Maine Department of Transportation
Highway Program

GEOTECHNICAL SERIES 100 REPORT

County Road
Eastport, Maine

Prepared by:
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Soils Research Scientist

Washington County

WIN 19194.00
Fed Project #: AC-STP-1919(400)X
March 20, 2013

Soils Report No. 2013-118
TEDOCS # 1273533

Location Map
A 0.61 mile portion of County Road.
Eastport, Maine
Washington County
WIN 19194.00 Federal No. AC-STP-1919(400)X
USGS 7.5' Series Topographic
Eastport Quadrangle
DeLORME Map 27 Grid A4

Map Scale 1:24000

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Highway Program
Brad Foley, Program Manager

Memorandum

DATE: March 20, 2013

TO: Shawn Davis **DEPT:** Region 4, Highway

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

SUBJECT: Final Soils Report No. 2013-118, Eastport County Road, WIN 19194.00

Project Information

A subsurface investigation has been completed for the reconstruction of a 0.62 mile portion of County Road in the town of Eastport. The purpose of this investigation is to determine the existing pavement structure and subsurface soil conditions. The investigation included the use of a drill rig, falling weight deflectometer (FWD) and ground penetrating radar (GPR). Stationing was determined by using a distance measuring instrument (DMI) and Route Log Mile information.

The project begins at the intersection of State Route 190 and Washington Street and extends southerly 0.62 miles to the intersection of Barron Road. Project stationing was not provided in the field. A starting station of 10+00 (RLM 0.0) was designated for the purposes of this report. All references to stationing are based on stationing determined in the field using a vehicle mounted distance measuring instrument (DMI).

Existing Pavement Data

ARAN Data Summary

Pavement distress is severe with cracking (fatigue, block, transverse, longitudinal, edge) and rutting. It is anticipated that this pavement distress is due to poor surficial and subsurface drainage, moist to wet subgrade soil conditions, moisture sensitive subgrade soils, frost effects, traffic loading, and fatigue.

A summary of the 2010 ARAN data is presented in Table 1 below. A complete listing of the ARAN data is presented on the Pavement Performance Assessment Summary (PPAS) found at the back of this report.

Table 1: Summary of 2010 ARAN Pavement Data

ARAN Pavement Data	Range	Average
Pavement Condition Rating (PCR)	2.03 – 3.41	2.17
International Roughness Index (IRI)	185 - 310	298
Rut Depth (left)	0.1” – 0.2”	0.19”
Rut Depth (right)	0.3” – 0.5”	0.48”

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. A description PCR rating follows:

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 2.03 – 3.41 with an average PCR of 2.17. The poorest values (2.03) were encountered between stations 10+00 and 40+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. A description IRI scale follows:

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

The IRI value for this project ranged between 185 - 310 in/mile with an average IRI value of 298 in/mile. The poorest IRI values (310 in/mile) were encountered between stations 10+00 and 40+00.

Wheel Path Rutting Values

Wheel path rutting is present throughout the project site. Rut depths varied from 0.1” – 0.5”. Rutting is worse in the outside wheel path between stations 10+00 and 40+00 where a minimum rut depth of 0.5” was encountered.

Existing HMA Thickness

Existing pavement thickness estimates have been provided based upon power auger borings, pavement coring and ground penetrating radar data.

Coring Data – Six pavement cores were obtained using a hand held, gas powered, coring machine utilizing a 2" thin wall core bit (See attached pavement core summary sheet). Pavement cores were conducted in the left travel lane, centerline and right travel lanes at stations 20+00, 30+00 and 40+00. The cores were transported to the Bangor Lab where they were photographed and stored. Photographs of the cores are included at the back of this report. A summary/comparison of the existing pavement thickness derived from coring data, boring data and GPR data is shown below in Table 2.

Power Auger Boring Data – Six power auger borings were conducted through the existing pavement. The pavement surface was found to be solid at all locations. No unbound pavement was encountered. The solid HMA thickness range and average from the power auger borings is listed below in Table 2. For location and offset of power auger borings please refer to boing logs included at the back of this report.

GPR Data – GPR data was collected at 1 foot intervals in the left and right wheel path of both travel lanes. Pavement thickness estimates were developed using Geophysical Survey Systems Inc. (GSSI) RADAN GPR Data Processing Software. Where available, pavement core thicknesses were used to ground truth the GPR data. The GPR pavement estimate data is presented on the attached GPR Estimated Pavement Thickness summary sheets as an average pavement thickness utilizing a 100' interval.

Table 2: Pavement Thickness Summary/Comparison

	Left Lane	**Centerline**	**Right Lane**
Pavement Core Data			
Range of Thickness	4.5" – 7.0"	4.0" – 6.5"	6.75"
Average Thickness	5.75"	5.6"	6.75"
Power Auger Data			
Range of Thickness	5.0" – 5.5"		5.0" – 5.5"
Average Thickness	5.2"		5.2"
Ground Penetrating Radar Data			
Range of Thickness	3.4" – 6.0"		
Average Thickness	4.6"		

Subsurface Explorations

Subsurface explorations were conducted by Maine DOT using a CME 45C truck mounted drill rig. Bore hole logging was performed by Maine DOT.

Power Auger Borings

A total of 6 power augers borings were conducted to determine the existing roadway structure and underlying subgrade soil conditions (See Boring Logs). Power auger borings were conducted using 5" solid stem augers. Soil sampling was conducted directly from the auger

flights. Power auger borings were conducted in the travel lanes only. Borings could not be conducted within the dirt shoulders due to overhead wires and buried utilities.

Soil Sampling

A total of 8 soil samples were collected 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. Atterberg limits were conducted on samples S2 and S6. Based on 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 at the back of this report.

Existing Roadway Base

Existing Base Material Type:	silty sandy GRAVEL, A-1-a silty gravelly SAND, A-1-b gravelly silty SAND, A-2-4
Percent Passing #200 Sieve:	12% - 43%
Range of Base Material Thickness:	8” – 18”
Quality of Drainage (AASHTO):	very poor to poor
Permeability:	0.1’ – 9’ per day

The existing base material varies greatly with respect to quality and grain size distribution. The base material ranged from gravelly silty sand (S5) with 43% fines to a silty sandy GRAVEL (S7) with 12 % fines. The thickness of the base material varied from 8-inches to 18-inches.

Subgrade Soils

Subgrade soils are anticipated to consist primarily of moist to wet silty clay silts similar to samples S2, S6 and S8. These soils are very silty with 89% - 91% passing the # 200 sieve. These clay silt soils are classified (AASHTO) as an A-4 and A-6 soil.

These plastic soils are very sensitive to moisture and have high volume changes between wet and dry states. They have a high dry strength but lose much of this strength upon absorbing water. These soils are poorly drained and were found to be wet in late September when the power auger borings were conducted. Drainage of these soils will be critical to future pavement performance.

FWD testing indicates that these soils have a very low (<3000 psi) subgrade resilient modulus value (See FWD Data) in areas. If these soils are not well drained long term pavement performance expectations may not be realized. In addition, if wet subgrade conditions exist during construction, these soils may be unable to support traffic once the existing pavement is removed. If these soils begin to fail additional base material will be necessary to support traffic during construction. Areas of greatest concern are between stations 15+00 – 17+00, 25+00 – 28+00, and 31+00 – 35+00.

Drainage

Drainage will be critical to achieving any future pavement expectations due the presence of moisture sensitive clay silt subgrade soils. Currently, drainage (ditching and/or underdrain) is marginal to non-existent throughout the project site. This lack of drainage is a contributing factor to the existing poor pavement conditions throughout the project site. Ditching and/or underdrain will be critical in providing pavement structure drainage and water table drawdown. Ditches

should be constructed with a minimum depth of 3 feet below finished grade when possible. Under drain is preferred over ditching because underdrain will allow for greater water table drawdown.

FWD Results

FWD data was collected every 200 feet throughout the project site. A summary of the FWD analysis is shown in Table 3 below.

FWD Deflection Plots

Payment Layer Deflections - FWD deflection plots for the pavement layer are very high (20 - 30 mils) and erratic throughout the project site. This is consistent with poor pavement conditions.

Subbase/Subgrade Soil Layer Deflections - FWD deflections in the subbase/subgrade soil layers are high and erratic throughout the project site. The deflections generally mirror the pavement deflections. These high and erratic deflections are generally indicative of poor and/or non-uniform subgrade conditions.

The FWD deflection plots have been included at the back of this report.

FWD Analysis

An FWD analysis was conducted using the following variables:

Design Life: 12	Future 18-kip P2.5 ESALs (Design Life): 3,105,420
Initial Serviceability: 4.5	Terminal Serviceability: 2.5
Reliability Level: 90%	Overall Standard Deviation: .45

Pavement depths used for DARWin analysis were taken from Ground Penetrating Radar Summary sheet. Gravel depths were obtained from power auger borings. A summary of the FWD Analysis is shown below in Table 3.

Table 3: Summary of FWD Analysis

Design Variables	% FAILS	Range	Average	75 Percentile
Existing SN fails to meet Future SN	94%			
Pavement Modulus (psi)		47,549 – 162,352	92,427	68,060
Subgrade Resilient Modulus (psi)		2,185 – 5,660	3,824	3,240

Existing Structural Number - The existing structural number along the project site fails to exceed the future structural number for 94% of the project site.

