Highway Program

Jeff Adams, Program Manager

Memorandum

DATE: April 3, 2007

TO: Heath Cowan **DEPT:** Region 3

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

SUBJECT: Final Soils Memo – Jay-Wilton, Rte. 156, Pin 12774.00

No. 2007-105

Site Description

A subsurface investigation has been completed for a 1.8 mile portion of Route 156 in the towns of Jay and Wilton. The project begins at the intersection of Route 133 and extends west 1.8 miles.

The investigation included the use of a drill rig and falling weight deflectometer (FWD). Project stationing was marked in the field by Region 3 survey. A distance measuring instrument (DMI) was used to locate specific boring and FWD locations based upon several survey points marked in the field. The beginning of the project (intersection of Rte. 133/156) was designated as station 10+00. All offsets used in this investigation are referenced from the existing roadway centerline.

FWD Results

The entire FWD results are included as a separate attachment to this memo. A summary of the FWD results follows:

% of project found to be deficient 73 %
Range of Recommended Overlay Thickness 0.5" – 5"
Average Recommended Overlay Thickness 2.5"

The subgrade resilient modulus is very low (< 3000psi) for approximately 12 % of the project length (See FWD Summary Sheet and PDS). It is anticipated that this is due to the presence of moist to wet silty sands and sandy silt soils. These areas could be soft especially during the spring. Depending on the conditions at the time of construction the use of additional base material may be necessary to enable these soils to support traffic during construction. Construction operations should take this into consideration. The greatest continuous concentration of low subgrade modulus values was encountered between stations 35+00-50+00. A complete list of areas with a low modulus is listed on Table 1.

Table 1.
Low Subgrade Modulus Areas (< 3000 psi)

Station	Soil Type	Water Content %	% Passing # 200	Ave Subgrade Modulus (psi)
14+00 - 16+00	SiSa	14	41	2758
34+00 - 36+00	SiSa	14	38-53	2109
38+00 - 43+00	SiSa	14	53	2651
46+00 - 51+00	SaSi	14	53	2600
69+00 - 72+00	SaSi	25	52	2600
94+00 - 97+00	SiSa	14	39	2700

Boring Information

The subsurface investigation consisted of 9 power auger borings and 16 pavement cores (See Boring Logs and Pavement Core Summary Sheet). Boring locations were determined based upon FWD deflection results and visual observations during an on-site visit. Soils were described and sampled in the field. Samples of the existing base material and subgrade soils were collected and analyzed in the Bangor lab. Testing results are summarized on the attached Laboratory Testing Summary Sheet.

Pavement Conditions

Pavement conditions vary from poor to good. The good pavement conditions are limited to a 2000' section that was overlaid (state aid?) several years ago. The details of what actually took place and when could not be confirmed by the designer/resident engineer.

Four power auger borings and ten pavements cores encountered an unbound pavement layer beneath a solid pavement layer. For a detail listing of pavement measurements refer to the "Pavement Depth Information" sheet included with this memo. A pavement thickness summary follows:

Range of Solid Pavement (SP) Thickness:	3.6" -7.8 "
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Average Solid Pavement Thickness: 5"

Range of Unbound Pavement UP) Thickness: 1.2" – 3.6"

Average Unbound Pavement Thickness: 2"

Range of Combined (SP+UP) Pavement Thickness: 3.6" – 9.6"

Average Combined Pavement Thickness: 6"

Note: Pavement thickness estimates are based upon 24 sample locations. Measurements were taken from boring holes and pavement cores. Actual pavement thickness may vary. The maximum sample spacing is 2250 feet.

Base Material

Existing Base Material Type: SiGSa, SiSaG, SiSa

Percent Passing #200: 5 %-17 % Range of Base Material Thickness: 6" – 20" Average Base Thickness: 16"

Quality of Drainage (AASHTO): Poor - Good Estimated Existing Permeability: 4-160 ft/day

The existing base material consists of silty gravelly sand or silty sandy gravel, and silty sand. This material has approximately 5%-17% passing the #200 sieve. In the silty gravelly sands and silty sands, the high percentage of fines has affected the permeability. Permeability estimates based upon grain size distribution, are as low as 4 ft/day in areas.

These limited performance characteristics should be taken into consideration when developing performance expectations related to strength and drainage.

Subgrade Soils

The subgrade soils along this project consist of silty sands and sandy silts. These till soils may be very cobbly in areas. The sandy silts and silty sands are very similar. It may be difficult to distinguish between these two soil types in the field. Samples indicate a silt content ranging between 38 % - 53 % passing the # 200 sieve. These soils are classified as A-4 soils using the ASSHTO classification system. These soils can perform adequately with proper moisture and compaction. However, they can swell and lose much of their stability unless properly compacted and drained. Careful field control of moisture content and pneumatic-tired rollers are normally required for proper compaction. These soils are highly frost susceptible.

A summary of the anticipated subgrade soil type is provided below. This summary is derived from boring logs, FWD deflections, and visual observations. Actual conditions may vary.

Summary of the anticipated subgrade soil type

Station	Soil Type	AASHTO	Sample	% #200	Subgrade Modulus x1000	Average RM x1000		
10+00 - 32+50	SiSa	A-4	S2,4	38 - 41	2.7 - 5.6	4.2		
32+50 – 52+00 SaSi A-4 S6 53 2.1 – 3.5 2.7								
*52+00 - 67+50	SaSi	A-4	S6	53	4.4 - 5.6	5.3		
67+50 - 105+00	SiSa/SaSi	A-4	S8,11	39 – 52	2.5 - 7.1	4.0		
	Shaded areas represent areas of low subgrade modulus.							

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*Possible State Aid Section?

Bedrock

No bedrock was encountered in any of the borings. It is anticipated that bedrock will not be encountered within 5' below the existing road surface. The subgrade modulus is quite high (8148 psi) in the vicinity of station 67+50. This could be indicative of the presence of a relatively shallow bedrock surface.

Performance Data Summary

A Performance Data Summary (PDS) sheet has been provided as a separate attachment to this memo. The PDS indicates that the first two thirds of the project (Sta. 10+00 - 72+00) fails to meet at least two of the four minimum performance data criteria.

A visual inspection of the pavement conditions between stations 52+00 – 75+00 (Davis Road) indicates that pavement is in good condition. However, the PDS indicates a lack of adequate base thickness and the existing structural number fails to meet the future traffic structural number. The good pavement conditions are likely because it appears that this section of roadway was recently overlaid or was part of a recent state aid reconstruction? (The designer could not confirm what was done in this area). Another likely factor contributing to the good pavement conditions is that this section is built upon fill and subgrade is well above the existing ground surface. In areas where the road is built upon native soils (cut sections), pavement distress is visible. Frequently, transverse cracks are present along the transition between the cut and fill sections. A power auger boring at station 62+50 indicates that the existing base material consist of silty sand with 17 % passing the #200 sieve rather than gravel. Although the pavement conditions are generally good at this time, this section (especially the cut areas) should be included for rehabilitation consideration.

The PDS indicates that the last third of the project (Sta.72+00-105+00) generally meets 3 or 4 of the minimum performance criteria. Borings indicate that adequate pavement and base thickness exists. However the pavement conditions are only fair. It is anticipated that this area is under performing due to age and the lack of drainage. Much of this section consists of a closed or box section without the existence of any underdrain system.

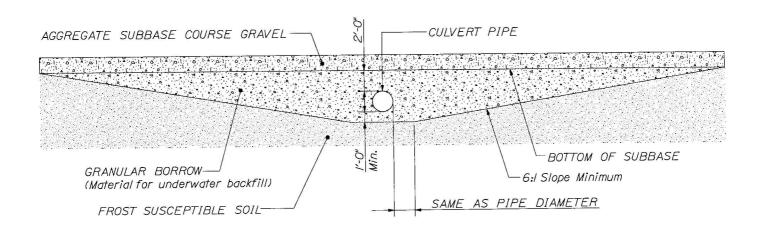
The following table is a summary of the PDS sheet. Please refer to the PDS Sheet for a detailed listing of existing conditions and minimum performance data criteria.

