

Highway Program

Brad Foley, Program Manager

Memorandum

DATE: February 13, 2004

TO: Robert Hough

DEPT: Region 1

FROM: Scott A. Hayden

DEPT: Highway Program

SUBJECT: 12740.00 Auburn Soils Information, Report # 2009-105
Intersection of Hotel Rd and Young's Corner RD

Site Description

A subsurface investigation has been completed for a four way intersection consisting of Hotel Road and Young's Corner Road in the town of Auburn. Three of the four 500' long legs of the intersection appear to be in fair to good condition. However, the west leg of the Young's Corner Road is severely rutted and is in poor condition. The subsurface investigation examined all four legs of the intersection with focused attention directed to the rutted area. On the west leg of the Young's Corner Road, the investigation also extended 1600 feet from the intersection for possible highway rehabilitation. The summary of the investigation area is listed below:

Hotel Road

South Leg : Station 8+00 – 13+18, Station 13+18 = centerline of intersection

North Leg : Station 13+18 – 18+00, Station 13+18 = centerline of intersection

Young's Corner Road

West Leg : Station 16+00 – 34+93, Station 34+93 = centerline of intersection

East Leg : 47+00 – 52+10, Station 52+10 = centerline of intersection



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. It should be noted that the borings were conducted in the winter (1/21/09). Because of the presence of frost, the exact boundary between the existing granular base member and the underlying subgrade soils becomes more difficult to identify. In addition the gradation of samples of the frozen base material may be skewed due to auger grinding. To avoid any potential errors, we have assumed the existing base material is an A-1-b soil for the purposes of FWD calculations.

Project stationing was not present in the field at the time of testing. Stationing was assigned to FWD and boring locations using a distance measuring instrument (DMI) and a preliminary plan view. FWD testing was conducted prior to the availability of a preliminary plan. Stationing for the FWD was later converted to reflect the stationing detailed on the preliminary plan view.

INVESTIGATION RESULTS

HOTEL ROAD – South Leg (Station 8+00 – 13+18)

Soils Information

The roadway is in good condition in this area. Field work consisted of two power auger borings and one power auger probe (See boring and probe logs). The existing base thickness ranged between 15.0” – 16.2” with an average thickness of 15.6”. The base material consists of a moist silty gravelly sand (S13) classified (AASHTO) as an A-1-b soil with 18% passing the #200 sieve.

The subgrade soils consist of a gold damp silty sand (S14) and is classified (AASHTO) as an A-2-4 with 10% fines. This material has a relatively low water content and appears to be draining adequately. There are no specific soil concerns for this leg of the intersection.

FWD Results

Between stations 10+00 and 12+50 the existing structural number fails to meet the future traffic structural number (See attached FWD Calculations). This is primarily due to the high future traffic requirement used for the FWD calculations. If the deficiency is corrected with additional pavement alone an overlay thickness of 1 inch would be required to meet the future traffic structural number. From station 12+50 to the center of the intersection (13+18) the existing structural numbers meets the future traffic number.

Between stations 10+00 and 12+50 the subgrade resilient modulus ranges between 4613 psi. and 5266 psi. A subgrade resilient modulus of 4900 psi is recommended for the south leg of Hotel Road. The subgrade resilient modulus is highest (9,227psi.) at station 8+18. This may be indicative of shallow bedrock. If there was ever any consideration of lowering the crest of this knoll, additional probes would be recommended to determine if shallow bedrock exists. Since this station was beyond the limits of the project power auger probes were not conducted. Bedrock is not anticipated to be encountered within the intersection leg limits. A power auger was conducted at the beginning station of 10+00 and penetrated to a depth of 5 feet without encountering a refusal.

INVESTIGATION RESULTS

HOTEL ROAD – North Leg (Station 13+18 – 18+00)

Soils Information

The roadway is in good condition in the immediate area of the intersection. Three power auger borings were conducted (See boring logs). The existing base thickness varied considerably ranging between 9.6” – 36” with an average thickness of 20”. The base material consists of a moist silty gravelly sand (S16) classified (AASHTO) as an A-1-b soil with 16% passing the #200 sieve. At station 15+00 an existing base thickness of 36” was reported. It is likely that frozen soil conditions and the presence of granular subgrade soils may have affected the identification of the exact boundary between the existing base member and the underlying soil member.

The subgrade soils in the immediate vicinity of the intersection consist of a gold damp silty sand (S14) classified (AASHTO) as an A-2-4 with 10% fines. This material has a relatively low water content and appears to be draining adequately. However, as you descend north away from the intersection (14+50 – 18+00) the subgrade soils become a wet silty sand (S17, S18) classified (AASHTO) as an A-2-4 with 19 – 26 % fines. Wet soil conditions were encountered at 3.5’ below the pavement at station 15+00 and 1.3’ at station 18+00. These subgrade soils will need to be adequately drained.

FWD Results

Between stations 13+18 – 15+00 the existing structural number meets the future traffic structural number (See attached FWD Calculations). Beyond station 15+00 the existing structural number fails to meet the future traffic structural number. If the deficiency is corrected with additional pavement alone an overlay thickness of $\frac{3}{4}$ inch would be required to meet the future traffic structural number.

The subgrade resilient modulus is highest (6194 psi. – 6393 psi.) in the immediate area of the intersection and drops off as you descend north away from the intersection. The reduction in the subgrade modulus value is likely due to the increase in water content and fines in the silty sandy subgrade soils. A subgrade resilient modulus value of 3500 psi is recommended for the north leg of Hotel Road.

INVESTIGATION RESULTS

YOUNG'S CORNER ROAD – East Leg (Station 47+00 – 52+10)

Soils Information

The roadway is in good condition in the immediate area of the intersection. Field work consisted of two power auger borings and two power auger probe (See boring and probe logs). The existing base thickness was generally 17". The base material consists of a moist silty gravelly sand (similar to S16) and is classified (AASHTO) as an A-1-b soil with 16% passing the #200 sieve.

