																																																																																																																																		

Comments:

AUTHORIZATION AND DISTRIBUTION

Reported by: **FOGG, BRIAN** Date Reported: **1/24/2011**



GEOTECHNICAL TEST REPORT

Central Laboratory

SAMPLE INFORMATION

Reference No.	Boring No./Sample No.	Sample Description	Sampled	Received
245505	HB-CAN-105/S5	<u>GEOTECHNICAL (DISTURBED)</u>	1/5/2011	1/13/2011
Sample Type: GEOTECHNICAL		Location: ROADWAY	Station: 521+06	Offset, ft: 9.0
WIN/Town 017885.00 - CANAAN			RT Dbfg, ft: 2.2-8.0	
			Sampler: WILDER, BRUCE H	

TEST RESULTS

<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th colspan="2" style="text-align: center;">Sieve Analysis (T 27, T 11)</th> </tr> <tr> <td colspan="2" style="text-align: center;">Wash Method</td> </tr> <tr> <td colspan="2" style="text-align: center; color: red;">Procedure A</td> </tr> <tr> <th style="text-align: center;">SIEVE SIZE U.S. [SI]</th> <th style="text-align: center;">% Passing</th> </tr> <tr> <td>3 in. [75.0 mm]</td> <td></td> </tr> <tr> <td>1 in. [25.0 mm]</td> <td></td> </tr> <tr> <td>¾ in. [19.0 mm]</td> <td style="text-align: center;">100.0</td> </tr> <tr> <td>½ in. [12.5 mm]</td> <td style="text-align: center;">97.5</td> </tr> <tr> <td>⅜ in. [9.5 mm]</td> <td style="text-align: center;">93.4</td> </tr> <tr> <td>¼ in. [6.3 mm]</td> <td style="text-align: center;">85.8</td> </tr> <tr> <td>No. 4 [4.75 mm]</td> <td style="text-align: center;">79.4</td> </tr> <tr> <td>No. 10 [2.00 mm]</td> <td style="text-align: center;">58.4</td> </tr> <tr> <td>No. 20 [0.850 mm]</td> <td style="text-align: center;">43.7</td> </tr> <tr> <td>No. 40 [0.425 mm]</td> <td style="text-align: center;">36.2</td> </tr> <tr> <td>No. 60 [0.250 mm]</td> <td style="text-align: center;">32.0</td> </tr> <tr> <td>No. 100 [0.150 mm]</td> <td style="text-align: center;">28.6</td> </tr> <tr> <td>No. 200 [0.075 mm]</td> <td style="text-align: center;">24.2</td> </tr> </table>	Sieve Analysis (T 27, T 11)		Wash Method		Procedure A		SIEVE SIZE U.S. [SI]	% Passing	3 in. [75.0 mm]		1 in. [25.0 mm]		¾ in. [19.0 mm]	100.0	½ in. [12.5 mm]	97.5	⅜ in. [9.5 mm]	93.4	¼ in. [6.3 mm]	85.8	No. 4 [4.75 mm]	79.4	No. 10 [2.00 mm]	58.4	No. 20 [0.850 mm]	43.7	No. 40 [0.425 mm]	36.2	No. 60 [0.250 mm]	32.0	No. 100 [0.150 mm]	28.6	No. 200 [0.075 mm]	24.2	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th colspan="6" style="text-align: center;">Direct Shear (T 236)</th> </tr> <tr> <td style="width: 30%;">Shear Angle, °</td> <td colspan="2"></td> <td colspan="3"></td> </tr> <tr> <td>Initial Water Content, %</td> <td colspan="2"></td> <td colspan="3"></td> </tr> <tr> <td>Normal Stress, psi</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Wet Density, lbs/ft³</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Dry Density, lbs/ft³</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Specimen Thickness, in</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <th colspan="6" style="text-align: center;">Consolidation (T 216)</th> </tr> <tr> <td colspan="6" style="text-align: center;">Trimming, Water Content, %</td> </tr> <tr> <td></td> <td style="text-align: center;">Initial</td> <td style="text-align: center;">Final</td> <td></td> <td style="text-align: center;">Void Ratio</td> <td style="text-align: center;">% Strain</td> </tr> <tr> <td>Water Content, %</td> <td></td> <td></td> <td style="text-align: center;">Pmin</td> <td></td> <td></td> </tr> <tr> <td>Dry Density, lbs/ft³</td> <td></td> <td></td> <td style="text-align: center;">Pp</td> <td></td> <td></td> </tr> <tr> <td>Void Ratio</td> <td></td> <td></td> <td style="text-align: center;">Pmax</td> <td></td> <td></td> </tr> <tr> <td>Saturation, %</td> <td></td> <td></td> <td style="text-align: center;">Cc/C'c</td> <td></td> <td></td> </tr> <tr> <th colspan="6" style="text-align: center;">Vane Shear Test on Shelby Tubes (Maine DOT)</th> </tr> <tr> <th rowspan="3" style="text-align: center;">Depth taken in tube, ft</th> <th colspan="2" style="text-align: center;">3 In.</th> <th colspan="2" style="text-align: center;">6 In.</th> <th rowspan="3" style="text-align: center;">Water Content, %</th> <th rowspan="3" style="text-align: center;">Description of Material Sampled at the Various Tube Depths</th> </tr> <tr> <th style="text-align: center;">U. Shear</th> <th style="text-align: center;">Remold</th> <th style="text-align: center;">U. Shear</th> <th style="text-align: center;">Remold</th> </tr> <tr> <th style="text-align: center;">tons/ft²</th> <th style="text-align: center;">tons/ft²</th> <th style="text-align: center;">tons/ft²</th> <th style="text-align: center;">tons/ft²</th> </tr> <tr> <td colspan="7" style="height: 100px;"></td> </tr> </table>	Direct Shear (T 236)						Shear Angle, °						Initial Water Content, %						Normal Stress, psi						Wet Density, lbs/ft³						Dry Density, lbs/ft³						Specimen Thickness, in						Consolidation (T 216)						Trimming, Water Content, %							Initial	Final		Void Ratio	% Strain	Water Content, %			Pmin			Dry Density, lbs/ft³			Pp			Void Ratio			Pmax			Saturation, %			Cc/C'c			Vane Shear Test on Shelby Tubes (Maine DOT)						Depth taken in tube, ft	3 In.		6 In.		Water Content, %	Description of Material Sampled at the Various Tube Depths	U. Shear	Remold	U. Shear	Remold	tons/ft²	tons/ft²	tons/ft²	tons/ft²								<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="text-align: center;">Miscellaneous Tests</th> </tr> <tr> <td style="text-align: center;"><u>Liquid Limit @ 25 blows (T 89), %</u></td> </tr> <tr> <td style="text-align: center;"><u>Plastic Limit (T 90), %</u></td> </tr> <tr> <td style="text-align: center;"><u>Plasticity Index (T 90), %</u></td> </tr> <tr> <td style="text-align: center;"><u>Specific Gravity, Corrected to 20°C (T 100)</u></td> </tr> <tr> <td style="text-align: center;"><u>Loss on Ignition (T 267)</u></td> </tr> <tr> <td style="text-align: center;"><u>Loss, %</u> <u>H2O, %</u></td> </tr> <tr> <td style="text-align: center;"><u>Water Content (T 265), %</u></td> </tr> <tr> <td style="text-align: center;">4.3</td> </tr> </table>	Miscellaneous Tests	<u>Liquid Limit @ 25 blows (T 89), %</u>	<u>Plastic Limit (T 90), %</u>	<u>Plasticity Index (T 90), %</u>	<u>Specific Gravity, Corrected to 20°C (T 100)</u>	<u>Loss on Ignition (T 267)</u>	<u>Loss, %</u> <u>H2O, %</u>	<u>Water Content (T 265), %</u>	4.3
Sieve Analysis (T 27, T 11)																																																																																																																																																													
Wash Method																																																																																																																																																													
Procedure A																																																																																																																																																													
SIEVE SIZE U.S. [SI]	% Passing																																																																																																																																																												
3 in. [75.0 mm]																																																																																																																																																													
1 in. [25.0 mm]																																																																																																																																																													
¾ in. [19.0 mm]	100.0																																																																																																																																																												
½ in. [12.5 mm]	97.5																																																																																																																																																												
⅜ in. [9.5 mm]	93.4																																																																																																																																																												
¼ in. [6.3 mm]	85.8																																																																																																																																																												
No. 4 [4.75 mm]	79.4																																																																																																																																																												
No. 10 [2.00 mm]	58.4																																																																																																																																																												
No. 20 [0.850 mm]	43.7																																																																																																																																																												
No. 40 [0.425 mm]	36.2																																																																																																																																																												
No. 60 [0.250 mm]	32.0																																																																																																																																																												
No. 100 [0.150 mm]	28.6																																																																																																																																																												
No. 200 [0.075 mm]	24.2																																																																																																																																																												
Direct Shear (T 236)																																																																																																																																																													
Shear Angle, °																																																																																																																																																													
Initial Water Content, %																																																																																																																																																													
Normal Stress, psi																																																																																																																																																													
Wet Density, lbs/ft³																																																																																																																																																													
Dry Density, lbs/ft³																																																																																																																																																													
Specimen Thickness, in																																																																																																																																																													
Consolidation (T 216)																																																																																																																																																													
Trimming, Water Content, %																																																																																																																																																													
	Initial	Final		Void Ratio	% Strain																																																																																																																																																								
Water Content, %			Pmin																																																																																																																																																										
Dry Density, lbs/ft³			Pp																																																																																																																																																										
Void Ratio			Pmax																																																																																																																																																										
Saturation, %			Cc/C'c																																																																																																																																																										
Vane Shear Test on Shelby Tubes (Maine DOT)																																																																																																																																																													
Depth taken in tube, ft	3 In.		6 In.		Water Content, %	Description of Material Sampled at the Various Tube Depths																																																																																																																																																							
	U. Shear	Remold	U. Shear	Remold																																																																																																																																																									
	tons/ft²	tons/ft²	tons/ft²	tons/ft²																																																																																																																																																									
Miscellaneous Tests																																																																																																																																																													
<u>Liquid Limit @ 25 blows (T 89), %</u>																																																																																																																																																													
<u>Plastic Limit (T 90), %</u>																																																																																																																																																													
<u>Plasticity Index (T 90), %</u>																																																																																																																																																													
<u>Specific Gravity, Corrected to 20°C (T 100)</u>																																																																																																																																																													
<u>Loss on Ignition (T 267)</u>																																																																																																																																																													
<u>Loss, %</u> <u>H2O, %</u>																																																																																																																																																													
<u>Water Content (T 265), %</u>																																																																																																																																																													
4.3																																																																																																																																																													