Station	Comments							
10+00 - 32+50	Additional pavement, base and drainage improvements may be required to							
	meet the future structural number and performance expectations. Variable							
	depth gravel placement between stations 12+50 – 20+00 could be considered.							
32+50 - 52+00	Additional pavement, base and drainage improvements are required to meet							
	the future structural number and performance expectations. Very low							
	subgrade resilient modulus values (< 3000 psi) were encountered throughout							
	much of this section. Some areas could be problematic during construction if							
	moist to wet conditions exist. Improvements to the existing drainage will be							
	very important. Variable depth gravel placement has been recommended.							
52+00-75+00	Additional pavement, base and drainage improvements may be required to							
	meet the future structural number and performance expectations. Ditching							
	within the existing cut sections will be important in approving performance.							
	Variable depth gravel placement could be considered between stations 52+00							
	- 71+00.							
75+00-90+00	Additional pavement and drainage improvements will be required to meet							
	future performance expectations. Adequate ditching in this area is critical.							
90+00 - 105+00	Additional pavement, base and drainage improvements may be required to							
	meet the future structural number and performance expectations. Low							
	subgrade resilient modulus. Underdrain is recommended throughout this							
	section if adequate ditches cannot be established.							

Recommendations

- 1. It is recommended that additional base material be considered between stations 32+50 and 52+00 due to varying existing base thickness, low subgrade resilient modulus values, and steep grade (slow moving loaded truck traffic).
- 2. It is recommended that existing cross pipes be lowered to allow for adequate deepening of existing ditches as well as for the construction of new ditches. To aid in the prevention of differential heaving, it is recommended that the cross pipes be installed using the attached schematic for cross pipe installation in frost susceptible soils.
- 3. It is recommended that the entire project area be drained with aggressive ditching wherever possible. Ditching should extend a minimum of 3 feet below finished grade whenever possible.
- 4. It is recommended that underdrain be installed between stations 90+00 and 105+00.
- 5. Due to the cobbly nature of the till soils, scarifying (6 inches) should be considered if the pavement is removed in any areas. It is anticipated that some of these cobbles may be present in the existing base layer.

CROSS CULVERT IN FROST SUSCEPTIBLE SOILS



Falling Weight Deflectometer (FWD) Summary Sheet

Project #: 12774.00 Town(s): Jay-Wilton

Route(s): #156

Date Tested: 05/24/2006 Requested By: S. Hayden Direction of Testing: North

Of FWD tests: 38 # Of Power Augers/Spoons 9/0
Design Life: 12 Yrs Future 18-kip ESALs (Design Life): 477,420

Initial Serviceability: 4.5 Terminal Serviceability: 2.5 Reliability Level: 95% Overall Standard Deviation: .45

Locations

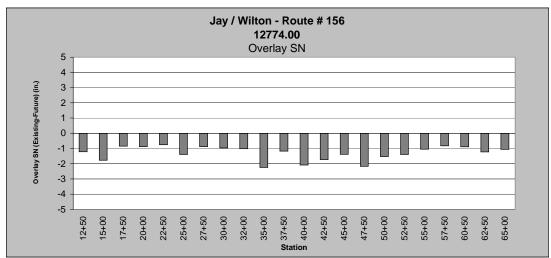
<u>Distance (Feet)</u> <u>Description</u>

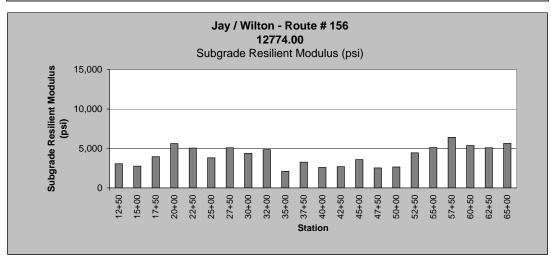
Comments:

12+50 3.15 4.36 -1.21 2.75 70,740 3,066 3.6 16.9 15+00 2.75 4.52 -1.77 4.02 47,523 2,758 3.6 16.9 17+50 3.15 4 -0.85 1.93 72,295 3,958 3.6 16.8 20+00 2.66 3.54 -0.88 2 43,619 5,622 3.6 16.8 22+50 2.93 3.68 -0.75 1.7 58,310 5,038 3.6 16.8 25+00 2.66 4.05 -1.39 3.16 43,565 3,809 3.6 16.8 27+50 2.78 3.66 -0.88 2 49,703 5,094 3.6 16.8 30+00 2.9 3.86 -0.96 2.18 56,707 4,386 3.6 16.8 35+00 2.68 4.93 -2.25 5.11 73,597 2,109 6 14.2 40+00 2.52 4.	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)
17+50 3.15 4 -0.85 1.93 72,295 3,958 3.6 16.8 20+00 2.66 3.54 -0.88 2 43,619 5,622 3.6 16.8 22+50 2.93 3.68 -0.75 1.7 58,310 5,038 3.6 16.8 25+00 2.66 4.05 -1.39 3.16 43,565 3,809 3.6 16.8 27+50 2.78 3.66 -0.88 2 49,703 5,094 3.6 16.8 30+00 2.9 3.86 -0.96 2.18 56,707 4,386 3.6 16.8 32+00 2.72 3.73 -1.01 2.3 46,423 4,849 3.6 16.8 35+00 2.68 4.93 -2.25 5.11 73,597 2,109 6 14.2 40+00 2.52 4.61 -2.09 4.75 61,516 2,599 6 14.2 42+50 2.82 4.55<	12+50	3.15	4.36	-1.21	2.75	70,740	3,066	3.6	16.9
20+00 2.66 3.54 -0.88 2 43,619 5,622 3.6 16.8 22+50 2.93 3.68 -0.75 1.7 58,310 5,038 3.6 16.8 25+00 2.66 4.05 -1.39 3.16 43,565 3,809 3.6 16.8 27+50 2.78 3.66 -0.88 2 49,703 5,094 3.6 16.8 30+00 2.9 3.86 -0.96 2.18 56,707 4,386 3.6 16.8 32+00 2.72 3.73 -1.01 2.3 46,423 4,849 3.6 16.8 35+00 2.68 4.93 -2.25 5.11 73,597 2,109 6 14.2 40+00 2.52 4.61 -2.09 4.75 61,516 2,599 6 14.2 42+50 2.82 4.55 -1.73 3.93 85,966 2,703 6 14.2 47+50 2.47 4.64	15+00	2.75	4.52	-1.77	4.02	47,523	2,758	3.6	16.9
22+50 2.93 3.68 -0.75 1.7 58,310 5,038 3.6 16.8 25+00 2.66 4.05 -1.39 3.16 43,565 3,809 3.6 16.8 27+50 2.78 3.66 -0.88 2 49,703 5,094 3.6 16.8 30+00 2.9 3.86 -0.96 2.18 56,707 4,386 3.6 16.8 32+00 2.72 3.73 -1.01 2.3 46,423 4,849 3.6 16.8 35+00 2.68 4.93 -2.25 5.11 73,597 2,109 6 14.2 37+50 3.1 4.27 -1.17 2.66 114,690 3,254 6 14.2 40+00 2.52 4.61 -2.09 4.75 61,516 2,599 6 14.2 42+50 2.82 4.55 -1.73 3.93 85,966 2,703 6 14.2 47+50 2.47 4.64 -2.17 4.93 58,028 2,541 6 14.2 5	17+50	3.15	4	-0.85	1.93	72,295	3,958	3.6	16.8
25+00 2.66 4.05 -1.39 3.16 43,565 3,809 3.6 16.8 27+50 2.78 3.66 -0.88 2 49,703 5,094 3.6 16.8 30+00 2.9 3.86 -0.96 2.18 56,707 4,386 3.6 16.8 32+00 2.72 3.73 -1.01 2.3 46,423 4,849 3.6 16.8 35+00 2.68 4.93 -2.25 5.11 73,597 2,109 6 14.2 37+50 3.1 4.27 -1.17 2.66 114,690 3,254 6 14.2 40+00 2.52 4.61 -2.09 4.75 61,516 2,599 6 14.2 42+50 2.82 4.55 -1.73 3.93 85,966 2,703 6 14.2 47+50 2.47 4.64 -2.17 4.93 58,028 2,541 6 14.2 50+00 3.04 4.57 -1.53 3.48 107,982 2,659 6 14.2 5	20+00	2.66	3.54	-0.88	2	43,619	5,622	3.6	16.8
27+50 2.78 3.66 -0.88 2 49,703 5,094 3.6 16.8 30+00 2.9 3.86 -0.96 2.18 56,707 4,386 3.6 16.8 32+00 2.72 3.73 -1.01 2.3 46,423 4,849 3.6 16.8 35+00 2.68 4.93 -2.25 5.11 73,597 2,109 6 14.2 37+50 3.1 4.27 -1.17 2.66 114,690 3,254 6 14.2 40+00 2.52 4.61 -2.09 4.75 61,516 2,599 6 14.2 42+50 2.82 4.55 -1.73 3.93 85,966 2,703 6 14.2 45+00 2.76 4.14 -1.38 3.14 80,763 3,585 6 14.2 47+50 2.47 4.64 -2.17 4.93 58,028 2,541 6 14.2 50+00 3.04 4.57 -1.53 3.48 107,982 2,659 6 14.2 55+	22+50	2.93	3.68	-0.75	1.7	58,310	5,038	3.6	16.8
30+00 2.9 3.86 -0.96 2.18 56,707 4,386 3.6 16.8 32+00 2.72 3.73 -1.01 2.3 46,423 4,849 3.6 16.8 35+00 2.68 4.93 -2.25 5.11 73,597 2,109 6 14.2 37+50 3.1 4.27 -1.17 2.66 114,690 3,254 6 14.2 40+00 2.52 4.61 -2.09 4.75 61,516 2,599 6 14.2 42+50 2.82 4.55 -1.73 3.93 85,966 2,703 6 14.2 45+00 2.76 4.14 -1.38 3.14 80,763 3,585 6 14.2 47+50 2.47 4.64 -2.17 4.93 58,028 2,541 6 14.2 50+00 3.04 4.57 -1.53 3.48 107,982 2,659 6 14.2 52+50 2.45 3.84 -1.39 3.16 86,918 4,440 4.2 12.3	25+00	2.66	4.05	-1.39	3.16	43,565	3,809	3.6	16.8
32+00 2.72 3.73 -1.01 2.3 46,423 4,849 3.6 16.8 35+00 2.68 4.93 -2.25 5.11 73,597 2,109 6 14.2 37+50 3.1 4.27 -1.17 2.66 114,690 3,254 6 14.2 40+00 2.52 4.61 -2.09 4.75 61,516 2,599 6 14.2 42+50 2.82 4.55 -1.73 3.93 85,966 2,703 6 14.2 45+00 2.76 4.14 -1.38 3.14 80,763 3,585 6 14.2 47+50 2.47 4.64 -2.17 4.93 58,028 2,541 6 14.2 50+00 3.04 4.57 -1.53 3.48 107,982 2,659 6 14.2 52+50 2.45 3.84 -1.39 3.16 86,918 4,440 4.2 12.3 57+50 2.61 3.66 -1.05 2.39 104,662 5,098 4.2 12.3 <t< th=""><td>27+50</td><td>2.78</td><td>3.66</td><td>-0.88</td><td>2</td><td>49,703</td><td>5,094</td><td>3.6</td><td>16.8</td></t<>	27+50	2.78	3.66	-0.88	2	49,703	5,094	3.6	16.8
35+00 2.68 4.93 -2.25 5.11 73,597 2,109 6 14.2 37+50 3.1 4.27 -1.17 2.66 114,690 3,254 6 14.2 40+00 2.52 4.61 -2.09 4.75 61,516 2,599 6 14.2 42+50 2.82 4.55 -1.73 3.93 85,966 2,703 6 14.2 45+00 2.76 4.14 -1.38 3.14 80,763 3,585 6 14.2 47+50 2.47 4.64 -2.17 4.93 58,028 2,541 6 14.2 50+00 3.04 4.57 -1.53 3.48 107,982 2,659 6 14.2 52+50 2.45 3.84 -1.39 3.16 86,918 4,440 4.2 12.3 55+00 2.61 3.66 -1.05 2.39 104,662 5,098 4.2 12.3 57+50 2.55 3.38 -0.83 1.89 97,322 6,400 4.2 12.3 <	30+00	2.9	3.86	-0.96	2.18	56,707	4,386	3.6	16.8
37+50 3.1 4.27 -1.17 2.66 114,690 3,254 6 14.2 40+00 2.52 4.61 -2.09 4.75 61,516 2,599 6 14.2 42+50 2.82 4.55 -1.73 3.93 85,966 2,703 6 14.2 45+00 2.76 4.14 -1.38 3.14 80,763 3,585 6 14.2 47+50 2.47 4.64 -2.17 4.93 58,028 2,541 6 14.2 50+00 3.04 4.57 -1.53 3.48 107,982 2,659 6 14.2 52+50 2.45 3.84 -1.39 3.16 86,918 4,440 4.2 12.3 55+00 2.61 3.66 -1.05 2.39 104,662 5,098 4.2 12.3 57+50 2.55 3.38 -0.83 1.89 97,322 6,400 4.2 12.3 60+50 2.71 3.6 -0.89 2.02 116,939 5,368 4.2 12.3	32+00	2.72	3.73	-1.01	2.3	46,423	4,849	3.6	16.8
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42+50 2.82 4.55 -1.73 3.93 85,966 2,703 6 14.2 45+00 2.76 4.14 -1.38 3.14 80,763 3,585 6 14.2 47+50 2.47 4.64 -2.17 4.93 58,028 2,541 6 14.2 50+00 3.04 4.57 -1.53 3.48 107,982 2,659 6 14.2 52+50 2.45 3.84 -1.39 3.16 86,918 4,440 4.2 12.3 55+00 2.61 3.66 -1.05 2.39 104,662 5,098 4.2 12.3 57+50 2.55 3.38 -0.83 1.89 97,322 6,400 4.2 12.3 60+50 2.71 3.6 -0.89 2.02 116,939 5,368 4.2 12.3 62+50 2.43 3.66 -1.23 2.8 84,166 5,092 4.2 12.3	37+50	3.1	4.27	-1.17	2.66	114,690	3,254	6	14.2
45+00 2.76 4.14 -1.38 3.14 80,763 3,585 6 14.2 47+50 2.47 4.64 -2.17 4.93 58,028 2,541 6 14.2 50+00 3.04 4.57 -1.53 3.48 107,982 2,659 6 14.2 52+50 2.45 3.84 -1.39 3.16 86,918 4,440 4.2 12.3 55+00 2.61 3.66 -1.05 2.39 104,662 5,098 4.2 12.3 57+50 2.55 3.38 -0.83 1.89 97,322 6,400 4.2 12.3 60+50 2.71 3.6 -0.89 2.02 116,939 5,368 4.2 12.3 62+50 2.43 3.66 -1.23 2.8 84,166 5,092 4.2 12.3	40+00	2.52	4.61	-2.09	4.75	61,516	2,599	6	14.2
47+50 2.47 4.64 -2.17 4.93 58,028 2,541 6 14.2 50+00 3.04 4.57 -1.53 3.48 107,982 2,659 6 14.2 52+50 2.45 3.84 -1.39 3.16 86,918 4,440 4.2 12.3 55+00 2.61 3.66 -1.05 2.39 104,662 5,098 4.2 12.3 57+50 2.55 3.38 -0.83 1.89 97,322 6,400 4.2 12.3 60+50 2.71 3.6 -0.89 2.02 116,939 5,368 4.2 12.3 62+50 2.43 3.66 -1.23 2.8 84,166 5,092 4.2 12.3	42+50	2.82	4.55	-1.73	3.93	85,966	2,703	6	14.2
50+00 3.04 4.57 -1.53 3.48 107,982 2,659 6 14.2 52+50 2.45 3.84 -1.39 3.16 86,918 4,440 4.2 12.3 55+00 2.61 3.66 -1.05 2.39 104,662 5,098 4.2 12.3 57+50 2.55 3.38 -0.83 1.89 97,322 6,400 4.2 12.3 60+50 2.71 3.6 -0.89 2.02 116,939 5,368 4.2 12.3 62+50 2.43 3.66 -1.23 2.8 84,166 5,092 4.2 12.3	45+00	2.76	4.14	-1.38	3.14	80,763	3,585	6	14.2
52+50 2.45 3.84 -1.39 3.16 86,918 4,440 4.2 12.3 55+00 2.61 3.66 -1.05 2.39 104,662 5,098 4.2 12.3 57+50 2.55 3.38 -0.83 1.89 97,322 6,400 4.2 12.3 60+50 2.71 3.6 -0.89 2.02 116,939 5,368 4.2 12.3 62+50 2.43 3.66 -1.23 2.8 84,166 5,092 4.2 12.3	47+50	2.47	4.64	-2.17	4.93	58,028	2,541	6	14.2
55+00 2.61 3.66 -1.05 2.39 104,662 5,098 4.2 12.3 57+50 2.55 3.38 -0.83 1.89 97,322 6,400 4.2 12.3 60+50 2.71 3.6 -0.89 2.02 116,939 5,368 4.2 12.3 62+50 2.43 3.66 -1.23 2.8 84,166 5,092 4.2 12.3	50+00	3.04	4.57	-1.53	3.48	107,982	2,659	6	14.2
57+50 2.55 3.38 -0.83 1.89 97,322 6,400 4.2 12.3 60+50 2.71 3.6 -0.89 2.02 116,939 5,368 4.2 12.3 62+50 2.43 3.66 -1.23 2.8 84,166 5,092 4.2 12.3	52+50	2.45	3.84	-1.39	3.16	86,918	4,440	4.2	12.3
60+50 2.71 3.6 -0.89 2.02 116,939 5,368 4.2 12.3 62+50 2.43 3.66 -1.23 2.8 84,166 5,092 4.2 12.3	55+00	2.61	3.66	-1.05	2.39	104,662	5,098	4.2	12.3
62+50 2.43 3.66 -1.23 2.8 84,166 5,092 4.2 12.3	57+50	2.55	3.38	-0.83	1.89	97,322	6,400	4.2	12.3
	60+50	2.71	3.6	-0.89	2.02	116,939	5,368	4.2	12.3
65+00 2.48 3.54 -1.06 2.41 89,661 5,628 4.2 12.3	62+50	2.43	3.66	-1.23	2.8	84,166	5,092	4.2	12.3
	65+00	2.48	3.54	-1.06	2.41	89,661	5,628	4.2	12.3

