Maine Department of Transportation
Highway Program

GEOTECHNICAL SERIES 100 REPORT

Route 15
Blue Hill, Penobscot, Orland, Maine

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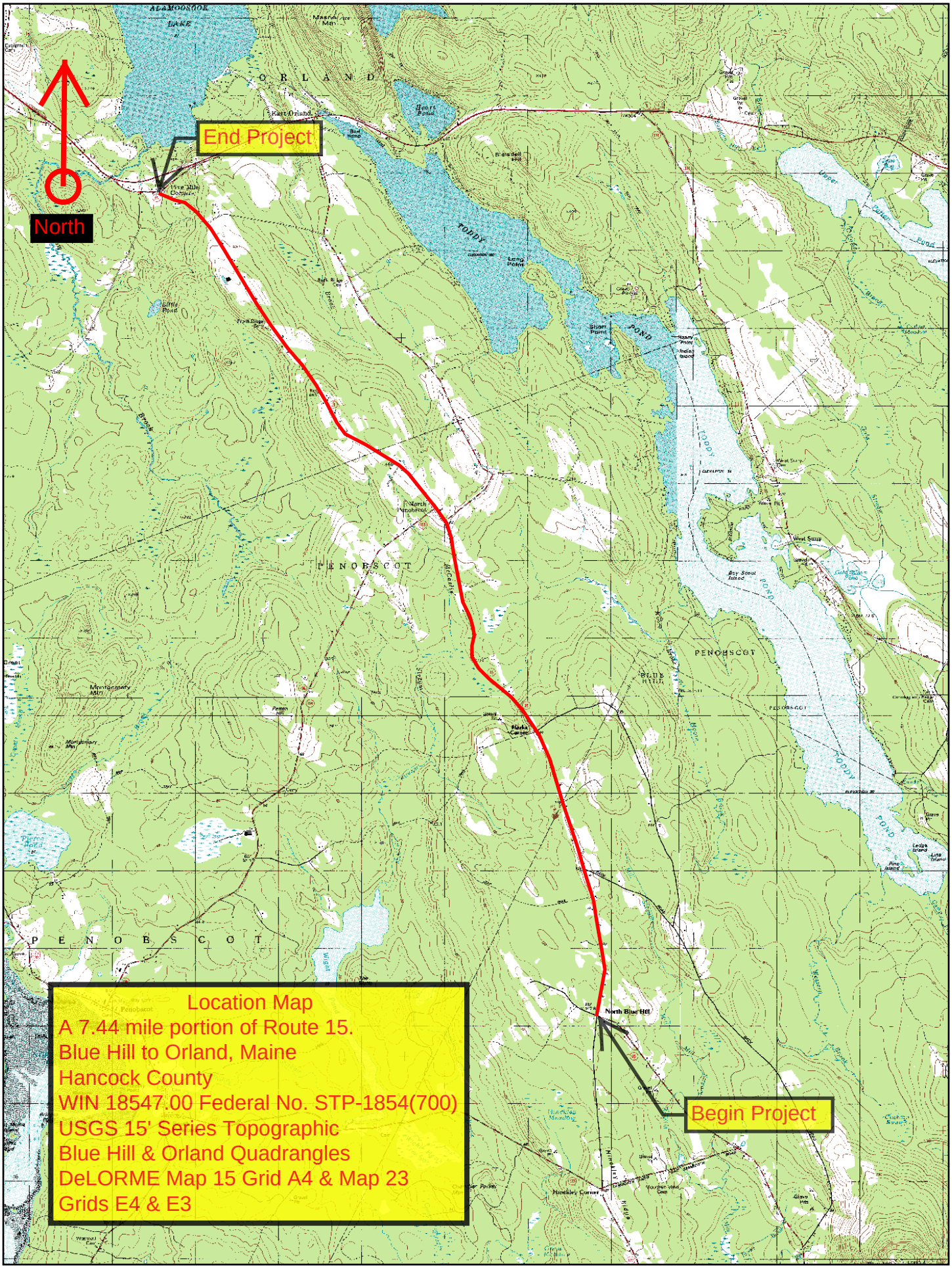
Hancock County

WIN 018547.00
Fed Project #: STP-1854(700)
January 13, 2015

Soils Report No. 2015-101
TEDOCS # 1432549



Map Scale 1:64000

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Highway Program

Brad Foley, Program Manager

Memorandum

DATE: January 13, 2015

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

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

SUBJECT: Blue Hill, Penobscot, Orland, Route 15, WIN 018547.00
Final Soils Report No. 2015-101,

Introduction

In March of 2013 Scott Hayden was requested to visually inspect a 7.4 mile segment of Route 15 to identify poorly performing areas associated with recent public complaints of severe roadway deformation. A roadway condition summary was produced from this inspection (See Roadway Condition Summary located on the follow pages). Subsequently to the field inspection, this segment of roadway was designated for rehabilitation as Federal Project No. STP-1854(700).

As part of Federal Project No. STP-1854(700) a subsurface investigation has been completed for the rehabilitation of a 7.4 mile portion of Route 15 in the towns of Blue Hill, Penobscot and Orland. The investigation included the use of a drill rig, falling weight deflectometer (FWD) and ground penetrating radar (GPR).

The area of investigation begins at the intersection of Route 15 and Hinckley Ridge Road (RLM 28.07) and extends north 7.4 miles to the intersection of Route 15 and Cedar Swamp Road (RLM 35.51). A starting station of 10+00 was designated for the purposes of this report. All references to stationing are based on approximate stationing determined in the field using a vehicle mounted distance measuring instrument (DMI).

Existing Conditions - Site Visit Observations

A site visit was conducted in March (pre-thaw) and June (post-thaw) to identify, photograph and document the location and severity of the roadway deformation. This documentation can be found in the Roadway Condition Summary located at the end of this report section.

The existing roadway consists of 11-foot travel lanes with 1-3 foot paved shoulders. The roadway core extending from centerline to approximately 7' left and right of centerline appears to be performing relatively well. However, pavement distress (lane drop off, cracking) is moderate to severe in the outer 1/2 of the paved way.

<u>Lane Drop Off</u>

Lane drop off can be observed at many locations (See photo illustrations 1-5). In these areas the shoulder elevation is higher than adjacent lane drop off area. The elevation differential between the lane drop area and shoulder area is most pronounced during the Winter/Spring indicating a differential heaving component (See photo illustrations 2, 5).

Lane drop off indicates a lack of support for the applied traffic loadings and failure of the pavement structure/subgrade. This lack of support is likely due to a combination of inadequate base thickness, poor quality of base material, inadequate drainage of the pavement structure and subgrade, and the presence of moist to wet, moisture sensitive, subgrade soils.

Photo Illustration 1: June Observation

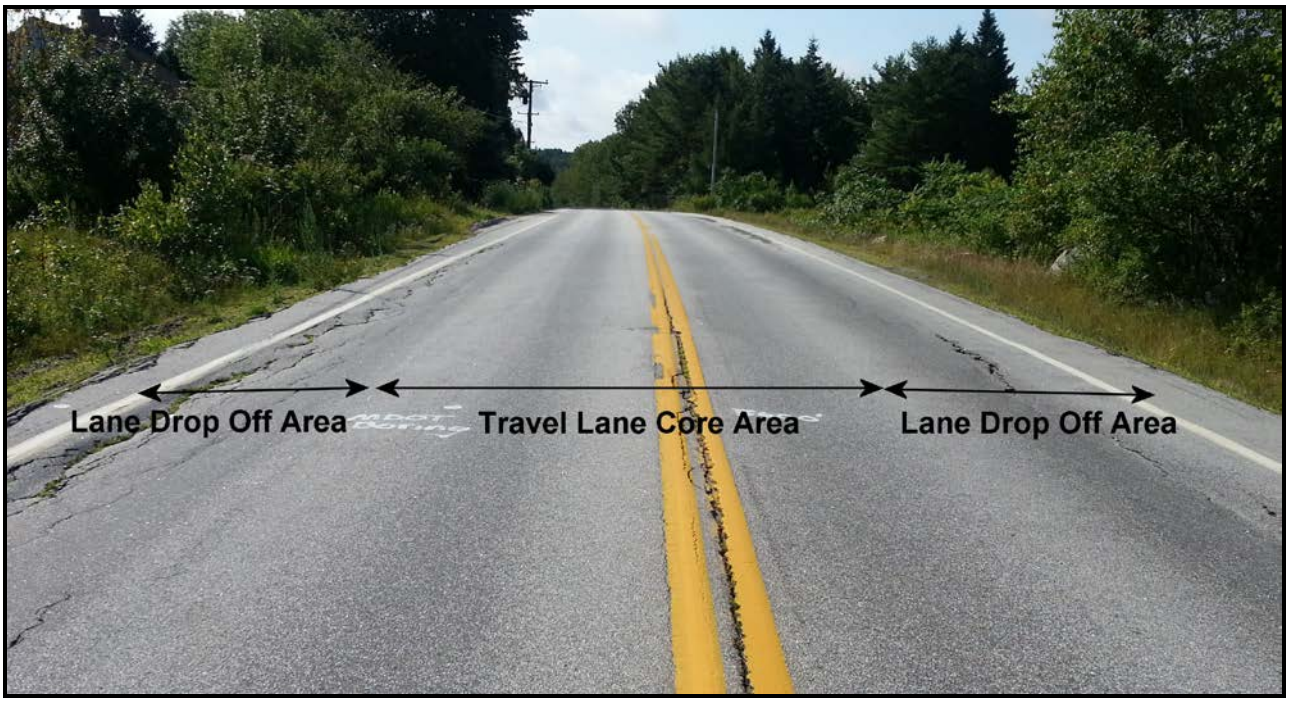

Photo Illustration 2: March Observation

Shoulder Deterioration/Failure

Pavement distress is moderate to severe in the paved shoulders. This distress has resulted in the complete failure of the shoulder pavement in many areas.

Photo Illustrations 3 and 4 : Shoulder Deterioation

During a March site visit differential heaving of the shoulder area was observed throughout much of the project area. In these areas the shoulders were considerably higher than the adjacent travel way. Shoulder heaving was severe in many locations and could be considered extreme in a few locations with vertical displacements of 9 inches or more (See photo illustration 5 below).

Differential heaving of the shoulders (shoulders heaving higher than the adjacent travel lane) is likely due to a non-uniform pavement structure and non-uniform subsurface soil conditions (difference in soil type, water content, etc.) within the shoulder area, the adjacent lane drop off area and the adjacent travel lane core area.

Photo Illustration 5: March Observation - Shoulder Heaving/Lane Drop Off

Differential heaving is not the sole cause of the elevation difference between the shoulder area and the adjacent lane drop off area. A post-thaw site visit (June) indicates the shoulders remain higher than the adjacent lane drop off area in many areas. This permanent elevation differential is likely due to the subgrade failure associated with the adjacent lane drop off and lateral displacement of base material from the lane drop off area into the shoulder area.

Note: Additional pavement condition photos (summer and winter) are included in the appendix (pages 32-57) at the back of this report

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Blue Hill, Penobscot, Orland

Route 15

18547.00

Roadway Condition Summary

X	Moderate Deformation Area	XX	High Deformation Area
XXX	Severe Deformation Area		Substantial Rehabilitation Needed

* Denotes Station Surveyed

Station Accuracy ± 250' (unless Surveyed)

		LEFT LANE					RIGHT LANE		
		Moderate	High	Severe			Moderate	High	Severe
Miles	Station				Miles	Station			
Begin	10+00	Verizon Pole 103							
0.10	15+28	X	X		0.10	15+28	X	X	
0.20	20+56	X	X		0.20	20+56	X	X	
0.30	25+84	X	X		0.30	25+84	X		
0.40	31+12	X	X		0.40	31+12	X		
0.50	36+40	X	X		0.50	36+40	X		
0.52	*37+39	X	X	X	0.52	*37+39	X		
0.60	41+68				0.60	41+68	X		
0.66	*44+98	X	X	Pic Loc 1	0.66	*44+98	X		
0.70	46+96	X	X	X	0.70	46+96			
0.80	52+24	X	X	X	0.80	52+24	X	X	
0.83	*53+86	X	X	X	0.83	*53+86	X	X	
0.90	57+52	X	X		0.90	57+52	X		
1.00	62+80	X			1.00	62+80			
1.10	68+08	X	X		1.10	68+08	X		
1.20	73+36	X			1.20	73+36	X		
1.30	78+64	X	X		1.30	78+64	X		
1.40	83+92	X	X		1.40	*86+40	X		
1.45	*86+40	X	X	X	1.45	*86+40	X	X	X
1.47	*87+92	X	X	X	1.47	*87+92	X	X	Pic Loc 2
1.50	89+20	X	X	X	1.50	89+20	X	X	X
1.51	*89+78	X	X	X	1.51	*89+78	X	X	X
1.60	94+48	X			1.60	94+48	X	X	X
1.63	*96+00	X			1.63	*96+00	X	X	X
1.70	99+76	X	X		1.70	99+76	X	X	
1.72	*101+12	X	X	X	1.72	*101+12	X	X	X
1.75	*102+28	X	X	X	1.75	*102+28	X	X	Pic Loc 3
1.78	*103+78	X	X	Pic Loc 4	1.78	*103+78	X	X	X
1.80	105+04	X	X	X	1.80	105+04	X	X	X
1.90	*110+24	X	X	X	1.90	110+24	X	X	X
2.00	115+60	X	X		2.00	115+60	X	X	X
2.02	*116+40	X	X		2.02	*116+40	X	X	X
2.10	120+88	X	X		2.10	120+88	X	X.5	
2.13	*122+61	X	X	X	2.13	*122+61	X	X	X
2.16	*124+38	X	X	X	2.16	*124+38	X	X	X
2.20	126+16	X	X	X	2.20	126+16	X	X	
2.30	131+44	X	X	X	2.30	131+44	X	X	
2.33	*133+17	X	X	Pic Loc 5	2.33	*133+17	X	X	
2.36	*134+92	X	X	X	2.36	*134+92	X	X	
2.40	136+72	X	X		2.40	136+72	X	X	
2.50	142+00	X	X		2.50	142+00	X	X	

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* Denotes Station Surveyed

Station Accuracy ± 250' (unless Surveyed)

		LEFT LANE						RIGHT LANE		
		Moderate	High	Severe				Moderate	High	Severe
Miles	Station					Miles	Station			
2.60	147+28	X	X			2.60	147+28	X	X	
2.70	152+56	X				2.70	152+56	X	X	
2.80	157+84	X				2.80	157+84	X	X	
2.90	163+12					2.90	163+12	X		
3.00	168+40					3.00	168+40	X	X	
3.10	173+68					3.10	173+68	X	X	
3.13	*175+02	X				3.13	*175+02	X	X	X
3.18	*177+66	x				3.18	*177+66	X	X	X
3.20	178+96	X				3.20	178+96	X	X	
3.30	184+24					3.30	184+24	X		
3.40	189+52					3.40	189+52	X		
3.50	194+80					3.50	194+80	X	X.5	
3.60	200+08					3.60	200+08	X	X.5	
3.70	205+36					3.70	205+36	X	X.5	
3.80	210+64	X				3.80	210+64	X	X	
3.90	215+92					3.90	215+92	X		
4.00	221+20					4.00	221+20	X		
4.10	226+48	X.5				4.10	226+48	X		
4.20	231+76	X				4.20	231+76	X	X	
4.30	237+04					4.30	237+04	X	X	
4.40	242+32					4.40	242+32	X	X	
4.50	247+60					4.50	247+60	X		
4.60	252+88	X	X			4.60	252+88	X	X	
4.70	258+16	X	X			4.70	258+16	X	X	
4.80	263+44	X	X			4.80	263+44	X	X	
4.90	268+72	X	X			4.90	268+72	X	X	
5.00	274+00	X	X			5.00	274+00	X	X	
5.03	*275+54	X	X	X		5.03	*275+54	X	X	X
5.06	*277+41	X	X	Pic Loc 6		5.06	*277+41	X	X	X
5.10	279+28	X	X	X		5.10	279+28	X	X	X
5.11	*279+61	X	X	X		5.11	*279+61	X	X	X
5.12	*280+15	X	X	X		5.12	*280+15			
5.20	284+56					5.20	284+56			
5.30	289+84	X	X			5.30	289+84	X		
5.40	295+12	X				5.40	295+12	X		
5.50	300+40	X				5.50	300+40			
5.60	305+68	X	HEAVE			5.60	305+68	X	HEAVE	
5.70	310+96	X	X			5.70	310+96	X	X	
5.80	316+24					5.80	316+24			
5.90	321+52	X	X			5.90	321+52	X	X.5	
6.00	326+80	X	X.5			6.00	326+80	X	X.5	
6.10	332+08	X				6.10	332+08	X		

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X	Moderate Deformation Area	XX	High Deformation Area
XXX	Severe Deformation Area		Substantial Rehabilitation Needed

* Denotes Station Surveyed

Station Accuracy ± 250' (unless Surveyed)

		LEFT LANE					RIGHT LANE		
		Moderate	High	Severe			Moderate	High	Severe
Miles	Station				Miles	Station			
6.20	337+36	X	X		6.20	337+36	X		
6.30	342+64	X	X.5		6.30	342+64	X	X	
6.40	347+92	X	X.5		6.40	347+92	X	X.5	
6.50	353+20	X	X		6.50	353+20	X	X	
6.57	*357+09	X	X	X	6.57	*357+09	X	X	
6.59	*358+00	X	X	X	6.59	*358+00	X	X	X
6.60	358+48	X	X	X	6.60	358+48	X	X	X
6.64	*360+59	X	X	Pic Loc 7	6.64	*360+59	X	X	X
6.70	363+76	X	X	X	6.70	363+76	X	X	X
6.72	*364+80	X	X	X	6.72	*364+80	X	X	X
6.80	369+04	X	X	X	6.80	369+04	X	X.5	
6.90	374+32	X	X	X	6.90	374+32	X	X.5	
7.00	379+60	X	X	X	7.00	379+60	X	X	
7.04	*381+52	X	X	X	7.04	*381+52	X	X	
7.10	384+88	X	X		7.10	384+88	X		
7.20	390+16	X	X		7.20	390+16	X		
7.30	395+44	X			7.30	395+44	X		
7.32	396+54	X			7.32	396+54	X		

As-Built Information

An archival plan search identified several projects to which their boundaries overlapped portions of this 7.4 mile area of investigation. Based on the archival typical sections the original roadway appears to have been constructed as two 9-foot travel lanes with mud shoulders utilizing an 18-inch gravel base beneath the travel lanes.

Over time the roadway has expanded to currently consist of two 11-foot travel lanes and 3-foot paved shoulders. A complete chronological listing of past projects detailing this horizontal and vertical transformation of the roadway and pavement structure could not be established.

A summary listing of known archival information is documented below in Table 1.

Table 1: Summary Listing of As-Built Projects

Town	Project No.	Year	General Location	Typical Section
Blue Hill	Maine Fed Aid No. F.A.S. 213-D(1)	1940	10+00 - 84+00	9-foot travel w mud shoulders 2” Gravel Surface 18” Gravel Base
Penobscot	Maine Fed Aid No. F.A.S. 213-C	1939	103+00 – 155+00	9-foot travel w mud shoulders 2” Gravel Surface 18” Gravel Base
Penobscot	U.S. Public Works No. NRS 278(1935)	1935	224+00 – 275+00	9-foot travel w mud shoulders Variable Gravel Base Depth 12” - 18” Gravel Base
Orland	CHIP STP – 1020(100)X	2003	325+00 – 395+00	11-foot travel, 3 foot paved shoulder C.I.P Recycle to a depth of 4.5” Gravel Shim of 3-foot shoulder 2¾” HMA Travel Lane and Shoulder

Existing Pavement Data

<u>ARAN Data Summary</u>

A summary of the 2012 ARAN data is presented in Table 2 below. A complete listing of the ARAN data is presented within the Pavement Condition Assessment Summary (See pages 25-27).

Table 2: Summary of 2012 ARAN Pavement Data

ARAN Pavement Data	Range	Average
Pavement Condition Rating (PCR)	2.44 – 4.08	3.24
International Roughness Index (IRI)	102 - 230	171
Rut Depth (left)	0.1” – 0.2”	0.2”
Rut Depth (right)	0.3” – 1.1”	0.6”

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 2.44 – 4.08 with an average PCR of 3.24. The PCR rating is low (<3.5) between stations 83+00 – 179+00, 275+00 – 292+00 and 320+00 – 403+00. The poorest value (2.44) was encountered between stations 83+00 and 115+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 102 - 230 in/mile with an average IRI value of 171 in/mile. IRI values were greater than 150 between stations 83+00 – 179+00 and 275+00 – 403+00. The highest value (230, poorest ride) was encountered between stations 83+00 and 115+00.

Wheel Path Rutting Values

Wheel path rutting is present throughout the project site. Rut depth values provided in the ARAN data do not capture the severity of lane drop off encountered throughout much of the project. Rutting is severe in the outside wheel path of both travel lanes within the lane drop areas.

In March, a straight edge was laid across the travel lane extending from the inside wheel path to the edge of the paved shoulder. Measurements taken in the outside wheel path (lane drop off area) encountered vertical displacements of 9 inches or more.

Photo Illustration 6:
Vertical Displacement in Outside Wheel Path
Due to Lane Drop Off and Shoulder Heaving

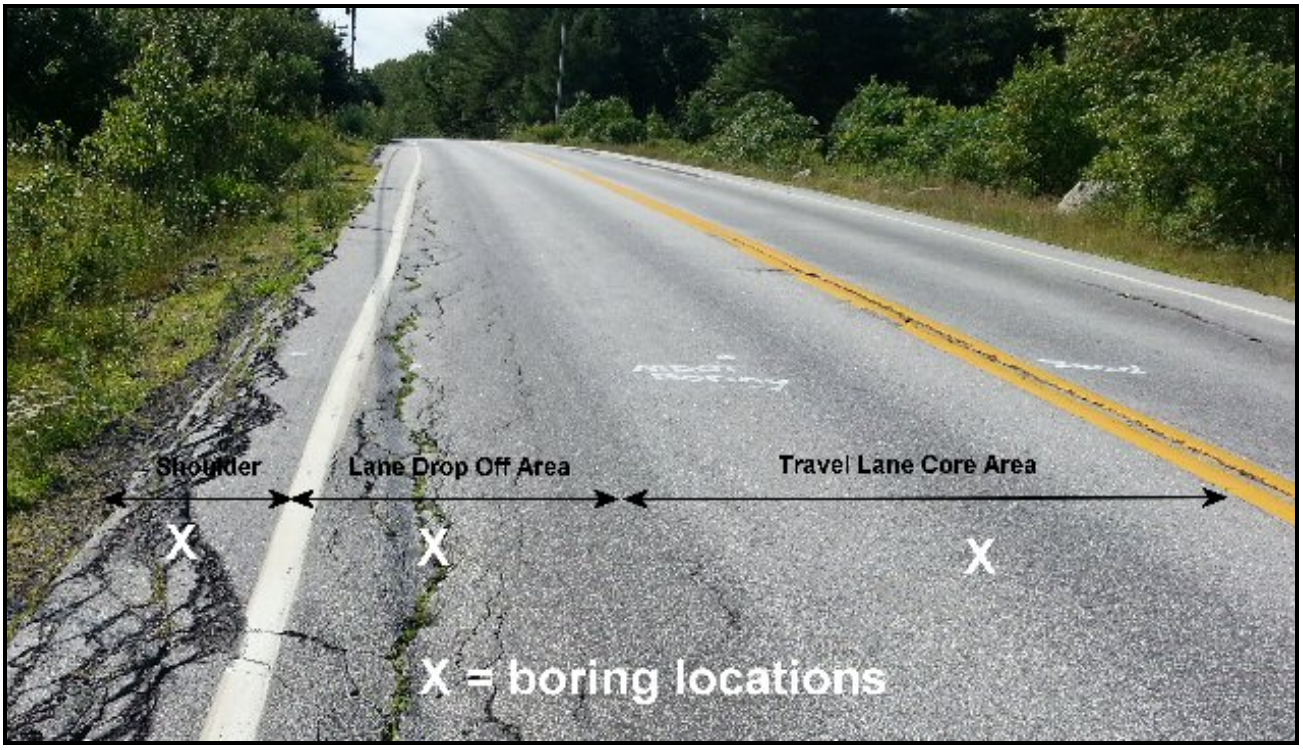
Note: Additional pavement condition photos (summer and winter) are included in the appendix (pages 32-57) at the back of this report

Boring Information

Power Auger Borings

A set of three power auger borings were conducted at six separate boring locations (Stations 53+21, 108+93, 137+50, 267+97, 351+51 and 358+72) for a total of 18 power borings. At each six boring locations a boring was conducted through the Travel Lane Core Area, Lane Drop Off Area, and Shoulder Area to determine the existing roadway structure and underlying subgrade soil conditions (See Photo Illustration 7).

Photo Illustration 7: Boring Location Illustration



Power auger borings were conducted by Maine DOT using 5" solid stem augers. Bore hole logging was performed by Maine DOT. Soil sampling was conducted directly from the auger flights. (Boring logs and sample results are provided in the appendix, pg 137).

A total of 31 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 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. Boring logs and testing results are provided in the Appendix.

A review of the boring logs and sample results have identified differences in the pavement structure within the travel lane core area, lane drop off area and shoulder area. These differences include pavement thickness, base thickness, and base quality. In general the pavement thickness, base thickness, and base quality are greater in the travel lane core area than the lane drop off and shoulder areas.

Existing HMA Thickness

The existing HMA thickness varied considerably across the pavement structure from the travel lane core area to the lane drop off area to the shoulder area. See Table 3 below for a summary of the HMA thickness in the travel lane core area, lane drop off area and shoulder area.

Existing Base Material

The existing base material varied considerably in thickness and quality across the pavement structure from the travel lane core area to the lane drop off area to the shoulder area. In general the base thickness and base quality is substantially less beneath the lane drop off and shoulder areas than the travel lane core area.

Travel Lane Core Area - The existing base material within the travel lane core area consists of silty gravelly SAND and gravelly silty SAND. These materials ranged in thickness from 10” – 30” with an average thickness of 18”. These materials had 12% - 22% passing the #200 sieve and are classified (AASHTO/Unified) primarily as A-1-b / SM soils. They are moderately frost susceptible. The base layer beneath the travel lane core area was found to be wet at three of the six boring station locations (53+21 moist, 108+93 wet, 137+50 moist, 267+97 wet, 351+51 wet, 358+72 moist). See Table 3 below.

Lane Drop Off Area - The existing base material within the lane drop off area consists of gravelly sandy SILT, gravelly silty SAND and silty gravelly SAND. These materials ranged in thickness from 5” – 10” with an average thickness of 8”. These materials had 2% - 49% passing the #200 sieve and are classified (AASHTO/Unified) as A-1-a, A-1-b, A-4 / SW-SM, SM soils. They are moderately to highly frost susceptible. The base layer beneath the lane drop off area was found to be wet at three of the six boring station locations (53+21 moist, 108+93 wet, 137+50 wet, 267+97 damp, 351+51 moist, 358+72 wet). See Table 3 below.

Shoulder Area - The existing base material within the shoulder area consists of gravelly sandy SILT, gravelly silty SAND and silty gravelly SAND. These materials ranged in thickness from 4” – 16” with an average thickness of 9”. These materials had 3% - 49% passing the #200 sieve and are classified (AASHTO/Unified) as A-1-a, A-1-b, A-4 / SW-SM, SM soils. They are moderately to highly frost susceptible. The base layer beneath the shoulder area was found to be wet at four of the six boring station locations (53+21 wet, 108+93 wet, 137+50 wet, 267+97 damp, 351+51 wet, 358+72 damp).

A summary of the existing HMA pavement thickness and base thickness is presented in Table 3 below. GPR pavement thickness estimates are provided in the appendix, pages 115-135.

Table 3: Pavement Structure Summary

	Travel Lane Core Area	**Lane Drop Off**	**Shoulder**
HMA Pavement			
Thickness Range	**Area** 5.5” – 6.5”	3.5” – 6.0”	1.5” – 3.5”
Ave. Thickness	6.0”	4.6”	2.6”
Base Material			
Base Soil Type	SiGSa, GSiSa	SiGSa,GSiSa,GSaSi	SiGSa,GSiSa,GSaSi
Thickness Range	10” – 30”	5” – 10”	4.0” – 16”
Ave. Thickness	18.4”	7.8”	8.7”
% Fines Range	12% – 22%	2% – 49%	3% – 49%
% Ave. Fines	15.5%	17.8%	18.3%

Subgrade Soils

The subgrade soils are anticipated to consist of moisture sensitive sandy SILT and clay SILT. Subgrade soils were found to be wet at 5 of the 6 boring station locations (53+21 wet, 108+93 wet, 137+50 moist, 267+97 wet, 351+51 wet and 358+72 wet). It is anticipated that the subgrade resilient modulus values (M_r) along the project site will be lowest in areas where these silty subgrade soils are moist to wet. Depending on seasonal conditions additional base material may be necessary to support traffic during construction if the existing pavement surface is removed. Drainage of these soils is critical for long term pavement performance.

Silty Sand/Sandy Silt - These subgrade soils (S6, S8, S12, S15, S17, S18, S20, S22, S26, S27, S31) are silty with approximately 45% - 67% passing the # 200 sieve. They are highly frost susceptible and are classified (AASHTO) as an A-4 soils. These soils have an affinity to water and will lose much of their stability unless properly drained and compacted. These soils were found to be poorly drained and were wet at most boring locations.

Clay Silt – These subgrade soils (S4, S10) are extremely silty with approximately 70% passing the #200 sieve. They are classified (AASHTO) as A-4 and (Unified) ML soils. These soils may be plastic and could have high volume changes between wet and dry states. They will likely have a high dry strength but will lose much of this strength upon absorbing water. These soils were found to moist. These soils are highly frost susceptible.

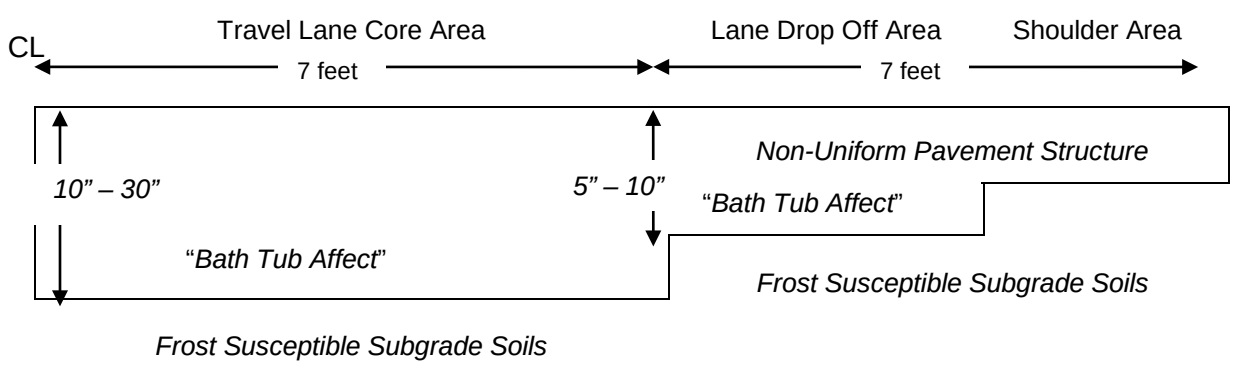
Exiting Pavement Structure - Comparison and Soil Issues

Based on the power auger boring data it is anticipated that the lane drop off, shoulder failure, and general poor pavement performance along the project area is directly related to a non-uniform pavement structure, insufficient pavement thickness, insufficient base gravel thickness and quality, saturated subbase and subgrade soils.

Borings indicate that there are substantial differences transversely in pavement thickness, base thickness and base quality within the existing pavement structure. In general the pavement thickness, base thickness, and base quality decreases in the outer half of the travel lane (lane drop off area and shoulder area).

This non-uniformity of the pavement structure has likely created a “bath tub” shaped pavement structure (See Figure 1 below) trapping water beneath the travel lane core area, lane drop off area and shoulder area.

Figure 1: Bath Tub Shaped Pavement Structure



A summary comparison of the pavement structure and subgrade soil conditions is provided on the following pages based on boring conducted within the Travel Lane Core Area, Lane Drop Off Area, and Shoulder Area at six investigation locations (53+21, 108+93, 137+50, 267+97, 351+51, 358+72).

Pavement Structure / Subgrade Soil Condition Comparison

Travel Lane Core Area vs **Travel Lane Drop Off Area** vs **Shoulder Area**

Station 53+21, Left

(severe deformation area)

Pavement Structure / **Subgrade Soil**		**Travel Lane Core Area** (≈ CL to Quarter point)		**Lane Drop Off Area** (≈ outside wheel path)		**Shoulder** (outside white line)
Pavement Structure	Sample No.		Sample No.		Sample No.	
Pavement Thickness		6.0		4.5		3.0
Base Thickness	S28	26.4	≈S28	7.4	S30	16.2
Base Description	S28	Silty Gravelly SAND	≈S28	Silty Gravelly SAND	S30	Silty Gravelly SAND
Class (Unified/AASHTO)	S28	SW-SM/A-1-b	≈S28	SW-SM/A-1-b	S30	SW-SM/A-1-b
Moisture	S28	Moist	≈S28	Moist	S30	Wet @ 0.25' (3.0")
Water Content	S28	5.5	≈S28	5.5	S30	7.2
% Fines	S28	11.6	≈S28	11.6	S30	8.5
Frost Classification	S28	0	≈S28	0	S30	0
Subgrade Conditions						
Subgrade Soil Type	S29	Gravelly Silty SAND	≈S29	Gravelly Silty SAND	S31	Sandy SILT
Class (Unified/AASHTO)	S29	SM/A-2-4	≈S29	SM/A-2-4	S31	ML/A-4
Moisture	S29	Wet @ 2.7' (32")	≈S29	Wet @ 1.0' (12")	S31	Wet
Water Content	S29	12.2	≈S29	12.2	S31	30.7
% Fines	S29	35.7	≈S29	35.7	S31	59.7
Frost Classification	S29	II	≈S29	II	S31	IV

Comments:

* Bath tub shaped pavement structure
* Base thickness considerably greater in travel lane core area
* Base is wet in shoulder area
* Subgrade soil type uniform in travel lane (GSiSa)but significantly different in shoulder (SaSi)
* Subgrade soils are wet in travel lane and shoulder
* % Fine similar in travel lane but significantly higher in shoulder
* Frost Class significantly higher in shoulder

Pavement Structure / Subgrade Soil Condition Comparison

Travel Lane Core Area vs **Travel Lane Drop Off Area** vs **Shoulder Area**

Station 108+93, Right

(severe deformation area)

Pavement Structure / **Subgrade Soil**		**Travel Lane Core Area** (≈ CL to Quarter point)		**Lane Drop Off Area** (≈ outside wheel path)		**Shoulder** (outside white line)
Pavement Structure	Sample No.		Sample No.		Sample No.	
Pavement Thickness		6.0		4.5		2.0
Base Thickness	S23	10.8	S25	7.4	≈S25	4.0
Base Description	S23	Silty Gravelly SAND	S25	Gravelly Silty SAND	≈S25	Gravelly Silty SAND
Class (Unified/AASHTO)	S23	SM/A-1-b	S25	SM/A-1-b	≈S25	SM/A-1-b
Moisture	S23	Wet @ 0.5' (6.0")	S25	Wet @ 0.38' (4.6")	≈S25	Wet @ 0.17' (2.0")
Water Content	S23	7.8	S25	10.1	≈S25	10.1
% Fines	S23	13.0	S25	17.5	≈S25	17.5
Frost Classification	S23	II	S25	II	≈S25	II
Subgrade Conditions						
Subgrade Soil Type	S24	Gravelly Silty SAND	S26	Gravelly Sandy SILT	S27	Sandy SILT
Class (Unified/AASHTO)	S24	SM/A-2-4	S26	SM/A-4	S27	SM/A-4
Moisture	S24	Dry @ 1.4' (16.8")	S26	Damp	S27	Wet
Water Content	S24	9.2	S26	10.7	S27	15.8
% Fines	S24	35.4	S26	43.5	S27	56.2
Frost Classification	S24	II	S26	III	S27	IV

Comments:

* Bath tub shaped pavement structure
* Base thickness < 12" full width.
* Base material less gravelly and more silty outside of the travel lane core area. Base material moderately frost susceptible.
* Base material wet full width
* Subgrade soils become more silty and frost susceptible beyond the travel lane core area
* Subgrade soils are wet in the shoulder

Pavement Structure / Subgrade Soil Condition Comparison

Travel Lane Core Area vs **Travel Lane Drop Off Area** vs **Shoulder Area**

Station 137+50, Right

(high deformation area)

Pavement Structure / **Subgrade Soil**		**Travel Lane Core Area** (≈ CL to Quarter point)		**Lane Drop Off Area** (≈ outside wheel path)		**Shoulder** (outside white line)
Pavement Structure	Sample No.		Sample No.		Sample No.	
Pavement Thickness		6.0		5.0		3.0
Base Thickness	S19	20.4	S21	9.4	≈S21	9.0
Base Description	S19	Gravelly Silty SAND	S21	Gravelly Silty SAND	≈S21	Gravelly Silty SAND
Class (Unified/AASHTO)	S19	SM/A-1-b	S21	SM/A-1-b	≈S21	SM/A-1-b
Moisture	S19	Moist	S21	Wet @ 0.42' (5.0")	≈S21	Wet @ 0.25' (3.0")
Water Content	S19	9.5	S21	9.6	≈S21	9.6
% Fines	S19	19.7	S21	20.9	≈S21	20.9
Frost Classification	S19	II	S21	II	≈S21	II
Subgrade Conditions						
Subgrade Soil Type	S20	Sandy SILT	S22	Sandy SILT	≈S22	Sandy SILT
Class (Unified/AASHTO)	S20	ML/A-4	S22	ML/A-4	≈S22	ML/A-4
Moisture	S20	Moist	S22	Moist	≈S22	Moist
Water Content	S20	14.7	S22	14.0	≈S22	14.0
% Fines	S20	66.9	S22	55.8	≈S22	55.8
Frost Classification	S20	IV	S22	IV	≈S22	IV

Comments:

* Bath tub shaped pavement structure
* Base thickness considerably greater in travel lane core area
* Base is wet in lane drop off area and shoulder area
* Base material lacks coarse material and has high % fines full width. Base material moderately frost susceptible.
* Subgrade soils are very silty (moisture sensitive) and highly frost susceptible full width

Pavement Structure / Subgrade Soil Condition Comparison

Travel Lane Core Area vs **Travel Lane Drop Off Area** vs **Shoulder Area**

Station 267+97, Left

(high deformation area)

Pavement Structure / **Subgrade Soil**		**Travel Lane Core Area** (≈ CL to Quarter point)		**Lane Drop Off Area** (≈ outside wheel path)		**Shoulder** (outside white line)
Pavement Structure	Sample No.		Sample No.		Sample No.	
Pavement Thickness		6.5		4.5		1.5
Base Thickness	S13/S14	29.5	S16	9.8		9.2
Base Description	S13	Silty Gravelly SAND (13.9")	S16	Gravelly Sandy SILT	≈S16	Gravelly Sandy SILT
	S14	Gravelly Silty SAND (15.6")				
Class (Unified/AASHTO)	S13/S14	SW-SM/SM/A-1-b	S16	SM/A-4	≈S16	SM/A-4
Moisture	S13/S14	Damp/Wet @ 1.7' (20.4")	S16	Damp	≈S16	Damp
Water Content	S13/S14	5.9/11.2	S16	20.2	≈S16	20.2
% Fines	S13/S14	9.2/19.2	S16	49.3	≈S16	49.3
Frost Classification	S13/S14	0/II	S16	III	≈S16	III
Subgrade Conditions						
Subgrade Soil Type	S15	Sandy SILT	S17	Sandy SILT	S18	Sandy SILT
Class (Unified/AASHTO)	S15	ML/A-4	S17	ML/A-4	S18	ML/A-4
Moisture	S15	Wet	S17	Wet @ 1.2' (14.4")	S18	Wet @ 0.9' (10.8")
Water Content	S15	14.2	S17	14.8	S18	17.4
% Fines	S15	63.5	S17	54.8	S18	57.3
Frost Classification	S15	IV	S17	IV	S18	IV

Comments:

* Bath tub shaped pavement structure
* Base thickness considerably greater in travel lane core area
* Base material very silty (49% fines) and highly frost susceptible in the lane drop off area and shoulder area
* Base is wet in travel lane core area
* Subgrade soils are wet, very silty (moisture sensitive) and highly frost susceptible full width

Pavement Structure / Subgrade Soil Condition Comparison

Travel Lane Core Area vs **Travel Lane Drop Off Area** vs **Shoulder Area**

Station 351+51, Left

(high deformation area)

Pavement Structure / **Subgrade Soil**		**Travel Lane Core Area** (≈ CL to Quarter point)		**Lane Drop Off Area** (≈ outside wheel path)		**Shoulder** (outside white line)
Pavement Structure	Sample No.		Sample No.		Sample No.	
Pavement Thickness		5.5		3.5		3.0
Base Thickness	S7	13.7	S9	4.9	S11	6.6
Base Description	S7	Silty Gravelly SAND	S9	Silty Gravelly SAND	S11	Silty Gravelly SAND
Class (Unified/AASHTO)	S7	SM/A-1-a	S9	SP/A-1-b	S11	SP-SM/A-1-b
Moisture	S7	Wet @ 0.46' (5.5")	S9	Moist	S11	Wet @ 0.25' (3.0")
Water Content	S7	8.6	S9	6.7	S11	8.5
% Fines	S7	12.3	S9	1.5	S11	10.8
Frost Classification	S7	II	S9	0	S11	0
Subgrade Conditions						
Subgrade Soil Type	S8	Gravelly Sandy SILT	S10	Clay SILT	S12	Sandy SILT
Class (Unified/AASHTO)	S8	SM/A-4	S10	ML/A-4	S12	ML/A-4
Moisture	S8	Wet	S10	Moist	S12	Moist
Water Content	S8	18.6	S10	13.6	S12	13.9
% Fines	S8	45.5	S10	70.4	S12	59.2
Frost Classification	S8	III	S10	IV	S12	IV

Comments:

* Bath tub shaped pavement structure
* Base thickness < 14" full width and considerably less in lane drop off area and shoulder
* Base is wet in travel lane core area and shoulder
* Base % fines higher in the travel lane core area (moderately frost susceptible) and shoulder area
* Subgrade soils are wet (travel lane core area), very silty (moisture sensitive) and highly frost susceptible full width

Pavement Structure / Subgrade Soil Condition Comparison

Travel Lane Core Area vs **Travel Lane Drop Off Area** vs **Shoulder Area**

Station 358+72, Right

(severe deformation area)

Pavement Structure **Subgrade Soil**		**Travel Lane Core Area** (≈ CL to Quarter point)		**Lane Drop Off Area** (≈ outside wheel path)		**Shoulder** (outside white line)
Pavement Structure	Sample No.		Sample No.		Sample No.	
Pavement Thickness		6.0		6.0		3.5
Base Thickness	S1	9.6	S3	8.4	S5	7.3
Base Description	S1	Silty Gravelly SAND	S3	Silty Gravelly SAND	S5	Silty Gravelly SAND
Class (Unified/AASHTO)	S1	SM/A-1-b	S3	SW-SM/A-1-a	S5	SW/A-1-a
Moisture	S1	Moist	S3	Wet @ 0.5' (6.0")	S5	Damp
Water Content	S1	6.8	S3	10.1	S5	3.3
% Fines	S1	21.5	S3	6.3	S5	3.2
Frost Classification	S1	II	S3	0	S5	0
Subgrade Conditions						
Subgrade Soil Type	S2	Sandy SILT	S4	Clay SILT	S6	Sandy SILT
Class (Unified/AASHTO)	S2	ML/A-4	S4	ML/A-4	S6	ML/A-4
Moisture	S2	Moist	S4	Moist	S6	Wet @ 0.9' (10.8")
Water Content	S2	13.2	S4	15.2	S6	16.4
% Fines	S2	66.5	S4	70.3	S6	56.4
Frost Classification	S2	IV	S4	IV	S6	IV

Comments:

* Base thickness < 10" full width
* Base is wet in the lane drop off area
* Base % fines considerably higher (21.5%) in the travel lane core area (moderately frost susceptible)
* Subgrade soils are wet (shoulder area), very silty (moisture sensitive) and highly frost susceptible full width

Multiple soil issues are identified and commented on at the bottom of the six Pavement Structure / Subgrade Soil Condition Comparisons. A summary of the soil issue comments and their frequency encountered at the six investigation locations are listed below in Table 4.

Table 4: Summary and Frequency of Soil Issues encountered at the Six Investigation Sites

Frequency	Soil Issues Identified in Borings
100%	Non-uniform pavement structure
100%	Presence of poorly drained silty, moisture sensitive, subgrade soils
83%	“Bath tub shaped ” pavement structure
83%	Non-uniform base thickness between travel lane core area, lane drop off area, shoulder area
83%	Base thickness < 12” in lane drop off area and shoulder area
83%	Base layer found to be wet in either the travel lane core area, lane drop off area, shoulder area
67%	Base material has high % fines (> 15%)
67%	Non-uniform pavement thickness in Travel Way
67%	Base is wet in shoulder area
67%	Presence of WET ,moisture sensitive, subgrade soils
50%	Base thickness considerably greater in travel lane core area
50%	Non-uniform percentage of fines in base material within travel lane core area, lane drop off area, and shoulder area
50%	Base material moderately frost susceptible.
50%	Base is wet in Travel Lane Core Area
50%	Base is wet in Lane Drop Off Area
34%	Base material less gravelly and more silty in lane drop off and shoulder areas

Drainage

Long term performance of the pavement structure is highly dependent on drainage. The existing pavement structure is not free draining due to a non-uniform pavement structure (bathtub affect) and lack of adequate ditching. Wet soil conditions were encountered at 5 of the 6 boring investigation areas (53+21 wet, 108+93 wet, 137+50 moist, 267+97 wet, 351+51 wet and 358+72 wet). A National Resources Conservation Service "depth to water table" map is provided in the appendix, pg. 195.

Creating a uniform pavement structure and eliminating the bath tub structure is important if a free draining subbase is to be established. Ditching throughout the project area will also be necessary for the removal of surface water and groundwater. Ditch elevation depths should be sufficient enough to collect surface water, lower the ground water table, and allow drainage of the subbase material. Ditch elevations should extend at least 1 foot below the bottom of the pavement structure (subbase).

Frost Susceptible Soils / Frost Penetration

The subgrade soils along the project site are anticipated to be highly frost susceptible. Frost action in soils requires the presence of frost susceptible soils, ground temperatures below 32° F, and water. Proper drainage of the pavement structure and the lowering or draw down of the ground table through ditching and/or under drain is critical in minimizing the damaging effects of frost action throughout this project. Frost ratings can be found on the Laboratory Testing Summary Sheet located in the Appendix, pg 139.

The Maine Design Freezing Index for this project is approximately 1400. Frost penetration depth beneath a snow free pavement is anticipated to be between 31” (silt or clay) and 73” (sand or gravel) based on the 1955 Army Corps of Engineers, “Prediction of Freezing Temperature Penetration in New England”.

Bedrock

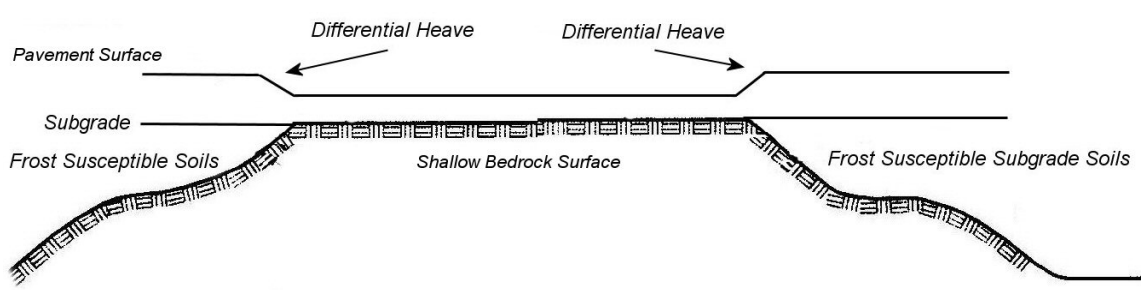
Bedrock in this area is mapped primarily as interbedded pelite and sandstone belonging to the Ellsworth Formation and granite from the Lucerne and Blue Hill plutons.

Based on FWD deflection data bedrock may be relatively shallow (< 6 feet) within the following areas:

Station	Method of Identification
183+00 – 187+00	FWD Deflections, Subgrade Resilient Modulus, Outcroppings
196+00 – 199+00	FWD Deflections, Subgrade Resilient Modulus
232+00 – 242+00	FWD Deflections, Subgrade Resilient Modulus
252+00 - 262+00	FWD Deflections, Subgrade Resilient Modulus
297+00 – 322+00	FWD Deflections, Subgrade Resilient Modulus, Outcroppings

Differential heaving related to shallow bedrock was observed in March 2013 between stations 308+28 and 309+53. A differential heave can occur at a soil/rock contact when transitioning from a rock subgrade to a soil subgrade (See Figure 2 below). In this example there is less vertical displacement of the roadway surface directly over the shallow rock at subgrade. However, as the bedrock elevation drops below subgrade the vertical displacement of the roadway surface increases dramatically due to soil expansion and ice lense development in the frost susceptible subgrade soils. A differential heave forms and the vertical displacement along the roadway surface becomes noticeable and problematic.

Figure 2: Differential Heaving
Associated with a Soil to Bedrock Contact



It is recommended that the subgrade soils be undercut a minimum of 14” below subgrade (assuming a 22-inch pavement structure) between stations 308+00 and 310+00 with a 20:1 longitudinal transition and replaced with non-frost susceptible soils.

FWD Results

FWD data was collected every 250 feet along the project site. Testing was conducted in the travel lane core area and the lane drop off area (in the vicinity of the white line) for both travel lanes. FWD testing attachments are located in the appendix, pages 59-113.

FWD Analysis

An FWD analysis was conducted using the following variables:

# Of FWD tests: 660	# Of Power Augers/Spoons - 18
Design Life: 12	Future 18-kip P2.5 ESALs (Design Life): 1,055,580
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 in Table 5 below.

Low Subgrade Modulus Values – Low subgrade resilient modulus values (≤ 3000psi) were encountered within the lane drop off / shoulder area throughout much of the project area. Please refer to the FWD Analysis Reports located in the Appendix. These low values are likely due to the reduced pavement structure and underlying subgrade soil conditions. Depending on seasonal soil conditions, additional gravel material may be required to facilitate the movement of traffic if the pavement is removed in these areas.

Table 5: FWD Analysis Summary

Northbound Travel Lane				
	Travel Lane Core Area		**Lane Drop Off Area / Shoulder**	
	% Fail		% Fail	
Existing SN fails to meet Future SN	23%		88%	
	Travel Lane Core Area		**Lane Drop Off Area / Shoulder**	
	Average	75th Percentile	Average	75th Percentile
Subgrade Resilient Modulus (psi)	5,925	4,280	3,997	3,020
Southbound Travel Lane				
	Travel Lane Core Area		**Lane Drop Off Area / Shoulder**	
	% Fail		% Fail	
Existing SN fails to meet Future SN	27%		92%	
	Travel Lane Core Area		**Lane Drop Off Area / Shoulder**	
	Average	75th Percentile	Average	75th Percentile
Subgrade Resilient Modulus (psi)	5,332	4,150	4,172	3,440

FWD Deflection Plots and Interpretation

FWD deflection plots are a graphical presentation of the numerical deflection values (measured in mils (thousandth of an inch)) obtained from the 7 recording sensors during FWD testing. Variations in the uniformity and/or height of the deflection plots can be used as a potential indicator of subsurface soil conditions which can impact existing and future pavement performance.

Pavement performance is likely to decrease in high deflection areas and/or in areas where deflection spikes (non-uniform deflection areas) are present. Higher deflections and/or less uniform deflections can be an indication of less favorable subsurface soil conditions. These variations in the height and/or uniformity of the deflection plots can indicate changes in subsurface soil conditions such as soil type, silt content, water content, plasticity and the general uniformity of the subgrade soil conditions.

FWD deflections of the travel lane core area and the lane drop off/shoulder area have been plotted on the same pages to provide a direct comparison. The deflections in the lane drop off / shoulder area are noticeably higher and less uniform than the deflections in the travel lane core area. Please refer to the FWD Deflection Plots located in the Appendix of this report. Pg 62-77.

Pavement Condition Assessment Summary

A Pavement Condition Assessment Summary (PCAS) is provided on the following page. The PCAS is a relative pavement condition evaluation tool utilizing data obtained from FWD and ARAN testing. The purpose of the PCAS is to highlight relative differences in the existing pavement conditions. Existing pavement rehabilitation needs may be more substantial in areas having a higher number of pavement condition deficiencies.

The data utilized from FWD testing includes the deflections, existing structural number, and future structural number. The data utilized from ARAN testing includes the Pavement Condition Rating (PCR), International Roughness Index (IRI), and rutting depths from both wheel paths.

Six potential condition criteria are used to develop the PCAS. An explanation of the six criteria follows:

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

2. Increased FWD Deflections (FWD Data) – An X is placed in this column anytime the pavement deflection (1st sensor) is greater than 15 mils.

3. IRI ≥ 150 (ARAN Data) – ARAN IRI values collected are listed on the PCAS in the IRI column. If the IRI value becomes ≥ 150 (indicating a reduction in ride performance) for any station the box will be shaded on the PCAS.

4. PCR ≤ 3.5 (ARAN Data) – ARAN PCR values are listed on the PCAS in the PCR column. If the PCR value becomes ≤ 3.5 (indicating increased pavement deterioration) for any station the box will be shaded on the PCAS.

5 & 6. Left Rut Depth and Right Rut Depth (ARAN Data) – ARAN rut depth values are listed on the PCAS in the rut depth columns. If the rut depth becomes 0.5” or greater the box will be shaded on the PCAS.

Deficiency Column - The total number of pavement condition deficiencies (0 – 6) are totaled for each station and are entered in the pavement condition deficiency column (Def). If the total number of pavement condition deficiencies is 3 or greater the box will be shaded. Existing pavement rehabilitation needs may be more substantial in areas having a higher number of pavement condition deficiencies.

Pavement Condition Assessment Summary

(PCAS)

Blue Hill, Penobscot, Orland

Route 15

18547.00

LOCATION		DEFICIENCIES	CONDITION MEASURESUREMENTS						GENERAL PAVEMENT INFORMATION						
			FWD Data		ARAN Performance Data				GPR	ARAN Supplemental Data					
Station	RLM	# of Performance Deficiencies (0 - 6)	Existing SN < Future SN	Increased FWD Pavement Deflections	PCR ≤ 3.5	IRI ≥ 150	Wheel Path Rutting ≥ 0.5"		Pave Thck (in.)	Shoulder Type and Width				Inv Yr	Yr. Resurf.
							Left	Right		Left		Right			
							(in.)	(in.)			ft		ft		
10+00	28.07	2	X	X	4.08	102	0.1	0.3	4	Paved	2	Paved	2	2012	2004
20+03	28.26	2	X	X	4.08	102	0.1	0.3	6	Paved	2	Paved	2	2012	2004
29+00	28.43	1	X		4.08	102	0.1	0.3	7	Paved	2	Paved	2	2012	2004
33+00	28.51	1	X		4.08	102	0.1	0.3	6	Paved	2	Paved	2	2012	2004
33+50	28.52	3	X	X	3.67	118	0.2	0.6	6	Paved	2	Paved	2	2012	2004
51+71	28.86	3	X	X	3.67	118	0.2	0.6	7	Paved	2	Paved	2	2012	2004
61+22	29.04	3	X	X	3.89	111	0.1	0.5	6	Paved	2	Paved	2	2012	2004
71+78	29.24	3	X	X	3.89	111	0.1	0.5	7	Paved	2	Paved	2	2012	2004
72+30	29.25	3	X	X	3.89	111	0.1	0.5	7	Paved	2	Paved	2	2012	2004
73+36	29.27	3	X	X	3.89	111	0.1	0.5	6	Paved	2	Paved	2	2012	2004
83+39	29.46	3	X	X	3.89	111	0.1	0.5	6	Paved	2	Paved	2	2012	2004
83+92	29.47	5	X	X	2.44	230	0.2	1.1	6	Paved	2	Paved	2	2012	2004
101+87	29.81	5	X	X	2.44	230	0.2	1.1	5	Paved	2	Paved	2	2012	2004
102+93	29.83	5	X	X	2.44	230	0.2	1.1	7	Paved	2	Paved	2	2012	2004
114+54	30.05	5	X	X	2.44	230	0.2	1.1	7	Paved	2	Paved	2	2012	2004
115+07	30.06	5	X	X	2.44	230	0.2	1.1	6	Paved	2	Paved	2	2012	2004
135+14	30.44	5	X	X	2.47	224	0.2	1.1	6	Paved	2	Paved	2	2012	2004
146+75	30.66	5	X	X	2.47	224	0.2	1.1	6	Paved	2	Paved	2	2012	2004
178+43	31.26	5	X	X	3.38	161	0.2	0.5	7	Paved	2	Paved	2	2012	2004
210+11	31.86	3	X	X	3.8	118	0.2	0.5	8	Paved	2	Paved	2	2012	2004
226+50	32.17	3	X	X	3.8	118	0.2	0.5	6	Paved	2	Paved	2	2012	2004
227+00	32.18	1	X		3.83	133	0.1	0.3	6	Paved	2	Paved	2	2012	2004
234+93	32.33	1	X		3.83	133	0.1	0.3	6	Paved	2	Paved	2	2012	2004
240+00	32.43	1	X		3.83	133	0.1	0.3	7	Paved	2	Paved	2	2012	2004
241+26	32.45	2	X	X	3.83	133	0.1	0.3	6	Paved	2	Paved	2	2012	2004
261+33	32.83	2	X	X	3.78	134	0.1	0.4	6	Paved	2	Paved	2	2012	2004
262+91	32.86	0			3.78	134	0.1	0.4	6	Paved	2	Paved	2	2012	2004
263+97	32.88	0			3.78	134	0.1	0.4	6	Paved	2	Paved	2	2012	2004
266+61	32.93	0			3.78	134	0.1	0.4	7	Paved	2	Paved	2	2012	2004
275+06	33.09	5	X	X	2.69	221	0.2	0.9	6	Paved	2	Paved	2	2012	2004
279+81	33.18	5	X	X	2.69	221	0.2	0.9	6	Paved	2	Paved	2	2012	2004
282+45	33.23	5	X	X	2.69	221	0.2	0.9	7	Paved	2	Paved	2	2012	1996
282+98	33.24	5	X	X	2.69	221	0.2	0.9	8	Paved	2	Paved	2	2012	1996
284+03	33.26	5	X	X	2.69	221	0.2	0.9	5	Paved	2	Paved	2	2012	1996
286+67	33.31	5	X	X	2.69	221	0.2	0.9	6	Paved	2	Paved	2	2012	1998
291+42	33.4	5	X	X	2.69	221	0.2	0.9	5	Paved	2	Paved	2	2012	1998
300+00	33.56	1			3.61	168	0.1	0.3	5	Paved	2	Paved	2	2012	1998
316+77	33.88	1			3.61	168	0.1	0.3	5	Paved	2	Paved	2	2012	1998
319+41	33.93	1			3.61	168	0.1	0.3	6	Paved	2	Paved	2	2012	1998

Pavement Condition Assessment Summary

(PCAS)

Blue Hill, Penobscot, Orland

Route 15

18547.00

LOCATION		DEFICIENCIES	CONDITION MEASURESUREMENTS						GENERAL PAVEMENT INFORMATION						
			FWD Data		ARAN Performance Data				GPR	ARAN Supplemental Data					
Station	RLM	# of Performance Deficiencies (0 - 6)	Existing SN < Future SN	Increased FWD Pavement Deflections	PCR ≤ 3.5	IRI ≥ 150	Wheel Path Rutting ≥ 0.5"		Pave Thck (in.)	Shoulder Type and Width				Inv Yr	Yr. Resurf.
							Left	Right		Left		Right			
							(in.)	(in.)			ft		ft		
319+94	33.94	3			3.3	168	0.1	0.7	5	Paved	2	Paved	2	2012	1998
322+58	33.99	4		X	3.3	168	0.1	0.7	5	Paved	2	Paved	2	2012	1998
325+22	34.04	5	X	X	3.3	168	0.1	0.7	7	Paved	2	Paved	2	2012	2004
327+86	34.09	5	X	X	3.3	168	0.1	0.7	8	Paved	2	Paved	2	2012	2004
343+17	34.38	5	X	X	3.3	168	0.1	0.7	7	Paved	2	Paved	2	2012	2004
368+51	34.86	5	X	X	2.84	222	0.2	1	6	Paved	2	Paved	2	2012	2004
390+69	35.28	5	X	X	3.03	185	0.2	0.7	6	Paved	2	Paved	2	2012	2004
391+22	35.29	5	X	X	3.03	185	0.2	0.7	5	Paved	2	Paved	2	2012	1996
392+80	35.32	5	X	X	3.03	185	0.2	0.7	6	Paved	2	Paved	2	2012	1996
393+86	35.34	5	X	X	3.03	185	0.2	0.7	7	Paved	2	Paved	2	2012	1996
394+38	35.35	4	X	X	2.61	211	0.2	0.3	6	Paved	2	Paved	2	2012	1996
395+44	35.37	4	X	X	2.61	211	0.2	0.3	NA	Paved	2	Paved	2	2012	1996
396+50	35.39	4	X	X	2.61	211	0.2	0.3	NA	Paved	2	Paved	2	2012	1996
397+02	35.4	4	X	X	2.61	211	0.2	0.3	NA	Paved	2	Paved	2	2012	1992
397+55	35.41	4	X	X	2.61	211	0.2	0.3	NA	Paved	4	Paved	4	2012	1992
402+83	35.51	4	X	X	2.61	211	0.2	0.3	NA	Paved	4	Paved	4	2012	1992
Average		**3.4**			**3.24**	**171**	**0.2**	**0.6**							

Conclusions/Recommendations

1. The existing pavement structure in the “Travel Lane Core Area” (Centerline to 7’ left and right) appears to be adequate to support traffic loadings. However, the pavement structure utilized in subsequent roadway widening has been inadequate to support traffic loading. As a result severe travel lane drop offs and shoulder failure have developed outside of the “Travel Lane Core Area” (outer ½ of travel way). Travel lane drop off indicates a lack of support for the applied traffic loadings and a failure of the pavement structure (subgrade failure). This lack of support is likely due to insufficient pavement thickness, insufficient base gravel thickness and quality, saturated subbase and subgrade soils, frost action, and thaw weakening.

As a minimum, partial reconstruction involving the boxing out of the outer 7 feet of the travel way and shoulder is recommended. A minimal pavement structure of 4-inches of HMA and 18-inches of base gravel is recommended. Giving past and existing pavement failures, traffic loadings, and the presence of moisture sensitive subgrade soils (sandy silts, clay silts), a 30-inch pavement structure should be considered.

2. Subsequent roadway widening utilizing varying pavement structures (varied pavement and gravel base thicknesses) has resulted in a non-uniform pavement structure (vertically and transversely). This has likely created a “bath tub” shaped pavement structure trapping water within the pavement structure preventing the transverse flow of water in the subbase to outlet into existing ditches (if present). The trapping of water within the pavement structure has likely decreased the functional life and performance of the pavement structure and has likely promoted frost action.

Boxing out of the outer 7 feet of the travel way and shoulder will aid in establishing a free draining uniform pavement structure. To fully eliminate the bath tub pavement structure, full depth and width reconstruction to a depth of 30 inches below the top of existing pavement is likely necessary.

3. Drainage provisions such as ditching are critical in order to improve the functional life and performance of the pavement structure. Ditching is recommended along the entire length of the project. Ditches should be constructed to a sufficient depth in order to collect surface water, lower the ground water table and allow drainage of the base material.

4. A transition zone will be required between stations 308+00 and 310+00 to alleviate the current differential frost heaving at this shallow rock location. It is recommended that the subgrade soils be undercut a minimum of 14” below subgrade (assuming a 22-inch pavement structure) between stations 308+00 and 310+00 with a 20:1 longitudinal transition and replaced with non-frost susceptible soils.

APPENDIX

Pavement Condition Photos

Summer Photos

Photograph 1: Station 53+21 (looking south)

Photograph 2: Station 53+51 (looking south)

Photograph 3: Station 108+94 (looking south)

Photograph 4: Station 108+94 (looking south)

Photograph 5: Station 137+50 (looking south)

Photograph 6: Station 137+50 (looking south)

Photograph 7: Station 267+97 (looking south)

Photograph 8: Station 267+97 (looking south)

Photograph 9: Station 351+51 (looking south)

Photograph 10: Station 351+51 (looking south)

Photograph 11: Station 358+72 (looking south)

Photograph 12: Station 358+72 (looking south)

Winter/Spring Photos

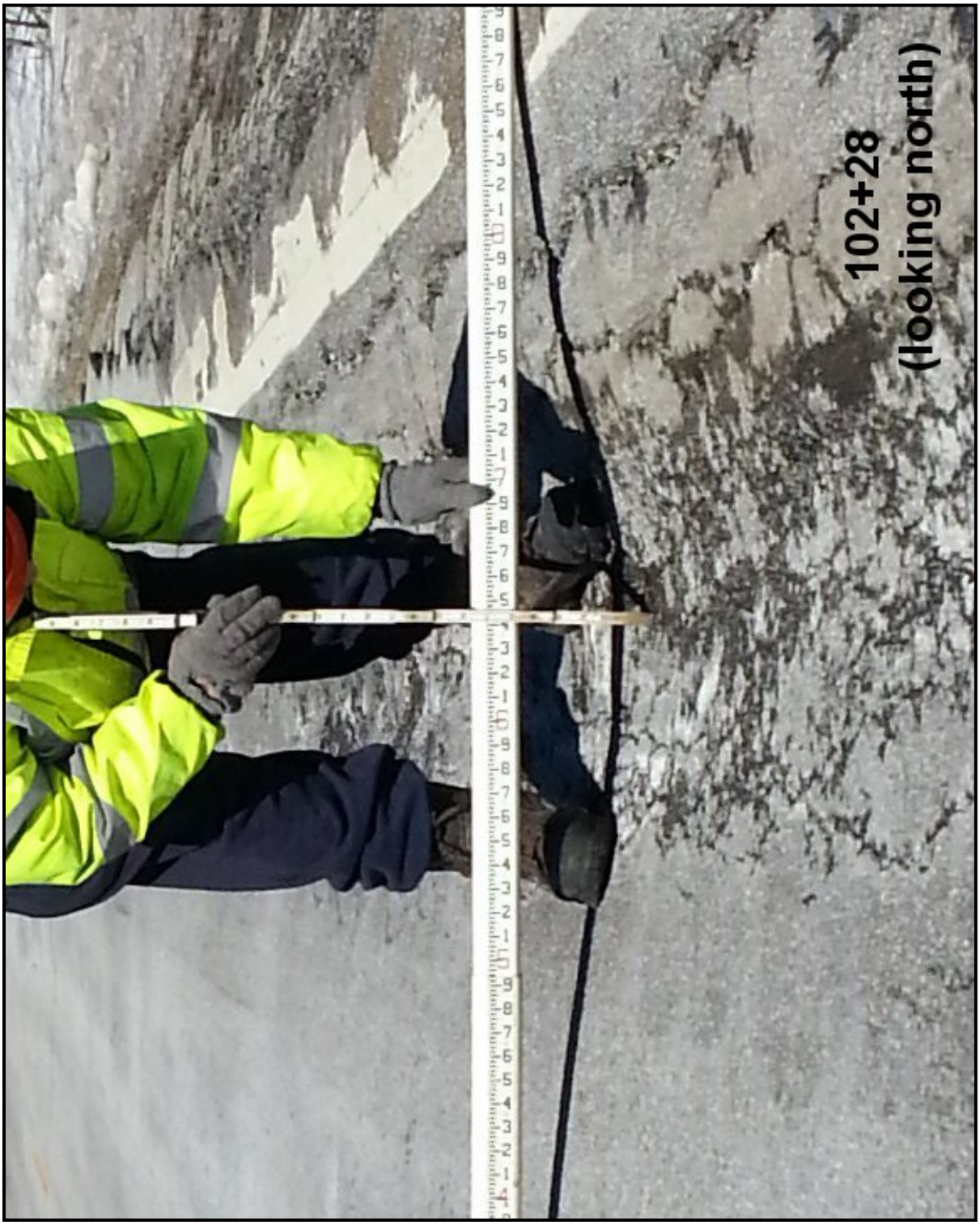
Photograph 13: Station 44+98 (looking north)

Photograph 14: Station 44+98 (looking north)

Photograph 15: Station 87+92 (looking north)

Photograph 16: Station 87+92 (looking north)

Photograph 17: Station 102+28 (looking north)



Photograph 18: Station 102+28 (looking north)

Photograph 19: Station 103+78 (looking north)

Photograph 20: Station 103+78 (looking north)

Photograph 21: Station 133+17 (looking north)

Photograph 22: Station 133+17 (looking north)

Photograph 23: Station 277+41 (looking north)

Photograph 24: Station 277+41 (looking north)

Photograph 25: Station 360+59 (looking north)

Photograph 26: Station 360+59 (looking north)

Falling Weight Deflectometer Data (FWD)

STATE OF MAINE

FILE: RTE 15

INTERDEPARTMENTAL MEMORANDUM

Date of Request: 10/6/2014 Return: 10/07/2014

Latest Date Needed By 10/31/2014

To: **Mike Morgan** Dept.: MDOT, Bureau of Planning

From: **Rob Clewley** Dept.: Highway Program

Subject: **Request for Traffic Information** Project Manager: **Shawn Davis**

TOWN(S): Blue Hill, Penobscot, Orland W.I.N. **18547.00** Consultant Proj

COUNTY: Hancock ROUTE: 15

LOCATION/ DESCRIPTION: On Rte 15, beginning at the Hinckley Hill Road and extending northerly 7.44 miles.