Comments:

AUTHORIZATION AND DISTRIBUTION

Reported by: **FOGG, BRIAN** Date Reported: **1/20/2011**



GEOTECHNICAL TEST REPORT

Central Laboratory

SAMPLE INFORMATION

Reference No.	Boring No./Sample No.	Sample Description	Sampled	Received
245506	HB-CAN-106/S6	<u>GEOTECHNICAL (DISTURBED)</u>	1/5/2011	1/13/2011
Sample Type: GEOTECHNICAL		Location: ROADWAY	Station: 525+06	Offset, ft: 9.0
WIN/Town 017885.00 - CANAAN		Sampler: WILDER, BRUCE H		

TEST RESULTS

Sieve Analysis (T 27, T 11) Wash Method Procedure A <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 70%;">SIEVE SIZE U.S. [SI]</th> <th style="width: 30%;">% Passing</th> </tr> </thead> <tbody> <tr><td>3 in. [75.0 mm]</td><td></td></tr> <tr><td>1 in. [25.0 mm]</td><td></td></tr> <tr><td>¾ in. [19.0 mm]</td><td>100.0</td></tr> <tr><td>½ in. [12.5 mm]</td><td>88.7</td></tr> <tr><td>⅜ in. [9.5 mm]</td><td>77.5</td></tr> <tr><td>¼ in. [6.3 mm]</td><td>67.8</td></tr> <tr><td>No. 4 [4.75 mm]</td><td>62.8</td></tr> <tr><td>No. 10 [2.00 mm]</td><td>50.3</td></tr> <tr><td>No. 20 [0.850 mm]</td><td>37.2</td></tr> <tr><td>No. 40 [0.425 mm]</td><td>27.8</td></tr> <tr><td>No. 60 [0.250 mm]</td><td>23.4</td></tr> <tr><td>No. 100 [0.150 mm]</td><td>19.9</td></tr> <tr><td>No. 200 [0.075 mm]</td><td>14.9</td></tr> </tbody> </table>	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]	88.7	⅜ in. [9.5 mm]	77.5	¼ in. [6.3 mm]	67.8	No. 4 [4.75 mm]	62.8	No. 10 [2.00 mm]	50.3	No. 20 [0.850 mm]	37.2	No. 40 [0.425 mm]	27.8	No. 60 [0.250 mm]	23.4	No. 100 [0.150 mm]	19.9	No. 200 [0.075 mm]	14.9	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="4" style="text-align: center;">Direct Shear (T 236)</th> </tr> </thead> <tbody> <tr><td>Shear Angle, °</td><td></td><td></td><td></td></tr> <tr><td>Initial Water Content, %</td><td></td><td></td><td></td></tr> <tr><td>Normal Stress, psi</td><td></td><td></td><td></td></tr> <tr><td>Wet Density, lbs/ft³</td><td></td><td></td><td></td></tr> <tr><td>Dry Density, lbs/ft³</td><td></td><td></td><td></td></tr> <tr><td>Specimen Thickness, in</td><td></td><td></td><td></td></tr> </tbody> </table> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="6" style="text-align: center;">Consolidation (T 216)</th> </tr> </thead> <tbody> <tr> <td colspan="6" style="text-align: center;">Trimblings, Water Content, %</td> </tr> <tr> <td></td> <td style="text-align: center;">Initial</td> <td style="text-align: center;">Final</td> <td></td> <td style="text-align: center;">Void Ratio</td> <td style="text-align: center;">% Strain</td> </tr> <tr> <td>Water Content, %</td> <td></td> <td></td> <td style="text-align: center;">Pmin</td> <td></td> <td></td> </tr> <tr> <td>Dry Density, lbs/ft³</td> <td></td> <td></td> <td style="text-align: center;">Pp</td> <td></td> <td></td> </tr> <tr> <td>Void Ratio</td> <td></td> <td></td> <td style="text-align: center;">Pmax</td> <td></td> <td></td> </tr> <tr> <td>Saturation, %</td> <td></td> <td></td> <td style="text-align: center;">Cc/C'c</td> <td></td> <td></td> </tr> </tbody> </table> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="7" style="text-align: center;">Vane Shear Test on Shelby Tubes (Maine DOT)</th> </tr> <tr> <th rowspan="3" style="text-align: center;">Depth taken in tube, ft</th> <th colspan="2" style="text-align: center;">3 In.</th> <th colspan="2" style="text-align: center;">6 In.</th> <th rowspan="3" style="text-align: center;">Water Content, %</th> <th rowspan="3" style="text-align: center;">Description of Material Sampled at the Various Tube Depths</th> </tr> <tr> <th style="text-align: center;">U. Shear</th> <th style="text-align: center;">Remold</th> <th style="text-align: center;">U. Shear</th> <th style="text-align: center;">Remold</th> </tr> <tr> <th style="text-align: center;">tons/ft²</th> <th style="text-align: center;">tons/ft²</th> <th style="text-align: center;">tons/ft²</th> <th style="text-align: center;">tons/ft²</th> </tr> </thead> <tbody> <tr> <td> </td> </tr> </tbody> </table>	Direct Shear (T 236)				Shear Angle, °				Initial Water Content, %				Normal Stress, psi				Wet Density, lbs/ft³				Dry Density, lbs/ft³				Specimen Thickness, in				Consolidation (T 216)						Trimblings, Water Content, %							Initial	Final		Void Ratio	% Strain	Water Content, %			Pmin			Dry Density, lbs/ft³			Pp			Void Ratio			Pmax			Saturation, %			Cc/C'c			Vane Shear Test on Shelby Tubes (Maine DOT)							Depth taken in tube, ft	3 In.		6 In.		Water Content, %	Description of Material Sampled at the Various Tube Depths	U. Shear	Remold	U. Shear	Remold	tons/ft²	tons/ft²	tons/ft²	tons/ft²								Miscellaneous Tests 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) <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">Loss, %</td> <td style="text-align: center;">H2O, %</td> </tr> </table> Water Content (T 265), % <p style="text-align: center; font-weight: bold;">4.0</p>	Loss, %	H2O, %
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]	88.7																																																																																																																																		
⅜ in. [9.5 mm]	77.5																																																																																																																																		
¼ in. [6.3 mm]	67.8																																																																																																																																		
No. 4 [4.75 mm]	62.8																																																																																																																																		
No. 10 [2.00 mm]	50.3																																																																																																																																		
No. 20 [0.850 mm]	37.2																																																																																																																																		
No. 40 [0.425 mm]	27.8																																																																																																																																		
No. 60 [0.250 mm]	23.4																																																																																																																																		
No. 100 [0.150 mm]	19.9																																																																																																																																		
No. 200 [0.075 mm]	14.9																																																																																																																																		
Direct Shear (T 236)																																																																																																																																			
Shear Angle, °																																																																																																																																			
Initial Water Content, %																																																																																																																																			
Normal Stress, psi																																																																																																																																			
Wet Density, lbs/ft³																																																																																																																																			
Dry Density, lbs/ft³																																																																																																																																			
Specimen Thickness, in																																																																																																																																			
Consolidation (T 216)																																																																																																																																			
Trimblings, Water Content, %																																																																																																																																			
	Initial	Final		Void Ratio	% Strain																																																																																																																														
Water Content, %			Pmin																																																																																																																																
Dry Density, lbs/ft³			Pp																																																																																																																																
Void Ratio			Pmax																																																																																																																																
Saturation, %			Cc/C'c																																																																																																																																
Vane Shear Test on Shelby Tubes (Maine DOT)																																																																																																																																			
Depth taken in tube, ft	3 In.		6 In.		Water Content, %	Description of Material Sampled at the Various Tube Depths																																																																																																																													
	U. Shear	Remold	U. Shear	Remold																																																																																																																															
	tons/ft²	tons/ft²	tons/ft²	tons/ft²																																																																																																																															
Loss, %	H2O, %																																																																																																																																		

Comments:

AUTHORIZATION AND DISTRIBUTION

Reported by: **FOGG, BRIAN** Date Reported: **1/20/2011**



GEOTECHNICAL TEST REPORT

Central Laboratory

SAMPLE INFORMATION

Reference No.	Boring No./Sample No.	Sample Description	Sampled	Received
245507	HB-CAN-106/S7	GEOTECHNICAL (DISTURBED)	1/5/2011	1/13/2011
Sample Type: GEOTECHNICAL		Location: ROADWAY	Station: 525+06	Offset, ft: 9.0
WIN/Town 017885.00 - CANAAN		Sampler: WILDER, BRUCE H		