Weak Subgrade Strong Subgrade

^{*} For actual Gravel Depths, see logdraft forms





Jay/Wilton - Route #156 12774.00

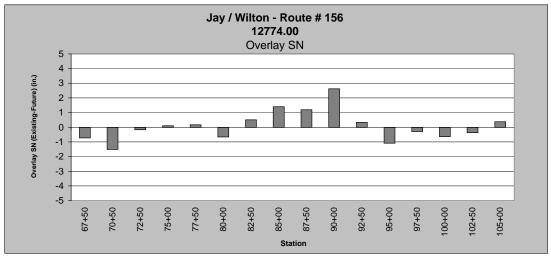
February	5,	2007
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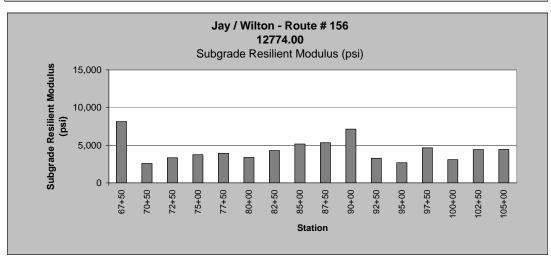
Station (Feet)	Existing Structural Number (in.)	Future Traffic Structural Number (in.)	Overlay Structural Number (Existing - Future)	Recommended Pavement Thickness (in.)	Pavement Modulus (psi)	Subgrade Resilient Modulus (psi)	Pavement Depth (in)	* Combined Pavement/Gravel Depth Used for Calculation (in)
67+50	2.38	3.1	-0.72	1.64	79,687	8,148	4.2	12.3
70+50	3.12	4.63	-1.51	3.43	35,318	2,563	4.6	21.1
72+50	4.07	4.24	-0.17	0.39	46,249	3,328	4.2	25.2
75+00	4.18	4.08	0.1	-	50,103	3,732	4.2	25.2
77+50	4.18	4.01	0.17	-	50,083	3,922	4.2	25.2
80+00	3.56	4.22	-0.66	1.5	30,971	3,385	4.2	25.2
82+50	4.4	3.89	0.51	-	41,803	4,299	4.2	28.2
85+00	5.04	3.64	1.4	-	62,669	5,168	4.2	28.2
87+50	4.8	3.61	1.19	-	54,239	5,326	4.2	28.2
90+00	5.87	3.25	2.62	-	99,224	7,129	4.2	28.2
92+50	4.59	4.26	0.33	-	57,494	3,276	7.8	26.4
95+00	3.49	4.57	-1.08	2.45	25,444	2,670	7.8	26.4
97+50	3.49	3.78	-0.29	0.66	46,469	4,647	6	21.6
100+00	3.72	4.36	-0.64	1.45	56,167	3,077	6	21.6
102+50	3.48	3.85	-0.37	0.84	46,001	4,417	6	21.6
105+00	4.22	3.84	0.38	-	81,655	4,446	6	21.6