Subgrade Resilient Modulus - A low subgrade resilient modulus value (M_r) was encountered between Stations 15+00 – 17+00, 25+00 – 28+00, and 31+00 – 35+00. It is anticipated that these low values are primarily due to moist to wet subgrade conditions and moisture sensitive clay silt subgrade soils. Unless these areas are well drained, poor pavement performance and premature pavement failure is likely regardless of rehabilitation/reconstruction methods. In addition, if wet subgrade conditions exist during construction, these areas may be unable to

support traffic once the existing pavement is removed. If these areas begin to fail additional base material would be necessary to support traffic during construction.

Recommendations

1. Full depth reconstruction is recommended for the entire project site due for the follow reasons:
    a. Inadequate existing base thickness and quality
    b. Moisture sensitive clay silt subgrade soils
    c. Low subgrade resilient modulus values
    d. Heavy truck loads

2. It is recommended that the entire project area be well drained due to the moisture sensitive clay silt subgrade soils. These soils have a high dry strength but lose much of this strength upon absorbing water. Underdrain is preferred over ditching because underdrain will provide increased drainage of the subgrade soils and will allow greater draw-down of the water table.

Pavement Performance Assessment Summary (PPAS)

The Pavement Performance Assessment Summary (PPAS) on the following page is a performance evaluation tool utilizing FWD and ARAN data. Based on the PPAS and ARAN data, pavement performance is poor throughout the project site.

Based on the Pavement Performance Assessment Summary the entire project site is performing poorly. See attached Pavement Performance Assessment Summary (PPAS).

Criteria Explanation

The purpose of the PPAS is to highlight potential areas along the project that may not be performing as well as other areas. Six potential performance criteria are used to provide this relative performance assessment. The 6 criteria are listed and explained below:

1. Existing Structural Number (SN) is less than the Future Structural Number (FWD Data) - If the existing SN is less than the future SN at any station along the project an X will be placed in the corresponding column and the box will be shaded.

2. Increased and/or Non Uniform FWD Deflections (FWD Data) – An X is placed in this column anytime the pavement deflection (1st sensor) is greater than 15 mils, anytime the 2nd sensor is greater than 10 mils, and anytime the deflections become non uniform.

3. IRI > 150 (ARAN Data) – A complete listing of all ARAN IRI values collected for the project are listed on the PPAS in the IRI column. If the IRI value becomes greater than 150 (indicating a reduction in ride performance) for any station the box will be shaded on the PPAS. This information includes the complete data collection from the ARAN inventory for the project rather than just the node data points supplied in projex..

4. PCR < 3.5 (ARAN Data) – A complete listing of all ARAN PCR values collected for the project are listed on the PPAS in the PCR column. If the PCR value becomes 3.5 or less (indicating increased pavement deterioration) for any station the box will be shaded on the PPAS. This information includes the complete data collection from the ARAN inventory for the project rather than just the node data points supplied in projex..

5 & 6. Left Rut Depth / Right Rut Depth (ARAN Data) – A complete listing of all left and right rut depth values collected along the project are listed on the PPAS in the rut depth columns. If the rut depth becomes 0.5” or greater the box will be shaded on the PPAS. This information includes the complete data collection from the ARAN inventory for the project rather than just the node data points supplied in projex..

Deficiency Column - The total number of deficient performance criteria (0 – 6) are totaled and placed in the deficient column (Def) for each station identified in the PPAS. If the total listed becomes 3 or greater the box will then be shaded. Existing and future pavement performance is likely to be reduced in areas exhibiting a greater number in the deficiency column. Additional reclamation measures may want to be considered in these poorly performing areas.

Pavement Performance Assessment Summary

(PPAS)

19194.00 Eastport

County Road

			PERFORMANCE MEASURESUREMENTS							GEN. PAVEMENT INFORMATION					
				FWD Data		ARAN Data				ARAN Supplied Data					
Station	RLM	Inv Yr	Def (≥ 3)	Existing SN < Future SN	Increased FWD Pavement Deflections	PCR < 3.5	IRI > 150	Rut Depth > 0.5"		Shoulder Type and Width				Yr. Built	Yr. Resurf.
								Left	Right	Left		Right			
								(in.)	(in.)		ft		ft		
10+00	0	2010	5	X	X	2.03	310	0.2	0.5	Gravel	2	Gravel	2		
14+00	0.08	2010	4	X		2.03	310	0.2	0.5	Gravel	2	Gravel	2		
15+81	0.11	2010	5	X	X	2.03	310	0.2	0.5	Gravel	2	Gravel	2		
22+00	0.23	2010	4		X	2.03	310	0.2	0.5	Gravel	2	Gravel	2		
23+20	0.25	2010	5	X	X	2.03	310	0.2	0.5	Gravel	2	Gravel	2		
25+31	0.29	2010	5	X	X	2.03	310	0.2	0.5	Gravel	2	Gravel	2		
33+23	0.44	2010	5	X	X	2.03	310	0.2	0.5	Gravel	2	Gravel	2		
38+00	0.53	2010	4	X		2.03	310	0.2	0.5	Gravel	2	Gravel	2		
40+00	0.57	2010	4	X		2.03	310	0.2	0.5	Gravel	2	Gravel	2		
41+68	0.6	2010	4	X	X	3.41	185	0.1	0.3	Gravel	2	Gravel	2		
Average			**4.5**			**2.17**	**298**	**0.19**	**0.48**						

Note: Dates provided in Year Built and Year Resurface are provided from the ARAN data and have not been verified.

Falling Weight Deflectometer (FWD)
Summary Sheet

Project #: 19194.00
Town(s): Eastport
Route(s): County Road
Date Tested: 07/26/2012
Requested By: S Hayden
Direction of Testing: South

Of FWD tests: 16 # Of Power Augers/Spoons - 6
Design Life: 12 Future 18-kip P2.5 ESALs (Design Life): 3,105,420
Initial Serviceability: 4.5 Terminal Serviceability: 2.5
Reliability Level: 90% Overall Standard Deviation: .45

Locations

Station (Feet)	Description

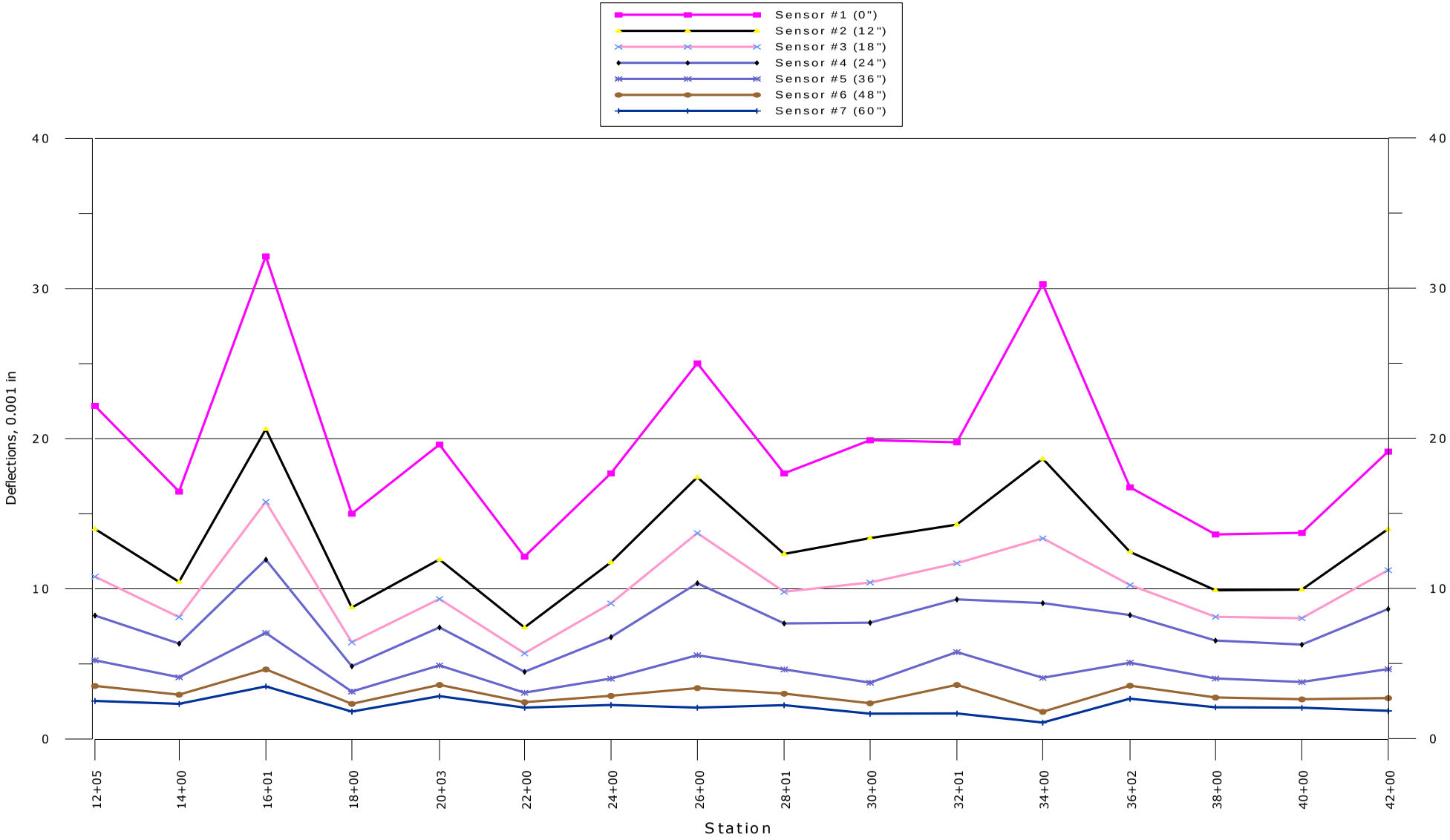
Comments:

Pavement depths used for DARWin analysis were taken from Ground Penetrating Radar Summary sheets.