TEST RESULTS

Sieve Analysis (T 27, T 11) Wash Method Procedure A <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 70%;">SIEVE SIZE U.S. [SI]</th> <th style="width: 30%;">% Passing</th> </tr> </thead> <tbody> <tr><td>3 in. [75.0 mm]</td><td></td></tr> <tr><td>1 in. [25.0 mm]</td><td></td></tr> <tr><td>¾ in. [19.0 mm]</td><td></td></tr> <tr><td>½ in. [12.5 mm]</td><td>100.0</td></tr> <tr><td>⅜ in. [9.5 mm]</td><td>98.6</td></tr> <tr><td>¼ in. [6.3 mm]</td><td>96.0</td></tr> <tr><td>No. 4 [4.75 mm]</td><td>94.2</td></tr> <tr><td>No. 10 [2.00 mm]</td><td>86.2</td></tr> <tr><td>No. 20 [0.850 mm]</td><td>73.9</td></tr> <tr><td>No. 40 [0.425 mm]</td><td>63.4</td></tr> <tr><td>No. 60 [0.250 mm]</td><td>57.7</td></tr> <tr><td>No. 100 [0.150 mm]</td><td>52.5</td></tr> <tr><td>No. 200 [0.075 mm]</td><td>43.7</td></tr> </tbody> </table>	SIEVE SIZE U.S. [SI]	% Passing	3 in. [75.0 mm]		1 in. [25.0 mm]		¾ in. [19.0 mm]		½ in. [12.5 mm]	100.0	⅜ in. [9.5 mm]	98.6	¼ in. [6.3 mm]	96.0	No. 4 [4.75 mm]	94.2	No. 10 [2.00 mm]	86.2	No. 20 [0.850 mm]	73.9	No. 40 [0.425 mm]	63.4	No. 60 [0.250 mm]	57.7	No. 100 [0.150 mm]	52.5	No. 200 [0.075 mm]	43.7	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="4" style="text-align: center;">Direct Shear (T 236)</th> </tr> </thead> <tbody> <tr><td>Shear Angle, °</td><td></td><td></td><td></td></tr> <tr><td>Initial Water Content, %</td><td></td><td></td><td></td></tr> <tr><td>Normal Stress, psi</td><td></td><td></td><td></td></tr> <tr><td>Wet Density, lbs/ft³</td><td></td><td></td><td></td></tr> <tr><td>Dry Density, lbs/ft³</td><td></td><td></td><td></td></tr> <tr><td>Specimen Thickness, in</td><td></td><td></td><td></td></tr> </tbody> </table> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="6" style="text-align: center;">Consolidation (T 216)</th> </tr> </thead> <tbody> <tr> <td colspan="6" style="text-align: center;">Trimblings, Water Content, %</td> </tr> <tr> <td></td> <td style="text-align: center;">Initial</td> <td style="text-align: center;">Final</td> <td></td> <td style="text-align: center;">Void Ratio</td> <td style="text-align: center;">% Strain</td> </tr> <tr> <td>Water Content, %</td> <td></td> <td></td> <td>Pmin</td> <td></td> <td></td> </tr> <tr> <td>Dry Density, lbs/ft³</td> <td></td> <td></td> <td>Pp</td> <td></td> <td></td> </tr> <tr> <td>Void Ratio</td> <td></td> <td></td> <td>Pmax</td> <td></td> <td></td> </tr> <tr> <td>Saturation, %</td> <td></td> <td></td> <td>Cc/C'c</td> <td></td> <td></td> </tr> </tbody> </table> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="7" style="text-align: center;">Vane Shear Test on Shelby Tubes (Maine DOT)</th> </tr> <tr> <th rowspan="3" style="width: 10%;">Depth taken in tube, ft</th> <th colspan="2" style="width: 15%;">3 In.</th> <th colspan="2" style="width: 15%;">6 In.</th> <th rowspan="3" style="width: 10%;">Water Content, %</th> <th rowspan="3" style="width: 40%;">Description of Material Sampled at the Various Tube Depths</th> </tr> <tr> <th style="width: 5%;">U. Shear</th> <th style="width: 10%;">Remold</th> <th style="width: 5%;">U. Shear</th> <th style="width: 10%;">Remold</th> </tr> <tr> <th style="text-align: center;">tons/ft²</th> <th style="text-align: center;">tons/ft²</th> <th style="text-align: center;">tons/ft²</th> <th style="text-align: center;">tons/ft²</th> </tr> </thead> <tbody> <tr> <td> </td> </tr> </tbody> </table>	Direct Shear (T 236)				Shear Angle, °				Initial Water Content, %				Normal Stress, psi				Wet Density, lbs/ft³				Dry Density, lbs/ft³				Specimen Thickness, in				Consolidation (T 216)						Trimblings, Water Content, %							Initial	Final		Void Ratio	% Strain	Water Content, %			Pmin			Dry Density, lbs/ft³			Pp			Void Ratio			Pmax			Saturation, %			Cc/C'c			Vane Shear Test on Shelby Tubes (Maine DOT)							Depth taken in tube, ft	3 In.		6 In.		Water Content, %	Description of Material Sampled at the Various Tube Depths	U. Shear	Remold	U. Shear	Remold	tons/ft²	tons/ft²	tons/ft²	tons/ft²								Miscellaneous Tests 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), % <p style="text-align: center;">13.3</p>
SIEVE SIZE U.S. [SI]	% Passing																																																																																																																																
3 in. [75.0 mm]																																																																																																																																	
1 in. [25.0 mm]																																																																																																																																	
¾ in. [19.0 mm]																																																																																																																																	
½ in. [12.5 mm]	100.0																																																																																																																																
⅜ in. [9.5 mm]	98.6																																																																																																																																
¼ in. [6.3 mm]	96.0																																																																																																																																
No. 4 [4.75 mm]	94.2																																																																																																																																
No. 10 [2.00 mm]	86.2																																																																																																																																
No. 20 [0.850 mm]	73.9																																																																																																																																
No. 40 [0.425 mm]	63.4																																																																																																																																
No. 60 [0.250 mm]	57.7																																																																																																																																
No. 100 [0.150 mm]	52.5																																																																																																																																
No. 200 [0.075 mm]	43.7																																																																																																																																
Direct Shear (T 236)																																																																																																																																	
Shear Angle, °																																																																																																																																	
Initial Water Content, %																																																																																																																																	
Normal Stress, psi																																																																																																																																	
Wet Density, lbs/ft³																																																																																																																																	
Dry Density, lbs/ft³																																																																																																																																	
Specimen Thickness, in																																																																																																																																	
Consolidation (T 216)																																																																																																																																	
Trimblings, Water Content, %																																																																																																																																	
	Initial	Final		Void Ratio	% Strain																																																																																																																												
Water Content, %			Pmin																																																																																																																														
Dry Density, lbs/ft³			Pp																																																																																																																														
Void Ratio			Pmax																																																																																																																														
Saturation, %			Cc/C'c																																																																																																																														
Vane Shear Test on Shelby Tubes (Maine DOT)																																																																																																																																	
Depth taken in tube, ft	3 In.		6 In.		Water Content, %	Description of Material Sampled at the Various Tube Depths																																																																																																																											
	U. Shear	Remold	U. Shear	Remold																																																																																																																													
	tons/ft²	tons/ft²	tons/ft²	tons/ft²																																																																																																																													

Comments:

AUTHORIZATION AND DISTRIBUTION

Reported by: **FOGG, BRIAN** Date Reported: **1/20/2011**



GEOTECHNICAL TEST REPORT

Central Laboratory

SAMPLE INFORMATION

Reference No.	Boring No./Sample No.	Sample Description	Sampled	Received
245508	HB-CAN-110/S8	GEOTECHNICAL (DISTURBED)	1/5/2011	1/13/2011
Sample Type: GEOTECHNICAL		Location: ROADWAY	Station: 546+06	Offset, ft: 9.0
WIN/Town 017885.00 - CANAAN		Sampler: WILDER, BRUCE H		