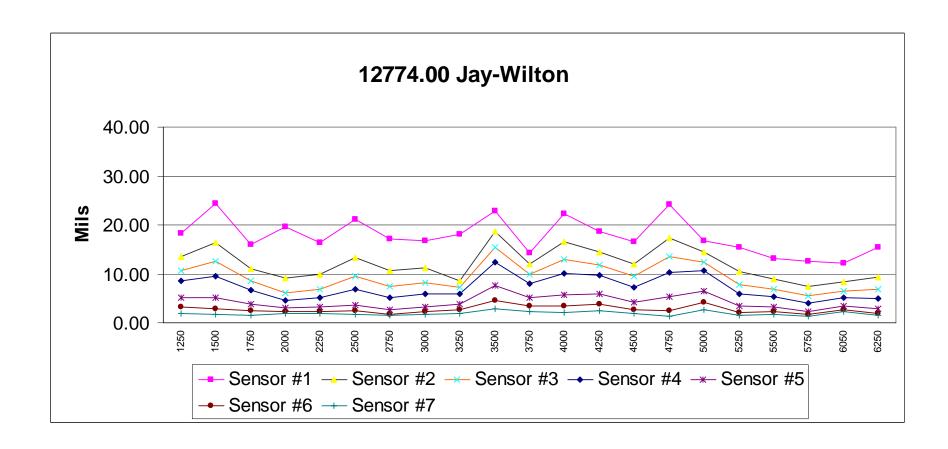
Weak Subgrade

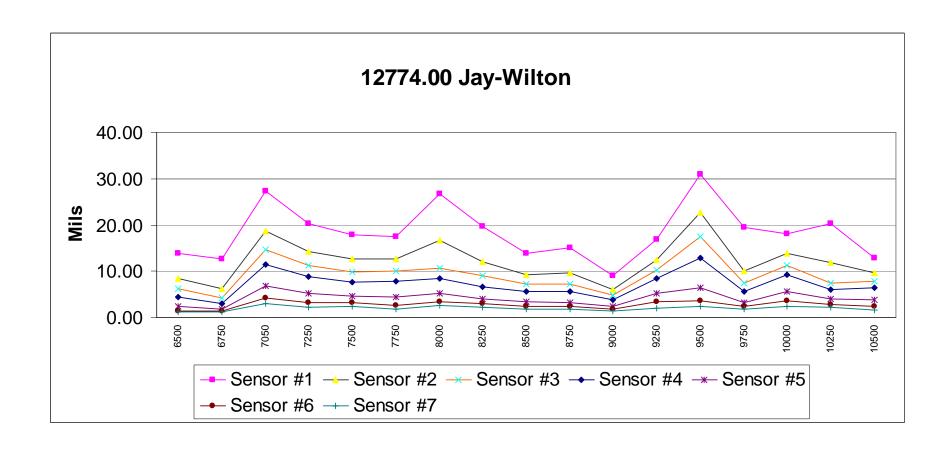
Strong Subgrade

^{*} For actual Gravel Depths, see logdraft forms









Performance Data Summary Sheet

Jay – Wilton Rte 156 CHIP 11774.00

Station	D E	Per	Mini forma			Data Boring Location (Plan View)		Ba Mate		Subgrade Soils	
(FWD)	F			teria				AASHTO Class	% #200	AASHTO Class	% #200
						KEY					
Station				– Fail 1 - Met		Solid Pave T Unbound Pav Base Thick (inches)	re - UP ness	Soil Type AASHTO Sample #	% 200 Frost Moisture	Soil Type AASHTO Sample #	% 200 Frost Moisture
						CL					
12+50	4					ı					
15+00	4						3.6 SP 4.8UP 10.8	SiGSa A-1-b S1	5 0 Damp	SiSa A-4 S2	41 III Damp
17+50	3								15+91 cross	pipe heaving	
20+00	2										
22+50	2										
25+00	2					3	3.6 SP - 20.4	SiSa A-2-4 S3	17 II Damp	GSiSa A-4 S4	38 III Moist
27+50	2								•		
30+00	2	es)	(S								
32+50	2	(4 inches)	(18 inches)	Si)							
35+00	3	- 'H	inc —	(3000 psi)	S						
37+50	2) S	18	8	sult						
40+00	3	Pavement Thickness	Thickness (Subgrade Modulus (3	in Results		6.0 SP 3.6 UP 6.0	SiGSA A-1-b S5	16 II Damp	GSaSi A-4 S6	53 IV Damp
42+50	3		- ick	upc -	Darwin 						
45+00	2	int 	- E	Ĭ	Ğ [—]			45+0	8 transverse	cracking (heav	ve?)
47+50	3	- au -	se	ıde -		ı					
50+00	3	ave 	Base	gre							
52+50	2	~~		Sub.							
55+00	2			. . .							
57+50	2										
60+50	2					ı					
62+50	2					4	4.2 SP - 16.2	SiSa A-2-4 S3	17 II Damp	GSaSi A-4 S6	53 IV Damp
65+00	2					62+8	7 transverse	cracking (hea			
67+50	2					68+00 -		heaving in vio	cinity of		
70+50	3								cut/fill b	oundary	

* SP = Solid Pavement Layer

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

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

Performance Data Summary Sheet

Jay – Wilton Rte 156 CHIP 11774.00

Station	D E	Per	Mini forma	ınce l				Ba Mate		Subg So:	
(FWD)	F		Crit	eria	ı	(Plan V		AASHTO Class	% #200	AASHTO Class	% #200
						Solid Pav	'				
Station				– Fail - Met		Unbound I Base Th (incl	Pave - UP ickness	Soil Type AASHTO Sample #	% 200 Frost Moisture	Soil Type AASHTO Sample #	% 200 Frost Moisture
						C	L				
70+50	2						4.6 SP - 19.4	SiGSa A-1-b S7	12 0 Damp	SaSi A-4 S8	52 IV Wet 3.7'
72+50	1										
75+00	0										
77+50	0										
80+00	1						4.2 SP 3.0 UP 18.0	SiSaG A-1-a S10	8 0 Damp	SiSa A-4 S11	39 III Moist
82+50	0								•		
85+00	0										
87+50	0	es)	(18 inches)	si)			4.2 SP 1.8 UP 20.4	SiSaG A-1-a S10	8 0 Damp	GSISa A-2-4 S12	26 II Moist
90+00	0	- ch	inc) p:					•		
92+50	0	1. 1.	18	00	S						
95+00	2	Thickness (4 inches)	Thickness (lus (3	Darwin Results		7.8 SP - 18.6	SiSaG A-1-a S10	8 0 Damp	SiSa A-4 S11	39 III Moist
97+50	2	ick _	ick	npc	. <u>H</u>				•		
100+00	3	Th.	- 년_	\breve{M}	arw _						
102+50	2	Pavement	Base	Subgrade Modulus (3000 psi)	D —		6.0 SP - 15.6	SiSaG A-1-a S10	8 0 Damp	SiSa A-4 S11	39 III Moist
105+00	1	ave 		qnş					•		
		P.									
										_	

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

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

PAVEMENT DEPTH INFORMATION

Jay - Wilton

Rte. 156 12774.00

STATION		LEFT		CL		RIGHT	
	15'	102	5,		5,	102	15'
	15′	10'	5′		5′	10'	15′
						(9')	
		6.0 SP	4.2 SP	5.4 SP	3.6 SP	3.6 SP	
15+00		1.8 UP	3.0 UP	1.8 UP	3.6 UP	4.8 UP	
		7.8	7.2	7.2	7.2	8.4	
			-		(7.5')		
25.00					3.6 SP		
25+00					-		
					3.6		
						(9')	
40+00		6.0 SP	6.0 SP	5.4 SP	6.0 SP	6.0 SP	
10100		1.8 UP	1.2 UP	1.8 UP	1.8 UP	3.6 UP	
		7.8	7.2	7.2	7.8	9.6	
		4 0 CD	2 6 0D	4.0 CD	2 6 0D	(8.0')	
62+50		4.8 SP	3.6 SP	4.2 SP	3.6 SP	4.2 SP	
		4.8	3.6	4.2	3.6	4.2	
		4.0	3.0	4.2	(7.0')	4.4	
					4.6 SP		
70+50					-		
					4.6		
					(6.5')		
80+00					4.2 SP		
80+00					3.0 UP		
					7.2		
87+50		4.8 SP	4.8 SP	5.4 SP	4.2 SP		
		2.4 UP	4.0	-	1.8 UP		
		7.2	4.8	5.4	6.0		
					(6.8') 7.8 SP		
95+00					7.6 SF -		
					7.8		
					(6.3')		
102 50					6.0 SP		
102+50					_		
					6.0		

State of Maine - Department of Transportation Pavement Core Summary Sheet

Town(s): Jay-Wilton Project Number: 12774.00

10W11(5).	Jay-Willon			Project Number. 12774			
Station	Offset	Pavement Depth	Unbound	PC-	Saved	Comments / Date	
(Feet)	(Feet)	(Feet)	Pavement	Number	Core	11/28/2006	
15+00	10.0 Lt.	0.50	0.50-0.65		no	5" Solid Stem Auger	
15+00	5.0 Lt.	0.35	0.35-0.60		no		
15+00	CL	0.45	0.45-0.60		no		
15+00	5.0 Rt.	0.30	0.30-0.60		no		
40+00	10.0 Lt.	0.50	0.50-0.65		no		
40+00	5.0 Lt.	0.50	0.50-0.60		no		
40+00	CL	0.45	0.45-0.60		no		
40+00	5.0 Rt.	0.50	0.50-0.65		no		
62+50	10.0 Lt.	0.40			no		
62+50	5.0 Lt.	0.30			no		
62+50	CL	0.35			no		
62+50	5.0 Rt.	0.30			no		
87+50	10.0 Lt.	0.40	0.40-0.60		no		
87+50	5.0 Lt.	0.40			no		
87+50	CL	0.45			no		
87+50	5.0 Rt.	0.35	0.35-0.50		no		
B		1				I.	