MaineDOT

FWD DEFLECTION DATA

WIN/Town:	**019194.00 - Eastport**			Reported By:	**COLSON, STEPHEN W**		
Route:	**County Road**	PMS Route Code		Tested:	**7/26/2012**	Reported:	**3/7/2013**
Comments:							



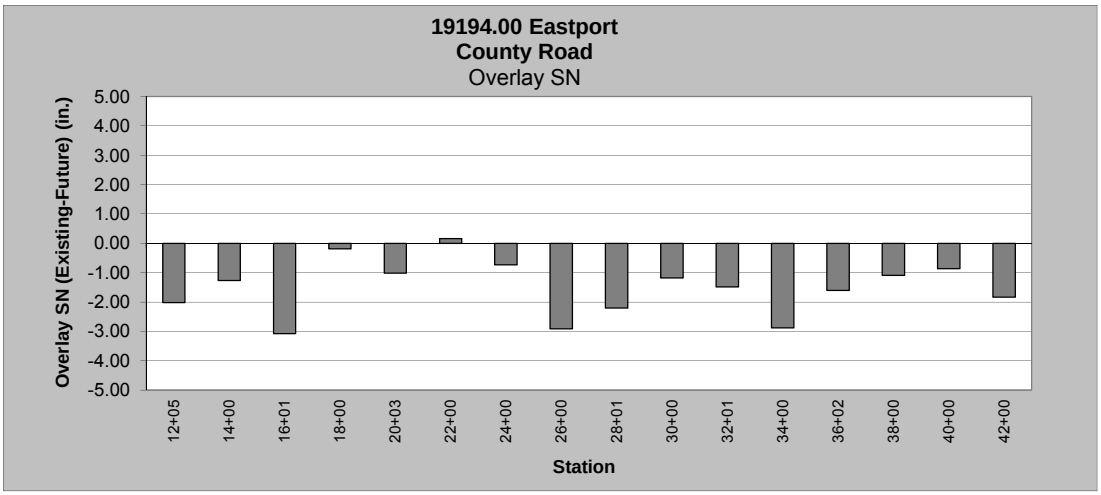
19194.00 Eastport
County Road

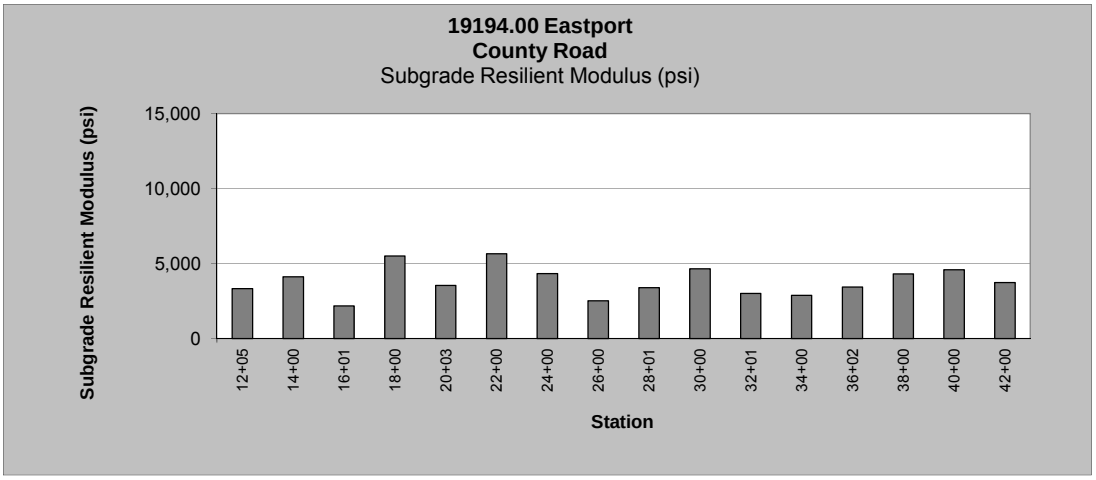
Station (Feet)	Existing Structural Number (in.)	Future Traffic Structural Number (in.)	Overlay Structural Number (Existing - Future)	Recommended Pavement Thickness (in.)	Pavement Modulus (psi)	Subgrade Resilient Modulus (psi)	Pavement Depth (in)	Combined Pavement/Gravel Depth Used for Calculation (in)
12+05	3.22	5.24	**-2.02**	**4.59**	65,041	3,319	4.1	**17.8**
14+00	3.62	4.89	**-1.27**	**2.89**	95,558	4,109	3.9	**17.6**
16+01	2.87	5.95	**-3.08**	**7.00**	47,549	**2,185**	3.9	**17.6**
18+00	4.26	4.45	**-0.19**	**0.43**	80,919	5,508	4.1	21.0
20+03	4.10	5.12	**-1.02**	**2.32**	69,062	3,553	4.4	22.0
22+00	4.57	4.41	0.16	-	99,729	5,660	4.1	21.0
24+00	4.08	4.81	**-0.73**	**1.66**	74,044	4,326	3.8	21.0
26+00	2.79	5.70	**-2.91**	**6.61**	98,644	**2,516**	5.4	**13.0**
28+01	2.99	5.20	**-2.21**	**5.02**	162,352	3,392	4.2	**12.0**
30+00	3.52	4.70	**-1.18**	**2.68**	61,893	4,642	4.4	**19.8**
32+01	3.91	5.40	**-1.49**	**3.39**	79,503	3,007	4.8	20.2
34+00	2.59	5.47	**-2.88**	**6.55**	49,225	**2,884**	5.1	**15.7**
36+02	3.57	5.18	**-1.61**	**3.66**	124,350	3,439	5.3	**15.9**
38+00	3.73	4.82	**-1.09**	**2.48**	158,926	4,315	4.7	**15.3**
40+00	3.86	4.72	**-0.86**	**1.95**	130,713	4,589	4.4	**16.9**
42+00	3.20	5.04	**-1.84**	**4.18**	81,322	3,743	3.9	**16.4**

Possible Weak Soils (<3000)

Possible Shallow Bedrock (>8000)

Pavement depths were taken from Ground Penetrating Radar Summary Sheet.





STATE OF MAINE

FILE: Wash. Co.

INTERDEPARTMENTAL MEMORANDUM

Date of Request: 1/29/2013 Return: 2/04/2013

Latest Date Needed By ASAP

To: **Ed Hanscom** Dept.: MDOT, Bureau of Planning

From: **Cindy L. Raymond** Dept.: Highway

Subject: **Request for Traffic Information** Project Manager: **Rob Clewley**

TOWN(S): Eastport P.I.N. **19194.00** Consultant Proj

COUNTY: Washington ROUTE: Route 190

LOCATION/ DESCRIPTION: **C311J) beginning at the intersection of State Route 190 and** Washington Street and extending southerly 0.62

	Roadway Changes or Relocation (Attach Sketch)	Turning Movement needed (Provide Locations under Comments)	Other Please Describe Under Comments
Please Check Box if Applicable:			

Prep By: MAM	Sec. 1	Sec. 2	Sec. 3	Sec. 4	Sec. 5
Description of Sections	Eastport - County Rd SE/O SR 190 (Washington St.)				
1 Latest AADT (Year)	900 (2012)				
2 Current 2013 AADT	900				
3 Future 2033 AADT	1080				
4 Future AADT					
5 DHV - % of AADT	12%	%	%	%	%
6 Design Hourly Volume	130				
7 % Heavy Trucks (AADT)	19%	%	%	%	%
8 % Heavy Trucks (DHV)	19%	%	%	%	%
9 Direct.Dist. (DHV)	60%	%	%	%	%
10 18-KIP Equivalent P 2.0	376				
11 18-KIP Equivalent P 2.5	358				

Notes or Remarks: 18-Kip ESALS is based on 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 **2.3.7.11**

Comments: Recostruction

Performance Data Summary

19194.00 Eastport
County Road

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, base thickness and base quality, 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, 94% of the project fails to meet 2 or more of the four minimum performance data criteria. Base thickness, base quality, low subgrade resilient modulus 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