TEST RESULTS

Sieve Analysis (T 27, T 11) Wash Method <b style="color: red;">Procedure A <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 70%;">SIEVE SIZE U.S. [SI]</th> <th style="width: 30%;">% Passing</th> </tr> </thead> <tbody> <tr><td>3 in. [75.0 mm]</td><td></td></tr> <tr><td>1 in. [25.0 mm]</td><td style="text-align: center;">100.0</td></tr> <tr><td>¾ in. [19.0 mm]</td><td style="text-align: center;">98.2</td></tr> <tr><td>½ in. [12.5 mm]</td><td style="text-align: center;">94.2</td></tr> <tr><td>⅜ in. [9.5 mm]</td><td style="text-align: center;">87.1</td></tr> <tr><td>¼ in. [6.3 mm]</td><td style="text-align: center;">79.0</td></tr> <tr><td>No. 4 [4.75 mm]</td><td style="text-align: center;">74.5</td></tr> <tr><td>No. 10 [2.00 mm]</td><td style="text-align: center;">60.9</td></tr> <tr><td>No. 20 [0.850 mm]</td><td style="text-align: center;">44.7</td></tr> <tr><td>No. 40 [0.425 mm]</td><td style="text-align: center;">31.2</td></tr> <tr><td>No. 60 [0.250 mm]</td><td style="text-align: center;">25.1</td></tr> <tr><td>No. 100 [0.150 mm]</td><td style="text-align: center;">20.5</td></tr> <tr><td>No. 200 [0.075 mm]</td><td style="text-align: center;">15.7</td></tr> </tbody> </table>	SIEVE SIZE U.S. [SI]	% Passing	3 in. [75.0 mm]		1 in. [25.0 mm]	100.0	¾ in. [19.0 mm]	98.2	½ in. [12.5 mm]	94.2	⅜ in. [9.5 mm]	87.1	¼ in. [6.3 mm]	79.0	No. 4 [4.75 mm]	74.5	No. 10 [2.00 mm]	60.9	No. 20 [0.850 mm]	44.7	No. 40 [0.425 mm]	31.2	No. 60 [0.250 mm]	25.1	No. 100 [0.150 mm]	20.5	No. 200 [0.075 mm]	15.7	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="4" style="text-align: center;">Direct Shear (T 236)</th> </tr> </thead> <tbody> <tr><td>Shear Angle, °</td><td></td><td></td><td></td></tr> <tr><td>Initial Water Content, %</td><td></td><td></td><td></td></tr> <tr><td>Normal Stress, psi</td><td></td><td></td><td></td></tr> <tr><td>Wet Density, lbs/ft³</td><td></td><td></td><td></td></tr> <tr><td>Dry Density, lbs/ft³</td><td></td><td></td><td></td></tr> <tr><td>Specimen Thickness, in</td><td></td><td></td><td></td></tr> </tbody> </table> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="6" style="text-align: center;">Consolidation (T 216)</th> </tr> </thead> <tbody> <tr> <td colspan="6" style="text-align: center;">Trimblings, Water Content, %</td> </tr> <tr> <td></td> <td style="text-align: center;">Initial</td> <td style="text-align: center;">Final</td> <td></td> <td style="text-align: center;">Void Ratio</td> <td style="text-align: center;">% Strain</td> </tr> <tr> <td>Water Content, %</td> <td></td> <td></td> <td style="text-align: center;">Pmin</td> <td></td> <td></td> </tr> <tr> <td>Dry Density, lbs/ft³</td> <td></td> <td></td> <td style="text-align: center;">Pp</td> <td></td> <td></td> </tr> <tr> <td>Void Ratio</td> <td></td> <td></td> <td style="text-align: center;">Pmax</td> <td></td> <td></td> </tr> <tr> <td>Saturation, %</td> <td></td> <td></td> <td style="text-align: center;">Cc/C'c</td> <td></td> <td></td> </tr> </tbody> </table> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="7" style="text-align: center;">Vane Shear Test on Shelby Tubes (Maine DOT)</th> </tr> <tr> <th rowspan="3" style="text-align: center;">Depth taken in tube, ft</th> <th colspan="2" style="text-align: center;">3 In.</th> <th colspan="2" style="text-align: center;">6 In.</th> <th rowspan="3" style="text-align: center;">Water Content, %</th> <th rowspan="3" style="text-align: center;">Description of Material Sampled at the Various Tube Depths</th> </tr> <tr> <th style="text-align: center;">U. Shear</th> <th style="text-align: center;">Remold</th> <th style="text-align: center;">U. Shear</th> <th style="text-align: center;">Remold</th> </tr> <tr> <th style="text-align: center;">tons/ft²</th> <th style="text-align: center;">tons/ft²</th> <th style="text-align: center;">tons/ft²</th> <th style="text-align: center;">tons/ft²</th> </tr> </thead> <tbody> <tr> <td> </td> </tr> </tbody> </table>	Direct Shear (T 236)				Shear Angle, °				Initial Water Content, %				Normal Stress, psi				Wet Density, lbs/ft³				Dry Density, lbs/ft³				Specimen Thickness, in				Consolidation (T 216)						Trimblings, Water Content, %							Initial	Final		Void Ratio	% Strain	Water Content, %			Pmin			Dry Density, lbs/ft³			Pp			Void Ratio			Pmax			Saturation, %			Cc/C'c			Vane Shear Test on Shelby Tubes (Maine DOT)							Depth taken in tube, ft	3 In.		6 In.		Water Content, %	Description of Material Sampled at the Various Tube Depths	U. Shear	Remold	U. Shear	Remold	tons/ft²	tons/ft²	tons/ft²	tons/ft²								Miscellaneous Tests 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), % <p style="text-align: center; font-weight: bold;">5.0</p>
SIEVE SIZE U.S. [SI]	% Passing																																																																																																																																
3 in. [75.0 mm]																																																																																																																																	
1 in. [25.0 mm]	100.0																																																																																																																																
¾ in. [19.0 mm]	98.2																																																																																																																																
½ in. [12.5 mm]	94.2																																																																																																																																
⅜ in. [9.5 mm]	87.1																																																																																																																																
¼ in. [6.3 mm]	79.0																																																																																																																																
No. 4 [4.75 mm]	74.5																																																																																																																																
No. 10 [2.00 mm]	60.9																																																																																																																																
No. 20 [0.850 mm]	44.7																																																																																																																																
No. 40 [0.425 mm]	31.2																																																																																																																																
No. 60 [0.250 mm]	25.1																																																																																																																																
No. 100 [0.150 mm]	20.5																																																																																																																																
No. 200 [0.075 mm]	15.7																																																																																																																																
Direct Shear (T 236)																																																																																																																																	
Shear Angle, °																																																																																																																																	
Initial Water Content, %																																																																																																																																	
Normal Stress, psi																																																																																																																																	
Wet Density, lbs/ft³																																																																																																																																	
Dry Density, lbs/ft³																																																																																																																																	
Specimen Thickness, in																																																																																																																																	
Consolidation (T 216)																																																																																																																																	
Trimblings, Water Content, %																																																																																																																																	
	Initial	Final		Void Ratio	% Strain																																																																																																																												
Water Content, %			Pmin																																																																																																																														
Dry Density, lbs/ft³			Pp																																																																																																																														
Void Ratio			Pmax																																																																																																																														
Saturation, %			Cc/C'c																																																																																																																														
Vane Shear Test on Shelby Tubes (Maine DOT)																																																																																																																																	
Depth taken in tube, ft	3 In.		6 In.		Water Content, %	Description of Material Sampled at the Various Tube Depths																																																																																																																											
	U. Shear	Remold	U. Shear	Remold																																																																																																																													
	tons/ft²	tons/ft²	tons/ft²	tons/ft²																																																																																																																													

Comments:

AUTHORIZATION AND DISTRIBUTION

Reported by: **FOGG, BRIAN** Date Reported: **1/24/2011**



GEOTECHNICAL TEST REPORT

Central Laboratory

SAMPLE INFORMATION

Reference No.	Boring No./Sample No.	Sample Description	Sampled	Received
245509	HB-CAN-110/S9	<u>GEOTECHNICAL (DISTURBED)</u>	1/5/2011	1/13/2011
Sample Type: GEOTECHNICAL		Location: ROADWAY	Station: 546+06	Offset, ft: 9.0
WIN/Town 017885.00 - CANAAN			RT Dbfg, ft: 3.8-5.0	
			Sampler: WILDER, BRUCE H	

TEST RESULTS

Sieve Analysis (T 27, T 11) Wash Method Procedure A <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 70%;">SIEVE SIZE U.S. [SI]</th> <th style="width: 30%;">% Passing</th> </tr> </thead> <tbody> <tr><td>3 in. [75.0 mm]</td><td></td></tr> <tr><td>1 in. [25.0 mm]</td><td></td></tr> <tr><td>¾ in. [19.0 mm]</td><td>100.0</td></tr> <tr><td>½ in. [12.5 mm]</td><td>91.4</td></tr> <tr><td>⅜ in. [9.5 mm]</td><td>87.2</td></tr> <tr><td>¼ in. [6.3 mm]</td><td>84.8</td></tr> <tr><td>No. 4 [4.75 mm]</td><td>75.5</td></tr> <tr><td>No. 10 [2.00 mm]</td><td>65.0</td></tr> <tr><td>No. 20 [0.850 mm]</td><td>55.9</td></tr> <tr><td>No. 40 [0.425 mm]</td><td>49.2</td></tr> <tr><td>No. 60 [0.250 mm]</td><td>42.9</td></tr> <tr><td>No. 100 [0.150 mm]</td><td>32.7</td></tr> <tr><td>No. 200 [0.075 mm]</td><td>31.2</td></tr> </tbody> </table>	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]	91.4	⅜ in. [9.5 mm]	87.2	¼ in. [6.3 mm]	84.8	No. 4 [4.75 mm]	75.5	No. 10 [2.00 mm]	65.0	No. 20 [0.850 mm]	55.9	No. 40 [0.425 mm]	49.2	No. 60 [0.250 mm]	42.9	No. 100 [0.150 mm]	32.7	No. 200 [0.075 mm]	31.2	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="4" style="text-align: center;">Direct Shear (T 236)</th> </tr> </thead> <tbody> <tr><td>Shear Angle, °</td><td></td><td></td><td></td></tr> <tr><td>Initial Water Content, %</td><td></td><td></td><td></td></tr> <tr><td>Normal Stress, psi</td><td></td><td></td><td></td></tr> <tr><td>Wet Density, lbs/ft³</td><td></td><td></td><td></td></tr> <tr><td>Dry Density, lbs/ft³</td><td></td><td></td><td></td></tr> <tr><td>Specimen Thickness, in</td><td></td><td></td><td></td></tr> </tbody> </table> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="6" style="text-align: center;">Consolidation (T 216)</th> </tr> </thead> <tbody> <tr> <td colspan="6" style="text-align: center;">Trimblings, Water Content, %</td> </tr> <tr> <td></td> <td style="text-align: center;">Initial</td> <td style="text-align: center;">Final</td> <td></td> <td style="text-align: center;">Void Ratio</td> <td style="text-align: center;">% Strain</td> </tr> <tr> <td>Water Content, %</td> <td></td> <td></td> <td>Pmin</td> <td></td> <td></td> </tr> <tr> <td>Dry Density, lbs/ft³</td> <td></td> <td></td> <td>Pp</td> <td></td> <td></td> </tr> <tr> <td>Void Ratio</td> <td></td> <td></td> <td>Pmax</td> <td></td> <td></td> </tr> <tr> <td>Saturation, %</td> <td></td> <td></td> <td>Cc/C'c</td> <td></td> <td></td> </tr> </tbody> </table> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="7" style="text-align: center;">Vane Shear Test on Shelby Tubes (Maine DOT)</th> </tr> <tr> <th rowspan="3" style="width: 10%;">Depth taken in tube, ft</th> <th colspan="2" style="width: 15%;">3 In.</th> <th colspan="2" style="width: 15%;">6 In.</th> <th rowspan="3" style="width: 10%;">Water Content, %</th> <th rowspan="3" style="width: 40%;">Description of Material Sampled at the Various Tube Depths</th> </tr> <tr> <th style="width: 5%;">U. Shear</th> <th style="width: 10%;">Remold</th> <th style="width: 5%;">U. Shear</th> <th style="width: 10%;">Remold</th> </tr> <tr> <th style="text-align: center;">tons/ft²</th> <th style="text-align: center;">tons/ft²</th> <th style="text-align: center;">tons/ft²</th> <th style="text-align: center;">tons/ft²</th> </tr> </thead> <tbody> <tr> <td> </td> </tr> </tbody> </table>	Direct Shear (T 236)				Shear Angle, °				Initial Water Content, %				Normal Stress, psi				Wet Density, lbs/ft³				Dry Density, lbs/ft³				Specimen Thickness, in				Consolidation (T 216)						Trimblings, Water Content, %							Initial	Final		Void Ratio	% Strain	Water Content, %			Pmin			Dry Density, lbs/ft³			Pp			Void Ratio			Pmax			Saturation, %			Cc/C'c			Vane Shear Test on Shelby Tubes (Maine DOT)							Depth taken in tube, ft	3 In.		6 In.		Water Content, %	Description of Material Sampled at the Various Tube Depths	U. Shear	Remold	U. Shear	Remold	tons/ft²	tons/ft²	tons/ft²	tons/ft²								Miscellaneous Tests 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) <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; text-align: center;">Loss, %</td> <td style="width: 50%; text-align: center;">H2O, %</td> </tr> </table> Water Content (T 265), % <p style="text-align: center; font-weight: bold;">7.7</p>	Loss, %	H2O, %
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]	91.4																																																																																																																																		
⅜ in. [9.5 mm]	87.2																																																																																																																																		
¼ in. [6.3 mm]	84.8																																																																																																																																		
No. 4 [4.75 mm]	75.5																																																																																																																																		
No. 10 [2.00 mm]	65.0																																																																																																																																		
No. 20 [0.850 mm]	55.9																																																																																																																																		
No. 40 [0.425 mm]	49.2																																																																																																																																		
No. 60 [0.250 mm]	42.9																																																																																																																																		
No. 100 [0.150 mm]	32.7																																																																																																																																		
No. 200 [0.075 mm]	31.2																																																																																																																																		
Direct Shear (T 236)																																																																																																																																			
Shear Angle, °																																																																																																																																			
Initial Water Content, %																																																																																																																																			
Normal Stress, psi																																																																																																																																			
Wet Density, lbs/ft³																																																																																																																																			
Dry Density, lbs/ft³																																																																																																																																			
Specimen Thickness, in																																																																																																																																			
Consolidation (T 216)																																																																																																																																			
Trimblings, Water Content, %																																																																																																																																			
	Initial	Final		Void Ratio	% Strain																																																																																																																														
Water Content, %			Pmin																																																																																																																																
Dry Density, lbs/ft³			Pp																																																																																																																																
Void Ratio			Pmax																																																																																																																																
Saturation, %			Cc/C'c																																																																																																																																
Vane Shear Test on Shelby Tubes (Maine DOT)																																																																																																																																			
Depth taken in tube, ft	3 In.		6 In.		Water Content, %	Description of Material Sampled at the Various Tube Depths																																																																																																																													
	U. Shear	Remold	U. Shear	Remold																																																																																																																															
	tons/ft²	tons/ft²	tons/ft²	tons/ft²																																																																																																																															
Loss, %	H2O, %																																																																																																																																		