	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	Orland - SR 15 SE/O IR 3245 (Dunbars Rd.)				
1 Latest AADT (Year)	3600(2011)				
2 Current **2015** AADT	3600				
3 Future **2027** AADT	4030				
4 Future AADT					
5 DHV - % of AADT	11%	%	%	%	%
6 Design Hourly Volume	443				
7 % Heavy Trucks (AADT)	11%	%	%	%	%
8 % Heavy Trucks (DHV)	7%	%	%	%	%
9 Direct.Dist. (DHV)	57%	%	%	%	%
10 18-KIP Equivalent P 2.0	253				
11 18-KIP Equivalent P 2.5	241				

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

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

Need Only Data Items Numbered

Comments: 2011 AADTs vary from 2410 to 3600 for the project.

December 18, 2014

Falling Weight Deflectometer (FWD)
Summary Sheet

Project #: 018547.00
Town(s): Blue Hill-Orland
Route(s): #15
Date Tested: 8/4/2014 – 8/7/2014
Requested By: S Hayden
Direction of Testing: North and South

Of FWD tests: 660 # Of Power Augers/Spoons - 18
Design Life: 12 Future 18-kip P2.5 ESALs (Design Life): 1,055,580
Initial Serviceability: 4.5 Terminal Serviceability: 2.5
Reliability Level: 90% Overall Standard Deviation: .45

Locations

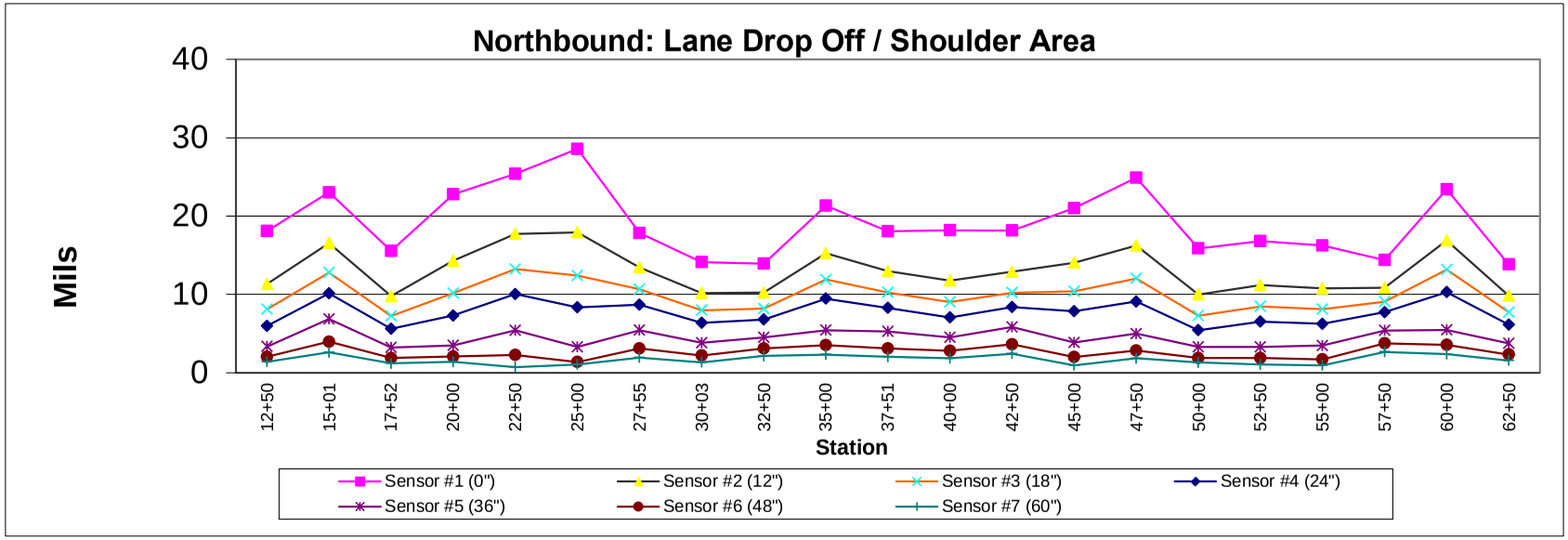
Station (Feet)	Description

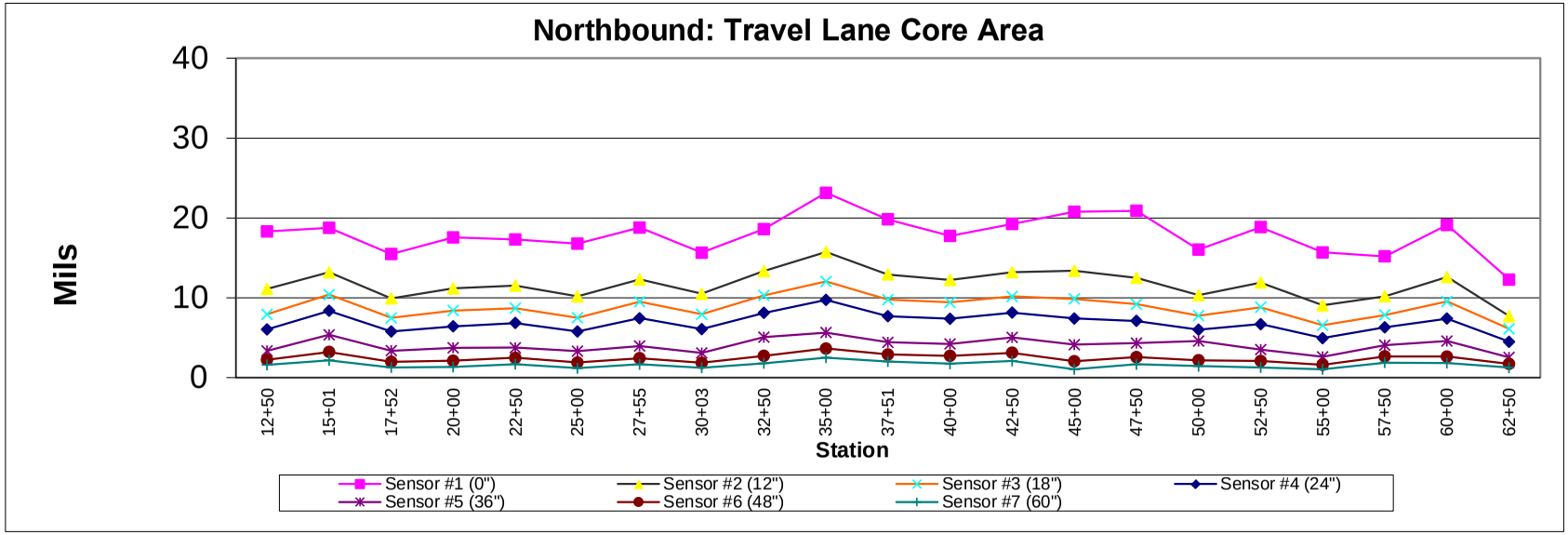
Comments:

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

FWD testing was completed in the outside wheel path and at the white line in both the North and South bound lanes.

18547.00 Blue Hill/Orland - Route #15





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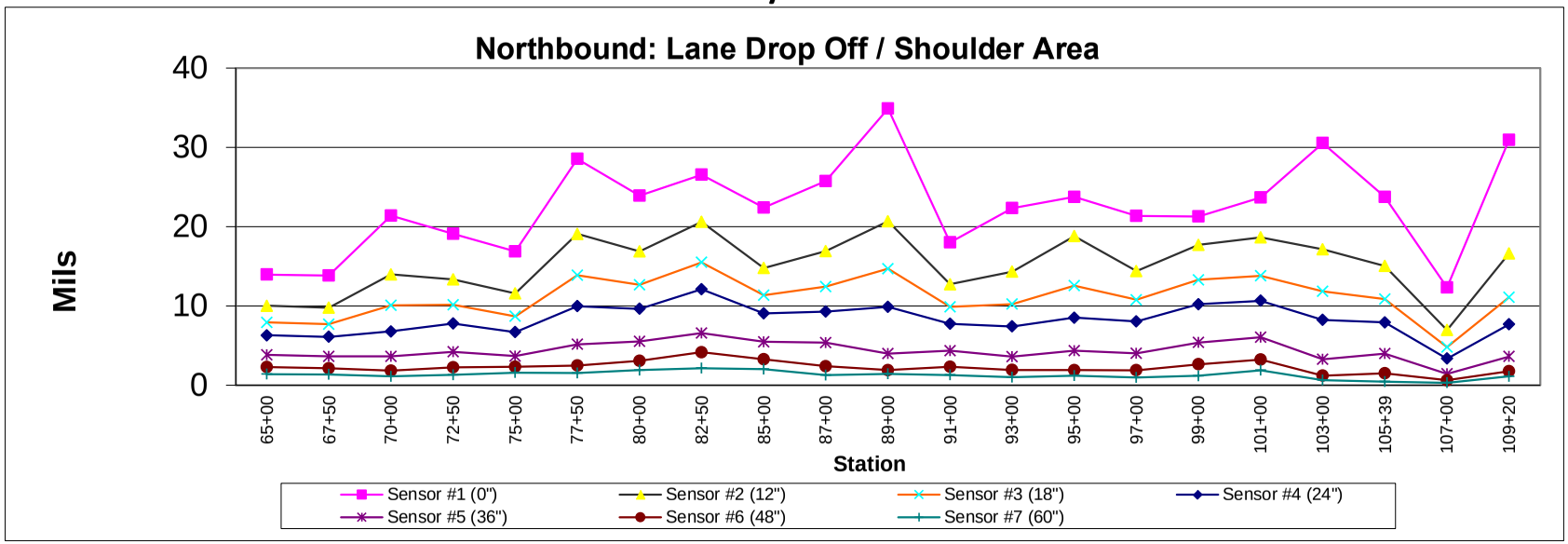

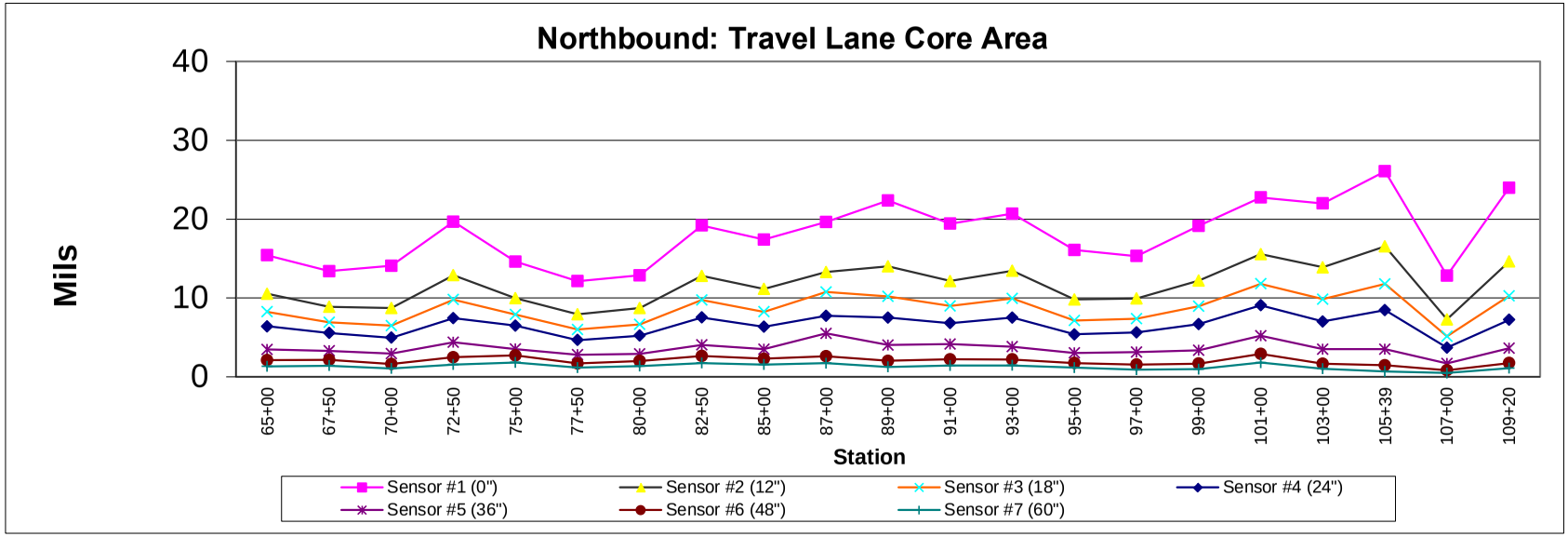

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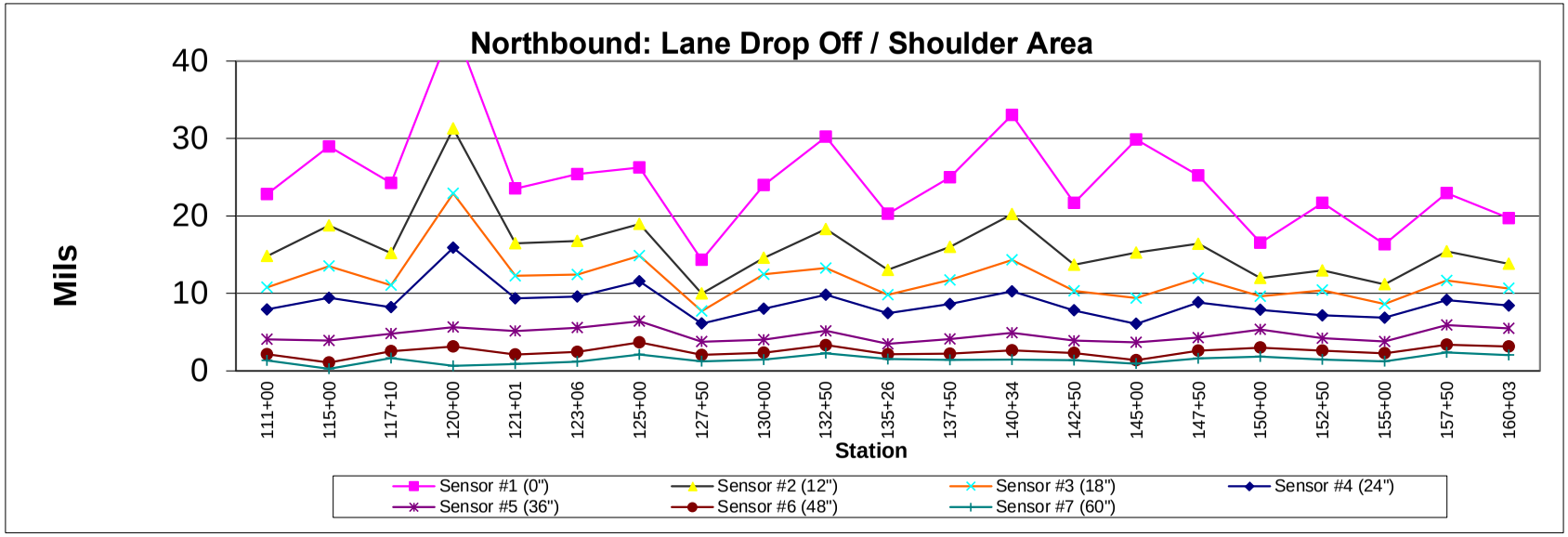

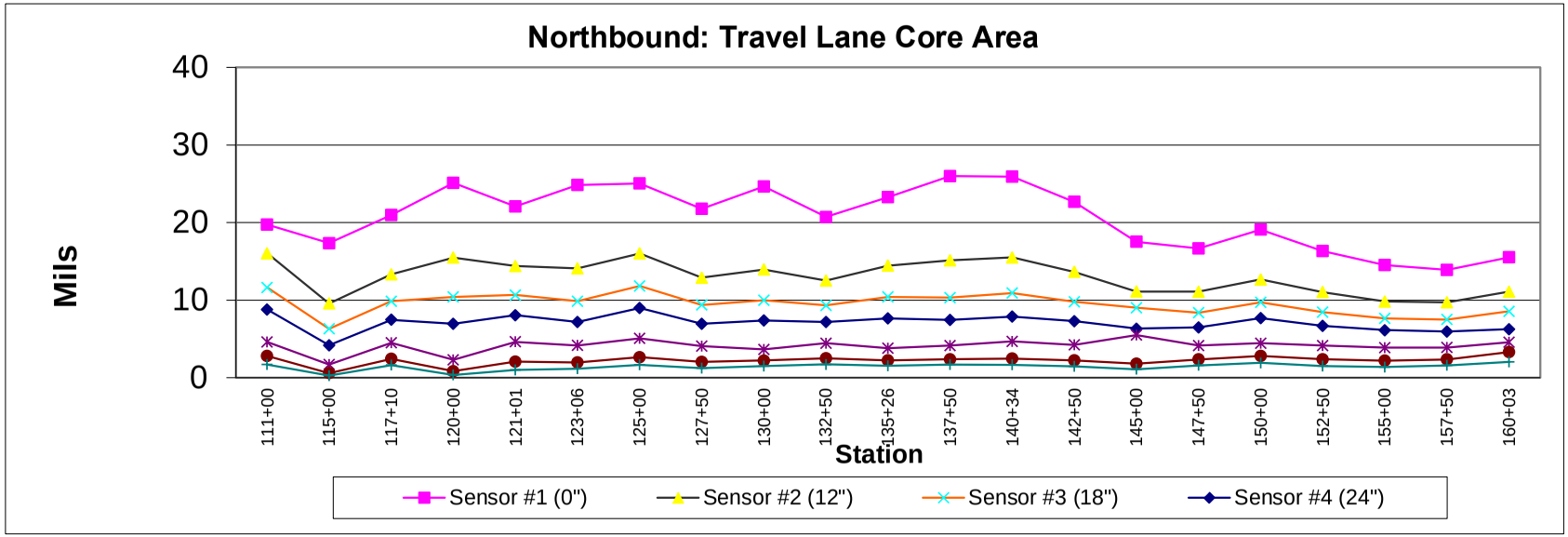

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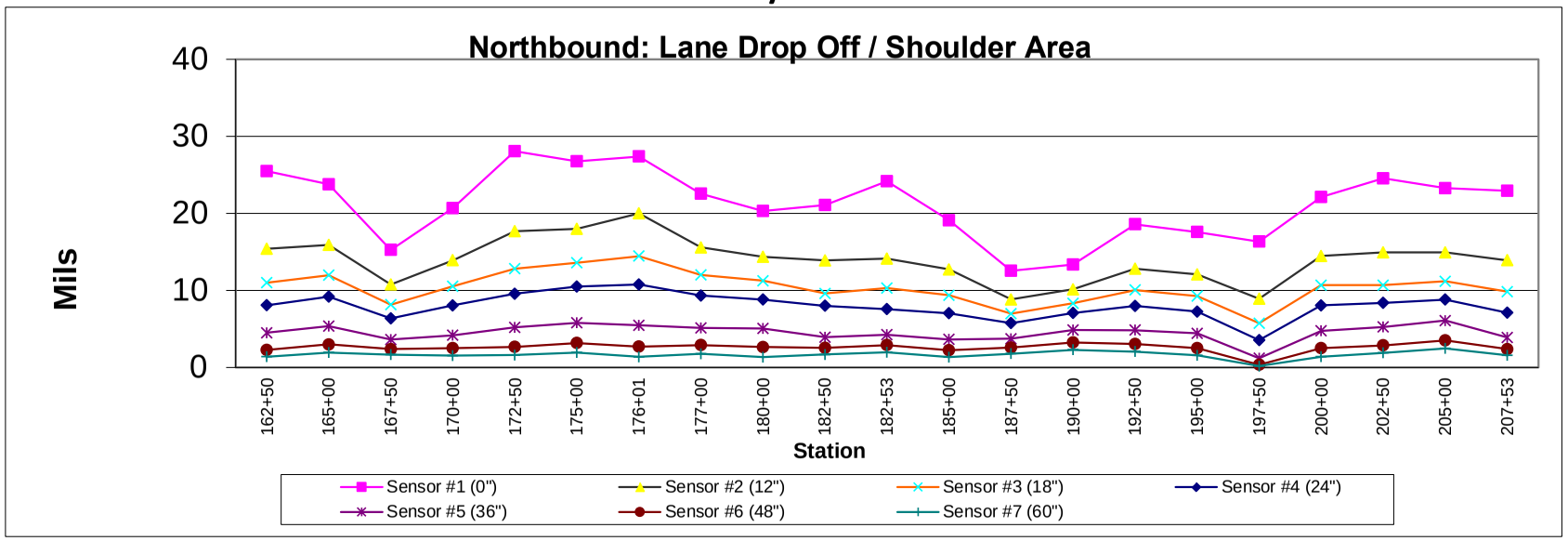

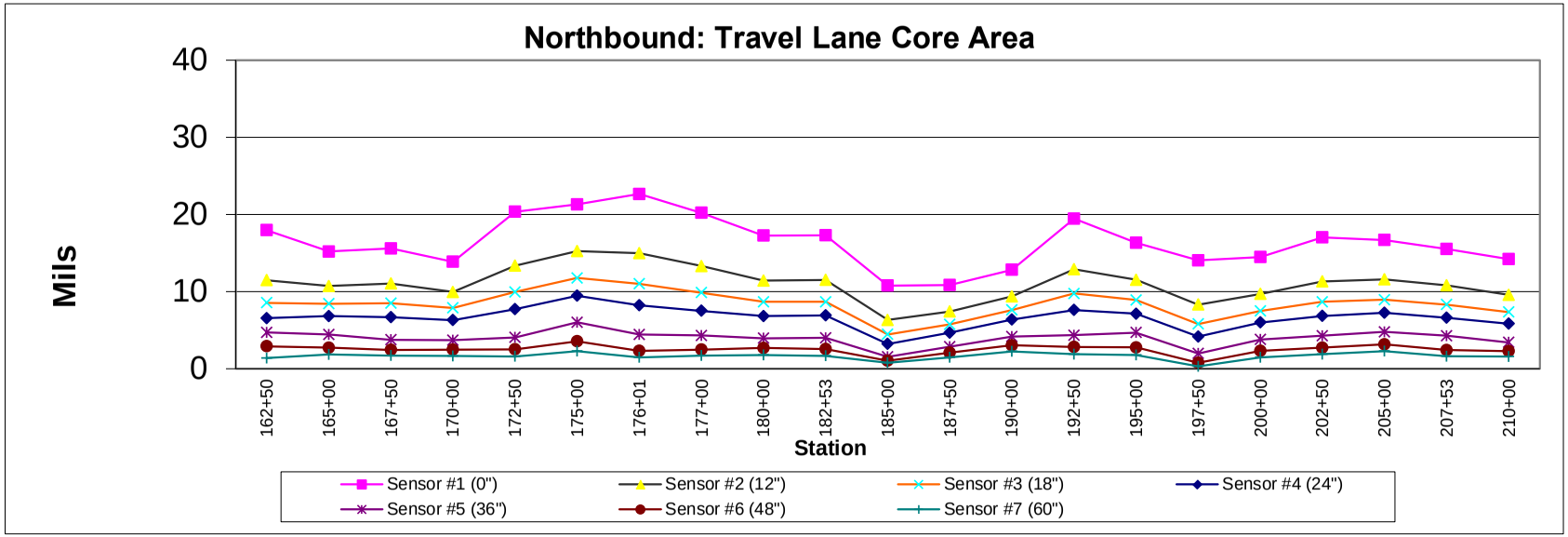

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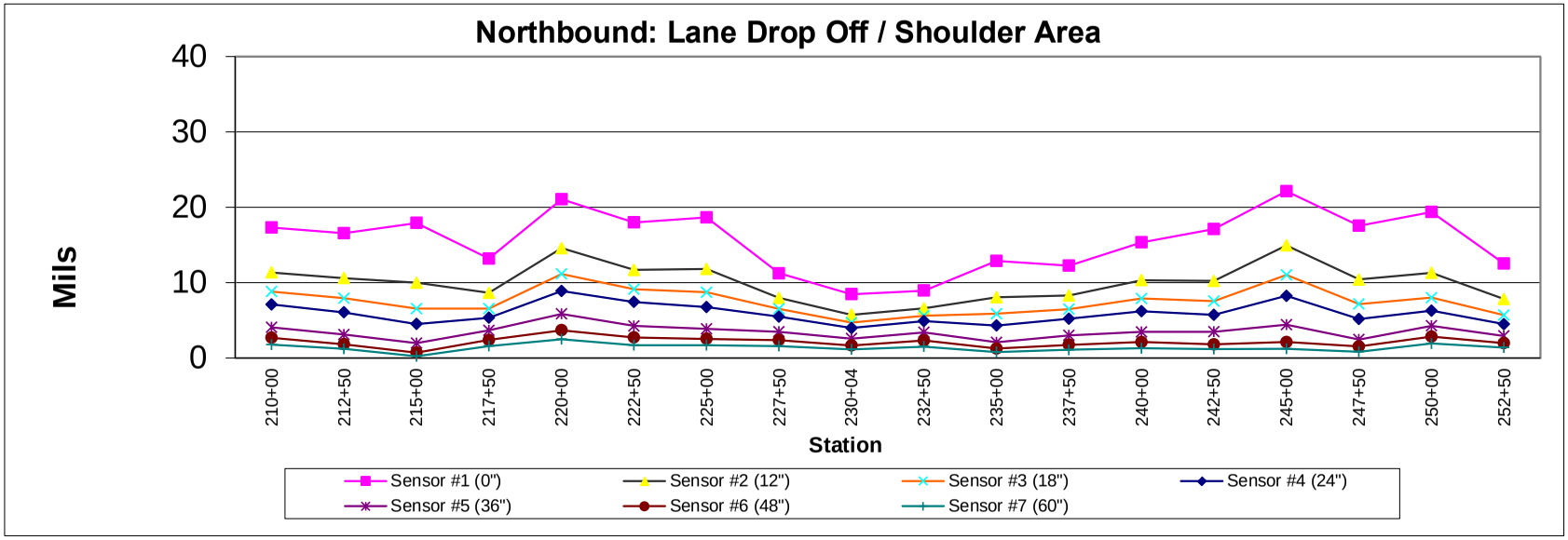

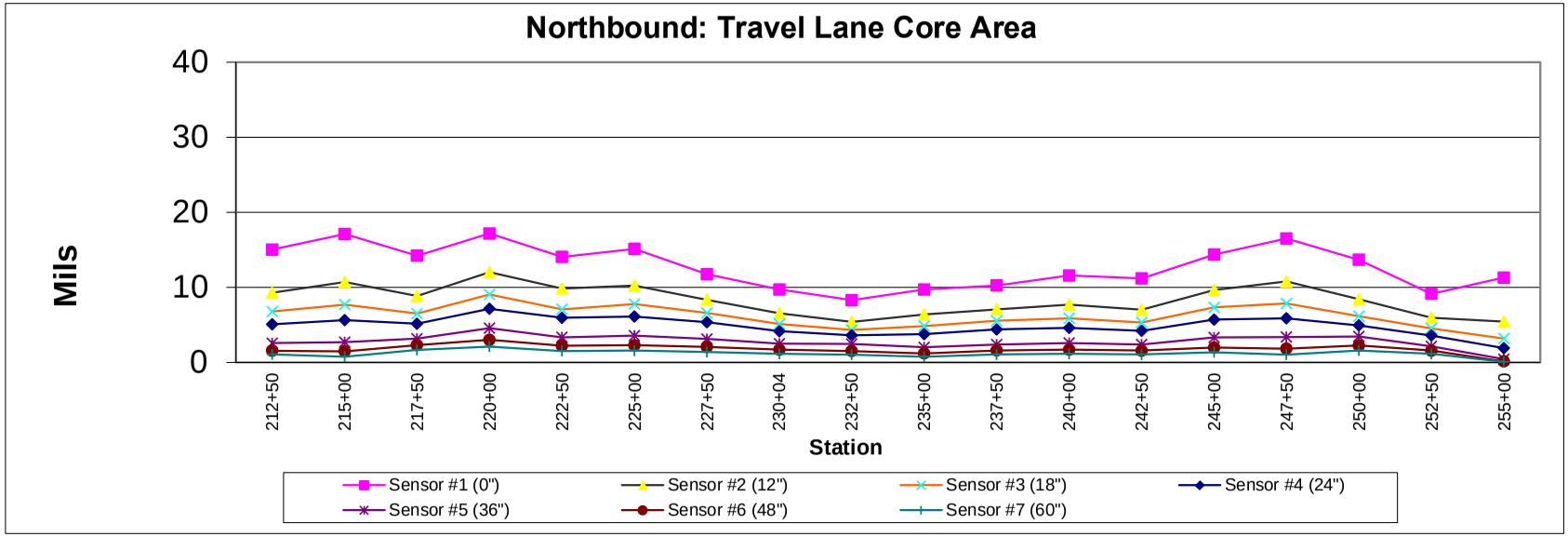

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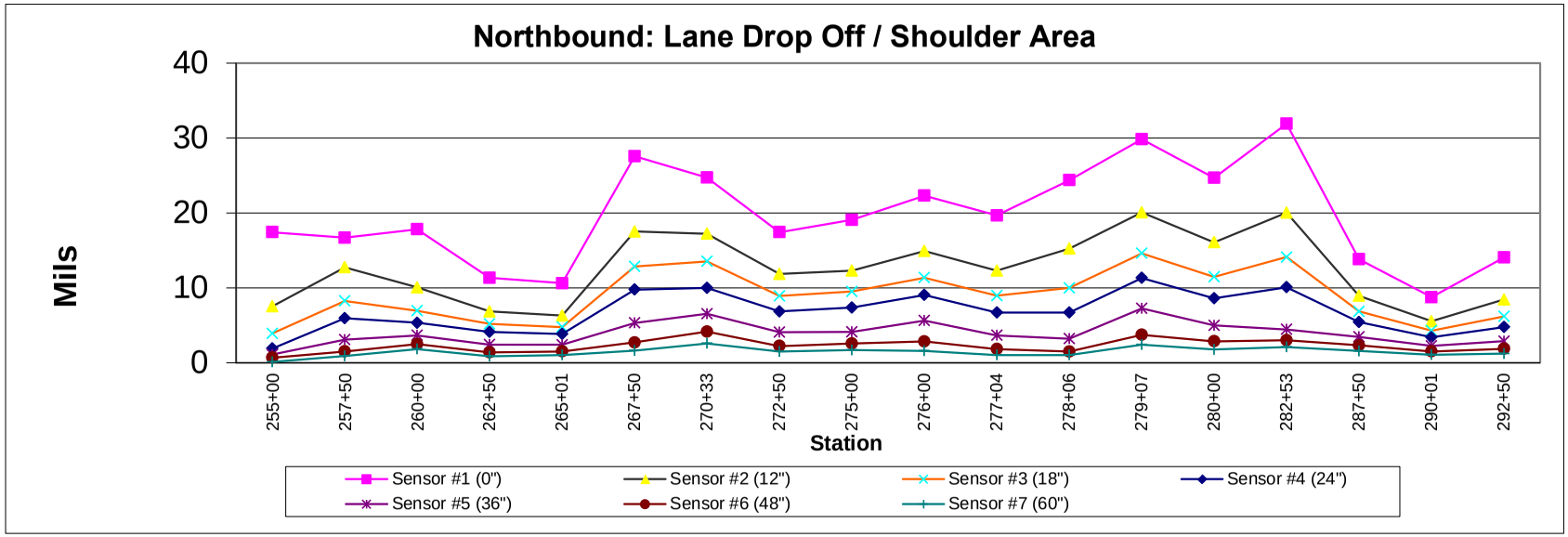

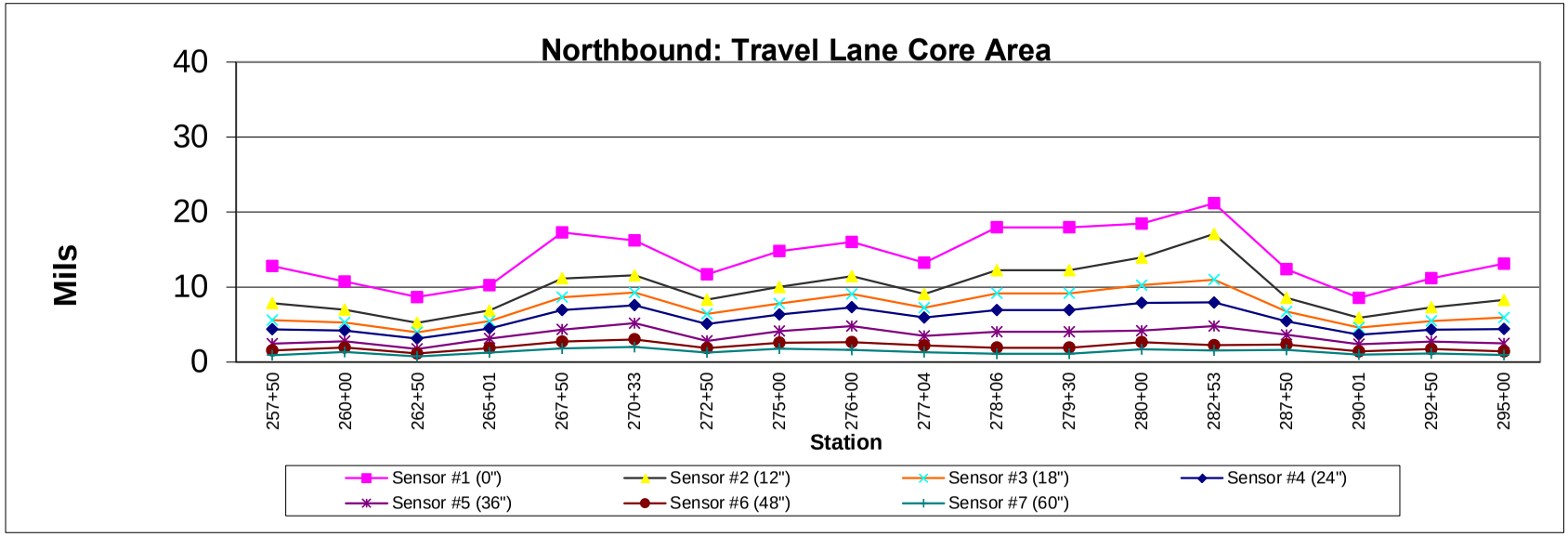

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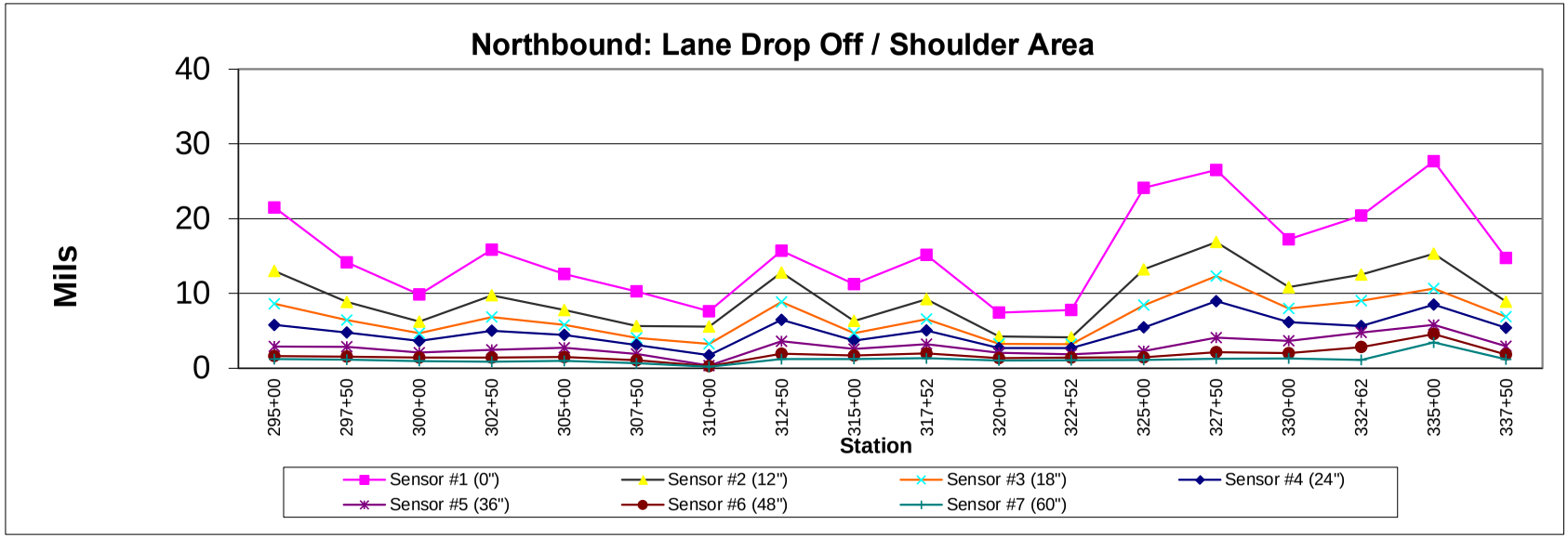

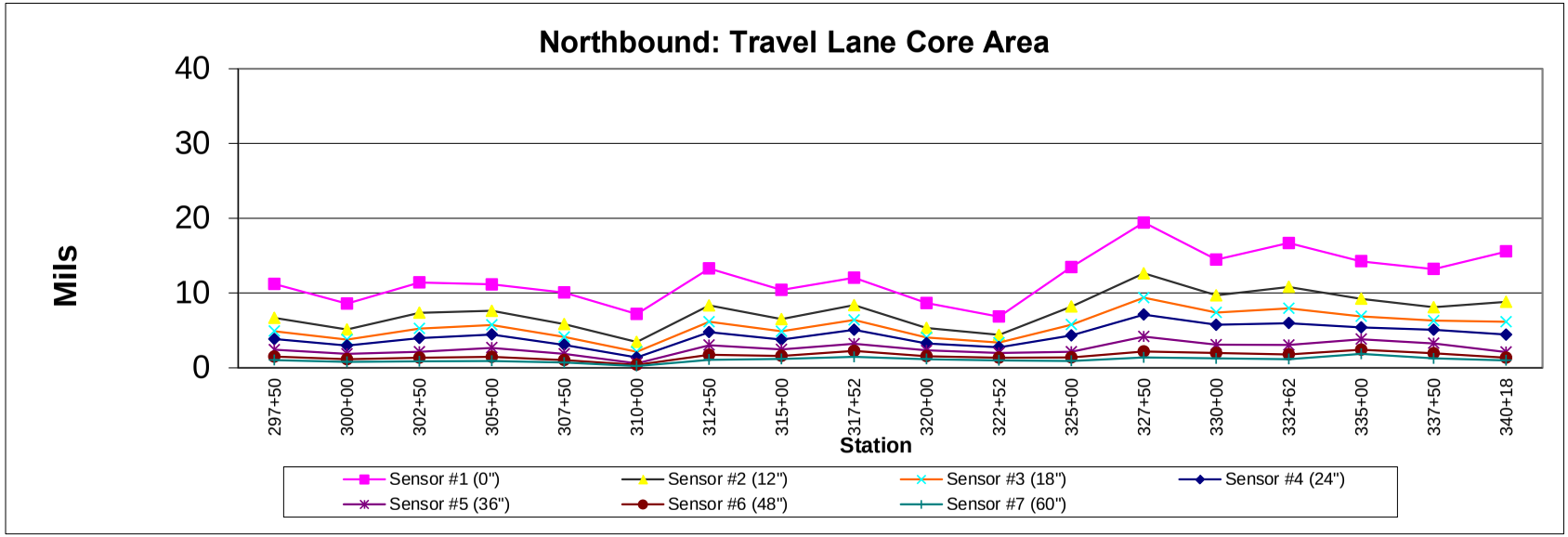

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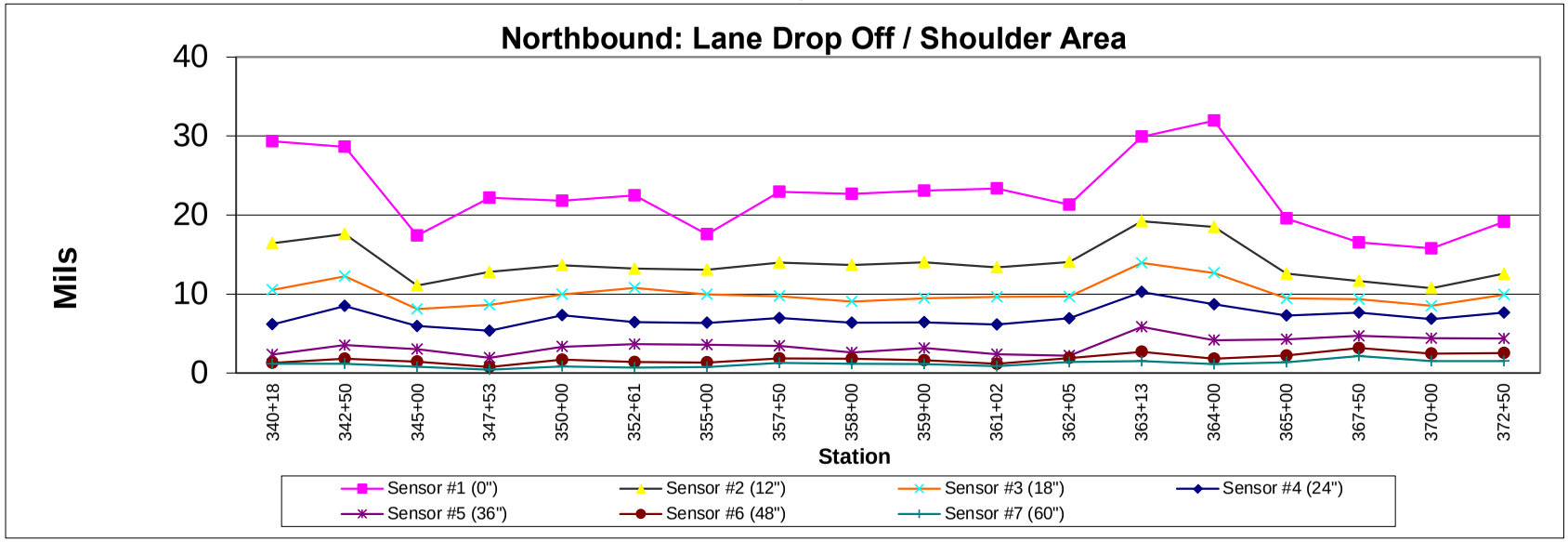

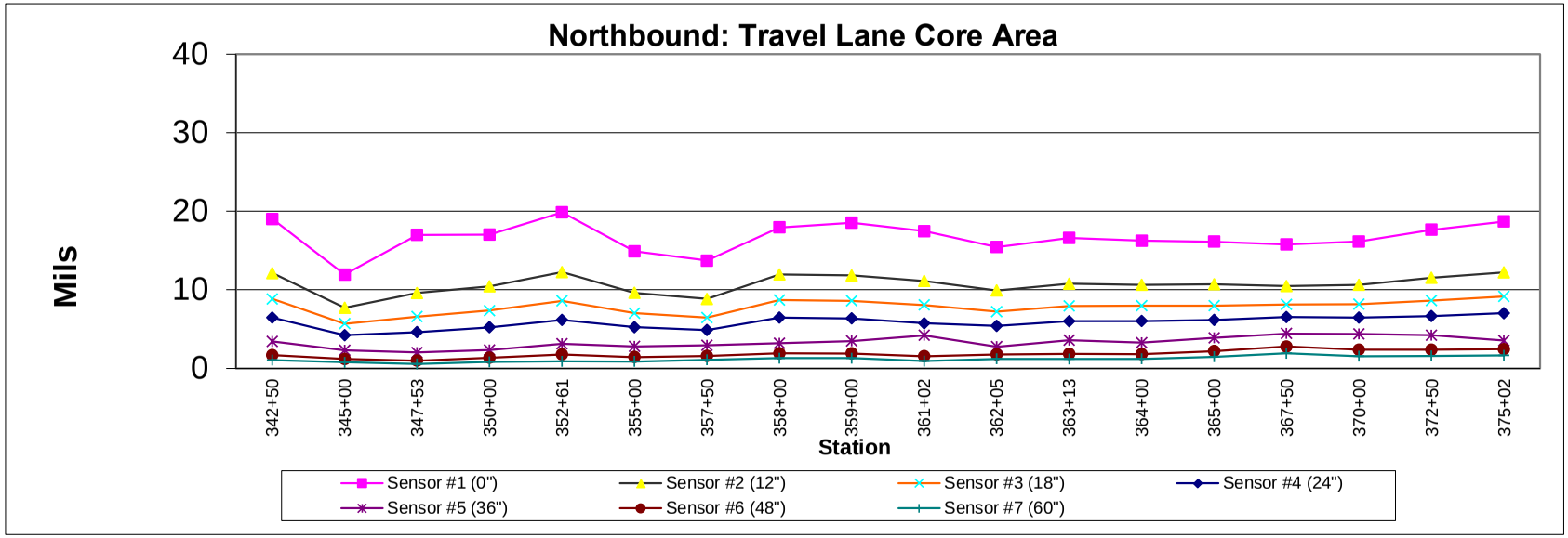

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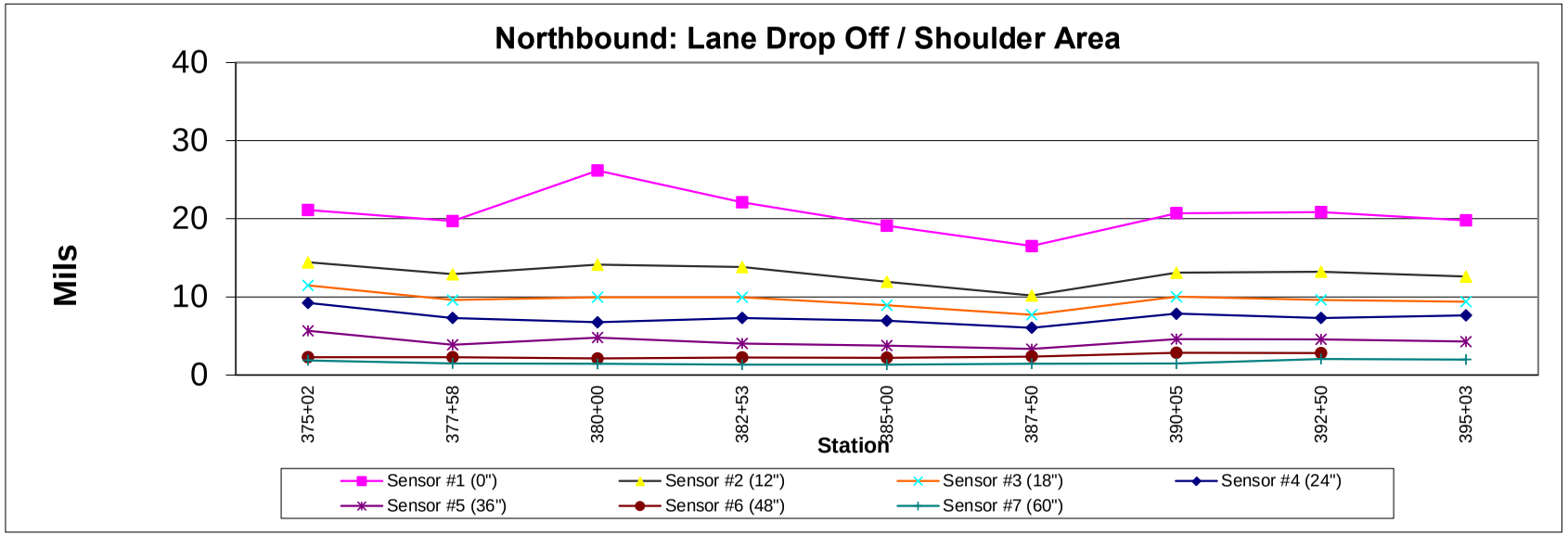

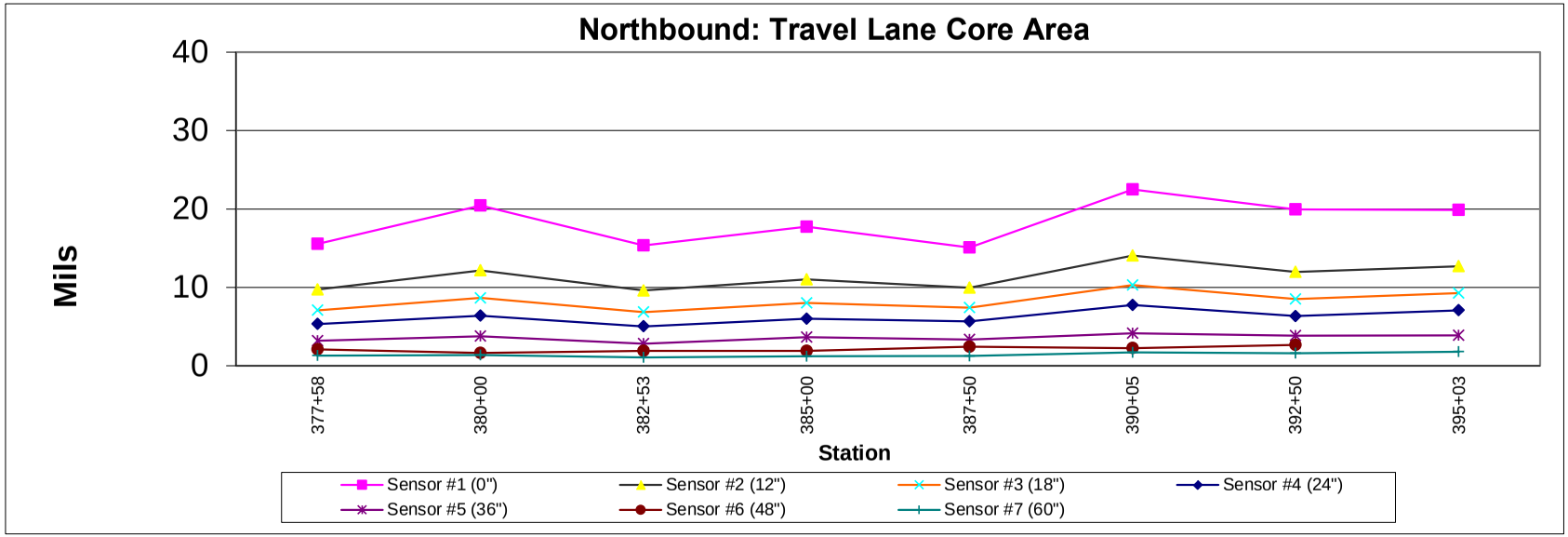

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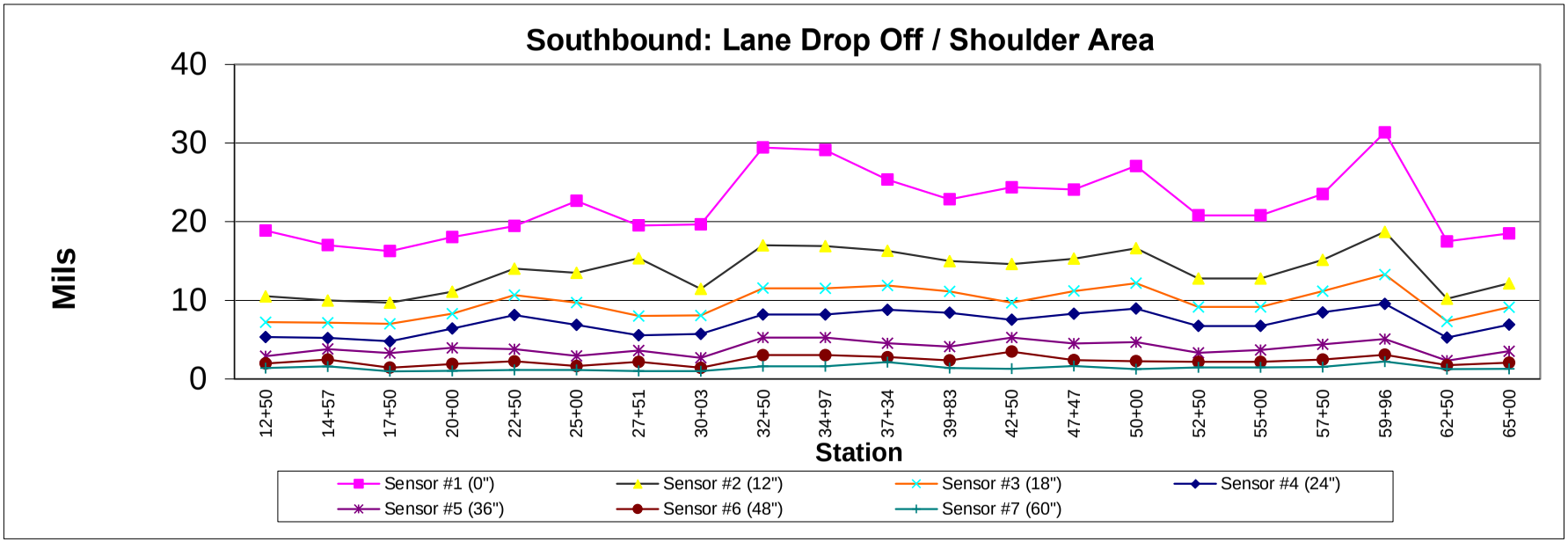

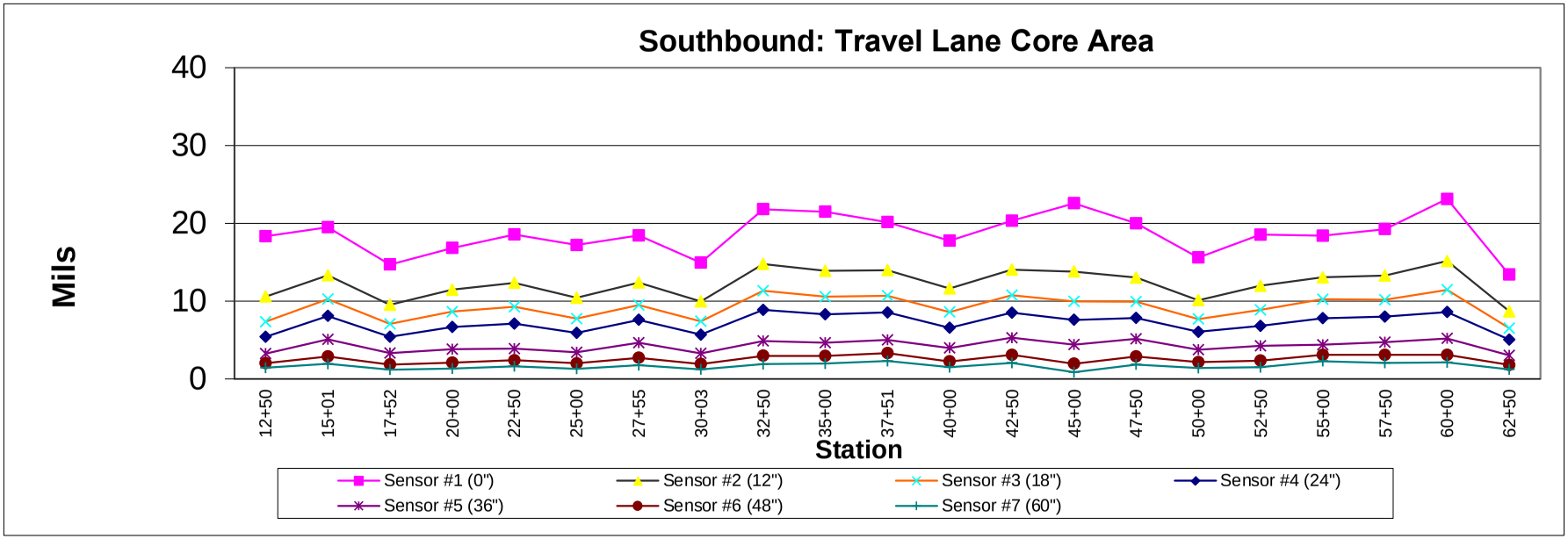

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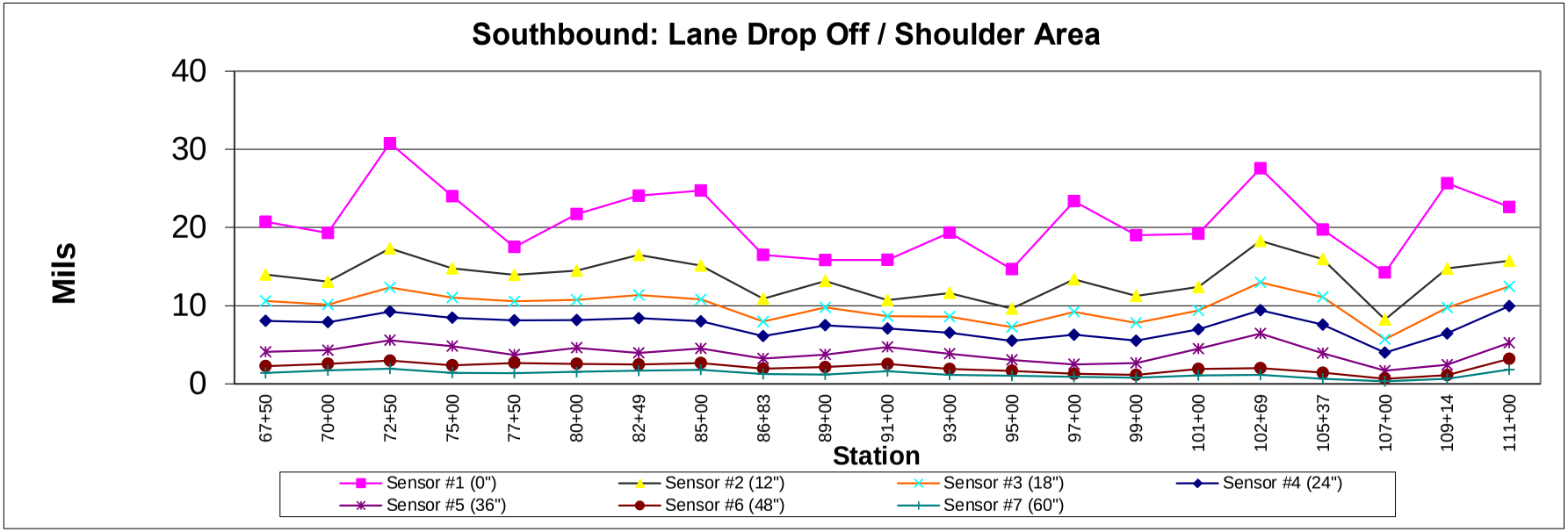

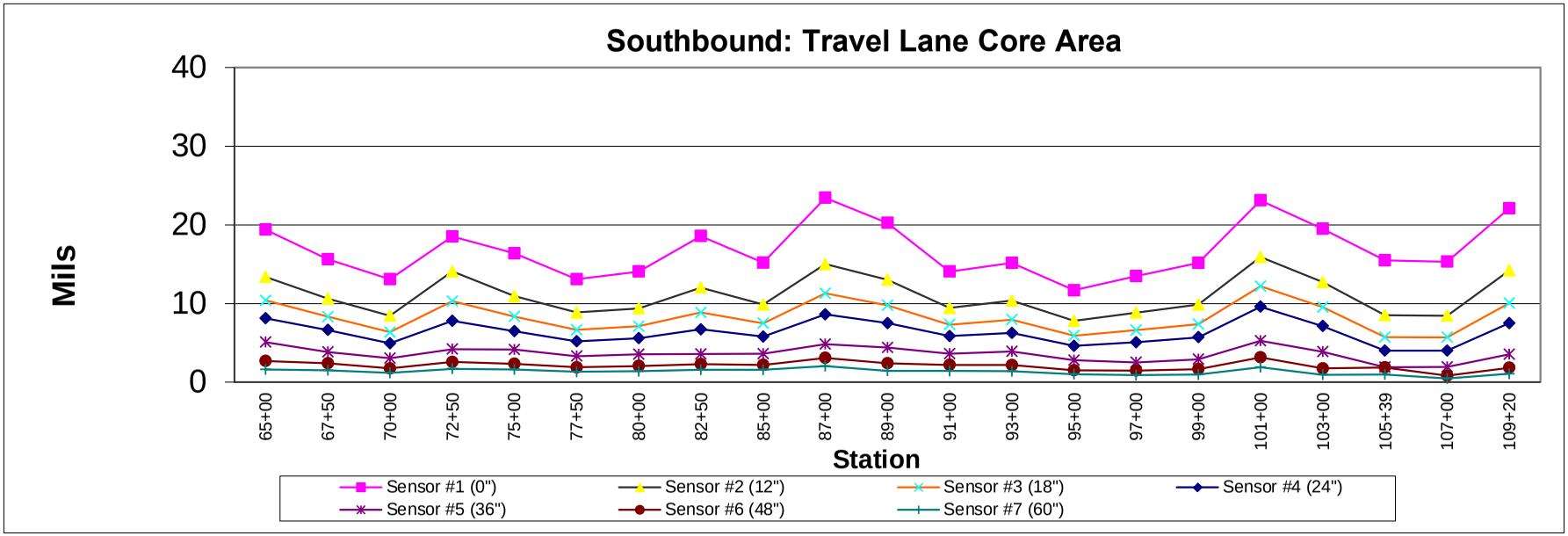

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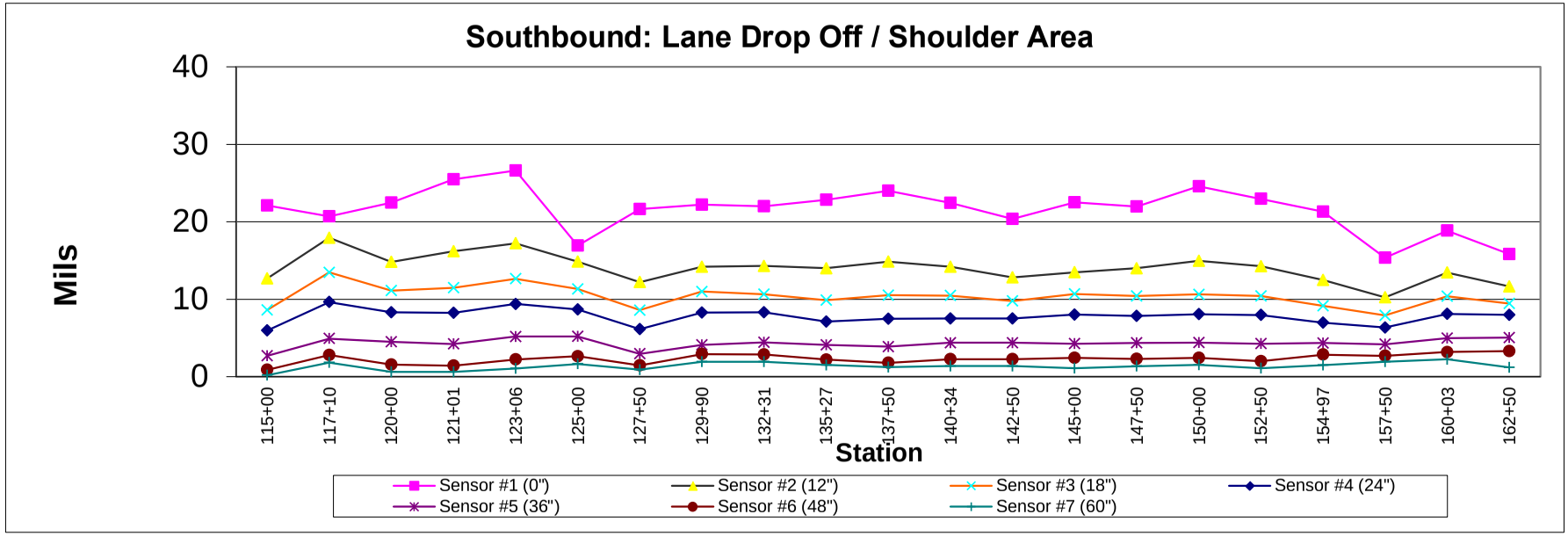

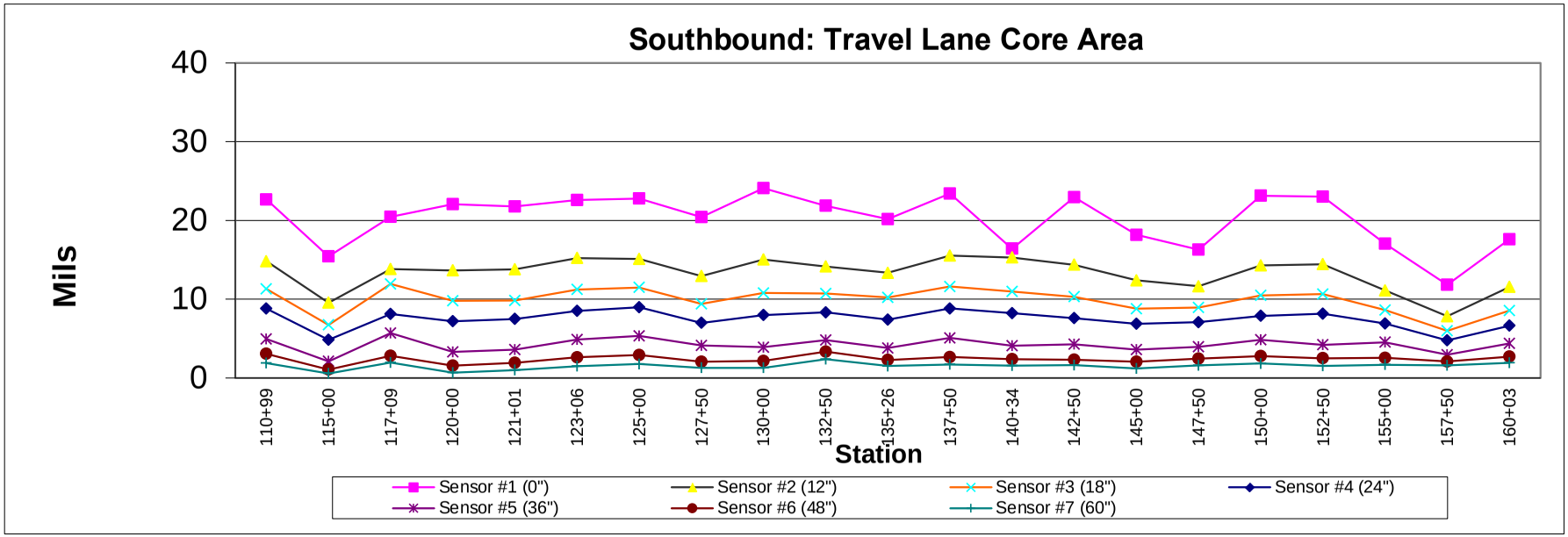

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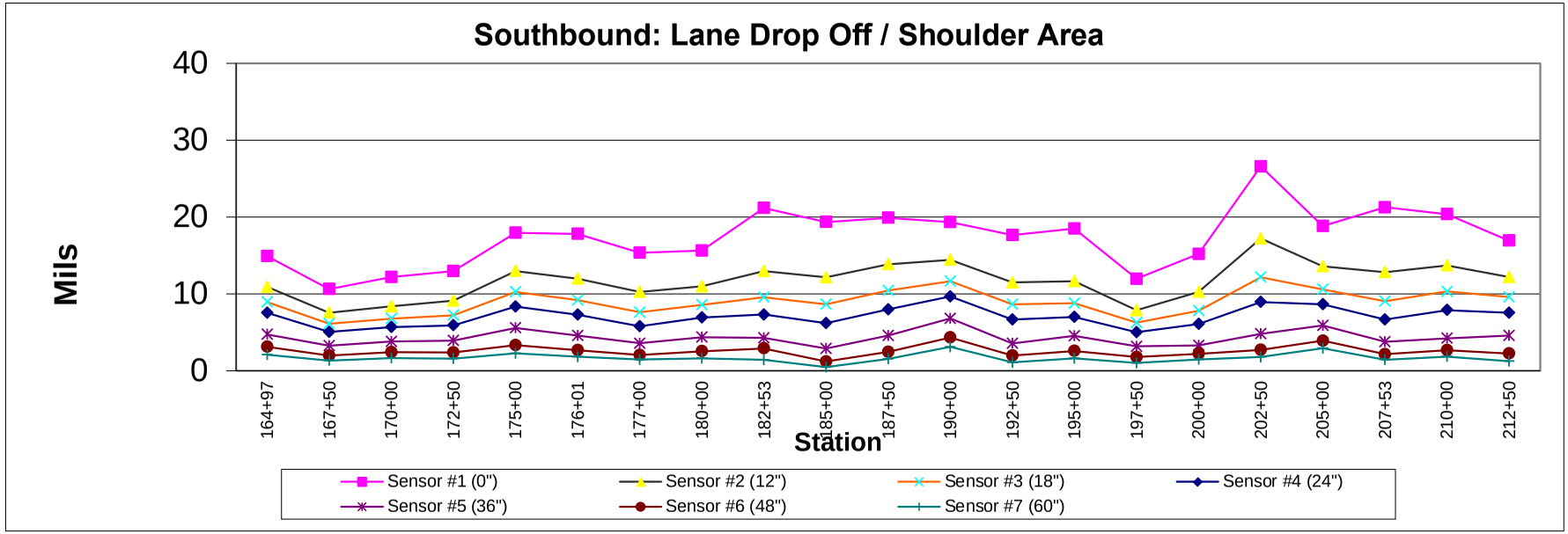