The subgrade soils between stations 51+00 and 52+10 consist of a gold damp silty sand (similar to S14) and is classified (AASHTO) as an A-2-4 with 10% fines. This material has a relatively low water content (5.1%) and appears to be draining adequately.

However between stations 47+00 and 51+00 the subgrade soil consists of moist clay (S20) classified (AASHTO) as an A-6 soil with 91% fines. This soil is plastic and is subject to considerable volume changes between wet and dry states. This material has a high dry strength but will lose much of this strength upon absorbing water. Samples taken of this material indicate a high water content of 21.6%. It is anticipated that these clay soils will be moist to wet year round. Without aggressive drainage these soils tend to remain poorly drained and will absorb water by capillary action. Capillary action may hold moisture above the ground water table against the force of gravity (capillary fringe). Thus moisture cannot be removed by gravity (shallow ditch). The only way to affect the height of the capillary fringe is by lowering the water table (i.e. deep ditch, underdrain) or by providing a capillary break. These soils may become soft especially during the spring between stations 47+00 - 51+00 (See FWD comments below). Future pavement performance will be reduced in this area if these soils are not adequately drained.

FWD Results

The existing structural number fails to meet the future traffic structural number throughout the east leg of the Young's Corner Road. This is likely due to the high future traffic requirement used for the FWD calculations and the presence of clay subgrade soils. If the deficiency is corrected with additional pavement alone an overlay thickness of 3 inches would be required to meet the future traffic structural number. See attached FWD calculations.

The subgrade resilient modulus values for the east leg vary from 2662 psi. – 3550 psi. with an average value of 3400 psi.. The subgrade resilient modulus is highest (6194 psi, 13+19) in the immediate area of the intersection and drops off as you move east. The lowest value for the east leg of Young's Corner Road is 2662 psi. This value was encountered at station 47+09 which is outside of the proposed construction limits. A subgrade resilient modulus value of 3200 psi is recommended for the east leg of Young's Corner Road.

Due to the clay soils and relatively low subgrade modulus values the soils may become soft especially during the spring between stations 47+00 - 51+00. 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 and design expectations should take this into consideration.

INVESTIGATION RESULTS

YOUNG'S CORNER ROAD – West Leg (Station 16+00 – 34+93)

Soils Information

The roadway is in good condition in the immediate area of the intersection (Station 34+00 - 34+93). However, the roadway conditions become poor as you extend westerly beyond the intersection. The roadway is in particularly poor condition between stations 29+00 and 33+50 due to rutting in both travel lanes. In this particular poor performing area the existing ground surface slopes downward right to left. The right lane appears to be built on native soils (cut section) whereas the left lane is built upon fill material. The ditching on the right is inadequate to non-existent.

Field work consisted of twelve power auger borings and seven power auger probes (See boring and probe logs). Nine of twelve borings were conducted between stations 29+00 and 33+50 to investigate the rutting. Base material consists of moist to wet silty gravelly sand (S7, S9) and moist to wet gravelly silty sand (S4, S11). These soils are classified (AASHTO) as an A-1-b and A-2-4 soil respectively. Percentages passing the #200 sieve ranged between 12% and 22%. The existing base thickness varied considerably between 16" – 32". In several locations between stations 29+00 and 33+50 the existing base thickness in the right outer wheel path was 4" to 9" less than in the left outer wheel path. See Table I on the following page.

As you move away from the immediate intersection area (fill) into the rutted area, the subgrade soils become wet and extremely silty. These silty subgrade soils consist of moist to wet sandy silt and moist clay. (See Table I.). The sandy silt (S5) is classified (AASHTO) as an A-4 soil and is highly frost susceptible. This soil is poorly drained and will swell and lose much of its stability unless properly compacted and drained. The clay soil (S8) is classified (AASHTO) as an A-6 soil. This soil is extremely silty (94% passing #200 sieve) and is plastic. The clay soil is poorly drained and can absorb water by capillary action. This material had the highest water content (24%) of any sample taken. Clay soils are subject to considerable volume changes with changing water content. They have a high dry strength but lose much of this strength upon absorbing water. It is anticipated that these soils will be moist to wet year round. Capillary action may hold moisture above the ground water table against the force of gravity (capillary fringe). Thus this moisture cannot be removed by gravity (shallow ditch). The only way to affect the height of the capillary fringe is by lowering the water table (i.e. deep ditch, underdrain) or by providing a capillary break.

Wet soil conditions were encountered along the entire west leg (16+00 – 34+93) of the Young's Corner except in the immediate intersection area. Water was encountered within the existing base member as well as in the underlying subgrade soils (See Table I). It is critical that these moisture sensitive soils be drained if future design/performance expectations are to be realized. These soils could be soft especially during the spring between stations 19+00 – 33+50. The area between stations 25+00 – 33+00 is of the greatest concern (See FWD comments on the next page).