19194.00 Eastport
County Road

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					
10+00	2										
12+00	2										
14+00	2										
16+00	3						5.5 - 13.7	SiGSa A-1-b S1	14 II Moist	ClSi A-4 S2	89 IV Damp
18+00	2										
20+00	2						5.0 - 17.7	SiGSa A-1-b S3	14 II Moist	SiSa A-4 S4	46 III Wet 1.9”
22+00	1										
24+00	2										
26+00	3	Pavement Thickness (4 inches)	Base Thickness (18 inches)	Subgrade Modulus (3000 psi)	Structural Number	5.0 - 8.2		GSiSa A-4 S5	43 III Moist	ClSi A-6 S6	89 III Moist
28+00	3										
30+00	2					5.0 - 15.4		SiSaG A-1-a S7	12 0 Moist	ClSi A-6 S8	91 III Moist
32+00	2										
34+00	3						5.0 - 10.6	SiSaG A-1-a S7	12 0 Moist	ClSi A-6 S8	91 III Moist
36+00	3										
38+00	2										
40+00	2						5.5 - 12.5	SiSaG A-1-a S7	12 0 Moist	Silty Sand Possible Utility Trench Material	
42+00	2										

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

State of Maine - Department of Transportation

Laboratory Testing Summary Sheet

Town(s): Eastport Work Number: 19194.00

Boring & Sample Identification Number	Station (Feet)	Offset (Feet)	Depth (Feet)	Reference Number	G.S.D.C. Sheet	W.C.	% Passing 200 Sieve		Classification		
									Unified	AASHTO	Frost
HB-EAST-101, S1	16+00	4.5 Rt.	0.46-1.6	267757	1	4.8	13.6		SM	A-1-b	II
HB-EAST-101, S2	16+00	4.5 Rt.	1.6-4.0	267758	1	19.2	88.5		CL-ML	A-4	IV
HB-EAST-102, S3	20+00	5.0 Rt.	0.42-1.9	267759	1	3.5	14.4		SM	A-1-b	II
HB-EAST-102, S4	20+00	5.0 Rt.	1.9-4.0	267760	1	15.9	45.5		SM	A-4	III
HB-EAST-103, S5	26+00	4.5 Lt.	0.42-1.1	267761	2	10.0	43.0		SM	A-4	III
HB-EAST-103, S6	26+00	4.5 Lt.	1.1-4.0	267762	2	21.9	89.2		CL	A-6	III
HB-EAST-104, S7	30+00	4.5 Lt.	0.42-1.7	267763	2	5.0	12.0		GW-GM	A-1-a	0
HB-EAST-104, S8	30+00	4.5 Lt.	1.7-4.0	267764	2	21.5	90.8		CL	A-6	III
							L.L.	P.I.			
HB-EAST-101, S2	16+00	4.5 Rt.	1.6-4.0	267758	1	19.2	23	5	CL-ML	A-4	IV
HB-EAST-103, S6	26+00	4.5 Lt.	1.1-4.0	267762	2	21.9	38	16	CL	A-6	III

Offsets are from Existing Roadway CL.

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

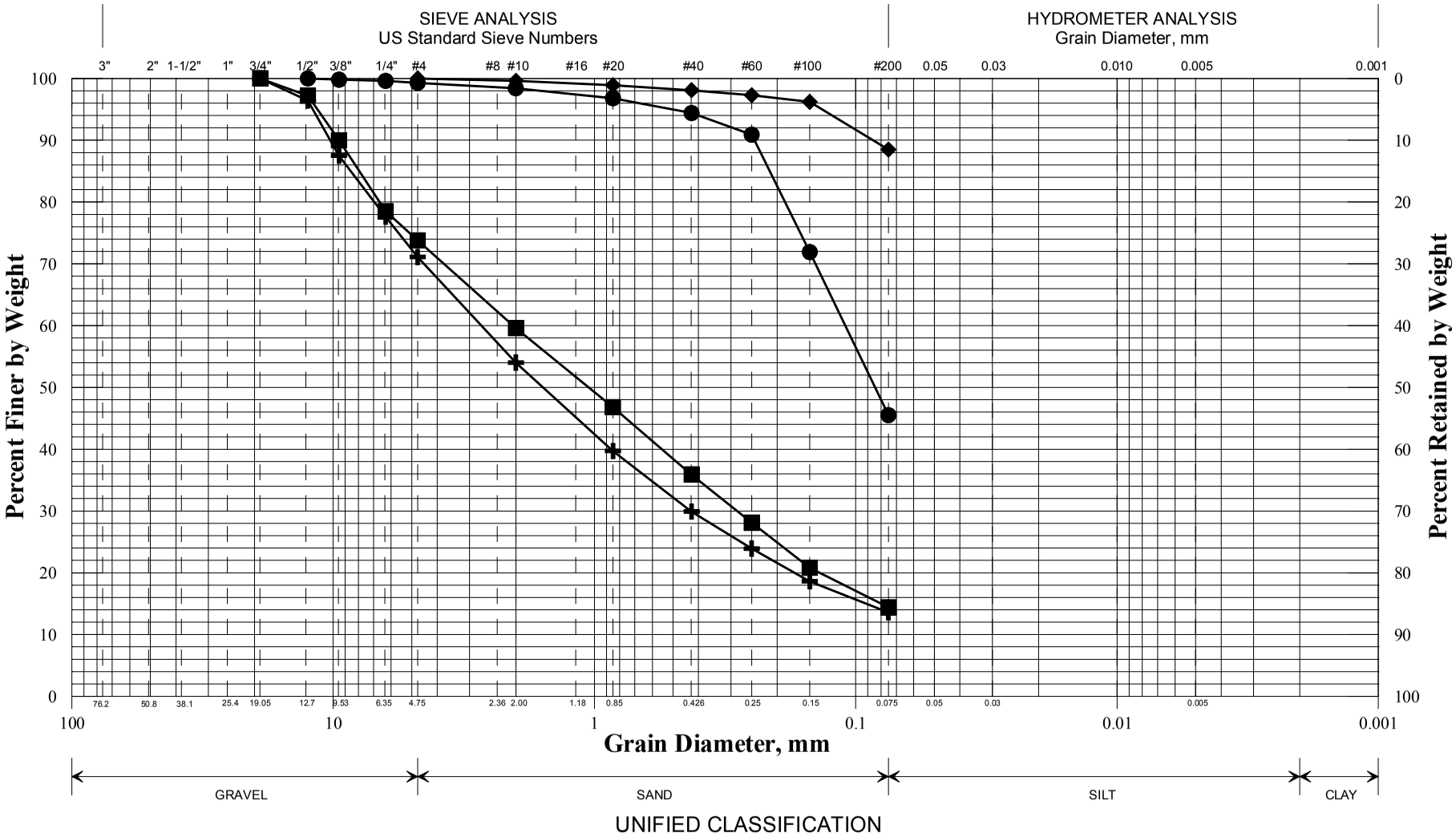
GSDC = Grain Size Distribution Curve as determined by AASHTO T 88-93 (1996) and/or ASTM D 422-63 (Reapproved 1998)