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

Town(s): Jay-Wilton

Project	Number:	12774.00
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	21.11	200					٠			—
Boring & Sample	Station	Offset	Depth	Reference		W.C.	_		assificatio	
Identification Number	(Feet)	(Feet)	(Feet)	Number	Sheet		200 Sieve		AASHTO	Frost
HB-JAWI-101, S1	15+00	9.0 Rt.	0.70-1.6	209776	1	7.0	5.1	SP-SM	A-1-b	0
HB-JAWI-101, S2	15+00	9.0 Rt.	1.6-5.0	209777	1	14.1	40.8	SM	A-4	Ш
HB-JAWI-102, S3	25+00	7.5 Rt.	0.30-2.0	209778	1	6.2	17.1	SM	A-2-4	II
HB-JAWI-102, S4	25+00	7.5 Rt.	3.3-5.0	209779	1	14.3	37.9	SM	A-4	Ш
HB-JAWI-103, S5	40+00	9.0 Rt.	0.80-1.3	209780	1	6.5	15.9	SM	A-1-b	П
HB-JAWI-103, S6	40+00	9.0 Rt.	1.3-5.0	209781	1	12.7	52.9	ML	A-4	IV
HB-JAWI-105, S7	70+50	7.0 Rt.	0.38-2.0	209782	2	4.8	11.5	SW-SM	A-1-b	0
HB-JAWI-105, S8	70+50	7.0 Rt.	2.0-3.7	209783	2	24.7	51.6	ML	A-4	IV
HB-JAWI-105, S9	70+50	7.0 Rt.	3.7-5.0	209784	2	38.8	48.4	SM	A-4	Ш
HB-JAWI-106, S10	80+00	6.5 Rt.	0.60-2.1	209785	2	2.7	8.2	GW-GM	A-1-a	0
HB-JAWI-106, S11	80+00	6.5 Rt.	2.1-5.0	209786	2	13.8	39.3	SM	A-4	III
HB-JAWI-107, S12	87+50	5.4 Rt.	2.2-3.9	209787	2	14.5	25.8	SM	A-2-4	II

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

N	Taine	Depa	artment	of Transporta	tion	ı	Project:	Route	156	Boring No.:	HB-JA	WI-101
		_ 5	Soil/Rock Expl JS CUSTOMA	oration Log			Location	ı: Jay-	Wilton, Maine	PIN:	1277	74.00
Drille	r:		MaineDOT		Eleva	ation	(ft.)			Auger ID/OD:	5" Dia.	
Oper			E. Giguere		Datu		(- /	NA	/D 88	Sampler:	Off Flights	
	ed By:		G. Lidstone		Rig T				k Mounted CME 45C	Hammer Wt./Fall:	N/A	
	Start/Fi	nish:	11/28/06-11/28	8/06	_		ethod:		1 Stem Auger	Core Barrel:	N/A	
	g Locat		15+00, 9.0' Rt.		Casir			N/A	1 Stem Plager	Water Level*:	None Observed	1
Definiti	ons:		13 · 00, 7.0 Kt.	•	Definiti	ions:				Definitions:	Trone Observed	•
MD = U U = Th R = Ro V = Ins		ful Split Spo be Sample ample hear Test	oon Sample attem	pt	T _V = Po q _p = Uo S _u (lab) WOH =	ocket T nconfir) = Lab = weigh	eld Vane S forvane Sho led Compre Vane She let of 140lb. let of rods	ear Strei essive St ar Streng	igth (psf) rength (ksf)	WC = water content, percent LL = Liquid Limit PL = Plastic Limit PI = Plasticity Index G = Grain Size Analysis C = Consolidation Test		
			,	Sample Information			,	ı				Laboratory
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		ption and Remarks		Testing Results/ AASHTO and Unified Class
0	S1		0.70 - 1.60			SSA	-0.30 -0.70		PAVEMENT.		0.30	
	S2		1.60 - 5.00			+	1		Unbound PAVEMENT.		0.70-	G#209776 A-1-b, SP-SM
	32		1.60 - 5.00				-1.60		Dark brown, damp, fine to coarse SA	ND, some gravel, little silt,		WC=7.0% G#209777
								000 000 0000	Brown, damp, sandy SILT, little grav	el.	1.00-	A-4, SM
								90 00				WC=14.1%
							1	6 6 66 6 6 6 6				
5 -						\perp	-5.00				5.00	
									Bottom of Exploration at NO REFUSAL	5.00 feet below ground sur	rface.	
							-					
							4					
10 -							1					
							4					
							1					
							4					
15 -												
13 -												
					-+		1					
							-					
					-+		1					
20 -					-+		4					
					T							
					-+		1					
							4					
25 -					-+		1					
Rema	ırks:											

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

Page 1 of 1

N	Aaine	Depa	of Transporta	tion		Project:	Route	156	Boring No.:	HB-JA	WI-102	
			Soil/Rock Expl JS CUSTOM				Locatio	n: Jay-	Wilton, Maine	PIN:	127	74.00
Drille	r:		MaineDOT		Elev	ation	(ft.)			Auger ID/OD:	5" Dia.	
Oper	ator:		E. Giguere		Datu			NA	/D 88	Sampler:	Off Flights	
Logg	ed By:		G. Lidstone		Rig	Type:		Tru	k Mounted CME 45C	Hammer Wt./Fall:	N/A	
	Start/Fir	nish:	11/28/06-11/2	8/06			ethod:	Soli	d Stem Auger	Core Barrel:	N/A	
Borir	g Locat	ion:	25+00, 7.5' Rt.		Casi	ing ID	/OD:	N/A		Water Level*:	None Observed	i
MD = U U = Th R = Ro V = Ins	lit Spoon S	ul Split Spoo e Sample imple near Test	on Sample attem		T _V = F q _p = U S _{u(late} WOH	Insitu F Pocket Unconfi b) = Lal = weig	ield Vane S Torvane SI ned Comp o Vane She ht of 140lb ht of rods	hear Stre ressive S ear Stren	ngth (psf) rength (ksf) yth (psf)	Definitions: WC = water content, percent LL = Liquid Limit PL = Plastic Limit PI = Plasticity Index G = Grain Size Analysis C = Consolidation Test		
		$\overline{}$		Sample Information			1	T				Laboratory
Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-value	Casing	Elevation (ft.)	Graphic Log	Visual Descri	ption and Remarks		Testing Results/ AASHTO and Unified Class
0	S3		0.30 - 2.00			SSA	-0.30	0	PAVEMENT.		0.30	G#209778
							-2.00		Brown, damp, fine to medium SAND	, little gravel, trace silt.	2.00	A-2-4, SM WC=6.2%
	S4		3.30 - 5.00				-3.30		Similar to above, but with cobbles.		3.30	G#209779
	34		3.30 - 3.00				_		Brown, moist, silty fine to medium S.	AND, cobbles, little gravel,	trace coarse sand.	A-4, SM WC=14.3%
- 5 -							-5.00	0	Bottom of Exploration at NO REFUSAL	5.00 feet below ground su	5.00	
									NO REPUSAL			
- 10 -												
10												
							_					
					<u></u>							
- 15 -							+					
					 		+					
							1					
- 20 -												
- 25 -												
Rema	arks:						-	•				•

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

Page 1 of 1

Location: Jay-Wilton, Maine PIN: 12774.00	N	Taine	Depa	artment	of Transporta	tion		Project:	Route	156	Boring No.:	HB-JA	WI-103
Design Designer			_ 5	Soil/Rock Expl	oration Log			Location	ı: Jay-	Wilton, Maine	PIN:	127	74.00
Design Designer	Drille	r:		MaineDOT		Eleva	ation	(ft.)			Auger ID/OD:	5" Dia.	
Lagged By: G Islamor New York New						+		()	NAV	/D 88			
Date Satisfy Friedrich 11/28/06 Defining Methods Solid Stern Auges Core Barels N/A						-					· ·		
Bering Location: 40 00, 90 %; Desiring Blobs: Desiring B			nish:		8/06	+		ethod:					
Definition Def						1				1 Stem Plager			4
Column C	Definition D = Spl MD = U U = Thi R = Roo V = Insi	ons: it Spoon S Insuccessf n Wall Tub ck Core Sa itu Vane SI	Sample ful Split Spo be Sample ample hear Test	,		Definiti Su = In Tv = Po qp = U Su(lab) WOH =	ons: nsitu Fi ocket \(\) nconfir \() = Lab \() = weigh	eld Vane S Forvane Sh ned Compro Vane She It of 140lb.	hear Stre ear Strer essive St ar Streng	igth (psf) rength (ksf)	Definitions: WC = water content, percent LL = Liquid Limit PL = Plastic Limit Pl = Plasticity Index G = Grain Size Analysis	None Observe	
Testing Result			ſ		Sample Information			_					Laboratory
SS		Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-value	Casing Blows	Elevation (ft.)	Graphic Log		ption and Remarks		Testing Results/ AASHTO
Bown, damp, andy SILT, cobbles, little gravel. 5.00 Bottom of Exploration at 5.00 feet below ground surface. 10 10 20 25	0	S5		0.80 - 1.30			SSA	-0.50		PAVEMENT.		0.50	
Bown, damp, andy SILT, cobbles, little gravel. 5.00 Bottom of Exploration at 5.00 feet below ground surface. 10 10 20 25		\$6		1.30 5.00				-0.80 -1.30		Unbound PAVEMENT.			G#209780
Bown, damp, sandy SILT, cobbles, little gravel. A-A, ML WC=12.7% Bottom of Exploration at 5.00 feet below ground surface. NO REFUSAL 15		50		1.30 - 3.00				-		Brown, damp, fine to medium SAND	, some gravel, trace coarse s	and, (Fill).	WC=6.5%
5.00 Bottom of Exploration at 5.00 feet below ground surface. 10 15 20								╛		Brown, damp, sandy SILT, cobbles, l	ittle gravel.	1.50	A-4, ML
									4.				WC=12.7%
							1	1					
NO REPUSAL NO REPUSAL 10 20 22 23	- 5 -					-	V	-5.00		Pottom of Evaloration at	5 00 foot below ground sur		
20								_		NO REFUSAL	5.00 feet below ground sur	race.	
20													
20								1					
20								\dashv					
20								4					
20	10												
20	10							7					
20								\dashv					
20								4					
20													
20								1					
20								-					
- 25	- 15 -							4					
- 25													
- 25													
- 25						\dashv		1					
- 25								-					
- 25													
- 25													
	20 -							┪					
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Remarks:	23]					
	Rema	rks.											