Table I. Boring Log Profile
 West Leg – Young’s Corner Road
 Intersection CL = 34+93

Station	Left Travel Lane	Centerline	Right Travel Lane
32+00			
Existing Base	25” Damp SiSa (WC=19)	17” Damp SiSa (WC=19)	32” Wet GSiSa (WC=15)
Subgrade Soil	Wet SiSa (44 % fines, WC=23)	Moist SiSa (34 % fines, WC=9)	Wet SiSa (44 % fines, WC=23)
	Wet @ 2.3’		Wet @ 0.35’
30+00			
Existing Base	20” Wet GSiSa (WC=15)	23” Wet GSiSa (WC=15)	16” Wet GSiSa (WC=15)
Subgrade Soil	Damp SiSa (28 % fines, WC=14)	Moist SaSi (63 % fines, WC=23)	Moist SaSi (63 % fines, WC=23)
	Wet @ 0.35’	Wet @ 0.35’	Wet @ 0.35’
28+00			
Existing Base	22” Damp SiGSa (WC=7)	25” Damp SiGSa (WC=7)	13” Damp SiGSa (WC=7)
Subgrade Soil	Moist Clay (94 % fines, WC=24)	Moist Clay (94 % fines, WC=24)	Moist Clay (94 % fines, WC=24)
21+00			
Existing Base	23” Damp SiGSa (WC=6)		15” Damp SiGSa (WC=6)
Subgrade Soil	Moist SiSa (35 % fines, WC=19)		Wet SiSa (35 % fines, WC=19)
			Wet @ 1.6’
19+00			
Existing Base			23” Moist GSiSa (WC=18)
Subgrade Soil			Wet SiGSa (13 % fines, WC=8.4)
			Wet @ 2.2’

<p>Legend GSiSa – Gravelly Silty Sand SiGSa – Silty Gravelly Sand SiSa – Silty Sand SaSi – Sandy Silt WC = Water Content</p>
--

FWD Results

The west leg of the Young’s Corner Road is in poor condition beyond the immediate intersection area. The worse area is between stations 29+00 and 33+50 due to rutting in both travel lanes. The FWD focused its testing within this area. Although the FWD collection was limited to between stations 29+94 – 34+93 it is anticipated that a similar conditions extend to station 19+00.

The subgrade modulus values for the west leg of Young’s Corner Road are the lowest of any encountered throughout the project area. They vary between 2176 psi. – 2997 psi. with an average value of 2710 psi.. It is not surprising that the pavement is plagued with rutting in this area. An area having a value of 3000 psi. or less is usually flagged as a possible problematic soil performance area. The only exception to these low values is the values obtained in the immediate area of the intersection. A subgrade resilient modulus value of 2700 psi is recommended for the west leg of Young’s Corner Road.

Based upon FWD and boring data the soils could be soft especially during the spring between stations 19+00 – 33+50. The area between stations 25+00 – 33+00 is of greatest concern due the presence of clay soils, wet soil conditions, very low subgrade modulus, and poor existing pavement performance. 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.

Bedrock

All 18 power auger borings conducted for this project extended to a depth of 5' without encountering any refusals. All 10 power auger probes conducted at proposed catch basin areas extended to a depth of 10' without encountering any refusals (see probe data below). No rock excavation is anticipated within the preliminary design limits depicted at the time of this investigation.

Based upon FWD deflection data, bedrock could be < 10' between stations 8+00 and 9+00 on the south leg of Hotel Road. However, these stations are currently outside of the proposed design area.

Table II. Power Auger Probes for Catch Basin Areas

Station (Feet)	Offset (Feet)	Weathered Rock (Feet)	Refusal (Feet)	No Refusal (Feet)	Water Depth (Ft.)	Comments / Date 1/22/2009
West Leg Youngs Corner Road						
21+58	14.9 Lt.			10.0	7.0	
23+00	15.2 Lt.			10.0		
23+00	8.7 Rt.			10.0		
29+59	11.4 Rt.			10.0		
32+50	12.3 Rt.			10.0		
34+32	10.9 Rt.			10.0		
32+35	21.8 Lt.			10.0		
Hotel Road						
12+57	11.0 Lt.			10.0		
East Leg Youngs Corner Road						
50+72	13.0 Rt.			10.0		
50+72	11.0 Lt.			10.0		

Recommendations

1. Due to varied subgrade soil conditions and differences in the 18-KIP Equivalent P 2.5 values being used for each of the intersection legs, the following subgrade resilient modulus values are recommended for the individual legs:

Subgrade Resilient Modulus Value	Station
4900 psi	Hotel Road – South Leg (Station 8+00 – 13+18)
3500 psi	Hotel Road – North Leg (Station 13+18 – 18+00)
3200 psi	Young's Corner Road - East Leg (Station 47+00 – 52+10)
2700 psi	Young's Corner Road – West Leg (Station 16+00 – 34+93)

2. Full depth reconstruction is recommended for the west leg of the Young's Corner Road due to existing failing pavement conditions, varied and inadequate base thickness, wet base and subgrade conditions, presence of moisture sensitive subgrade soils and very low subgrade modulus values. The highest risk area is between stations 25+00 – 33+00.

If raising the vertical grade is not issue, a variable depth gravel application could be considered. Such an application would provide additional base material resulting in an increase in the structural capacity. In addition the existing base member could serve as a stable construction

platform as well as a separator and capillary barrier. By raising the grade you in affect lower the water table.

- Moisture sensitive subgrade soils could become problematic during construction, especially during the spring and early summer. It is strongly recommended that the existing pavement surface not be removed for recycling or reconstruction until absolutely necessary. The roadway could become unstable under loading after the existing pavement surface is removed. Additional base material could be required to facilitate construction and traffic flow if the subgrade soils become unstable. The new pavement surface should be placed as soon as possible. Specific areas of concern are listed below:

Station	Soil Description	% Fines,	Water Content	Subgrade Resilient Modulus (psi)
25+00 – 33+00	Wet Sandy Silt, Moist Clay	63% - 94%	23	2176 - 2997
47+00 – 51+00	Moist Clay	91%	22	2662 - 3821