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

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

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

State of Maine Department of Transportation
GRAIN SIZE DISTRIBUTION CURVE



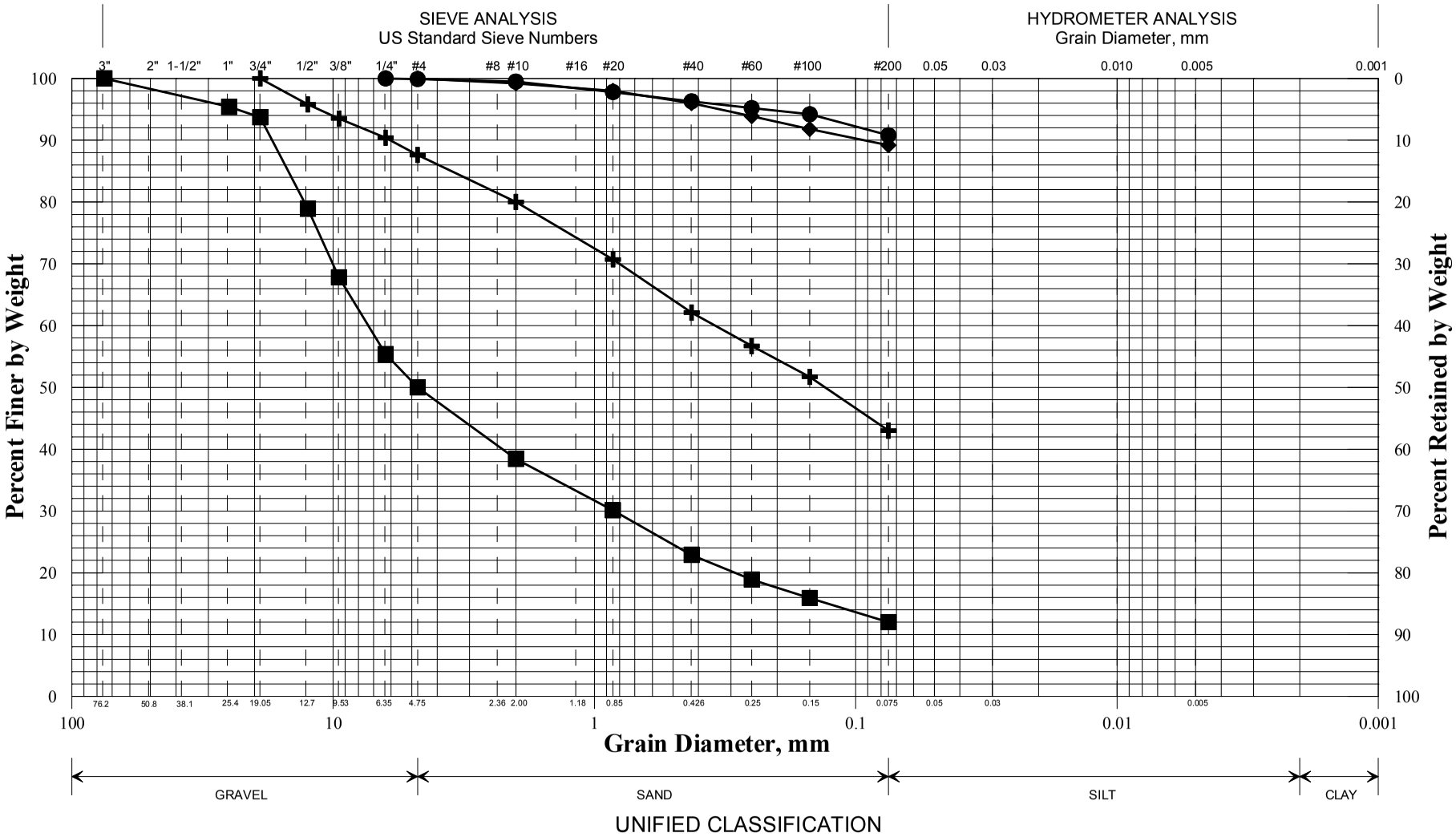
UNIFIED CLASSIFICATION

	Boring/Sample No.	Station	Offset, ft	Depth, ft	Description	W, %	LL	PL	PI
✚	HB-EAST-101/S1	16+00	4.5 RT	0.46-1.6	SAND, some gravel, little silt.	4.8			
◆	HB-EAST-101/S2	16+00	4.5 RT	1.6-4.0	SILT, little sand.	19.2	23	18	5
■	HB-EAST-102/S3	20+00	5.0 RT	0.42-1.9	SAND, some gravel, little silt.	3.5			
●	HB-EAST-102/S4	20+00	5.0 RT	1.9-4.0	Silty SAND, trace gravel.	15.9			
▲									
✕									

WIN
019194.00
Town
Eastport
Reported by/Date
WHITE, TERRY A 10/16/2012

SHEET 1

State of Maine Department of Transportation
GRAIN SIZE DISTRIBUTION CURVE



	Boring/Sample No.	Station	Offset, ft	Depth, ft	Description	W, %	LL	PL	PI
✚	HB-EAST-103/S5	26+00	4.5 LT	0.42-1.1	Silty SAND, little gravel.	10.0			
◆	HB-EAST-103/S6	26+00	4.5 LT	1.1-4.0	SILT, little sand.	21.9	38	22	16
■	HB-EAST-104/S7	30+00	4.5 LT	0.42-1.7	Sandy GRAVEL, little silt.	5.0			
●	HB-EAST-104/S8	30+00	4.5 LT	1.7-4.0	SILT, trace sand, trace gravel.	21.5			
▲									
✕									

WIN
019194.00
Town
Eastport
Reported by/Date
WHITE, TERRY A 10/16/2012

SHEET 2

State of Maine - Department of Transportation

Pavement Core Summary Sheet

Town(s): Eastport Work Number: 19194.00

Station (Feet)	Offset (Feet)	Pavement Depth (Inches)	Unbound Pavement	PC-Number	Saved Core	Comments / Date 9/26/2012
20+00	1.0 Lt.	4.0		1	yes	
20+00	9.0 Lt.	4.5		2	yes	
30+00	1.0 Lt.	6.5		3	yes	
30+00	9.0 Lt.	7.0		4	yes	
40+00	1.0 Rt.	6.5		5	yes	
40+00	9.0 Rt.	6.75		6	yes	

MaineDOT

Ground Penetrating Radar (GPR)

Estimated Pavement Thickness

019194.00 - Eastport

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

GPR data was collected in the left and right wheel path of both lanes. Data was collected at 1 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 thickness from Geotechnical borings and/or pavement cores 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.

Additional Comments

Project Manager	Reported By	Test Date	Reported Date
DAVIS, SHAWN R	**VOSE, RYAN K**	**7/18/2012**	**3/7/2013**

Lane Tested	Analysis Distance, ft.	Overall Average Thickness, in.	Overall Minimum Thickness, in.	Overall Maximum Thickness, in.
MAINLINE	**100**	**4.6**	**3.4**	**6**

***Depth at this location may be impacted by a bridge deck or other pavement anomaly.**

Highlighted inches indicate either the Overall Minimum or Overall Maximum thickness.

Station Limits, feet		Average Depth, in.	Station Limits, feet		Average Depth, in.	Station Limits, feet		Average Depth, in.	Station Limits, feet		Average Depth, in.
10+00	11+00	3.4	11+00	12+00	3.9	12+00	13+00	4.1	13+00	14+00	4.6
14+00	15+00	3.9	15+00	16+00	3.9	16+00	17+00	4.1	17+00	18+00	4.1
18+00	19+00	4.3	19+00	20+00	4.3	20+00	21+00	4.4	21+00	22+00	5.0
22+00	23+00	4.1	23+00	24+00	3.8	24+00	25+00	4.5	25+00	26+00	5.4
26+00	27+00	5.6	27+00	28+00	6.0	28+00	29+00	4.2	29+00	30+00	4.4
30+00	31+00	4.9	31+00	32+00	4.8	32+00	33+00	4.9	33+00	34+00	5.1
34+00	35+00	5.2	35+00	36+00	5.6	36+00	37+00	5.3	37+00	38+00	4.8
38+00	39+00	4.7	39+00	40+00	4.4	40+00	41+00	4.7	41+00	42+05	3.9

MaineDOT

Ground Penetrating Radar (GPR)

Estimated Pavement Depths at Transverse Locations

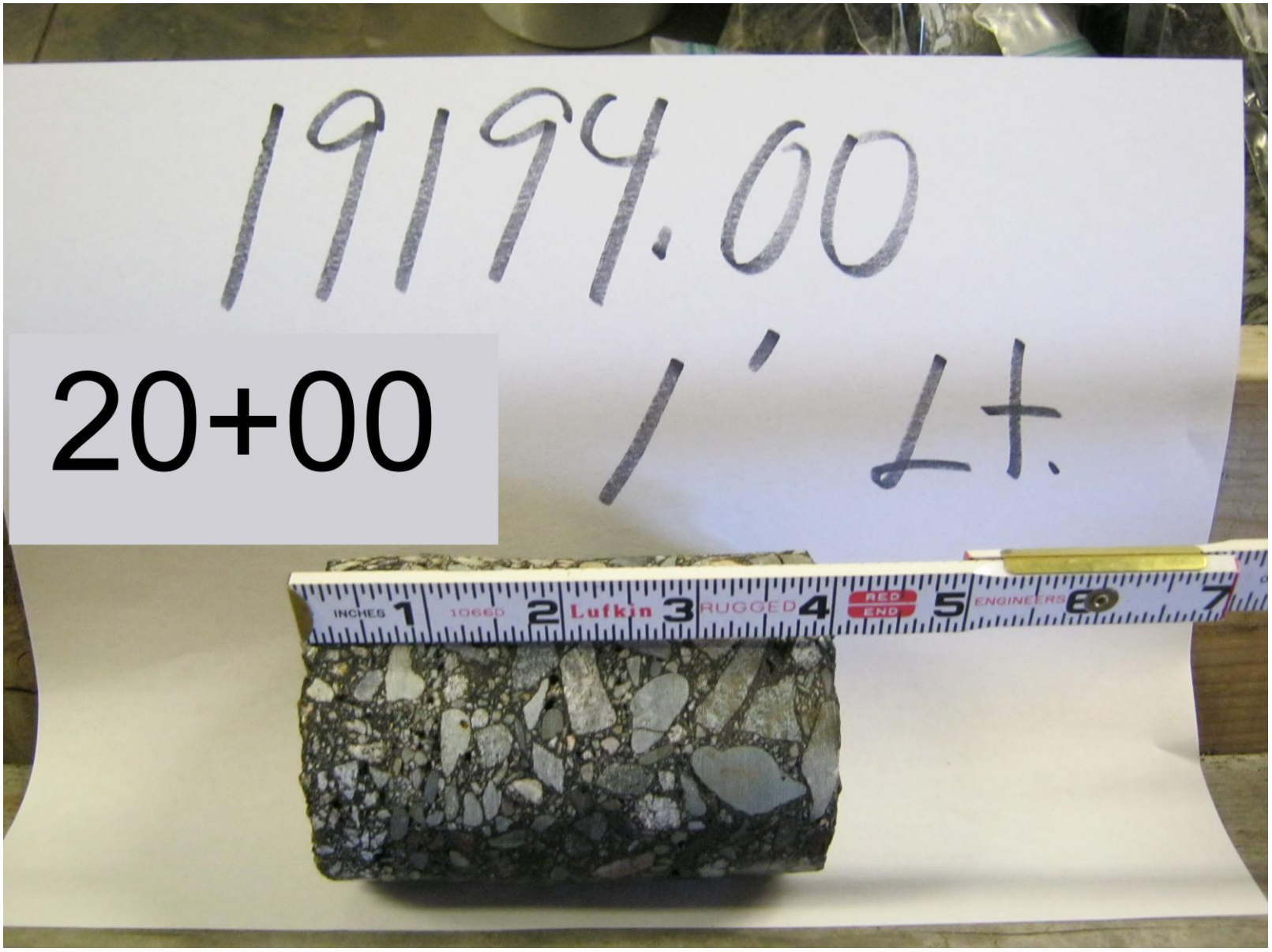
019194.00 - Eastport

Station	Left Offset, ft					CL	Right Offset, ft					Comments
				9	1		1	9				
20+00				4.75	4		3.5	5				
30+00				7	6.5		7.25	7.5				
40+00							6.5	6.75				No GPR collected at this location

Highlighted areas indicate pavement cores were taken at this location.