* 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.

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Maine Department of Transpo Soil/Rock Exploration Log US CUSTOMARY UNITS					ation		Project:	Route	156	Boring No.:	HB-JA	WI-104
						ļ	Locatio	n: Jay-	Wilton, Maine	PIN:	127′	74.00
Drille	r:		MaineDOT		Eleva	ation	(ft.)			Auger ID/OD:	5" Dia.	
Opera	ator:		E. Giguere		Datu	m:		NA	VD 88	Sampler:	Off Flights	
Logg	ed By:		G. Lidstone		Rig 1	Гуре:		Tru	k Mounted CME 45C	Hammer Wt./Fall:	N/A	
Date	Start/Fir	nish:	11/28/06-11/2	8/06	Drilli	ng Me	ethod:	Soli	d Stem Auger	Core Barrel:	N/A	
Borin	g Locati	ion:	62+50, 8.0' Rt	•		ng ID/	OD:	N/A		Water Level*:	None Observed	i
MD = U U = Thi R = Ro V = Ins	it Spoon S	ul Split Sp be Sample ample hear Test			T _V = P q _p = U S _{u(lab} WOH:	nsitu Fie Pocket T Inconfin) = Lab = weigh	eld Vane S orvane Sh ned Compr Vane She nt of 140lb.	ear Stre essive S ar Stren	ngth (psf) rength (ksf) yth (psf)	Definitions: WC = water content, percent LL = Liquid Limit PL = Plastic Limit PI = Plasticity Index G = Grain Size Analysis C = Consolidation Test		
				Sample Information	Т		1					Laboratory
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		ption and Remarks		Testing Results/ AASHTO and Unified Class
0						SSA	-0.35		PAVEMENT.		0.35	
							1 70		Brown, damp, fine to medium SAND), little gravel, trace silt.≅S3	1.70	
							-1./0		Brown, damp, sandy SILT, cobbles,	little gravel.≅S6	1.70	
· 5 -						$\frac{1}{}$	-5.00				5.00	
									Bottom of Exploration at NO REFUSAL	5.00 feet below ground su		
10 -												
15 -												
20 -												
25 -												
Rema	ırks:											

* 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.

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N	Taine	Dep	artment	of Transporta	tion	F	Project:	Route	156	Boring No.:	HB-JA	WI-105
			Soil/Rock Expl US CUSTOMA			L	_ocation	: Jay-	Wilton, Maine	PIN:	127	74.00
Drille	r:		MaineDOT		Eleva	ation ((ft.)			Auger ID/OD:	5" Dia.	
Opera	ator:		E. Giguere		Datu		. ,	NA	'D 88	Sampler:	Off Flights	
-	ed By:		G. Lidstone		+	Гуре:			k Mounted CME 45C	Hammer Wt./Fall:	N/A	
	Start/Fir	nieh:	11/28/06-11/28	8/06	+ <u> </u>	ing Me	thod:		1 Stem Auger	Core Barrel:	N/A	
	g Locat		70+50, 7.0' Rt.		+	ng ID/		N/A	r Stein / tuger	Water Level*:	3.7' bgs.	
Definition D = Spl MD = U U = Thi R = Roo V = Insi	ons: lit Spoon S	Sample ful Split Spo pe Sample ample hear Test	oon Sample attem	pt	Definit Su = II Tv = P qp = U Su(lab)	tions: nsitu Fie Pocket To Jnconfin o) = Lab = weigh	eld Vane Sl	near Stre ear Strer essive St ar Streng	gth (psf) rength (ksf)	Definitions: WC = water content, percent LL = Liquid Limit PL = Plastic Limit Pl = Plasticity Index G = Grain Size Analysis C = Consolidation Test	3.7 Ugs.	
		Ι _		Sample Information								Laboratory
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		ption and Remarks		Testing Results/ AASHTO and Unified Class
0	S7		0.38 - 2.00			SSA	-0.38		PAVEMENT. Brown, damp, fine to coarse SAND, s	some gravel, trace silt, (Fill).	0.38	G#209782 A-1-b, SW-SM
			1				-2.00				2.00	WC=4.8%
	S8		2.00 - 3.70						Brown, moist, silty fine SAND.		2.00	G#209783 A-4, ML WC=24.7%
	S9		3.70 - 5.00				-3.70				3.70	
						\/	1		Brown, wet, silty fine SAND.			A-4, SM
5 -							-5.00	111111111	Bottom of Exploration at	5.00 feet below ground sur	5.00- face.	WC=38.8%
									NO REFUSAL			
					_		-					
10 -												
							-					
15 -												
							1					
					_		-					
					_		-					
					\dashv		+					
20 -					\dashv		+					
					\dashv		+					
					\dashv		-					
					_		-					
					\dashv		4					
25 -							4					
Rema	ırks:						-					

* 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.

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N	laine	Dep	artment	of Transporta	rtation Project: Route 156 Boring No.						HB-JA	WI-106
			Soil/Rock Expl US CUSTOM/			ļ	Locatior	ı: Jay-	Wilton, Maine	PIN:	1277	74.00
Drille	r:		MaineDOT		Eleva	ation	(ft.)			Auger ID/OD:	5" Dia.	
Opera	tor:		E. Giguere		Datu	m:		NA	7D 88	Sampler:	Off Flights	
Logge	ed By:		G. Lidstone		Rig T	уре:		Truc	k Mounted CME 45C	Hammer Wt./Fall:	N/A	
Date S	Start/Fir	nish:	11/28/06-11/2	8/06	Drilli	ng Me	ethod:	Soli	l Stem Auger	Core Barrel:	N/A	
Borin	g Locat	ion:	80+00, 6.5' Rt		Casir	ng ID/	OD:	N/A		Water Level*:	None Observed	i
MD = U U = Thir R = Roo V = Insi	it Spoon S nsuccessf	ful Split Spo be Sample ample hear Test	oon Sample attem		T _V = Po q _p = U S _{u(lab)} WOH =	nsitu Fie ocket T Inconfin) = Lab = weigh	eld Vane S Forvane Sh ned Compre Vane She nt of 140lb.	ear Strei essive S ar Streng	igth (psf) rength (ksf)	Definitions: WC = water content, percent LL = Liquid Limit PL = Plastic Limit PI = Plasticty Index G = Grain Size Analysis C = Consolidation Test		
ŀ				Sample Information			1					Laboratory
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		ption and Remarks		Testing Results/ AASHTO and Unified Class
0	S10		0.60 - 2.10			SSA	-0.35 -0.60		PAVEMENT.		0.35-	G#209785
ŀ							7		Unbound PAVEMENT.		0.60-	A-1-a, GW-GM
ŀ							-2.10		Damp GRAVEL, some brown, fine to	o coarse sand, trace silt, (Fill). ————————————————————————————————————	WC=2.7% G#209786
	S11		2.10 - 5.00				$\frac{1}{2}$	6 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	Brown, moist, silty fine SAND, trace	medium and coarse sand, tra	ace gravel.	A-4, SM WC=13.8%
ŀ							1	0 0 00				
5						V	-5.00		Bottom of Exploration at NO REFUSAL	5.00 feet below ground sur	5.00- rface.	
									NO KLI OSAL			
-							-					
							-					
10												
Ī							1					
ŀ							\dashv					
ŀ							4					
15												
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ŀ							-					
ľ							1					
20							-					
							4					
ŀ					\dashv		1					
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25							_					
23												
Rema	rks:	 	1		Ł		=					L

* 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.