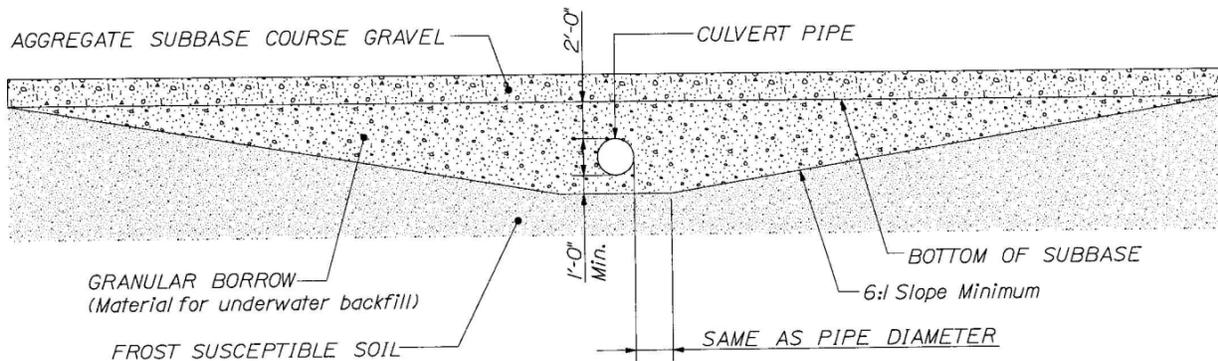
- It is recommended that the areas listed above containing moisture sensitive soils be drained well before the existing pavement surface is removed if possible. Ditch construction and/or underdrain must be constructed as early as possible in the construction process. Ditching should be a minimum of 2 feet below subgrade. Underdrain is preferred if possible because it will be more affective in drawing draw down the water table resulting in the lowering of the height of the capillary fringe.
- In addition to the sensitive soil areas, it is recommended that all areas be drained with aggressive ditching due to wet soil conditions. This is especially critical in the following areas:

Stations 19+00 - 34+00 (west leg of Young's Corner Road)

Stations 14+50 - 18+00 (north leg of Hotel Road)

Stations 47+00 – 51+00 (east leg of Young's Corner Road)

- It is recommended that any and all cross pipes be lowered to allow for an adequate ditching depth. Cross pipes should be installed based upon the following design schematic:



February 3, 2009

Falling Weight Deflectometer (FWD) Summary Sheet

Project #: 12740.00
Town(s): Auburn
Route(s): Hotel Road/Young's Corner Intersection
Date Tested: 11/10/2008
Requested By: S. Hayden
Direction of Testing: North and East

# Of FWD tests: 22	# Of Power Augers/Spoons - 10
Design Life: 20 Yrs	Future 18-kip ESALs (Design Life): See Below
Initial Serviceability: 4.5	Terminal Serviceability: 2.5
Reliability Level: 90	Overall Standard Deviation: .45
Functional Class: Major Collector	

Locations

Station (meters)

Description

Project Stationing

Comments: Future 18-kip ESALs used :

North leg of Intersection – 233,600
South leg of Intersection – 708,100
East leg of Intersection – 773,800
West leg of Intersection – 131,400

Auburn
12740.00
Hotel Road

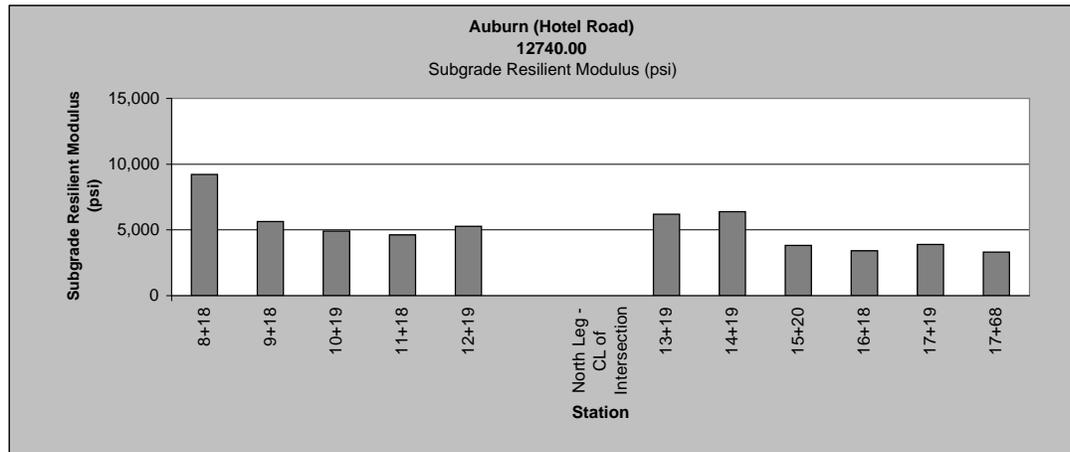
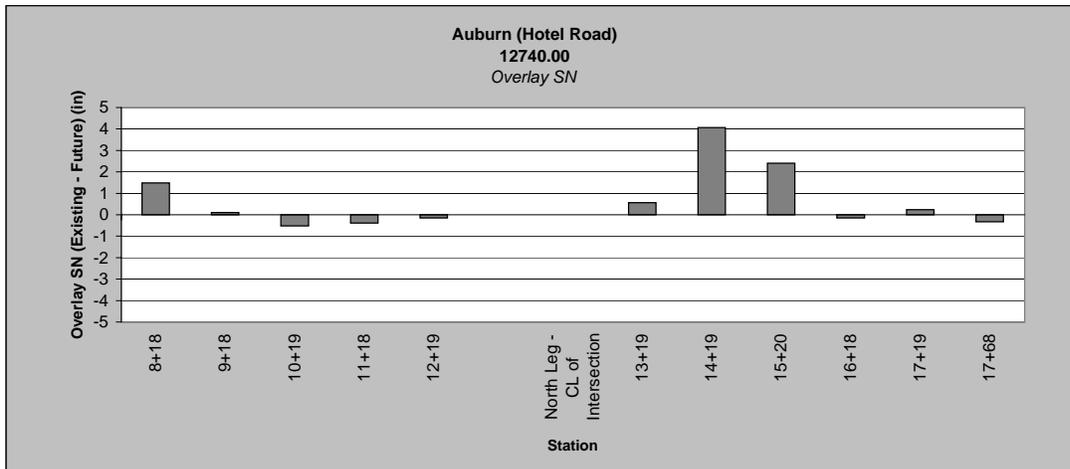
February 3, 2009