Comments:

AUTHORIZATION AND DISTRIBUTION

Reported by: **FOGG, BRIAN** Date Reported: **1/20/2011**



GEOTECHNICAL TEST REPORT

Central Laboratory

SAMPLE INFORMATION

Reference No.	Boring No./Sample No.	Sample Description	Sampled	Received
245510	HB-CAN-113/S10	<u>GEOTECHNICAL (DISTURBED)</u>	1/5/2011	1/13/2011
Sample Type: GEOTECHNICAL		Location: ROADWAY	Station: 551+06	Offset, ft: 9.0
WIN/Town 017885.00 - CANAAN		RT Dbfg, ft: 0.55-2.4		
				Sampler: WILDER, BRUCE H

TEST RESULTS

Sieve Analysis (T 27, T 11)	
Wash Method	
Procedure A	
SIEVE SIZE U.S. [SI]	% Passing
3 in. [75.0 mm]	
1 in. [25.0 mm]	
¾ in. [19.0 mm]	100.0
½ in. [12.5 mm]	97.8
⅜ in. [9.5 mm]	91.8
¼ in. [6.3 mm]	83.8
No. 4 [4.75 mm]	79.6
No. 10 [2.00 mm]	68.2
No. 20 [0.850 mm]	55.0
No. 40 [0.425 mm]	43.1
No. 60 [0.250 mm]	36.4
No. 100 [0.150 mm]	30.9
No. 200 [0.075 mm]	23.7

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

Consolidation (T 216)					
Trimblings, Water Content, %					
	Initial	Final		Void Ratio	% Strain
Water Content, %			Pmin		
Dry Density, lbs/ft³			Pp		
Void Ratio			Pmax		
Saturation, %			Cc/C'c		

Miscellaneous Tests	
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), %	
6.8	

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

Comments:

AUTHORIZATION AND DISTRIBUTION

Reported by: **FOGG, BRIAN**

Date Reported: **1/20/2011**

Paper Copy: Lab File; Project File; Geotech File



GEOTECHNICAL TEST REPORT

Central Laboratory

SAMPLE INFORMATION

Reference No.	Boring No./Sample No.	Sample Description	Sampled	Received
245511	HB-CAN-113/S11	GEOTECHNICAL (DISTURBED)	1/5/2011	1/13/2011
Sample Type: GEOTECHNICAL		Location: ROADWAY	Station: 551+06	Offset, ft: 9.0
WIN/Town 017885.00 - CANAAN		Sampler: WILDER, BRUCE H		

TEST RESULTS

Sieve Analysis (T 27, T 11) Wash Method Procedure A <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 70%;">SIEVE SIZE U.S. [SI]</th> <th style="width: 30%;">% Passing</th> </tr> </thead> <tbody> <tr><td>3 in. [75.0 mm]</td><td></td></tr> <tr><td>1 in. [25.0 mm]</td><td></td></tr> <tr><td>¾ in. [19.0 mm]</td><td></td></tr> <tr><td>½ in. [12.5 mm]</td><td style="text-align: center;">100.0</td></tr> <tr><td>⅜ in. [9.5 mm]</td><td style="text-align: center;">98.9</td></tr> <tr><td>¼ in. [6.3 mm]</td><td style="text-align: center;">97.0</td></tr> <tr><td>No. 4 [4.75 mm]</td><td style="text-align: center;">95.5</td></tr> <tr><td>No. 10 [2.00 mm]</td><td style="text-align: center;">90.3</td></tr> <tr><td>No. 20 [0.850 mm]</td><td style="text-align: center;">83.7</td></tr> <tr><td>No. 40 [0.425 mm]</td><td style="text-align: center;">77.9</td></tr> <tr><td>No. 60 [0.250 mm]</td><td style="text-align: center;">72.2</td></tr> <tr><td>No. 100 [0.150 mm]</td><td style="text-align: center;">65.8</td></tr> <tr><td>No. 200 [0.075 mm]</td><td style="text-align: center;">55.8</td></tr> </tbody> </table>	SIEVE SIZE U.S. [SI]	% Passing	3 in. [75.0 mm]		1 in. [25.0 mm]		¾ in. [19.0 mm]		½ in. [12.5 mm]	100.0	⅜ in. [9.5 mm]	98.9	¼ in. [6.3 mm]	97.0	No. 4 [4.75 mm]	95.5	No. 10 [2.00 mm]	90.3	No. 20 [0.850 mm]	83.7	No. 40 [0.425 mm]	77.9	No. 60 [0.250 mm]	72.2	No. 100 [0.150 mm]	65.8	No. 200 [0.075 mm]	55.8	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="4" style="text-align: center;">Direct Shear (T 236)</th> </tr> </thead> <tbody> <tr><td>Shear Angle, °</td><td></td><td></td><td></td></tr> <tr><td>Initial Water Content, %</td><td></td><td></td><td></td></tr> <tr><td>Normal Stress, psi</td><td></td><td></td><td></td></tr> <tr><td>Wet Density, lbs/ft³</td><td></td><td></td><td></td></tr> <tr><td>Dry Density, lbs/ft³</td><td></td><td></td><td></td></tr> <tr><td>Specimen Thickness, in</td><td></td><td></td><td></td></tr> </tbody> </table> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="6" style="text-align: center;">Consolidation (T 216)</th> </tr> </thead> <tbody> <tr> <td colspan="6" style="text-align: center;">Trimmings, Water Content, %</td> </tr> <tr> <td></td> <td style="text-align: center;">Initial</td> <td style="text-align: center;">Final</td> <td></td> <td style="text-align: center;">Void Ratio</td> <td style="text-align: center;">% Strain</td> </tr> <tr> <td>Water Content, %</td> <td></td> <td></td> <td style="text-align: center;">Pmin</td> <td></td> <td></td> </tr> <tr> <td>Dry Density, lbs/ft³</td> <td></td> <td></td> <td style="text-align: center;">Pp</td> <td></td> <td></td> </tr> <tr> <td>Void Ratio</td> <td></td> <td></td> <td style="text-align: center;">Pmax</td> <td></td> <td></td> </tr> <tr> <td>Saturation, %</td> <td></td> <td></td> <td style="text-align: center;">Cc/C'c</td> <td></td> <td></td> </tr> </tbody> </table> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="7" style="text-align: center;">Vane Shear Test on Shelby Tubes (Maine DOT)</th> </tr> <tr> <th rowspan="3" style="text-align: center;">Depth taken in tube, ft</th> <th colspan="2" style="text-align: center;">3 In.</th> <th colspan="2" style="text-align: center;">6 In.</th> <th rowspan="3" style="text-align: center;">Water Content, %</th> <th rowspan="3" style="text-align: center;">Description of Material Sampled at the Various Tube Depths</th> </tr> <tr> <th style="text-align: center;">U. Shear</th> <th style="text-align: center;">Remold</th> <th style="text-align: center;">U. Shear</th> <th style="text-align: center;">Remold</th> </tr> <tr> <th style="text-align: center;">tons/ft²</th> <th style="text-align: center;">tons/ft²</th> <th style="text-align: center;">tons/ft²</th> <th style="text-align: center;">tons/ft²</th> </tr> </thead> <tbody> <tr> <td> </td> </tr> </tbody> </table>	Direct Shear (T 236)				Shear Angle, °				Initial Water Content, %				Normal Stress, psi				Wet Density, lbs/ft³				Dry Density, lbs/ft³				Specimen Thickness, in				Consolidation (T 216)						Trimmings, Water Content, %							Initial	Final		Void Ratio	% Strain	Water Content, %			Pmin			Dry Density, lbs/ft³			Pp			Void Ratio			Pmax			Saturation, %			Cc/C'c			Vane Shear Test on Shelby Tubes (Maine DOT)							Depth taken in tube, ft	3 In.		6 In.		Water Content, %	Description of Material Sampled at the Various Tube Depths	U. Shear	Remold	U. Shear	Remold	tons/ft²	tons/ft²	tons/ft²	tons/ft²								<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">Miscellaneous Tests</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">Liquid Limit @ 25 blows (T 89), %</td> </tr> <tr> <td> </td> </tr> <tr> <td style="text-align: center;">Plastic Limit (T 90), %</td> </tr> <tr> <td> </td> </tr> <tr> <td style="text-align: center;">Plasticity Index (T 90), %</td> </tr> <tr> <td> </td> </tr> <tr> <td style="text-align: center;">Specific Gravity, Corrected to 20°C (T 100)</td> </tr> <tr> <td> </td> </tr> <tr> <td style="text-align: center;">Loss on Ignition (T 267)</td> </tr> <tr> <td style="text-align: center;">Loss, % H2O, %</td> </tr> <tr> <td> </td> </tr> <tr> <td style="text-align: center;">Water Content (T 265), %</td> </tr> <tr> <td style="text-align: center;">14.1</td> </tr> </tbody> </table>	Miscellaneous Tests	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), %	14.1
SIEVE SIZE U.S. [SI]	% Passing																																																																																																																																														
3 in. [75.0 mm]																																																																																																																																															
1 in. [25.0 mm]																																																																																																																																															
¾ in. [19.0 mm]																																																																																																																																															
½ in. [12.5 mm]	100.0																																																																																																																																														
⅜ in. [9.5 mm]	98.9																																																																																																																																														
¼ in. [6.3 mm]	97.0																																																																																																																																														
No. 4 [4.75 mm]	95.5																																																																																																																																														
No. 10 [2.00 mm]	90.3																																																																																																																																														
No. 20 [0.850 mm]	83.7																																																																																																																																														
No. 40 [0.425 mm]	77.9																																																																																																																																														
No. 60 [0.250 mm]	72.2																																																																																																																																														
No. 100 [0.150 mm]	65.8																																																																																																																																														
No. 200 [0.075 mm]	55.8																																																																																																																																														
Direct Shear (T 236)																																																																																																																																															
Shear Angle, °																																																																																																																																															
Initial Water Content, %																																																																																																																																															
Normal Stress, psi																																																																																																																																															
Wet Density, lbs/ft³																																																																																																																																															
Dry Density, lbs/ft³																																																																																																																																															
Specimen Thickness, in																																																																																																																																															
Consolidation (T 216)																																																																																																																																															
Trimmings, Water Content, %																																																																																																																																															
	Initial	Final		Void Ratio	% Strain																																																																																																																																										
Water Content, %			Pmin																																																																																																																																												
Dry Density, lbs/ft³			Pp																																																																																																																																												
Void Ratio			Pmax																																																																																																																																												
Saturation, %			Cc/C'c																																																																																																																																												
Vane Shear Test on Shelby Tubes (Maine DOT)																																																																																																																																															
Depth taken in tube, ft	3 In.		6 In.		Water Content, %	Description of Material Sampled at the Various Tube Depths																																																																																																																																									
	U. Shear	Remold	U. Shear	Remold																																																																																																																																											
	tons/ft²	tons/ft²	tons/ft²	tons/ft²																																																																																																																																											
Miscellaneous Tests																																																																																																																																															
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), %																																																																																																																																															
14.1																																																																																																																																															