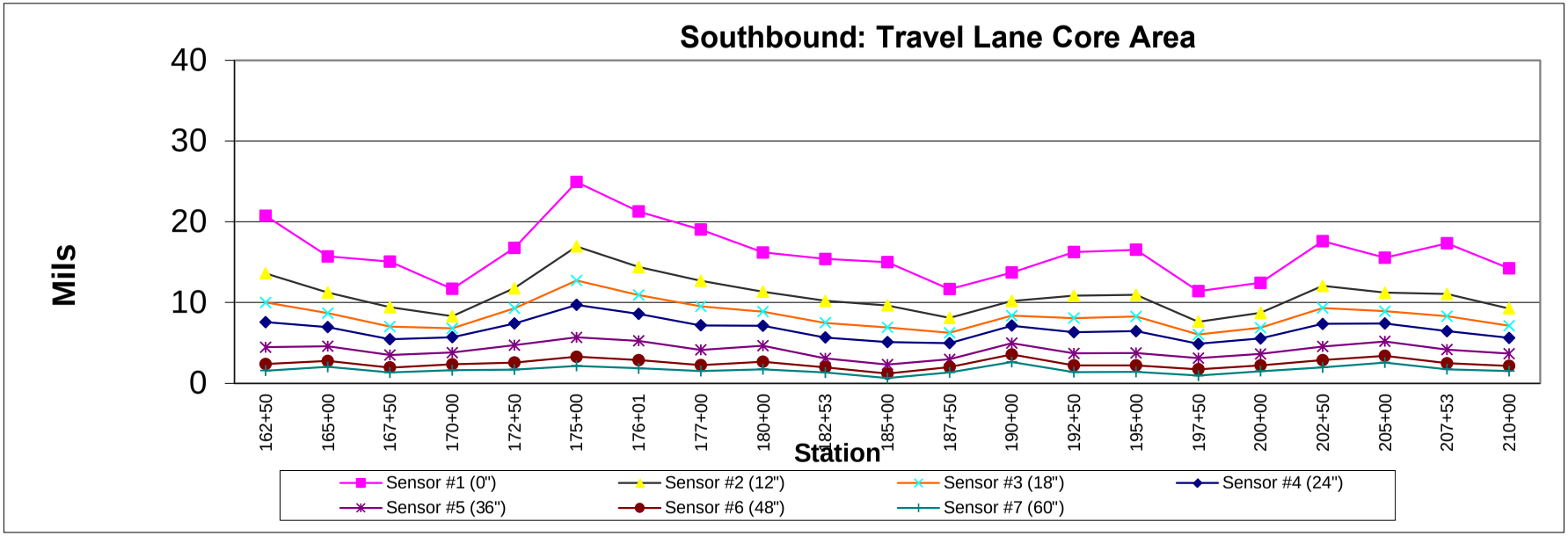

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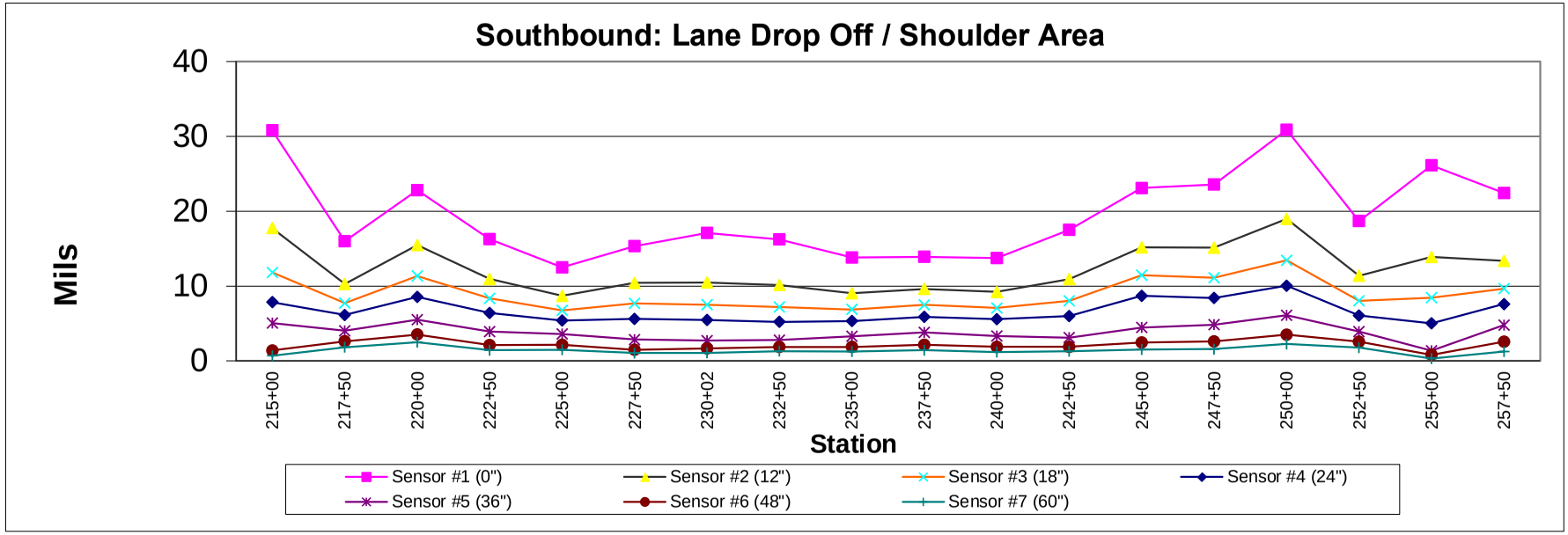

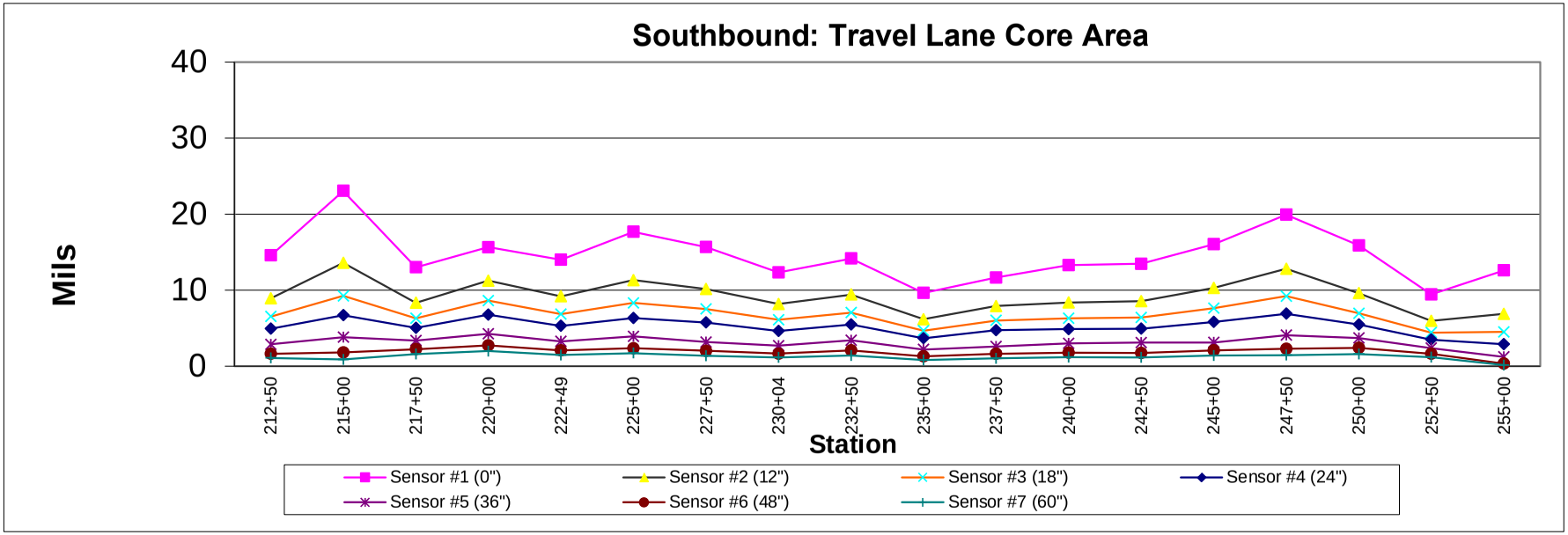

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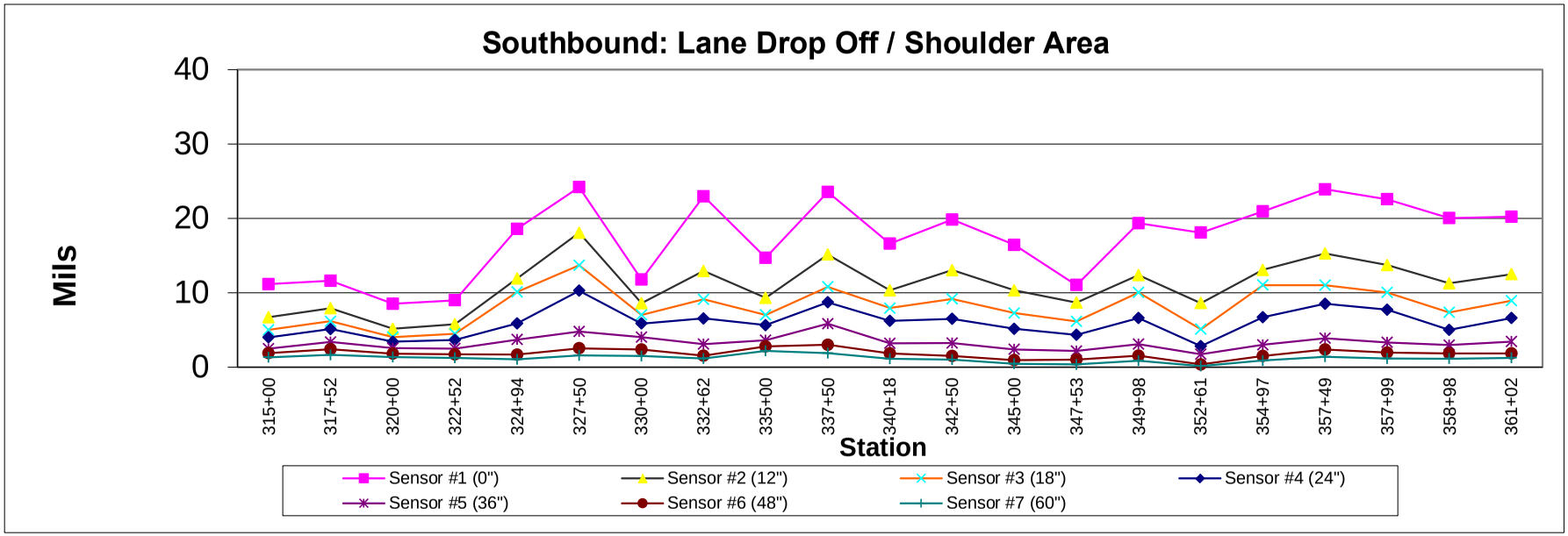

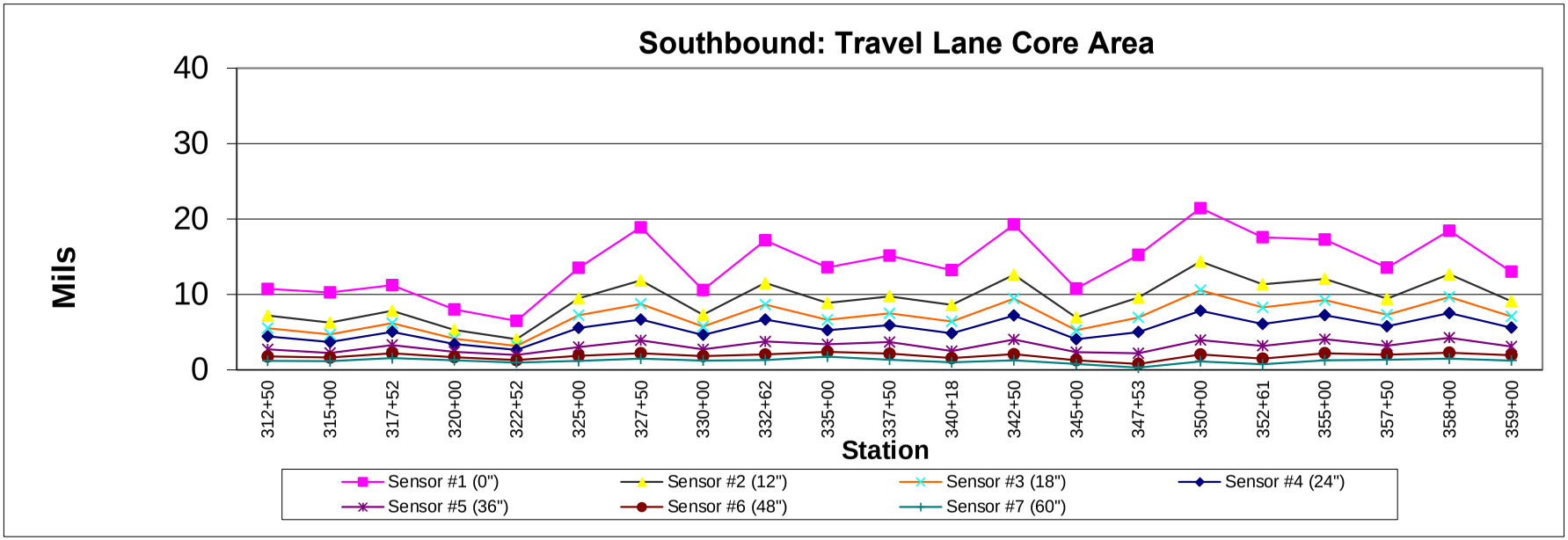

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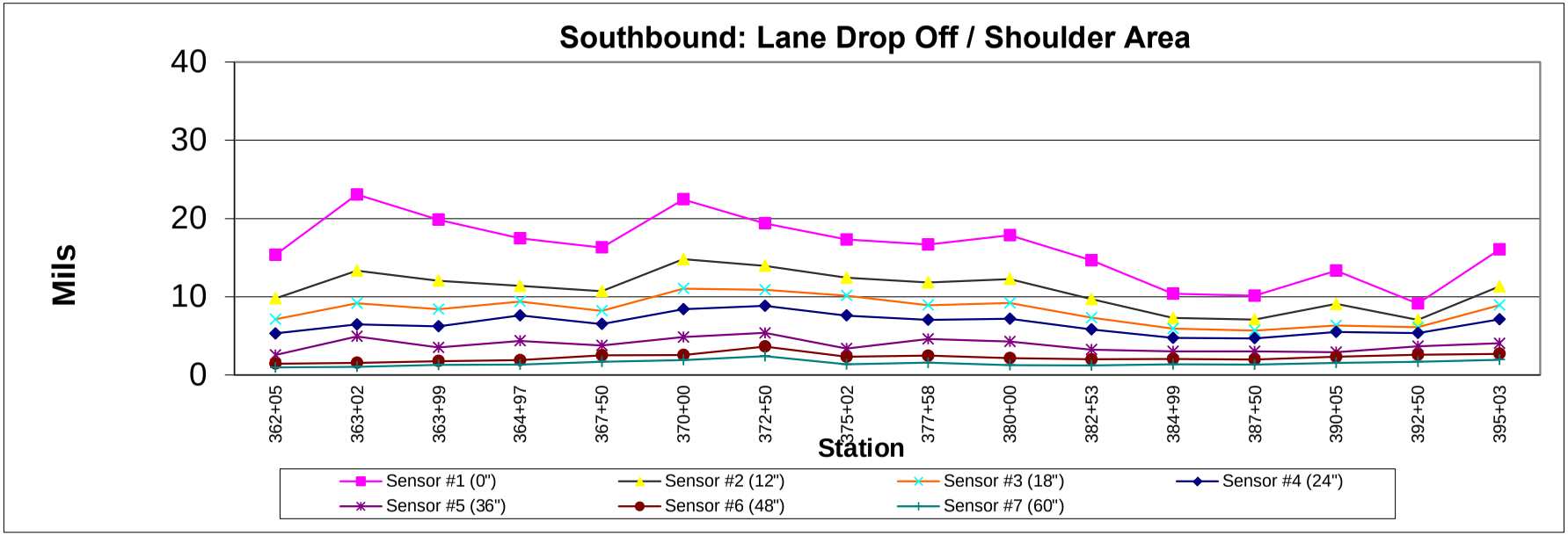
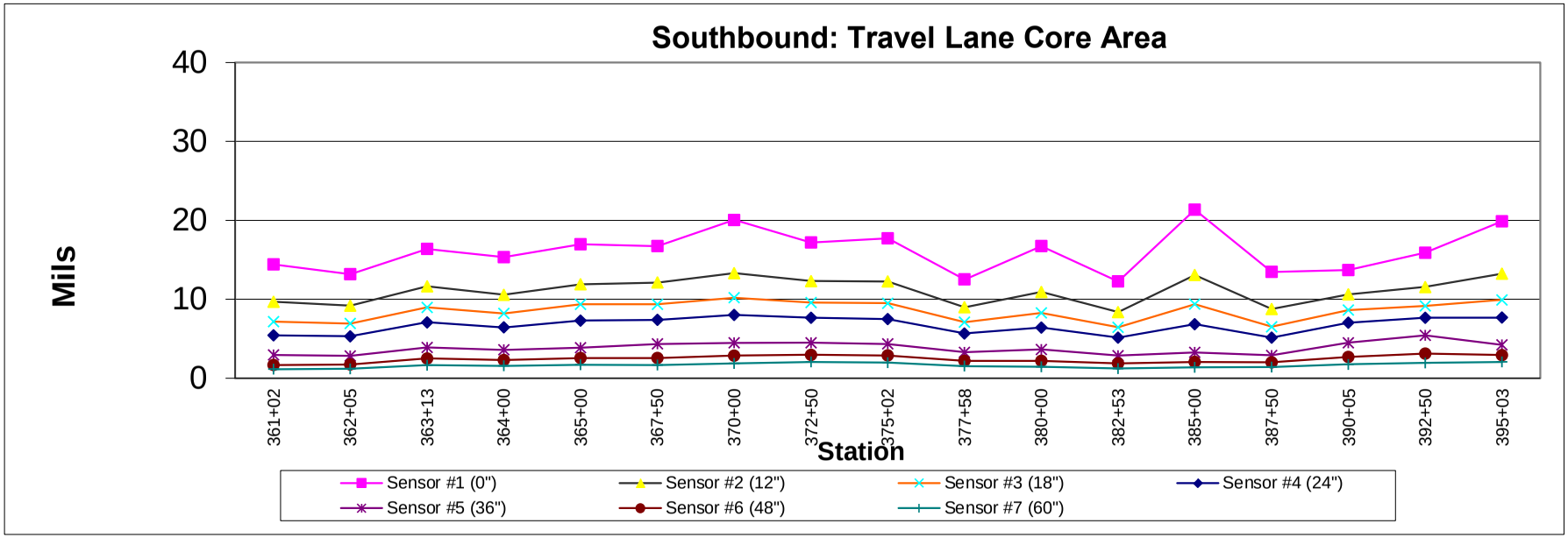




18547.00 Blue Hill-Orland
Route #15 (Southbound Inner)

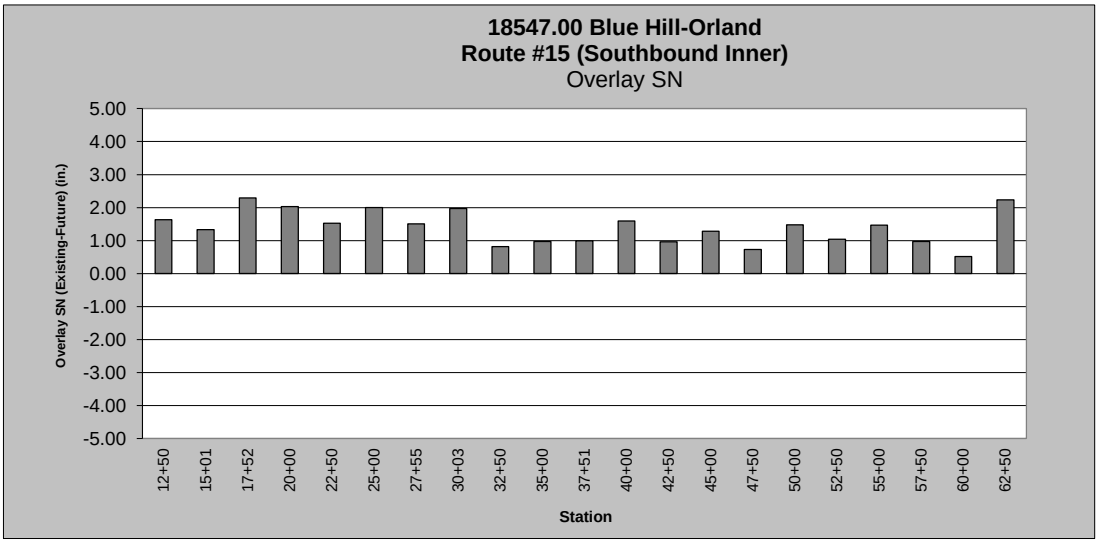
December 18,2014

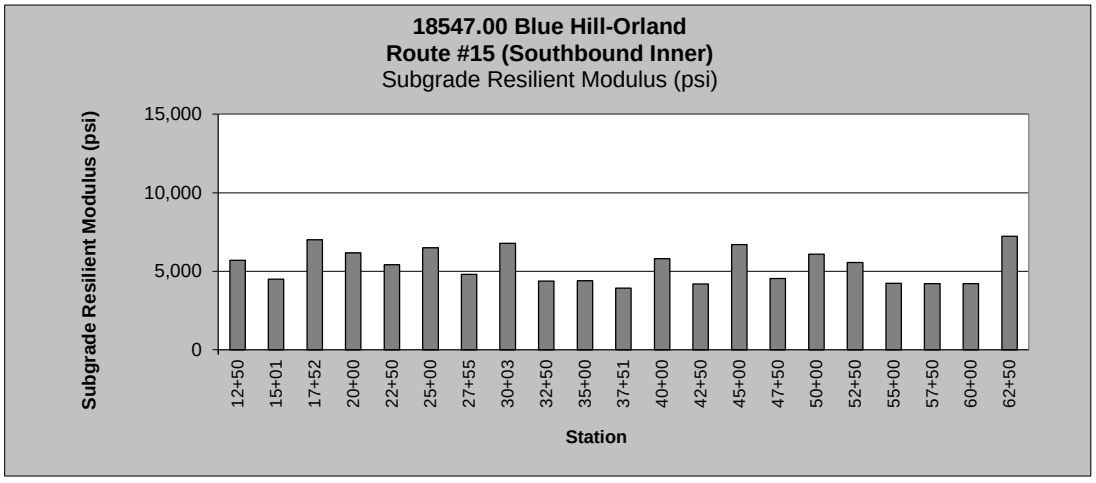
Station (Feet)	Existing Structural Number (in.)	Future Traffic Structural Number (in.)	Overlay Structural Number (Existing - Future)	Recommended Pavement Thickness (in.)	Pavement Modulus (psi)	Subgrade Resilient Modulus (psi)	Pavement Depth (in)	* Combined Pavement/Gravel Depth Used for Calculation (in)
12+50	5.60	3.97	1.63	-	71,446	5,691	4.2	30.0
15+01	5.63	4.30	1.33	-	72,345	4,496	5.7	30.0
17+52	5.98	3.69	2.29	-	86,815	7,000	6.2	30.0
20+00	5.89	3.86	2.03	-	83,233	6,173	6.4	30.0
22+50	5.57	4.04	1.53	-	70,406	5,411	6.2	30.0
25+00	5.79	3.79	2.00	-	78,917	6,502	7.0	30.0
27+55	5.72	4.21	1.51	-	75,905	4,796	6.9	30.0
30+03	5.71	3.74	1.97	-	75,854	6,782	6.2	30.0
32+50	5.16	4.34	0.82	-	55,874	4,380	5.8	30.0
35+00	5.30	4.33	0.97	-	60,474	4,399	6.7	30.0
37+51	5.49	4.50	0.99	-	67,382	3,924	6.2	30.0
40+00	5.54	3.95	1.59	-	69,122	5,794	5.8	30.0
42+50	5.36	4.40	0.96	-	62,421	4,194	5.8	30.0
45+00	5.03	3.75	1.28	-	51,855	6,693	6.4	30.0
47+50	5.02	4.29	0.73	-	51,544	4,534	6.6	30.0
50+00	5.36	3.88	1.48	-	62,550	6,081	7.3	30.0
52+50	5.04	4.00	1.04	-	52,141	5,559	6.6	30.0
55+00	5.86	4.39	1.47	-	81,586	4,227	7.0	30.0
57+50	5.37	4.40	0.97	-	62,919	4,207	5.8	30.0
60+00	4.91	4.39	0.52	-	48,179	4,217	6.5	30.0
62+50	5.88	3.65	2.23	-	82,481	7,234	6.2	30.0

Possible Weak Soils (<3000)

Possible Shallow Bedrock (>10000)

Pavement depths were taken from Ground Penetrating Radar Summary Sheet - SouthBound Lane/Outer Wheelpath.





18547.00 Blue Hill-Orland
Route #15 (Southbound Inner)

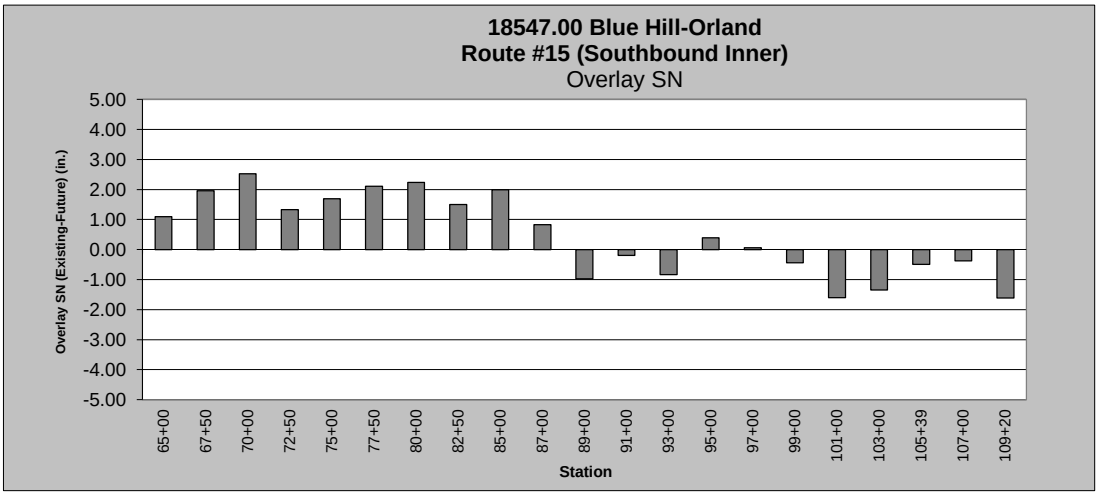
December 18,2014

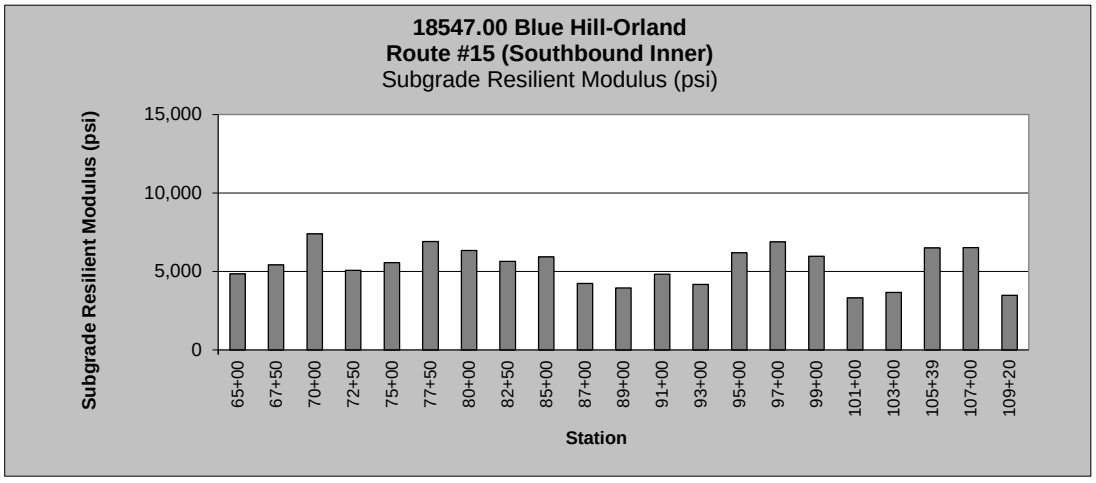
Station (Feet)	Existing Structural Number (in.)	Future Traffic Structural Number (in.)	Overlay Structural Number (Existing - Future)	Recommended Pavement Thickness (in.)	Pavement Modulus (psi)	Subgrade Resilient Modulus (psi)	Pavement Depth (in)	* Combined Pavement/Gravel Depth Used for Calculation (in)
65+00	5.29	4.19	1.10	-	60,246	4,857	6.1	30.0
67+50	6.00	4.04	1.96	-	87,864	5,414	6.2	30.0
70+00	6.14	3.62	2.52	-	94,000	7,388	6.2	30.0
72+50	5.46	4.13	1.33	-	65,980	5,080	5.9	30.0
75+00	5.69	4.00	1.69	-	74,758	5,569	5.5	30.0
77+50	5.82	3.71	2.11	-	80,213	6,903	6.8	30.0
80+00	6.07	3.83	2.24	-	90,959	6,336	6.3	30.0
82+50	5.48	3.98	1.50	-	66,900	5,645	5.9	30.0
85+00	5.90	3.91	1.99	-	83,500	5,937	5.3	30.0
87+00	5.22	4.39	0.83	-	57,836	4,233	6.4	30.0
89+00	3.52	4.49	**-0.97**	**2.20**	97,648	3,953	6.2	**17.0**
91+00	4.01	4.20	**-0.19**	**0.43**	149,702	4,824	6.0	**16.8**
93+00	3.58	4.41	**-0.83**	**1.89**	106,293	4,179	6.0	**16.8**
95+00	4.25	3.86	0.39	-	135,174	6,188	7.6	**18.4**
97+00	3.77	3.71	0.06	-	99,185	6,893	7.3	**18.1**
99+00	3.47	3.91	**-0.44**	**1.00**	92,002	5,964	6.3	**17.1**
101+00	3.16	4.76	**-1.60**	**3.64**	76,724	3,310	5.7	**16.5**
103+00	3.26	4.61	**-1.35**	**3.07**	67,573	3,658	7.0	**17.8**
105+39	3.30	3.79	**-0.49**	**1.11**	68,801	6,499	7.1	**17.9**
107+00	3.41	3.79	**-0.38**	**0.86**	79,482	6,517	6.8	**17.6**
109+20	3.07	4.68	**-1.61**	**3.66**	55,104	3,476	7.1	**17.9**

Possible Weak Soils (<3000)

Possible Shallow Bedrock (>10000)

Pavement depths were taken from Ground Penetrating Radar Summary Sheet - SouthBound Lane/Outer Wheelpath.





18547.00 Blue Hill-Orland
Route #15 (Southbound Inner)

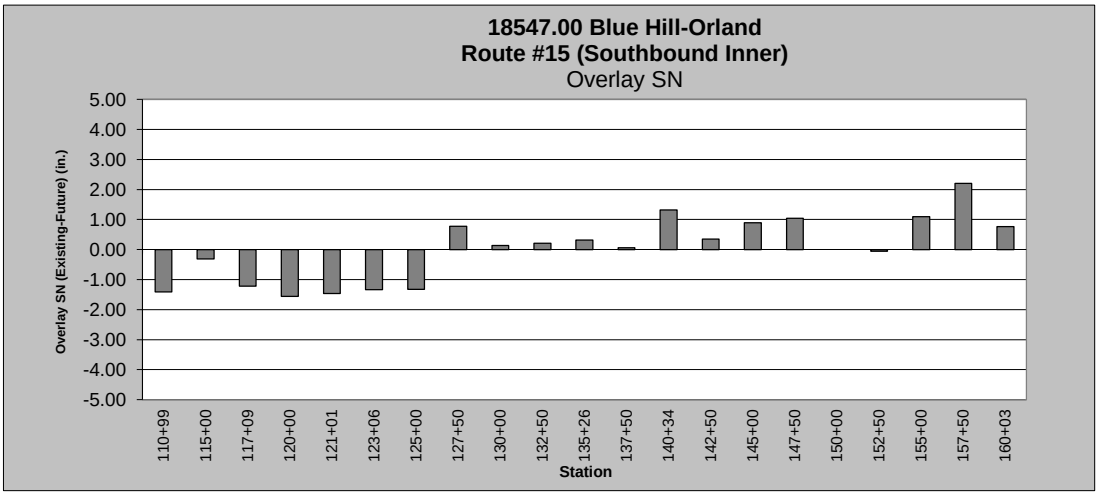
December 18,2014

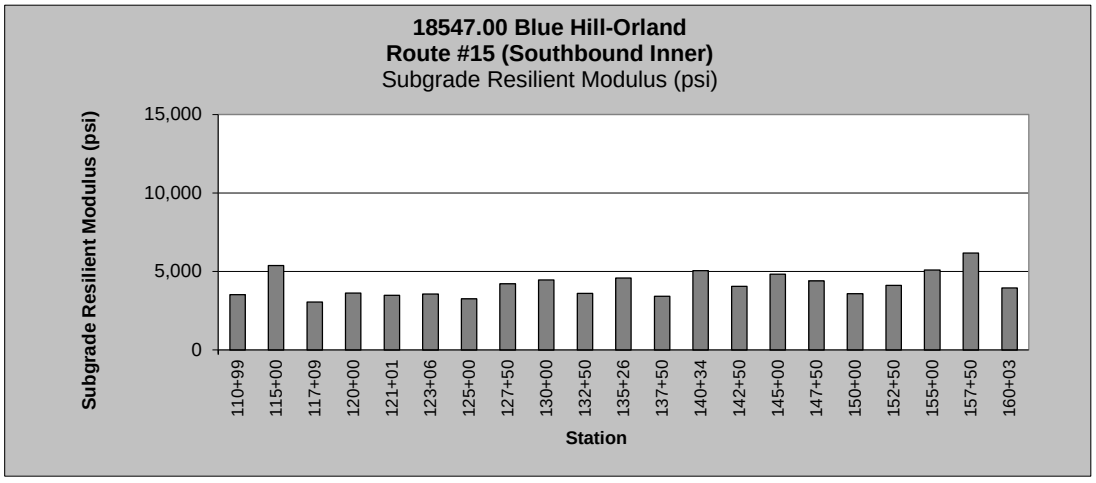
Station (Feet)	Existing Structural Number (in.)	Future Traffic Structural Number (in.)	Overlay Structural Number (Existing - Future)	Recommended Pavement Thickness (in.)	Pavement Modulus (psi)	Subgrade Resilient Modulus (psi)	Pavement Depth (in)	* Combined Pavement/Gravel Depth Used for Calculation (in)
110+99	3.26	4.67	**-1.41**	**3.20**	67,526	3,518	7.0	**17.8**
115+00	3.74	4.05	**-0.31**	**0.70**	100,251	5,374	7.1	**17.9**
117+09	3.67	4.89	**-1.22**	**2.77**	106,376	3,047	6.4	**17.2**
120+00	3.06	4.62	**-1.56**	**3.55**	63,980	3,626	6.2	**17.0**
121+01	3.22	4.68	**-1.46**	**3.32**	70,903	3,483	6.5	**17.3**
123+06	3.31	4.65	**-1.34**	**3.05**	80,977	3,564	6.2	**17.0**
125+00	3.46	4.79	**-1.33**	**3.02**	86,139	3,250	6.6	**17.4**
127+50	5.16	4.39	0.77	-	74,176	4,218	6.9	27.3
130+00	4.45	4.31	0.14	-	50,345	4,456	6.4	26.8
132+50	4.84	4.63	0.21	-	63,758	3,611	6.5	26.9
135+26	4.60	4.28	0.32	-	61,530	4,572	5.5	25.9
137+50	4.77	4.71	0.06	-	59,674	3,418	6.7	27.1
140+34	5.45	4.13	1.32	-	86,359	5,056	7.0	27.4
142+50	4.80	4.45	0.35	-	57,803	4,054	7.2	27.6
145+00	5.09	4.20	0.89	-	68,655	4,824	7.2	27.6
147+50	5.37	4.33	1.04	-	86,297	4,399	6.6	27.0
150+00	4.64	4.64	0.00	-	54,472	3,585	6.8	27.2
152+50	4.37	4.43	**-0.06**	**0.14**	50,958	4,121	5.8	26.2
155+00	5.21	4.12	1.09	-	79,523	5,091	6.5	26.9
157+50	6.06	3.86	2.20	-	126,713	6,179	6.4	26.8
160+03	5.25	4.49	0.76	-	86,218	3,957	6.0	26.4

Possible Weak Soils (<3000)

Possible Shallow Bedrock (>10000)

Pavement depths were taken from Ground Penetrating Radar Summary Sheet - SouthBound Lane/Outer Wheelpath.





18547.00 Blue Hill-Orland
Route #15 (Southbound Inner)

December 18,2014

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)
162+50	4.89	4.51	0.38	-	65,091	3,897	6.6	27.0
165+00	5.19	4.23	0.96	-	88,228	4,721	5.5	25.9
167+50	5.50	4.16	1.34	-	95,669	4,955	6.3	26.7
170+00	5.96	4.01	1.95	-	129,260	5,540	5.8	26.2
172+50	5.15	4.41	0.74	-	83,439	4,180	5.8	26.2
175+00	4.48	4.88	**-0.40**	**0.91**	51,304	3,059	6.4	26.8
176+01	4.90	4.76	0.14	-	62,574	3,316	7.0	27.4
177+00	4.75	4.40	0.35	-	62,446	4,214	6.2	26.6
180+00	4.73	4.57	0.16	-	66,696	3,737	5.5	25.9
182+53	4.68	3.98	0.70	-	60,985	5,633	6.0	26.4
185+00	4.66	3.61	1.05	-	57,779	7,458	6.4	26.8
187+50	5.25	3.93	1.32	-	87,309	5,866	5.9	26.3
190+00	5.76	4.61	1.15	-	106,366	3,643	6.6	27.0
192+50	4.87	4.24	0.63	-	68,924	4,707	6.0	26.4
195+00	4.76	4.26	0.50	-	64,372	4,628	6.0	26.4
197+50	5.67	4.00	1.67	-	103,002	5,565	6.5	26.9
200+00	5.45	4.01	1.44	-	92,476	5,522	6.4	26.8
202+50	4.86	4.54	0.32	-	65,527	3,816	6.4	26.8
205+00	5.27	4.54	0.73	-	88,473	3,826	5.9	26.3
207+53	5.08	4.41	0.67	-	72,373	4,163	6.7	27.1
210+00	5.39	4.23	1.16	-	94,610	4,742	5.9	26.3

Possible Weak Soils (<3000)

Possible Shallow Bedrock (>10000)

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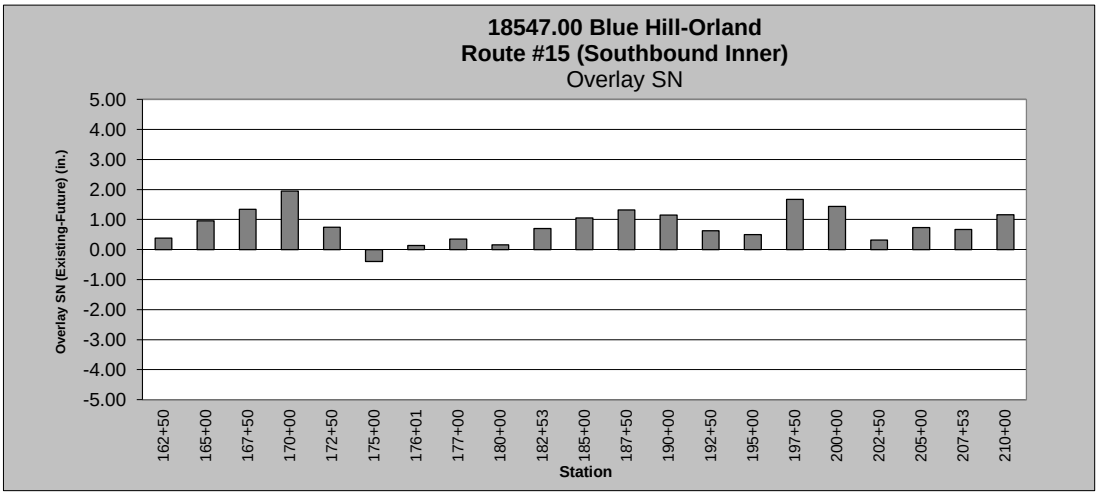
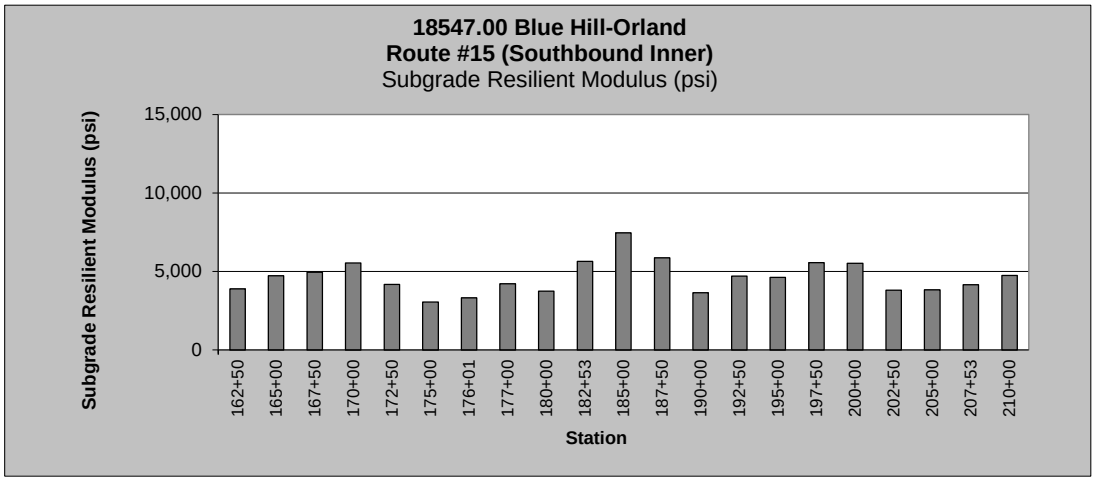




18547.00 Blue Hill-Orland
Route #15 (Southbound Inner)

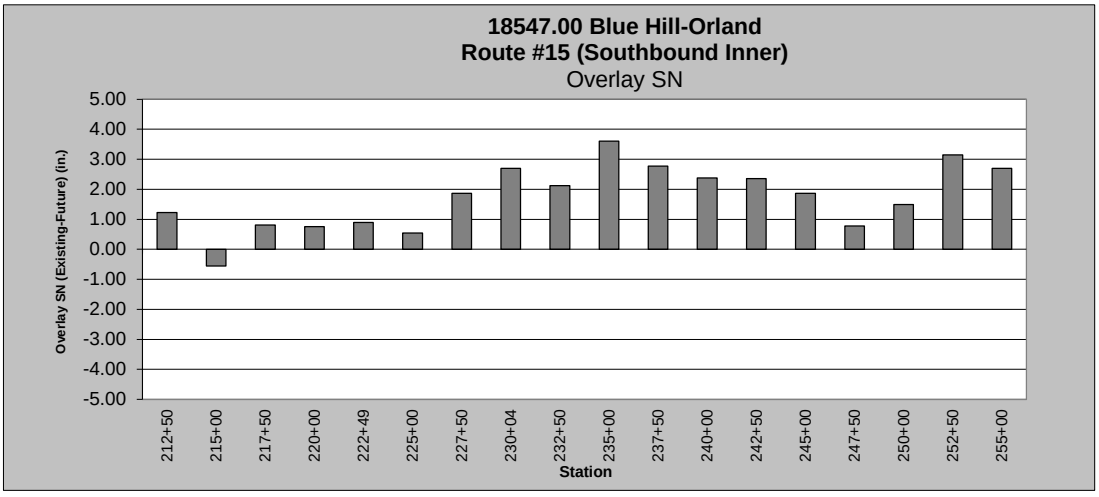
December 18,2014

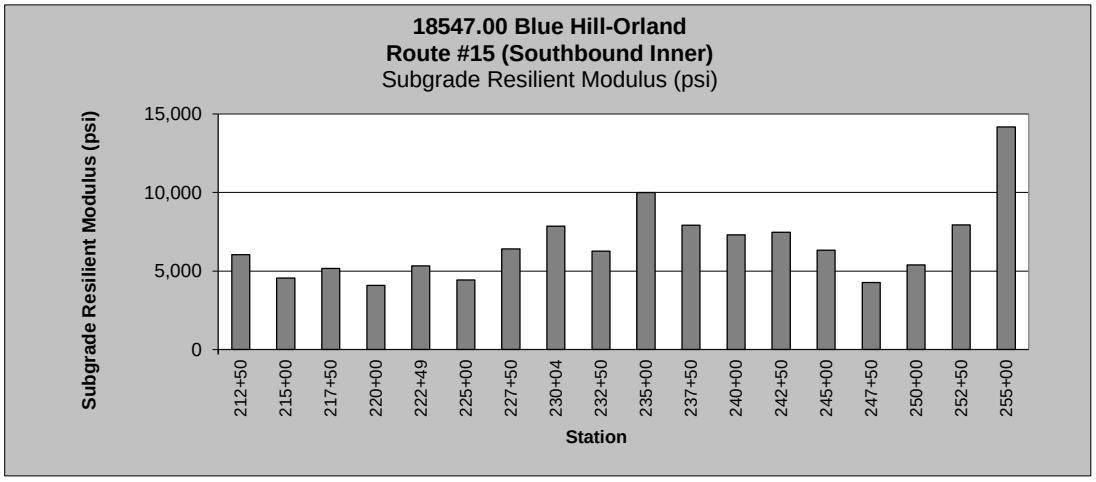
Station (Feet)	Existing Structural Number (in.)	Future Traffic Structural Number (in.)	Overlay Structural Number (Existing - Future)	Recommended Pavement Thickness (in.)	Pavement Modulus (psi)	Subgrade Resilient Modulus (psi)	Pavement Depth (in)	* Combined Pavement/Gravel Depth Used for Calculation (in)
212+50	5.12	3.89	1.23	-	71,566	6,034	7.0	27.4
215+00	3.72	4.28	**-0.56**	**1.27**	40,370	4,551	3.7	24.1
217+50	4.92	4.11	0.81	-	94,268	5,162	3.6	24.0
220+00	5.20	4.44	0.76	-	84,726	4,093	5.9	26.3
222+49	4.95	4.06	0.89	-	74,228	5,324	5.8	26.2
225+00	4.87	4.33	0.54	-	69,728	4,422	5.9	26.3
227+50	5.67	3.81	1.86	-	74,062	6,418	6.5	30.0
230+04	6.25	3.55	2.70	-	99,209	7,861	6.6	30.0
232+50	5.96	3.84	2.12	-	86,136	6,256	6.5	30.0
235+00	6.85	3.25	3.60	-	128,949	9,992	6.8	30.0
237+50	6.31	3.54	2.77	-	102,268	7,925	6.0	30.0
240+00	6.02	3.64	2.38	-	88,876	7,315	5.6	30.0
242+50	5.97	3.61	2.36	-	86,580	7,465	6.1	30.0
245+00	5.69	3.83	1.86	-	75,016	6,318	6.7	30.0
247+50	5.16	4.38	0.78	-	55,900	4,266	3.5	30.0
250+00	5.53	4.04	1.49	-	68,773	5,395	3.3	30.0
252+50	6.67	3.53	3.14	-	120,388	7,943	3.1	30.0
255+00	5.57	2.87	2.70	-	70,316	**14,172**	2.9	30.0

Possible Weak Soils (<3000)

Possible Shallow Bedrock (>10000)

Pavement depths were taken from Ground Penetrating Radar Summary Sheet - SouthBound Lane/Outer Wheelpath.





18547.00 Blue Hill-Orland
Route #15 (Southbound Inner)

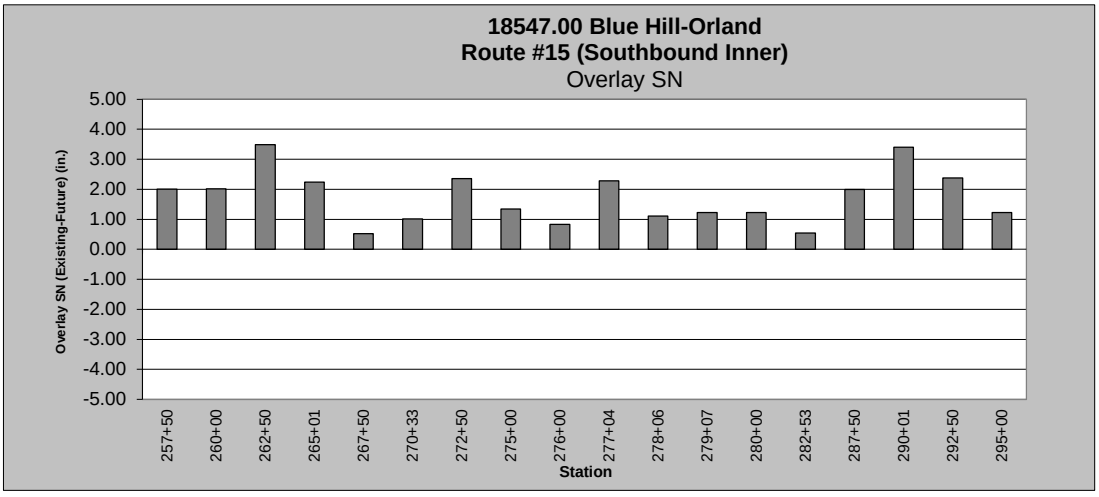
December 18,2014

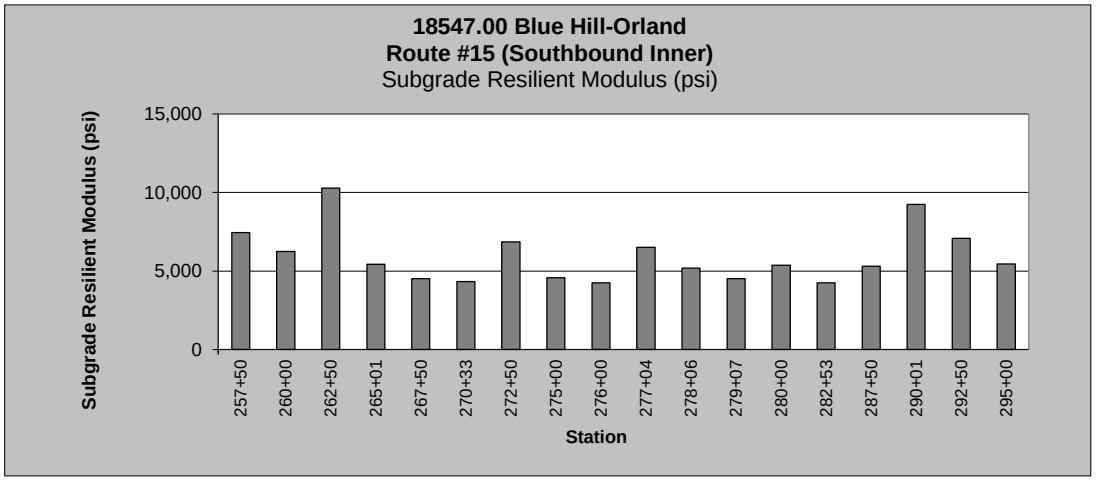
Station (Feet)	Existing Structural Number (in.)	Future Traffic Structural Number (in.)	Overlay Structural Number (Existing - Future)	Recommended Pavement Thickness (in.)	Pavement Modulus (psi)	Subgrade Resilient Modulus (psi)	Pavement Depth (in)	* Combined Pavement/Gravel Depth Used for Calculation (in)
257+50	5.61	3.61	2.00	-	71,711	7,454	3.5	30.0
260+00	5.85	3.84	2.01	-	81,321	6,252	3.6	30.0
262+50	6.71	3.22	3.49	-	122,806	**10,273**	5.7	30.0
265+01	6.28	4.04	2.24	-	100,454	5,425	6.4	30.0
267+50	4.82	4.30	0.52	-	45,402	4,515	6.2	30.0
270+33	5.36	4.35	1.01	-	62,502	4,336	5.7	30.0
272+50	6.08	3.72	2.36	-	91,172	6,850	5.9	30.0
275+00	5.62	4.28	1.34	-	72,283	4,567	6.7	30.0
276+00	5.21	4.38	0.83	-	57,598	4,254	7.0	30.0
277+04	6.07	3.79	2.28	-	91,100	6,518	7.5	30.0
278+06	5.21	4.10	1.11	-	57,598	5,176	7.4	30.0
279+07	5.52	4.29	1.23	-	68,434	4,521	6.8	30.0
280+00	5.27	4.05	1.22	-	59,564	5,359	6.7	30.0
282+53	4.93	4.39	0.54	-	48,831	4,240	5.9	30.0
287+50	6.05	4.06	1.99	-	89,970	5,314	5.1	30.0
290+01	6.75	3.35	3.40	-	125,112	9,233	5.3	30.0
292+50	6.06	3.68	2.38	-	90,497	7,087	3.8	30.0
295+00	5.25	4.03	1.22	-	58,791	5,442	5.1	30.0

Possible Weak Soils (<3000)

Possible Shallow Bedrock (>10000)

Pavement depths were taken from Ground Penetrating Radar Summary Sheet - SouthBound Lane/Outer Wheelpath.





18547.00 Blue Hill-Orland
Route #15 (Southbound Inner)

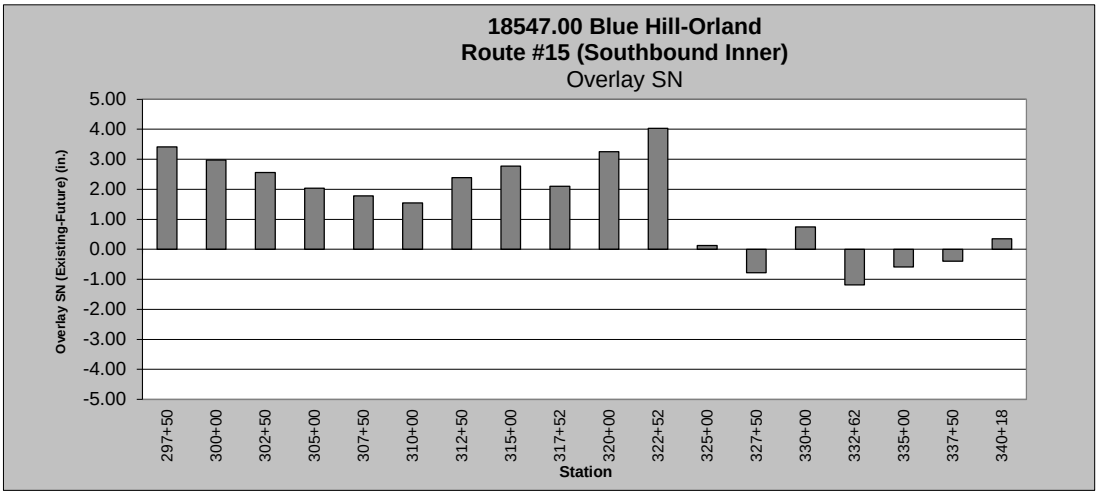
December 18,2014

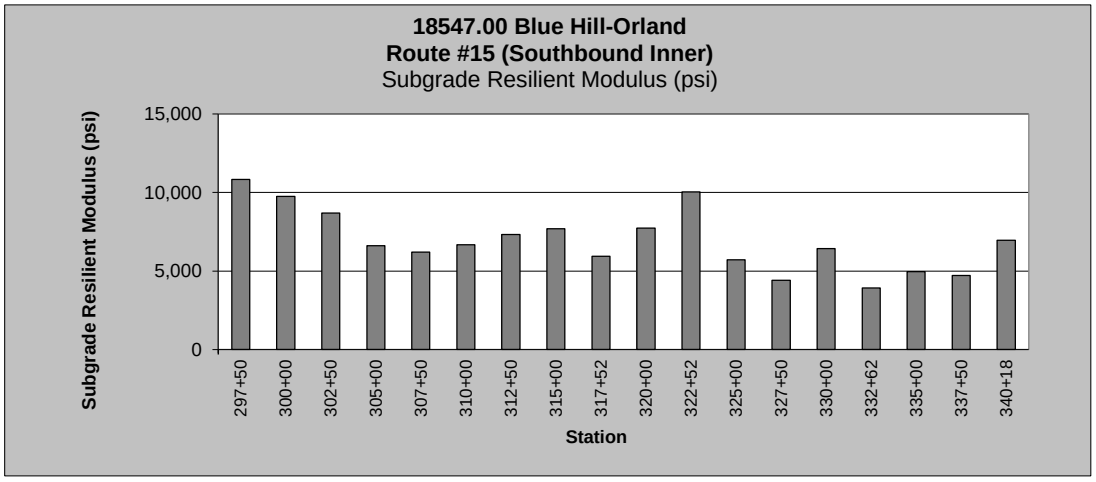
Station (Feet)	Existing Structural Number (in.)	Future Traffic Structural Number (in.)	Overlay Structural Number (Existing - Future)	Recommended Pavement Thickness (in.)	Pavement Modulus (psi)	Subgrade Resilient Modulus (psi)	Pavement Depth (in)	* Combined Pavement/Gravel Depth Used for Calculation (in)
297+50	6.57	3.16	3.41	-	115,126	**10,828**	4.8	30.0
300+00	6.25	3.28	2.97	-	99,376	9,747	3.5	30.0
302+50	5.98	3.42	2.56	-	86,807	8,691	5.9	30.0
305+00	5.81	3.77	2.04	-	79,903	6,609	5.2	30.0
307+50	5.63	3.85	1.78	-	72,372	6,203	4.5	30.0
310+00	5.31	3.76	1.55	-	60,932	6,668	4.2	30.0
312+50	6.03	3.64	2.39	-	88,995	7,325	4.8	30.0
315+00	6.34	3.57	2.77	-	103,749	7,701	4.5	30.0
317+52	6.01	3.91	2.10	-	88,401	5,930	4.7	30.0
320+00	6.82	3.57	3.25	-	128,808	7,739	5.1	30.0
322+52	7.28	3.25	4.03	-	156,567	**10,045**	5.1	30.0
325+00	4.09	3.96	0.13	-	84,742	5,715	7.0	20.7
327+50	3.55	4.33	**-0.78**	**1.77**	58,007	4,415	6.7	20.4
330+00	4.55	3.81	0.74	-	111,521	6,421	7.3	21.0
332+62	3.33	4.51	**-1.18**	**2.68**	76,744	3,911	3.7	**17.4**
335+00	3.57	4.16	**-0.59**	**1.34**	99,473	4,960	3.4	**17.1**
337+50	3.83	4.23	**-0.40**	**0.91**	81,592	4,726	5.9	**19.6**
340+18	4.05	3.70	0.35	-	93,632	6,951	6.1	**19.8**

Possible Weak Soils (<3000)

Possible Shallow Bedrock (>10000)

Pavement depths were taken from Ground Penetrating Radar Summary Sheet - SouthBound Lane/Outer Wheelpath.





18547.00 Blue Hill-Orland
Route #15 (Southbound Inner)

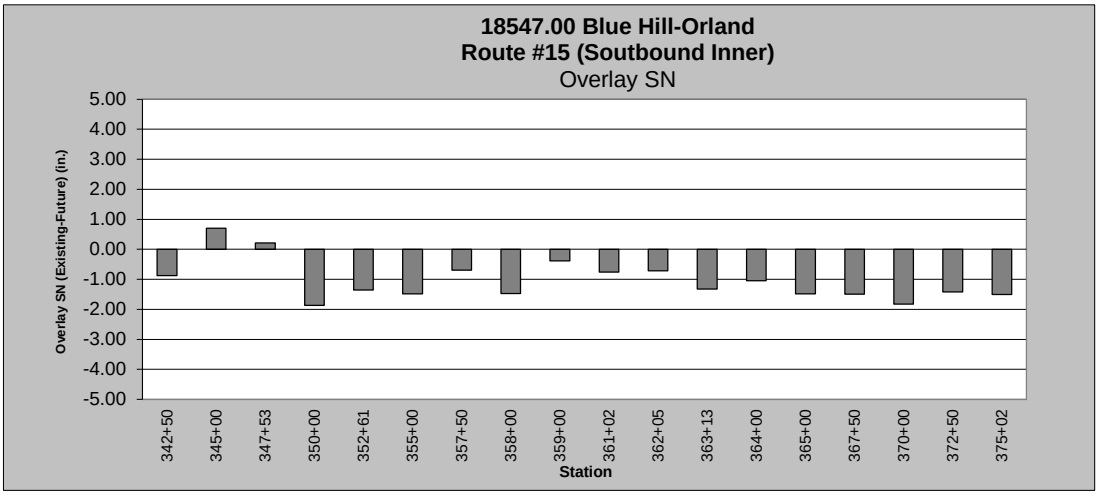
December 18,2014

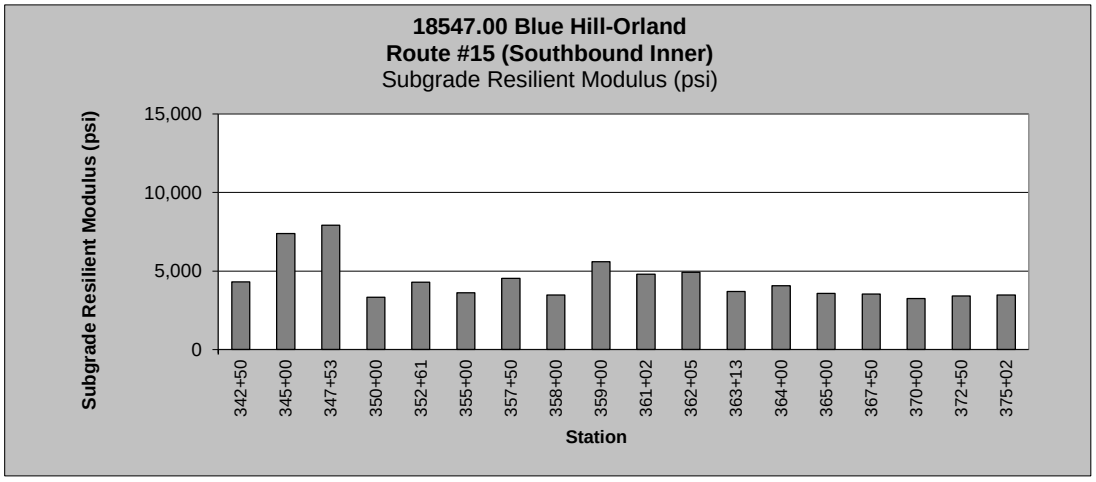
Station (Feet)	Existing Structural Number (in.)	Future Traffic Structural Number (in.)	Overlay Structural Number (Existing - Future)	Recommended Pavement Thickness (in.)	Pavement Modulus (psi)	Subgrade Resilient Modulus (psi)	Pavement Depth (in)	* Combined Pavement/Gravel Depth Used for Calculation (in)
342+50	3.48	4.36	**-0.88**	**2.00**	61,161	4,305	5.9	**19.6**
345+00	4.32	3.62	0.70	-	105,560	7,394	6.6	20.3
347+53	3.75	3.54	0.21	-	69,932	7,921	6.5	20.2
350+00	2.88	4.75	**-1.87**	**4.25**	66,334	3,334	6.2	**15.8**
352+61	3.01	4.37	**-1.36**	**3.09**	78,878	4,284	6.0	**15.6**
355+00	3.15	4.63	**-1.48**	**3.36**	109,975	3,605	5.0	**14.6**
357+50	3.60	4.29	**-0.69**	**1.57**	134,794	4,526	6.0	**15.6**
358+00	3.22	4.69	**-1.47**	**3.34**	94,596	3,468	6.1	**15.7**
359+00	3.61	3.99	**-0.38**	**0.86**	117,171	5,602	6.8	**16.4**
361+02	3.45	4.21	**-0.76**	**1.73**	111,747	4,796	6.3	**15.9**
362+05	3.45	4.17	**-0.72**	**1.64**	118,819	4,913	6.0	**15.6**
363+13	3.27	4.59	**-1.32**	**3.00**	101,459	3,687	6.0	**15.6**
364+00	3.40	4.45	**-1.05**	**2.39**	109,744	4,059	6.2	**15.8**
365+00	3.16	4.64	**-1.48**	**3.36**	98,224	3,573	5.6	**15.2**
367+50	3.17	4.66	**-1.49**	**3.39**	107,375	3,532	5.2	**14.8**
370+00	2.95	4.78	**-1.83**	**4.16**	77,129	3,257	5.8	**15.4**
372+50	3.29	4.71	**-1.42**	**3.23**	107,395	3,409	5.8	**15.4**
375+02	3.17	4.68	-1.51	-	97,317	3,480	5.7	**15.3**

Possible Weak Soils (<3000)

Possible Shallow Bedrock (>10000)

Pavement depths were taken from Ground Penetrating Radar Summary Sheet - SouthBound Lane/Outer Wheelpath.





18547.00 Blue Hill-Orland
Route #15 (Southbound Inner)

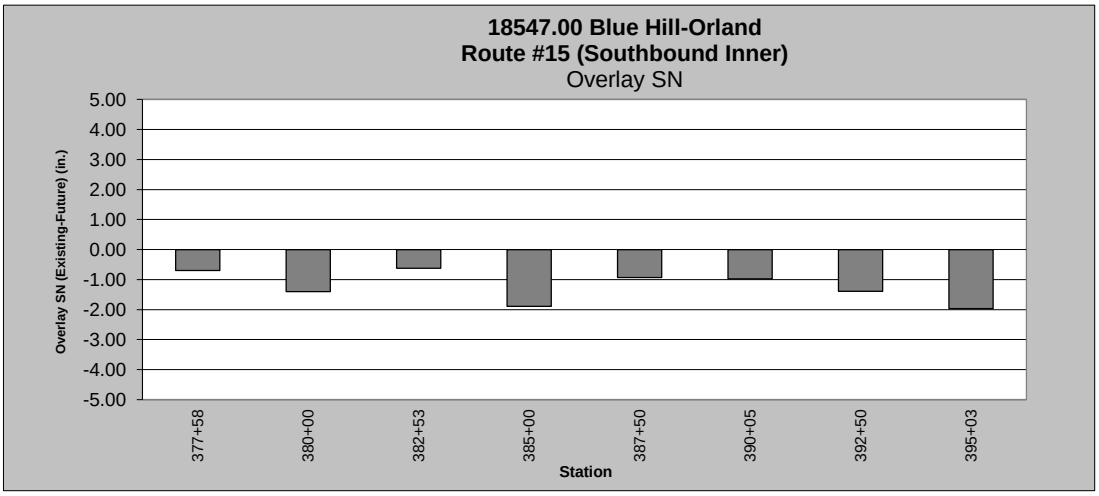
December 18,2014

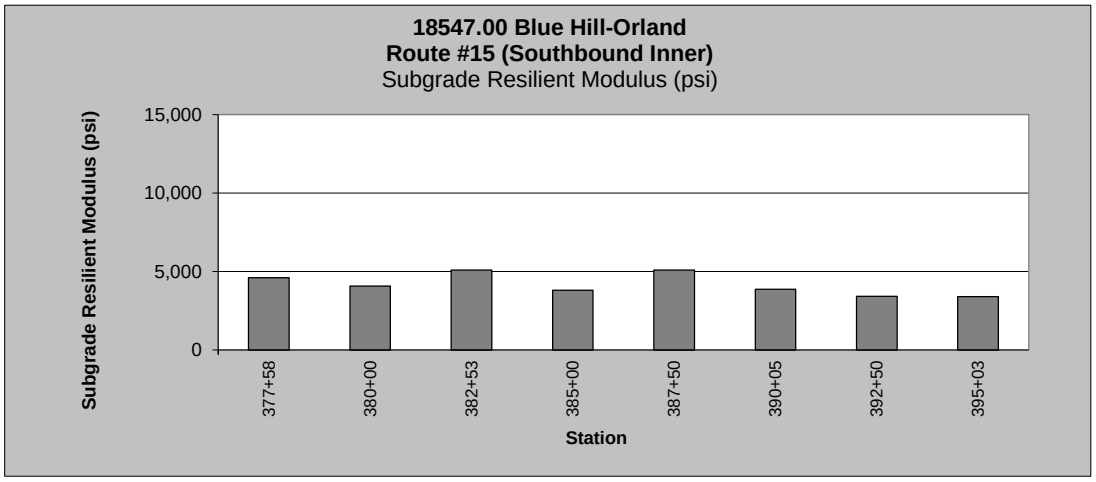
Station (Feet)	Existing Structural Number (in.)	Future Traffic Structural Number (in.)	Overlay Structural Number (Existing - Future)	Recommended Pavement Thickness (in.)	Pavement Modulus (psi)	Subgrade Resilient Modulus (psi)	Pavement Depth (in)	* Combined Pavement/Gravel Depth Used for Calculation (in)
377+58	3.57	4.27	**-0.70**	**1.59**	150,628	4,605	5.3	**14.9**
380+00	3.05	4.45	**-1.40**	**3.18**	98,001	4,072	5.1	**14.7**
382+53	3.51	4.13	**-0.62**	**1.41**	140,488	5,088	5.4	**15.0**
385+00	2.65	4.54	**-1.89**	**4.30**	66,734	3,810	4.9	**14.5**
387+50	3.20	4.13	**-0.93**	**2.11**	120,883	5,083	4.8	**14.4**
390+05	3.55	4.52	**-0.97**	**2.20**	148,167	3,871	5.3	**14.9**
392+50	3.32	4.71	**-1.39**	**3.16**	112,097	3,412	5.7	**15.3**
395+03	2.75	4.72	**-1.97**	**4.48**	81,513	3,398	4.5	**14.1**

Possible Weak Soils (<3000)

Possible Shallow Bedrock (>10000)

Pavement depths were taken from Ground Penetrating Radar Summary Sheet - SouthBound Lane/Outer Wheelpath.