Station (Feet)	Existing Structural Number (in)	Future Traffic Structural Number (in)	Overlay Structural Number (Existing - Future)	Recommended Pavement Thickness (in)	Existing Pavement Modulus (psi)	Subgrade Resilient Modulus (psi)	Pavement Depth (in)	* Combined Pavement/Gravel Depth Used for Calculation (in)
South Leg - CL of Intersection = 13+18								
8+18	4.45	2.97	1.48	-	165,867	9,227	4.2	18
9+18	3.64	3.54	0.1	-	90,510	5,628	4.2	18
10+19	3.2	3.72	-0.52	1.18	61,716	4,913	4.2	18
11+18	3.41	3.8	-0.39	0.89	74,768	4,613	4.2	18
12+19	3.48	3.63	-0.15	0.34	78,995	5,266	4.2	18
North Leg - CL of Intersection = 13+18								
13+19	4	3.43	0.57	-	143,316	6,194	4.2	17
14+19	6.91	2.85	4.06	-	137,997	6,393	4.2	29.7
15+20	5.84	3.43	2.41	-	83,644	3,829	4.2	29.7
16+18	3.42	3.57	-0.15	0.34	153,295	3,419	6	14.2
17+19	3.64	3.41	0.23	-	185,159	3,893	6	14.2
17+68	3.28	3.61	-0.33	0.75	135,247	3,304	6	14.2

* For actual Gravel Depths, see attached logdraft forms

Weak Subgrade (< 3,000)

High Value May Indicate Shallow Bedrock (> 8,000)



**Auburn
12740.00
Youngs Corner Road**

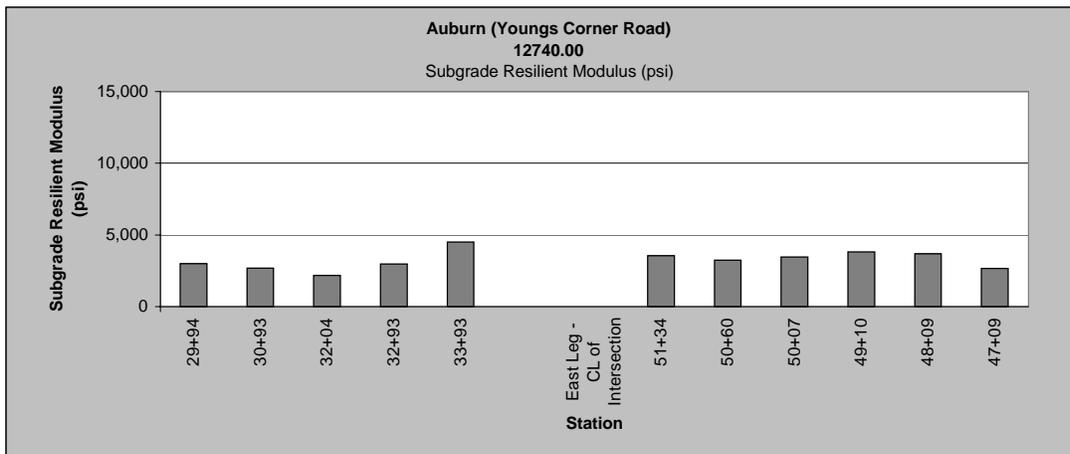
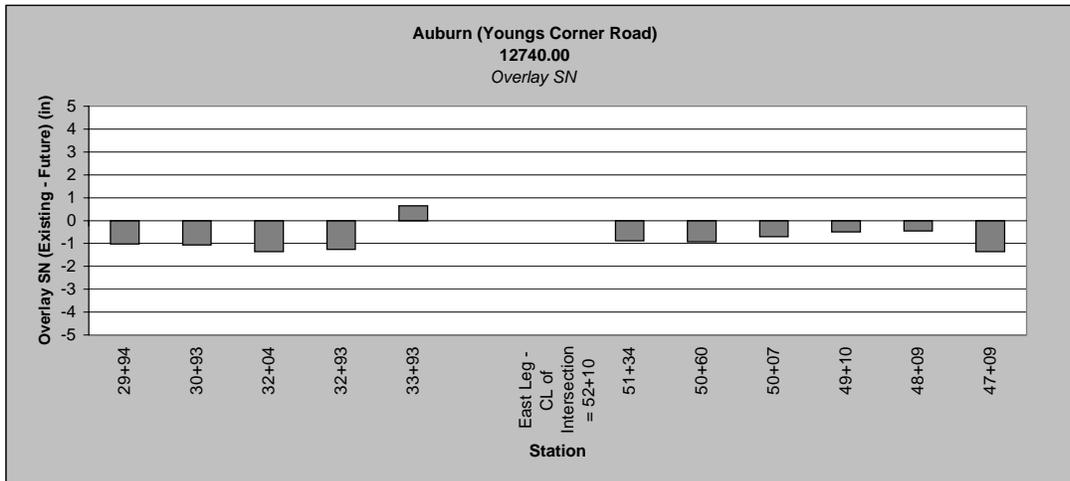
February 3, 2009