Comments:

AUTHORIZATION AND DISTRIBUTION

Reported by: **FOGG, BRIAN** Date Reported: **1/20/2011**



GEOTECHNICAL TEST REPORT

Central Laboratory

SAMPLE INFORMATION

Reference No.	Boring No./Sample No.	Sample Description	Sampled	Received
245512	HB-CAN-117/S12	GEOTECHNICAL (DISTURBED)	1/5/2011	1/13/2011
Sample Type: GEOTECHNICAL		Location: ROADWAY	Station: 565+06	Offset, ft: 8.0 RT Dbfg, ft: 0.5-3.5
WIN/Town 017885.00 - CANAAN			Sampler: WILDER, BRUCE H	

TEST RESULTS

<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><th colspan="2" style="text-align: center;">Sieve Analysis (T 27, T 11)</th></tr> <tr><td colspan="2" style="text-align: center;">Wash Method</td></tr> <tr><td colspan="2" style="text-align: center; color: red;">Procedure A</td></tr> <tr> <th style="text-align: center;">SIEVE SIZE U.S. [SI]</th> <th style="text-align: center;">% Passing</th> </tr> <tr><td>3 in. [75.0 mm]</td><td></td></tr> <tr><td>1 in. [25.0 mm]</td><td></td></tr> <tr><td>¾ in. [19.0 mm]</td><td style="text-align: center;">100.0</td></tr> <tr><td>½ in. [12.5 mm]</td><td style="text-align: center;">97.5</td></tr> <tr><td>⅜ in. [9.5 mm]</td><td style="text-align: center;">95.6</td></tr> <tr><td>¼ in. [6.3 mm]</td><td style="text-align: center;">89.2</td></tr> <tr><td>No. 4 [4.75 mm]</td><td style="text-align: center;">83.7</td></tr> <tr><td>No. 10 [2.00 mm]</td><td style="text-align: center;">68.6</td></tr> <tr><td>No. 20 [0.850 mm]</td><td style="text-align: center;">50.2</td></tr> <tr><td>No. 40 [0.425 mm]</td><td style="text-align: center;">37.3</td></tr> <tr><td>No. 60 [0.250 mm]</td><td style="text-align: center;">29.7</td></tr> <tr><td>No. 100 [0.150 mm]</td><td style="text-align: center;">23.1</td></tr> <tr><td>No. 200 [0.075 mm]</td><td style="text-align: center;">16.8</td></tr> </table>	Sieve Analysis (T 27, T 11)		Wash Method		Procedure A		SIEVE SIZE U.S. [SI]	% Passing	3 in. [75.0 mm]		1 in. [25.0 mm]		¾ in. [19.0 mm]	100.0	½ in. [12.5 mm]	97.5	⅜ in. [9.5 mm]	95.6	¼ in. [6.3 mm]	89.2	No. 4 [4.75 mm]	83.7	No. 10 [2.00 mm]	68.6	No. 20 [0.850 mm]	50.2	No. 40 [0.425 mm]	37.3	No. 60 [0.250 mm]	29.7	No. 100 [0.150 mm]	23.1	No. 200 [0.075 mm]	16.8	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><th colspan="4" style="text-align: center;">Direct Shear (T 236)</th></tr> <tr><td>Shear Angle, °</td><td></td><td></td><td></td></tr> <tr><td>Initial Water Content, %</td><td></td><td></td><td></td></tr> <tr><td>Normal Stress, psi</td><td></td><td></td><td></td></tr> <tr><td>Wet Density, lbs/ft³</td><td></td><td></td><td></td></tr> <tr><td>Dry Density, lbs/ft³</td><td></td><td></td><td></td></tr> <tr><td>Specimen Thickness, in</td><td></td><td></td><td></td></tr> <tr><th colspan="4" style="text-align: center;">Consolidation (T 216)</th></tr> <tr><td colspan="4" style="text-align: center;">Trimming, Water Content, %</td></tr> <tr> <td></td> <td style="text-align: center;">Initial</td> <td style="text-align: center;">Final</td> <td></td> </tr> <tr> <td>Water Content, %</td> <td></td> <td></td> <td style="text-align: center;">Pmin</td> </tr> <tr> <td>Dry Density, lbs/ft³</td> <td></td> <td></td> <td style="text-align: center;">Pp</td> </tr> <tr> <td>Void Ratio</td> <td></td> <td></td> <td style="text-align: center;">Pmax</td> </tr> <tr> <td>Saturation, %</td> <td></td> <td></td> <td style="text-align: center;">Cc/C'c</td> </tr> <tr><th colspan="4" style="text-align: center;">Vane Shear Test on Shelby Tubes (Maine DOT)</th></tr> <tr> <th rowspan="2" style="text-align: center;">Depth taken in tube, ft</th> <th colspan="2" style="text-align: center;">3 In.</th> <th colspan="2" style="text-align: center;">6 In.</th> <th rowspan="2" style="text-align: center;">Water Content, %</th> <th rowspan="2" style="text-align: center;">Description of Material Sampled at the Various Tube Depths</th> </tr> <tr> <th style="text-align: center;">U. Shear tons/ft²</th> <th style="text-align: center;">Remold tons/ft²</th> <th style="text-align: center;">U. Shear tons/ft²</th> <th style="text-align: center;">Remold tons/ft²</th> </tr> <tr><td colspan="7" style="height: 100px;"></td></tr> </table>	Direct Shear (T 236)				Shear Angle, °				Initial Water Content, %				Normal Stress, psi				Wet Density, lbs/ft³				Dry Density, lbs/ft³				Specimen Thickness, in				Consolidation (T 216)				Trimming, Water Content, %					Initial	Final		Water Content, %			Pmin	Dry Density, lbs/ft³			Pp	Void Ratio			Pmax	Saturation, %			Cc/C'c	Vane Shear Test on Shelby Tubes (Maine DOT)				Depth taken in tube, ft	3 In.		6 In.		Water Content, %	Description of Material Sampled at the Various Tube Depths	U. Shear tons/ft²	Remold tons/ft²	U. Shear tons/ft²	Remold tons/ft²								<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><th colspan="2" style="text-align: center;">Miscellaneous Tests</th></tr> <tr><td colspan="2" style="text-align: center;">Liquid Limit @ 25 blows (T 89), %</td></tr> <tr><td colspan="2" style="text-align: center;">Plastic Limit (T 90), %</td></tr> <tr><td colspan="2" style="text-align: center;">Plasticity Index (T 90), %</td></tr> <tr><td colspan="2" style="text-align: center;">Specific Gravity, Corrected to 20°C (T 100)</td></tr> <tr><td colspan="2" style="text-align: center;">Loss on Ignition (T 267)</td></tr> <tr> <td style="text-align: center;">Loss, %</td> <td style="text-align: center;">H2O, %</td> </tr> <tr><td colspan="2" style="text-align: center;">Water Content (T 265), %</td></tr> <tr><td colspan="2" style="text-align: center;">4.3</td></tr> </table>	Miscellaneous Tests		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), %		4.3	
Sieve Analysis (T 27, T 11)																																																																																																																																				
Wash Method																																																																																																																																				
Procedure A																																																																																																																																				
SIEVE SIZE U.S. [SI]	% Passing																																																																																																																																			
3 in. [75.0 mm]																																																																																																																																				
1 in. [25.0 mm]																																																																																																																																				
¾ in. [19.0 mm]	100.0																																																																																																																																			
½ in. [12.5 mm]	97.5																																																																																																																																			
⅜ in. [9.5 mm]	95.6																																																																																																																																			
¼ in. [6.3 mm]	89.2																																																																																																																																			
No. 4 [4.75 mm]	83.7																																																																																																																																			
No. 10 [2.00 mm]	68.6																																																																																																																																			
No. 20 [0.850 mm]	50.2																																																																																																																																			
No. 40 [0.425 mm]	37.3																																																																																																																																			
No. 60 [0.250 mm]	29.7																																																																																																																																			
No. 100 [0.150 mm]	23.1																																																																																																																																			
No. 200 [0.075 mm]	16.8																																																																																																																																			
Direct Shear (T 236)																																																																																																																																				
Shear Angle, °																																																																																																																																				
Initial Water Content, %																																																																																																																																				
Normal Stress, psi																																																																																																																																				
Wet Density, lbs/ft³																																																																																																																																				
Dry Density, lbs/ft³																																																																																																																																				
Specimen Thickness, in																																																																																																																																				
Consolidation (T 216)																																																																																																																																				
Trimming, Water Content, %																																																																																																																																				
	Initial	Final																																																																																																																																		
Water Content, %			Pmin																																																																																																																																	
Dry Density, lbs/ft³			Pp																																																																																																																																	
Void Ratio			Pmax																																																																																																																																	
Saturation, %			Cc/C'c																																																																																																																																	
Vane Shear Test on Shelby Tubes (Maine DOT)																																																																																																																																				
Depth taken in tube, ft	3 In.		6 In.		Water Content, %	Description of Material Sampled at the Various Tube Depths																																																																																																																														
	U. Shear tons/ft²	Remold tons/ft²	U. Shear tons/ft²	Remold tons/ft²																																																																																																																																
Miscellaneous Tests																																																																																																																																				
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), %																																																																																																																																				
4.3																																																																																																																																				