MaineDOT

Pavement Cores
019194.00 - Eastport



MaineDOT

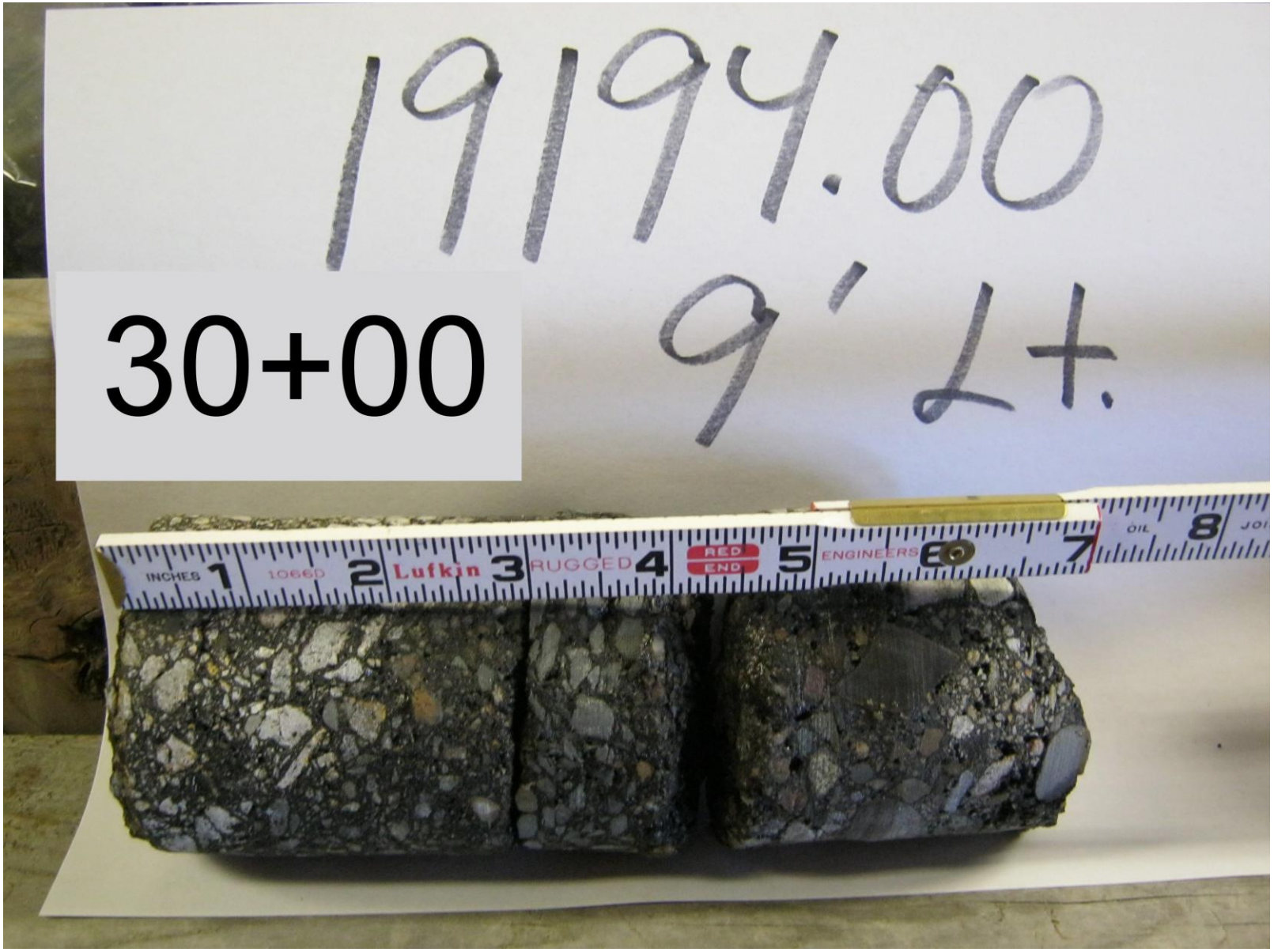
Pavement Cores
019194.00 - Eastport

MaineDOT

Pavement Cores
019194.00 - Eastport

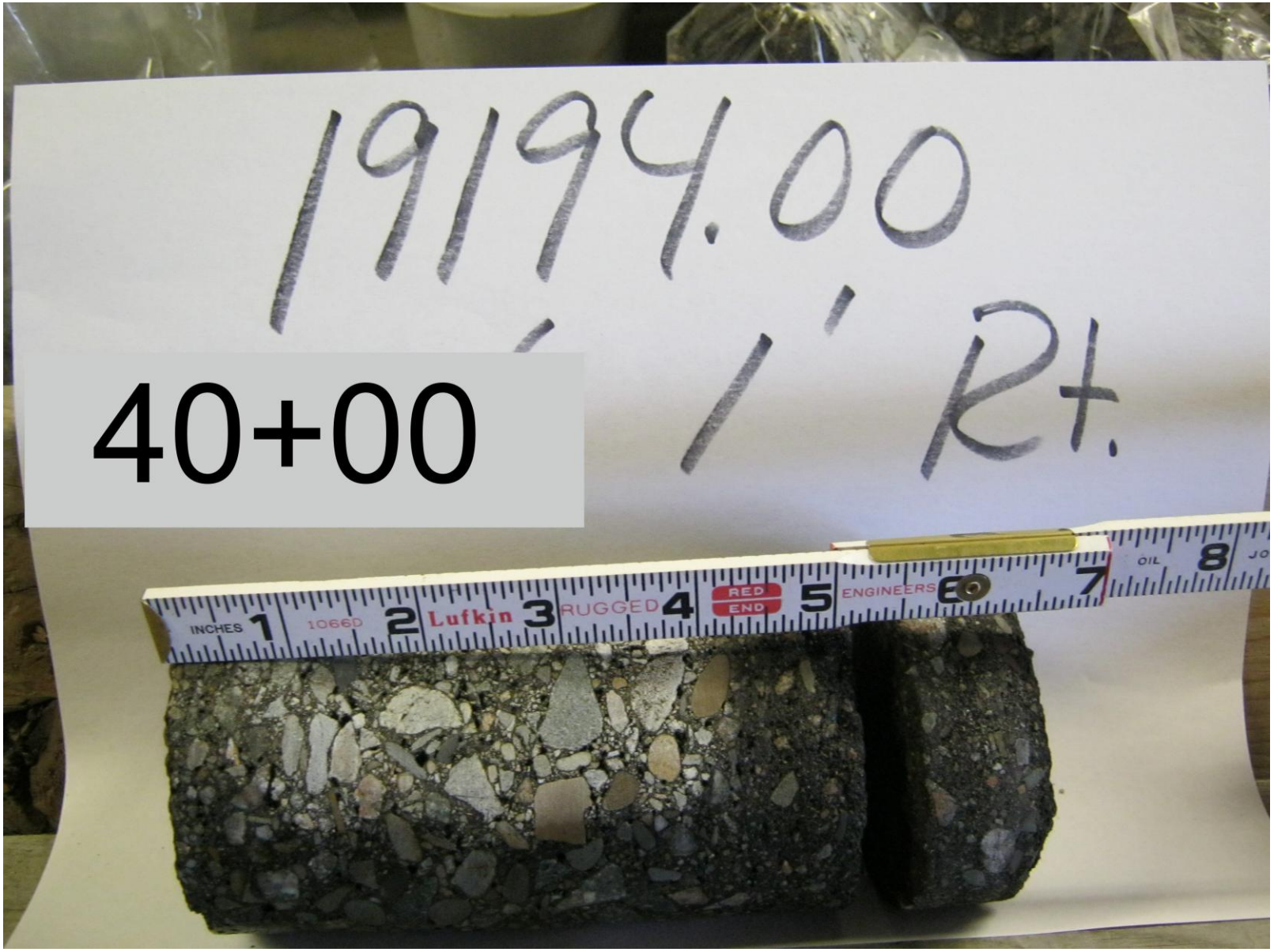
MaineDOT

Pavement Cores
019194.00 - Eastport



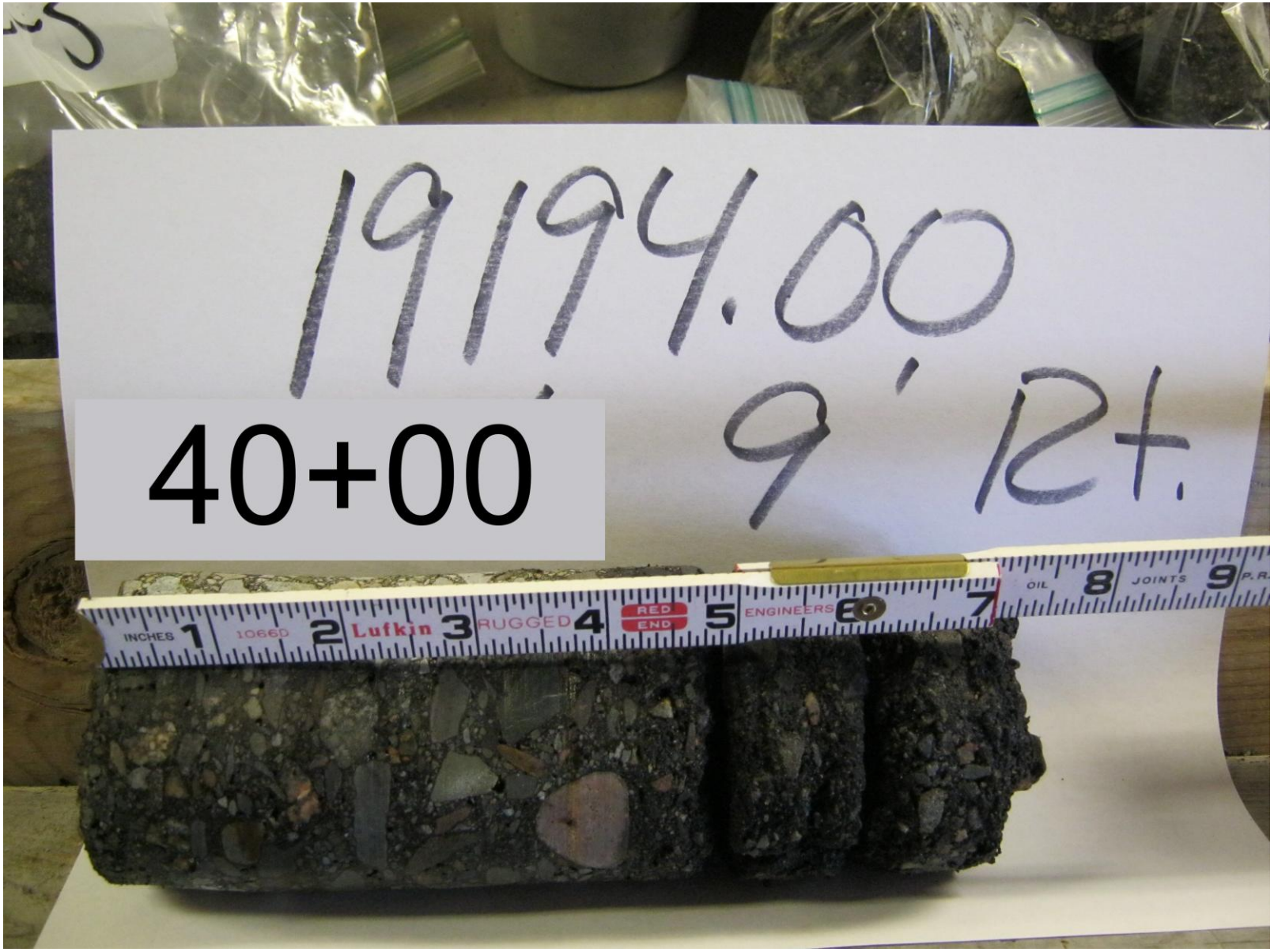
MaineDOT

Pavement Cores
019194.00 - Eastport



MaineDOT

Pavement Cores
019194.00 - Eastport



Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: A 0.62 mile portion of County Road
Location: Eastport, Maine

Boring No.: HB-EAST-101
WIN: 19194.00

Driller:	MaineDOT	**Elevation (ft.)**		**Auger ID/OD:**	5" Dia.
Operator:	Enos/Giles/Daggett	**Datum:**	NAVD 88	**Sampler:**	Off Flights
Logged By:	B. Wilder	**Rig Type:**	CME 45C	**Hammer Wt./Fall:**	N/A
Date Start/Finish:	9/26/12-9/26/12	**Drilling Method:**	Solid Stem Auger	**Core Barrel:**	N/A
Boring Location:	16+00, 4.5 ft 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

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	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
0	S1		0.46 - 1.60			SSA	-0.46		5½" PAVEMENT. 0.46	
	S2		1.60 - 4.00				-1.60		Brown, moist, fine to coarse SAND, some gravel, little silt. 1.60	G#267757 A-1-b, SM WC=4.8%
							-4.00		Brown, damp, SILT, some fine sand. 4.00	G#267758 A-4, CL-ML WC=19.2% LL=23 PL=18 PI=5
5									**Bottom of Exploration at 4.00 feet below ground surface.** NO REFUSAL	
10										
15										
20										
25										

Remarks:

Offsets are from the Existing Roadway CL.

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

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

Boring No.: HB-EAST-101

Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: A 0.62 mile portion of County Road
Location: Eastport, Maine

Boring No.: HB-EAST-102
WIN: 19194.00

Driller:	MaineDOT	**Elevation (ft.)**		**Auger ID/OD:**	5" Dia.
Operator:	Enos/Giles/Daggett	**Datum:**	NAVD 88	**Sampler:**	Off Flights
Logged By:	B. Wilder	**Rig Type:**	CME 45C	**Hammer Wt./Fall:**	N/A
Date Start/Finish:	9/26/12-9/26/12	**Drilling Method:**	Solid Stem Auger	**Core Barrel:**	N/A
Boring Location:	20+00, 5.0 ft 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

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	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
0	S3		0.42 - 1.90			SSA	-0.42		5" PAVEMENT. 0.42	G#267759 A-1-b, SM WC=3.5%
	S4		1.90 - 4.00				-1.90		Brown, moist, fine to coarse SAND, some gravel, little silt. 1.90	G#267760 A-4, SM WC=15.9%
							-4.00		Grey, wet, fine to medium SAND, some silt. 4.00	
5									**Bottom of Exploration at 4.00 feet below ground surface.** NO REFUSAL	