Station (Feet)	Existing Structural Number (in)	Future Traffic Structural Number (in)	Overlay Structural Number (Existing - Future)	Recommended Pavement Thickness (in)	Existing Pavement Modulus (psi)	Subgrade Resilient Modulus (psi)	Pavement Depth (in)	* Combined Pavement/Gravel Depth Used for Calculation (in)
West Leg - CL of Intersection = 34+93								
29+94	2.41	3.43	-1.02	2.32	46,408	2,997	4.2	14.9
30+93	2.49	3.56	-1.07	2.43	51,256	2,693	4.2	14.9
32+04	2.48	3.84	-1.36	3.09	65,218	2,176	3	13.7
32+93	2.17	3.43	-1.26	2.86	43,443	2,976	3	13.7
33+93	3.6	2.96	0.64	-	74,449	4,509	4.2	19
East Leg - CL of Intersection = 52+10								
51+34	3.33	4.22	-0.89	2.02	58,845	3,550	4.2	19
50+60	3.42	4.35	-0.93	2.11	64,276	3,242	4.2	19
50+07	3.56	4.26	-0.7	1.59	72,167	3,452	4.2	19
49+10	3.62	4.11	-0.49	1.11	75,760	3,821	4.2	19
48+09	3.72	4.17	-0.45	1.02	82,665	3,673	4.2	19
47+09	3.29	4.64	-1.35	3.07	56,761	2,662	4.2	19

* For actual Gravel Depths, see attached logdraft forms

Weak Subgrade

High Value May Indicate Shallow Bedrock (> 8,000)



STATE OF MAINE

FILE: Auburn

INTERDEPARTMENTAL MEMORANDUM

Date of Request: 11/5/2008

TEDOCS #

Latest Date Needed By: _____

Return: 12/1/08

To: **Ed Hanscom** Dept.: MDOT, Bureau of Planning
 From: **Aaron B. Eaton** Dept.: Highway
 Subject: **Request for Traffic Information** Project Manager: **Robert Hough**

TOWN(S): Auburn P.I.N. 12715&12740 Consultant Proj
 COUNTY: Androscoggin ROUTE: _____

LOCATION/ DESCRIPTION: PIN 12715 - C4340 Beginning at Lost Valley entrance and extends .47 miles to Hotel Rd.
PIN 12740 - Intersection Improvement Without a Signal at the intersection of Hotel Road and Young's Corner Road

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

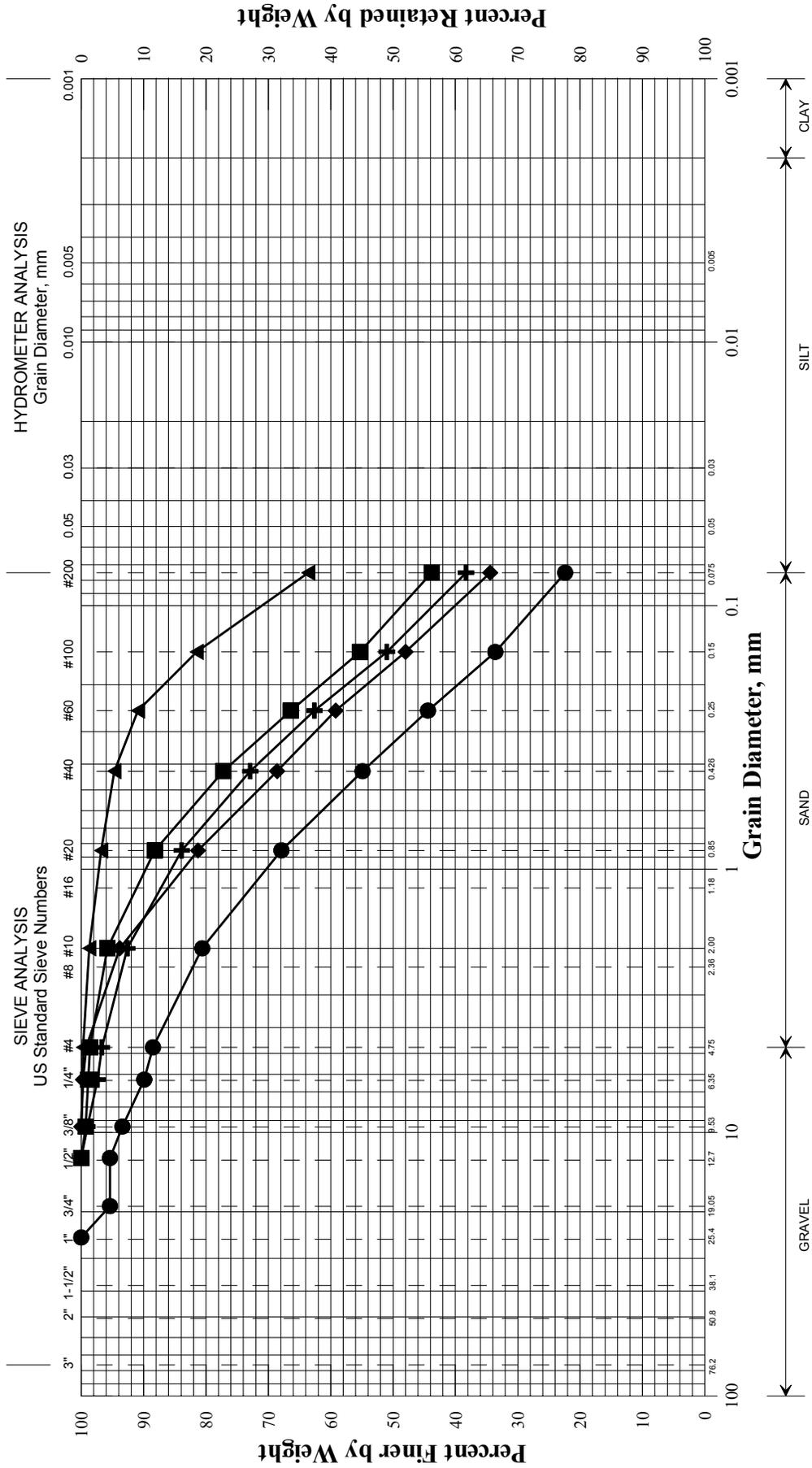
	<u>Sec. 1</u>	<u>Sec. 2</u>	<u>Sec. 3</u>	<u>Sec. 4</u>	<u>Sec. 5</u>
Prep By: <u>RLD</u>	<u>Auburn</u>	<u>Auburn</u>	<u>Auburn</u>	<u>Auburn</u>	_____
Town	<u>Auburn</u>	<u>Auburn</u>	<u>Auburn</u>	<u>Auburn</u>	_____
Description of Sections	<u>W AUBURN RD N/O YOUNGS CORNER RD</u>	<u>YOUNGS CORNER RD E/O HOTEL RD</u>	<u>HOTEL RD S/O YOUNGS CORNER RD</u>	<u>YOUNGS CORNER RD NW/O HOTEL RD @ BR</u>	_____
1 Latest AADT (Year)	<u>1810(2006)</u>	<u>6390(2005)</u>	<u>5060(2006)</u>	<u>4270(2006)</u>	_____
2 Current 2009 AADT	<u>1950</u>	<u>7030</u>	<u>5440</u>	<u>4590</u>	_____
3 Future 2021 AADT	<u>2540</u>	<u>9140</u>	<u>7070</u>	<u>5970</u>	_____
4 Future _____ AADT	_____	_____	_____	_____	_____
5 DHV - % of AADT	<u>9%</u>	<u>11%</u>	<u>10%</u>	<u>11%</u>	_____ %
6 Design Hourly Volume	<u>235</u>	<u>984</u>	<u>683</u>	<u>640</u>	_____
7 % Heavy Trucks (AADT)	<u>5%</u>	<u>4%</u>	<u>5%</u>	<u>3%</u>	_____ %
8 % Heavy Trucks (DHV)	<u>4%</u>	<u>1%</u>	<u>1%</u>	<u>1%</u>	_____ %
9 Direct.Dist. (DHV)	<u>65%</u>	<u>63%</u>	<u>52%</u>	<u>66%</u>	_____ %
10 18-KIP Equivalent P 2.0	<u>34</u>	<u>111</u>	<u>102</u>	<u>19</u>	_____
11 18-KIP Equivalent P 2.5	<u>32</u>	<u>106</u>	<u>97</u>	<u>18</u>	_____