Comments:

AUTHORIZATION AND DISTRIBUTION

Reported by: **FOGG, BRIAN** Date Reported: **1/24/2011**



GEOTECHNICAL TEST REPORT

Central Laboratory

SAMPLE INFORMATION

Reference No.	Boring No./Sample No.	Sample Description	Sampled	Received
245513	HB-CAN-117/S13	<u>GEOTECHNICAL (DISTURBED)</u>	1/5/2011	1/13/2011
Sample Type: GEOTECHNICAL		Location: ROADWAY	Station: 565+06	Offset, ft: 8.0
WIN/Town 017885.00 - CANAAN		Sampler: WILDER, BRUCE H		

TEST RESULTS

Sieve Analysis (T 27, T 11) Wash Method Procedure A <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 70%;">SIEVE SIZE U.S. [SI]</th> <th style="width: 30%;">% Passing</th> </tr> </thead> <tbody> <tr><td>3 in. [75.0 mm]</td><td></td></tr> <tr><td>1 in. [25.0 mm]</td><td></td></tr> <tr><td>¾ in. [19.0 mm]</td><td></td></tr> <tr><td>½ in. [12.5 mm]</td><td></td></tr> <tr><td>⅜ in. [9.5 mm]</td><td style="text-align: center;">100.0</td></tr> <tr><td>¼ in. [6.3 mm]</td><td style="text-align: center;">99.7</td></tr> <tr><td>No. 4 [4.75 mm]</td><td style="text-align: center;">99.2</td></tr> <tr><td>No. 10 [2.00 mm]</td><td style="text-align: center;">98.0</td></tr> <tr><td>No. 20 [0.850 mm]</td><td style="text-align: center;">95.8</td></tr> <tr><td>No. 40 [0.425 mm]</td><td style="text-align: center;">93.8</td></tr> <tr><td>No. 60 [0.250 mm]</td><td style="text-align: center;">92.7</td></tr> <tr><td>No. 100 [0.150 mm]</td><td style="text-align: center;">89.8</td></tr> <tr><td>No. 200 [0.075 mm]</td><td style="text-align: center;">75.9</td></tr> </tbody> </table>	SIEVE SIZE U.S. [SI]	% Passing	3 in. [75.0 mm]		1 in. [25.0 mm]		¾ in. [19.0 mm]		½ in. [12.5 mm]		⅜ in. [9.5 mm]	100.0	¼ in. [6.3 mm]	99.7	No. 4 [4.75 mm]	99.2	No. 10 [2.00 mm]	98.0	No. 20 [0.850 mm]	95.8	No. 40 [0.425 mm]	93.8	No. 60 [0.250 mm]	92.7	No. 100 [0.150 mm]	89.8	No. 200 [0.075 mm]	75.9	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="6" style="text-align: center; background-color: #e0e0e0;">Direct Shear (T 236)</th> </tr> </thead> <tbody> <tr><td>Shear Angle, °</td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>Initial Water Content, %</td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>Normal Stress, psi</td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>Wet Density, lbs/ft³</td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>Dry Density, lbs/ft³</td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>Specimen Thickness, in</td><td></td><td></td><td></td><td></td><td></td></tr> <tr> <th colspan="6" style="text-align: center; background-color: #e0e0e0;">Consolidation (T 216)</th> </tr> <tr> <td colspan="6" style="text-align: center;">Trimming, Water Content, %</td> </tr> <tr> <td></td> <td style="text-align: center;">Initial</td> <td style="text-align: center;">Final</td> <td></td> <td style="text-align: center;">Void Ratio</td> <td style="text-align: center;">% Strain</td> </tr> <tr><td>Water Content, %</td><td></td><td></td><td>Pmin</td><td></td><td></td></tr> <tr><td>Dry Density, lbs/ft³</td><td></td><td></td><td>Pp</td><td></td><td></td></tr> <tr><td>Void Ratio</td><td></td><td></td><td>Pmax</td><td></td><td></td></tr> <tr><td>Saturation, %</td><td></td><td></td><td>Cc/C'c</td><td></td><td></td></tr> <tr> <th colspan="6" style="text-align: center; background-color: #e0e0e0;">Vane Shear Test on Shelby Tubes (Maine DOT)</th> </tr> <tr> <th rowspan="3" style="text-align: center;">Depth taken in tube, ft</th> <th colspan="2" style="text-align: center;">3 In.</th> <th colspan="2" style="text-align: center;">6 In.</th> <th rowspan="3" style="text-align: center;">Water Content, %</th> <th rowspan="3" style="text-align: center;">Description of Material Sampled at the Various Tube Depths</th> </tr> <tr> <th style="text-align: center;">U. Shear</th> <th style="text-align: center;">Remold</th> <th style="text-align: center;">U. Shear</th> <th style="text-align: center;">Remold</th> </tr> <tr> <th style="text-align: center;">tons/ft²</th> <th style="text-align: center;">tons/ft²</th> <th style="text-align: center;">tons/ft²</th> <th style="text-align: center;">tons/ft²</th> </tr> <tr><td> </td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </tbody> </table>	Direct Shear (T 236)						Shear Angle, °						Initial Water Content, %						Normal Stress, psi						Wet Density, lbs/ft³						Dry Density, lbs/ft³						Specimen Thickness, in						Consolidation (T 216)						Trimming, Water Content, %							Initial	Final		Void Ratio	% Strain	Water Content, %			Pmin			Dry Density, lbs/ft³			Pp			Void Ratio			Pmax			Saturation, %			Cc/C'c			Vane Shear Test on Shelby Tubes (Maine DOT)						Depth taken in tube, ft	3 In.		6 In.		Water Content, %	Description of Material Sampled at the Various Tube Depths	U. Shear	Remold	U. Shear	Remold	tons/ft²	tons/ft²	tons/ft²	tons/ft²								Miscellaneous Tests 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), % <p style="text-align: center;">20.3</p>
SIEVE SIZE U.S. [SI]	% Passing																																																																																																																																													
3 in. [75.0 mm]																																																																																																																																														
1 in. [25.0 mm]																																																																																																																																														
¾ in. [19.0 mm]																																																																																																																																														
½ in. [12.5 mm]																																																																																																																																														
⅜ in. [9.5 mm]	100.0																																																																																																																																													
¼ in. [6.3 mm]	99.7																																																																																																																																													
No. 4 [4.75 mm]	99.2																																																																																																																																													
No. 10 [2.00 mm]	98.0																																																																																																																																													
No. 20 [0.850 mm]	95.8																																																																																																																																													
No. 40 [0.425 mm]	93.8																																																																																																																																													
No. 60 [0.250 mm]	92.7																																																																																																																																													
No. 100 [0.150 mm]	89.8																																																																																																																																													
No. 200 [0.075 mm]	75.9																																																																																																																																													
Direct Shear (T 236)																																																																																																																																														
Shear Angle, °																																																																																																																																														
Initial Water Content, %																																																																																																																																														
Normal Stress, psi																																																																																																																																														
Wet Density, lbs/ft³																																																																																																																																														
Dry Density, lbs/ft³																																																																																																																																														
Specimen Thickness, in																																																																																																																																														
Consolidation (T 216)																																																																																																																																														
Trimming, Water Content, %																																																																																																																																														
	Initial	Final		Void Ratio	% Strain																																																																																																																																									
Water Content, %			Pmin																																																																																																																																											
Dry Density, lbs/ft³			Pp																																																																																																																																											
Void Ratio			Pmax																																																																																																																																											
Saturation, %			Cc/C'c																																																																																																																																											
Vane Shear Test on Shelby Tubes (Maine DOT)																																																																																																																																														
Depth taken in tube, ft	3 In.		6 In.		Water Content, %	Description of Material Sampled at the Various Tube Depths																																																																																																																																								
	U. Shear	Remold	U. Shear	Remold																																																																																																																																										
	tons/ft²	tons/ft²	tons/ft²	tons/ft²																																																																																																																																										