18547.00 Blue Hill-Orland
Route #15 (Northbound Outer)

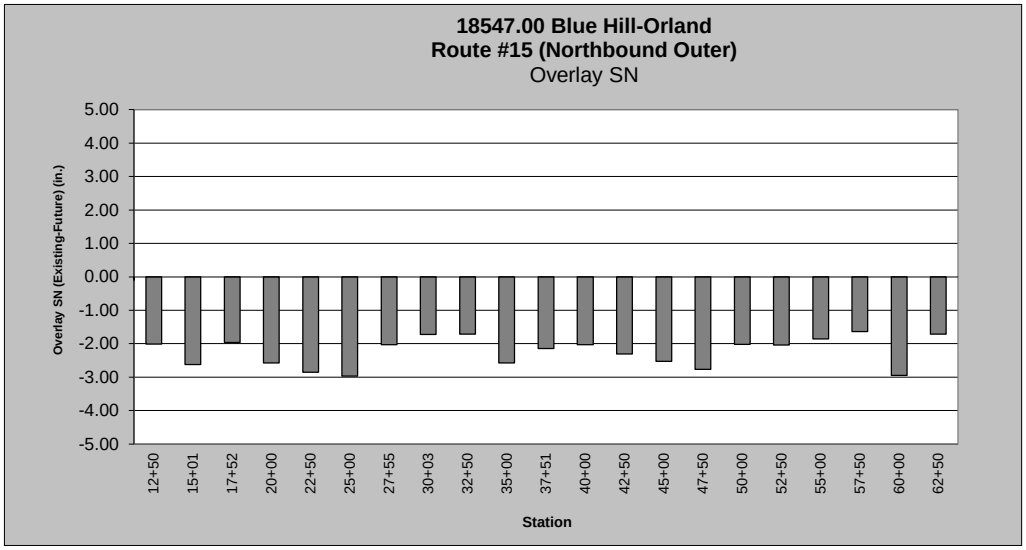
December 18,2014

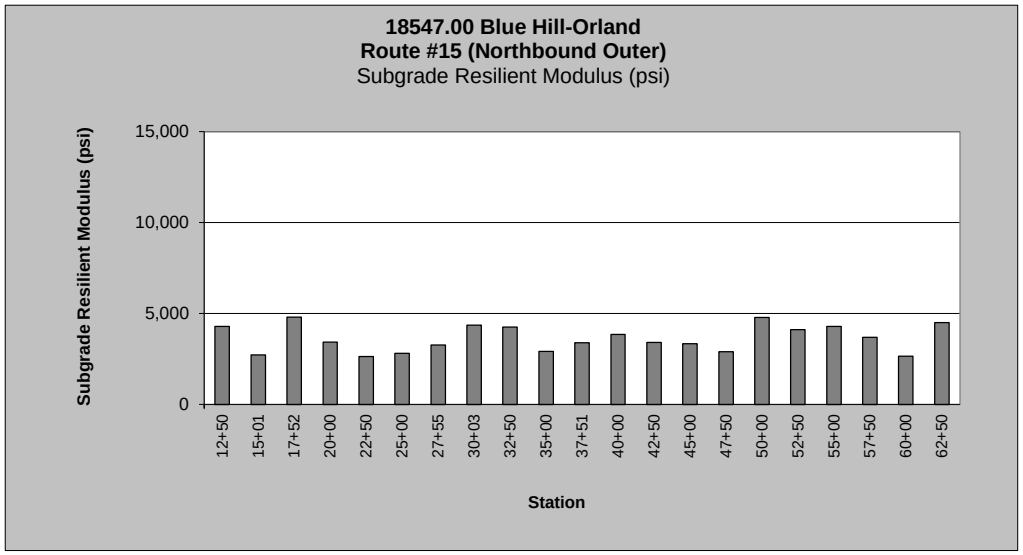
Station (Feet)	Existing Structural Number (in.)	Future Traffic Structural Number (in.)	Overlay Structural Number (Existing - Future)	Recommended Pavement Thickness (in.)	Pavement Modulus (psi)	Subgrade Resilient Modulus (psi)	Pavement Depth (in)	* Combined Pavement/Gravel Depth Used for Calculation (in)
12+50	2.13	4.14	**-2.01**	**4.57**	263,453	4,291	3.4	**3.4**
15+01	2.19	4.81	**-2.62**	**5.95**	320,403	**2,720**	3.1	**3.1**
17+52	2.02	3.98	**-1.96**	**4.45**	251,508	4,791	3.1	**3.1**
20+00	1.89	4.46	**-2.57**	**5.84**	235,388	3,424	2.8	**2.8**
22+50	2.02	4.87	**-2.85**	**6.48**	169,266	**2,628**	4.1	**4.1**
25+00	1.79	4.76	**-2.97**	**6.75**	160,583	**2,805**	3.3	**3.3**
27+55	2.50	4.53	**-2.03**	**4.61**	373,735	3,264	3.7	**3.7**
30+03	2.39	4.11	**-1.72**	**3.91**	316,585	4,361	3.8	**3.8**
32+50	2.44	4.15	**-1.71**	**3.89**	395,473	4,248	3.4	**3.4**
35+00	2.13	4.70	**-2.57**	**5.84**	367,672	**2,923**	2.6	**2.6**
37+51	2.34	4.48	**-2.14**	**4.86**	445,151	3,393	2.8	**2.8**
40+00	2.26	4.29	**-2.03**	**4.61**	327,541	3,851	3.3	**3.3**
42+50	2.16	4.47	**-2.31**	**5.25**	261,925	3,406	3.5	**3.5**
45+00	1.97	4.50	**-2.53**	**5.75**	257,325	3,343	2.9	**2.9**
47+50	1.95	4.72	**-2.77**	**6.30**	225,878	**2,890**	3.1	**3.1**
50+00	1.97	3.99	**-2.02**	**4.59**	235,603	4,779	3.1	**3.1**
52+50	2.16	4.20	**-2.04**	**4.64**	271,370	4,109	3.4	**3.4**
55+00	2.28	4.14	**-1.86**	**4.23**	362,163	4,280	3.1	**3.1**
57+50	2.71	4.35	**-1.64**	**3.73**	461,748	3,684	3.8	**3.8**
60+00	1.91	4.86	**-2.95**	**6.70**	291,788	**2,644**	2.4	**2.4**
62+50	2.36	4.07	**-1.71**	**3.89**	357,578	4,501	3.4	**3.4**

Possible Weak Soils (<3000)

Possible Shallow Bedrock (>10000)

Pavement depths were taken from Ground Penetrating Radar Summary Sheet - North Bound Lane/Outer Edge (White Line).





18547.00 Blue Hill-Orland
Route #15 (Northbound Outer)

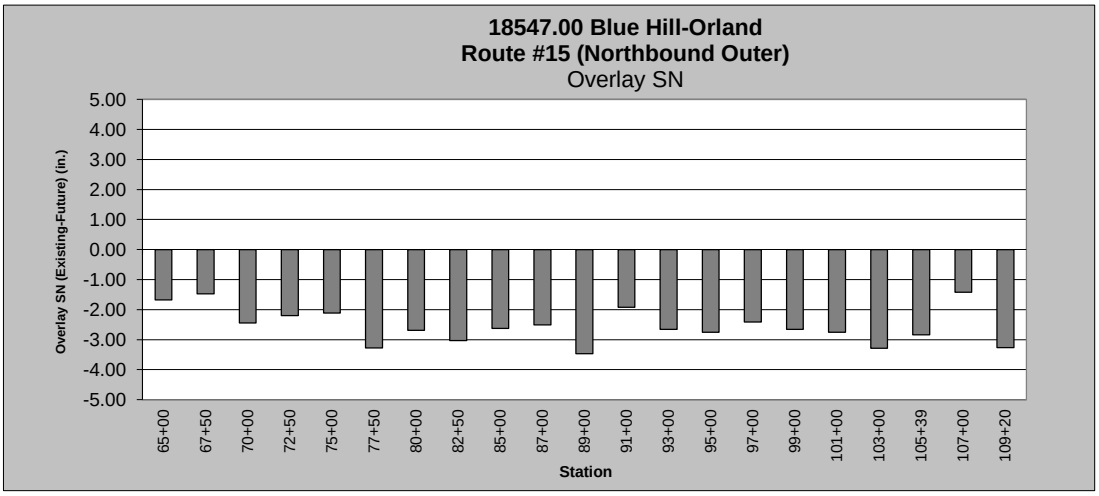
December 18,2014

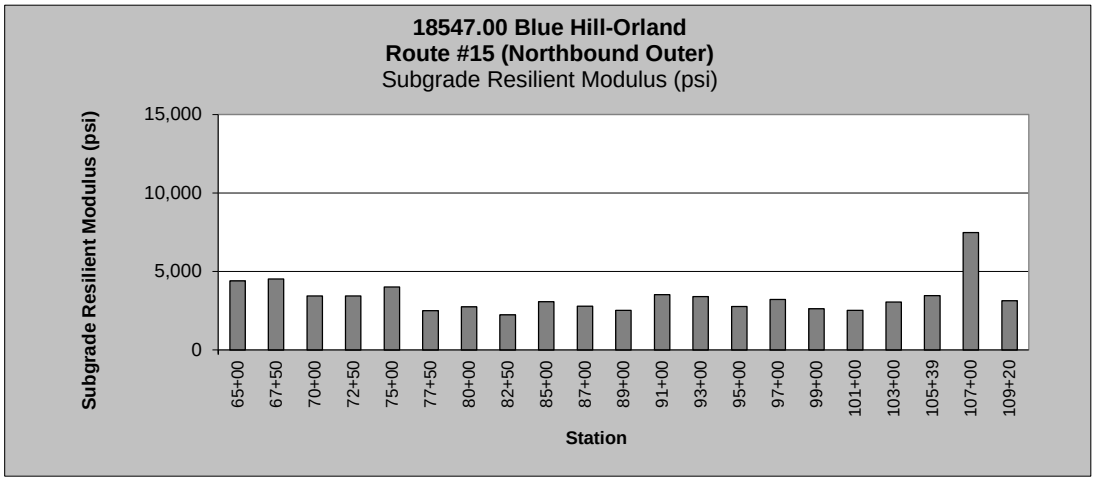
Station (Feet)	Existing Structural Number (in.)	Future Traffic Structural Number (in.)	Overlay Structural Number (Existing - Future)	Recommended Pavement Thickness (in.)	Pavement Modulus (psi)	Subgrade Resilient Modulus (psi)	Pavement Depth (in)	* Combined Pavement/Gravel Depth Used for Calculation (in)
65+00	2.42	4.10	**-1.68**	**3.82**	381,697	4,390	3.4	**7.4**
67+50	2.59	4.06	**-1.47**	**3.34**	509,107	4,520	3.2	**7.2**
70+00	2.00	4.45	**-2.45**	**5.57**	235,564	3,449	3.2	**7.2**
72+50	2.26	4.46	**-2.20**	**5.00**	339,151	3,431	3.2	**7.2**
75+00	2.12	4.24	**-2.12**	**4.82**	236,614	4,003	3.6	**7.6**
77+50	1.66	4.94	**-3.28**	**7.45**	135,659	**2,507**	3.2	**7.2**
80+00	2.11	4.80	**-2.69**	**6.11**	187,680	**2,745**	4.2	**8.2**
82+50	2.09	5.12	**-3.03**	**6.89**	366,057	**2,243**	2.5	**6.5**
85+00	2.00	4.63	**-2.63**	**5.98**	305,458	3,067	2.6	**6.6**
87+00	1.96	4.47	**-2.51**	**6.39**	212,175	**2,797**	3.3	**7.3**
89+00	1.46	4.93	**-3.47**	**7.89**	124,792	**2,523**	2.5	**6.5**
91+00	2.50	4.42	**-1.92**	**4.36**	312,546	3,515	4.2	**8.2**
93+00	1.81	4.47	**-2.66**	**6.05**	216,653	3,397	2.7	**6.7**
95+00	2.02	4.78	**-2.76**	**6.27**	286,517	**2,770**	2.8	**6.8**
97+00	2.14	4.55	**-2.41**	**5.48**	218,225	3,226	3.9	**7.9**
99+00	2.21	4.87	**-2.66**	**6.05**	411,925	**2,616**	2.6	**6.6**
101+00	2.17	4.93	**-2.76**	**6.27**	373,881	**2,521**	2.7	**6.7**
103+00	1.35	4.64	**-3.29**	**7.48**	98,547	3,044	2.5	**6.5**
105+39	1.60	4.44	**-2.84**	**6.45**	178,724	3,470	2.3	**6.3**
107+00	1.99	3.41	**-1.42**	**3.23**	316,934	7,478	2.5	**6.5**
109+20	1.32	4.59	**-3.27**	**7.43**	96,608	3,140	2.4	**6.4**

Possible Weak Soils (<3000)

Possible Shallow Bedrock (>10000)

Pavement depths were taken from Ground Penetrating Radar Summary Sheet - North Bound Lane/Outer Edge (White Line).





18547.00 Blue Hill-Orland
Route #15 (Northbound Outer)

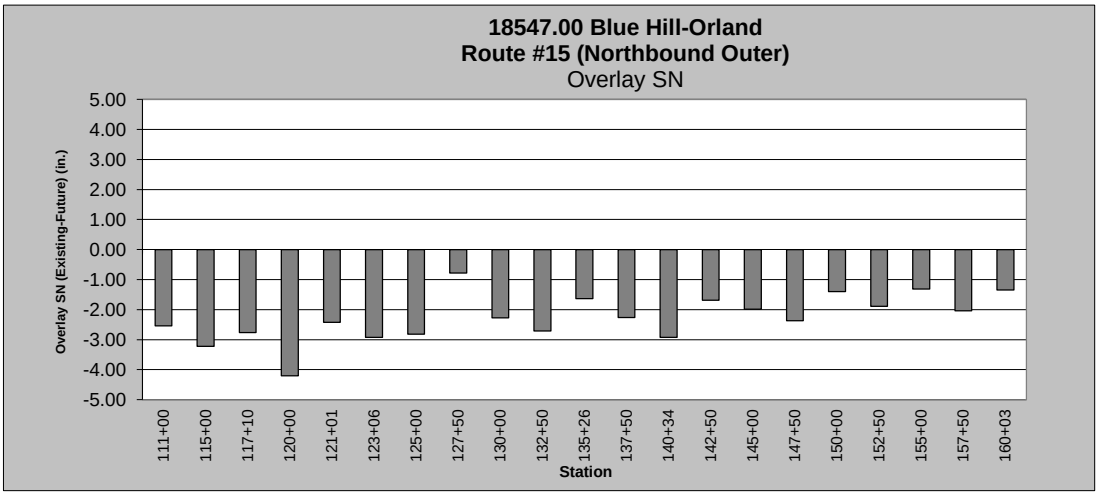
December 18,2014

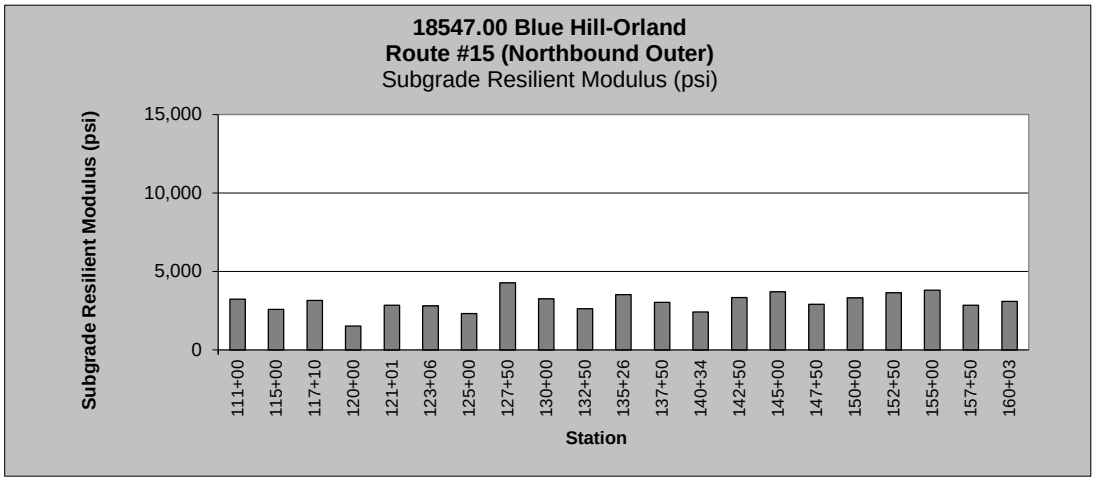
Station (Feet)	Existing Structural Number (in.)	Future Traffic Structural Number (in.)	Overlay Structural Number (Existing - Future)	Recommended Pavement Thickness (in.)	Pavement Modulus (psi)	Subgrade Resilient Modulus (psi)	Pavement Depth (in)	* Combined Pavement/Gravel Depth Used for Calculation (in)
111+00	2.01	4.55	**-2.54**	**5.77**	250,698	3,228	3.1	**7.1**
115+00	1.68	4.90	**-3.22**	**7.32**	230,824	**2,576**	2.1	**6.1**
117+10	1.82	4.59	**-2.77**	**6.30**	250,398	3,146	2.4	**6.4**
120+00	1.57	5.77	**-4.20**	**9.55**	140,981	**1,520**	2.7	**6.7**
121+01	2.33	4.75	**-2.42**	**5.50**	178,457	**2,839**	5.2	**9.2**
123+06	1.84	4.77	**-2.93**	**6.66**	273,109	**2,798**	2.3	**6.3**
125+00	2.25	5.07	**-2.82**	**6.41**	286,161	**2,314**	3.6	**7.6**
127+50	3.36	4.14	**-0.78**	**1.77**	198,173	4,276	3.8	**12.8**
130+00	2.27	4.54	**-2.27**	**5.16**	80,317	3,259	2.7	**11.7**
132+50	2.16	4.87	**-2.71**	**6.16**	71,188	**2,628**	2.6	**11.6**
135+26	2.78	4.42	**-1.64**	**3.73**	105,408	3,527	4.1	**13.1**
137+50	2.39	4.65	**-2.26**	**5.14**	84,951	3,024	3.1	**12.1**
140+34	2.06	4.99	**-2.93**	**6.66**	62,974	**2,428**	2.5	**11.5**
142+50	2.81	4.50	**-1.69**	**3.84**	110,317	3,344	4.0	**13.0**
145+00	2.35	4.34	**-1.99**	**4.52**	49,983	3,710	5.2	**14.2**
147+50	2.34	4.71	**-2.37**	**5.39**	82,985	**2,910**	2.9	**11.9**
150+00	3.11	4.51	**-1.40**	**3.18**	187,020	3,313	3.1	**12.1**
152+50	2.48	4.37	**-1.89**	**4.30**	94,748	3,644	3.1	**12.1**
155+00	3.00	4.31	**-1.31**	**2.98**	175,733	3,806	2.9	**11.9**
157+50	2.70	4.74	**-2.04**	**4.64**	121,656	**2,855**	3.1	**12.1**
160+03	3.26	4.61	**-1.35**	**3.07**	157,629	3,100	4.4	**13.4**

Possible Weak Soils (<3000)

Possible Shallow Bedrock (>10000)

Pavement depths were taken from Ground Penetrating Radar Summary Sheet - North Bound Lane/Outer Edge (White Line).





18547.00 Blue Hill-Orland
Route #15 (Northbound Outer)

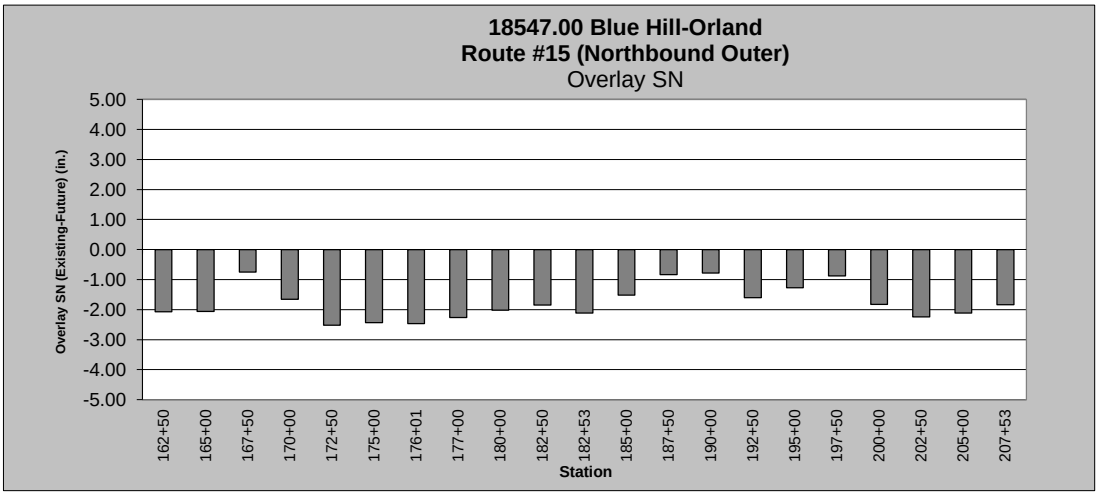
December 18,2014

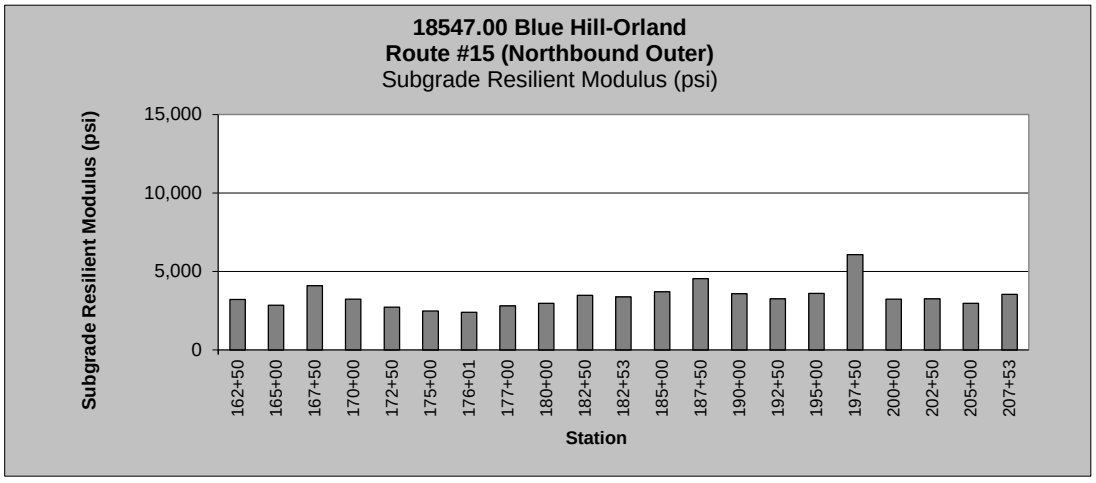
Station (Feet)	Existing Structural Number (in.)	Future Traffic Structural Number (in.)	Overlay Structural Number (Existing - Future)	Recommended Pavement Thickness (in.)	Pavement Modulus (psi)	Subgrade Resilient Modulus (psi)	Pavement Depth (in)	* Combined Pavement/Gravel Depth Used for Calculation (in)
162+50	2.49	4.56	**-2.07**	**4.70**	86,511	3,207	3.5	**12.5**
165+00	2.68	4.74	**-2.06**	**4.68**	113,033	**2,845**	3.3	**12.3**
167+50	3.45	4.20	**-0.75**	**1.70**	195,876	4,095	4.2	**13.2**
170+00	2.89	4.55	**-1.66**	**3.77**	129,936	3,236	3.7	**12.7**
172+50	2.29	4.81	**-2.52**	**5.73**	78,391	**2,719**	2.9	**11.9**
175+00	2.52	4.95	**-2.43**	**5.52**	94,553	**2,488**	3.3	**12.3**
176+01	2.53	5.00	**-2.47**	**5.61**	100,589	**2,409**	3.1	**12.1**
177+00	2.51	4.77	**-2.26**	**5.14**	105,974	**2,799**	2.8	**11.8**
180+00	2.66	4.68	**-2.02**	**4.59**	108,909	**2,963**	3.4	**12.4**
182+50	2.58	4.43	**-1.85**	**4.20**	103,641	3,490	3.2	**12.2**
182+53	2.37	4.48	**-2.11**	**4.80**	78,107	3,381	3.3	**12.3**
185+00	2.82	4.34	**-1.52**	**3.45**	117,349	3,714	3.8	**12.8**
187+50	3.22	4.06	**-0.84**	**1.91**	241,295	4,535	2.5	**11.5**
190+00	3.62	4.40	**-0.78**	**1.77**	286,276	3,580	3.2	**12.2**
192+50	2.93	4.53	**-1.60**	**3.64**	159,039	3,264	3.0	**12.0**
195+00	3.12	4.39	**-1.27**	**2.89**	155,249	3,600	3.9	**12.9**
197+50	2.79	3.67	**-0.88**	**2.00**	107,912	6,061	4.0	**13.0**
200+00	2.71	4.54	**-1.83**	**4.16**	114,518	3,241	3.4	**12.4**
202+50	2.30	4.54	**-2.24**	**5.09**	85,982	3,259	2.6	**11.6**
205+00	2.56	4.68	**-2.12**	**4.82**	114,526	**2,963**	2.7	**11.7**
207+53	2.57	4.41	**-1.84**	**4.18**	95,782	3,546	3.5	**12.5**

Possible Weak Soils (<3000)

Possible Shallow Bedrock (>10000)

Pavement depths were taken from Ground Penetrating Radar Summary Sheet - North Bound Lane/Outer Edge (White Line).





18547.00 Blue Hill-Orland
Route #15 (Northbound Outer)

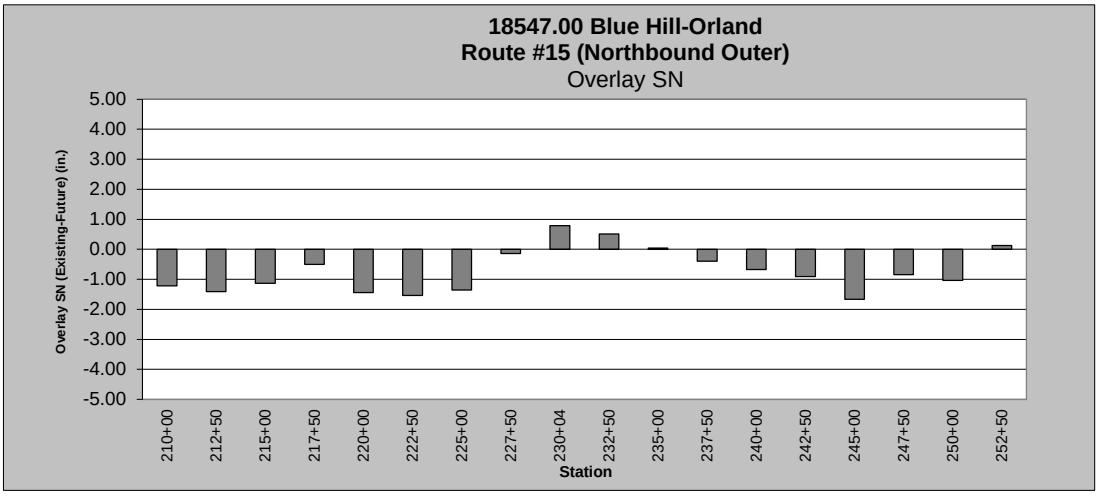
December 18,2014

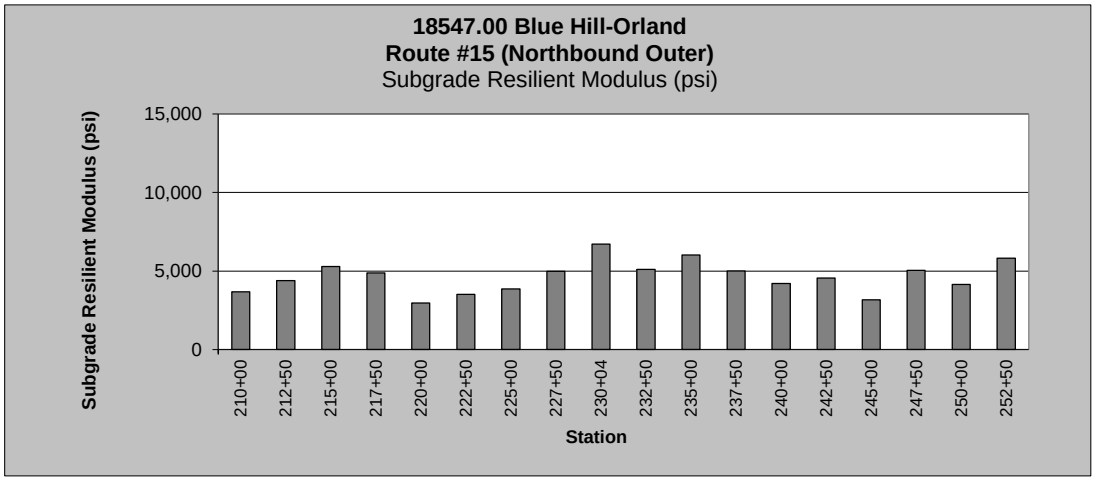
Station (Feet)	Existing Structural Number (in.)	Future Traffic Structural Number (in.)	Overlay Structural Number (Existing - Future)	Recommended Pavement Thickness (in.)	Pavement Modulus (psi)	Subgrade Resilient Modulus (psi)	Pavement Depth (in)	* Combined Pavement/Gravel Depth Used for Calculation (in)
210+00	3.14	4.36	**-1.22**	**2.77**	178,553	3,669	3.4	**12.4**
212+50	2.69	4.10	**-1.41**	**3.20**	140,700	4,389	2.5	**11.5**
215+00	2.72	3.85	**-1.13**	**2.57**	102,722	5,295	3.9	**12.9**
217+50	3.46	3.96	**-0.50**	**1.14**	202,183	4,886	4.1	**13.1**
220+00	3.24	4.68	**-1.44**	**3.27**	139,211	**2,956**	4.9	**13.9**
222+50	2.89	4.43	**-1.54**	**3.50**	149,618	3,506	3.1	**12.1**
225+00	2.93	4.29	**-1.36**	**3.09**	140,712	3,852	3.5	**12.5**
227+50	3.79	3.93	**-0.14**	**0.32**	328,536	4,975	3.2	**12.2**
230+04	4.33	3.54	0.79	-	424,789	6,712	3.8	**12.8**
232+50	4.41	3.90	0.51	-	545,452	5,100	3.0	**12.0**
235+00	3.72	3.68	0.04	-	205,616	6,027	5.0	**14.0**
237+50	3.52	3.92	**-0.40**	**0.91**	269,658	5,007	3.1	**12.1**
240+00	3.49	4.16	**-0.67**	**1.52**	203,437	4,208	4.2	**13.2**
242+50	3.15	4.06	**-0.91**	**2.07**	145,408	4,547	4.3	**13.3**
245+00	2.92	4.58	**-1.66**	**3.77**	136,906	3,164	3.6	**12.6**
247+50	3.07	3.91	**-0.84**	**1.91**	128,663	5,044	4.5	**13.5**
250+00	3.14	4.18	**-1.04**	**2.36**	126,049	4,152	4.9	**13.9**
252+50	3.86	3.73	0.13	-	220,312	5,808	5.2	**14.2**

Possible Weak Soils (<3000)

Possible Shallow Bedrock (>10000)

Pavement depths were taken from Ground Penetrating Radar Summary Sheet - North Bound Lane/Outer Edge (White Line).





18547.00 Blue Hill-Orland
Route #15 (Northbound Outer)

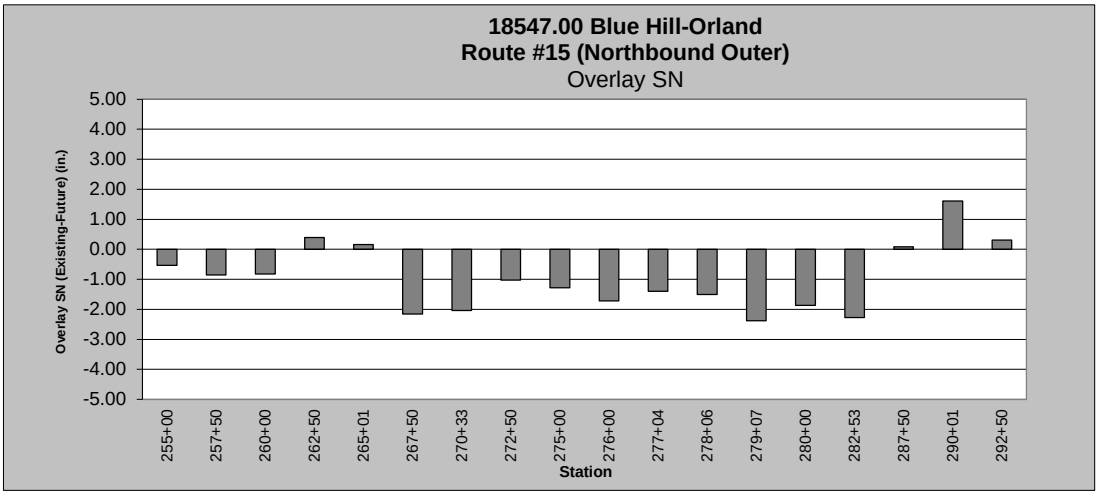
December 18,2014

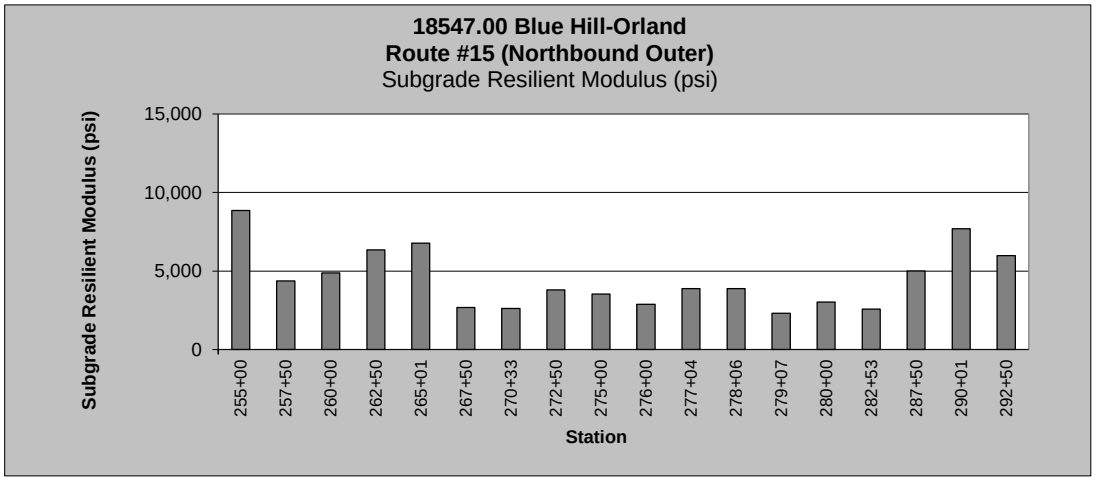
Station (Feet)	Existing Structural Number (in.)	Future Traffic Structural Number (in.)	Overlay Structural Number (Existing - Future)	Recommended Pavement Thickness (in.)	Pavement Modulus (psi)	Subgrade Resilient Modulus (psi)	Pavement Depth (in)	* Combined Pavement/Gravel Depth Used for Calculation (in)
255+00	2.68	3.21	**-0.53**	**1.20**	80,800	8,853	4.8	**13.8**
257+50	3.26	4.11	**-0.85**	**1.93**	161,030	4,367	4.3	**13.3**
260+00	3.14	3.96	**-0.82**	**1.86**	128,686	4,872	4.8	**13.8**
262+50	4.00	3.61	0.39	-	250,808	6,341	5.1	**14.1**
265+01	3.69	3.53	0.16	-	262,982	6,775	3.8	**12.8**
267+50	2.68	4.84	**-2.16**	**4.91**	101,050	**2,670**	3.8	**12.8**
270+33	2.83	4.87	**-2.04**	**4.64**	130,569	**2,613**	3.4	**12.4**
272+50	3.28	4.31	**-1.03**	**2.34**	184,909	3,806	3.8	**12.8**
275+00	3.13	4.41	**-1.28**	**2.91**	172,438	3,538	3.5	**12.5**
276+00	3.00	4.72	**-1.72**	**3.91**	159,427	**2,885**	3.3	**12.3**
277+04	2.88	4.28	**-1.40**	**3.18**	137,087	3,888	3.4	**12.4**
278+06	2.78	4.28	**-1.50**	**3.41**	98,054	3,885	4.4	**13.4**
279+07	2.69	5.07	**-2.38**	**5.41**	106,928	**2,304**	3.6	**12.6**
280+00	2.78	4.65	**-1.87**	**4.25**	117,953	3,024	3.6	**12.6**
282+53	2.62	4.89	**-2.27**	**5.16**	84,328	**2,585**	4.3	**13.3**
287+50	4.00	3.92	0.08	-	191,745	5,011	6.4	**15.4**
290+01	4.98	3.37	1.61	-	344,540	7,684	6.8	**15.8**
292+50	4.00	3.69	0.31	-	175,208	5,987	6.9	**15.9**

Possible Weak Soils (<3000)

Possible Shallow Bedrock (>10000)

Pavement depths were taken from Ground Penetrating Radar Summary Sheet - North Bound Lane/Outer Edge (White Line).





18547.00 Blue Hill-Orland
Route #15 (Northbound Outer)

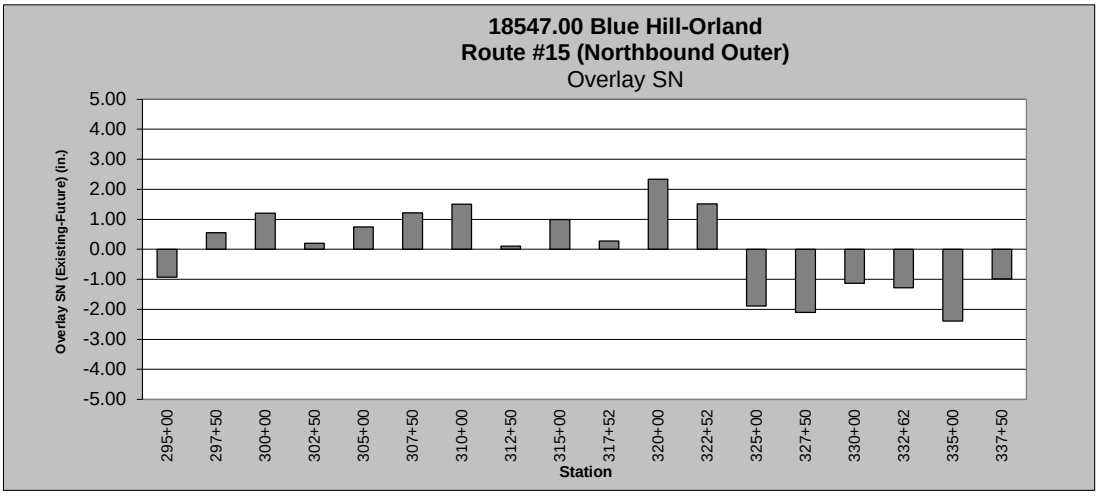
December 18,2014

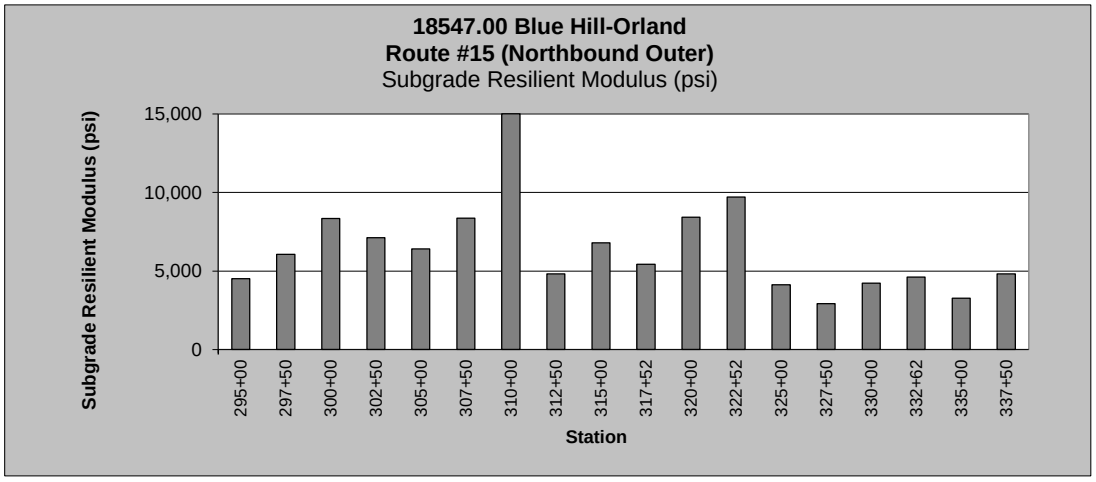
Station (Feet)	Existing Structural Number (in.)	Future Traffic Structural Number (in.)	Overlay Structural Number (Existing - Future)	Recommended Pavement Thickness (in.)	Pavement Modulus (psi)	Subgrade Resilient Modulus (psi)	Pavement Depth (in)	* Combined Pavement/Gravel Depth Used for Calculation (in)
295+00	3.14	4.07	**-0.93**	**2.11**	99,010	4,515	6.1	**15.1**
297+50	4.22	3.67	0.55	-	168,358	6,060	8.0	**17.0**
300+00	4.48	3.28	1.20	-	237,017	8,338	7.1	**16.1**
302+50	3.67	3.47	0.20	-	118,189	7,117	7.6	**16.6**
305+00	4.34	3.60	0.74	-	186,097	6,407	7.9	**16.9**
307+50	4.48	3.27	1.21	-	215,582	8,373	7.6	**16.6**
310+00	4.14	2.64	1.50	-	225,952	**15,005**	6.1	**15.1**
312+50	4.09	3.98	0.11	-	179,337	4,814	7.1	**16.1**
315+00	4.51	3.52	0.99	-	255,828	6,793	6.8	**15.8**
317+52	4.09	3.81	0.28	-	160,711	5,429	7.7	**16.7**
320+00	5.59	3.26	2.33	-	410,699	8,420	7.7	**16.7**
322+52	4.61	3.10	1.51	-	252,118	9,710	7.2	**16.2**
325+00	2.30	4.19	**-1.89**	**4.30**	75,823	4,123	4.8	**12.1**
327+50	2.61	4.71	**-2.10**	**4.77**	112,724	**2,913**	4.7	**12.0**
330+00	3.03	4.16	**-1.13**	**2.57**	136,160	4,231	5.8	**13.1**
332+62	2.75	4.03	**-1.28**	**2.91**	104,439	4,617	5.7	**13.0**
335+00	2.14	4.53	**-2.39**	**5.43**	65,635	3,269	4.5	**11.8**
337+50	2.99	3.97	**-0.98**	**2.23**	247,136	4,827	3.3	**10.6**

Possible Weak Soils (<3000)

Possible Shallow Bedrock (>10000)

Pavement depths were taken from Ground Penetrating Radar Summary Sheet - North Bound Lane/Outer Edge (White Line).





18547.00 Blue Hill-Orland
Route #15 (Northbound Outer)

December 18,2014

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)
340+18	2.11	4.52	**-2.41**	**5.48**	79,912	3,304	3.6	**10.9**
342+50	2.33	4.62	**-2.29**	**5.20**	102,058	3,075	3.8	**11.1**
345+00	2.98	4.10	**-1.12**	**2.55**	201,049	4,399	4.0	**11.3**
347+53	2.54	4.23	**-1.69**	**3.84**	106,980	4,029	4.6	**11.9**
350+00	2.52	4.40	**-1.88**	**4.27**	122,236	3,561	4.0	**11.3**
352+61	2.27	4.21	**-1.94**	**4.41**	102,399	4,062	3.5	**10.8**
355+00	3.23	4.20	**-0.97**	**2.20**	184,675	4,110	5.3	**12.6**
357+50	2.53	4.33	**-1.80**	**4.09**	123,797	3,744	4.0	**11.3**
358+00	2.53	4.29	**-1.76**	**4.00**	123,512	3,846	4.0	**11.3**
359+00	2.46	4.36	**-1.90**	**4.32**	128,958	3,674	3.5	**10.8**
361+02	2.41	4.15	**-1.74**	**3.95**	104,020	4,260	4.1	**11.4**
362+05	2.55	4.39	**-1.84**	**4.18**	144,212	3,596	3.5	**10.8**
363+13	2.12	4.94	**-2.82**	**6.41**	105,215	**2,499**	2.7	**10.0**
364+00	2.12	4.80	**-2.68**	**6.09**	80,963	**2,747**	3.6	**10.9**
365+00	2.72	4.39	**-1.67**	**3.80**	175,439	3,585	3.5	**10.8**
367+50	3.53	4.35	**-0.82**	**1.86**	236,536	3,705	5.4	**12.7**
370+00	3.19	4.30	**-1.11**	**2.52**	260,440	3,817	3.8	**11.1**
372+50	2.81	4.47	**-1.66**	**3.77**	198,212	3,411	3.4	**10.7**

Possible Weak Soils (<3000)

Possible Shallow Bedrock (>10000)

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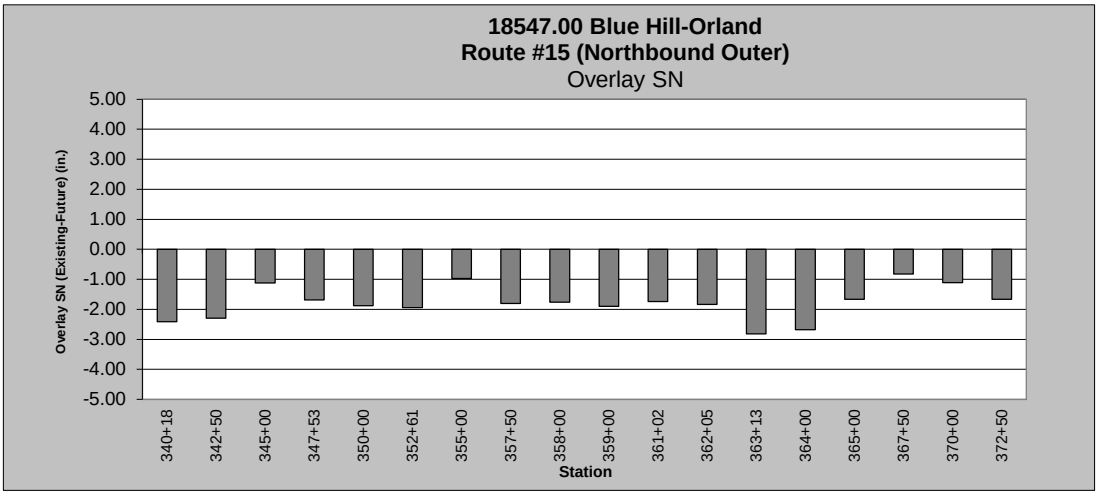

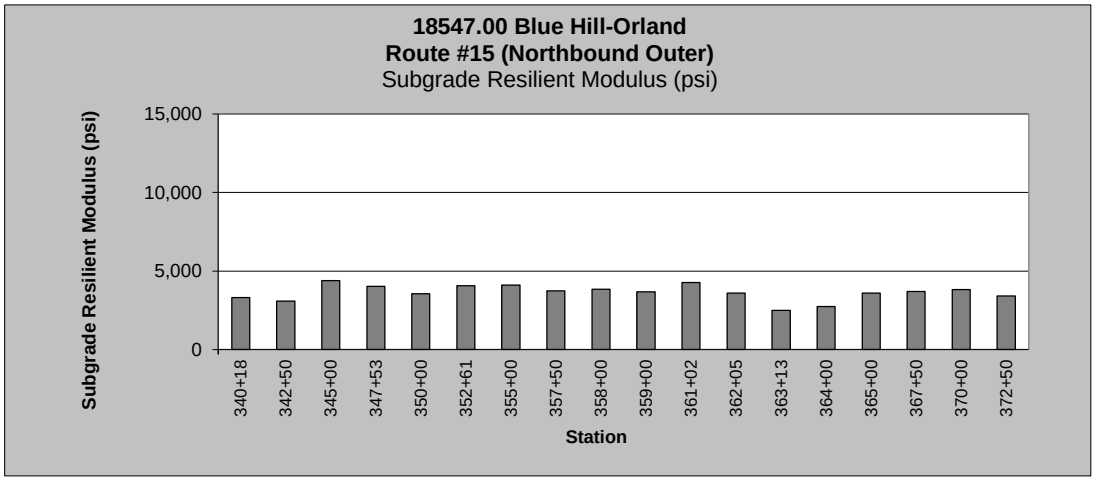

18547.00 Blue Hill-Orland
Route #15 (Northbound Outer)

December 18,2014

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)
375+02	2.99	4.75	**-1.76**	**4.00**	192,266	**2,830**	4.2	**11.5**
377+58	2.81	4.40	**-1.59**	**3.61**	173,788	3,575	3.9	**11.2**
380+00	2.10	4.43	**-2.33**	**5.30**	88,214	3,496	3.2	**10.5**
382+53	2.53	4.41	**-1.88**	**4.27**	129,963	3,555	3.8	**11.1**
385+00	3.03	4.32	**-1.29**	**2.93**	171,979	3,770	4.8	**12.1**
387+50	3.14	4.13	**-0.99**	**2.25**	191,036	4,325	4.8	**12.1**
390+05	2.82	4.50	**-1.68**	**3.82**	165,521	3,330	4.1	**11.4**
392+50	2.35	4.38	**-2.03**	**4.61**	116,283	3,625	3.4	**10.7**
395+03	2.78	4.47	**-1.69**	**3.84**	159,883	3,415	4.1	**11.4**

Possible Weak Soils (<3000)

Possible Shallow Bedrock (>10000)

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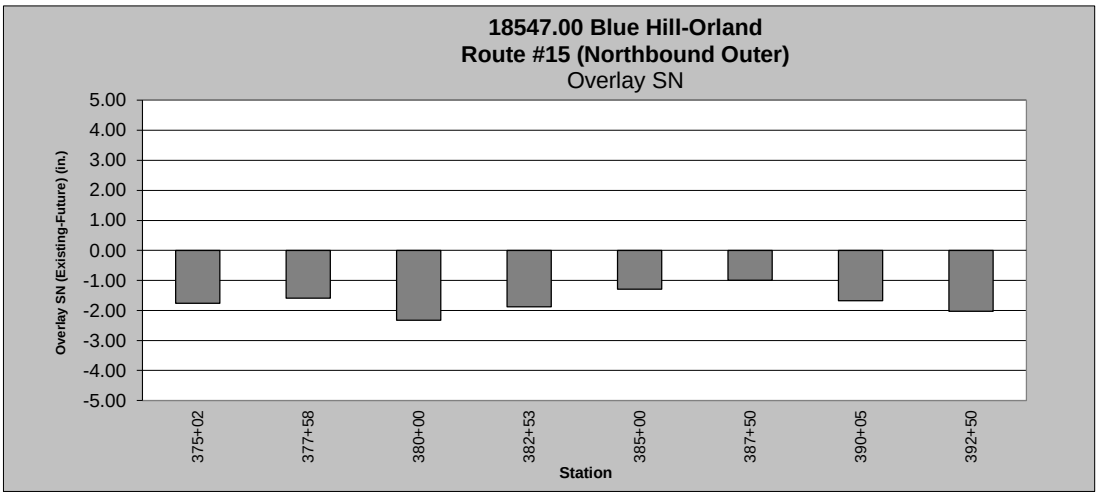
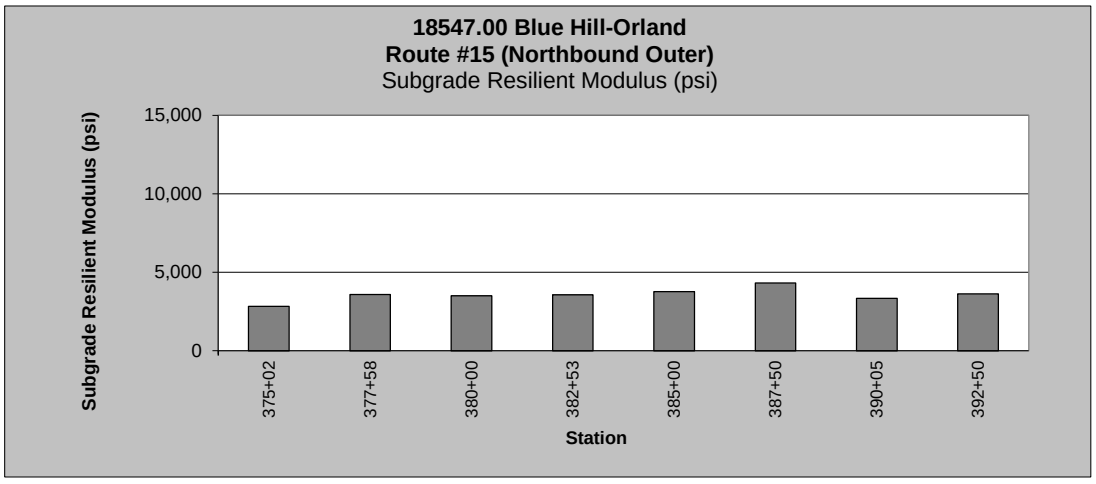




18547.00 Blue Hill-Orland
Route #15 (Northbound Inner)

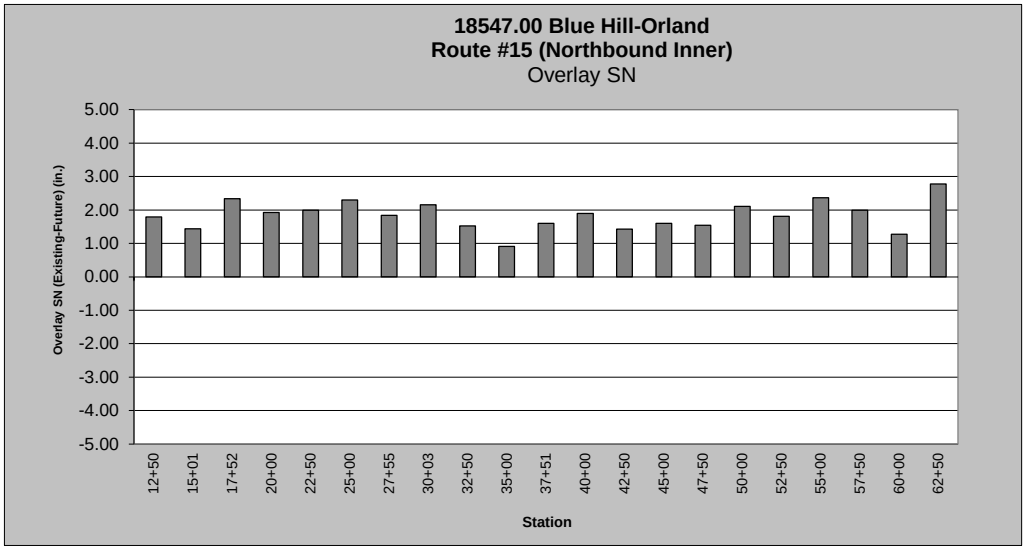
December 18, 2014

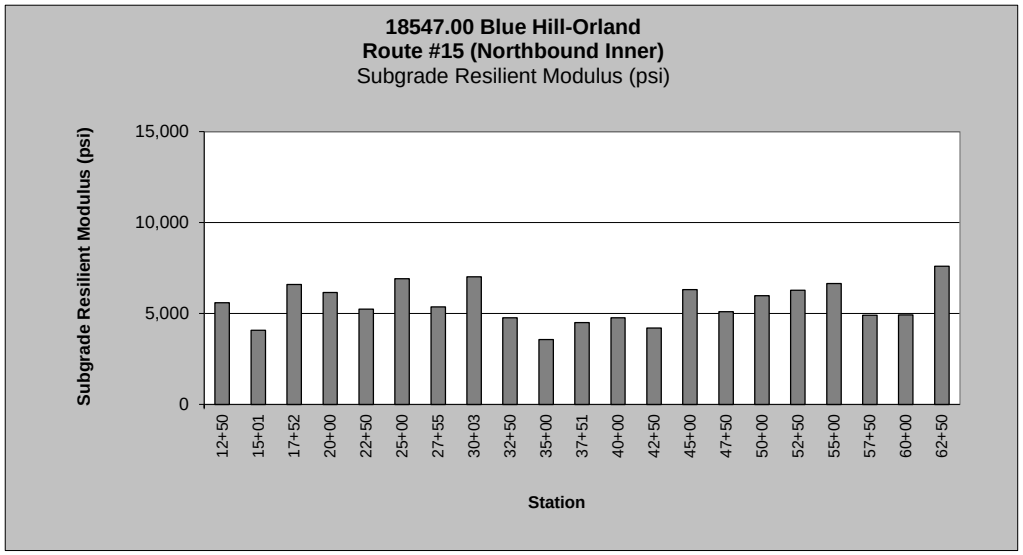
Station (Feet)	Existing Structural Number (in.)	Future Traffic Structural Number (in.)	Overlay Structural Number (Existing - Future)	Recommended Pavement Thickness (in.)	Pavement Modulus (psi)	Subgrade Resilient Modulus (psi)	Pavement Depth (in)	* Combined Pavement/Gravel Depth Used for Calculation (in)
12+50	5.56	3.77	1.79	-	69,914	5,598	4.0	30.0
15+01	5.65	4.21	1.44	-	73,456	4,073	5.0	30.0
17+52	5.90	3.56	2.34	-	83,391	6,601	6.1	30.0
20+00	5.57	3.65	1.92	-	70,227	6,159	5.7	30.0
22+50	5.85	3.86	1.99	-	81,397	5,238	5.8	30.0
25+00	5.80	3.50	2.30	-	79,454	6,912	6.7	30.0
27+55	5.67	3.83	1.84	-	74,006	5,357	6.0	30.0
30+03	5.63	3.48	2.15	-	72,462	7,015	6.0	30.0
32+50	5.51	3.99	1.52	-	68,148	4,766	5.4	30.0
35+00	5.31	4.40	0.91	-	60,806	3,565	6.4	30.0
37+51	5.67	4.07	1.60	-	74,277	4,494	6.8	30.0
40+00	5.89	3.99	1.90	-	83,041	4,766	5.8	30.0
42+50	5.60	4.17	1.43	-	71,391	4,196	6.0	30.0
45+00	5.22	3.62	1.60	-	57,913	6,322	6.8	30.0
47+50	5.44	3.90	1.54	-	65,551	5,096	6.9	30.0
50+00	5.80	3.69	2.11	-	79,300	5,979	6.6	30.0
52+50	5.43	3.62	1.81	-	65,228	6,284	6.6	30.0
55+00	5.91	3.55	2.36	-	83,785	6,657	6.9	30.0
57+50	5.94	3.95	1.99	-	85,185	4,908	5.9	30.0
60+00	5.22	3.95	1.27	-	57,663	4,923	6.7	30.0
62+50	6.17	3.39	2.78	-	95,288	7,599	6.0	30.0

Possible Weak Soils (<3000)

Possible Shallow Bedrock (>10000)

Pavement depths were taken from Ground Penetrating Radar Summary Sheet - North Bound Lane/Outer Wheelpath.





18547.00 Blue Hill-Orland
Route #15 (Northbound Inner)

December 18, 2014

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)
65+00	5.67	3.65	2.02	-	74,257	6,153	6.5	30.0
67+50	6.37	3.67	2.70	-	105,037	6,068	5.7	30.0
70+00	5.97	3.32	2.65	-	86,583	8,057	5.9	30.0
72+50	5.50	3.85	1.65	-	67,448	5,272	6.9	30.0
75+00	6.33	3.98	2.35	-	102,851	4,816	6.6	30.0
77+50	6.22	3.36	2.86	-	97,951	7,796	5.5	30.0
80+00	6.42	3.58	2.84	-	107,730	6,482	6.2	30.0
82+50	5.81	3.95	1.86	-	79,526	4,928	6.1	30.0
85+00	5.84	3.75	2.09	-	81,154	5,699	5.7	30.0
87+00	5.65	3.91	1.74	-	73,449	5,039	5.9	30.0
89+00	3.51	4.12	**-0.61**	**1.39**	96,696	4,327	6.2	**17.0**
91+00	3.85	4.17	**-0.32**	**0.73**	27,473	4,197	6.2	**17.0**
93+00	3.24	4.05	**-0.81**	**1.84**	84,319	4,559	5.6	**16.4**
95+00	3.95	3.73	0.22	-	126,513	5,769	6.7	**17.5**
97+00	3.96	3.78	0.18	-	133,612	5,582	6.4	**17.2**
99+00	3.37	3.88	**-0.51**	**1.16**	93,748	5,162	5.7	**16.5**
101+00	3.36	4.49	**-1.13**	**2.57**	96,271	3,352	5.5	**16.3**
103+00	3.33	4.05	**-0.72**	**1.64**	77,232	4,568	6.6	**17.4**
105+39	3.13	4.62	**-1.49**	**3.39**	74,613	3,091	5.7	**16.5**
107+00	3.88	3.47	0.41	-	147,977	7,093	5.5	**16.3**
109+20	3.41	4.38	**-0.97**	**2.20**	82,420	3,611	6.6	**17.4**

Possible Weak Soils (<3000)

Possible Shallow Bedrock (>10000)

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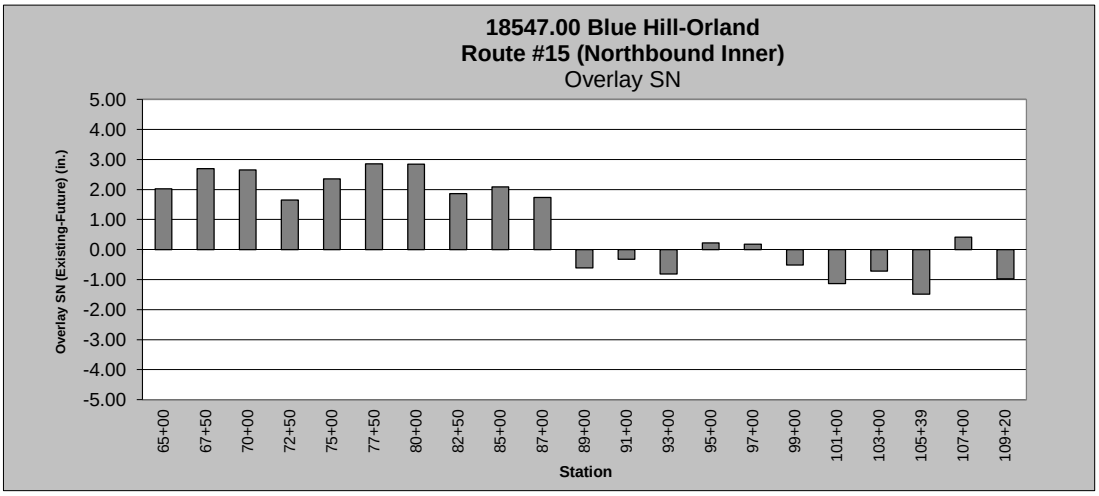
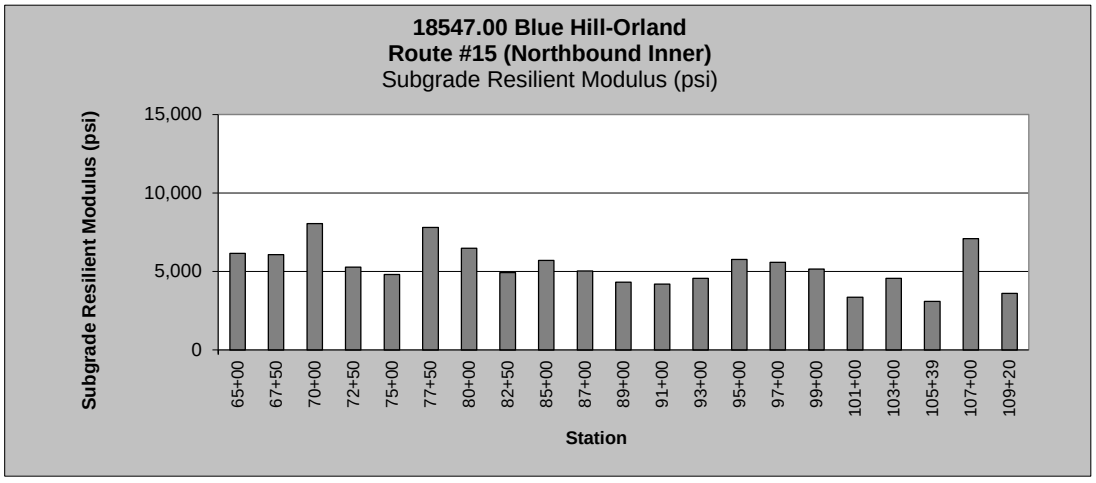




18547.00 Blue Hill-Orland
Route #15 (Northbound Inner)

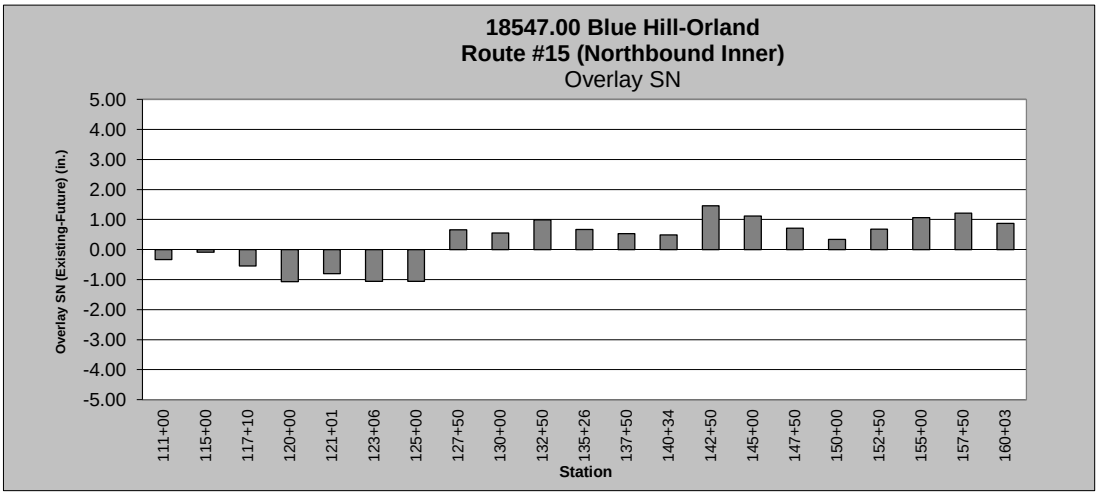
December 18, 2014

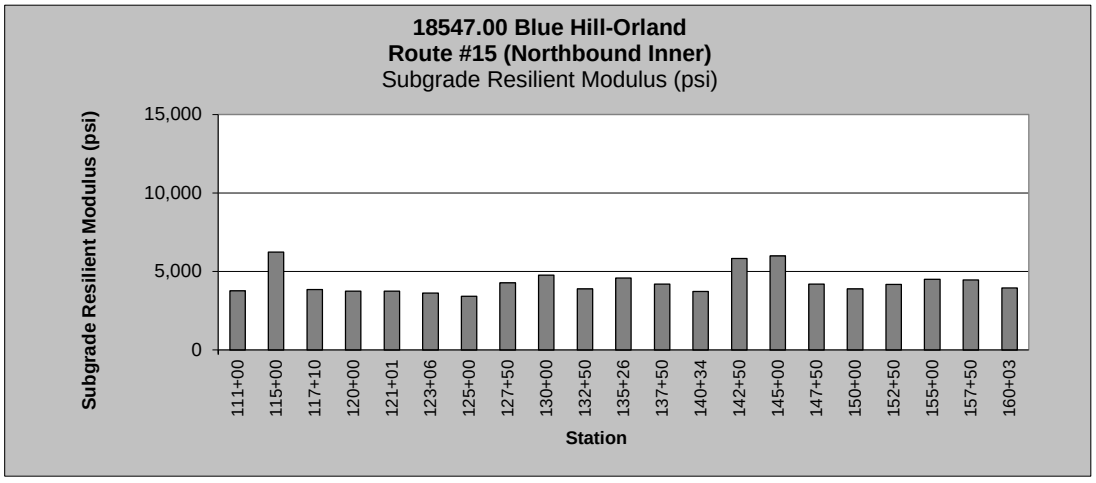
Station (Feet)	Existing Structural Number (in.)	Future Traffic Structural Number (in.)	Overlay Structural Number (Existing - Future)	Recommended Pavement Thickness (in.)	Pavement Modulus (psi)	Subgrade Resilient Modulus (psi)	Pavement Depth (in)	* Combined Pavement/Gravel Depth Used for Calculation (in)
111+00	3.99	4.32	**-0.33**	**0.75**	134,605	3,762	6.5	**17.3**
115+00	3.54	3.63	**-0.09**	**0.20**	95,626	6,236	6.4	**17.2**
117+10	3.74	4.29	**-0.55**	**1.25**	108,973	3,855	6.6	**17.4**
120+00	3.26	4.33	**-1.07**	**2.43**	72,436	3,745	6.6	**17.4**
121+01	3.53	4.33	**-0.80**	**1.82**	96,245	3,754	6.3	**17.1**
123+06	3.32	4.38	**-1.06**	**2.41**	76,043	3,627	6.6	**17.4**
125+00	3.40	4.46	**-1.06**	**2.41**	80,512	3,422	6.7	**17.5**
127+50	5.12	4.46	0.66	-	74,044	4,281	6.7	27.1
130+00	4.54	3.99	0.55	-	54,127	4,771	6.3	26.7
132+50	5.27	4.28	0.99	-	84,333	3,892	6.3	26.7
135+26	4.72	4.05	0.67	-	59,184	4,574	6.5	26.9
137+50	4.70	4.17	0.53	-	56,128	4,199	6.9	27.3
140+34	4.83	4.34	0.49	-	61,433	3,716	6.8	27.2
142+50	5.18	3.72	1.46	-	67,384	5,822	7.9	28.3
145+00	4.81	3.69	1.12	-	55,480	5,991	7.6	28.0
147+50	4.88	4.17	0.71	-	65,324	4,198	6.5	26.9
150+00	4.61	4.27	0.34	-	55,282	3,894	6.5	26.9
152+50	4.85	4.17	0.68	-	69,474	4,176	6.2	26.6
155+00	5.14	4.08	1.06	-	80,974	4,497	6.0	26.4
157+50	5.29	4.08	1.21	-	86,491	4,453	6.2	26.6
160+03	5.12	4.25	0.87	-	76,429	3,948	6.4	26.8

Possible Weak Soils (<3000)

Possible Shallow Bedrock (>10000)

Pavement depths were taken from Ground Penetrating Radar Summary Sheet - North Bound Lane/Outer Wheelpath.