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

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

Comments: We request turning movement at the intersection of Hotel Rd and Youngs Corner Rd at all legs.

State of Maine Department of Transportation
GRAIN SIZE DISTRIBUTION CURVE

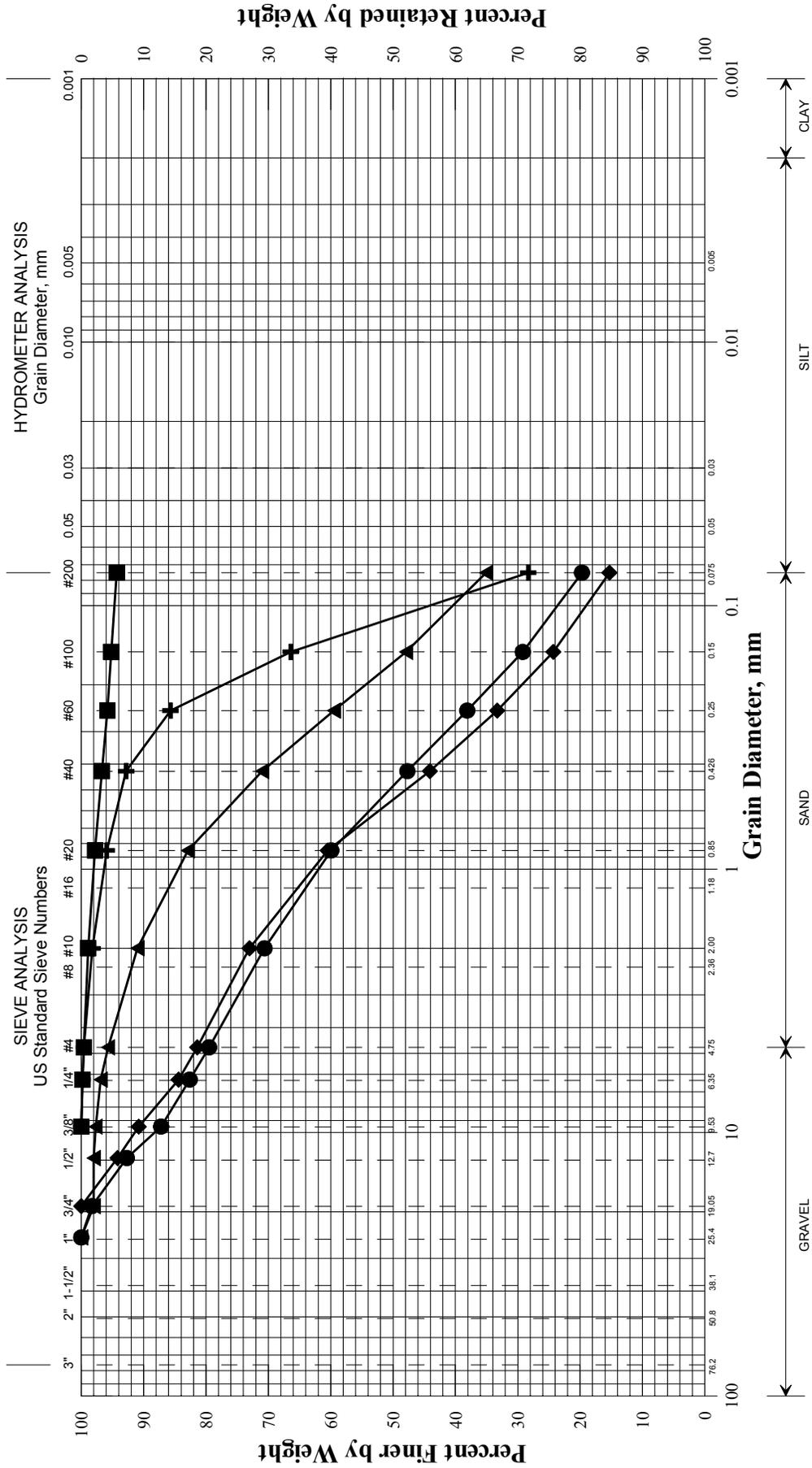


UNIFIED CLASSIFICATION

Boring/Sample No.	Station	Offset, ft	Depth, ft	Description	W, %	LL	PL	PI
+	32+00	CL	0.25-1.7	Silty SAND, trace gravel.	19.0			
◆	32+00	CL	1.7-5.0	SAND, some silt, trace gravel.	4.8			
■	32+00	8.5 LT	2.3-5.0	Silty SAND, trace gravel.	23.0			
●	32+00	7.0 RT	0.35-3.0	SAND, some silt, little gravel.	14.7			
▲	30+00	8.5 RT	1.7-5.0	Sandy SILT, trace gravel.	23.4			
×								

012740.00	PIN