Comments:

AUTHORIZATION AND DISTRIBUTION

Reported by: **FOGG, BRIAN** Date Reported: **1/24/2011**



GEOTECHNICAL TEST REPORT

Central Laboratory

SAMPLE INFORMATION

Reference No.	Boring No./Sample No.	Sample Description	Sampled	Received
245514	HB-CAN-119/S14	GEOTECHNICAL (DISTURBED)	1/5/2011	1/13/2011
Sample Type: GEOTECHNICAL		Location: ROADWAY	Station: 582+06	Offset, ft: 9.0
WIN/Town 017885.00 - CANAAN		Sampler: WILDER, BRUCE H		

TEST RESULTS

Sieve Analysis (T 27, T 11) Wash Method Procedure A <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 70%;">SIEVE SIZE U.S. [SI]</th> <th style="width: 30%;">% Passing</th> </tr> </thead> <tbody> <tr><td>3 in. [75.0 mm]</td><td></td></tr> <tr><td>1 in. [25.0 mm]</td><td></td></tr> <tr><td>¾ in. [19.0 mm]</td><td>100.0</td></tr> <tr><td>½ in. [12.5 mm]</td><td>94.5</td></tr> <tr><td>⅜ in. [9.5 mm]</td><td>87.4</td></tr> <tr><td>¼ in. [6.3 mm]</td><td>76.3</td></tr> <tr><td>No. 4 [4.75 mm]</td><td>70.5</td></tr> <tr><td>No. 10 [2.00 mm]</td><td>54.9</td></tr> <tr><td>No. 20 [0.850 mm]</td><td>41.4</td></tr> <tr><td>No. 40 [0.425 mm]</td><td>33.3</td></tr> <tr><td>No. 60 [0.250 mm]</td><td>28.8</td></tr> <tr><td>No. 100 [0.150 mm]</td><td>25.1</td></tr> <tr><td>No. 200 [0.075 mm]</td><td>19.3</td></tr> </tbody> </table>	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]	94.5	⅜ in. [9.5 mm]	87.4	¼ in. [6.3 mm]	76.3	No. 4 [4.75 mm]	70.5	No. 10 [2.00 mm]	54.9	No. 20 [0.850 mm]	41.4	No. 40 [0.425 mm]	33.3	No. 60 [0.250 mm]	28.8	No. 100 [0.150 mm]	25.1	No. 200 [0.075 mm]	19.3	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="4" style="text-align: center;">Direct Shear (T 236)</th> </tr> </thead> <tbody> <tr><td>Shear Angle, °</td><td></td><td></td><td></td></tr> <tr><td>Initial Water Content, %</td><td></td><td></td><td></td></tr> <tr><td>Normal Stress, psi</td><td></td><td></td><td></td></tr> <tr><td>Wet Density, lbs/ft³</td><td></td><td></td><td></td></tr> <tr><td>Dry Density, lbs/ft³</td><td></td><td></td><td></td></tr> <tr><td>Specimen Thickness, in</td><td></td><td></td><td></td></tr> </tbody> </table> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="6" style="text-align: center;">Consolidation (T 216)</th> </tr> </thead> <tbody> <tr> <td colspan="6" style="text-align: center;">Trimming, Water Content, %</td> </tr> <tr> <td></td> <td style="text-align: center;">Initial</td> <td style="text-align: center;">Final</td> <td></td> <td style="text-align: center;">Void Ratio</td> <td style="text-align: center;">% Strain</td> </tr> <tr> <td>Water Content, %</td> <td></td> <td></td> <td>Pmin</td> <td></td> <td></td> </tr> <tr> <td>Dry Density, lbs/ft³</td> <td></td> <td></td> <td>Pp</td> <td></td> <td></td> </tr> <tr> <td>Void Ratio</td> <td></td> <td></td> <td>Pmax</td> <td></td> <td></td> </tr> <tr> <td>Saturation, %</td> <td></td> <td></td> <td>Cc/C'c</td> <td></td> <td></td> </tr> </tbody> </table> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="7" style="text-align: center;">Vane Shear Test on Shelby Tubes (Maine DOT)</th> </tr> <tr> <th rowspan="3" style="width: 10%;">Depth taken in tube, ft</th> <th colspan="2" style="width: 15%;">3 In.</th> <th colspan="2" style="width: 15%;">6 In.</th> <th rowspan="3" style="width: 10%;">Water Content, %</th> <th rowspan="3" style="width: 40%;">Description of Material Sampled at the Various Tube Depths</th> </tr> <tr> <th style="width: 5%;">U. Shear</th> <th style="width: 10%;">Remold</th> <th style="width: 5%;">U. Shear</th> <th style="width: 10%;">Remold</th> </tr> <tr> <th style="text-align: center;">tons/ft²</th> <th style="text-align: center;">tons/ft²</th> <th style="text-align: center;">tons/ft²</th> <th style="text-align: center;">tons/ft²</th> </tr> </thead> <tbody> <tr> <td> </td> </tr> </tbody> </table>	Direct Shear (T 236)				Shear Angle, °				Initial Water Content, %				Normal Stress, psi				Wet Density, lbs/ft³				Dry Density, lbs/ft³				Specimen Thickness, in				Consolidation (T 216)						Trimming, Water Content, %							Initial	Final		Void Ratio	% Strain	Water Content, %			Pmin			Dry Density, lbs/ft³			Pp			Void Ratio			Pmax			Saturation, %			Cc/C'c			Vane Shear Test on Shelby Tubes (Maine DOT)							Depth taken in tube, ft	3 In.		6 In.		Water Content, %	Description of Material Sampled at the Various Tube Depths	U. Shear	Remold	U. Shear	Remold	tons/ft²	tons/ft²	tons/ft²	tons/ft²								Miscellaneous Tests 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) <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; text-align: center;">Loss, %</td> <td style="width: 50%; text-align: center;">H2O, %</td> </tr> </table> Water Content (T 265), % <p style="text-align: center; font-weight: bold;">3.6</p>	Loss, %	H2O, %
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]	94.5																																																																																																																																		
⅜ in. [9.5 mm]	87.4																																																																																																																																		
¼ in. [6.3 mm]	76.3																																																																																																																																		
No. 4 [4.75 mm]	70.5																																																																																																																																		
No. 10 [2.00 mm]	54.9																																																																																																																																		
No. 20 [0.850 mm]	41.4																																																																																																																																		
No. 40 [0.425 mm]	33.3																																																																																																																																		
No. 60 [0.250 mm]	28.8																																																																																																																																		
No. 100 [0.150 mm]	25.1																																																																																																																																		
No. 200 [0.075 mm]	19.3																																																																																																																																		
Direct Shear (T 236)																																																																																																																																			
Shear Angle, °																																																																																																																																			
Initial Water Content, %																																																																																																																																			
Normal Stress, psi																																																																																																																																			
Wet Density, lbs/ft³																																																																																																																																			
Dry Density, lbs/ft³																																																																																																																																			
Specimen Thickness, in																																																																																																																																			
Consolidation (T 216)																																																																																																																																			
Trimming, Water Content, %																																																																																																																																			
	Initial	Final		Void Ratio	% Strain																																																																																																																														
Water Content, %			Pmin																																																																																																																																
Dry Density, lbs/ft³			Pp																																																																																																																																
Void Ratio			Pmax																																																																																																																																
Saturation, %			Cc/C'c																																																																																																																																
Vane Shear Test on Shelby Tubes (Maine DOT)																																																																																																																																			
Depth taken in tube, ft	3 In.		6 In.		Water Content, %	Description of Material Sampled at the Various Tube Depths																																																																																																																													
	U. Shear	Remold	U. Shear	Remold																																																																																																																															
	tons/ft²	tons/ft²	tons/ft²	tons/ft²																																																																																																																															
Loss, %	H2O, %																																																																																																																																		

Comments:

AUTHORIZATION AND DISTRIBUTION

Reported by: **FOGG, BRIAN** Date Reported: **1/24/2011**



GEOTECHNICAL TEST REPORT

Central Laboratory

SAMPLE INFORMATION

Reference No.	Boring No./Sample No.	Sample Description	Sampled	Received
245515	HB-CAN-119/S15	<u>GEOTECHNICAL (DISTURBED)</u>	1/5/2011	1/13/2011
Sample Type: GEOTECHNICAL		Location: ROADWAY	Station: 582+06	Offset, ft: 9.0 RT Dbfg, ft: 1.8-5.0
WIN/Town 017885.00 - CANAAN			Sampler: WILDER, BRUCE H	

TEST RESULTS

Sieve Analysis (T 27, T 11)	
Wash Method	
Procedure A	
SIEVE SIZE U.S. [SI]	% Passing
3 in. [75.0 mm]	
1 in. [25.0 mm]	
¾ in. [19.0 mm]	
½ in. [12.5 mm]	
⅜ in. [9.5 mm]	100.0
¼ in. [6.3 mm]	99.5
No. 4 [4.75 mm]	99.4
No. 10 [2.00 mm]	98.7
No. 20 [0.850 mm]	96.4
No. 40 [0.425 mm]	92.6
No. 60 [0.250 mm]	85.8
No. 100 [0.150 mm]	74.1
No. 200 [0.075 mm]	54.0

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

Consolidation (T 216)					
Trimblings, Water Content, %					
	Initial	Final		Void Ratio	% Strain
Water Content, %			Pmin		
Dry Density, lbs/ft³			Pp		
Void Ratio			Pmax		
Saturation, %			Cc/C'c		

Miscellaneous Tests	
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), %	
23.6	

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

Comments:

AUTHORIZATION AND DISTRIBUTION

Reported by: **FOGG, BRIAN** Date Reported: **1/24/2011**