18547.00 Blue Hill-Orland
Route #15 (Northbound Inner)

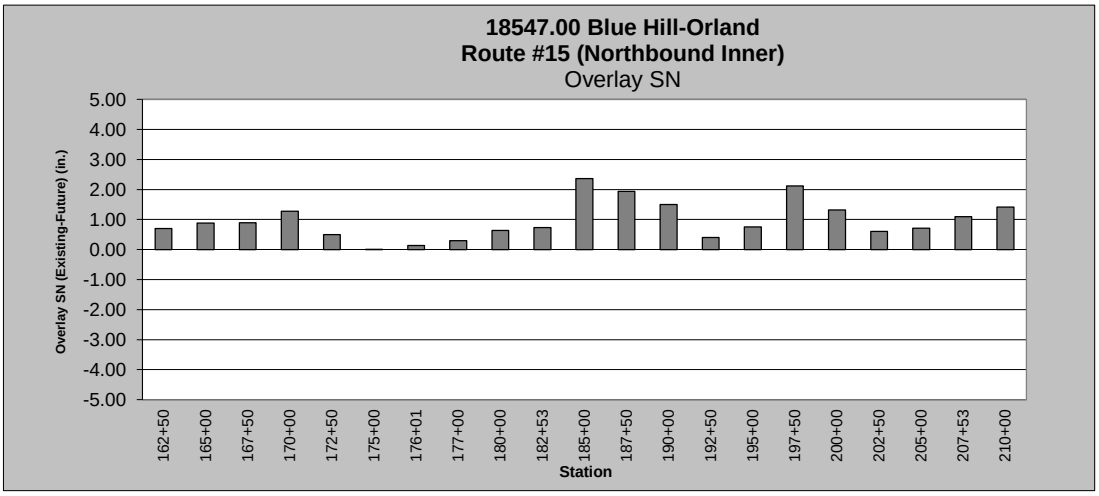
December 18, 2014

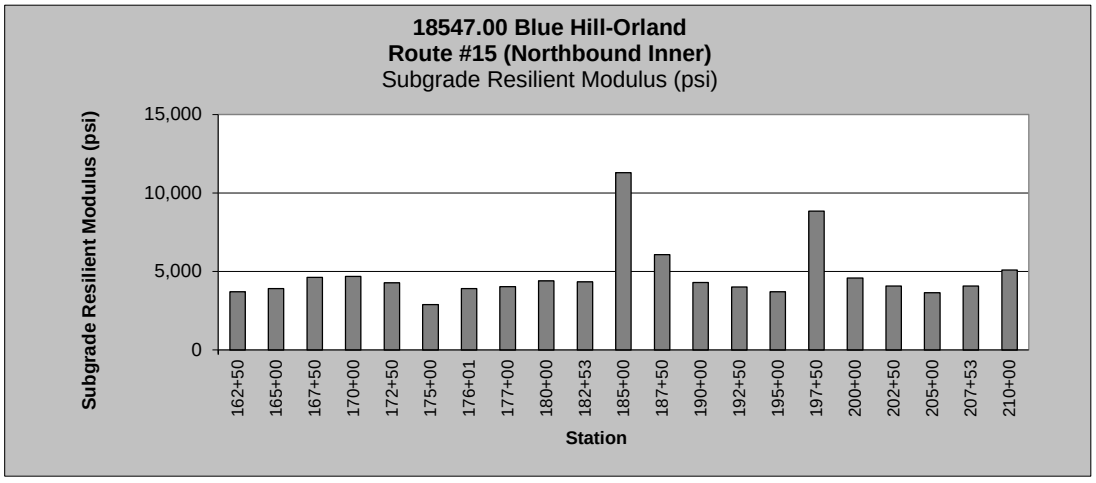
Station (Feet)	Existing Structural Number (in.)	Future Traffic Structural Number (in.)	Overlay Structural Number (Existing - Future)	Recommended Pavement Thickness (in.)	Pavement Modulus (psi)	Subgrade Resilient Modulus (psi)	Pavement Depth (in)	* Combined Pavement/Gravel Depth Used for Calculation (in)
162+50	5.05	4.35	0.70	-	66,440	3,706	7.3	27.7
165+00	5.15	4.27	0.88	-	81,436	3,914	6.0	26.4
167+50	4.92	4.03	0.89	-	73,524	4,622	5.7	26.1
170+00	5.29	4.01	1.28	-	86,289	4,686	6.2	26.6
172+50	4.64	4.14	0.50	-	52,052	4,280	7.2	27.6
175+00	4.73	4.72	0.01	-	54,705	**2,888**	7.3	27.7
176+01	4.41	4.27	0.14	-	44,683	3,919	7.2	27.6
177+00	4.52	4.22	0.30	-	51,578	4,039	6.6	27.0
180+00	4.74	4.10	0.64	-	60,703	4,394	6.4	26.8
182+53	4.85	4.12	0.73	-	62,032	4,342	6.8	27.2
185+00	5.30	2.94	2.36	-	82,996	11,282	6.6	27.0
187+50	5.61	3.67	1.94	-	103,210	6,076	6.2	26.6
190+00	5.64	4.14	1.50	-	94,896	4,291	7.1	27.5
192+50	4.64	4.24	0.40	-	52,761	4,002	7.1	27.5
195+00	5.09	4.34	0.75	-	69,506	3,714	7.1	27.5
197+50	5.33	3.21	2.12	-	67,413	8,848	8.7	29.1
200+00	5.37	4.05	1.32	-	80,750	4,574	7.2	27.6
202+50	4.82	4.21	0.61	-	66,871	4,063	6.0	26.4
205+00	5.08	4.37	0.71	-	74,095	3,642	6.5	26.9
207+53	5.30	4.21	1.09	-	76,903	4,068	7.3	27.7
210+00	5.32	3.90	1.42	-	82,120	5,088	6.8	27.2

Possible Weak Soils (<3000)

Possible Shallow Bedrock (>10000)

Pavement depths were taken from Ground Penetrating Radar Summary Sheet - North Bound Lane/Outer Wheelpath.





18547.00 Blue Hill-Orland
Route #15 (Northbound Inner)

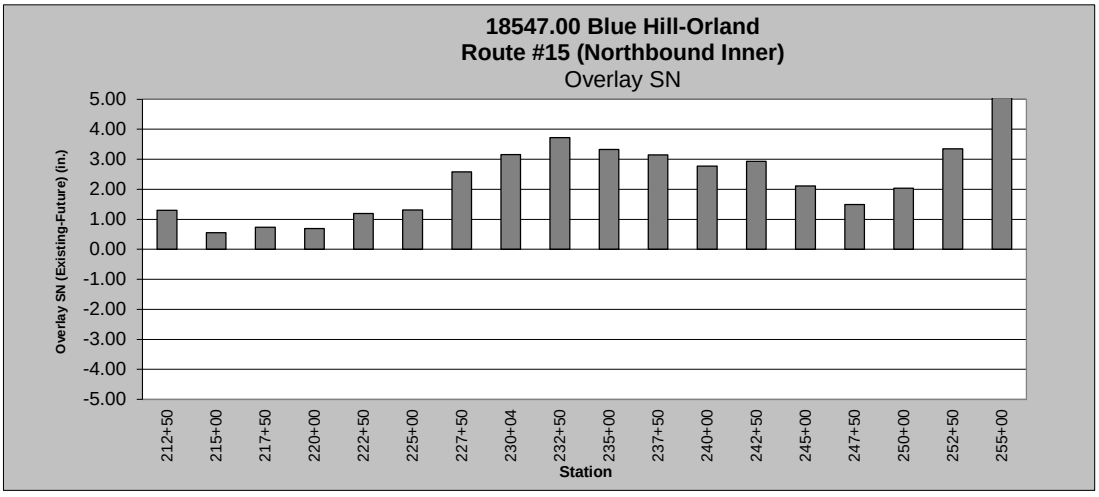
December 18, 2014

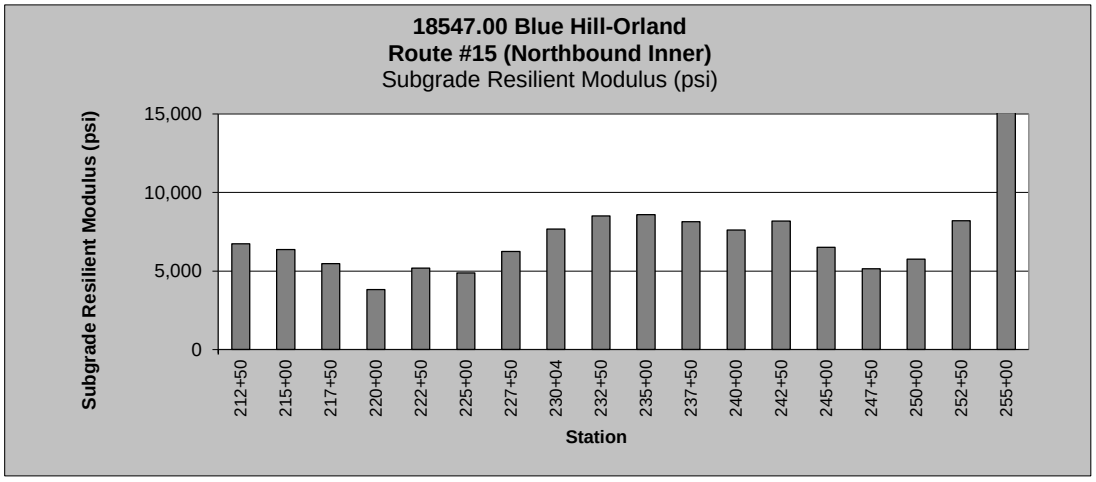
Station (Feet)	Existing Structural Number (in.)	Future Traffic Structural Number (in.)	Overlay Structural Number (Existing - Future)	Recommended Pavement Thickness (in.)	Pavement Modulus (psi)	Subgrade Resilient Modulus (psi)	Pavement Depth (in)	* Combined Pavement/Gravel Depth Used for Calculation (in)
212+50	4.84	3.54	1.30	-	65,430	6,736	6.3	26.7
215+00	4.16	3.61	0.55	-	55,617	6,367	3.8	24.2
217+50	4.53	3.80	0.73	-	75,873	5,479	3.4	23.8
220+00	5.00	4.31	0.69	-	68,726	3,813	6.7	27.1
222+50	5.07	3.88	1.19	-	78,802	5,178	5.9	26.3
225+00	5.27	3.96	1.31	-	76,433	4,872	7.2	27.6
227+50	6.21	3.63	2.58	-	97,266	6,241	6.2	30.0
230+04	6.53	3.37	3.16	-	113,206	7,676	5.8	30.0
232+50	6.97	3.25	3.72	-	137,563	8,518	5.7	30.0
235+00	6.57	3.24	3.33	-	115,428	8,598	5.5	30.0
237+50	6.44	3.30	3.14	-	108,320	8,147	5.4	30.0
240+00	6.15	3.38	2.77	-	94,702	7,615	6.4	30.0
242+50	6.23	3.30	2.93	-	98,315	8,185	6.9	30.0
245+00	5.69	3.58	2.11	-	74,907	6,510	6.1	30.0
247+50	5.38	3.89	1.49	-	63,419	5,137	3.6	30.0
250+00	5.78	3.74	2.04	-	78,640	5,754	3.8	30.0
252+50	6.65	3.30	3.35	-	119,346	8,202	3.4	30.0
255+00	6.89	1.84	5.05	-	133,190	39,015	3.8	30.0

Possible Weak Soils (<3000)

Possible Shallow Bedrock (>10000)

Pavement depths were taken from Ground Penetrating Radar Summary Sheet - North Bound Lane/Outer Wheelpath.





18547.00 Blue Hill-Orland
Route #15 (Northbound Inner)

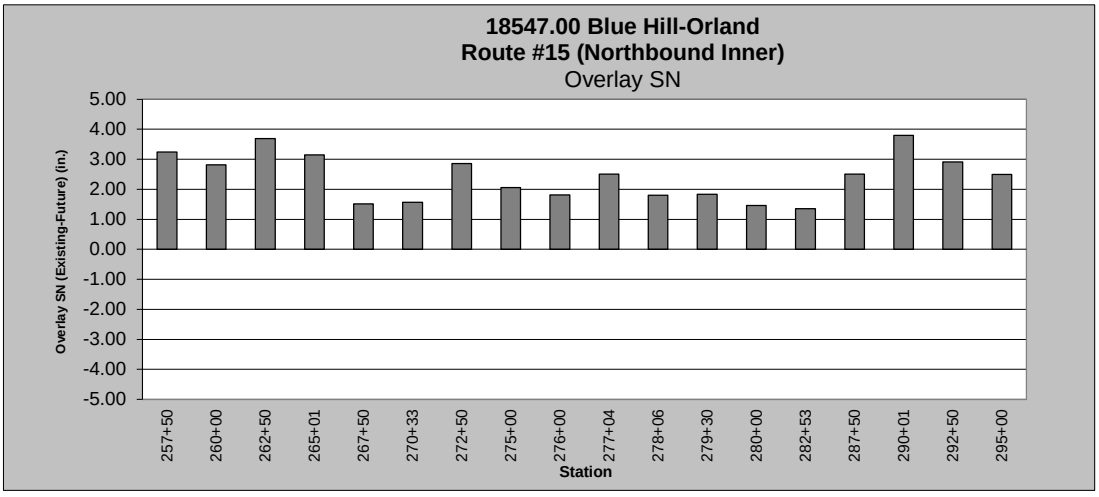
December 18, 2014

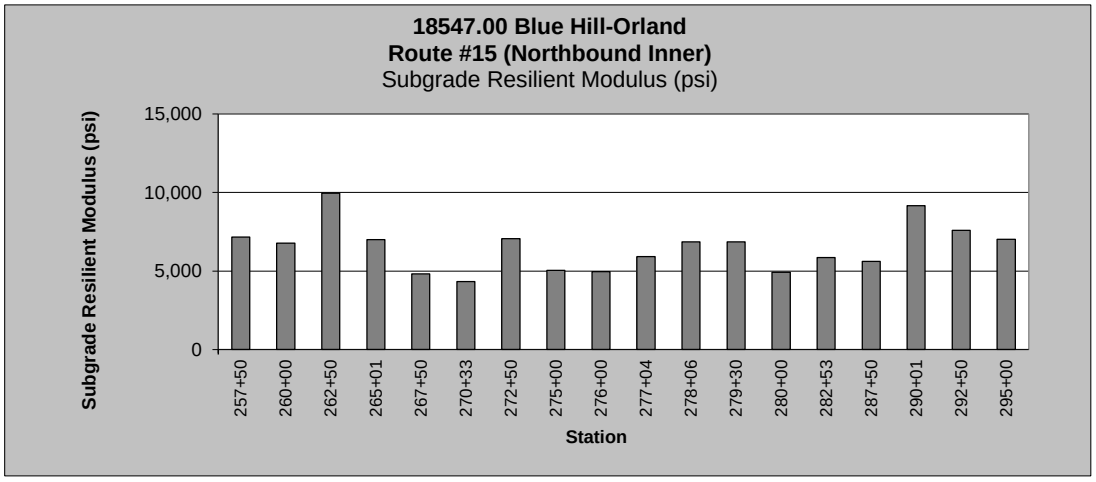
Station (Feet)	Existing Structural Number (in.)	Future Traffic Structural Number (in.)	Overlay Structural Number (Existing - Future)	Recommended Pavement Thickness (in.)	Pavement Modulus (psi)	Subgrade Resilient Modulus (psi)	Pavement Depth (in)	* Combined Pavement/Gravel Depth Used for Calculation (in)
257+50	6.18	2.94	3.24	-	80,283	7,164	3.6	30.0
260+00	6.34	3.53	2.81	-	103,338	6,770	3.5	30.0
262+50	6.76	3.07	3.69	-	125,467	9,961	5.6	30.0
265+01	6.64	3.49	3.15	-	118,731	6,993	6.2	30.0
267+50	5.48	3.97	1.51	-	66,909	4,823	6.3	30.0
270+33	5.69	4.12	1.57	-	75,051	4,327	6.2	30.0
272+50	6.34	3.48	2.86	-	103,415	7,062	6.9	30.0
275+00	5.97	3.91	2.06	-	86,390	5,051	6.4	30.0
276+00	5.74	3.93	1.81	-	76,932	4,965	6.3	30.0
277+04	6.21	3.70	2.51	-	97,147	5,927	7.2	30.0
278+06	5.31	3.51	1.80	-	60,833	6,856	6.6	30.0
279+30	5.34	3.51	1.83	-	61,778	6,856	6.4	30.0
280+00	5.41	3.95	1.46	-	64,294	4,915	6.5	30.0
282+53	5.07	3.72	1.35	-	52,969	5,849	7.0	30.0
287+50	6.28	3.77	2.51	-	100,663	5,607	5.2	30.0
290+01	6.96	3.17	3.79	-	136,963	9,159	4.8	30.0
292+50	6.30	3.39	2.91	-	101,733	7,584	4.5	30.0
295+00	5.97	3.48	2.49	-	86,495	7,021	5.1	30.0

Possible Weak Soils (<3000)

Possible Shallow Bedrock (>10000)

Pavement depths were taken from Ground Penetrating Radar Summary Sheet - North Bound Lane/Outer Wheelpath.





18547.00 Blue Hill-Orland
Route #15 (Northbound Inner)

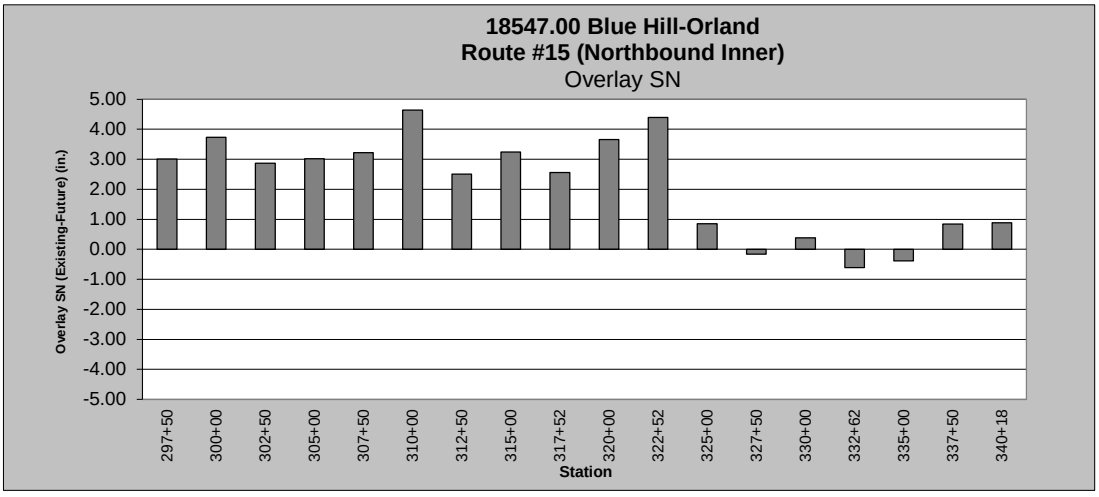
December 18, 2014

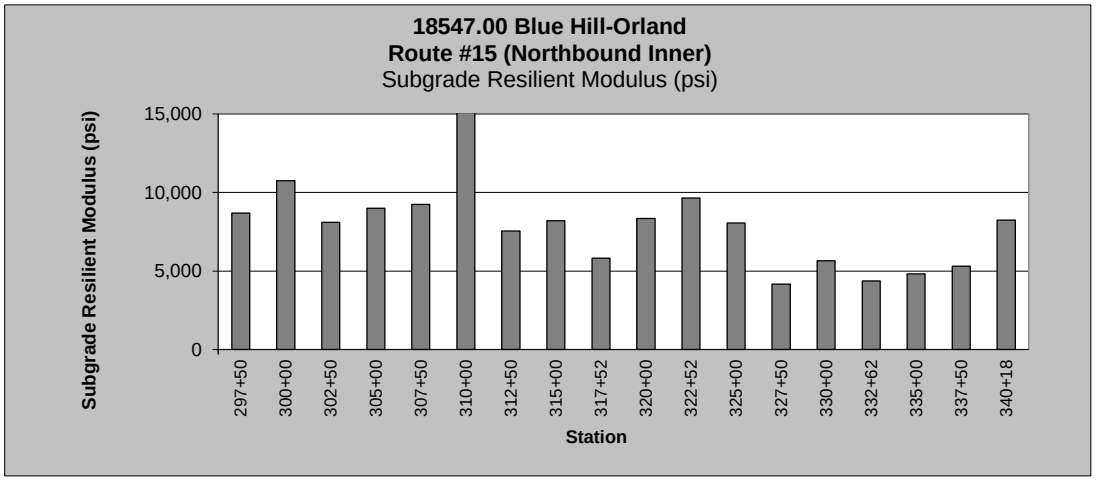
Station (Feet)	Existing Structural Number (in.)	Future Traffic Structural Number (in.)	Overlay Structural Number (Existing - Future)	Recommended Pavement Thickness (in.)	Pavement Modulus (psi)	Subgrade Resilient Modulus (psi)	Pavement Depth (in)	* Combined Pavement/Gravel Depth Used for Calculation (in)
297+50	6.24	3.23	3.01	-	98,843	8,687	6.1	30.0
300+00	6.72	2.99	3.73	-	123,567	10,756	5.0	30.0
302+50	6.18	3.31	2.87	-	96,078	8,100	5.9	30.0
305+00	6.21	3.19	3.02	-	97,122	8,999	5.8	30.0
307+50	6.38	3.16	3.22	-	105,623	9,248	4.5	30.0
310+00	6.71	2.07	4.64	-	123,046	28,709	4.7	30.0
312+50	5.91	3.40	2.51	-	84,039	7,545	5.4	30.0
315+00	6.53	3.29	3.24	-	113,248	8,210	5.1	30.0
317+52	6.29	3.73	2.56	-	101,098	5,810	5.8	30.0
320+00	6.94	3.28	3.66	-	135,980	8,343	5.2	30.0
322+52	7.50	3.11	4.39	-	171,316	9,660	4.5	30.0
325+00	4.17	3.32	0.85	-	85,849	8,057	7.3	21.0
327+50	4.02	4.18	**-0.16**	**0.36**	73,691	4,165	7.6	21.3
330+00	4.14	3.76	0.38	-	95,867	5,655	6.4	20.1
332+62	3.50	4.11	**-0.61**	**1.39**	91,219	4,363	3.6	**17.3**
335+00	3.58	3.97	**-0.39**	**0.89**	104,160	4,825	3.2	**16.9**
337+50	4.68	3.84	0.84	-	129,073	5,317	6.9	20.6
340+18	4.17	3.29	0.88	-	84,637	8,247	7.4	21.1

Possible Weak Soils (<3000)

Possible Shallow Bedrock (>10000)

Pavement depths were taken from Ground Penetrating Radar Summary Sheet - North Bound Lane/Outer Wheelpath.





18547.00 Blue Hill-Orland
Route #15 (Northbound Inner)

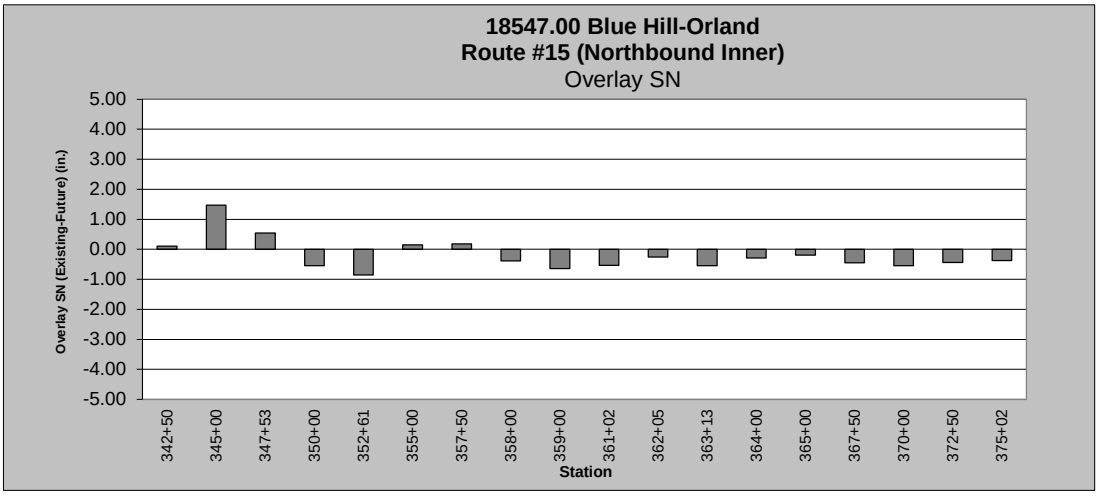
December 18, 2014

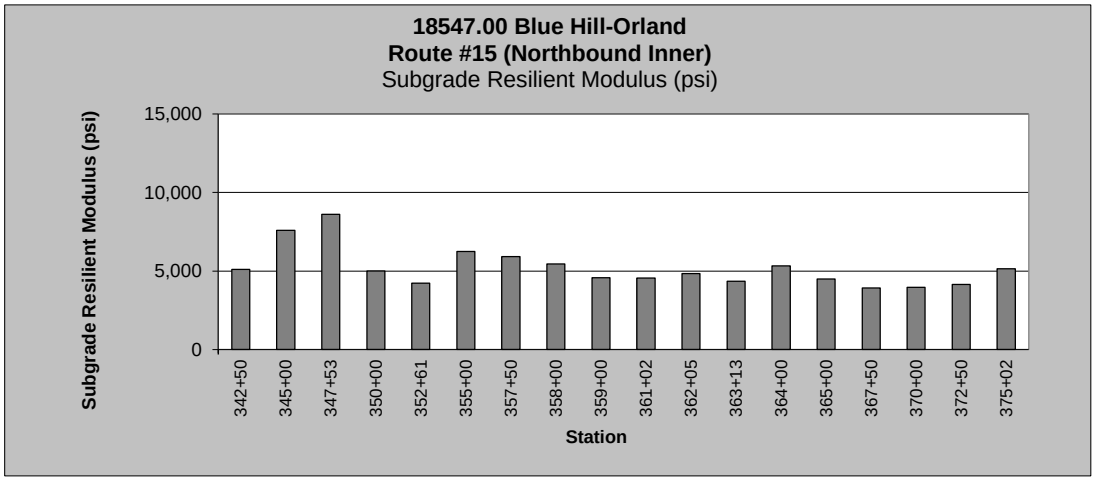
Station (Feet)	Existing Structural Number (in.)	Future Traffic Structural Number (in.)	Overlay Structural Number (Existing - Future)	Recommended Pavement Thickness (in.)	Pavement Modulus (psi)	Subgrade Resilient Modulus (psi)	Pavement Depth (in)	* Combined Pavement/Gravel Depth Used for Calculation (in)
342+50	4.01	3.90	0.11	-	74,391	5,101	7.5	21.2
345+00	4.86	3.39	1.47	-	128,311	7,584	7.7	21.4
347+53	3.78	3.24	0.54	-	72,850	8,606	6.4	20.1
350+00	3.38	3.93	**-0.55**	**1.25**	107,820	5,000	6.2	**15.8**
352+61	3.31	4.16	**-0.85**	**1.93**	93,334	4,234	6.6	**16.2**
355+00	3.78	3.63	0.15	-	122,728	6,236	7.3	**16.9**
357+50	3.88	3.70	0.18	-	159,214	5,924	6.3	**15.9**
358+00	3.43	3.81	**-0.38**	**0.86**	106,222	5,449	6.5	**16.1**
359+00	3.41	4.05	**-0.64**	**1.45**	116,822	4,565	5.9	**15.5**
361+02	3.53	4.06	**-0.53**	**1.20**	119,662	4,544	6.3	**15.9**
362+05	3.71	3.97	**-0.26**	**0.59**	139,292	4,845	6.3	**15.9**
363+13	3.57	4.12	**-0.55**	**1.25**	131,155	4,350	6.0	**15.6**
364+00	3.55	3.84	**-0.29**	**0.66**	119,705	5,324	6.4	**16.0**
365+00	3.88	4.07	**-0.19**	**0.43**	127,886	4,499	7.5	**17.1**
367+50	3.81	4.26	**-0.45**	**1.02**	157,052	3,929	6.1	**15.7**
370+00	3.71	4.25	**-0.54**	**1.23**	157,052	3,970	6.3	**15.9**
372+50	3.75	4.19	**-0.44**	**1.00**	126,678	4,139	7.0	**16.6**
375+02	3.52	3.89	**-0.37**	**0.84**	95,868	5,137	7.5	**17.1**

Possible Weak Soils (<3000)

Possible Shallow Bedrock (>10000)

Pavement depths were taken from Ground Penetrating Radar Summary Sheet - North Bound Lane/Outer Wheelpath.





18547.00 Blue Hill-Orland
Route #15 (Northbound Inner)

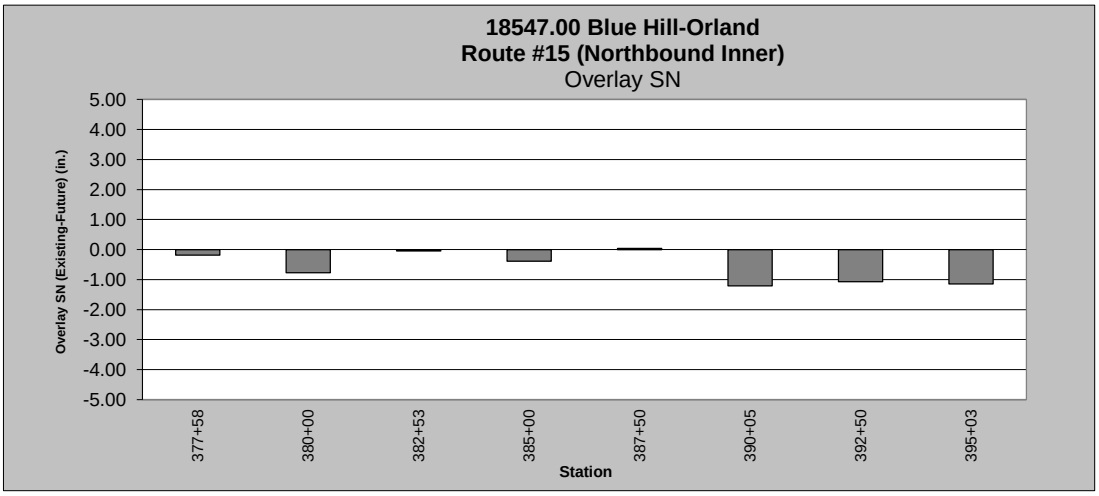
December 18, 2014

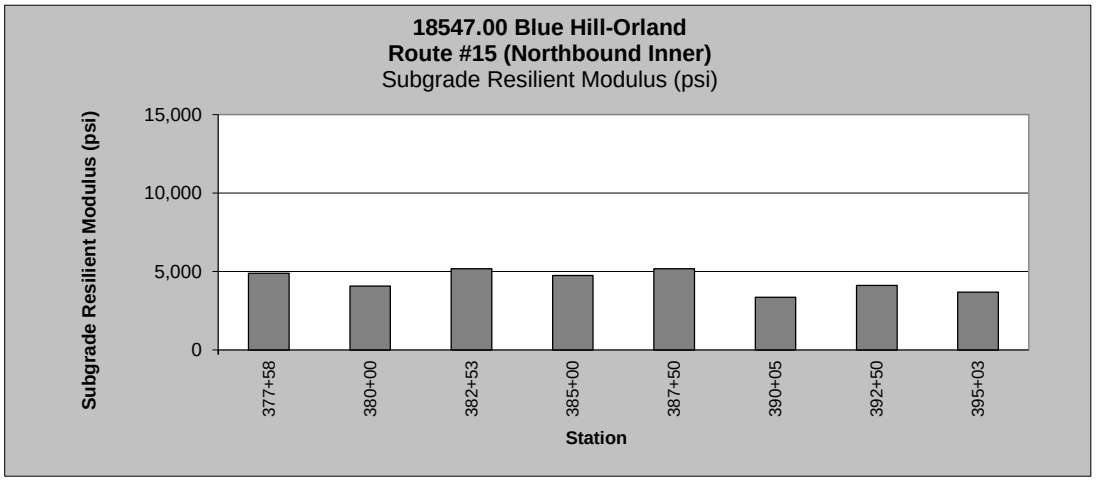
Station (Feet)	Existing Structural Number (in.)	Future Traffic Structural Number (in.)	Overlay Structural Number (Existing - Future)	Recommended Pavement Thickness (in.)	Pavement Modulus (psi)	Subgrade Resilient Modulus (psi)	Pavement Depth (in)	* Combined Pavement/Gravel Depth Used for Calculation (in)
377+58	3.77	3.96	**-0.19**	**0.43**	143,894	4,884	6.4	**16.0**
380+00	3.44	4.21	**-0.77**	**1.75**	101,692	4,077	6.8	**16.4**
382+53	3.83	3.88	**-0.05**	**0.11**	137,242	5,180	6.9	**16.5**
385+00	3.61	4.00	**-0.39**	**0.89**	116,804	4,745	6.8	**16.4**
387+50	3.92	3.88	0.04	-	145,036	5,175	7.0	**16.6**
390+05	3.28	4.49	**-1.21**	**2.75**	102,040	3,360	6.0	**15.6**
392+50	3.13	4.20	**-1.07**	**2.43**	92,034	4,108	5.8	**15.4**
395+03	3.21	4.35	**-1.14**	**2.59**	111,512	3,687	5.2	**14.8**

Possible Weak Soils (<3000)

Possible Shallow Bedrock (>10000)

Pavement depths were taken from Ground Penetrating Radar Summary Sheet - North Bound Lane/Outer Wheelpath.





18547.00 Blue Hill-Orland
Route #15 (Southbound Outer)

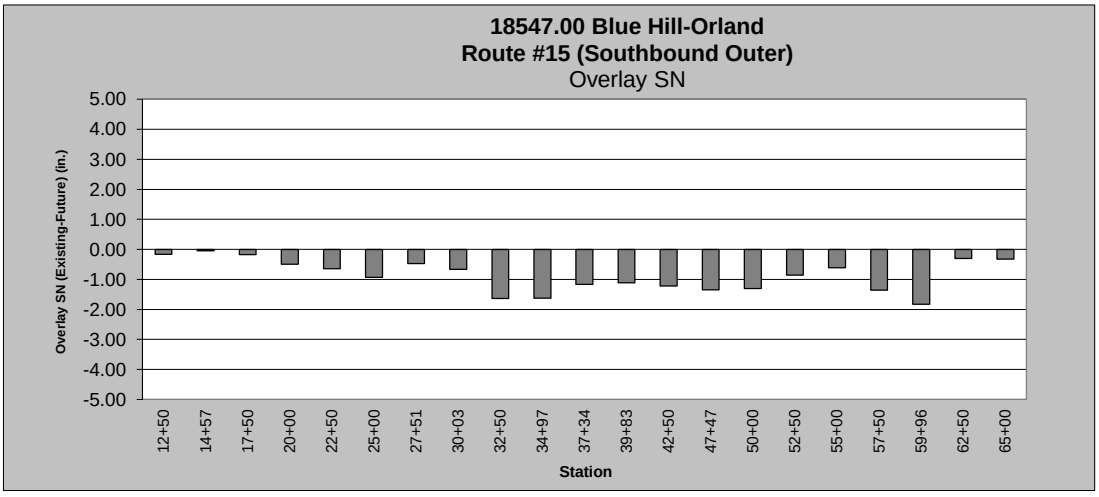
December 18, 2014

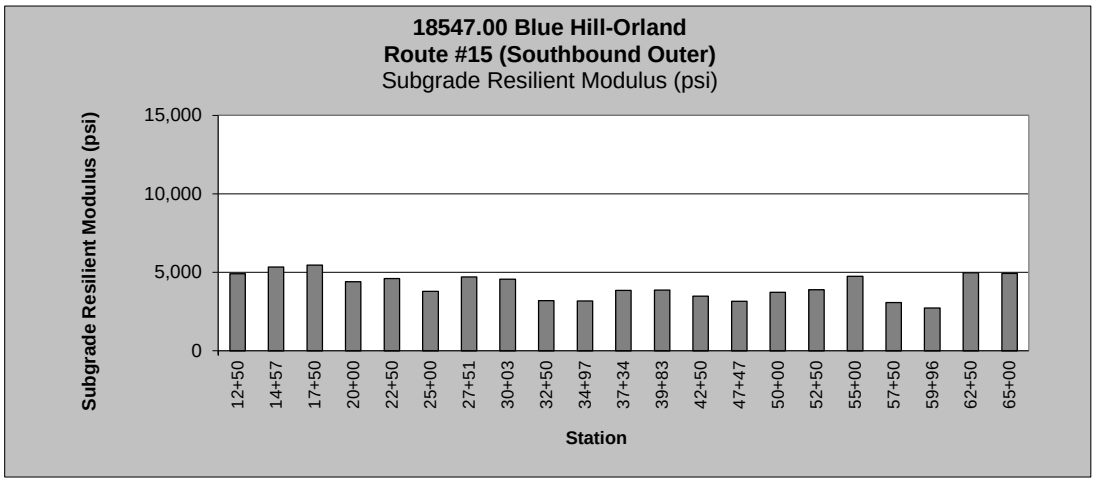
Station (Feet)	Existing Structural Number (in.)	Future Traffic Structural Number (in.)	Overlay Structural Number (Existing - Future)	Recommended Pavement Thickness (in.)	Pavement Modulus (psi)	Subgrade Resilient Modulus (psi)	Pavement Depth (in)	* Combined Pavement/Gravel Depth Used for Calculation (in)
12+50	3.79	3.95	**-0.16**	**0.36**	81,525	4,902	3.2	**19.4**
14+57	3.79	3.84	**-0.05**	**0.11**	84,734	5,326	3.0	**19.2**
17+50	3.64	3.81	**-0.17**	**0.39**	83,777	5,456	2.3	**18.5**
20+00	3.61	4.10	**-0.49**	**1.11**	80,030	4,393	2.4	**18.6**
22+50	3.40	4.04	**-0.64**	**1.45**	69,120	4,594	2.2	**18.4**
25+00	3.38	4.31	**-0.93**	**2.11**	63,780	3,793	2.6	**18.8**
27+51	3.54	4.01	**-0.47**	**1.07**	71,859	4,700	2.7	**18.9**
30+03	3.39	4.05	**-0.66**	**1.50**	68,933	4,567	2.2	**18.4**
32+50	2.93	4.57	**-1.64**	**3.73**	45,822	3,192	2.0	**18.2**
34+97	2.95	4.57	**-1.62**	**3.68**	45,762	3,183	2.1	**18.3**
37+34	3.13	4.30	**-1.17**	**2.66**	52,225	3,838	2.4	**18.6**
39+83	3.18	4.29	**-1.11**	**2.52**	56,805	3,861	2.2	**18.4**
42+50	3.22	4.44	**-1.22**	**2.77**	58,700	3,472	2.2	**18.4**
47+47	3.24	4.59	**-1.35**	**3.07**	61,800	3,148	2.0	**18.2**
50+00	3.04	4.34	**-1.30**	**1.30**	46,966	3,721	2.5	**18.7**
52+50	3.42	4.28	**-0.86**	**1.95**	70,518	3,882	2.2	**18.4**
55+00	3.39	4.00	**-0.61**	**1.39**	66,361	4,738	2.4	**18.6**
57+50	3.26	4.62	**-1.36**	**3.09**	60,072	3,080	2.3	**18.5**
59+96	2.97	4.80	**-1.83**	**4.16**	43,916	**2,734**	2.5	**18.7**
62+50	3.63	3.93	**-0.30**	**0.68**	81,383	4,975	2.4	**18.6**
65+00	3.62	3.94	**-0.32**	**0.73**	77,398	4,933	2.7	**18.9**

Possible Weak Soils (<3000)

Possible Shallow Bedrock (>10000)

Pavement depths were taken from Ground Penetrating Radar Summary Sheet - South Bound Lane/Outer Edge (White Line).





18547.00 Blue Hill-Orland
Route #15 (Southbound Outer)

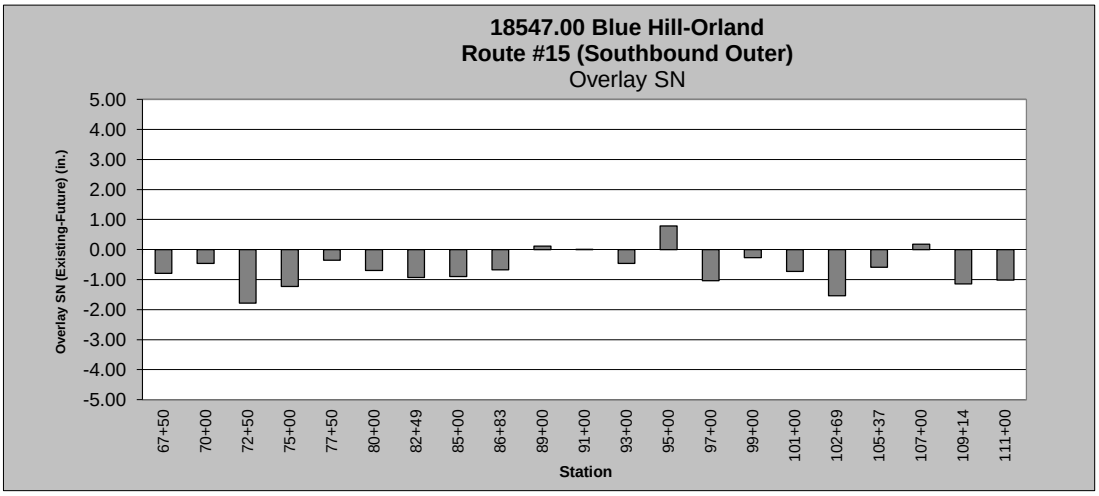
December 18, 2014

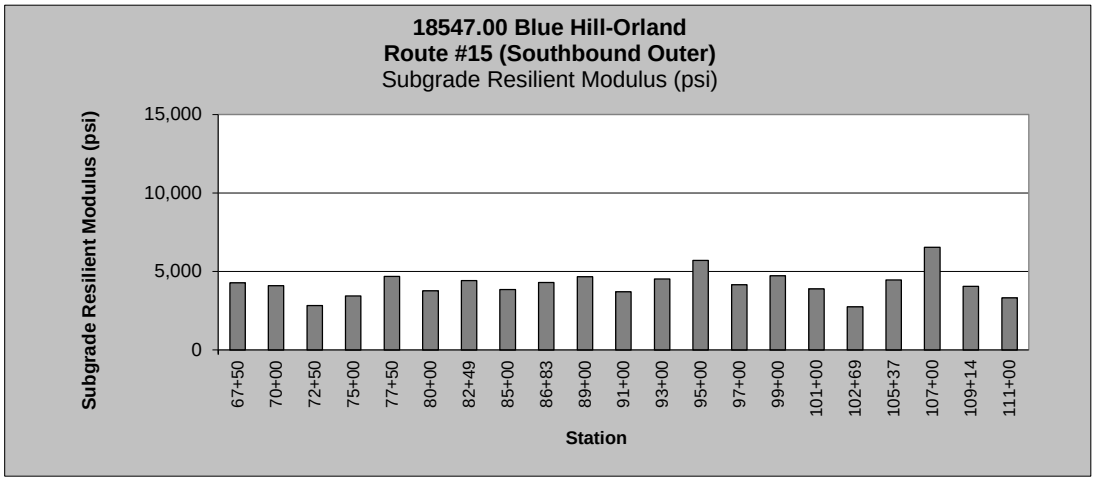
Station (Feet)	Existing Structural Number (in.)	Future Traffic Structural Number (in.)	Overlay Structural Number (Existing - Future)	Recommended Pavement Thickness (in.)	Pavement Modulus (psi)	Subgrade Resilient Modulus (psi)	Pavement Depth (in)	* Combined Pavement/Gravel Depth Used for Calculation (in)
67+50	3.35	4.14	**-0.79**	**1.80**	67,331	4,270	2.1	**18.3**
70+00	3.74	4.20	**-0.46**	**1.05**	83,929	4,101	2.8	**19.0**
72+50	2.97	4.75	**-1.78**	**4.05**	46,294	**2,824**	2.2	**18.4**
75+00	3.22	4.45	**-1.23**	**2.80**	59,830	3,446	2.1	**18.3**
77+50	3.66	4.01	**-0.35**	**0.80**	83,514	4,683	2.4	**18.6**
80+00	3.62	4.32	**-0.70**	**1.59**	73,429	3,771	3.0	**19.2**
82+49	3.16	4.09	**-0.93**	**2.11**	53,615	4,429	2.4	**18.6**
85+00	3.39	4.29	**-0.90**	**2.05**	60,434	3,849	3.0	**19.2**
86+83	3.47	4.14	**-0.67**	**1.52**	73,373	4,288	2.2	**18.4**
89+00	4.13	4.02	0.11	-	109,552	4,654	3.0	**19.2**
91+00	4.36	4.35	0.01	-	126,286	3,703	3.1	**19.3**
93+00	3.60	4.06	**-0.46**	**1.05**	74,837	4,519	2.8	**19.0**
95+00	4.54	3.75	0.79	-	120,972	5,705	4.2	20.4
97+00	3.14	4.18	**-1.04**	**2.36**	55,522	4,160	2.1	**18.3**
99+00	3.73	4.00	**-0.27**	**0.61**	78,138	4,727	3.2	**19.4**
101+00	3.55	4.28	**-0.73**	**1.66**	79,843	3,893	2.1	**18.3**
102+69	3.26	4.80	**-1.54**	**3.50**	57,897	**2,743**	2.5	**18.7**
105+37	3.49	4.08	**-0.59**	**1.34**	69,908	4,460	2.6	**18.8**
107+00	3.75	3.57	0.18	-	90,087	6,536	2.4	**18.6**
109+14	3.08	4.22	**-1.14**	**2.59**	48,307	4,048	2.6	**18.8**
111+00	3.49	4.51	**-1.02**	**2.32**	69,346	3,321	2.7	**18.9**

Possible Weak Soils (<3000)

Possible Shallow Bedrock (>10000)

Pavement depths were taken from Ground Penetrating Radar Summary Sheet - South Bound Lane/Outer Edge (White Line).





18547.00 Blue Hill-Orland
Route #15 (Southbound Outer)

December 18, 2014

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)
115+00	3.21	4.11	**-0.90**	**2.05**	55,321	4,375	2.5	**18.7**
117+10	3.59	4.42	**-0.83**	**1.89**	77,847	3,533	2.5	**18.7**
120+00	3.37	4.28	**-0.91**	**2.07**	62,126	3,877	2.7	**18.9**
121+01	3.15	4.19	**-1.04**	**2.36**	49,841	4,120	2.8	**19.0**
123+06	3.15	4.49	**-1.34**	**3.05**	53,422	3,361	2.4	**18.6**
125+00	3.99	4.15	**-0.16**	**0.36**	112,215	3,351	2.2	**18.4**
127+50	3.44	4.15	**-0.71**	**1.61**	66,305	4,257	2.7	**18.9**
129+90	3.26	4.14	**-0.88**	**2.00**	60,276	4,293	2.3	**18.5**
132+31	3.37	4.26	**-0.89**	**2.02**	65,495	3,938	2.4	**18.6**
135+27	3.44	4.15	**-0.71**	**1.61**	61,283	4,246	3.2	**19.4**
137+50	3.14	4.08	**-0.94**	**2.14**	52,876	4,479	2.4	**18.6**
140+34	3.35	4.25	**-0.90**	**2.05**	63,194	3,973	2.5	**18.7**
142+50	3.50	4.25	**-0.75**	**1.70**	73,033	3,973	2.4	**18.6**
145+00	3.29	4.20	**-0.91**	**2.07**	60,033	4,096	2.5	**18.7**
147+50	3.50	4.24	**-0.74**	**1.68**	67,464	3,985	2.9	**19.1**
150+00	3.23	4.55	**-1.32**	**3.00**	58,405	3,232	2.3	**18.5**
152+50	3.34	4.53	**-1.19**	**2.70**	65,804	3,277	2.2	**18.4**
154+97	3.50	4.24	**-0.74**	**1.68**	69,785	4,003	2.7	**18.9**
157+50	4.45	4.18	0.27	-	132,033	4,152	3.2	**19.4**
160+03	3.79	4.40	**-0.61**	**1.39**	94,160	3,564	2.3	**18.5**
162+50	4.15	4.45	**-0.30**	**0.68**	126,220	3,459	2.2	**18.4**

Possible Weak Soils (<3000)

Possible Shallow Bedrock (>10000)

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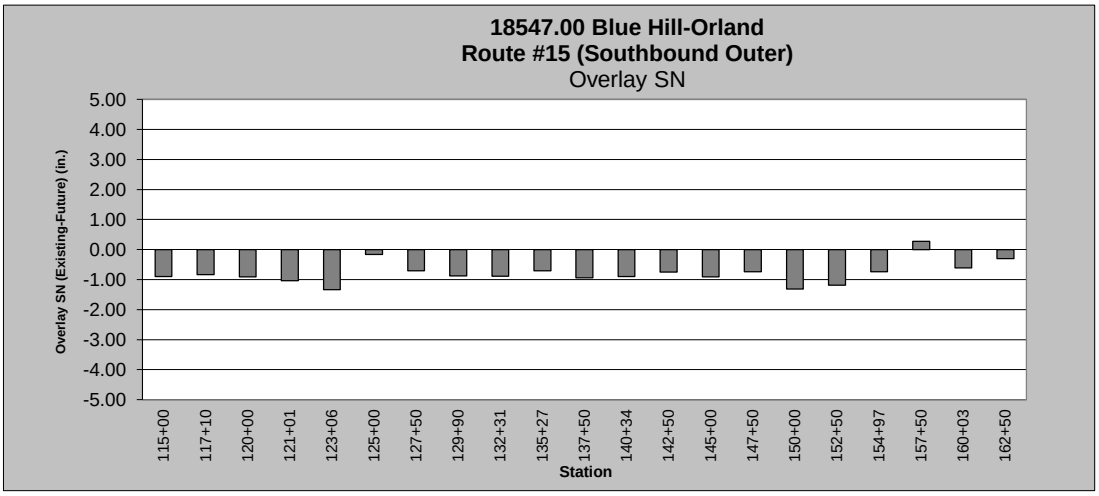

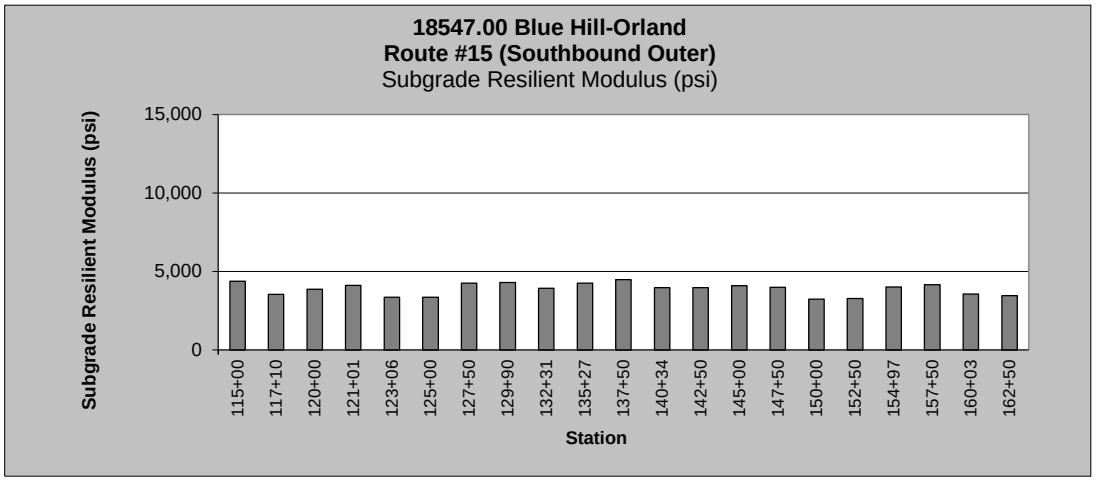

18547.00 Blue Hill-Orland
Route #15 (Southbound Outer)

December 18, 2014

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)
164+97	4.16	4.36	**-0.20**	**0.45**	120,975	3,659	2.5	**18.7**
167+50	4.95	3.85	1.10	-	193,704	5,305	2.8	**19.0**
170+00	4.53	4.05	0.48	-	161,509	4,555	2.3	**18.5**
172+50	4.33	4.10	0.23	-	142,977	4,416	2.2	**18.4**
175+00	3.88	4.60	**-0.72**	**1.64**	104,976	3,122	2.1	**18.3**
176+01	4.00	4.31	**-0.31**	**0.70**	99,159	3,811	3.0	**19.2**
177+00	3.81	3.96	**-0.15**	**0.34**	99,380	4,857	2.1	**18.3**
180+00	3.94	4.25	**-0.31**	**0.70**	107,403	3,973	2.2	**18.4**
182+53	3.40	4.40	**-1.00**	**2.27**	68,974	3,568	2.2	**18.4**
185+00	2.50	4.23	**-1.73**	**3.93**	118,480	4,026	2.1	**11.3**
187+50	2.62	4.53	**-1.91**	**4.34**	136,687	3,272	2.1	**11.3**
190+00	3.14	4.82	**-1.68**	**3.82**	207,366	**2,699**	2.6	**11.8**
192+50	2.75	4.27	**-1.52**	**3.45**	128,271	3,907	2.9	**12.1**
195+00	2.62	4.28	**-1.66**	**3.77**	136,669	3,878	2.1	**11.3**
197+50	3.32	3.87	**-0.55**	**1.25**	264,614	5,192	2.3	**11.5**
200+00	3.00	4.14	**-1.14**	**2.59**	195,460	4,292	2.3	**11.5**
202+50	2.35	4.70	**-2.35**	**5.34**	87,093	**2,918**	2.6	**11.8**
205+00	3.03	4.66	**-1.63**	**3.70**	194,771	3,011	2.4	**11.6**
207+53	2.42	4.29	**-1.87**	**4.25**	105,160	3,847	2.2	**11.4**
210+00	2.66	4.51	**-1.85**	**4.20**	142,571	3,305	2.1	**11.3**
212+50	2.95	4.45	**-1.50**	**3.41**	195,813	3,461	2.1	**11.3**

Possible Weak Soils (<3000)

Possible Shallow Bedrock (>10000)

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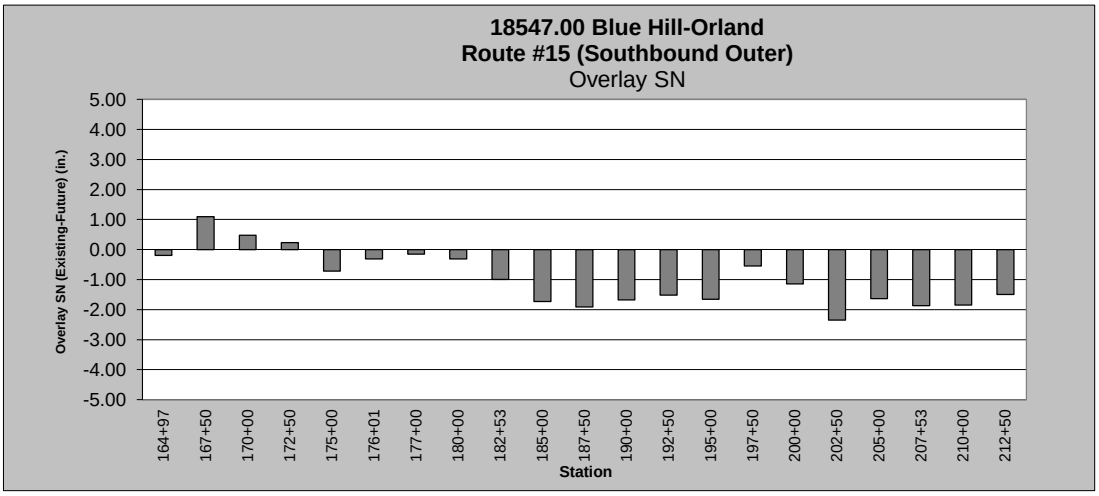

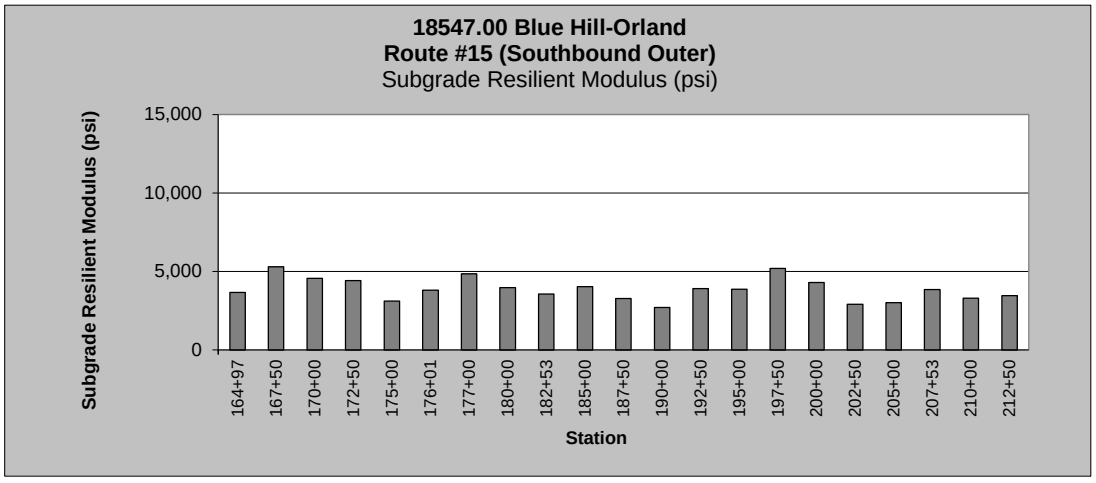

18547.00 Blue Hill-Orland
Route #15 (Southbound Outer)

December 18, 2014

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)
215+00	2.22	4.69	**-2.47**	**5.61**	64,129	**2,946**	3.1	**12.3**
217+50	3.09	4.15	**-1.06**	**2.41**	174,034	4,249	3.1	**12.3**
220+00	2.47	4.63	**-2.16**	**4.91**	117,391	3,055	2.0	**11.2**
222+50	2.78	4.21	**-1.43**	**3.25**	167,041	4,073	2.0	**11.2**
225+00	3.28	3.97	**-0.69**	**1.57**	261,603	4,840	2.2	**11.4**
227+50	2.98	4.03	**-1.05**	**2.39**	177,498	4,647	2.6	**11.8**
230+02	2.80	3.99	**-1.19**	**2.70**	135,613	4,753	2.9	**12.1**
232+50	2.63	3.98	**-1.35**	**3.07**	141,998	4,816	2.0	**11.2**
235+00	3.15	3.95	**-0.80**	**1.82**	208,160	4,895	2.6	**11.8**
237+50	3.08	4.09	**-1.01**	**2.30**	228,803	4,424	2.0	**11.2**
240+00	3.19	4.02	**-0.83**	**1.89**	222,540	4,665	2.5	**11.7**
242+50	2.74	4.12	**-1.38**	**3.14**	140,355	4,341	2.5	**11.7**
245+00	2.44	4.65	**-2.21**	**5.02**	113,642	3,024	2.0	**11.2**
247+50	2.49	4.61	**-2.12**	**4.82**	105,851	3,098	2.5	**11.7**
250+00	2.22	4.89	**-2.67**	**6.07**	75,056	**2,589**	2.5	**11.7**
252+50	2.70	4.12	**-1.42**	**3.23**	124,649	4,340	2.8	**12.0**
255+00	2.08	4.20	**-2.12**	**4.82**	63,312	4,114	2.4	**11.6**
257+50	2.48	4.39	**-1.91**	**4.34**	101,534	3,604	2.6	**11.8**

Possible Weak Soils (<3000)

Possible Shallow Bedrock (>10000)

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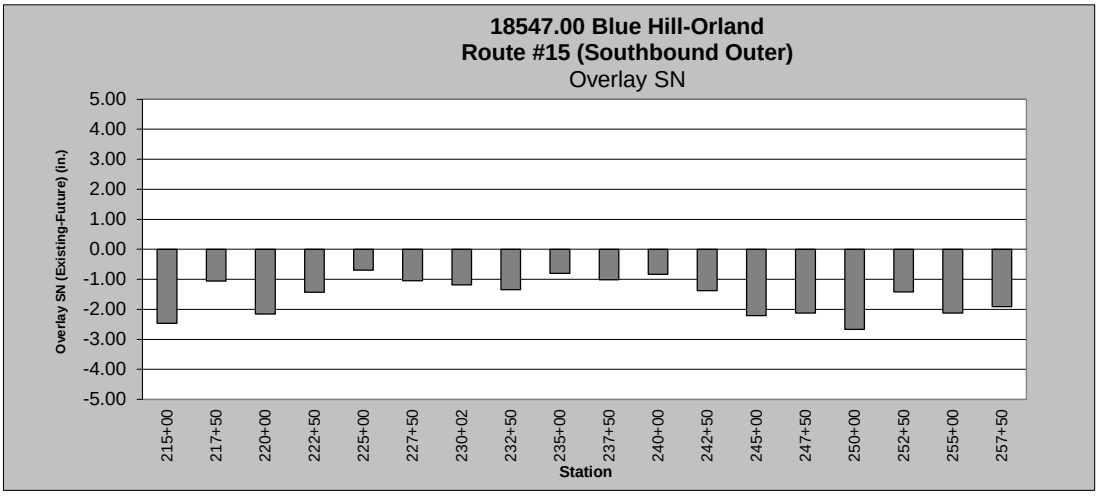

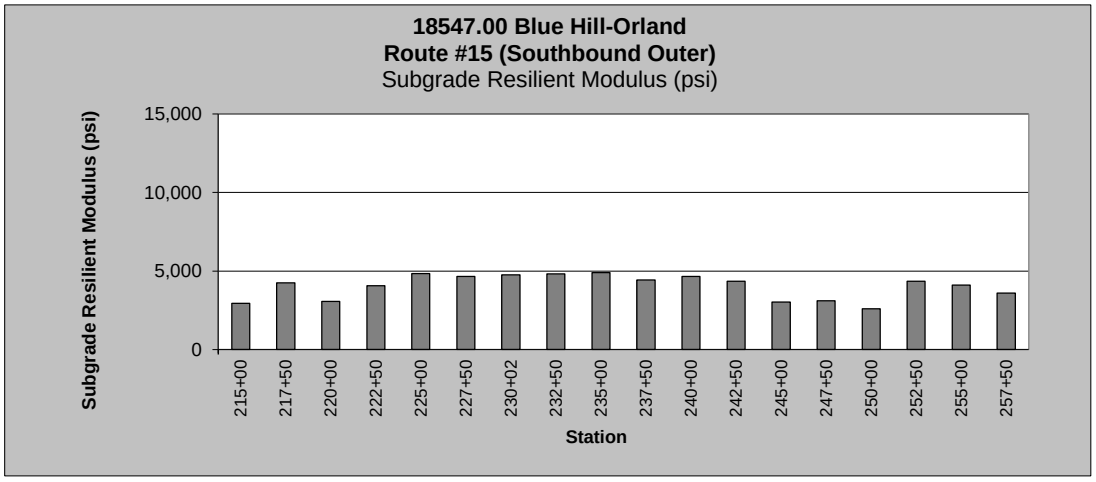

18547.00 Blue Hill-Orland
Route #15 (Southbound Outer)

December 18, 2014

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)
260+00	2.32	3.97	**-1.65**	**3.75**	73,817	4,840	3.1	**12.3**
262+50	2.99	3.94	**-0.95**	**2.16**	192,306	4,962	2.3	**11.5**
265+01	2.50	4.26	**-1.76**	**4.00**	119,258	3,944	2.1	**11.3**
267+38	2.23	5.49	**-3.26**	**7.41**	84,223	**1,793**	2.1	**11.3**
270+33	2.64	5.03	**-2.39**	**5.43**	139,618	**2,369**	2.1	**11.3**
272+50	2.17	5.12	**-2.95**	**6.70**	77,902	**2,243**	2.1	**11.3**
275+00	2.88	4.98	**-2.10**	**4.77**	176,064	**2,446**	2.2	**11.4**
276+00	2.27	5.01	**-2.74**	**6.23**	84,139	**2,397**	2.3	**11.5**
277+04	2.57	4.50	**-1.93**	**4.39**	109,932	3,339	2.7	**11.9**
278+06	2.45	4.60	**-2.15**	**4.89**	102,980	3,119	2.4	**11.6**
279+07	3.51	4.69	**-1.18**	**2.68**	310,786	**2,941**	2.3	**11.5**
280+00	2.32	4.73	**-2.41**	**5.48**	87,836	**2,871**	2.4	**11.6**
282+54	2.33	4.91	**-2.58**	**5.86**	96,681	**2,547**	2.1	**11.3**
287+50	3.93	3.80	0.13	-	288,890	5,507	4.0	**13.2**
290+01	4.15	3.40	0.75	-	318,217	7,488	4.3	**13.5**
292+50	2.98	3.51	**-0.53**	**1.20**	152,521	6,883	3.2	**12.4**
294+89	2.48	4.17	**-1.69**	**3.84**	72,685	4,205	4.0	**13.2**
297+50	3.21	3.22	**-0.01**	**0.02**	181,537	8,774	3.4	**12.6**

Possible Weak Soils (<3000)

Possible Shallow Bedrock (>10000)

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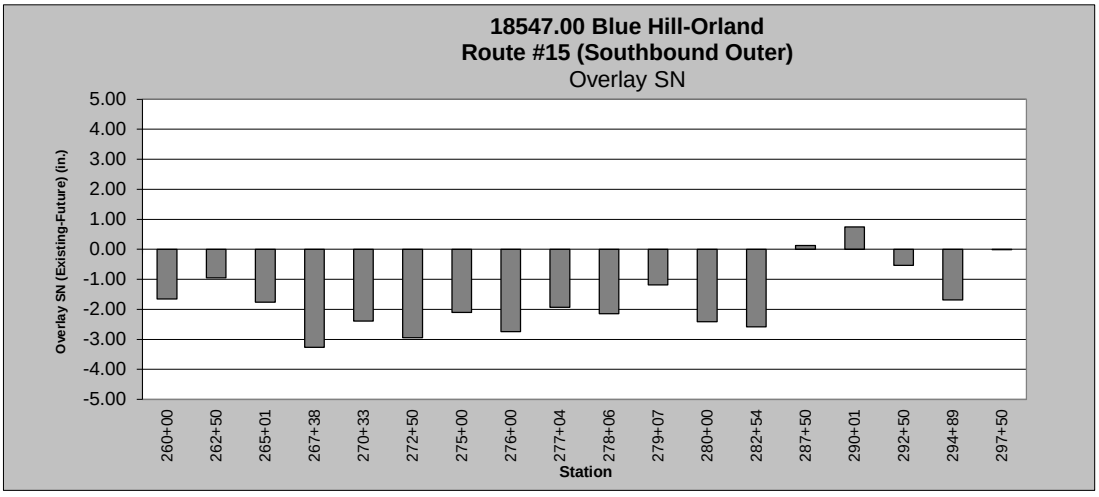

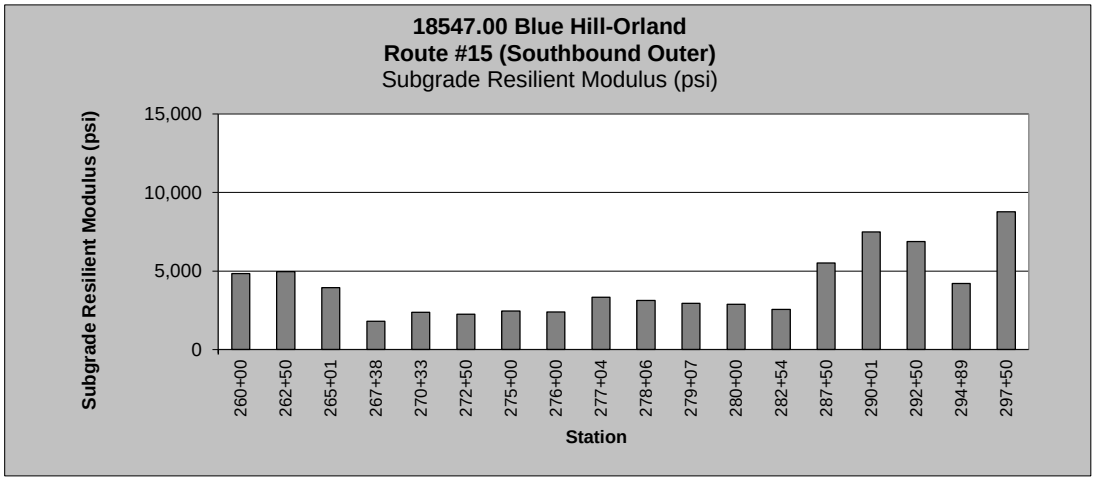

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Route #15 (Southbound Outer)

December 18, 2014

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)
300+00	2.55	3.61	**-1.06**	**2.41**	111,062	6,337	2.6	**11.8**
302+50	2.93	3.65	**-0.72**	**1.64**	109,255	6,148	4.4	**13.6**
305+00	3.34	3.62	**-0.28**	**0.64**	185,291	6,309	3.8	**13.0**
307+50	3.13	3.76	**-0.63**	**1.43**	168,426	5,671	3.4	**12.6**
310+00	3.26	4.24	**-0.98**	**2.23**	164,598	3,981	4.0	**13.2**
312+50	3.25	4.19	**-0.94**	**2.14**	128,279	4,133	5.1	**14.3**
315+00	3.57	3.58	**-0.01**	**0.02**	212,652	6,494	4.1	**13.3**
317+52	3.88	3.89	**-0.01**	**0.02**	227,958	5,134	4.9	**14.1**
320+00	4.04	3.39	0.65	-	288,385	7,603	4.4	**13.6**
322+52	4.25	3.46	0.79	-	294,381	7,149	5.0	**14.2**
324+94	2.48	4.09	**-1.61**	**3.66**	137,064	4,425	4.1	**10.7**
327+50	2.38	4.92	**-2.54**	**5.77**	189,841	**2,539**	2.6	**9.2**
330+00	3.47	4.09	**-0.62**	**1.41**	485,719	4,448	3.2	**9.8**
332+62	2.37	4.30	**-1.93**	**4.39**	113,313	3,817	4.3	**10.9**
335+00	2.87	3.97	**-1.10**	**2.50**	225,032	4,830	3.9	**10.5**
337+50	2.31	4.55	**-2.24**	**5.09**	134,467	3,223	3.4	**10.0**
340+18	2.93	4.17	**-1.24**	**2.82**	245,459	4,187	3.8	**10.4**
342+50	2.55	4.28	**-1.73**	**3.93**	170,811	3,867	3.6	**10.2**

Possible Weak Soils (<3000)

Possible Shallow Bedrock (>10000)

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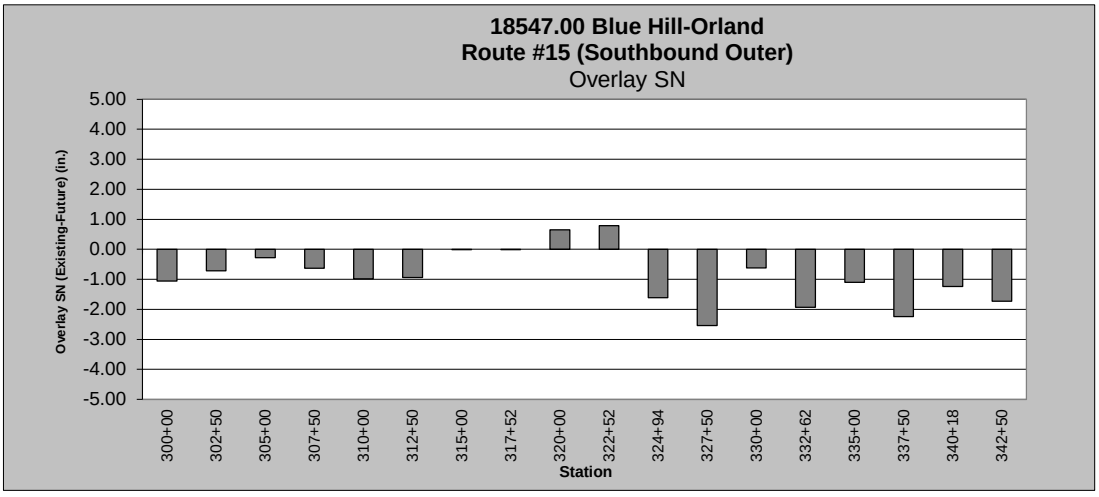

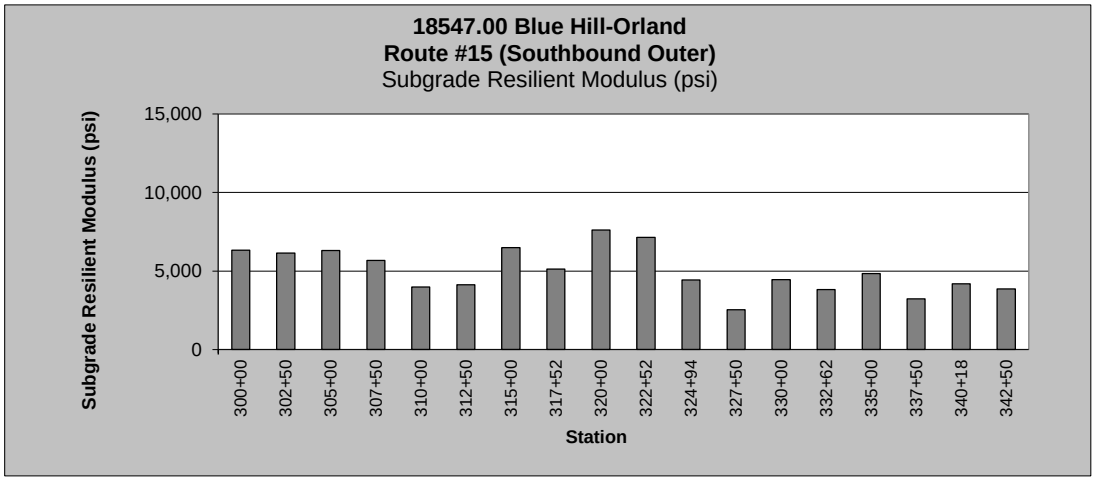

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Route #15 (Southbound Outer)

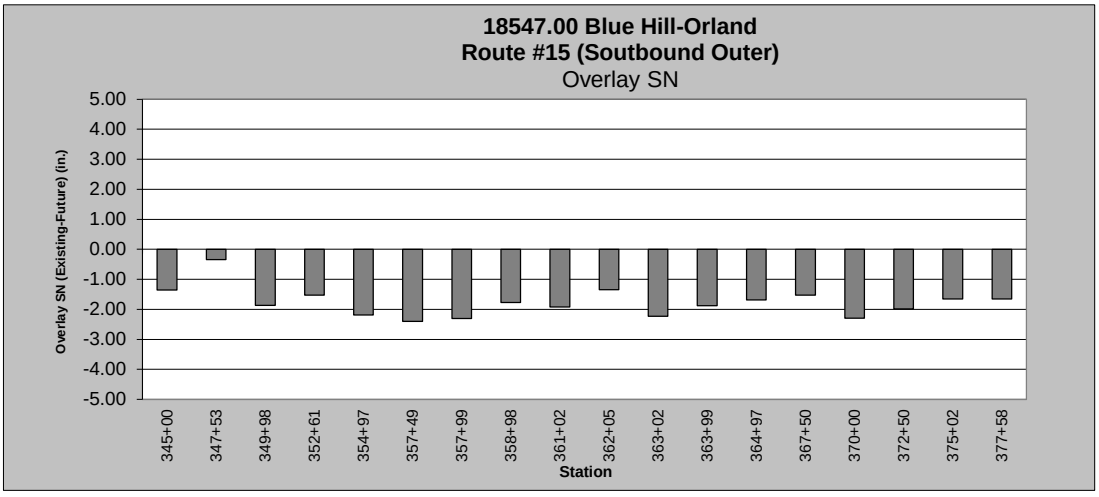
December 18, 2014

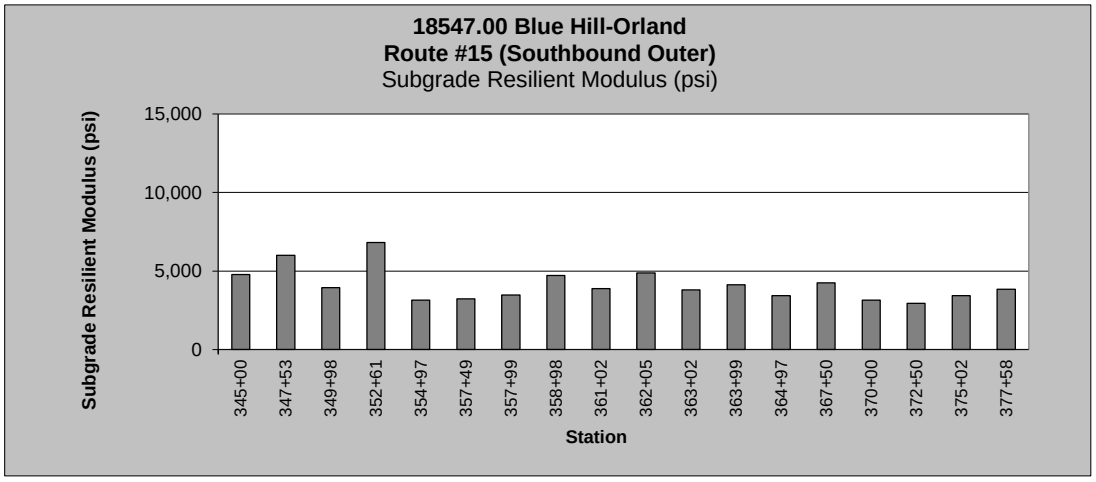
Station (Feet)	Existing Structural Number (in.)	Future Traffic Structural Number (in.)	Overlay Structural Number (Existing - Future)	Recommended Pavement Thickness (in.)	Pavement Modulus (psi)	Subgrade Resilient Modulus (psi)	Pavement Depth (in)	* Combined Pavement/Gravel Depth Used for Calculation (in)
345+00	2.63	3.99	**-1.36**	**3.09**	194,275	4,777	3.5	**10.1**
347+53	3.35	3.69	**-0.34**	**0.77**	401,714	5,993	3.5	**10.1**
349+98	2.38	4.25	**-1.87**	**4.25**	168,102	3,951	3.0	**9.6**
352+61	1.99	3.52	**-1.53**	**3.48**	95,053	6,817	3.1	**9.7**
354+97	2.40	4.59	**-2.19**	**4.98**	207,509	3,153	2.4	**9.0**
357+49	2.15	4.55	**-2.40**	**5.45**	148,628	3,223	2.4	**9.0**
357+99	2.14	4.44	**-2.30**	**5.23**	148,507	3,465	2.4	**9.0**
358+98	2.23	4.00	**-1.77**	**4.02**	128,860	4,724	3.2	**9.8**
361+02	2.36	4.28	**-1.92**	**4.36**	158,741	3,890	3.1	**9.7**
362+05	2.62	3.96	**-1.34**	**3.05**	222,317	4,887	3.0	**9.6**
363+02	2.08	4.31	**-2.23**	**5.07**	119,645	3,792	2.8	**9.4**
363+99	2.31	4.19	**-1.88**	**4.27**	143,776	4,132	3.2	**9.8**
364+97	2.77	4.46	**-1.69**	**3.84**	272,129	3,433	2.9	**9.5**
367+50	2.62	4.15	**-1.53**	**3.48**	238,723	4,243	2.8	**9.4**
370+00	2.30	4.59	**-2.29**	**5.20**	161,741	3,150	2.8	**9.4**
372+50	2.70	4.69	**-1.99**	**4.52**	287,120	**2,951**	2.5	**9.1**
375+02	2.81	4.46	**-1.65**	**3.75**	293,200	3,436	2.8	**9.4**
377+58	2.65	4.30	**-1.65**	**3.75**	279,103	3,832	2.4	**9.0**

Possible Weak Soils (<3000)

Possible Shallow Bedrock (>10000)

Pavement depths were taken from Ground Penetrating Radar Summary Sheet - South Bound Lane/Outer Edge (White Line).