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N	Taine	Dep	artment	of Transporta	tion		Project:	Route	156	Boring No.:	HB-JA	WI-107
		- ;	Soil/Rock Expl US CUSTOMA	oration Log		- 1	Location	1: Jay-	Wilton, Maine	PIN:	127	74.00
Drille	r:		MaineDOT		Elev	ation	(ft.)			Auger ID/OD:	5" Dia.	
Opera			E. Giguere		Datu		,	NA'	/D 88	Sampler:	Off Flights	
Logg	ed By:		G. Lidstone		Rig	Type:			k Mounted CME 45C	Hammer Wt./Fall:	N/A	
	Start/Fir	nish:	11/28/06-11/28	8/06	+		ethod:		l Stem Auger	Core Barrel:	N/A	
	g Locat		87+50, 5.4' Rt.		_	ing ID		N/A		Water Level*:	None Observed	d.
Definition D = Spi MD = U U = Thi R = Ro V = Ins	ons: lit Spoon S	ample ful Split Spo te Sample ample hear Test	oon Sample attem	pt	Defini S _u = I T _V = I q _p = I S _u (lal WOH	itions: Insitu Fi Pocket Unconfir b) = Lab	eld Vane S Forvane Sh	hear Stre ear Stre essive Streng	igth (psf) rength (ksf) th (psf)	Definitions: WC = water content, percent LL = Liquid Limit PL = Plastic Limit Pl = Plasticity Index G = Grain Size Analysis C = Consolidation Test		
				Sample Information			_	1				Laboratory
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		ption and Remarks		Testing Results/ AASHTO and Unified Class
0				T	Ī	SSA	-0.35 -0.50		PAVEMENT.		0.35	
						+	T -0.30		Unbound PAVEMENT.		0.50	
						+	-2.20		Damp GRAVEL, some brown, fine to	coarse sand, trace silt, (Fill). ≅S10 —————2.20	
	S12		2.20 - 3.90						Grey, damp, silty fine to coarse SAN	D, frequent cobbles, little gra	avel.	G#209787 A-2-4, SM WC=14.5%
· 5 -						$\overline{\mathbf{V}}$	-3.90 -5.00	0000	Brown, moist, silty fine SAND, trace	medium and coarse sand, tra	3.90 ace gravel.≅S11 ——5.00	
3 -							-5.00		Bottom of Exploration at NO REFUSAL	5.00 feet below ground sur		
							-					
							1					
10 -												
							-					
15 -							-					
							-					
20 -							+					
							4					
							-					
25 -							+					
Rema	ırks:											<u> </u>

* 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.

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Driller Opera	itor:		US CUSTOMA				ocation	. Iov	Wilton Maina	DIN.		
	itor:	Soil/Rock Exploration Log US CUSTOMARY UNITS Driller: MaineDOT Operator: F. Gignere					Location: Jay-Wilton, Maine vation (ft.)			PIN:	127	74.00
Opera		E. Giguere			Elev	ation ((ft.)			Auger ID/OD:	5" Dia.	
					Datu			NA	/D 88	Sampler:	Off Flights	
Logge	ea Bv:		G. Lidstone			Type:			k Mounted CME 45C	Hammer Wt./Fall:	N/A	
	Start/Fin	nish:	11/28/06-11/28	8/06		ing Me	thod:		l Stem Auger	Core Barrel:	N/A	
	g Locati		95+00, 6.8' Rt.		_	ing ID/		N/A		Water Level*:	None Observe	d
Definition D = Split MD = U U = Thir R = Roo V = Insit	Definitions: D = Spilt Spoon Sample MD = Unsuccessful Spilt Spoon Sample attempt U = Thin Wall Tube Sample R = Rock Core Sample V = Institu Vane Shear Test SSA = Solid Stem Auger Sample Information				Defini S _U = I T _V = F q _p = U S _U (lat WOH	itions: Insitu Fie Pocket To Unconfine	eld Vane S orvane Sh ed Compro Vane She t of 140lb.	hear Stre ear Strer essive St ar Streng	renath (ksf)	Definitions: WC = water content, percer LL = Liquid Limit PL = Plastic Limit PI = Plasticity Index G = Grain Size Analysis C = Consolidation Test		1
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 Descri	ption and Remarks		Laboratory Testing Results/ AASHTO and Unified Class
0						SSA	-0.65		PAVEMENT.		0.65	
							-2.20		Damp GRAVEL, some brown, fine to Brown, moist, silty fine SAND, trace		ll).≅S10 ————2.20	
5 -							-5.00	80000000000000000000000000000000000000			5.00	
-									Bottom of Exploration at NO REFUSAL	5.00 feet below ground su	ırface.	
10												
15 -												
20												
-												
25 -	rke:											

* 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.

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N	Maine	Depa	rtment	of Trans	sporta	tion	F	Project:	Route	156	Boring No.:	HB-JA	WI-109
			oil/Rock Expl JS CUSTOMA	-			L	_ocatior	ı: Jay-	Wilton, Maine	PIN:	127′	74.00
Drille	er:		MaineDOT			Elev	ation ((ft.)			Auger ID/OD:	5" Dia.	
Oper	ator:		E. Giguere			Dati	ım:		NA	VD 88	Sampler:	Off Flights	
Logg	jed By:		G. Lidstone			Rig	Type:		Tru	ck Mounted CME 45C	Hammer Wt./Fall:	N/A	
Date	Start/Fir	nish:	11/28/06-11/2	8/06		Drill	ing Me	thod:	Soli	d Stem Auger	Core Barrel:	N/A	
Borir	ng Locat	ion:	102+50, 6.3' R	t.		Cas	ing ID/	OD:	N/A		Water Level*:	None Observed	i
MD = 1 U = Th R = Ro V = Ins	olit Spoon S	ful Split Spoo be Sample ample hear Test	on Sample attem			S _u = T _v = q _p = S _{u(la} WOH	Pocket Tourner	orvane Sh ed Compre Vane She t of 140lb.	ear Stre	trenath (ksf)	Definitions: WC = water content, percen LL = Liquid Limit PL = Plastic Limit Pl = Plasticity Index G = Grain Size Analysis C = Consolidation Test	t	
		_		Sample Infor				1		-			Laboratory
Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength	(pst) or RQD (%)	N-value	Casing Blows	Elevation (ft.)	Graphic Log		ption and Remarks		Testing Results/ AASHTO and Unified Class
0							SSA	-0.50		PAVEMENT. Damp GRAVEL, some brown, fine to	o coarse sand, trace silt, (Fil	0.50- l).≅S10	
								-1.80	85 85 85 85 85 85 85 85 85 85 85 85 85 8	Brown, moist, silty fine SAND, trace	medium and coarse sand, to	1.80- race gravel.≅S11	
- 5 -							<u></u>	-5.00	80 80 80	Detter & Frankrike	5 00 footbales are also	5.00	
										NO REFUSAL	5.00 feet below ground su	riace.	
- 10 -													
- 15 -								-					
								-					
								1					
- 20 -								1					
					+	-		\dashv					
								_					
							_						
								1					
								1					
- 25 -	-				+			1					
Rema	arks:							4					

STRONG ODOR IN THIS BORING.

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.

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