10										
15										
20										
25										

Remarks:

Offsets are from the Existing Roadway CL.

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

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

Boring No.: HB-EAST-102

Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: A 0.62 mile portion of County Road
Location: Eastport, Maine

Boring No.: HB-EAST-103
WIN: 19194.00

Driller:	MaineDOT	**Elevation (ft.)**		**Auger ID/OD:**	5" Dia.
Operator:	Enos/Giles/Daggett	**Datum:**	NAVD 88	**Sampler:**	Off Flights
Logged By:	B. Wilder	**Rig Type:**	CME 45C	**Hammer Wt./Fall:**	N/A
Date Start/Finish:	9/26/12-9/26/12	**Drilling Method:**	Solid Stem Auger	**Core Barrel:**	N/A
Boring Location:	26+00, 4.5 ft Lt.	**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

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	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
0	S5		0.42 - 1.10			SSA	-0.42		5" PAVEMENT. 0.42	G#267761 A-4, SM WC=10.0%
	S6		1.10 - 4.00				-1.10		Brown, moist, fine to coarse SAND, some silt, little gravel. 1.10	G#267762 A-6, CL WC=21.9% LL=38 PL=22 PI=16
									Olive, moist, clayey-SILT, trace fine sand.	
							-4.00		4.00	
5									**Bottom of Exploration at 4.00 feet below ground surface.** NO REFUSAL	
10										
15										
20										
25										

Remarks:

Offsets are from the Existing Roadway CL.

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

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

Boring No.: HB-EAST-103

Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: A 0.62 mile portion of County Road
Location: Eastport, Maine

Boring No.: HB-EAST-104
WIN: 19194.00

Driller:	MaineDOT	**Elevation (ft.)**		**Auger ID/OD:**	5" Dia.
Operator:	Enos/Giles/Daggett	**Datum:**	NAVD 88	**Sampler:**	Off Flights
Logged By:	B. Wilder	**Rig Type:**	CME 45C	**Hammer Wt./Fall:**	N/A
Date Start/Finish:	9/26/12-9/26/12	**Drilling Method:**	Solid Stem Auger	**Core Barrel:**	N/A
Boring Location:	30+00, 4.5 ft Lt.	**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

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	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
0	S7		0.42 - 1.70			SSA	-0.42		5" PAVEMENT. 0.42	
	S8		1.70 - 4.00				-1.70		Brown, moist, gravelly, fine to coarse SAND, little silt. 1.70	G#267763 A-1-a, GW-GM WC=5.0%
							-4.00		Light brown, moist, SILT, some clay, trace fine sand. 4.00	G#267764 A-6, CL WC=21.5%
5									**Bottom of Exploration at 4.00 feet below ground surface.** NO REFUSAL	
10										
15										
20										
25										

Remarks:

Offsets are from the Existing Roadway CL.