18547.00 Blue Hill-Orland
Route #15 (Southbound Outer)

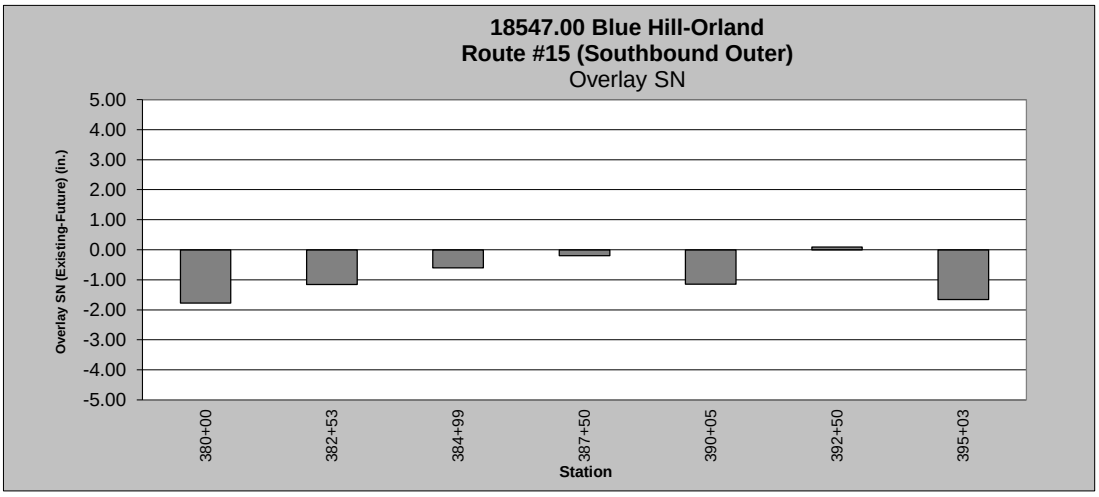
December 18, 2014

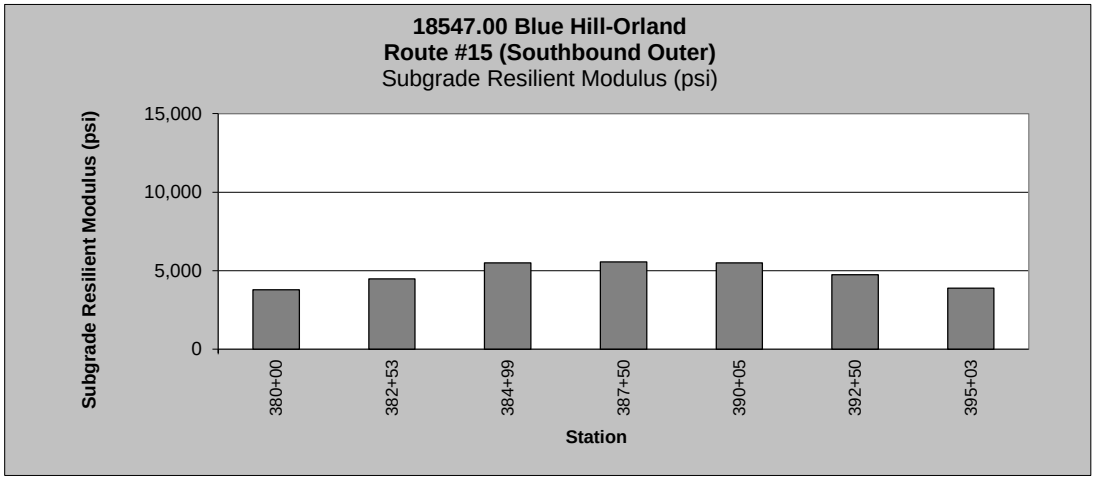
Station (Feet)	Existing Structural Number (in.)	Future Traffic Structural Number (in.)	Overlay Structural Number (Existing - Future)	Recommended Pavement Thickness (in.)	Pavement Modulus (psi)	Subgrade Resilient Modulus (psi)	Pavement Depth (in)	* Combined Pavement/Gravel Depth Used for Calculation (in)
380+00	2.54	4.32	**-1.78**	**4.05**	237,818	3,784	2.5	**9.1**
382+53	2.92	4.08	**-1.16**	**2.64**	290,104	4,476	3.2	**9.8**
384+99	3.20	3.80	**-0.60**	**1.36**	544,691	5,497	2.1	**8.7**
387+50	3.58	3.78	**-0.20**	**0.45**	518,321	5,567	3.3	**9.9**
390+05	2.65	3.80	**-1.15**	**2.61**	262,870	5,503	2.6	**9.2**
392+50	4.09	4.00	0.09	-	930,861	4,736	2.7	**9.3**
395+03	2.61	4.27	**-1.66**	**3.77**	268,058	3,895	2.4	**9.0**

Possible Weak Soils (<3000)

Possible Shallow Bedrock (>10000)

Pavement depths were taken from Ground Penetrating Radar Summary Sheet - South Bound Lane/Outer Edge (White Line).





Ground Penetrating Radar Data
GPR

MaineDOT

Ground Penetrating Radar (GPR)
Estimated Pavement Thickness Summary
018547.00 - Blue Hill, Penobscot, Orland

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

GPR data was collected at the inner and outer wheel path of the lane at 1 foot intervals along the entire section. Pavement thickness estimates were developed using Geophysical Survey Systems, Inc. (GSSI) RADAN7 GPR data processing software. Where available, pavement thickness values from Geotechnical borings and/or pavement cores collected by MaineDOT personnel were used in developing the estimated GPR pavement thicknesses.

Data Confidence Level:

Very Good - Reflection layers appear strong throughout much of the project. Layer depths correlate well with known pavement depths obtained from pavement cores.

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	COLSON, STEPHEN W	7/22/2014	1/5/2015

Lane Tested	Route	Avg. Thickness, in.	Min. Thickness, in.	Max. Thickness, in.	Analysis Distance, ft.
NORTHBOUND Travel Lane Core	15	6.2	2.1	10.1	50

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

Station	Inner Average Thickness, in.	Outer Average Thickness, in.	Station	Inner Average Thickness, in.	Outer Average Thickness, in.	Station	Inner Average Thickness, in.	Outer Average Thickness, in.	Station	Inner Average Thickness, in.	Outer Average Thickness, in.
10+50*	3.7	3.6	11+00	3.6	3.7	11+50	4.0	4.0	12+00	3.6	3.6
12+50	4.2	4.0	13+00	3.8	3.9	13+50	3.4	3.5	14+00	3.4	3.7
14+50	3.0	3.1	15+00	3.9	5.0	15+50	5.9	5.9	16+00	6.6	6.4
16+50	6.8	6.2	17+00	6.7	6.4	17+50	6.7	6.5	18+00	6.7	6.1
18+50	7.3	6.3	19+00	6.5	5.9	19+50	6.3	5.9	20+00	6.3	5.7
20+50	6.6	6.3	21+00	6.9	6.6	21+50	6.3	6.4	22+00	5.9	5.8
22+50	5.8	5.8	23+00	5.6	5.7	23+50	6.3	6.6	24+00	5.4	7.1
24+50	5.8	7.1	25+00	5.7	7.2	25+50	5.8	6.7	26+00	6.4	6.3
26+50	6.3	6.2	27+00	6.1	5.7	27+50	6.8	5.8	28+00	6.0	6.0
28+50	6.1	5.9	29+00	6.3	6.5	29+50	7.0	6.2	30+00	6.1	6.1
30+50	6.2	6.0	31+00	6.0	5.8	31+50	6.2	6.1	32+00	6.1	5.9
32+50	5.6	5.4	33+00	6.8	5.7	33+50	6.9	6.4	34+00	6.8	6.4
34+50	6.7	6.6	35+00	6.8	6.4	35+50	6.5	6.7	36+00	6.6	6.6
36+50	7.1	7.0	37+00	6.9	7.0	37+50	7.0	6.7	38+00	7.1	6.8
38+50	7.0	6.7	39+00	6.3	6.4	39+50	6.7	6.6	40+00	6.2	6.0
40+50	5.9	5.8	41+00	5.8	6.0	41+50	5.6	6.0	42+00	6.6	5.9
42+50	6.9	6.0	43+00	7.0	6.5	43+50	7.0	6.6	44+00	6.5	6.4

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

Station	Inner Average Thickness, in.	Outer Average Thickness, in.	Station	Inner Average Thickness, in.	Outer Average Thickness, in.	Station	Inner Average Thickness, in.	Outer Average Thickness, in.	Station	Inner Average Thickness, in.	Outer Average Thickness, in.
44+50	6.2	6.5	45+00	6.5	6.9	45+50	6.7	6.8	46+00	7.1	7.1
46+50	7.1	7.6	47+00	7.3	7.6	47+50	6.9	6.9	48+00	7.5	6.9
48+50	8.0	6.3	49+00	8.2	6.9	49+50	9.2	6.8	50+00	7.9	6.9
50+50	7.2	6.6	51+00	7.7	6.9	51+50	7.4	6.6	52+00	6.7	6.7
52+50	7.4	6.6	53+00	6.9	6.7	53+50	7.2	6.5	54+00	6.7	6.3
54+50	6.7	6.5	55+00	6.5	7.4	55+50	6.5	6.9	56+00	6.6	6.7
56+50	6.7	6.7	57+00	6.0	6.4	57+50	6.1	6.2	58+00	6.0	5.9
58+50	5.8	6.0	59+00	6.0	6.2	59+50	6.1	6.1	60+00	5.6	6.7
60+50	6.0	6.7	61+00	6.1	6.2	61+50	5.8	6.1	62+00	6.1	6.5
62+50	7.0	6.3	63+00	7.0	6.0	63+50	6.7	5.9	64+00	7.3	6.5
64+50	7.0	6.0	65+00	7.1	5.9	65+50	6.3	6.5	66+00	6.8	6.6
66+50	5.6	6.2	67+00	5.7	5.7	67+50	5.9	5.7	68+00	6.5	6.0
68+50	6.4	6.2	69+00	5.7	6.2	69+50	6.1	6.4	70+00	6.1	5.9
70+50	5.7	6.1	71+00	6.6	6.6	71+50	6.7	6.4	72+00	6.0	6.4
72+50	6.2	6.9	73+00	6.4	6.9	73+50	6.7	6.3	74+00	6.8	6.1
74+50	6.3	7.5	75+00	6.4	7.6	75+50	5.9	6.6	76+00	5.2	5.6
76+50	5.6	5.9	77+00	5.3	5.6	77+50	5.2	5.5	78+00	5.3	5.5
78+50	5.4	5.6	79+00	5.6	5.6	79+50	5.9	6.1	80+00	5.8	6.2
80+50	5.9	6.6	81+00	5.5	6.5	81+50	6.1	6.5	82+00	5.6	6.7
82+50	5.7	6.1	83+00	5.5	6.2	83+50	5.4	6.1	84+00	5.3	5.9
84+50	5.3	6.0	85+00	5.1	5.9	85+50	5.6	5.7	86+00	5.5	5.9
86+50	5.5	5.6	87+00	5.5	5.9	87+50	5.8	5.9	88+00	5.7	6.0
88+50	6.1	5.8	89+00	6.2	6.2	89+50	6.2	6.1	90+00	5.6	5.8
90+50	5.6	6.1	91+00	5.4	6.2	91+50	5.4	6.4	92+00	5.5	6.3
92+50	5.5	6.0	93+00	5.4	6.0	93+50	5.5	5.6	94+00	5.4	5.7
94+50	6.0	6.3	95+00	6.3	6.7	95+50	6.4	7.1	96+00	6.3	6.9
96+50	6.2	6.9	97+00	6.4	6.4	97+50	6.4	6.4	98+00	6.3	6.2
98+50	5.8	5.7	99+00	5.7	5.8	99+50	5.8	5.7	100+00	5.8	5.8
100+50	5.3	5.3	101+00	5.4	5.6	101+50	5.2	5.5	102+00	5.2	5.5
102+50	5.9	6.1	103+00	6.9	6.7	103+50	6.6	6.7	104+00	6.0	6.7
104+50	5.9	6.3	105+00	5.6	5.6	105+50	6.0	5.7	106+00	5.7	5.4
106+50	5.5	5.7	107+00	5.3	5.5	107+50	5.5	5.6	108+00	5.6	5.6
108+50	6.2	6.0	109+00	6.3	6.6	109+50	6.5	6.8	110+00	6.7	6.7
110+50	6.1	7.0	111+00	6.3	6.5	111+50	6.9	7.0	112+00	6.7	7.3
112+50	6.5	7.1	113+00	6.3	6.9	113+50	6.7	6.8	114+00	7.0	6.9
114+50	6.8	6.8	115+00	6.0	6.4	115+50	6.6	6.4	116+00	6.1	5.9
116+50	6.9	6.3	117+00	7.3	6.3	117+50	6.4	6.6	118+00	6.3	7.0
118+50	6.5	6.8	119+00	7.1	7.1	119+50	7.0	7.1	120+00	6.5	6.6
120+50	7.5	7.0	121+00	7.8	6.7	121+50	7.4	6.3	122+00	7.1	6.0
122+50	6.6	5.2	123+00	6.3	5.8	123+50	5.6	6.6	124+00	5.8	6.4
124+50	6.0	7.2	125+00	6.1	6.7	125+50	6.1	7.3	126+00	6.0	7.1
126+50	6.0	7.0	127+00	5.9	7.0	127+50	6.0	6.7	128+00	6.0	6.7
128+50	6.2	6.3	129+00	6.0	6.4	129+50	5.9	6.5	130+00	6.2	6.5
130+50	5.8	6.3	131+00	6.1	6.9	131+50	5.3	5.9	132+00	5.3	6.7
132+50	5.6	6.3	133+00	5.9	7.1	133+50	5.7	6.9	134+00	6.0	7.0
134+50	6.2	7.1	135+00	5.6	7.4	135+50	5.5	6.5	136+00	5.6	6.6

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

Station	Inner Average Thickness, in.	Outer Average Thickness, in.	Station	Inner Average Thickness, in.	Outer Average Thickness, in.	Station	Inner Average Thickness, in.	Outer Average Thickness, in.	Station	Inner Average Thickness, in.	Outer Average Thickness, in.
136+50	6.5	6.6	137+00	6.7	6.7	137+50	6.9	6.9	138+00	6.6	7.1
138+50	6.4	7.5	139+00	6.7	7.7	139+50	6.5	7.2	140+00	5.9	6.8
140+50	5.5	6.8	141+00	6.0	7.0	141+50	5.9	7.3	142+00	6.5	7.7
142+50	6.3	7.9	143+00	6.4	8.0	143+50	6.5	8.0	144+00	6.5	8.1
144+50	6.9	8.4	145+00	6.5	8.0	145+50	6.1	7.6	146+00	6.1	6.9
146+50	6.5	6.3	147+00	6.4	6.8	147+50	7.3	6.7	148+00	7.7	6.5
148+50	7.6	6.9	149+00	7.7	6.8	149+50	7.3	6.5	150+00	6.5	6.5
150+50	6.7	6.5	151+00	7.0	6.8	151+50	6.6	6.2	152+00	7.4	6.5
152+50	7.0	6.2	153+00	6.3	6.8	153+50	6.0	6.6	154+00	6.5	6.7
154+50	6.4	7.0	155+00	5.7	6.4	155+50	6.1	6.0	156+00	6.5	6.5
156+50	6.7	6.9	157+00	6.2	7.1	157+50	5.7	6.2	158+00	5.6	6.7
158+50	5.2	6.5	159+00	5.3	6.3	159+50	6.1	6.9	160+00	5.5	6.5
160+50	5.4	6.4	161+00	6.1	7.2	161+50	6.3	7.5	162+00	6.5	7.4
162+50	6.5	7.3	163+00	6.3	7.4	163+50	6.2	7.2	164+00	5.9	7.3
164+50	5.8	6.8	165+00	5.3	6.1	165+50	5.3	6.0	166+00	5.8	6.4
166+50	6.3	6.9	167+00	6.4	6.4	167+50	5.9	5.7	168+00	5.8	5.9
168+50	6.1	6.8	169+00	5.5	6.5	169+50	5.4	6.3	170+00	5.4	6.2
170+50	5.4	6.2	171+00	5.8	7.5	171+50	6.0	7.7	172+00	6.0	7.5
172+50	5.9	7.4	173+00	6.2	7.2	173+50	6.4	7.2	174+00	6.3	7.3
174+50	6.3	7.4	175+00	6.2	7.3	175+50	6.2	6.9	176+00	6.2	7.2
176+50	5.8	6.6	177+00	6.4	6.6	177+50	6.1	6.4	178+00	6.2	6.3
178+50	6.2	6.2	179+00	5.8	6.4	179+50	6.5	6.9	180+00	6.5	6.4
180+50	5.9	6.2	181+00	5.6	6.2	181+50	6.1	6.6	182+00	6.0	6.9
182+50	6.2	6.8	183+00	5.8	6.5	183+50	5.5	6.7	184+00	5.4	6.8
184+50	5.8	7.3	185+00	6.1	6.6	185+50	5.8	6.3	186+00	6.0	5.8
186+50	6.6	6.3	187+00	6.6	6.1	187+50	6.3	6.2	188+00	5.9	6.8
188+50	6.0	6.8	189+00	6.0	6.2	189+50	6.0	6.2	190+00	6.4	7.0
190+50	6.4	6.8	191+00	6.2	6.7	191+50	6.2	6.6	192+00	6.8	6.4
192+50	6.5	7.1	193+00	6.7	7.6	193+50	6.4	7.3	194+00	6.3	8.1
194+50	6.0	7.1	195+00	6.2	7.1	195+50	6.4	7.3	196+00	6.5	7.5
196+50	6.3	7.5	197+00	5.9	8.0	197+50	5.5	8.7	198+00	6.1	7.8
198+50	6.4	7.4	199+00	6.0	7.3	199+50	6.1	6.8	200+00	6.1	7.2
200+50	6.1	7.1	201+00	6.2	6.6	201+50	6.2	6.6	202+00	6.1	6.4
202+50	6.3	6.0	203+00	7.2	6.1	203+50	6.6	6.1	204+00	5.8	6.6
204+50	6.4	6.7	205+00	6.1	6.5	205+50	6.1	6.7	206+00	5.3	6.5
206+50	5.5	6.9	207+00	6.0	6.7	207+50	6.6	7.3	208+00	7.0	7.3
208+50	7.1	7.3	209+00	6.3	7.1	209+50	5.7	7.2	210+00	5.4	6.8
210+50	5.9	7.0	211+00	6.1	7.1	211+50	6.4	6.4	212+00	6.8	6.6
212+50	6.6	6.3	213+00	6.3	6.8	213+50	5.5	7.1	214+00	4.4	5.2
214+50	3.0	3.6	215+00	2.8	3.8	215+50	2.5	2.9	216+00	2.6	3.1
216+50	2.6	3.1	217+00	2.8	3.6	217+50	2.8	3.4	218+00	2.8	3.8
218+50	3.0	4.1	219+00	3.0	4.1	219+50	4.5	5.4	220+00	5.3	6.7
220+50	5.3	6.3	221+00	5.6	6.6	221+50	5.4	6.6	222+00	5.1	5.7
222+50	5.5	5.9	223+00	5.7	6.5	223+50	5.2	6.6	224+00	5.4	6.9
224+50	5.2	6.7	225+00	5.7	7.2	225+50	4.8	6.1	226+00	4.5	6.0
226+50	4.9	6.1	227+00	5.1	5.7	227+50	5.3	6.2	228+00	5.8	6.5

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

Station	Inner Average Thickness, in.	Outer Average Thickness, in.	Station	Inner Average Thickness, in.	Outer Average Thickness, in.	Station	Inner Average Thickness, in.	Outer Average Thickness, in.	Station	Inner Average Thickness, in.	Outer Average Thickness, in.
228+50	5.6	6.7	229+00	5.5	6.9	229+50	5.3	6.5	230+00	5.4	6.0
230+50	5.4	5.8	231+00	5.6	6.0	231+50	5.5	6.7	232+00	5.6	5.8
232+50	5.3	5.7	233+00	5.3	5.1	233+50	5.5	5.4	234+00	5.2	5.7
234+50	5.6	6.5	235+00	4.9	5.5	235+50	5.5	5.7	236+00	6.3	5.5
236+50	5.5	5.1	237+00	5.4	4.9	237+50	5.5	5.4	238+00	5.2	5.7
238+50	5.1	5.8	239+00	5.1	5.5	239+50	5.4	6.1	240+00	5.1	6.4
240+50	5.5	6.6	241+00	5.1	6.2	241+50	4.9	5.9	242+00	5.3	6.7
242+50	5.7	6.9	243+00	6.1	6.7	243+50	5.9	5.9	244+00	5.6	5.8
244+50	5.0	6.2	245+00	5.2	6.0	245+50	5.6	6.7	246+00	6.0	6.9
246+50	5.3	6.5	247+00	3.1	4.4	247+50	2.9	3.6	248+00	2.9	3.5
248+50	3.7	3.6	249+00	3.5	3.7	249+50	3.5	3.6	250+00	3.6	3.8
250+50	3.4	3.6	251+00	3.5	3.5	251+50	3.5	3.4	252+00	3.8	3.8
252+50	3.6	3.4	253+00	3.9	4.1	253+50	3.6	3.5	254+00	3.8	3.8
254+50	3.7	3.8	255+00	3.9	3.8	255+50	3.7	3.4	256+00	3.5	3.5
256+50	3.4	3.4	257+00	3.5	3.5	257+50	3.8	3.6	258+00	3.4	3.1
258+50	3.3	3.3	259+00	3.5	3.3	259+50	3.5	3.5	260+00	3.7	3.5
260+50	3.2	3.3	261+00	3.9	4.9	261+50	6.8	5.8	262+00	7.5	5.8
262+50	7.0	5.6	263+00	7.0	5.6	263+50	7.1	5.3	264+00	7.3	5.1
264+50	6.9	5.5	265+00	7.1	6.2	265+50	7.6	6.6	266+00	6.8	6.1
266+50	7.3	6.7	267+00	7.1	6.7	267+50	7.2	6.3	268+00	6.9	6.3
268+50	6.7	6.7	269+00	7.1	7.2	269+50	6.7	6.6	270+00	6.5	6.1
270+50	6.5	6.2	271+00	6.8	6.4	271+50	6.2	5.6	272+00	6.4	6.0
272+50	7.0	6.8	273+00	7.2	6.9	273+50	7.3	6.7	274+00	7.3	6.4
274+50	7.4	6.4	275+00	7.3	6.5	275+50	7.2	5.9	276+00	7.7	6.3
276+50	7.5	6.9	277+00	7.8	7.2	277+50	8.9	7.3	278+00	7.6	7.3
278+50	7.2	6.6	279+00	6.9	6.5	279+50	6.7	6.4	280+00	7.1	6.5
280+50	7.3	6.3	281+00	7.4	6.5	281+50	7.6	6.8	282+00	7.8	7.0
282+50	7.8	7.0	283+00	7.6	7.0	283+50	7.3	6.8	284+00	5.4	5.4
284+50	4.9	4.9	285+00	5.3	5.6	285+50	5.3	4.8	286+00	5.8	5.3
286+50	6.6	6.3	287+00	6.7	6.2	287+50	6.2	5.2	288+00	6.0	5.2
288+50	5.7	4.9	289+00	6.0	5.4	289+50	6.2	5.7	290+00	5.2	4.8
290+50	6.2	5.7	291+00	5.7	6.0	291+50	5.4	5.5	292+00	4.8	5.2
292+50	4.6	4.5	293+00	4.4	4.3	293+50	4.7	4.7	294+00	5.3	5.4
294+50	4.7	4.7	295+00	5.3	5.1	295+50	5.9	5.9	296+00	6.4	6.4
296+50	6.7	6.5	297+00	7.1	6.4	297+50	6.3	6.1	298+00	6.3	6.1
298+50	6.7	6.4	299+00	5.7	5.2	299+50	5.1	5.1	300+00	4.9	5.0
300+50	5.3	5.5	301+00	5.1	5.1	301+50	5.3	5.3	302+00	5.3	5.3
302+50	5.8	5.9	303+00	6.4	6.4	303+50	6.9	6.9	304+00	6.7	6.7
304+50	6.3	5.5	305+00	6.3	5.8	305+50	6.7	6.4	306+00	5.9	5.7
306+50	5.4	5.4	307+00	5.5	5.6	307+50	4.9	4.5	308+00	5.2	4.8
308+50	4.7	4.3	309+00	4.8	4.6	309+50	5.1	4.8	310+00	5.4	4.7
310+50	5.9	5.3	311+00	5.5	5.6	311+50	6.1	5.4	312+00	4.8	4.8
312+50	5.6	5.4	313+00	5.5	5.6	313+50	5.0	4.7	314+00	5.2	5.3
314+50	4.8	5.0	315+00	5.1	5.1	315+50	5.0	4.8	316+00	5.4	5.3
316+50	5.7	5.3	317+00	5.9	5.5	317+50	5.7	5.4	318+00	6.0	5.8
318+50	6.4	5.7	319+00	6.1	5.5	319+50	6.6	5.8	320+00	6.0	5.3

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

Station	Inner Average Thickness, in.	Outer Average Thickness, in.	Station	Inner Average Thickness, in.	Outer Average Thickness, in.	Station	Inner Average Thickness, in.	Outer Average Thickness, in.	Station	Inner Average Thickness, in.	Outer Average Thickness, in.
320+50	6.1	4.9	321+00	6.1	5.3	321+50	6.4	5.7	322+00	6.0	5.5
322+50	5.7	4.7	323+00	5.3	4.6	323+50	5.0	4.0	324+00	5.1	4.2
324+50	7.4	7.1	325+00	7.4	7.3	325+50	7.5	7.4	326+00	7.6	7.3
326+50	7.6	7.9	327+00	7.9	8.3	327+50	7.6	7.6	328+00	7.6	8.0
328+50	7.5	8.2	329+00	7.2	6.9	329+50	7.1	6.9	330+00	6.8	6.4
330+50	7.2	6.4	331+00	7.5	6.9	331+50	7.8	7.2	332+00	6.1	5.2
332+50	3.8	4.2	333+00	3.7	3.6	333+50	3.5	3.4	334+00	3.6	3.2
334+50	3.7	3.2	335+00	3.4	3.2	335+50	3.3	3.3	336+00	4.0	3.5
336+50	8.2	7.8	337+00	8.4	7.2	337+50	7.1	6.9	338+00	6.7	7.1
338+50	6.7	7.3	339+00	7.3	7.3	339+50	7.7	7.5	340+00	8.1	7.3
340+50	7.7	7.4	341+00	8.0	7.8	341+50	7.8	7.6	342+00	7.1	7.1
342+50	7.5	7.5	343+00	8.0	7.9	343+50	7.2	7.0	344+00	7.1	7.1
344+50	7.6	7.9	345+00	7.5	7.7	345+50	7.2	7.2	346+00	7.5	6.7
346+50	6.8	6.2	347+00	7.1	6.6	347+50	7.3	7.1	348+00	6.7	6.4
348+50	6.7	6.4	349+00	7.1	6.9	349+50	6.9	6.7	350+00	6.5	6.2
350+50	6.2	5.6	351+00	6.4	5.9	351+50	6.7	6.3	352+00	6.5	6.2
352+50	7.1	6.9	353+00	6.7	6.6	353+50	6.8	6.9	354+00	7.1	7.4
354+50	6.8	7.2	355+00	6.9	7.3	355+50	6.6	6.8	356+00	6.3	6.6
356+50	6.4	6.8	357+00	6.3	6.4	357+50	6.8	6.3	358+00	6.8	6.5
358+50	6.6	6.5	359+00	6.5	5.9	359+50	6.7	6.0	360+00	6.4	5.8
360+50	6.7	5.8	361+00	7.2	6.7	361+50	7.4	6.3	362+00	7.7	6.3
362+50	8.2	6.3	363+00	7.8	6.3	363+50	7.7	6.0	364+00	7.3	6.4
364+50	7.1	7.4	365+00	7.3	7.5	365+50	7.0	6.4	366+00	7.9	6.0
366+50	8.2	6.0	367+00	8.0	6.0	367+50	7.6	6.1	368+00	7.1	6.4
368+50	7.1	6.6	369+00	8.0	6.5	369+50	7.5	6.5	370+00	7.3	6.3
370+50	7.0	6.1	371+00	6.9	6.3	371+50	6.7	6.7	372+00	6.7	6.9
372+50	7.0	7.0	373+00	6.8	7.1	373+50	7.7	6.9	374+00	7.5	6.8
374+50	7.0	6.9	375+00	7.0	6.9	375+50	6.9	7.5	376+00	6.9	7.3
376+50	6.6	7.0	377+00	7.0	7.2	377+50	6.9	7.1	378+00	6.4	6.4
378+50	6.7	6.5	379+00	7.6	6.6	379+50	8.0	6.5	380+00	7.5	6.8
380+50	7.3	6.7	381+00	7.2	6.3	381+50	7.1	7.0	382+00	7.3	6.5
382+50	8.1	6.8	383+00	6.6	6.9	383+50	7.7	6.8	384+00	7.4	6.5
384+50	7.3	7.0	385+00	7.4	6.8	385+50	7.1	6.9	386+00	7.7	6.8
386+50	7.4	6.6	387+00	7.4	7.0	387+50	8.2	7.0	388+00	8.4	6.5
388+50	8.4	6.2	389+00	6.7	6.2	389+50	6.3	5.8	390+00	6.5	5.7
390+50	6.6	6.0	391+00	6.4	5.9	391+50	6.4	5.6	392+00	6.3	5.8
392+50	6.5	5.8	393+00	6.1	5.8	393+50	6.1	6.9	394+00	5.7	7.6
394+50	6.2	6.8	395+00*	4.9	5.2						

MaineDOT

Ground Penetrating Radar (GPR)
Estimated Pavement Thickness Summary
018547.00 - Blue Hill, Penobscot, Orland

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

GPR data was collected at the inner and outer wheel path of the lane at 1 foot intervals along the entire section. Pavement thickness estimates were developed using Geophysical Survey Systems, Inc. (GSSI) RADAN7 GPR data processing software. Where available, pavement thickness values from Geotechnical borings and/or pavement cores collected by MaineDOT personnel were used in developing the estimated GPR pavement thicknesses.

Data Confidence Level:

Poor - Reflection layers are weak and 'jumbled' throughout much of the project. Layer depths do not correlate well with known pavement depths obtained from pavement cores.

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

Additional Comments
Northbound Outer Edge of Pavement (White Line - Edge of Travelway)

Project Manager	Reported By	Test Date	Reported Date
DAVIS, SHAWN R	**COLSON, STEPHEN W**	**7/22/2014**	**1/5/2015**

Lane Tested	Route	Avg. Thickness, in.	Min. Thickness, in.	Max. Thickness, in.	Analysis Distance, ft.
NORTHBOUND LANE (outer)	**15**				**50**

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

Station	Outer Average Thickness, in.	Station	Outer Average Thickness, in.	Station	Outer Average Thickness, in.	Station	Outer Average Thickness, in.
10+50*	3.5	11+00	3.7	11+50	4.1	12+00	3.2
12+50	3.4	13+00	3.4	13+50	3.5	14+00	3.8
14+50	3.6	15+00	3.1	15+50	3.2	16+00	3.2
16+50	2.9	17+00	3.2	17+50	3.1	18+00	2.8
18+50	3.0	19+00	2.5	19+50	2.8	20+00	2.8
20+50	3.0	21+00	3.0	21+50	3.0	22+00	3.8
22+50	4.1	23+00	3.4	23+50	3.2	24+00	3.3
24+50	3.5	25+00	3.3	25+50	3.0	26+00	3.1
26+50	3.3	27+00	3.5	27+50	3.7	28+00	4.4
28+50	4.8	29+00	4.5	29+50	4.0	30+00	3.8
30+50	3.5	31+00	3.5	31+50	3.9	32+00	3.6
32+50	3.4	33+00	3.9	33+50	4.3	34+00	4.8
34+50	3.2	35+00	2.6	35+50	2.8	36+00	2.8
36+50	3.0	37+00	3.3	37+50	3.4	38+00	2.8
38+50	2.7	39+00	3.1	39+50	3.3	40+00	4.1
40+50	4.1	41+00	4.2	41+50	4.0	42+00	4.6
42+50	3.5	43+00	2.9	43+50	2.8	44+00	2.9

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

Station	Outer Average Thickness, in.	Station	Outer Average Thickness, in.	Station	Outer Average Thickness, in.	Station	Outer Average Thickness, in.
44+50	2.9	45+00	3.1	45+50	3.3	46+00	3.3
46+50	3.6	47+00	3.5	47+50	3.1	48+00	2.9
48+50	3.0	49+00	4.0	49+50	3.1	50+00	3.6
50+50	3.6	51+00	3.3	51+50	3.2	52+00	3.4
52+50	3.6	53+00	3.2	53+50	3.1	54+00	2.9
54+50	3.1	55+00	4.7	55+50	4.1	56+00	4.2
56+50	3.8	57+00	4.1	57+50	3.8	58+00	3.9
58+50	3.6	59+00	2.6	59+50	2.4	60+00	2.5
60+50	3.3	61+00	2.5	61+50	3.1	62+00	3.4
62+50	3.7	63+00	3.6	63+50	3.2	64+00	3.0
64+50	3.5	65+00	3.4	65+50	3.0	66+00	2.8
66+50	3.7	67+00	4.0	67+50	3.2	68+00	3.4
68+50	2.8	69+00	2.6	69+50	2.8	70+00	3.2
70+50	3.1	71+00	3.4	71+50	3.3	72+00	3.2
72+50	3.5	73+00	4.0	73+50	3.6	74+00	3.2
74+50	3.6	75+00	4.3	75+50	3.7	76+00	3.1
76+50	3.6	77+00	3.2	77+50	4.0	78+00	4.5
78+50	3.8	79+00	4.2	79+50	4.4	80+00	4.2
80+50	3.6	81+00	3.6	81+50	3.6	82+00	3.1
82+50	2.5	83+00	3.3	83+50	3.8	84+00	2.6
84+50	2.7	85+00	3.8	85+50	4.1	86+00	3.0
86+50	3.5	87+00	3.3	87+50	3.0	88+00	3.1
88+50	2.5	89+00	3.1	89+50	3.6	90+00	4.0
90+50	4.4	91+00	4.2	91+50	5.0	92+00	3.8
92+50	3.1	93+00	2.7	93+50	2.6	94+00	2.6
94+50	2.8	95+00	3.0	95+50	3.2	96+00	3.8
96+50	4.1	97+00	3.9	97+50	3.4	98+00	2.7
98+50	2.6	99+00	2.7	99+50	2.8	100+00	3.0
100+50	3.1	101+00	2.7	101+50	3.0	102+00	2.3
102+50	2.5	103+00	3.5	103+50	2.9	104+00	3.4
104+50	2.4	105+00	2.3	105+50	2.3	106+00	2.3
106+50	2.5	107+00	2.7	107+50	2.6	108+00	2.1
108+50	2.4	109+00	2.4	109+50	2.8	110+00	2.6
110+50	3.1	111+00	3.4	111+50	3.4	112+00	3.1
112+50	3.0	113+00	2.2	113+50	2.3	114+00	2.7
114+50	2.2	115+00	2.1	115+50	2.0	116+00	2.0
116+50	2.1	117+00	2.4	117+50	2.9	118+00	2.8
118+50	2.9	119+00	2.7	119+50	2.7	120+00	3.0
120+50	4.1	121+00	5.2	121+50	4.5	122+00	3.5
122+50	3.0	123+00	2.3	123+50	3.0	124+00	3.5
124+50	4.1	125+00	3.6	125+50	3.8	126+00	4.0
126+50	3.8	127+00	3.8	127+50	3.8	128+00	3.5
128+50	3.7	129+00	3.8	129+50	3.5	130+00	2.7
130+50	2.8	131+00	2.8	131+50	2.4	132+00	3.3
132+50	2.6	133+00	3.7	133+50	3.6	134+00	3.0
134+50	3.1	135+00	4.1	135+50	3.4	136+00	3.1

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

Station	Outer Average Thickness, in.	Station	Outer Average Thickness, in.	Station	Outer Average Thickness, in.	Station	Outer Average Thickness, in.
136+50	2.9	137+00	3.1	137+50	3.1	138+00	4.1
138+50	4.4	139+00	3.7	139+50	2.6	140+00	2.5
140+50	2.6	141+00	3.2	141+50	3.2	142+00	4.0
142+50	4.5	143+00	4.5	143+50	4.8	144+00	5.1
144+50	5.5	145+00	5.2	145+50	3.5	146+00	3.0
146+50	2.9	147+00	2.9	147+50	2.9	148+00	2.7
148+50	3.0	149+00	3.6	149+50	3.4	150+00	3.1
150+50	2.6	151+00	3.0	151+50	2.9	152+00	3.1
152+50	3.3	153+00	3.7	153+50	4.9	154+00	4.3
154+50	3.4	155+00	2.9	155+50	3.9	156+00	4.0
156+50	3.6	157+00	3.1	157+50	3.7	158+00	3.7
158+50	4.5	159+00	4.7	159+50	3.6	160+00	4.3
160+50	3.6	161+00	3.1	161+50	3.2	162+00	3.6
162+50	3.5	163+00	3.0	163+50	3.0	164+00	3.6
164+50	3.3	165+00	3.8	165+50	4.0	166+00	3.9
166+50	4.9	167+00	4.2	167+50	3.0	168+00	3.8
168+50	4.4	169+00	5.4	169+50	6.1	170+00	3.7
170+50	4.3	171+00	4.4	171+50	3.3	172+00	2.9
172+50	2.9	173+00	3.4	173+50	3.7	174+00	3.6
174+50	3.3	175+00	3.0	175+50	2.9	176+00	3.1
176+50	2.8	177+00	2.8	177+50	3.0	178+00	2.9
178+50	3.3	179+00	3.2	179+50	3.4	180+00	3.1
180+50	3.4	181+00	2.9	181+50	3.7	182+00	3.2
182+50	3.3	183+00	3.3	183+50	3.1	184+00	3.4
184+50	3.8	185+00	4.4	185+50	3.9	186+00	3.3
186+50	3.0	187+00	2.5	187+50	3.1	188+00	3.1
188+50	3.2	189+00	3.4	189+50	4.2	190+00	3.1
190+50	3.9	191+00	3.5	191+50	4.1	192+00	3.0
192+50	3.5	193+00	3.3	193+50	3.7	194+00	3.7
194+50	4.3	195+00	3.9	195+50	4.4	196+00	4.0
196+50	4.1	197+00	4.0	197+50	4.1	198+00	3.5
198+50	3.7	199+00	3.2	199+50	3.4	200+00	3.3
200+50	3.1	201+00	2.9	201+50	2.8	202+00	2.6
202+50	2.7	203+00	3.2	203+50	3.0	204+00	3.1
204+50	2.7	205+00	3.1	205+50	3.9	206+00	3.8
206+50	3.8	207+00	3.0	207+50	3.5	208+00	3.1
208+50	3.4	209+00	3.7	209+50	3.4	210+00	3.1
210+50	3.2	211+00	3.1	211+50	3.0	212+00	2.5
212+50	2.9	213+00	3.5	213+50	4.7	214+00	4.9
214+50	3.9	215+00	4.6	215+50	3.3	216+00	3.6
216+50	3.6	217+00	4.1	217+50	4.1	218+00	4.6
218+50	4.7	219+00	5.2	219+50	4.9	220+00	2.9
220+50	2.8	221+00	3.1	221+50	3.3	222+00	3.1
222+50	2.8	223+00	2.9	223+50	3.0	224+00	2.9
224+50	3.4	225+00	3.6	225+50	3.2	226+00	3.1
226+50	3.6	227+00	3.2	227+50	3.3	228+00	3.3

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

Station	Outer Average Thickness, in.	Station	Outer Average Thickness, in.	Station	Outer Average Thickness, in.	Station	Outer Average Thickness, in.
228+50	3.5	229+00	3.6	229+50	3.8	230+00	3.8
230+50	3.7	231+00	3.4	231+50	3.0	232+00	3.0
232+50	3.0	233+00	3.0	233+50	3.5	234+00	3.9
234+50	5.0	235+00	3.9	235+50	4.1	236+00	3.1
236+50	3.3	237+00	3.2	237+50	3.0	238+00	3.1
238+50	3.2	239+00	3.6	239+50	4.2	240+00	3.3
240+50	2.6	241+00	2.7	241+50	3.6	242+00	4.3
242+50	4.0	243+00	3.5	243+50	2.8	244+00	2.8
244+50	3.7	245+00	2.7	245+50	3.1	246+00	3.7
246+50	3.6	247+00	4.5	247+50	4.2	248+00	3.9
248+50	4.9	249+00	5.1	249+50	4.9	250+00	4.7
250+50	4.6	251+00	4.6	251+50	4.7	252+00	5.2
252+50	5.0	253+00	5.2	253+50	4.8	254+00	4.9
254+50	5.2	255+00	4.8	255+50	4.1	256+00	4.2
256+50	4.1	257+00	4.2	257+50	4.6	258+00	4.1
258+50	4.6	259+00	4.6	259+50	4.9	260+00	4.8
260+50	4.1	261+00	4.0	261+50	5.1	262+00	5.1
262+50	5.2	263+00	4.7	263+50	4.2	264+00	4.0
264+50	3.8	265+00	4.8	265+50	3.4	266+00	2.9
266+50	3.7	267+00	3.8	267+50	3.8	268+00	3.5
268+50	3.9	269+00	4.0	269+50	4.2	270+00	3.4
270+50	3.2	271+00	3.5	271+50	3.3	272+00	3.7
272+50	5.0	273+00	4.1	273+50	3.6	274+00	3.4
274+50	3.9	275+00	3.5	275+50	3.3	276+00	3.3
276+50	3.7	277+00	4.5	277+50	5.2	278+00	4.4
278+50	3.4	279+00	3.6	279+50	3.6	280+00	3.7
280+50	3.5	281+00	3.9	281+50	4.2	282+00	5.0
282+50	4.3	283+00	4.1	283+50	4.9	284+00	8.2
284+50	7.7	285+00	7.9	285+50	6.7	286+00	7.2
286+50	8.6	287+00	7.8	287+50	6.5	288+00	6.9
288+50	6.5	289+00	7.8	289+50	7.6	290+00	6.8
290+50	7.6	291+00	8.5	291+50	8.3	292+00	7.0
292+50	6.0	293+00	5.6	293+50	6.2	294+00	7.1
294+50	6.1	295+00	6.7	295+50	8.0	296+00	8.3
296+50	8.4	297+00	8.1	297+50	8.7	298+00	8.7
298+50	8.2	299+00	6.9	299+50	7.1	300+00	7.4
300+50	7.8	301+00	7.0	301+50	7.1	302+00	7.5
302+50	7.8	303+00	9.1	303+50	9.5	304+00	8.9
304+50	7.9	305+00	8.0	305+50	9.0	306+00	8.0
306+50	7.3	307+00	7.6	307+50	5.9	308+00	6.3
308+50	5.2	309+00	6.1	309+50	6.1	310+00	5.9
310+50	7.1	311+00	8.0	311+50	7.4	312+00	7.1
312+50	7.5	313+00	7.9	313+50	6.7	314+00	7.2
314+50	6.8	315+00	6.8	315+50	6.6	316+00	7.4
316+50	7.5	317+00	7.5	317+50	7.7	318+00	7.8
318+50	7.9	319+00	7.8	319+50	8.3	320+00	7.7

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

Station	Outer Average Thickness, in.	Station	Outer Average Thickness, in.	Station	Outer Average Thickness, in.	Station	Outer Average Thickness, in.
320+50	7.4	321+00	7.6	321+50	8.5	322+00	8.5
322+50	7.2	323+00	6.4	323+50	5.4	324+00	4.8
324+50	5.4	325+00	4.8	325+50	4.9	326+00	5.4
326+50	4.8	327+00	4.8	327+50	4.7	328+00	5.1
328+50	4.5	329+00	5.2	329+50	5.5	330+00	5.8
330+50	6.7	331+00	6.3	331+50	5.5	332+00	6.1
332+50	5.7	333+00	5.1	333+50	4.3	334+00	4.3
334+50	4.5	335+00	4.5	335+50	4.5	336+00	4.9
336+50	4.2	337+00	3.3	337+50	3.4	338+00	3.6
338+50	4.0	339+00	4.7	339+50	4.5	340+00	3.6
340+50	4.0	341+00	3.7	341+50	4.6	342+00	4.1
342+50	3.8	343+00	4.2	343+50	4.7	344+00	4.7
344+50	4.0	345+00	4.8	345+50	4.3	346+00	4.6
346+50	4.3	347+00	4.6	347+50	4.6	348+00	4.6
348+50	5.7	349+00	4.6	349+50	4.7	350+00	4.0
350+50	3.6	351+00	3.0	351+50	3.5	352+00	3.0
352+50	3.5	353+00	3.4	353+50	4.2	354+00	5.0
354+50	5.3	355+00	5.9	355+50	5.0	356+00	4.5
356+50	5.6	357+00	5.2	357+50	4.0	358+00	4.2
358+50	4.0	359+00	3.5	359+50	3.4	360+00	3.7
360+50	4.1	361+00	4.1	361+50	3.5	362+00	3.5
362+50	3.2	363+00	2.7	363+50	3.5	364+00	4.6
364+50	3.5	365+00	3.8	365+50	4.3	366+00	5.0
366+50	5.2	367+00	5.4	367+50	5.6	368+00	4.9
368+50	4.7	369+00	4.3	369+50	3.9	370+00	3.8
370+50	3.6	371+00	4.2	371+50	3.5	372+00	3.4
372+50	3.6	373+00	3.4	373+50	3.4	374+00	3.2
374+50	4.6	375+00	4.2	375+50	5.1	376+00	4.8
376+50	4.3	377+00	4.1	377+50	3.9	378+00	3.8
378+50	3.2	379+00	3.2	379+50	3.4	380+00	3.3
380+50	3.2	381+00	3.0	381+50	3.8	382+00	3.8
382+50	3.8	383+00	4.7	383+50	5.2	384+00	5.0
384+50	4.8	385+00	5.2	385+50	4.8	386+00	5.1
386+50	5.3	387+00	4.7	387+50	5.5	388+00	4.7
388+50	3.9	389+00	4.0	389+50	4.3	390+00	4.1
390+50	4.0	391+00	4.2	391+50	3.9	392+00	3.4
392+50	3.8	393+00	4.7	393+50	3.3	394+00	3.9
394+50	3.4	395+00	4.1				

MaineDOT

Ground Penetrating Radar (GPR)
Estimated Pavement Thickness Summary
018547.00 - Blue Hill, Penobscot, Orland

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

GPR data was collected at the inner and outer wheel path of the lane at 1 foot intervals along the entire section. Pavement thickness estimates were developed using Geophysical Survey Systems, Inc. (GSSI) RADAN7 GPR data processing software. Where available, pavement thickness values from Geotechnical borings and/or pavement cores collected by MaineDOT personnel were used in developing the estimated GPR pavement thicknesses.

Data Confidence Level:

Very Good - Reflection layers appear strong throughout much of the project. Layer depths correlate well with known pavement depths obtained from pavement cores.

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	**COLSON, STEPHEN W**	**7/22/2014**	**1/5/2015**

Lane Tested	Route	Avg. Thickness, in.	Min. Thickness, in.	Max. Thickness, in.	Analysis Distance, ft.
SOUTHBOUND Travel Lane Core	**15**	**6**	**2**	**9.6**	**50**

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

Station	Inner Average Thickness, in.	Outer Average Thickness, in.	Station	Inner Average Thickness, in.	Outer Average Thickness, in.	Station	Inner Average Thickness, in.	Outer Average Thickness, in.	Station	Inner Average Thickness, in.	Outer Average Thickness, in.
10+50	4.2	4.0	11+00	4.0	3.8	11+50	4.3	3.9	12+00	3.9	3.8
12+50	4.5	4.4	13+00	4.3	4.2	13+50	4.1	4.0	14+00	3.3	3.5
14+50	3.7	3.8	15+00	5.8	4.5	15+50	6.4	5.7	16+00	6.9	6.9
16+50	7.1	6.9	17+00	7.1	6.8	17+50	6.5	6.3	18+00	6.2	6.2
18+50	6.1	6.4	19+00	6.1	6.3	19+50	6.4	6.6	20+00	6.2	6.4
20+50	6.6	6.5	21+00	7.1	6.9	21+50	6.2	6.6	22+00	5.8	6.3
22+50	5.9	6.4	23+00	6.0	6.2	23+50	6.1	6.4	24+00	6.1	6.2
24+50	6.6	6.8	25+00	6.5	7.0	25+50	6.6	7.1	26+00	6.8	6.8
26+50	7.1	7.1	27+00	7.0	6.7	27+50	6.3	6.3	28+00	6.6	6.9
28+50	6.0	6.1	29+00	6.1	6.5	29+50	6.3	6.3	30+00	6.3	6.3
30+50	6.3	6.2	31+00	5.9	6.1	31+50	6.4	6.9	32+00	6.4	6.3
32+50	6.6	5.8	33+00	5.9	5.9	33+50	6.0	6.0	34+00	5.9	5.7
34+50	5.8	6.1	35+00	6.5	6.7	35+50	7.0	7.1	36+00	7.3	7.2
36+50	6.0	6.5	37+00	6.5	6.7	37+50	6.0	6.4	38+00	6.1	6.2
38+50	7.5	6.3	39+00	7.1	6.7	39+50	6.7	6.8	40+00	6.1	5.8
40+50	5.6	6.0	41+00	5.8	6.3	41+50	6.6	6.8	42+00	5.9	6.5
42+50	6.4	6.4	43+00	6.5	5.8	43+50	6.8	6.8	44+00	7.9	6.4

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

Station	Inner Average Thickness, in.	Outer Average Thickness, in.	Station	Inner Average Thickness, in.	Outer Average Thickness, in.	Station	Inner Average Thickness, in.	Outer Average Thickness, in.	Station	Inner Average Thickness, in.	Outer Average Thickness, in.
44+50	7.5	6.0	45+00	7.3	6.4	45+50	7.1	6.7	46+00	7.1	6.9
46+50	7.1	6.7	47+00	6.7	6.5	47+50	6.7	6.8	48+00	7.1	6.6
48+50	6.0	6.3	49+00	7.0	6.7	49+50	7.6	7.2	50+00	8.4	7.5
50+50	7.5	7.3	51+00	6.8	6.5	51+50	6.9	6.5	52+00	7.1	6.6
52+50	7.2	6.6	53+00	7.1	7.0	53+50	7.4	7.4	54+00	6.7	6.6
54+50	6.7	6.8	55+00	7.3	7.3	55+50	7.1	7.0	56+00	6.9	6.6
56+50	7.5	6.7	57+00	6.4	6.5	57+50	6.0	6.6	58+00	5.6	5.8
58+50	5.8	6.0	59+00	5.8	6.4	59+50	5.9	6.6	60+00	6.1	7.0
60+50	6.2	6.5	61+00	6.0	5.9	61+50	6.0	5.9	62+00	6.3	5.8
62+50	6.2	6.2	63+00	6.4	6.8	63+50	6.2	6.6	64+00	6.0	5.9
64+50	6.7	6.3	65+00	6.6	6.4	65+50	6.1	5.9	66+00	6.1	6.4
66+50	6.0	6.0	67+00	6.1	6.2	67+50	6.2	6.3	68+00	6.2	6.2
68+50	6.2	6.1	69+00	4.9	6.2	69+50	5.1	6.5	70+00	5.4	7.3
70+50	5.6	6.2	71+00	5.4	5.6	71+50	5.9	6.2	72+00	6.4	6.9
72+50	6.4	5.9	73+00	6.1	6.0	73+50	5.8	6.0	74+00	5.7	6.1
74+50	6.2	6.2	75+00	6.1	5.8	75+50	6.0	5.5	76+00	6.1	5.9
76+50	6.3	6.5	77+00	6.1	6.4	77+50	6.5	6.8	78+00	7.3	6.8
78+50	6.3	6.4	79+00	6.5	6.6	79+50	6.0	6.1	80+00	6.1	6.3
80+50	6.2	6.4	81+00	6.2	6.6	81+50	5.9	6.7	82+00	6.0	6.5
82+50	5.9	6.0	83+00	6.0	5.9	83+50	6.2	6.4	84+00	5.9	5.9
84+50	5.7	5.7	85+00	6.0	5.3	85+50	6.0	5.6	86+00	6.1	6.5
86+50	6.4	6.8	87+00	6.6	6.7	87+50	6.1	6.4	88+00	6.3	6.3
88+50	5.5	6.2	89+00	5.6	6.3	89+50	5.7	6.2	90+00	5.9	6.1
90+50	5.7	6.3	91+00	6.1	6.5	91+50	6.1	6.0	92+00	5.9	5.7
92+50	6.1	5.8	93+00	5.8	6.0	93+50	6.0	6.0	94+00	6.5	6.6
94+50	6.6	7.0	95+00	6.9	8.2	95+50	6.3	7.6	96+00	6.8	7.7
96+50	6.7	8.1	97+00	6.5	7.8	97+50	6.1	7.3	98+00	6.1	7.3
98+50	5.8	6.8	99+00	5.3	6.5	99+50	5.7	6.3	100+00	5.7	6.1
100+50	5.6	5.8	101+00	5.4	5.7	101+50	5.7	5.8	102+00	6.5	6.2
102+50	6.6	6.8	103+00	7.6	7.0	103+50	6.7	7.0	104+00	6.4	7.2
104+50	6.5	7.2	105+00	6.5	7.0	105+50	7.3	7.1	106+00	7.3	7.2
106+50	7.4	7.2	107+00	6.5	7.0	107+50	6.2	6.8	108+00	6.3	7.0
108+50	6.3	7.2	109+00	6.8	7.6	109+50	6.8	7.1	110+00	6.9	6.5
110+50	6.6	6.8	111+00	6.2	7.0	111+50	6.4	7.4	112+00	6.5	7.0
112+50	6.9	7.2	113+00	6.2	8.1	113+50	6.3	7.7	114+00	6.2	7.8
114+50	6.1	7.7	115+00	6.1	7.5	115+50	6.3	7.1	116+00	6.9	7.3
116+50	6.5	7.7	117+00	6.5	6.9	117+50	6.1	6.4	118+00	5.7	5.9
118+50	5.8	6.2	119+00	6.0	6.2	119+50	6.3	6.9	120+00	5.8	6.7
120+50	5.4	6.2	121+00	5.9	6.6	121+50	5.8	6.5	122+00	6.0	6.4
122+50	5.8	6.3	123+00	5.7	6.1	123+50	6.5	6.2	124+00	7.4	6.1
124+50	6.8	6.5	125+00	7.2	7.0	125+50	7.3	6.6	126+00	7.0	6.7
126+50	6.8	7.1	127+00	6.8	7.1	127+50	6.8	7.0	128+00	6.8	6.9
128+50	6.8	6.8	129+00	6.7	6.7	129+50	6.5	6.5	130+00	6.7	6.7
130+50	6.3	6.4	131+00	6.4	6.6	131+50	6.2	6.2	132+00	6.5	6.4
132+50	7.0	6.8	133+00	7.0	6.5	133+50	6.5	6.7	134+00	6.4	7.1
134+50	7.2	7.1	135+00	6.0	6.1	135+50	6.1	5.5	136+00	5.8	6.9

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

Station	Inner Average Thickness, in.	Outer Average Thickness, in.	Station	Inner Average Thickness, in.	Outer Average Thickness, in.	Station	Inner Average Thickness, in.	Outer Average Thickness, in.	Station	Inner Average Thickness, in.	Outer Average Thickness, in.
136+50	6.2	7.3	137+00	6.6	7.6	137+50	6.6	7.0	138+00	6.5	6.7
138+50	6.2	6.6	139+00	6.5	6.9	139+50	5.9	6.1	140+00	6.0	6.9
140+50	6.6	7.0	141+00	6.9	6.7	141+50	6.1	6.1	142+00	7.1	6.9
142+50	6.8	7.2	143+00	6.1	7.3	143+50	6.3	7.7	144+00	6.5	7.6
144+50	6.3	6.7	145+00	6.5	7.2	145+50	6.6	8.0	146+00	6.7	7.8
146+50	7.3	7.4	147+00	7.9	7.1	147+50	8.3	7.0	148+00	7.3	6.6
148+50	7.2	7.1	149+00	6.5	7.2	149+50	7.0	7.1	150+00	6.7	7.0
150+50	6.5	6.8	151+00	6.6	7.4	151+50	6.2	7.2	152+00	6.1	6.4
152+50	6.3	5.8	153+00	6.3	6.6	153+50	6.8	6.7	154+00	7.0	7.1
154+50	7.1	6.9	155+00	8.3	6.5	155+50	7.3	7.3	156+00	6.9	7.4
156+50	6.7	8.0	157+00	6.1	6.5	157+50	6.0	6.4	158+00	5.8	6.6
158+50	5.6	6.3	159+00	5.5	5.9	159+50	5.9	6.1	160+00	6.1	5.9
160+50	5.9	6.0	161+00	6.4	6.8	161+50	6.9	7.6	162+00	6.5	7.7
162+50	6.8	7.7	163+00	6.1	6.6	163+50	6.0	6.2	164+00	5.8	6.1
164+50	5.9	5.9	165+00	6.5	5.5	165+50	6.9	5.9	166+00	6.7	6.3
166+50	6.8	6.4	167+00	7.2	7.2	167+50	7.0	6.9	168+00	6.9	6.3
168+50	6.0	5.6	169+00	6.0	5.9	169+50	5.8	5.7	170+00	5.9	5.8
170+50	6.2	6.0	171+00	6.3	6.2	171+50	6.6	6.3	172+00	6.5	6.3
172+50	6.3	5.8	173+00	6.9	6.2	173+50	6.7	6.3	174+00	6.9	6.4
174+50	6.6	6.4	175+00	6.6	6.4	175+50	6.3	7.0	176+00	6.5	6.6
176+50	7.1	7.0	177+00	6.3	6.4	177+50	6.2	6.2	178+00	6.5	6.4
178+50	6.6	6.3	179+00	6.3	5.7	179+50	6.6	6.3	180+00	7.4	5.7
180+50	7.2	5.5	181+00	7.2	5.8	181+50	7.3	6.2	182+00	7.3	6.4
182+50	6.4	6.3	183+00	6.2	6.0	183+50	5.9	6.3	184+00	5.9	6.2
184+50	6.6	6.2	185+00	6.3	6.4	185+50	6.7	6.4	186+00	6.9	7.1
186+50	7.0	7.0	187+00	6.7	6.7	187+50	6.4	6.2	188+00	6.3	5.9
188+50	7.2	6.1	189+00	6.9	6.1	189+50	6.6	6.1	190+00	7.5	6.6
190+50	7.5	7.0	191+00	6.8	7.6	191+50	6.8	7.6	192+00	6.2	7.0
192+50	6.1	6.2	193+00	5.8	6.0	193+50	5.8	6.0	194+00	6.3	5.6
194+50	6.5	5.9	195+00	6.2	6.0	195+50	6.4	6.4	196+00	6.3	6.1
196+50	6.0	6.9	197+00	6.4	7.5	197+50	5.9	6.5	198+00	6.1	6.6
198+50	5.9	6.4	199+00	7.2	6.0	199+50	7.0	6.4	200+00	6.0	6.4
200+50	6.5	7.1	201+00	6.4	7.4	201+50	6.9	7.1	202+00	6.7	6.2
202+50	6.6	6.4	203+00	6.5	6.8	203+50	6.7	6.9	204+00	6.8	7.6
204+50	7.2	7.3	205+00	7.6	6.6	205+50	7.5	5.9	206+00	7.7	6.1
206+50	6.7	6.5	207+00	6.4	6.7	207+50	6.7	6.8	208+00	6.7	6.7
208+50	7.1	6.7	209+00	7.2	6.4	209+50	7.3	6.2	210+00	6.9	5.9
210+50	7.8	6.2	211+00	6.7	6.0	211+50	7.8	6.1	212+00	8.3	6.7
212+50	6.1	7.4	213+00	6.2	7.0	213+50	6.7	7.0	214+00	5.8	6.3
214+50	3.9	4.0	215+00	3.4	3.7	215+50	3.3	3.8	216+00	3.2	3.4
216+50	3.4	4.0	217+00	3.4	3.9	217+50	3.6	4.4	218+00	3.2	3.6
218+50	3.2	3.6	219+00	3.5	4.1	219+50	5.9	5.6	220+00	5.8	5.9
220+50	6.3	6.1	221+00	6.2	6.0	221+50	6.1	6.1	222+00	5.9	6.2
222+50	5.7	5.8	223+00	6.0	6.0	223+50	6.1	6.2	224+00	5.9	5.2
224+50	6.1	5.7	225+00	6.0	5.9	225+50	5.9	6.1	226+00	5.6	6.1
226+50	5.6	6.3	227+00	5.8	6.6	227+50	5.5	6.6	228+00	5.7	6.5