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

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

Boring No.: HB-EAST-104

Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: A 0.62 mile portion of County Road
Location: Eastport, Maine

Boring No.: HB-EAST-105
WIN: 19194.00

Driller:	MaineDOT	**Elevation (ft.)**		**Auger ID/OD:**	5" Dia.
Operator:	Enos/Giles/Daggett	**Datum:**	NAVD 88	**Sampler:**	Off Flights
Logged By:	B. Wilder	**Rig Type:**	CME 45C	**Hammer Wt./Fall:**	N/A
Date Start/Finish:	9/26/12-9/26/12	**Drilling Method:**	Solid Stem Auger	**Core Barrel:**	N/A
Boring Location:	34+00, 4.5 ft 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 No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-value	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
0						SSA	-0.42		5" PAVEMENT. 0.42	
							-1.30		Brown, moist, gravelly, fine to coarse SAND, little silt. ≅S7 1.30	
									Light brown, moist, SILT, some clay, trace fine sand. ≅S8	
							-4.00		4.00	
									Bottom of Exploration at 4.00 feet below ground surface. NO REFUSAL	
5										
10										
15										
20										
25										

Remarks:

Offsets are from the Existing Roadway CL.

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

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

Boring No.: HB-EAST-105

Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: A 0.62 mile portion of County Road
Location: Eastport, Maine

Boring No.: HB-EAST-106
WIN: 19194.00

Driller:	MaineDOT	**Elevation (ft.)**		**Auger ID/OD:**	5" Dia.
Operator:	Enos/Giles/Daggett	**Datum:**	NAVD 88	**Sampler:**	Off Flights
Logged By:	B. Wilder	**Rig Type:**	CME 45C	**Hammer Wt./Fall:**	N/A
Date Start/Finish:	9/26/12-9/26/12	**Drilling Method:**	Solid Stem Auger	**Core Barrel:**	N/A
Boring Location:	40+00, 3.0 ft Lt.	**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 No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-value	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
0						SSA	-0.46		5½" PAVEMENT. 0.46	
							-1.50		Brown, moist, gravelly, fine to coarse SAND, little silt. ≅S7 1.50	
							-3.00		Brown, fine to medium SAND, clean, possable trench. 3.00	
									Bottom of Exploration at 3.00 feet below ground surface. NO REFUSAL, stopped boring.	
5										
10										
15										
20										
25										

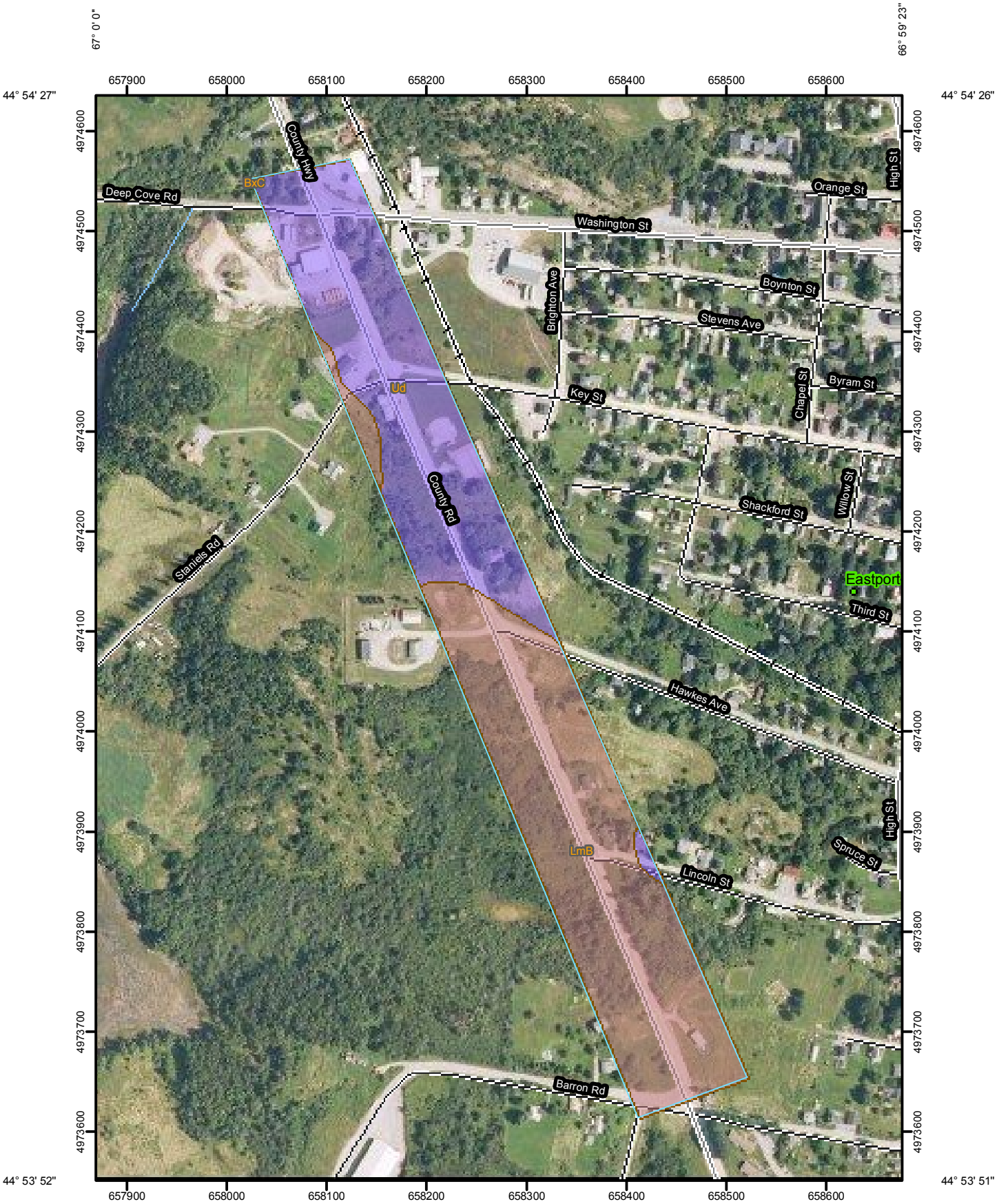
Remarks:

Offsets are from the Existing Roadway CL.

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

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

Boring No.: HB-EAST-106


67° 0' 0"
66° 59' 23"
44° 54' 27"
44° 54' 26"
44° 53' 52"
44° 53' 51"
67° 0' 1"
66° 59' 25"
657900
658000
658100
658200
658300
658400
658500
658600
4974600
4974500
4974400
4974300
4974200
4974100
4974000
4973900
4973800
4973700
4973600
BxC
Ud
LmB
County Hwy
County Rd
Deep Cove Rd
Washington St
Orange St
High St
Boynton St
Brighton Ave
Stevens Ave
Key St
Chapel St
Byram St
Willow St
Shackford St
Staniels Rd
Eastport
Third St
Hawkes Ave
Spruce St
Lincoln St
Barron Rd
Map Scale: 1:5,180 if printed on A size (8.5" x 11") sheet.
N
Meters
0 45 90 180 270
Feet
0 150 300 600 900

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Map Units

Soil Ratings

fine glaciolacustrine deposits and/or fine glaciomarine deposits

glaciolacustrine deposits derived from siltstone and/ or glaciomarine deposits derived from siltstone

mine spoil or earthy fill

Not rated or not available

Political Features

Cities

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

MAP INFORMATION

Map Scale: 1:5,180 if printed on A size (8.5" × 11") sheet.

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for accurate map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: UTM Zone 19N NAD83

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Washington County Area, Maine
Survey Area Data: Version 13, Oct 2, 2009

Date(s) aerial images were photographed: Data not available.

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Parent Material Name

Parent Material Name— Summary by Map Unit — Washington County Area, Maine (ME617)				
Map unit symbol	**Map unit name**	**Rating**	**Acres in AOI**	**Percent of AOI**
BxC	Buxton silt loam, 8 to 15 percent slopes	glaciolacustrine deposits derived from siltstone and/or glaciomarine deposits derived from siltstone	0.0	0.0%
LmB	Lamoine-Scantic complex, 0 to 5 percent slopes	fine glaciolacustrine deposits and/or fine glaciomarine deposits	15.2	56.7%
Ud	Udorthents-Urban land complex	mine spoil or earthy fill	11.6	43.2%
Totals for Area of Interest			**26.8**	**100.0%**

Description

Parent material name is a term for the general physical, chemical, and mineralogical composition of the unconsolidated material, mineral or organic, in which the soil forms. Mode of deposition and/or weathering may be implied by the name.

The soil surveyor uses parent material to develop a model used for soil mapping. Soil scientists and specialists in other disciplines use parent material to help interpret soil boundaries and project performance of the material below the soil. Many soil properties relate to parent material. Among these properties are proportions of sand, silt, and clay; chemical content; bulk density; structure; and the kinds and amounts of rock fragments. These properties affect interpretations and may be criteria used to separate soil series. Soil properties and landscape information may imply the kind of parent material.

For each soil in the database, one or more parent materials may be identified. One is marked as the representative or most commonly occurring. The representative parent material name is presented here.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: *None Specified*

Tie-break Rule: Lower