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

Station	Inner Average Thickness, in.	Outer Average Thickness, in.	Station	Inner Average Thickness, in.	Outer Average Thickness, in.	Station	Inner Average Thickness, in.	Outer Average Thickness, in.	Station	Inner Average Thickness, in.	Outer Average Thickness, in.
228+50	5.7	6.9	229+00	5.9	6.7	229+50	5.7	6.5	230+00	5.7	6.9
230+50	5.8	6.6	231+00	6.3	7.3	231+50	6.8	7.1	232+00	6.7	7.1
232+50	6.0	6.8	233+00	6.1	6.5	233+50	6.2	6.7	234+00	6.1	6.9
234+50	6.4	6.7	235+00	6.4	7.0	235+50	6.8	6.8	236+00	6.6	7.2
236+50	6.8	6.8	237+00	6.5	6.3	237+50	6.4	6.0	238+00	6.4	6.1
238+50	5.9	5.8	239+00	5.9	6.1	239+50	5.8	5.9	240+00	5.9	6.0
240+50	5.3	5.6	241+00	6.7	6.9	241+50	6.5	6.9	242+00	6.6	7.1
242+50	6.4	6.7	243+00	6.0	6.1	243+50	6.0	6.3	244+00	6.4	6.6
244+50	6.7	7.1	245+00	6.9	6.7	245+50	6.9	7.2	246+00	6.9	6.9
246+50	5.0	5.1	247+00	3.2	3.6	247+50	3.4	3.8	248+00	3.0	3.5
248+50	2.8	3.5	249+00	3.0	3.4	249+50	2.9	3.5	250+00	2.9	3.6
250+50	3.0	3.3	251+00	2.9	3.4	251+50	3.0	3.3	252+00	3.0	2.9
252+50	2.9	3.1	253+00	3.0	3.2	253+50	2.7	2.9	254+00	2.8	3.2
254+50	2.9	3.8	255+00	2.9	2.9	255+50	2.8	3.0	256+00	3.1	3.5
256+50	3.2	4.0	257+00	3.3	3.8	257+50	3.4	3.9	258+00	3.0	3.5
258+50	3.1	3.3	259+00	3.4	3.7	259+50	3.6	3.9	260+00	3.3	3.6
260+50	3.3	3.8	261+00	4.5	5.7	261+50	6.6	5.7	262+00	6.6	5.7
262+50	6.4	5.7	263+00	6.3	5.8	263+50	6.0	5.9	264+00	6.9	6.6
264+50	6.8	6.3	265+00	6.5	6.4	265+50	6.9	6.5	266+00	6.6	6.6
266+50	6.3	6.6	267+00	6.9	6.8	267+50	6.2	6.2	268+00	6.8	6.2
268+50	6.8	6.2	269+00	6.2	6.1	269+50	6.3	6.1	270+00	6.1	5.8
270+50	5.9	5.7	271+00	5.5	5.0	271+50	5.8	5.2	272+00	6.5	5.6
272+50	6.2	6.0	273+00	6.2	5.9	273+50	6.1	6.1	274+00	5.9	5.9
274+50	6.0	6.5	275+00	6.2	6.9	275+50	6.6	6.7	276+00	6.5	8.0
276+50	6.4	7.0	277+00	5.9	6.7	277+50	6.7	7.5	278+00	6.4	7.2
278+50	6.6	7.4	279+00	6.7	7.5	279+50	6.8	6.8	280+00	6.3	7.0
280+50	6.7	6.7	281+00	6.6	6.6	281+50	7.0	6.8	282+00	7.1	6.5
282+50	6.4	5.9	283+00	7.2	5.8	283+50	5.7	5.8	284+00	4.2	4.4
284+50	4.0	3.9	285+00	4.5	4.5	285+50	4.4	4.6	286+00	4.8	4.8
286+50	5.5	5.1	287+00	5.3	5.3	287+50	5.5	5.3	288+00	5.4	5.1
288+50	5.0	4.9	289+00	5.3	4.6	289+50	5.1	5.1	290+00	5.1	4.9
290+50	5.1	5.3	291+00	5.2	5.2	291+50	4.8	4.5	292+00	4.2	3.9
292+50	4.5	4.2	293+00	4.1	3.8	293+50	4.4	4.0	294+00	4.7	4.2
294+50	4.6	4.8	295+00	5.0	5.1	295+50	5.2	5.1	296+00	5.4	5.1
296+50	5.7	5.5	297+00	5.6	5.5	297+50	5.2	4.9	298+00	5.5	4.8
298+50	5.0	5.0	299+00	4.3	4.5	299+50	4.2	4.3	300+00	3.5	3.5
300+50	3.9	3.8	301+00	4.0	3.7	301+50	4.5	4.4	302+00	4.8	4.9
302+50	5.6	5.9	303+00	5.9	6.3	303+50	5.8	5.8	304+00	6.2	6.5
304+50	6.1	6.1	305+00	6.2	5.7	305+50	5.3	5.2	306+00	5.4	5.0
306+50	4.7	4.8	307+00	4.2	4.1	307+50	5.0	4.5	308+00	4.8	4.6
308+50	4.5	4.3	309+00	4.9	4.3	309+50	5.2	4.4	310+00	5.6	4.5
310+50	5.2	4.2	311+00	5.2	4.8	311+50	5.5	5.0	312+00	5.3	5.5
312+50	5.4	5.2	313+00	5.3	4.8	313+50	4.9	5.2	314+00	5.0	4.4
314+50	5.0	4.5	315+00	4.9	4.5	315+50	4.8	4.8	316+00	4.8	4.5
316+50	5.4	5.0	317+00	5.2	5.2	317+50	4.7	5.2	318+00	5.0	4.7
318+50	6.0	5.7	319+00	5.6	5.2	319+50	5.5	5.3	320+00	5.4	5.1

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

Station	Inner Average Thickness, in.	Outer Average Thickness, in.	Station	Inner Average Thickness, in.	Outer Average Thickness, in.	Station	Inner Average Thickness, in.	Outer Average Thickness, in.	Station	Inner Average Thickness, in.	Outer Average Thickness, in.
320+50	5.8	5.4	321+00	6.4	6.2	321+50	6.8	6.1	322+00	5.4	4.6
322+50	5.6	4.9	323+00	5.2	5.1	323+50	5.5	5.5	324+00	5.2	5.5
324+50	6.9	7.1	325+00	6.5	7.0	325+50	6.6	7.2	326+00	6.7	7.4
326+50	7.0	7.5	327+00	7.2	7.4	327+50	7.6	6.8	328+00	6.4	6.7
328+50	7.1	6.5	329+00	6.2	6.3	329+50	6.7	6.8	330+00	7.0	7.4
330+50	7.4	7.3	331+00	7.1	7.4	331+50	6.7	7.6	332+00	5.1	5.6
332+50	3.6	3.9	333+00	3.4	3.7	333+50	3.2	3.5	334+00	3.2	3.4
334+50	3.5	3.6	335+00	3.1	3.6	335+50	3.0	3.4	336+00	3.5	3.9
336+50	6.0	4.8	337+00	7.3	6.0	337+50	6.3	5.9	338+00	6.9	6.4
338+50	7.6	7.1	339+00	7.5	6.9	339+50	6.5	6.3	340+00	6.3	5.9
340+50	6.3	6.1	341+00	6.0	6.3	341+50	6.5	6.5	342+00	6.7	6.7
342+50	6.8	6.2	343+00	6.5	5.9	343+50	6.4	6.3	344+00	6.5	6.1
344+50	6.6	6.7	345+00	6.6	6.7	345+50	7.1	6.6	346+00	7.0	6.8
346+50	5.8	5.8	347+00	6.2	6.2	347+50	6.1	6.6	348+00	5.8	6.5
348+50	6.0	6.4	349+00	6.0	6.1	349+50	5.9	6.6	350+00	6.0	6.3
350+50	5.9	6.2	351+00	6.3	6.8	351+50	5.9	6.7	352+00	5.6	5.6
352+50	5.7	5.6	353+00	5.9	6.0	353+50	6.3	5.7	354+00	6.6	5.8
354+50	7.1	5.5	355+00	6.9	5.3	355+50	6.6	5.0	356+00	5.5	5.0
356+50	5.9	5.5	357+00	5.3	5.7	357+50	5.9	6.0	358+00	5.5	6.1
358+50	5.7	6.6	359+00	6.1	6.8	359+50	5.9	7.0	360+00	5.9	7.1
360+50	6.3	7.6	361+00	5.5	7.0	361+50	5.1	6.3	362+00	5.4	6.1
362+50	5.5	6.0	363+00	5.8	6.2	363+50	5.9	6.0	364+00	6.1	6.2
364+50	6.6	6.8	365+00	5.9	6.0	365+50	5.5	5.6	366+00	5.2	5.2
366+50	5.4	5.1	367+00	5.7	5.3	367+50	5.9	5.4	368+00	5.8	5.2
368+50	6.3	5.5	369+00	5.7	5.4	369+50	5.7	5.6	370+00	6.1	6.0
370+50	5.8	5.8	371+00	6.0	6.1	371+50	5.4	6.1	372+00	6.1	6.1
372+50	5.4	5.8	373+00	5.4	5.4	373+50	5.6	5.5	374+00	5.4	5.7
374+50	5.9	5.7	375+00	5.8	5.6	375+50	6.0	5.7	376+00	5.8	5.7
376+50	5.7	5.8	377+00	5.6	5.7	377+50	5.6	5.3	378+00	6.6	5.3
378+50	6.3	5.8	379+00	6.8	5.9	379+50	5.7	5.5	380+00	5.5	5.2
380+50	5.6	5.1	381+00	5.5	5.3	381+50	5.2	5.2	382+00	5.1	5.6
382+50	5.2	5.7	383+00	5.8	5.4	383+50	6.1	5.9	384+00	6.3	6.0
384+50	6.0	5.7	385+00	5.9	5.5	385+50	5.7	4.9	386+00	6.1	5.7
386+50	6.0	5.6	387+00	5.7	5.9	387+50	5.3	5.0	388+00	5.1	4.8
388+50	5.0	4.7	389+00	5.2	4.7	389+50	6.6	5.1	390+00	5.9	4.8
390+50	6.1	5.3	391+00	6.0	5.4	391+50	5.7	5.2	392+00	5.8	5.6
392+50	6.0	5.7	393+00	5.8	5.9	393+50	5.6	5.9	394+00	5.3	5.4
394+50	5.3	5.4	395+00	3.9	4.5						

MaineDOT

Ground Penetrating Radar (GPR)
Estimated Pavement Thickness Summary
018547.00 - Blue Hill, Penobscot, Orland

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

GPR data was collected at the inner and outer wheel path of the lane at 1 foot intervals along the entire section. Pavement thickness estimates were developed using Geophysical Survey Systems, Inc. (GSSI) RADAN7 GPR data processing software. Where available, pavement thickness values from Geotechnical borings and/or pavement cores collected by MaineDOT personnel were used in developing the estimated GPR pavement thicknesses.

Data Confidence Level:

Poor - Reflection layers are weak and 'jumbled' throughout much of the project. Layer depths do not correlate well with known pavement depths obtained from pavement cores.

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

Additional Comments
Southbound Outer Edge of Pavement (White Line - Edge of Travelway)

Project Manager	Reported By	Test Date	Reported Date
DAVIS, SHAWN R	**COLSON, STEPHEN W**	**7/22/2014**	**1/5/2015**

Lane Tested	Route	Avg. Thickness, in.	Min. Thickness, in.	Max. Thickness, in.	Analysis Distance, ft.
SOUTHBOUND LANE (outer)	**15**	**2.9**	**2**	**7.3**	**50**

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

Station	Outer Average Thickness, in.	Station	Outer Average Thickness, in.	Station	Outer Average Thickness, in.	Station	Outer Average Thickness, in.
10+50*	3.5	11+00	3.1	11+50	3.2	12+00	3.2
12+50	3.5	13+00	3.5	13+50	3.6	14+00	3.5
14+50	3.6	15+00	3.0	15+50	2.0	16+00	2.1
16+50	2.5	17+00	2.4	17+50	2.3	18+00	2.2
18+50	2.2	19+00	2.2	19+50	2.4	20+00	2.4
20+50	2.4	21+00	2.4	21+50	2.5	22+00	2.4
22+50	2.2	23+00	2.0	23+50	2.2	24+00	2.4
24+50	2.6	25+00	2.7	25+50	3.0	26+00	3.4
26+50	2.8	27+00	2.7	27+50	2.7	28+00	2.5
28+50	2.2	29+00	2.1	29+50	2.2	30+00	2.2
30+50	2.0	31+00	2.0	31+50	2.1	32+00	2.0
32+50	2.1	33+00	2.2	33+50	2.3	34+00	2.1
34+50	2.1	35+00	2.4	35+50	2.4	36+00	2.9
36+50	2.7	37+00	2.5	37+50	2.4	38+00	2.3
38+50	2.1	39+00	2.1	39+50	2.2	40+00	2.2
40+50	2.6	41+00	3.1	41+50	2.5	42+00	2.2
42+50	3.1	43+00	2.6	43+50	2.4	44+00	2.6

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

Station	Outer Average Thickness, in.	Station	Outer Average Thickness, in.	Station	Outer Average Thickness, in.	Station	Outer Average Thickness, in.
44+50	2.1	45+00	2.0	45+50	2.0	46+00	2.5
46+50	2.5	47+00	2.7	47+50	2.5	48+00	2.4
48+50	2.2	49+00	2.4	49+50	2.6	50+00	2.2
50+50	3.0	51+00	2.9	51+50	2.4	52+00	2.7
52+50	2.4	53+00	2.8	53+50	2.8	54+00	2.9
54+50	2.3	55+00	2.5	55+50	2.4	56+00	2.4
56+50	2.4	57+00	2.9	57+50	2.5	58+00	2.3
58+50	3.2	59+00	2.1	59+50	2.4	60+00	2.8
60+50	2.7	61+00	2.5	61+50	2.4	62+00	2.7
62+50	3.4	63+00	3.6	63+50	3.0	64+00	2.6
64+50	2.1	65+00	2.7	65+50	3.1	66+00	3.1
66+50	2.3	67+00	2.8	67+50	3.2	68+00	2.8
68+50	2.6	69+00	2.1	69+50	2.2	70+00	2.3
70+50	2.5	71+00	2.0	71+50	2.5	72+00	2.4
72+50	2.1	73+00	2.5	73+50	2.7	74+00	3.1
74+50	2.4	75+00	2.9	75+50	3.8	76+00	3.5
76+50	3.6	77+00	3.5	77+50	3.0	78+00	2.9
78+50	3.7	79+00	3.2	79+50	3.3	80+00	3.3
80+50	3.0	81+00	3.0	81+50	2.9	82+00	2.6
82+50	2.4	83+00	2.6	83+50	2.4	84+00	2.9
84+50	2.8	85+00	3.1	85+50	3.0	86+00	2.9
86+50	2.6	87+00	2.2	87+50	2.9	88+00	3.2
88+50	3.5	89+00	3.0	89+50	3.4	90+00	4.3
90+50	4.5	91+00	3.7	91+50	3.1	92+00	3.3
92+50	3.6	93+00	2.8	93+50	3.0	94+00	3.6
94+50	3.8	95+00	4.2	95+50	4.2	96+00	3.5
96+50	3.9	97+00	2.7	97+50	2.1	98+00	2.6
98+50	2.1	99+00	3.1	99+50	3.2	100+00	4.1
100+50	2.5	101+00	2.1	101+50	2.1	102+00	2.3
102+50	2.7	103+00	2.5	103+50	2.7	104+00	2.5
104+50	2.7	105+00	2.2	105+50	2.6	106+00	2.3
106+50	3.0	107+00	2.4	107+50	3.0	108+00	3.1
108+50	2.7	109+00	2.4	109+50	2.6	110+00	2.5
110+50	2.5	111+00	2.7	111+50	2.7	112+00	2.8
112+50	2.9	113+00	2.4	113+50	2.4	114+00	2.7
114+50	2.9	115+00	2.5	115+50	2.5	116+00	2.3
116+50	2.7	117+00	2.8	117+50	2.5	118+00	2.4
118+50	2.1	119+00	2.6	119+50	2.9	120+00	3.1
120+50	2.7	121+00	2.8	121+50	2.8	122+00	2.7
122+50	2.2	123+00	2.3	123+50	2.4	124+00	2.3
124+50	2.3	125+00	2.3	125+50	2.2	126+00	2.5
126+50	3.0	127+00	3.3	127+50	3.0	128+00	2.7
128+50	3.0	129+00	2.5	129+50	2.3	130+00	2.3
130+50	3.0	131+00	3.1	131+50	3.2	132+00	2.7
132+50	2.4	133+00	2.3	133+50	2.3	134+00	2.7
134+50	2.8	135+00	2.6	135+50	3.2	136+00	2.4

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

Station	Outer Average Thickness, in.	Station	Outer Average Thickness, in.	Station	Outer Average Thickness, in.	Station	Outer Average Thickness, in.
136+50	2.2	137+00	2.4	137+50	2.4	138+00	2.4
138+50	2.5	139+00	2.4	139+50	2.2	140+00	2.9
140+50	2.5	141+00	2.2	141+50	2.3	142+00	2.6
142+50	2.4	143+00	2.6	143+50	3.0	144+00	3.2
144+50	3.0	145+00	2.5	145+50	3.0	146+00	3.1
146+50	3.3	147+00	2.7	147+50	3.1	148+00	2.9
148+50	2.8	149+00	2.7	149+50	3.0	150+00	2.4
150+50	2.3	151+00	2.7	151+50	2.6	152+00	2.1
152+50	2.2	153+00	2.2	153+50	2.3	154+00	2.6
154+50	2.5	155+00	2.7	155+50	2.3	156+00	2.9
156+50	3.4	157+00	4.2	157+50	3.2	158+00	3.2
158+50	3.6	159+00	2.6	159+50	2.8	160+00	2.8
160+50	2.3	161+00	2.0	161+50	2.5	162+00	2.5
162+50	2.2	163+00	2.4	163+50	2.9	164+00	2.6
164+50	2.6	165+00	2.5	165+50	2.4	166+00	2.4
166+50	2.6	167+00	2.8	167+50	2.8	168+00	3.1
168+50	2.0	169+00	2.0	169+50	2.0	170+00	2.5
170+50	2.3	171+00	2.3	171+50	2.1	172+00	2.1
172+50	2.4	173+00	2.2	173+50	2.0	174+00	2.2
174+50	2.6	175+00	2.1	175+50	2.1	176+00	2.2
176+50	3.0	177+00	2.2	177+50	2.1	178+00	2.1
178+50	2.1	179+00	2.4	179+50	2.7	180+00	2.2
180+50	2.4	181+00	2.3	181+50	2.9	182+00	2.3
182+50	2.2	183+00	2.2	183+50	2.3	184+00	2.2
184+50	2.5	185+00	2.1	185+50	2.4	186+00	2.9
186+50	2.3	187+00	2.0	187+50	2.1	188+00	2.0
188+50	2.0	189+00	2.0	189+50	2.2	190+00	2.6
190+50	3.2	191+00	3.2	191+50	3.3	192+00	3.3
192+50	2.9	193+00	2.9	193+50	3.0	194+00	2.4
194+50	2.3	195+00	2.1	195+50	2.4	196+00	2.1
196+50	2.2	197+00	2.3	197+50	2.3	198+00	2.2
198+50	2.1	199+00	2.1	199+50	2.3	200+00	2.3
200+50	2.3	201+00	2.8	201+50	2.6	202+00	2.5
202+50	2.8	203+00	2.6	203+50	2.2	204+00	2.2
204+50	3.2	205+00	2.4	205+50	2.4	206+00	2.9
206+50	3.0	207+00	2.1	207+50	2.2	208+00	2.2
208+50	3.0	209+00	3.0	209+50	2.8	210+00	2.2
210+50	2.1	211+00	2.0	211+50	2.6	212+00	2.0
212+50	2.0	213+00	2.1	213+50	2.4	214+00	2.7
214+50	3.2	215+00	3.1	215+50	3.2	216+00	2.9
216+50	3.1	217+00	3.5	217+50	3.2	218+00	3.1
218+50	2.8	219+00	3.2	219+50	3.3	220+00	2.0
220+50	2.0	221+00	2.0	221+50	2.0	222+00	2.0
222+50	2.0	223+00	2.0	223+50	2.0	224+00	2.1
224+50	2.0	225+00	2.2	225+50	2.3	226+00	2.4
226+50	2.6	227+00	2.7	227+50	2.6	228+00	2.7

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

Station	Outer Average Thickness, in.	Station	Outer Average Thickness, in.	Station	Outer Average Thickness, in.	Station	Outer Average Thickness, in.
228+50	2.7	229+00	2.8	229+50	2.8	230+00	2.8
230+50	2.9	231+00	2.3	231+50	2.0	232+00	2.0
232+50	2.0	233+00	2.0	233+50	3.0	234+00	3.2
234+50	2.9	235+00	2.6	235+50	3.4	236+00	2.5
236+50	2.1	237+00	2.0	237+50	2.0	238+00	2.3
238+50	2.3	239+00	2.1	239+50	2.5	240+00	2.6
240+50	2.5	241+00	2.3	241+50	2.7	242+00	2.6
242+50	2.8	243+00	2.5	243+50	2.0	244+00	2.2
244+50	2.2	245+00	2.3	245+50	2.0	246+00	3.1
246+50	3.5	247+00	2.4	247+50	2.5	248+00	2.6
248+50	2.8	249+00	2.8	249+50	2.7	250+00	2.7
250+50	2.5	251+00	2.6	251+50	2.8	252+00	2.8
252+50	2.8	253+00	3.0	253+50	2.7	254+00	2.7
254+50	2.9	255+00	2.4	255+50	2.4	256+00	2.7
256+50	2.9	257+00	2.9	257+50	2.7	258+00	2.6
258+50	2.5	259+00	2.4	259+50	2.9	260+00	3.1
260+50	3.1	261+00	3.0	261+50	2.4	262+00	2.1
262+50	2.5	263+00	2.3	263+50	2.3	264+00	2.9
264+50	2.4	265+00	2.0	265+50	2.1	266+00	2.1
266+50	2.1	267+00	2.5	267+50	2.1	268+00	2.1
268+50	2.0	269+00	2.2	269+50	2.1	270+00	2.1
270+50	2.1	271+00	2.9	271+50	2.4	272+00	2.1
272+50	2.1	273+00	2.3	273+50	2.6	274+00	2.3
274+50	2.4	275+00	2.2	275+50	2.2	276+00	2.3
276+50	2.3	277+00	2.4	277+50	2.7	278+00	3.2
278+50	2.4	279+00	2.7	279+50	2.3	280+00	2.4
280+50	2.4	281+00	2.3	281+50	2.2	282+00	2.1
282+50	2.1	283+00	2.1	283+50	2.7	284+00	3.5
284+50	2.9	285+00	3.7	285+50	3.9	286+00	3.7
286+50	4.1	287+00	4.3	287+50	4.1	288+00	4.0
288+50	3.9	289+00	3.9	289+50	4.3	290+00	4.0
290+50	4.3	291+00	3.9	291+50	3.3	292+00	2.9
292+50	3.3	293+00	3.2	293+50	3.4	294+00	3.6
294+50	3.9	295+00	4.0	295+50	3.7	296+00	3.7
296+50	3.8	297+00	3.9	297+50	3.5	298+00	3.4
298+50	3.4	299+00	3.1	299+50	3.2	300+00	2.6
300+50	2.8	301+00	2.6	301+50	3.3	302+00	3.8
302+50	4.4	303+00	4.7	303+50	4.3	304+00	5.3
304+50	4.8	305+00	4.4	305+50	3.8	306+00	3.6
306+50	3.8	307+00	3.0	307+50	3.4	308+00	3.8
308+50	3.3	309+00	3.3	309+50	3.2	310+00	4.0
310+50	4.5	311+00	4.9	311+50	4.7	312+00	5.3
312+50	5.1	313+00	4.6	313+50	5.8	314+00	4.3
314+50	4.2	315+00	4.1	315+50	4.6	316+00	4.7
316+50	5.4	317+00	5.3	317+50	5.4	318+00	4.9
318+50	6.1	319+00	4.8	319+50	5.1	320+00	4.4

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

Station	Outer Average Thickness, in.	Station	Outer Average Thickness, in.	Station	Outer Average Thickness, in.	Station	Outer Average Thickness, in.
320+50	4.8	321+00	6.0	321+50	6.0	322+00	4.4
322+50	4.3	323+00	5.0	323+50	5.7	324+00	4.8
324+50	3.9	325+00	4.1	325+50	4.1	326+00	4.0
326+50	3.6	327+00	3.9	327+50	3.5	328+00	2.6
328+50	3.4	329+00	3.6	329+50	3.5	330+00	3.4
330+50	3.2	331+00	3.5	331+50	3.9	332+00	4.8
332+50	4.7	333+00	4.3	333+50	3.7	334+00	3.7
334+50	4.3	335+00	4.3	335+50	3.9	336+00	4.6
336+50	2.3	337+00	3.1	337+50	3.5	338+00	3.4
338+50	3.5	339+00	3.6	339+50	3.9	340+00	4.3
340+50	3.8	341+00	3.3	341+50	3.1	342+00	4.4
342+50	4.2	343+00	3.6	343+50	4.1	344+00	3.4
344+50	3.0	345+00	3.9	345+50	3.5	346+00	3.0
346+50	3.5	347+00	3.7	347+50	3.6	348+00	3.5
348+50	4.4	349+00	4.7	349+50	3.2	350+00	3.0
350+50	2.7	351+00	2.3	351+50	3.5	352+00	3.7
352+50	3.8	353+00	3.1	353+50	2.8	354+00	3.0
354+50	2.7	355+00	2.4	355+50	2.7	356+00	2.8
356+50	2.6	357+00	2.6	357+50	2.4	358+00	2.4
358+50	3.3	359+00	3.2	359+50	3.1	360+00	3.7
360+50	4.2	361+00	3.6	361+50	3.1	362+00	2.8
362+50	3.0	363+00	2.7	363+50	2.8	364+00	3.2
364+50	3.1	365+00	2.9	365+50	2.9	366+00	3.4
366+50	3.4	367+00	3.6	367+50	4.4	368+00	2.8
368+50	2.6	369+00	2.6	369+50	3.2	370+00	2.8
370+50	2.8	371+00	3.1	371+50	2.7	372+00	2.5
372+50	3.2	373+00	2.5	373+50	2.9	374+00	2.8
374+50	2.7	375+00	3.1	375+50	2.8	376+00	3.1
376+50	3.9	377+00	2.6	377+50	2.6	378+00	2.4
378+50	2.6	379+00	2.3	379+50	2.3	380+00	2.5
380+50	2.6	381+00	4.3	381+50	4.1	382+00	3.0
382+50	2.8	383+00	3.2	383+50	2.4	384+00	2.2
384+50	2.1	385+00	2.1	385+50	2.8	386+00	3.5
386+50	3.0	387+00	4.2	387+50	3.3	388+00	3.7
388+50	3.3	389+00	3.2	389+50	2.8	390+00	2.8
390+50	2.6	391+00	2.5	391+50	2.3	392+00	2.6
392+50	2.7	393+00	2.7	393+50	3.0	394+00	3.1
394+50	3.3	395+00	2.4				

Boring Logs and Sample Results

State of Maine - Department of Transportation

Laboratory Testing Summary Sheet

Town(s): Orland-Penobscot-Blue Hill Work Number: 18547.00

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-OPBH-101, S1	358+72	5.2 Rt.	0.5-1.3	263129	1	6.8	21.5	SM	A-1-b	II
HB-OPBH-101, S2	358+72	5.2 Rt.	1.3-5.0	263130	1	13.2	66.5	ML	A-4	IV
HB-OPBH-102, S3	358+72	11.0 Rt.	0.5-1.2	263131	1	10.1	6.3	SW-SM	A-1-a	0
HB-OPBH-102, S4	358+72	11.0 Rt.	1.2-5.0	263132	1	15.2	70.3	ML	A-4	IV
HB-OPBH-103, S5	358+72	13.2 Rt.	0.29-0.9	263133	1	3.3	3.2	SW	A-1-a	0
HB-OPBH-103, S6	358+72	13.2 Rt.	0.9-5.0	263134	1	16.4	56.4	ML	A-4	IV
HB-OPBH-104, S7	351+51	4.4 Lt.	0.46-1.6	263135	2	8.6	12.3	SM	A-1-a	II
HB-OPBH-104, S8	351+51	4.4 Lt.	1.6-4.7	263136	2	18.6	45.5	SM	A-4	III
HB-OPBH-105, S9	351+51	10.5 Lt.	0.29-0.7	263137	2	6.7	1.5	SP	A-1-b	0
HB-OPBH-105, S10	351+51	10.5 Lt.	0.7-5.0	263138	2	13.6	70.4	ML	A-4	IV
HB-OPBH-106, S11	351+51	14.0 Lt.	0.25-0.8	263139	2	8.5	10.8	SP-SM	A-1-b	0
HB-OPBH-106, S12	351+51	14.0 Lt.	0.8-4.4	263140	2	13.9	59.2	ML	A-4	IV
HB-OPBH-107, S13	267+97	3.0 Lt.	0.54-1.7	263141	3	5.9	9.2	SW-SM	A-1-b	0
HB-OPBH-107, S14	267+97	3.0 Lt.	1.7-3.0	263142	3	11.2	19.2	SM	A-1-b	II
HB-OPBH-107, S15	267+97	3.0 Lt.	3.0-5.0	263143	3	14.2	63.5	ML	A-4	IV
HB-OPBH-108, S16	267+97	10.0 Rt.	0.38-1.2	263144	3	20.2	49.3	SM	A-4	III
HB-OPBH-108, S17	267+97	10.0 Rt.	1.2-3.2	263145	3	14.8	54.8	ML	A-4	IV
HB-OPBH-109, S18	267+96	14.0 Lt.	0.9-5.0	263146	3	17.4	57.3	ML	A-4	IV
HB-OPBH-110, S19	137+50	5.0 Rt.	0.5-2.2	263147	4	9.5	19.7	SM	A-1-b	II
HB-OPBH-110, S20	137+50	5.0 Rt.	2.2-5.0	263148	4	14.7	66.9	ML	A-4	IV
HB-OPBH-111, S21	137+50	9.5 Rt.	0.42-1.2	263149	4	9.6	20.9	SM	A-1-b	II
HB-OPBH-111, S22	137+50	9.5 Rt.	1.2-5.0	263150	4	14.0	55.8	ML	A-4	IV
HB-OPBH-113, S23	108+93	5.0 Rt.	0.5-1.4	243076	4	7.8	13.0	SM	A-1-b	II
HB-OPBH-113, S24	108+93	5.0 Rt.	1.4-5.0	243077	4	9.2	35.4	SM	A-2-4	II
HB-OPBH-114, S25	108+93	10.0 Rt.	0.38-1.0	243078	5	10.1	17.5	SM	A-1-b	II
HB-OPBH-114, S26	108+93	10.0 Rt.	1.0-5.0	243079	5	10.7	43.5	SM	A-4	III
HB-OPBH-115, S27	108+93	13.5 Rt.	0.5-5.0	243080	5	15.8	56.2	ML	A-4	IV
HB-OPBH-116, S28	53+51	4.5 Lt.	0.5-2.7	243081	6	5.5	11.6	SW-SM	A-1-b	0
HB-OPBH-116, S29	53+51	4.5 Lt.	2.7-5.0	243082	6	12.2	35.7	SM	A-2-4	II
HB-OPBH-118, S30	53+51	13.0 Lt.	0.25-1.6	243083	6	7.2	8.5	SW-SM	A-1-b	0
HB-OPBH-118, S31	53+51	13.0 Lt.	1.6-5.0	243084	6	30.7	59.7	ML	A-4	IV

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.

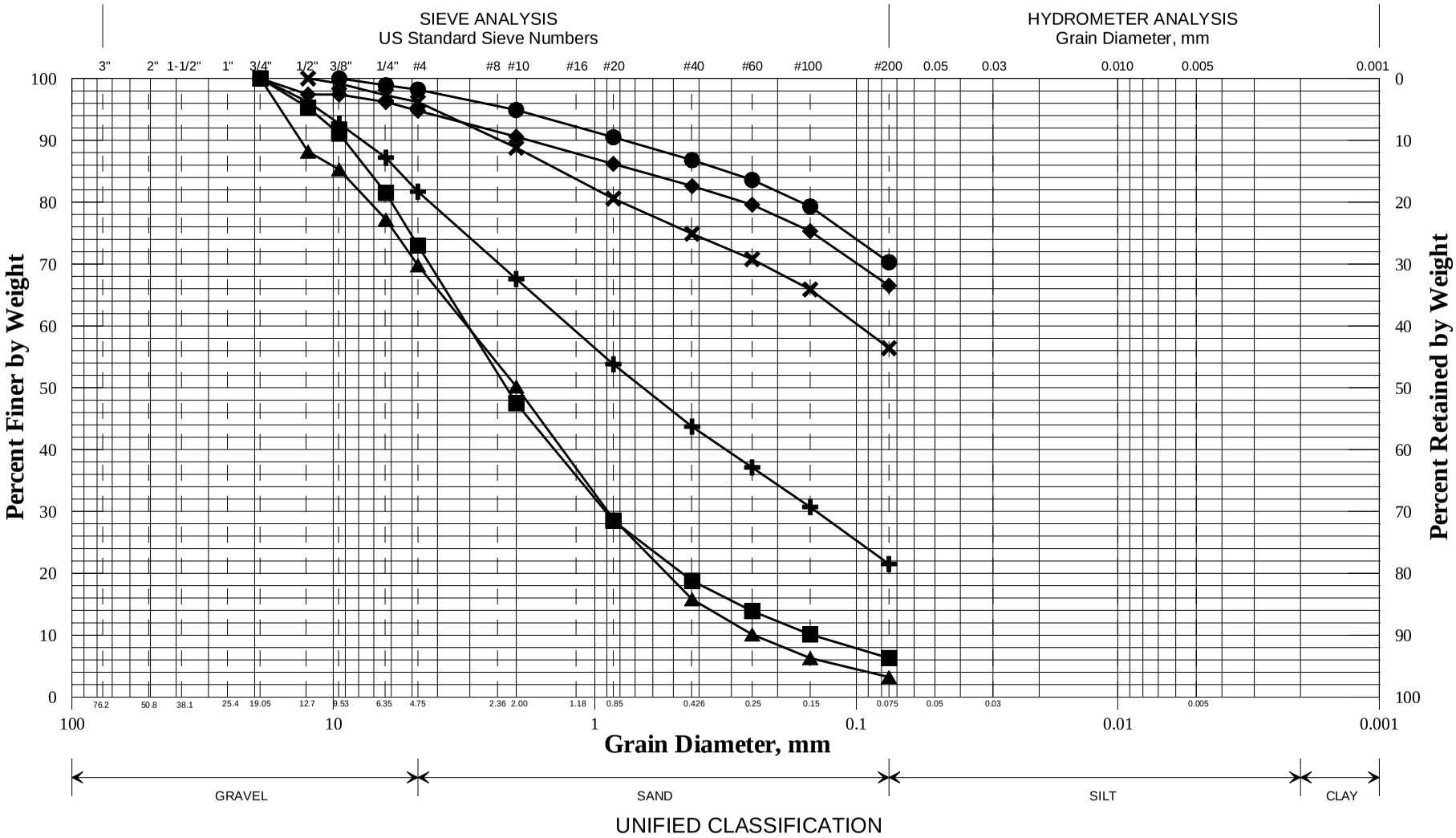
GSDC = Grain Size Distribution Curve as determined by AASHTO T 88-93 (1996) and/or ASTM D 422-63 (Reapproved 1998)

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



	Boring/Sample No.	Station	Offset, ft	Depth, ft	Description	W, %	LL	PL	PI
✚	HB-OPBH-101/S1	358+72	5.2 RT	0.5-1.3	SAND, some silt, little gravel.	6.8			
◆	HB-OPBH-101/S2	358+72	5.2 RT	1.3-5.0	SILT, some sand, trace gravel.	13.2			
■	HB-OPBH-102/S3	358+72	11.0 RT	0.5-1.2	SAND, some gravel, trace silt.	10.1			
●	HB-OPBH-102/S4	358+72	11.0 RT	1.2-5.0	SILT, some sand, trace gravel.	15.2			
▲	HB-OPBH-103/S5	358+72	13.2 RT	0.29-0.9	SAND, some gravel, trace silt.	3.3			
✖	HB-OPBH-103/S6	358+72	13.2 RT	0.9-5.0	Sandy SILT, trace gravel.	16.4			

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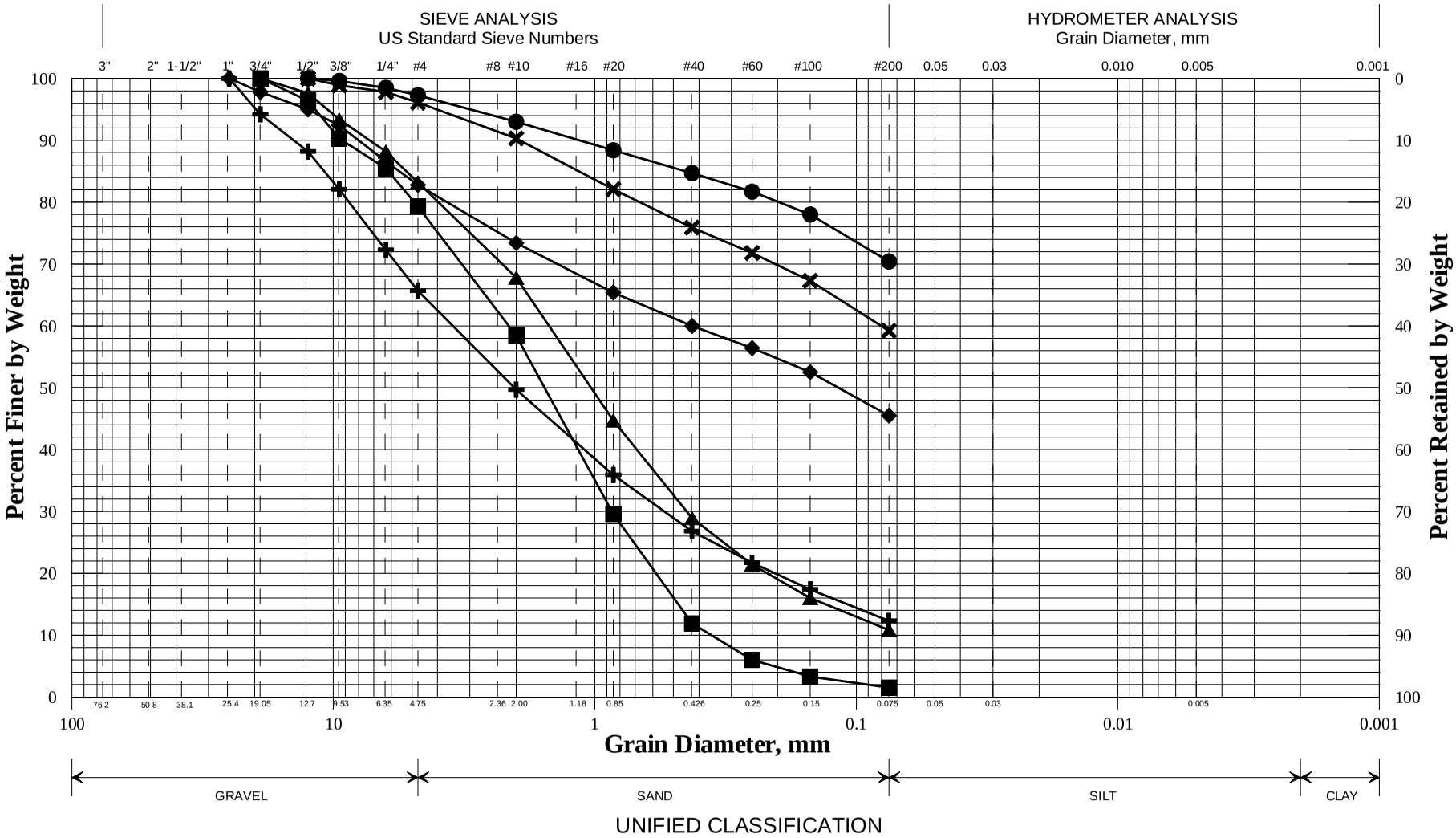
SHEET 1

State of Maine Department of Transportation
GRAIN SIZE DISTRIBUTION CURVE



	Boring/Sample No.	Station	Offset, ft	Depth, ft	Description	W, %	LL	PL	PI
✚	HB-OPBH-104/S7	351+51	4.4 LT	0.46-1.6	SAND, some gravel, little silt.	8.6			
◆	HB-OPBH-104/S8	351+51	4.4 LT	1.6-4.7	Sandy SILT, little gravel.	18.6			
■	HB-OPBH-105/S9	351+51	10.5 LT	0.29-0.7	SAND, some gravel, trace silt.	6.7			
●	HB-OPBH-105/S10	351+51	10.5 LT	0.7-5.0	SILT, some sand, trace gravel.	13.6			
▲	HB-OPBH-106/S11	351+51	14.0 LT	0.25-0.8	SAND, little gravel, little silt.	8.5			
✖	HB-OPBH-106/S12	351+51	14.0 LT	0.8-4.4	Sandy SILT, trace gravel.	13.9			

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SHEET 2

State of Maine Department of Transportation
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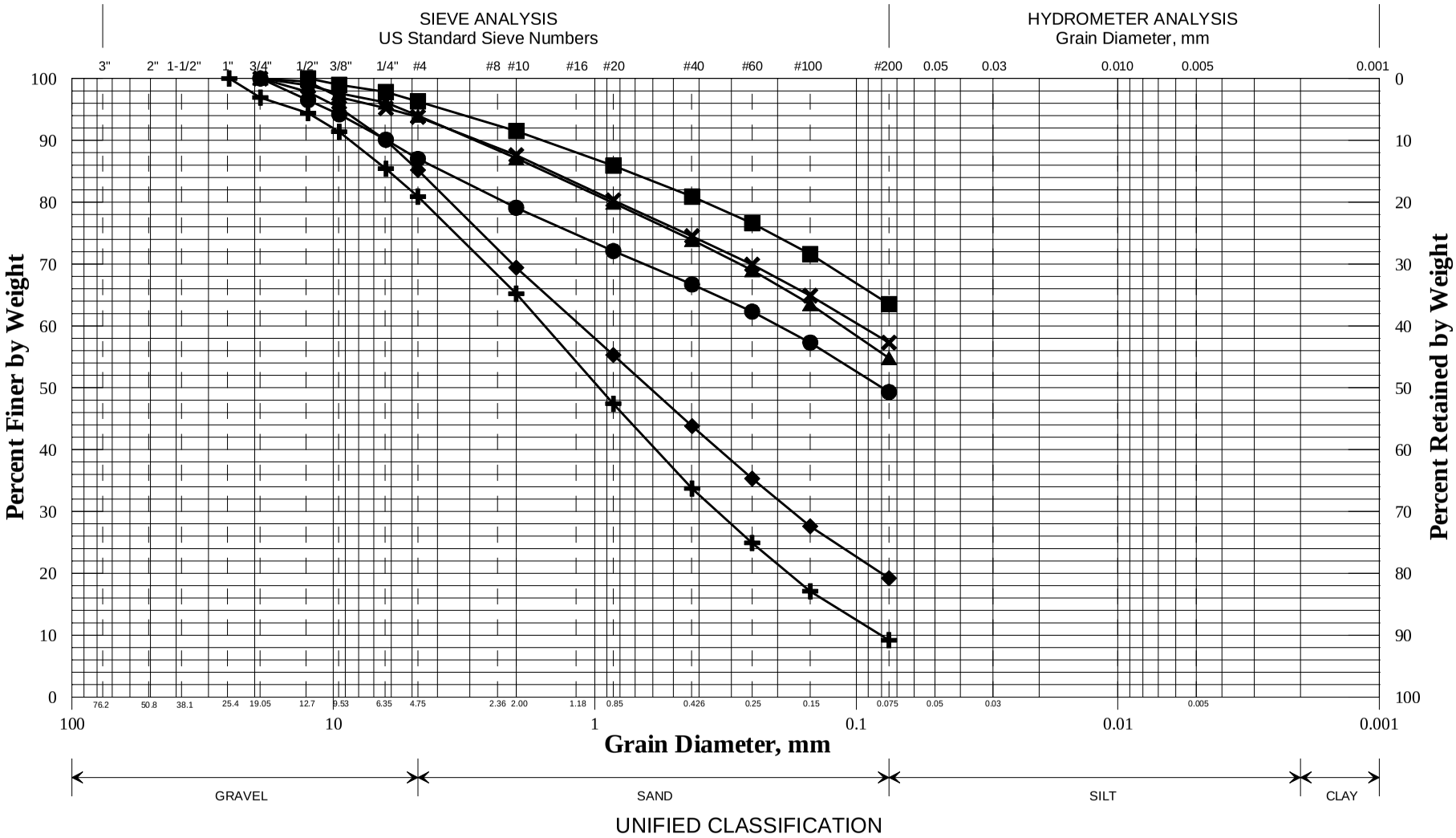

UNIFIED CLASSIFICATION

	Boring/Sample No.	Station	Offset, ft	Depth, ft	Description	W, %	LL	PL	PI
✚	HB-OPBH-107/S13	267+97	3.0 LT	0.54-1.7	SAND, little gravel, trace silt.	5.9			
◆	HB-OPBH-107/S14	267+97	3.0 LT	1.7-3.0	SAND, little silt, little gravel.	11.2			
■	HB-OPBH-107/S15	267+97	3.0 LT	3.0-5.0	SILT, some sand, trace gravel.	14.2			
●	HB-OPBH-108/S16	267+97	10.0 RT	0.38-1.2	Sandy SILT, little gravel.	20.2			
▲	HB-OPBH-108/S17	267+97	10.0 RT	1.2-3.2	Sandy SILT, trace gravel.	14.8			
✕	HB-OPBH-109/S18	267+96	14.0 LT	0.9-5.0	Sandy SILT, trace gravel.	17.4			

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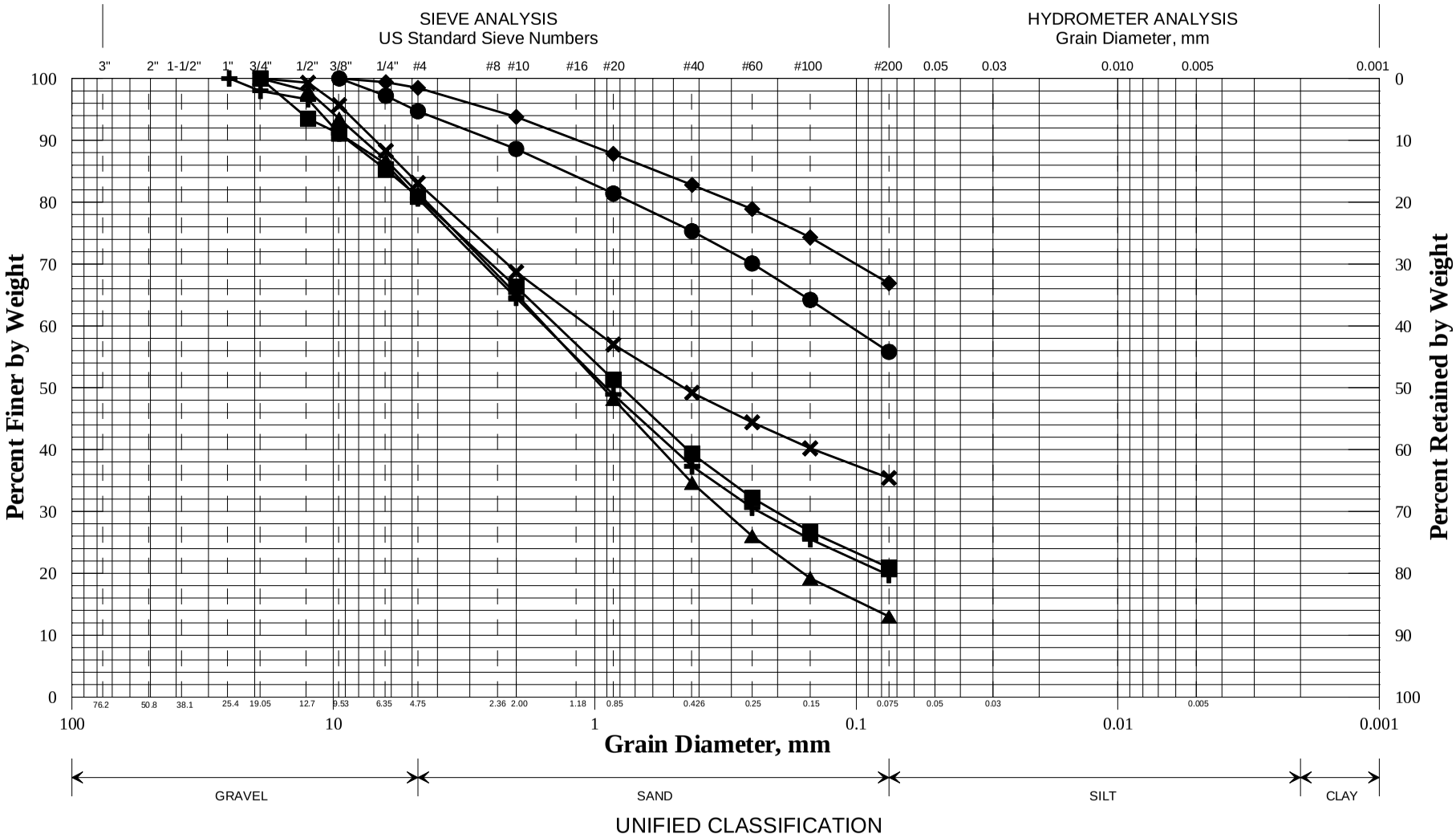
SHEET 3

State of Maine Department of Transportation
GRAIN SIZE DISTRIBUTION CURVE



	Boring/Sample No.	Station	Offset, ft	Depth, ft	Description	W, %	LL	PL	PI
✚	HB-OPBH-110/S19	137+50	5.0 RT	0.5-2.2	SAND, little silt, little gravel.	9.5			
◆	HB-OPBH-110/S20	137+50	5.0 RT	2.2-5.0	SILT, some sand, trace gravel.	14.7			
■	HB-OPBH-111/S21	137+50	9.5 RT	0.42-1.2	SAND, some silt, little gravel.	9.6			
●	HB-OPBH-111/S22	137+50	9.5 RT	1.2-5.0	Sandy SILT, trace gravel.	14.0			
▲	HB-OPBH-113/S23	108+93	5.0 RT	0.5-1.4	SAND, little gravel, little silt.	7.8			
✖	HB-OPBH-113/S24	108+93	5.0 RT	1.4-5.0	Silty SAND, little gravel.	9.2			

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SHEET 4

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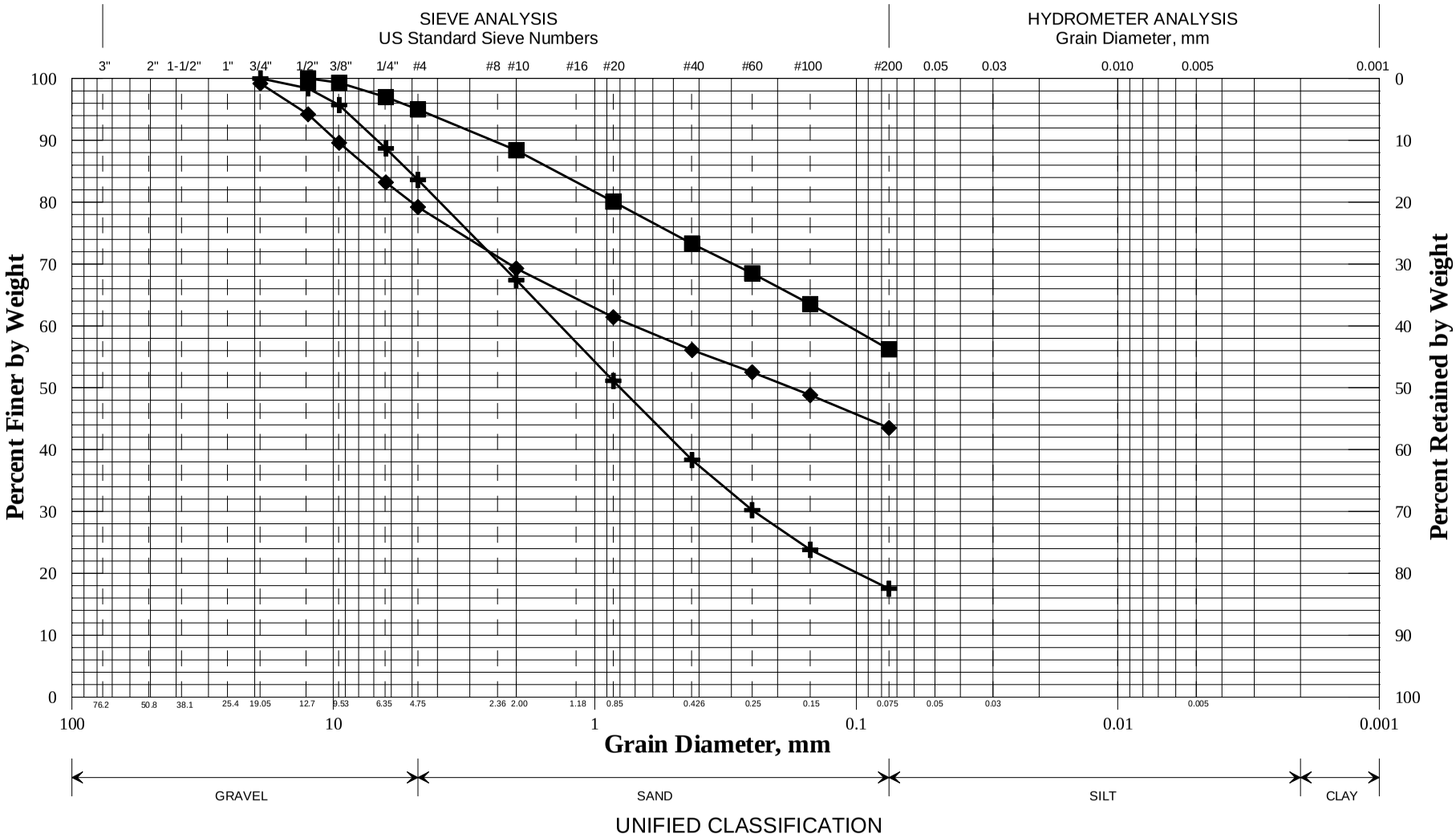

	Boring/Sample No.	Station	Offset, ft	Depth, ft	Description	W, %	LL	PL	PI
✚	HB-OPBH-114/S25	108+93	10.0 RT	0.38-1.0	SAND, little silt, little gravel.	10.1			
◆	HB-OPBH-114/S26	108+93	10.0 RT	1.0-5.0	Sandy SILT, some gravel.	10.7			
■	HB-OPBH-115/S27	108+93	13.5 RT	0.5-5.0	Sandy SILT, trace gravel.	15.8			
●									
▲									
✕									

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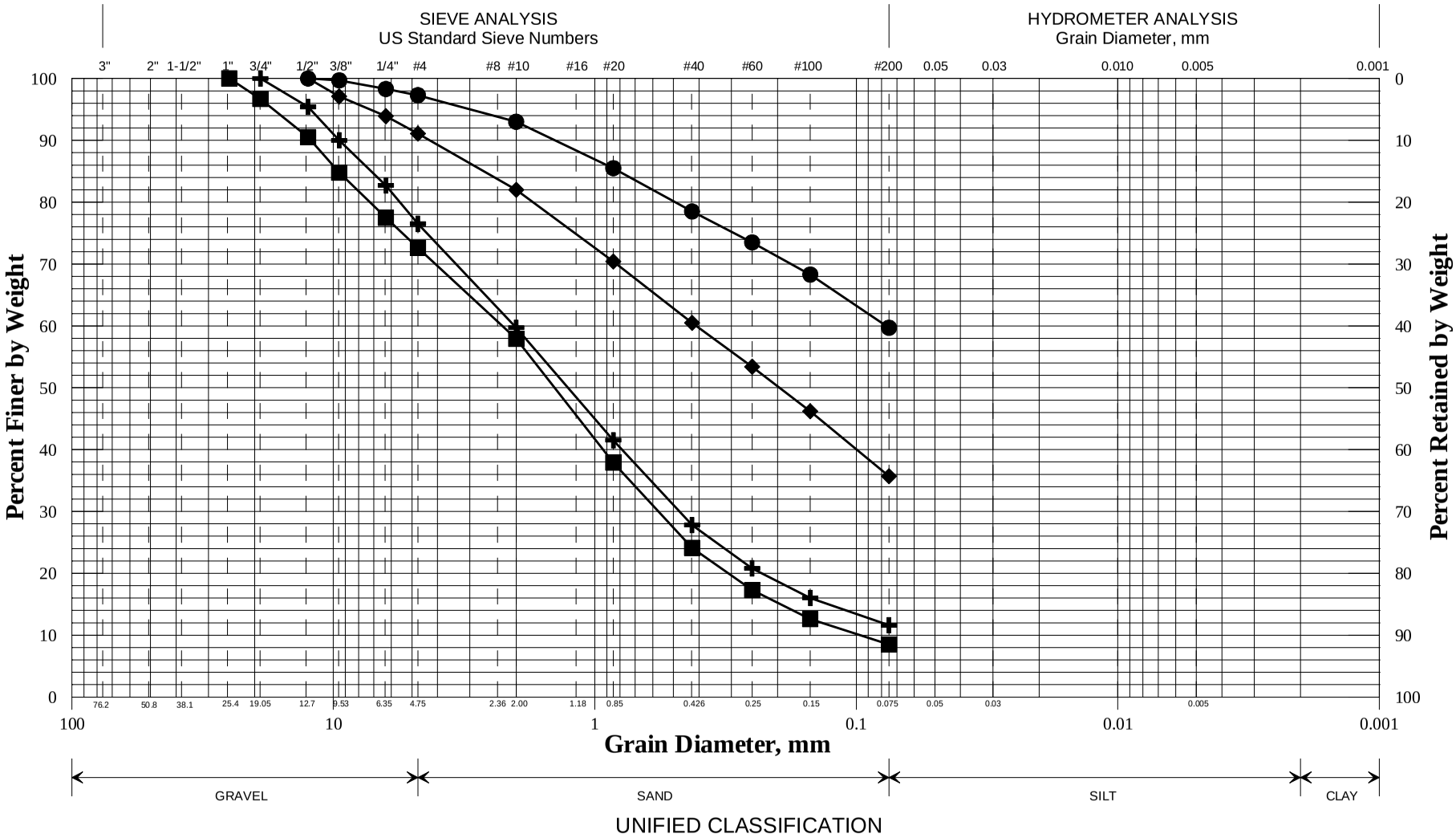
SHEET 5

State of Maine Department of Transportation
GRAIN SIZE DISTRIBUTION CURVE



	Boring/Sample No.	Station	Offset, ft	Depth, ft	Description	W, %	LL	PL	PI
✚	HB-OPBH-116/S28	53+51	4.5 LT	0.5-2.7	SAND, some gravel, little silt.	5.5			
◆	HB-OPBH-116/S29	53+51	4.5 LT	2.7-5.0	Silty SAND, trace gravel.	12.2			
■	HB-OPBH-118/S30	53+51	13.0 LT	0.25-1.6	SAND, some gravel, trace silt.	7.2			
●	HB-OPBH-118/S31	53+51	13.0 LT	1.6-5.0	Sandy SILT, trace gravel.	30.7			
▲									
✕									

WIN
018547.00
Town
Blue Hill, Penobscot, Orland
Reported by/Date
WHITE, TERRY A 11/6/2014

SHEET 6

Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Route 15
Location: Orland-Penobscot-Blue Hill, Maine

Boring No.: HB-OPBH-101
WIN: 18547.00

Driller:	MaineDOT	**Elevation (ft.)**		**Auger ID/OD:**	5" Dia.
Operator:	Giles/Daggett	**Datum:**	NAVD88	**Sampler:**	Off Flights
Logged By:	B. Wilder	**Rig Type:**	CME 45C	**Hammer Wt./Fall:**	N/A
Date Start/Finish:	9/3/2013-9/3/2013	**Drilling Method:**	Solid Stem Auger	**Core Barrel:**	N/A
Boring Location:	358+72, 5.2 ft Rt. Orland	**Casing ID/OD:**	N/A	**Water Level*:**	None Observed

Definitions:
D = Split Spoon Sample S = Sample off Auger Flight
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 ≅ = Similar or Equal too
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	S1		0.50 - 1.30			SSA	-0.50		6" PAVEMENT. (0.50)	G#263129 A-1-b, SM WC=6.8%
	S2		1.30 - 5.00				-1.30		Brown, moist, fine to coarse SAND, some gravel, little silt. (1.30)	G#263130 A-4, ML WC=13.2%
									Light brown, moist, silty, fine to medium SAND.	
5							-5.00		(5.00) **Bottom of Exploration at 5.00 feet below ground surface.** NO REFUSAL	
10										
15										
20										
25										

Remarks:

Boring Offsets based on Existing CL.
Boring conducted within stable roadway core.

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.

Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Route 15
Location: Orland-Penobscot-Blue Hill, Maine

Boring No.: HB-OPBH-102
WIN: 9055-99-ADM

Driller:	MaineDOT	**Elevation (ft.)**		**Auger ID/OD:**	5" Dia.
Operator:	Giles/Daggett	**Datum:**	NAVD88	**Sampler:**	Off Flights
Logged By:	B. Wilder	**Rig Type:**	CME 45C	**Hammer Wt./Fall:**	N/A
Date Start/Finish:	9/3/2013-9/3/2013	**Drilling Method:**	Solid Stem Auger	**Core Barrel:**	N/A
Boring Location:	358+72, 11.0 ft Rt. Orland	**Casing ID/OD:**	N/A	**Water Level*:**	None Observed

Definitions:
D = Split Spoon Sample S = Sample off Auger Flight
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 ≅ = Similar or Equal too
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	S3		0.50 - 1.20			SSA	-0.50		6" PAVEMENT. 0.50	G#263131 A-1-a, SW-SM WC=10.1%
	S4		1.20 - 5.00				-1.20		Dark brown, wet, fine to coarse SAND, some gravel, trace silt. 1.20	G#263132 A-4, ML WC=15.2%
									Light brown, moist, silty, fine to medium SAND.	
5							-5.00		5.00	
									Bottom of Exploration at 5.00 feet below ground surface. NO REFUSAL	
10										
15										
20										
25										

Remarks:

Boring Offsets based on Existing CL.
Boring conducted within lane drop-off area.

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

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Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Route 15
Location: Orland-Penobscot-Blue Hill, Maine

Boring No.: HB-OPBH-103
WIN: 18547.00

Driller:	MaineDOT	**Elevation (ft.)**		**Auger ID/OD:**	5" Dia.
Operator:	Giles/Daggett	**Datum:**	NAVD88	**Sampler:**	Off Flights
Logged By:	B. Wilder	**Rig Type:**	CME 45C	**Hammer Wt./Fall:**	N/A
Date Start/Finish:	9/3/2013-9/3/2013	**Drilling Method:**	Solid Stem Auger	**Core Barrel:**	N/A
Boring Location:	358+72, 13.2 ft Rt. Orland	**Casing ID/OD:**	N/A	**Water Level*:**	None Observed

Definitions:
D = Split Spoon Sample S = Sample off Auger Flight
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 ≅ = Similar or Equal too
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	S5		0.29 - 0.90			SSA	-0.29		3½" PAVEMENT. 0.29	G#263133 A-1-a, SW WC=3.3%
	S6		0.90 - 5.00				-0.90		Brown, damp, fine to coarse SAND, some gravel, trace silt. 0.90	G#263134 A-4, ML WC=16.4%
									Light brown, wet, silty, fine to medium SAND.	
5							-5.00		**Bottom of Exploration at 5.00 feet below ground surface.** 5.00	
									NO REFUSAL	
10										
15										
20										
25										

Remarks:

Boring Offsets based on Existing CL.
Boring conducted outside of white line.

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

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Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Route 15
Location: Orland-Penobscot-Blue Hill, Maine

Boring No.: HB-OPBH-104
WIN: 18547.00

Driller:	MaineDOT	**Elevation (ft.)**		**Auger ID/OD:**	5" Dia.
Operator:	Giles/Daggett	**Datum:**	NAVD88	**Sampler:**	Off Flights
Logged By:	B. Wilder	**Rig Type:**	CME 45C	**Hammer Wt./Fall:**	N/A
Date Start/Finish:	9/3/2013-9/3/2013	**Drilling Method:**	Solid Stem Auger	**Core Barrel:**	N/A
Boring Location:	351+51, 4.4 ft Lt. Orland	**Casing ID/OD:**	N/A	**Water Level*:**	2.7 ft bgs.

Definitions:
D = Split Spoon Sample S = Sample off Auger Flight
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 ≅ = Similar or Equal too
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	S7		0.46 - 1.60			SSA	-0.46		5½" PAVEMENT. 0.46	
	S8		1.60 - 4.70				-1.60		Brown, wet, fine to coarse SAND, some gravel, trace silt. 1.60	G#263135 A-1-a, SM WC=8.6%
									Light brown, saturated, silty, fine to medium SAND.	G#263136 A-4, SM WC=18.6%
							-4.70		4.70	
5									**Bottom of Exploration at 4.70 feet below ground surface.** REFUSAL	
10										
15										
20										
25										

Remarks:

Boring Offsets based on Existing CL.
Boring conducted within stable roadway core.

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

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Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Route 15
Location: Orland-Penobscot-Blue Hill, Maine

Boring No.: HB-OPBH-105
WIN: 18547.00

Driller:	MaineDOT	**Elevation (ft.)**		**Auger ID/OD:**	5" Dia.
Operator:	Giles/Daggett	**Datum:**	NAVD88	**Sampler:**	Off Flights
Logged By:	B. Wilder	**Rig Type:**	CME 45C	**Hammer Wt./Fall:**	N/A
Date Start/Finish:	9/3/2013-9/3/2013	**Drilling Method:**	Solid Stem Auger	**Core Barrel:**	N/A
Boring Location:	351+51, 10.5 ft Lt. Orland	**Casing ID/OD:**	N/A	**Water Level*:**	None Observed

Definitions:
D = Split Spoon Sample S = Sample off Auger Flight
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 ≅ = Similar or Equal too
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	S9		0.29 - 0.70			SSA	-0.29		3½" PAVEMENT. 0.29	G#263137 A-1-b, SP WC=6.7%
	S10		0.70 - 5.00				-0.70		Dark brown, moist, fine to coarse SAND, little gravel, trace silt. 0.70	G#263138 A-4, ML WC=13.6%
									Light brown, moist, silty, fine to medium SAND.	
5							-5.00		5.00 **Bottom of Exploration at 5.00 feet below ground surface.** NO REFUSAL	
10										
15										
20										
25										

Remarks:

Boring Offsets based on Existing CL.
Boring conducted within lane drop-off area.

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

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Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Route 15
Location: Orland-Penobscot-Blue Hill, Maine

Boring No.: HB-OPBH-106
WIN: 18547.00

Driller:	MaineDOT	**Elevation (ft.)**		**Auger ID/OD:**	5" Dia.
Operator:	Giles/Daggett	**Datum:**	NAVD88	**Sampler:**	Off Flights
Logged By:	B. Wilder	**Rig Type:**	CME 45C	**Hammer Wt./Fall:**	N/A
Date Start/Finish:	9/3/2013-9/3/2013	**Drilling Method:**	Solid Stem Auger	**Core Barrel:**	N/A
Boring Location:	351+51, 14.0 ft Lt. Orland	**Casing ID/OD:**	N/A	**Water Level*:**	None Observed

Definitions:
D = Split Spoon Sample S = Sample off Auger Flight
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 ≅ = Similar or Equal too
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	S11		0.25 - 0.80			SSA	-0.25		3" PAVEMENT. (0.25)	G#263139 A-1-b, SP-SM WC=8.5%
	S12		0.80 - 4.40				-0.80		Brown, wet, fine to coarse SAND, some gravel, trace silt. (0.80)	G#263140 A-4, ML WC=13.9%
									Light brown, moist, silty, fine to medium SAND.	
							-4.40		**Bottom of Exploration at 4.40 feet below ground surface.** (4.40) REFUSAL	
5										
10										
15										
20										
25										

Remarks:

Boring Offsets based on Existing CL.
Boring conducted outside of white line.

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

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Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Route 15
Location: Orland-Penobscot-Blue Hill, Maine

Boring No.: HB-OPBH-107
WIN: 18547.00

Driller:	MaineDOT	**Elevation (ft.)**		**Auger ID/OD:**	5" Dia.
Operator:	Giles/Daggett	**Datum:**	NAVD88	**Sampler:**	Off Flights
Logged By:	B. Wilder	**Rig Type:**	CME 45C	**Hammer Wt./Fall:**	N/A
Date Start/Finish:	9/3/2013-9/3/2013	**Drilling Method:**	Solid Stem Auger	**Core Barrel:**	N/A
Boring Location:	267+97, 3.0 ft Lt. Penobscot	**Casing ID/OD:**	N/A	**Water Level*:**	None Observed

Definitions:
D = Split Spoon Sample S = Sample off Auger Flight
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 ≅ = Similar or Equal too
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	S13		0.54 - 1.70			SSA	-0.54		6½" PAVEMENT.	
									0.54 Dark brown, damp, fine to coarse SAND, some gravel, trace silt.	G#263141 A-1-b, SW-SM WC=5.9%
	S14		1.70 - 3.00				-1.70		1.70 Brown, wet, silty, fine to coarse SAND, some silt, little gravel.	G#263142 A-1-b, SM WC=11.2%
							-3.00		3.00 Light brown, wet, silty, fine to medium SAND.	G#263143 A-4, ML WC=14.2%
	S15		3.00 - 5.00							
5							-5.00		5.00 **Bottom of Exploration at 5.00 feet below ground surface.** NO REFUSAL	
10										
15										
20										
25										

Remarks:

Boring Offsets based on Existing CL.
Boring conducted within stable roadway core.

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.

Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Route 15
Location: Orland-Penobscot-Blue Hill, Maine

Boring No.: HB-OPBH-108
WIN: 18547.00

Driller:	MaineDOT	**Elevation (ft.)**		**Auger ID/OD:**	5" Dia.
Operator:	Giles/Daggett	**Datum:**	NAVD88	**Sampler:**	Off Flights
Logged By:	B. Wilder	**Rig Type:**	CME 45C	**Hammer Wt./Fall:**	N/A
Date Start/Finish:	9/3/2013-9/3/2013	**Drilling Method:**	Solid Stem Auger	**Core Barrel:**	N/A
Boring Location:	267+97, 10.0 ft Lt. Penobscot	**Casing ID/OD:**	N/A	**Water Level*:**	None Observed

Definitions:
D = Split Spoon Sample S = Sample off Auger Flight
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 ≅ = Similar or Equal too
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	S16		0.38 - 1.20			SSA	-0.38		4½" PAVEMENT. 0.38	G#263144 A-4, SM WC=20.2%
	S17		1.20 - 3.20				-1.20		Dark brown, damp, fine to coarse SAND, some gravel, trace silt. 1.20	G#263145 A-4, ML WC=14.8%
									Light brown, wet, silty, fine to medium SAND.	
5							-5.00		5.00	
									Bottom of Exploration at 5.00 feet below ground surface. NO REFUSAL	
10										
15										
20										
25										

Remarks:

Boring Offsets based on Existing CL.
Boring conducted within lane drop-off area.

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.

Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Route 15
Location: Orland-Penobscot-Blue Hill, Maine

Boring No.: HB-OPBH-109
WIN: 18547.00

Driller:	MaineDOT	**Elevation (ft.)**		**Auger ID/OD:**	5" Dia.
Operator:	Giles/Daggett	**Datum:**	NAVD88	**Sampler:**	Off Flights
Logged By:	B. Wilder	**Rig Type:**	CME 45C	**Hammer Wt./Fall:**	N/A
Date Start/Finish:	9/3/2013-9/3/2013	**Drilling Method:**	Solid Stem Auger	**Core Barrel:**	N/A
Boring Location:	267+96, 14.0 ft Lt. Penobscot	**Casing ID/OD:**	N/A	**Water Level*:**	None Observed

Definitions:
D = Split Spoon Sample S = Sample off Auger Flight
MD = Unsuccessful Split Spoon Sample attempt
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$S_{u(lab)}$ = Lab Vane Shear Strength (psf)
WOH = weight of 140lb. hammer
WOR = weight of rods WOC = weight of casing

Definitions:
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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	S18		0.90 - 5.00			SSA	-0.13		1½" PAVEMENT. 0.13	
							-0.90		Dark brown, damp, fine to coarse SAND, some gravel, trace silt. ≅S16 0.90	G#263146 A-4, ML WC=17.4%
									Light brown, wet, silty, fine to medium SAND.	
5							-5.00		5.00	
									Bottom of Exploration at 5.00 feet below ground surface. NO REFUSAL	
10										
15										
20										
25										

Remarks:

Boring Offsets based on Existing CL.
Boring conducted outside of white line.

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

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Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Route 15
Location: Orland-Penobscot-Blue Hill, Maine

Boring No.: HB-OPBH-110
WIN: 18547.00

Driller:	MaineDOT	**Elevation (ft.)**		**Auger ID/OD:**	5" Dia.
Operator:	Giles/Daggett	**Datum:**	NAVD88	**Sampler:**	Off Flights
Logged By:	B. Wilder	**Rig Type:**	CME 45C	**Hammer Wt./Fall:**	N/A
Date Start/Finish:	9/3/2013-9/3/2013	**Drilling Method:**	Solid Stem Auger	**Core Barrel:**	N/A
Boring Location:	137+50, 5.0 ft Rt. Penobscot	**Casing ID/OD:**	N/A	**Water Level*:**	None Observed

Definitions:
D = Split Spoon Sample S = Sample off Auger Flight
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 ≅ = Similar or Equal too
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	S19		0.50 - 2.20			SSA	-0.50		6" PAVEMENT.	
									0.50 Brown, moist, fine to coarse SAND, little gravel, trace silt.	G#263147 A-1-b, SM WC=9.5%
	S20		2.20 - 5.00				-2.20		2.20 Light brown, moist, silty, fine to medium SAND.	G#263148 A-4, ML WC=14.7%
5							-5.00		5.00 **Bottom of Exploration at 5.00 feet below ground surface.** NO REFUSAL	
10										
15										
20										
25										

Remarks:

Boring Offsets based on Existing CL.
Boring conducted within stable roadway core.

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.

Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Route 15
Location: Orland-Penobscot-Blue Hill, Maine

Boring No.: HB-OPBH-111
WIN: 18547.00

Driller:	MaineDOT	**Elevation (ft.)**		**Auger ID/OD:**	5" Dia.
Operator:	Giles/Daggett	**Datum:**	NAVD88	**Sampler:**	Off Flights
Logged By:	B. Wilder	**Rig Type:**	CME 45C	**Hammer Wt./Fall:**	N/A
Date Start/Finish:	9/3/2013-9/3/2013	**Drilling Method:**	Solid Stem Auger	**Core Barrel:**	N/A
Boring Location:	137+50, 9.5 ft Rt. Penobscot	**Casing ID/OD:**	N/A	**Water Level*:**	None Observed

Definitions:
D = Split Spoon Sample S = Sample off Auger Flight
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 ≅ = Similar or Equal too
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	S21		0.42 - 1.20			SSA	-0.42		5" PAVEMENT. 0.42	G#263149 A-1-b, SM WC=9.6%
	S22		1.20 - 5.00				-1.20		Brown, wet, fine to coarse SAND, little gravel, trace silt. 1.20	G#263150 A-4, ML WC=14.0%
									Light brown, moist, silty, fine to medium SAND.	
5							-5.00		5.00	
									Bottom of Exploration at 5.00 feet below ground surface. NO REFUSAL	
10										
15										
20										
25										

Remarks:

Boring Offsets based on Existing CL.
Boring conducted within lane drop-off area.

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.

Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Route 15
Location: Orland-Penobscot-Blue Hill, Maine

Boring No.: HB-OPBH-112
WIN: 18547.00

Driller:	MaineDOT	**Elevation (ft.)**		**Auger ID/OD:**	5" Dia.
Operator:	Giles/Daggett	**Datum:**	NAVD88	**Sampler:**	Off Flights
Logged By:	B. Wilder	**Rig Type:**	CME 45C	**Hammer Wt./Fall:**	N/A
Date Start/Finish:	9/3/2013-9/3/2013	**Drilling Method:**	Solid Stem Auger	**Core Barrel:**	N/A
Boring Location:	137+50, 12.5 ft Rt. Penobscot	**Casing ID/OD:**	N/A	**Water Level*:**	None Observed

Definitions:
D = Split Spoon Sample S = Sample off Auger Flight
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 ≅ = Similar or Equal too
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	-0.25		3" PAVEMENT. 0.25	
							-1.00		Brown, wet, fine to coarse SAND, little gravel, trace silt. ≅S21 1.00	
									Light brown, moist, silty, fine to medium SAND. ≅S22	
5							-5.00		5.00	
									Bottom of Exploration at 5.00 feet below ground surface. NO REFUSAL	
10										
15										
20										
25										

Remarks:

Boring Offsets based on Existing CL.
Boring conducted outside of white line.

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.

Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Route 15
Location: Orland-Penobscot-Blue Hill, Maine

Boring No.: HB-OPBH-113
WIN: 18547.00

Driller:	MaineDOT	**Elevation (ft.)**		**Auger ID/OD:**	5" Dia.
Operator:	Giles/Daggett	**Datum:**	NAVD88	**Sampler:**	Off Flights
Logged By:	B. Wilder	**Rig Type:**	CME 45C	**Hammer Wt./Fall:**	N/A
Date Start/Finish:	9/3/2013-9/3/2013	**Drilling Method:**	Solid Stem Auger	**Core Barrel:**	N/A
Boring Location:	108+93, 5.0 ft Rt. Penobscot	**Casing ID/OD:**	N/A	**Water Level*:**	None Observed

Definitions:
D = Split Spoon Sample S = Sample off Auger Flight
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 ≅ = Similar or Equal too
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	S23		0.50 - 1.40			SSA	-0.50		6" PAVEMENT. 0.50	
	S24		1.40 - 5.00				-1.40		Brown, wet, fine to coarse SAND, little gravel, trace silt. 1.40	G#243076 A-1-b, SM WC=7.8%
									Light brown, dry, silty, fine to coarse SAND, little gravel.	G#243077 A-2-4, SM WC=9.2%
5							-5.00		5.00	
									Bottom of Exploration at 5.00 feet below ground surface. NO REFUSAL	
10										
15										
20										
25										

Remarks:

Boring Offsets based on Existing CL.
Boring conducted within stable roadway core.

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.

Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Route 15
Location: Orland-Penobscot-Blue Hill, Maine

Boring No.: HB-OPBH-114
WIN: 18547.00

Driller:	MaineDOT	**Elevation (ft.)**		**Auger ID/OD:**	5" Dia.
Operator:	Giles/Daggett	**Datum:**	NAVD88	**Sampler:**	Off Flights
Logged By:	B. Wilder	**Rig Type:**	CME 45C	**Hammer Wt./Fall:**	N/A
Date Start/Finish:	9/3/2013-9/3/2013	**Drilling Method:**	Solid Stem Auger	**Core Barrel:**	N/A
Boring Location:	108+93, 10.0 ft Rt. Penobscot	**Casing ID/OD:**	N/A	**Water Level*:**	None Observed

Definitions:
D = Split Spoon Sample S = Sample off Auger Flight
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 ≅ = Similar or Equal too
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	S25		0.38 - 1.00			SSA	-0.38		4½" PAVEMENT. 0.38	G#243078 A-1-b, SM WC=10.1%
	S26		1.00 - 5.00				-1.00		Brown, wet, fine to coarse SAND, little gravel, trace silt. 1.00	G#243079 A-4, SM WC=10.7%
									Light brown, damp, silty, fine to coarse SAND, little gravel.	
5							-5.00		5.00	
									Bottom of Exploration at 5.00 feet below ground surface. NO REFUSAL	
10										
15										
20										
25										

Remarks:

Boring Offsets based on Existing CL.
Boring conducted within lane drop-off area.

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

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Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Route 15
Location: Orland-Penobscot-Blue Hill, Maine

Boring No.: HB-OPBH-115
WIN: 18547.00

Driller:	MaineDOT	**Elevation (ft.)**		**Auger ID/OD:**	5" Dia.
Operator:	Giles/Daggett	**Datum:**	NAVD88	**Sampler:**	Off Flights
Logged By:	B. Wilder	**Rig Type:**	CME 45C	**Hammer Wt./Fall:**	N/A
Date Start/Finish:	9/3/2013-9/3/2013	**Drilling Method:**	Solid Stem Auger	**Core Barrel:**	N/A
Boring Location:	108+93, 13.5 ft Rt. Penobscot	**Casing ID/OD:**	N/A	**Water Level*:**	None Observed

Definitions:
D = Split Spoon Sample S = Sample off Auger Flight
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 ≅ = Similar or Equal too
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	S27		0.50 - 5.00			SSA	-0.17		2" PAVEMENT.	
							-0.50		Brown, wet, fine to coarse SAND, little gravel, trace silt. ≅S25 (0.17–0.50)	G#243080 A-4, ML WC=15.8%
									Brown, wet, 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:

Boring Offsets based on Existing CL.
Boring conducted outside of white line.

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Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Route 15
Location: Orland-Penobscot-Blue Hill, Maine

Boring No.: HB-OPBH-116
WIN: 18547.00

Driller:	MaineDOT	**Elevation (ft.)**		**Auger ID/OD:**	5" Dia.
Operator:	Giles/Daggett	**Datum:**	NAVD88	**Sampler:**	Off Flights
Logged By:	B. Wilder	**Rig Type:**	CME 45C	**Hammer Wt./Fall:**	N/A
Date Start/Finish:	9/3/2013-9/3/2013	**Drilling Method:**	Solid Stem Auger	**Core Barrel:**	N/A
Boring Location:	53+51, 4.5 ft Lt. Blue Hill	**Casing ID/OD:**	N/A	**Water Level*:**	None Observed

Definitions:
D = Split Spoon Sample S = Sample off Auger Flight
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 ≅ = Similar or Equal too
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.)	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
0	S28		0.50 - 2.70			SSA	-0.50	6" PAVEMENT.	
								0.50 Brown, moist, gravelly, fine to coarse SAND, trace silt.	G#243081 A-1-b, SW-SM WC=5.5%
	S29		2.70 - 5.00				-2.70	2.70 Grey, wet, silty, fine to medium SAND, trace gravel.	G#243082 A-2-4, SM WC=12.2%
5							-5.00	5.00 **Bottom of Exploration at 5.00 feet below ground surface.** NO REFUSAL	
10									
15									
20									
25									

Remarks:

Boring Offsets based on Existing CL.
Boring conducted within stable roadway core.

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

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Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Route 15
Location: Orland-Penobscot-Blue Hill, Maine

Boring No.: HB-OPBH-117
WIN: 18547.00

Driller:	MaineDOT	**Elevation (ft.)**		**Auger ID/OD:**	5" Dia.
Operator:	Giles/Daggett	**Datum:**	NAVD88	**Sampler:**	Off Flights
Logged By:	B. Wilder	**Rig Type:**	CME 45C	**Hammer Wt./Fall:**	N/A
Date Start/Finish:	9/3/2013-9/3/2013	**Drilling Method:**	Solid Stem Auger	**Core Barrel:**	N/A
Boring Location:	53+51, 10.0 ft Lt. Blue Hill	**Casing ID/OD:**	N/A	**Water Level*:**	None Observed

Definitions:
D = Split Spoon Sample S = Sample off Auger Flight
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 ≅ = Similar or Equal too
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	-0.38		4½" PAVEMENT.	
							-1.00		Brown, moist, gravelly, fine to coarse SAND, trace silt. ≅S28 (0.38)	
									Grey, wet, silty, fine to medium SAND, trace gravel. ≅S29 (1.00)	
5							-5.00		**Bottom of Exploration at 5.00 feet below ground surface.** NO REFUSAL (5.00)	
10										
15										
20										
25										

Remarks:

Boring Offsets based on Existing CL.
Boring conducted within lane drop-off area.

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.

Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Route 15
Location: Orland-Penobscot-Blue Hill, Maine

Boring No.: HB-OPBH-118
WIN: 18547.00

Driller:	MaineDOT	**Elevation (ft.)**		**Auger ID/OD:**	5" Dia.
Operator:	Giles/Daggett	**Datum:**	NAVD88	**Sampler:**	Off Flights
Logged By:	B. Wilder	**Rig Type:**	CME 45C	**Hammer Wt./Fall:**	N/A
Date Start/Finish:	9/3/2013-9/3/2013	**Drilling Method:**	Solid Stem Auger	**Core Barrel:**	N/A
Boring Location:	53+21, 13.0 ft Lt. Blue Hill	**Casing ID/OD:**	N/A	**Water Level*:**	None Observed

Definitions:
D = Split Spoon Sample S = Sample off Auger Flight
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 ≅ = Similar or Equal too
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	S30		0.25 - 1.60			SSA	-0.25		3" PAVEMENT. 0.25	G#243083 A-1-b, SW-SM WC=7.2%
	S31		1.60 - 5.00				-1.60		Brown, wet, gravelly, fine to coarse SAND, trace silt. 1.60	G#243084 A-4, ML WC=30.7%
									Light brown, wet, silty, fine to medium SAND.	
5							-5.00		5.00	
									Bottom of Exploration at 5.00 feet below ground surface. NO REFUSAL	
10										
15										
20										
25										

Remarks:

Boring Offsets based on Existing CL.
Boring conducted outside of white line.

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

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MaineDOT

GEOTECHNICAL TEST REPORT
Central Laboratory

SAMPLE INFORMATION

Reference No.	Boring No./Sample No.	Sample Description	Sampled	Received
263129	**HB-OPBH-101/S1**	**GEOTECHNICAL (DISTURBED)**	**9/3/2013**	**9/19/2013**

Sample Type: **GEOTECHNICAL** Location: **ROADWAY** Station: **358+72** Offset, ft: **5.2** **RT** Dbfg, ft: **0.5-1.3**

WIN/Town **018547.00 - BLUE HILL, PENOBSCOT** Sampler: **BRUCE WILDER**

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]	**96.2**
⅜ in. [9.5 mm]	**92.7**
¼ in. [6.3 mm]	**87.2**
No. 4 [4.75 mm]	**81.7**
No. 10 [2.00 mm]	**67.6**
No. 20 [0.850 mm]	**53.8**
No. 40 [0.425 mm]	**43.7**
No. 60 [0.250 mm]	**37.1**
No. 100 [0.150 mm]	**30.7**
No. 200 [0.075 mm]	**21.5**

Miscellaneous Tests

Liquid Limit @ 25 blows (T 89), %	
Plastic Limit (T 90), %	
Plasticity Index (T 90), %	
Specific Gravity, Corrected to 20℃ (T 100)	
Loss on Ignition (T 267)	
Loss, %	
H2O, %	
Water Content (T 265), %	**6.8**

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 tons/ft²	Remold tons/ft²	U. Shear tons/ft²	Remold tons/ft²		

Comments:

AUTHORIZATION AND DISTRIBUTION

Reported by: **BRIAN FOGG** Date Reported: **10/2/2013**

Paper Copy: Lab File; Project File; Geotech File

MaineDOT

GEOTECHNICAL TEST REPORT
Central Laboratory

SAMPLE INFORMATION

Reference No.	Boring No./Sample No.	Sample Description	Sampled	Received
263130	**HB-OPBH-101/S2**	**GEOTECHNICAL (DISTURBED)**	**9/3/2013**	**9/19/2013**

Sample Type: **GEOTECHNICAL** Location: **ROADWAY** Station: **358+72** Offset, ft: **5.2** **RT** Dbfg, ft: **1.3-5.0**

WIN/Town **018547.00 - BLUE HILL, PENOBSCOT** Sampler: **BRUCE WILDER**

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]	**97.4**
⅜ in. [9.5 mm]	**97.4**
¼ in. [6.3 mm]	**96.2**
No. 4 [4.75 mm]	**94.8**
No. 10 [2.00 mm]	**90.6**
No. 20 [0.850 mm]	**86.2**
No. 40 [0.425 mm]	**82.6**
No. 60 [0.250 mm]	**79.6**
No. 100 [0.150 mm]	**75.3**
No. 200 [0.075 mm]	**66.5**

Miscellaneous Tests

Liquid Limit @ 25 blows (T 89), %	
Plastic Limit (T 90), %	
Plasticity Index (T 90), %	
Specific Gravity, Corrected to 20℃ (T 100)	
Loss on Ignition (T 267)	
Loss, %	
H2O, %	
Water Content (T 265), %	**13.2**

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 tons/ft²	Remold tons/ft²	U. Shear tons/ft²	Remold tons/ft²		

Comments:

AUTHORIZATION AND DISTRIBUTION

Reported by: **BRIAN FOGG** Date Reported: **9/27/2013**

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MaineDOT

GEOTECHNICAL TEST REPORT
Central Laboratory

SAMPLE INFORMATION

Reference No.	Boring No./Sample No.	Sample Description	Sampled	Received
263131	HB-OPBH-102/S3	GEOTECHNICAL (DISTURBED)	9/3/2013	9/19/2013

Sample Type: **GEOTECHNICAL** Location: **ROADWAY** Station: **358+72** Offset, ft: **11.0 RT** Dbfg, ft: **0.5-1.2**

WIN/Town **018547.00 - BLUE HILL, PENOBSCOT** Sampler: **BRUCE WILDER**

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]	95.3
⅜ in. [9.5 mm]	91.1
¼ in. [6.3 mm]	81.5
No. 4 [4.75 mm]	73.0
No. 10 [2.00 mm]	47.5
No. 20 [0.850 mm]	28.5
No. 40 [0.425 mm]	18.8
No. 60 [0.250 mm]	13.9
No. 100 [0.150 mm]	10.1
No. 200 [0.075 mm]	6.3

Miscellaneous Tests

Liquid Limit @ 25 blows (T 89), %	
Plastic Limit (T 90), %	
Plasticity Index (T 90), %	
Specific Gravity, Corrected to 20℃ (T 100)	
Loss on Ignition (T 267)	
Loss, %	
H2O, %	
Water Content (T 265), %	10.1

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 tons/ft²	Remold tons/ft²	U. Shear tons/ft²	Remold tons/ft²		

Comments:

AUTHORIZATION AND DISTRIBUTION

Reported by: **BRIAN FOGG** Date Reported: **10/3/2013**

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GEOTECHNICAL TEST REPORT
Central Laboratory

SAMPLE INFORMATION

Reference No.	Boring No./Sample No.	Sample Description	Sampled	Received
263132	HB-OPBH-102/S4	GEOTECHNICAL (DISTURBED)	9/3/2013	9/19/2013

Sample Type: **GEOTECHNICAL** Location: **ROADWAY** Station: **358+72** Offset, ft: **11.0 RT** Dbfg, ft: **1.2-5.0**

WIN/Town **018547.00 - BLUE HILL, PENOBSCOT** Sampler: **BRUCE WILDER**

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]	**98.9**
No. 4 [4.75 mm]	**98.2**
No. 10 [2.00 mm]	**94.9**
No. 20 [0.850 mm]	**90.5**
No. 40 [0.425 mm]	**86.8**
No. 60 [0.250 mm]	**83.6**
No. 100 [0.150 mm]	**79.3**
No. 200 [0.075 mm]	**70.3**

Miscellaneous Tests

Liquid Limit @ 25 blows (T 89), %	
Plastic Limit (T 90), %	
Plasticity Index (T 90), %	
Specific Gravity, Corrected to 20℃ (T 100)	
Loss on Ignition (T 267)	
Loss, %	
H2O, %	
Water Content (T 265), %	**15.2**

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 tons/ft²	Remold tons/ft²	U. Shear tons/ft²	Remold tons/ft²		

Comments:

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GEOTECHNICAL TEST REPORT
Central Laboratory

SAMPLE INFORMATION

Reference No.	Boring No./Sample No.	Sample Description	Sampled	Received
263133	**HB-OPBH-103/S5**	**GEOTECHNICAL (DISTURBED)**	**9/3/2013**	**9/19/2013**

Sample Type: **GEOTECHNICAL** Location: **ROADWAY** Station: **358+72** Offset, ft: **13.2 RT** Dbfg, ft: **0.29-0.9**

WIN/Town **018547.00 - BLUE HILL, PENOBSCOT** Sampler: **BRUCE WILDER**

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]	**88.2**
⅜ in. [9.5 mm]	**85.3**
¼ in. [6.3 mm]	**77.2**
No. 4 [4.75 mm]	**69.8**
No. 10 [2.00 mm]	**50.2**
No. 20 [0.850 mm]	**28.8**
No. 40 [0.425 mm]	**15.8**
No. 60 [0.250 mm]	**10.1**
No. 100 [0.150 mm]	**6.3**
No. 200 [0.075 mm]	**3.2**

Miscellaneous Tests

Liquid Limit @ 25 blows (T 89), %	
Plastic Limit (T 90), %	
Plasticity Index (T 90), %	
Specific Gravity, Corrected to 20℃ (T 100)	
Loss on Ignition (T 267)	
Loss, %	
H2O, %	
Water Content (T 265), %	**3.3**

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 tons/ft²	Remold tons/ft²	U. Shear tons/ft²	Remold tons/ft²		

Comments:

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GEOTECHNICAL TEST REPORT
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SAMPLE INFORMATION

Reference No.	Boring No./Sample No.	Sample Description	Sampled	Received
263134	**HB-OPBH-103/S6**	**GEOTECHNICAL (DISTURBED)**	**9/3/2013**	**9/19/2013**

Sample Type: **GEOTECHNICAL** Location: **ROADWAY** Station: **358+72** Offset, ft: **13.2 RT** Dbfg, ft: **0.9-5.0**

WIN/Town **018547.00 - BLUE HILL, PENOBSCOT** Sampler: **BRUCE WILDER**

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]	**100.0**
⅜ in. [9.5 mm]	**99.2**
¼ in. [6.3 mm]	**97.3**
No. 4 [4.75 mm]	**96.2**
No. 10 [2.00 mm]	**88.8**
No. 20 [0.850 mm]	**80.6**
No. 40 [0.425 mm]	**74.9**
No. 60 [0.250 mm]	**70.8**
No. 100 [0.150 mm]	**65.9**
No. 200 [0.075 mm]	**56.4**

Miscellaneous Tests

Liquid Limit @ 25 blows (T 89), %	
Plastic Limit (T 90), %	
Plasticity Index (T 90), %	
Specific Gravity, Corrected to 20℃ (T 100)	
Loss on Ignition (T 267)	
Loss, %	
H2O, %	
Water Content (T 265), %	**16.4**

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 tons/ft²	Remold tons/ft²	U. Shear tons/ft²	Remold tons/ft²		

Comments:

AUTHORIZATION AND DISTRIBUTION

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GEOTECHNICAL TEST REPORT
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SAMPLE INFORMATION

Reference No.	Boring No./Sample No.	Sample Description	Sampled	Received
263135	**HB-OPBH-104/S7**	**GEOTECHNICAL (DISTURBED)**	**9/3/2013**	**9/19/2013**

Sample Type: **GEOTECHNICAL** Location: **ROADWAY** Station: **351+51** Offset, ft: **4.4** **LT** Dbfg, ft: **0.46-1.6**

WIN/Town **018547.00 - BLUE HILL, PENOBSCOT** Sampler: **BRUCE WILDER**

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]	**100.0**
¾ in. [19.0 mm]	**94.2**
½ in. [12.5 mm]	**88.2**
⅜ in. [9.5 mm]	**82.1**
¼ in. [6.3 mm]	**72.3**
No. 4 [4.75 mm]	**65.7**
No. 10 [2.00 mm]	**49.7**
No. 20 [0.850 mm]	**35.9**
No. 40 [0.425 mm]	**26.8**
No. 60 [0.250 mm]	**21.7**
No. 100 [0.150 mm]	**17.4**
No. 200 [0.075 mm]	**12.3**

Miscellaneous Tests

Liquid Limit @ 25 blows (T 89), %	
Plastic Limit (T 90), %	
Plasticity Index (T 90), %	
Specific Gravity, Corrected to 20℃ (T 100)	
Loss on Ignition (T 267)	
Loss, %	
H2O, %	
Water Content (T 265), %	**8.6**

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 tons/ft²	Remold tons/ft²	U. Shear tons/ft²	Remold tons/ft²		

Comments:

AUTHORIZATION AND DISTRIBUTION

Reported by: **BRIAN FOGG** Date Reported: **9/26/2013**

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GEOTECHNICAL TEST REPORT
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SAMPLE INFORMATION

Reference No.	Boring No./Sample No.	Sample Description	Sampled	Received
263136	**HB-OPBH-104/S8**	**GEOTECHNICAL (DISTURBED)**	**9/3/2013**	**9/19/2013**

Sample Type: **GEOTECHNICAL** Location: **ROADWAY** Station: **351+51** Offset, ft: **4.4** **LT** Dbfg, ft: **1.6-4.7**

WIN/Town **018547.00 - BLUE HILL, PENOBSCOT** Sampler: **BRUCE WILDER**

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]	**100.0**
¾ in. [19.0 mm]	**97.8**
½ in. [12.5 mm]	**95.0**
⅜ in. [9.5 mm]	**92.4**
¼ in. [6.3 mm]	**86.6**
No. 4 [4.75 mm]	**82.8**
No. 10 [2.00 mm]	**73.4**
No. 20 [0.850 mm]	**65.4**
No. 40 [0.425 mm]	**60.0**
No. 60 [0.250 mm]	**56.4**
No. 100 [0.150 mm]	**52.5**
No. 200 [0.075 mm]	**45.5**

Miscellaneous Tests

Liquid Limit @ 25 blows (T 89), %	
Plastic Limit (T 90), %	
Plasticity Index (T 90), %	
Specific Gravity, Corrected to 20℃ (T 100)	
Loss on Ignition (T 267)	
Loss, %	
H2O, %	
Water Content (T 265), %	**18.6**

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 tons/ft²	Remold tons/ft²	U. Shear tons/ft²	Remold tons/ft²		

Comments:

AUTHORIZATION AND DISTRIBUTION

Reported by: **BRIAN FOGG** Date Reported: **9/26/2013**

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GEOTECHNICAL TEST REPORT
Central Laboratory

SAMPLE INFORMATION

Reference No.	Boring No./Sample No.	Sample Description	Sampled	Received
263137	HB-OPBH-105/S9	GEOTECHNICAL (DISTURBED)	9/3/2013	9/19/2013

Sample Type: **GEOTECHNICAL** Location: **ROADWAY** Station: **351+51** Offset, ft: **10.5 LT** Dbfg, ft: **0.29-0.7**

WIN/Town **018547.00 - BLUE HILL, PENOBSCOT** Sampler: **BRUCE WILDER**

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]	**96.4**
⅜ in. [9.5 mm]	**90.3**
¼ in. [6.3 mm]	**85.5**
No. 4 [4.75 mm]	**79.3**
No. 10 [2.00 mm]	**58.4**
No. 20 [0.850 mm]	**29.6**
No. 40 [0.425 mm]	**11.9**
No. 60 [0.250 mm]	**6.0**
No. 100 [0.150 mm]	**3.3**
No. 200 [0.075 mm]	**1.5**

Miscellaneous Tests

Liquid Limit @ 25 blows (T 89), %	
Plastic Limit (T 90), %	
Plasticity Index (T 90), %	
Specific Gravity, Corrected to 20℃ (T 100)	
Loss on Ignition (T 267)	
Loss, %	
H2O, %	
Water Content (T 265), %	**6.7**

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 tons/ft²	Remold tons/ft²	U. Shear tons/ft²	Remold tons/ft²		

Comments:

AUTHORIZATION AND DISTRIBUTION

Reported by: **BRIAN FOGG** Date Reported: **10/3/2013**

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GEOTECHNICAL TEST REPORT
Central Laboratory

SAMPLE INFORMATION

Reference No.	Boring No./Sample No.	Sample Description	Sampled	Received
263138	**HB-OPBH-105/S10**	**GEOTECHNICAL (DISTURBED)**	**9/3/2013**	**9/19/2013**

Sample Type: **GEOTECHNICAL** Location: **ROADWAY** Station: **351+51** Offset, ft: **10.5 LT** Dbfg, ft: **0.7-5.0**

WIN/Town **018547.00 - BLUE HILL, PENOBSCOT** Sampler: **BRUCE WILDER**

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]	**100.0**
⅜ in. [9.5 mm]	**99.6**
¼ in. [6.3 mm]	**98.5**
No. 4 [4.75 mm]	**97.3**
No. 10 [2.00 mm]	**93.0**
No. 20 [0.850 mm]	**88.4**
No. 40 [0.425 mm]	**84.7**
No. 60 [0.250 mm]	**81.7**
No. 100 [0.150 mm]	**78.0**
No. 200 [0.075 mm]	**70.4**

Miscellaneous Tests

Liquid Limit @ 25 blows (T 89), %	
Plastic Limit (T 90), %	
Plasticity Index (T 90), %	
Specific Gravity, Corrected to 20℃ (T 100)	
Loss on Ignition (T 267)	
Loss, %	
H2O, %	
Water Content (T 265), %	**13.6**

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 tons/ft²	Remold tons/ft²	U. Shear tons/ft²	Remold tons/ft²		

Comments:

AUTHORIZATION AND DISTRIBUTION

Reported by: **BRIAN FOGG** Date Reported: **9/26/2013**

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GEOTECHNICAL TEST REPORT
Central Laboratory

SAMPLE INFORMATION

Reference No.	Boring No./Sample No.	Sample Description	Sampled	Received
263139	**HB-OPBH-106/S11**	**GEOTECHNICAL (DISTURBED)**	**9/3/2013**	**9/19/2013**

Sample Type: **GEOTECHNICAL** Location: **ROADWAY** Station: **351+51** Offset, ft: **14.0 LT** Dbfg, ft: **0.25-0.8**

WIN/Town **018547.00 - BLUE HILL, PENOBSCOT** Sampler: **BRUCE WILDER**

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]	**97.6**
⅜ in. [9.5 mm]	**93.4**
¼ in. [6.3 mm]	**88.2**
No. 4 [4.75 mm]	**83.2**
No. 10 [2.00 mm]	**67.8**
No. 20 [0.850 mm]	**44.7**
No. 40 [0.425 mm]	**28.9**
No. 60 [0.250 mm]	**21.4**
No. 100 [0.150 mm]	**16.0**
No. 200 [0.075 mm]	**10.8**

Miscellaneous Tests

Liquid Limit @ 25 blows (T 89), %	
Plastic Limit (T 90), %	
Plasticity Index (T 90), %	
Specific Gravity, Corrected to 20℃ (T 100)	
Loss on Ignition (T 267)	
Loss, %	
H2O, %	
Water Content (T 265), %	**8.5**

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 tons/ft²	Remold tons/ft²	U. Shear tons/ft²	Remold tons/ft²		

Comments:

AUTHORIZATION AND DISTRIBUTION

Reported by: **BRIAN FOGG** Date Reported: **10/2/2013**

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MaineDOT

GEOTECHNICAL TEST REPORT
Central Laboratory

SAMPLE INFORMATION

Reference No.	Boring No./Sample No.	Sample Description	Sampled	Received
263140	**HB-OPBH-106/S12**	**GEOTECHNICAL (DISTURBED)**	**9/3/2013**	**9/19/2013**

Sample Type: **GEOTECHNICAL** Location: **ROADWAY** Station: **351+51** Offset, ft: **14.0 LT** Dbfg, ft: **0.8-4.4**

WIN/Town **018547.00 - BLUE HILL, PENOBSCOT** Sampler: **BRUCE WILDER**

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]	**100.0**
⅜ in. [9.5 mm]	**98.9**
¼ in. [6.3 mm]	**97.8**
No. 4 [4.75 mm]	**96.1**
No. 10 [2.00 mm]	**90.3**
No. 20 [0.850 mm]	**82.1**
No. 40 [0.425 mm]	**75.9**
No. 60 [0.250 mm]	**71.8**
No. 100 [0.150 mm]	**67.3**
No. 200 [0.075 mm]	**59.2**

Miscellaneous Tests

Liquid Limit @ 25 blows (T 89), %	
Plastic Limit (T 90), %	
Plasticity Index (T 90), %	
Specific Gravity, Corrected to 20℃ (T 100)	
Loss on Ignition (T 267)	
Loss, %	
H2O, %	
Water Content (T 265), %	**13.9**

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 tons/ft²	Remold tons/ft²	U. Shear tons/ft²	Remold tons/ft²		

Comments:

AUTHORIZATION AND DISTRIBUTION

Reported by: **BRIAN FOGG** Date Reported: **9/26/2013**

Paper Copy: Lab File; Project File; Geotech File

MaineDOT

GEOTECHNICAL TEST REPORT
Central Laboratory

SAMPLE INFORMATION

Reference No.	Boring No./Sample No.	Sample Description	Sampled	Received
263141	HB-OPBH-107/S13	GEOTECHNICAL (DISTURBED)	9/3/2013	9/19/2013

Sample Type: **GEOTECHNICAL** Location: **ROADWAY** Station: **267+97** Offset, ft: **3.0** **LT** Dbfg, ft: **0.54-1.7**

WIN/Town **018547.00 - BLUE HILL, PENOBSCOT** Sampler: **BRUCE WILDER**

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]	**100.0**
¾ in. [19.0 mm]	**96.9**
½ in. [12.5 mm]	**94.4**
⅜ in. [9.5 mm]	**91.4**
¼ in. [6.3 mm]	**85.4**
No. 4 [4.75 mm]	**80.9**
No. 10 [2.00 mm]	**65.2**
No. 20 [0.850 mm]	**47.4**
No. 40 [0.425 mm]	**33.7**
No. 60 [0.250 mm]	**24.9**
No. 100 [0.150 mm]	**17.1**
No. 200 [0.075 mm]	**9.2**

Miscellaneous Tests

Liquid Limit @ 25 blows (T 89), %	
Plastic Limit (T 90), %	
Plasticity Index (T 90), %	
Specific Gravity, Corrected to 20℃ (T 100)	
Loss on Ignition (T 267)	
Loss, %	
H2O, %	
Water Content (T 265), %	**5.9**

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 tons/ft²	Remold tons/ft²	U. Shear tons/ft²	Remold tons/ft²		

Comments:

AUTHORIZATION AND DISTRIBUTION

Reported by: **BRIAN FOGG** Date Reported: **10/4/2013**

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MaineDOT

GEOTECHNICAL TEST REPORT
Central Laboratory

SAMPLE INFORMATION

Reference No.	Boring No./Sample No.	Sample Description	Sampled	Received
263142	HB-OPBH-107/S14	GEOTECHNICAL (DISTURBED)	9/3/2013	9/19/2013

Sample Type: **GEOTECHNICAL** Location: **ROADWAY** Station: **267+97** Offset, ft: **3.0** **LT** Dbfg, ft: **1.7-3.0**

WIN/Town **018547.00 - BLUE HILL, PENOBSCOT** Sampler: **BRUCE WILDER**

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]	**95.3**
¼ in. [6.3 mm]	**90.0**
No. 4 [4.75 mm]	**85.2**
No. 10 [2.00 mm]	**69.4**
No. 20 [0.850 mm]	**55.3**
No. 40 [0.425 mm]	**43.8**
No. 60 [0.250 mm]	**35.3**
No. 100 [0.150 mm]	**27.6**
No. 200 [0.075 mm]	**19.2**

Miscellaneous Tests

Liquid Limit @ 25 blows (T 89), %	
Plastic Limit (T 90), %	
Plasticity Index (T 90), %	
Specific Gravity, Corrected to 20℃ (T 100)	
Loss on Ignition (T 267)	
Loss, %	
H2O, %	
Water Content (T 265), %	**11.2**

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 tons/ft²	Remold tons/ft²	U. Shear tons/ft²	Remold tons/ft²		

Comments:

AUTHORIZATION AND DISTRIBUTION

Reported by: **BRIAN FOGG** Date Reported: **10/2/2013**

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MaineDOT

GEOTECHNICAL TEST REPORT
Central Laboratory

SAMPLE INFORMATION

Reference No.	Boring No./Sample No.	Sample Description	Sampled	Received
263143	**HB-OPBH-107/S15**	**GEOTECHNICAL (DISTURBED)**	**9/3/2013**	**9/19/2013**

Sample Type: **GEOTECHNICAL** Location: **ROADWAY** Station: **267+97** Offset, ft: **3.0** **LT** Dbfg, ft: **3.0-5.0**

WIN/Town **018547.00 - BLUE HILL, PENOBSCOT** Sampler: **BRUCE WILDER**

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]	**100.0**
⅜ in. [9.5 mm]	**99.0**
¼ in. [6.3 mm]	**97.8**
No. 4 [4.75 mm]	**96.3**
No. 10 [2.00 mm]	**91.5**
No. 20 [0.850 mm]	**85.9**
No. 40 [0.425 mm]	**80.9**
No. 60 [0.250 mm]	**76.6**
No. 100 [0.150 mm]	**71.6**
No. 200 [0.075 mm]	**63.5**

Miscellaneous Tests

Liquid Limit @ 25 blows (T 89), %	
Plastic Limit (T 90), %	
Plasticity Index (T 90), %	
Specific Gravity, Corrected to 20℃ (T 100)	
Loss on Ignition (T 267)	
Loss, %	
H2O, %	
Water Content (T 265), %	**14.2**

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 tons/ft²	Remold tons/ft²	U. Shear tons/ft²	Remold tons/ft²		

Comments:

AUTHORIZATION AND DISTRIBUTION

Reported by: **BRIAN FOGG** Date Reported: **9/26/2013**

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GEOTECHNICAL TEST REPORT
Central Laboratory

SAMPLE INFORMATION

Reference No.	Boring No./Sample No.	Sample Description	Sampled	Received
263144	**HB-OPBH-108/S16**	**GEOTECHNICAL (DISTURBED)**	**9/3/2013**	**9/19/2013**

Sample Type: **GEOTECHNICAL** Location: **ROADWAY** Station: **267+97** Offset, ft: **10.0 RT** Dbfg, ft: **0.38-1.2**

WIN/Town **018547.00 - BLUE HILL, PENOBSCOT** Sampler: **BRUCE WILDER**

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]	**96.5**
⅜ in. [9.5 mm]	**94.2**
¼ in. [6.3 mm]	**90.1**
No. 4 [4.75 mm]	**87.0**
No. 10 [2.00 mm]	**79.1**
No. 20 [0.850 mm]	**72.1**
No. 40 [0.425 mm]	**66.7**
No. 60 [0.250 mm]	**62.3**
No. 100 [0.150 mm]	**57.3**
No. 200 [0.075 mm]	**49.3**

Miscellaneous Tests

Liquid Limit @ 25 blows (T 89), %	
Plastic Limit (T 90), %	
Plasticity Index (T 90), %	
Specific Gravity, Corrected to 20℃ (T 100)	
Loss on Ignition (T 267)	
Loss, %	
H2O, %	
Water Content (T 265), %	**20.2**

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 tons/ft²	Remold tons/ft²	U. Shear tons/ft²	Remold tons/ft²		

Comments:

AUTHORIZATION AND DISTRIBUTION

Reported by: **BRIAN FOGG** Date Reported: **9/26/2013**

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GEOTECHNICAL TEST REPORT
Central Laboratory

SAMPLE INFORMATION

Reference No.	Boring No./Sample No.	Sample Description	Sampled	Received
263145	**HB-OPBH-108/S17**	**GEOTECHNICAL (DISTURBED)**	**9/3/2013**	**9/19/2013**

Sample Type: **GEOTECHNICAL** Location: **ROADWAY** Station: **267+97** Offset, ft: **10.0 RT** Dbfg, ft: **1.2-3.2**

WIN/Town **018547.00 - BLUE HILL, PENOBSCOT** Sampler: **BRUCE WILDER**

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]	**98.9**
⅜ in. [9.5 mm]	**97.6**
¼ in. [6.3 mm]	**96.1**
No. 4 [4.75 mm]	**94.0**
No. 10 [2.00 mm]	**87.1**
No. 20 [0.850 mm]	**79.9**
No. 40 [0.425 mm]	**73.9**
No. 60 [0.250 mm]	**69.0**
No. 100 [0.150 mm]	**63.5**
No. 200 [0.075 mm]	**54.8**

Miscellaneous Tests

Liquid Limit @ 25 blows (T 89), %	
Plastic Limit (T 90), %	
Plasticity Index (T 90), %	
Specific Gravity, Corrected to 20℃ (T 100)	
Loss on Ignition (T 267)	
Loss, %	
H2O, %	
Water Content (T 265), %	**14.8**

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 tons/ft²	Remold tons/ft²	U. Shear tons/ft²	Remold tons/ft²		

Comments:

AUTHORIZATION AND DISTRIBUTION

Reported by: **BRIAN FOGG** Date Reported: **9/26/2013**

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GEOTECHNICAL TEST REPORT
Central Laboratory

SAMPLE INFORMATION

Reference No.	Boring No./Sample No.	Sample Description	Sampled	Received
263146	**HB-OPBH-109/S18**	**GEOTECHNICAL (DISTURBED)**	**9/3/2013**	**9/19/2013**

Sample Type: **GEOTECHNICAL** Location: **ROADWAY** Station: **267+96** Offset, ft: **14.0 LT** Dbfg, ft: **0.9-5.0**

WIN/Town **018547.00 - BLUE HILL, PENOBSCOT** Sampler: **BRUCE WILDER**

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]	**99.5**
⅜ in. [9.5 mm]	**97.0**
¼ in. [6.3 mm]	**95.2**
No. 4 [4.75 mm]	**93.8**
No. 10 [2.00 mm]	**87.6**
No. 20 [0.850 mm]	**80.3**
No. 40 [0.425 mm]	**74.5**
No. 60 [0.250 mm]	**69.9**
No. 100 [0.150 mm]	**64.9**
No. 200 [0.075 mm]	**57.3**

Miscellaneous Tests

Liquid Limit @ 25 blows (T 89), %	
Plastic Limit (T 90), %	
Plasticity Index (T 90), %	
Specific Gravity, Corrected to 20℃ (T 100)	
Loss on Ignition (T 267)	
Loss, %	
H2O, %	
Water Content (T 265), %	**17.4**

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 tons/ft²	Remold tons/ft²	U. Shear tons/ft²	Remold tons/ft²		

Comments:

AUTHORIZATION AND DISTRIBUTION

Reported by: **BRIAN FOGG** Date Reported: **9/26/2013**

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GEOTECHNICAL TEST REPORT
Central Laboratory

SAMPLE INFORMATION

Reference No.	Boring No./Sample No.	Sample Description	Sampled	Received
263147	HB-OPBH-110/S19	GEOTECHNICAL (DISTURBED)	9/3/2013	9/19/2013

Sample Type: **GEOTECHNICAL** Location: **ROADWAY** Station: **137+50** Offset, ft: **5.0** **RT** Dbfg, ft: **0.5-2.2**

WIN/Town **018547.00 - BLUE HILL, PENOBSCOT** Sampler: **BRUCE WILDER**

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]	**100.0**
¾ in. [19.0 mm]	**98.0**
½ in. [12.5 mm]	**96.6**
⅜ in. [9.5 mm]	**91.1**
¼ in. [6.3 mm]	**86.2**
No. 4 [4.75 mm]	**80.6**
No. 10 [2.00 mm]	**64.5**
No. 20 [0.850 mm]	**48.9**
No. 40 [0.425 mm]	**37.3**
No. 60 [0.250 mm]	**30.6**
No. 100 [0.150 mm]	**25.5**
No. 200 [0.075 mm]	**19.7**

Miscellaneous Tests

Liquid Limit @ 25 blows (T 89), %	
Plastic Limit (T 90), %	
Plasticity Index (T 90), %	
Specific Gravity, Corrected to 20℃ (T 100)	
Loss on Ignition (T 267)	
Loss, %	
H2O, %	
Water Content (T 265), %	**9.5**

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 tons/ft²	Remold tons/ft²	U. Shear tons/ft²	Remold tons/ft²		

Comments:

AUTHORIZATION AND DISTRIBUTION

Reported by: **BRIAN FOGG** Date Reported: **9/26/2013**

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GEOTECHNICAL TEST REPORT
Central Laboratory

SAMPLE INFORMATION

Reference No.	Boring No./Sample No.	Sample Description	Sampled	Received
263148	**HB-OPBH-110/S20**	**GEOTECHNICAL (DISTURBED)**	**9/3/2013**	**9/19/2013**

Sample Type: **GEOTECHNICAL** Location: **ROADWAY** Station: **137+50** Offset, ft: **5.0** **RT** Dbfg, ft: **2.2-5.0**

WIN/Town **018547.00 - BLUE HILL, PENOBSCOT** Sampler: **BRUCE WILDER**

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]	**99.4**
No. 4 [4.75 mm]	**98.5**
No. 10 [2.00 mm]	**93.8**
No. 20 [0.850 mm]	**87.8**
No. 40 [0.425 mm]	**82.8**
No. 60 [0.250 mm]	**78.9**
No. 100 [0.150 mm]	**74.3**
No. 200 [0.075 mm]	**66.9**

Miscellaneous Tests

Liquid Limit @ 25 blows (T 89), %	
Plastic Limit (T 90), %	
Plasticity Index (T 90), %	
Specific Gravity, Corrected to 20℃ (T 100)	
Loss on Ignition (T 267)	
Loss, %	
H2O, %	
Water Content (T 265), %	**14.7**

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 tons/ft²	Remold tons/ft²	U. Shear tons/ft²	Remold tons/ft²		

Comments:

AUTHORIZATION AND DISTRIBUTION

Reported by: **BRIAN FOGG** Date Reported: **9/26/2013**

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MaineDOT

GEOTECHNICAL TEST REPORT
Central Laboratory

SAMPLE INFORMATION

Reference No.	Boring No./Sample No.	Sample Description	Sampled	Received
263149	HB-OPBH-111/S21	GEOTECHNICAL (DISTURBED)	9/3/2013	9/19/2013

Sample Type: **GEOTECHNICAL** Location: **ROADWAY** Station: **137+50** Offset, ft: **9.5** **RT** Dbfg, ft: **0.42-1.2**

WIN/Town **018547.00 - BLUE HILL, PENOBSCOT** Sampler: **BRUCE WILDER**

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]	**93.5**
⅜ in. [9.5 mm]	**91.1**
¼ in. [6.3 mm]	**85.3**
No. 4 [4.75 mm]	**80.9**
No. 10 [2.00 mm]	**66.3**
No. 20 [0.850 mm]	**51.3**
No. 40 [0.425 mm]	**39.3**
No. 60 [0.250 mm]	**32.2**
No. 100 [0.150 mm]	**26.7**
No. 200 [0.075 mm]	**20.9**

Miscellaneous Tests

Liquid Limit @ 25 blows (T 89), %	
Plastic Limit (T 90), %	
Plasticity Index (T 90), %	
Specific Gravity, Corrected to 20℃ (T 100)	
Loss on Ignition (T 267)	
Loss, %	
H2O, %	
Water Content (T 265), %	**9.6**

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 tons/ft²	Remold tons/ft²	U. Shear tons/ft²	Remold tons/ft²		

Comments:

AUTHORIZATION AND DISTRIBUTION

Reported by: **BRIAN FOGG** Date Reported: **9/26/2013**

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GEOTECHNICAL TEST REPORT
Central Laboratory

SAMPLE INFORMATION

Reference No.	Boring No./Sample No.	Sample Description	Sampled	Received
263150	**HB-OPBH-111/S22**	**GEOTECHNICAL (DISTURBED)**	**9/3/2013**	**9/19/2013**

Sample Type: **GEOTECHNICAL** Location: **ROADWAY** Station: **137+50** Offset, ft: **9.5** **RT** Dbfg, ft: **1.2-5.0**

WIN/Town **018547.00 - BLUE HILL, PENOBSCOT** Sampler: **BRUCE WILDER**

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]	**97.2**
No. 4 [4.75 mm]	**94.7**
No. 10 [2.00 mm]	**88.6**
No. 20 [0.850 mm]	**81.4**
No. 40 [0.425 mm]	**75.3**
No. 60 [0.250 mm]	**70.1**
No. 100 [0.150 mm]	**64.2**
No. 200 [0.075 mm]	**55.8**

Miscellaneous Tests

Liquid Limit @ 25 blows (T 89), %	
Plastic Limit (T 90), %	
Plasticity Index (T 90), %	
Specific Gravity, Corrected to 20℃ (T 100)	
Loss on Ignition (T 267)	
Loss, %	
H2O, %	
Water Content (T 265), %	**14.0**

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 tons/ft²	Remold tons/ft²	U. Shear tons/ft²	Remold tons/ft²		

Comments:

AUTHORIZATION AND DISTRIBUTION

Reported by: **BRIAN FOGG** Date Reported: **9/26/2013**

Paper Copy: Lab File; Project File; Geotech File

MaineDOT

GEOTECHNICAL TEST REPORT
Central Laboratory

SAMPLE INFORMATION

Reference No.	Boring No./Sample No.	Sample Description	Sampled	Received
243076	**HB-OPBH-113/S23**	**GEOTECHNICAL (DISTURBED)**	**9/3/2013**	**9/19/2013**

Sample Type: **GEOTECHNICAL** Location: **ROADWAY** Station: **108+93** Offset, ft: **5.0** **RT** Dbfg, ft: **0.5-1.4**

WIN/Town **018547.00 - BLUE HILL, PENOBSCOT** Sampler: **BRUCE WILDER**

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]	**98.0**
⅜ in. [9.5 mm]	**93.5**
¼ in. [6.3 mm]	**86.8**
No. 4 [4.75 mm]	**81.5**
No. 10 [2.00 mm]	**65.1**
No. 20 [0.850 mm]	**48.2**
No. 40 [0.425 mm]	**34.6**
No. 60 [0.250 mm]	**26.0**
No. 100 [0.150 mm]	**19.2**
No. 200 [0.075 mm]	**13.0**

Miscellaneous Tests

Liquid Limit @ 25 blows (T 89), %	
Plastic Limit (T 90), %	
Plasticity Index (T 90), %	
Specific Gravity, Corrected to 20℃ (T 100)	
Loss on Ignition (T 267)	
Loss, %	
H2O, %	
Water Content (T 265), %	**7.8**

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 tons/ft²	Remold tons/ft²	U. Shear tons/ft²	Remold tons/ft²		

Comments:

AUTHORIZATION AND DISTRIBUTION

Reported by: **BRIAN FOGG** Date Reported: **9/26/2013**

Paper Copy: Lab File; Project File; Geotech File

MaineDOT

GEOTECHNICAL TEST REPORT
Central Laboratory

SAMPLE INFORMATION

Reference No.	Boring No./Sample No.	Sample Description	Sampled	Received
243077	HB-OPBH-113/S24	GEOTECHNICAL (DISTURBED)	9/3/2013	9/19/2013

Sample Type: **GEOTECHNICAL** Location: **ROADWAY** Station: **108+93** Offset, ft: **5.0** **RT** Dbfg, ft: **1.4-5.0**

WIN/Town **018547.00 - BLUE HILL, PENOBSCOT** Sampler: **BRUCE WILDER**

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]	**99.3**
⅜ in. [9.5 mm]	**95.7**
¼ in. [6.3 mm]	**88.3**
No. 4 [4.75 mm]	**83.1**
No. 10 [2.00 mm]	**68.7**
No. 20 [0.850 mm]	**57.0**
No. 40 [0.425 mm]	**49.2**
No. 60 [0.250 mm]	**44.4**
No. 100 [0.150 mm]	**40.2**
No. 200 [0.075 mm]	**35.4**

Miscellaneous Tests

Liquid Limit @ 25 blows (T 89), %	
Plastic Limit (T 90), %	
Plasticity Index (T 90), %	
Specific Gravity, Corrected to 20℃ (T 100)	
Loss on Ignition (T 267)	
Loss, %	
H2O, %	
Water Content (T 265), %	**9.2**

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 tons/ft²	Remold tons/ft²	U. Shear tons/ft²	Remold tons/ft²		

Comments:

AUTHORIZATION AND DISTRIBUTION

Reported by: **BRIAN FOGG** Date Reported: **9/27/2013**

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GEOTECHNICAL TEST REPORT
Central Laboratory

SAMPLE INFORMATION

Reference No.	Boring No./Sample No.	Sample Description	Sampled	Received
243078	**HB-OPBH-114/S25**	**GEOTECHNICAL (DISTURBED)**	**9/3/2013**	**9/19/2013**

Sample Type: **GEOTECHNICAL** Location: **ROADWAY** Station: **108+93** Offset, ft: **10.0 RT** Dbfg, ft: **0.38-1.0**

WIN/Town **018547.00 - BLUE HILL, PENOBSCOT** Sampler: **BRUCE WILDER**

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]	**98.4**
⅜ in. [9.5 mm]	**95.7**
¼ in. [6.3 mm]	**88.7**
No. 4 [4.75 mm]	**83.6**
No. 10 [2.00 mm]	**67.4**
No. 20 [0.850 mm]	**51.1**
No. 40 [0.425 mm]	**38.3**
No. 60 [0.250 mm]	**30.2**
No. 100 [0.150 mm]	**23.8**
No. 200 [0.075 mm]	**17.5**

Miscellaneous Tests

Liquid Limit @ 25 blows (T 89), %	
Plastic Limit (T 90), %	
Plasticity Index (T 90), %	
Specific Gravity, Corrected to 20℃ (T 100)	
Loss on Ignition (T 267)	
Loss, %	
H2O, %	
Water Content (T 265), %	**10.1**

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 tons/ft²	Remold tons/ft²	U. Shear tons/ft²	Remold tons/ft²		

Comments:

AUTHORIZATION AND DISTRIBUTION

Reported by: **BRIAN FOGG** Date Reported: **9/26/2013**

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MaineDOT

GEOTECHNICAL TEST REPORT
Central Laboratory

SAMPLE INFORMATION

Reference No.	Boring No./Sample No.	Sample Description	Sampled	Received
243079	**HB-OPBH-114/S26**	**GEOTECHNICAL (DISTURBED)**	**9/3/2013**	**9/19/2013**

Sample Type: **GEOTECHNICAL** Location: **ROADWAY** Station: **108+93** Offset, ft: **10.0 RT** Dbfg, ft: **1.0-5.0**

WIN/Town **018547.00 - BLUE HILL, PENOBSCOT** Sampler: **BRUCE WILDER**

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]	**99.2**
½ in. [12.5 mm]	**94.2**
⅜ in. [9.5 mm]	**89.6**
¼ in. [6.3 mm]	**83.2**
No. 4 [4.75 mm]	**79.2**
No. 10 [2.00 mm]	**69.3**
No. 20 [0.850 mm]	**61.4**
No. 40 [0.425 mm]	**56.1**
No. 60 [0.250 mm]	**52.5**
No. 100 [0.150 mm]	**48.8**
No. 200 [0.075 mm]	**43.5**

Miscellaneous Tests

Liquid Limit @ 25 blows (T 89), %	
Plastic Limit (T 90), %	
Plasticity Index (T 90), %	
Specific Gravity, Corrected to 20℃ (T 100)	
Loss on Ignition (T 267)	
Loss, %	
H2O, %	
Water Content (T 265), %	**10.7**

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 tons/ft²	Remold tons/ft²	U. Shear tons/ft²	Remold tons/ft²		

Comments:

AUTHORIZATION AND DISTRIBUTION

Reported by: **BRIAN FOGG** Date Reported: **9/27/2013**

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GEOTECHNICAL TEST REPORT
Central Laboratory

SAMPLE INFORMATION

Reference No.	Boring No./Sample No.	Sample Description	Sampled	Received
243080	**HB-OPBH-115/S27**	**GEOTECHNICAL (DISTURBED)**	**9/3/2013**	**9/19/2013**

Sample Type: **GEOTECHNICAL** Location: **ROADWAY** Station: **108+93** Offset, ft: **13.5 RT** Dbfg, ft: **0.5-5.0**

WIN/Town **018547.00 - BLUE HILL, PENOBSCOT** Sampler: **BRUCE WILDER**

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]	**100.0**
⅜ in. [9.5 mm]	**99.3**
¼ in. [6.3 mm]	**97.0**
No. 4 [4.75 mm]	**95.0**
No. 10 [2.00 mm]	**88.4**
No. 20 [0.850 mm]	**80.1**
No. 40 [0.425 mm]	**73.3**
No. 60 [0.250 mm]	**68.5**
No. 100 [0.150 mm]	**63.5**
No. 200 [0.075 mm]	**56.2**

Miscellaneous Tests

Liquid Limit @ 25 blows (T 89), %	
Plastic Limit (T 90), %	
Plasticity Index (T 90), %	
Specific Gravity, Corrected to 20℃ (T 100)	
Loss on Ignition (T 267)	
Loss, %	
H2O, %	
Water Content (T 265), %	**15.8**

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 tons/ft²	Remold tons/ft²	U. Shear tons/ft²	Remold tons/ft²		

Comments:

AUTHORIZATION AND DISTRIBUTION

Reported by: **BRIAN FOGG** Date Reported: **9/26/2013**

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MaineDOT

GEOTECHNICAL TEST REPORT
Central Laboratory

SAMPLE INFORMATION

Reference No.	Boring No./Sample No.	Sample Description	Sampled	Received
243081	**HB-OPBH-116/S28**	**GEOTECHNICAL (DISTURBED)**	**9/3/2013**	**9/19/2013**

Sample Type: **GEOTECHNICAL** Location: **ROADWAY** Station: **53+51** Offset, ft: **4.5** **LT** Dbfg, ft: **0.5-2.7**

WIN/Town **018547.00 - BLUE HILL, PENOBSCOT** Sampler: **BRUCE WILDER**

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]	**95.4**
⅜ in. [9.5 mm]	**90.0**
¼ in. [6.3 mm]	**82.7**
No. 4 [4.75 mm]	**76.5**
No. 10 [2.00 mm]	**59.7**
No. 20 [0.850 mm]	**41.5**
No. 40 [0.425 mm]	**27.8**
No. 60 [0.250 mm]	**20.8**
No. 100 [0.150 mm]	**16.0**
No. 200 [0.075 mm]	**11.6**

Miscellaneous Tests

Liquid Limit @ 25 blows (T 89), %	
Plastic Limit (T 90), %	
Plasticity Index (T 90), %	
Specific Gravity, Corrected to 20℃ (T 100)	
Loss on Ignition (T 267)	
Loss, %	
H2O, %	
Water Content (T 265), %	**5.5**

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 tons/ft²	Remold tons/ft²	U. Shear tons/ft²	Remold tons/ft²		

Comments:

AUTHORIZATION AND DISTRIBUTION

Reported by: **BRIAN FOGG** Date Reported: **9/27/2013**

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GEOTECHNICAL TEST REPORT
Central Laboratory

SAMPLE INFORMATION

Reference No.	Boring No./Sample No.	Sample Description	Sampled	Received
243082	**HB-OPBH-116/S29**	**GEOTECHNICAL (DISTURBED)**	**9/3/2013**	**9/19/2013**

Sample Type: **GEOTECHNICAL** Location: **ROADWAY** Station: **53+51** Offset, ft: **4.5** **LT** Dbfg, ft: **2.7-5.0**

WIN/Town **018547.00 - BLUE HILL, PENOBSCOT** Sampler: **BRUCE WILDER**

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]	**100.0**
⅜ in. [9.5 mm]	**97.1**
¼ in. [6.3 mm]	**93.9**
No. 4 [4.75 mm]	**91.1**
No. 10 [2.00 mm]	**82.0**
No. 20 [0.850 mm]	**70.4**
No. 40 [0.425 mm]	**60.5**
No. 60 [0.250 mm]	**53.4**
No. 100 [0.150 mm]	**46.2**
No. 200 [0.075 mm]	**35.7**

Miscellaneous Tests

Liquid Limit @ 25 blows (T 89), %	
Plastic Limit (T 90), %	
Plasticity Index (T 90), %	
Specific Gravity, Corrected to 20℃ (T 100)	
Loss on Ignition (T 267)	
Loss, %	
H2O, %	
Water Content (T 265), %	**12.2**

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 tons/ft²	Remold tons/ft²	U. Shear tons/ft²	Remold tons/ft²		

Comments:

AUTHORIZATION AND DISTRIBUTION

Reported by: **BRIAN FOGG** Date Reported: **9/27/2013**

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MaineDOT

GEOTECHNICAL TEST REPORT
Central Laboratory

SAMPLE INFORMATION

Reference No.	Boring No./Sample No.	Sample Description	Sampled	Received
243083	**HB-OPBH-118/S30**	**GEOTECHNICAL (DISTURBED)**	**9/3/2013**	**9/19/2013**

Sample Type: **GEOTECHNICAL** Location: **ROADWAY** Station: **53+51** Offset, ft: **13.0 LT** Dbfg, ft: **0.25-1.6**

WIN/Town **018547.00 - BLUE HILL, PENOBSCOT** Sampler: **BRUCE WILDER**

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]	**100.0**
¾ in. [19.0 mm]	**96.7**
½ in. [12.5 mm]	**90.5**
⅜ in. [9.5 mm]	**84.8**
¼ in. [6.3 mm]	**77.5**
No. 4 [4.75 mm]	**72.6**
No. 10 [2.00 mm]	**57.9**
No. 20 [0.850 mm]	**37.9**
No. 40 [0.425 mm]	**24.1**
No. 60 [0.250 mm]	**17.3**
No. 100 [0.150 mm]	**12.6**
No. 200 [0.075 mm]	**8.5**

Miscellaneous Tests

Liquid Limit @ 25 blows (T 89), %	
Plastic Limit (T 90), %	
Plasticity Index (T 90), %	
Specific Gravity, Corrected to 20℃ (T 100)	
Loss on Ignition (T 267)	
Loss, %	
H2O, %	
Water Content (T 265), %	**7.2**

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 tons/ft²	Remold tons/ft²	U. Shear tons/ft²	Remold tons/ft²		

Comments:

AUTHORIZATION AND DISTRIBUTION

Reported by: **BRIAN FOGG** Date Reported: **10/3/2013**

Paper Copy: Lab File; Project File; Geotech File

MaineDOT

GEOTECHNICAL TEST REPORT
Central Laboratory

SAMPLE INFORMATION

Reference No.	Boring No./Sample No.	Sample Description	Sampled	Received
243084	**HB-OPBH-118/S31**	**GEOTECHNICAL (DISTURBED)**	**9/3/2013**	**9/19/2013**

Sample Type: **GEOTECHNICAL** Location: **ROADWAY** Station: **53+51** Offset, ft: **13.0 LT** Dbfg, ft: **1.6-5.0**

WIN/Town **018547.00 - BLUE HILL, PENOBSCOT** Sampler: **BRUCE WILDER**

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]	**100.0**
⅜ in. [9.5 mm]	**99.7**
¼ in. [6.3 mm]	**98.3**
No. 4 [4.75 mm]	**97.3**
No. 10 [2.00 mm]	**93.0**
No. 20 [0.850 mm]	**85.5**
No. 40 [0.425 mm]	**78.5**
No. 60 [0.250 mm]	**73.5**
No. 100 [0.150 mm]	**68.3**
No. 200 [0.075 mm]	**59.7**

Miscellaneous Tests

Liquid Limit @ 25 blows (T 89), %	
Plastic Limit (T 90), %	
Plasticity Index (T 90), %	
Specific Gravity, Corrected to 20℃ (T 100)	
Loss on Ignition (T 267)	
Loss, %	
H2O, %	
Water Content (T 265), %	**30.7**

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 tons/ft²	Remold tons/ft²	U. Shear tons/ft²	Remold tons/ft²		

Comments:

AUTHORIZATION AND DISTRIBUTION

Reported by: **BRIAN FOGG** Date Reported: **9/26/2013**

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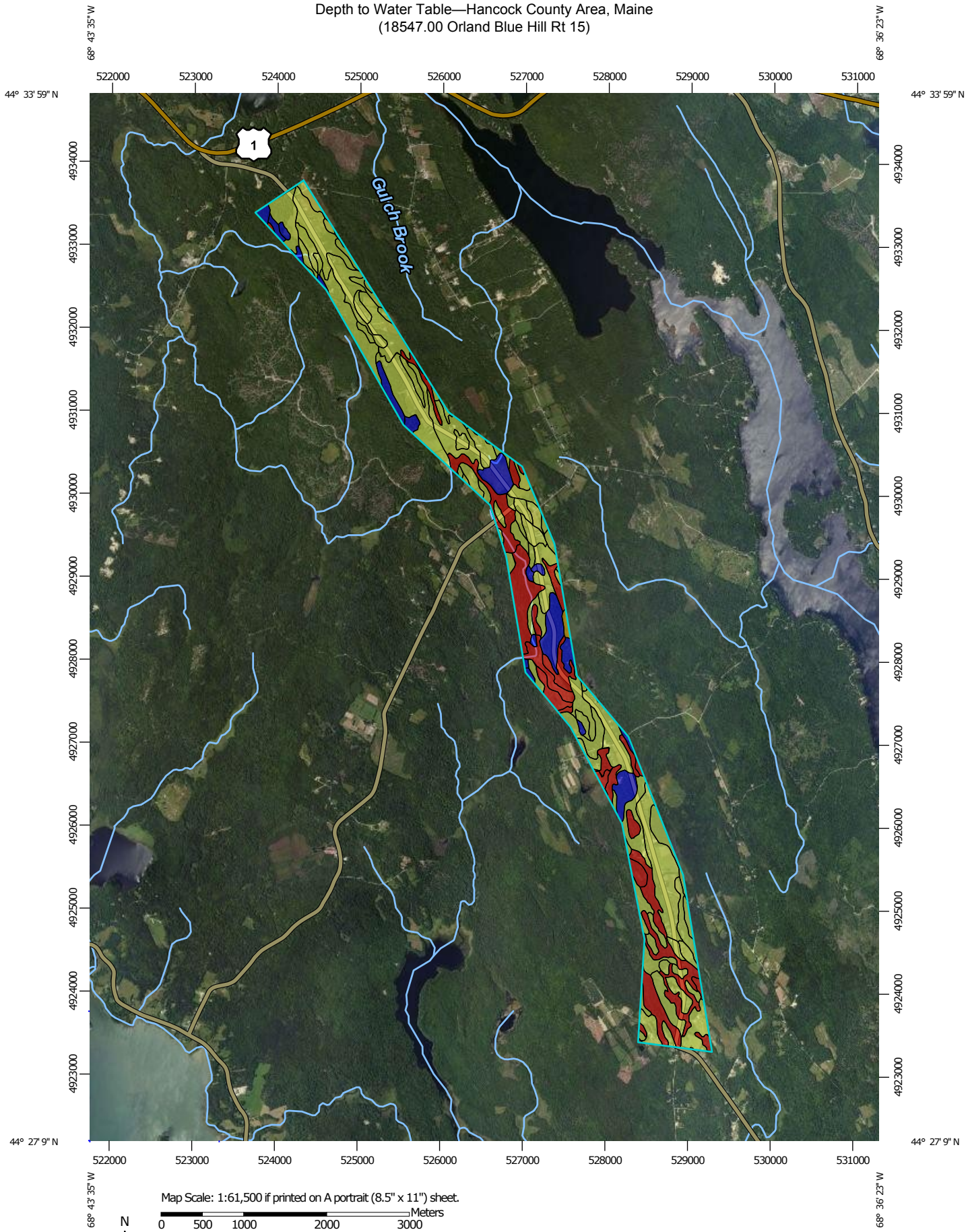
National Resources Conservation Maps

Depth to Water Table—Hancock County Area, Maine
(18547.00 Orland Blue Hill Rt 15)



MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

Soil Rating Polygons

- 0 - 25 cm
- 25 - 50 cm
- 50 - 100 cm
- 100 - 150 cm
- 150 - 200 cm
- > 200 cm
- Not rated or not available

Soil Rating Lines

- 0 - 25
- 25 - 50
- 50 - 100
- 100 - 150
- 150 - 200
- > 200
- Not rated or not available

Soil Rating Points

- 0 - 25
- 25 - 50
- 50 - 100
- 100 - 150
- 150 - 200
- > 200
- Not rated or not available

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

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

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

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

Soil Survey Area: Hancock County Area, Maine
Survey Area Data: Version 13, Dec 9, 2013

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 27, 2010—Aug 31, 2010

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.