Auburn	Town
WHITE, TERRY A	Reported by/Date
2/3/2009	

State of Maine Department of Transportation
GRAIN SIZE DISTRIBUTION CURVE

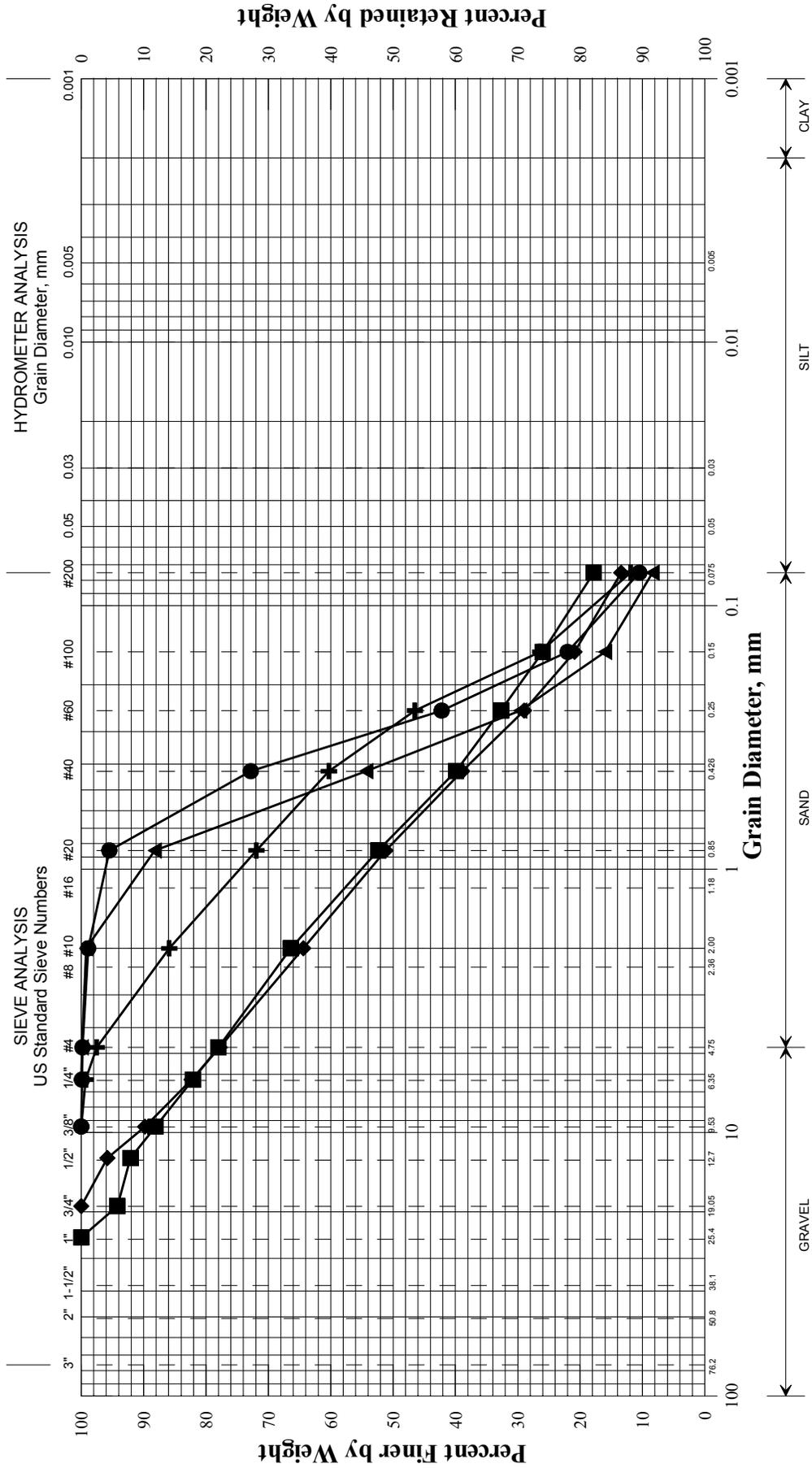


UNIFIED CLASSIFICATION

Boring/Sample No.	Station	Offset, ft	Depth, ft	Description	W, %	LL	PL	PI
+	30+00	6.0 LT	2.0-5.0	SAND, some silt, trace gravel.	14.3			
◆	28+00	7.0 LT	0.35-2.2	SAND, little gravel, little silt.	6.9			
■	28+00	7.0 LT	2.2-5.0	Clayey SILT, trace sand, trace gravel.	23.6	37	23	14
●	21+00	7.5 LT	0.35-2.3	SAND, some gravel, little silt.	5.5			
▲	21+00	7.5 LT	2.3-5.0	SAND, some silt, trace gravel.	18.9			
×								

PIN	012740.00
Town	Auburn
Reported by/Date	WHITE, TERRY A 2/3/2009

State of Maine Department of Transportation
GRAIN SIZE DISTRIBUTION CURVE

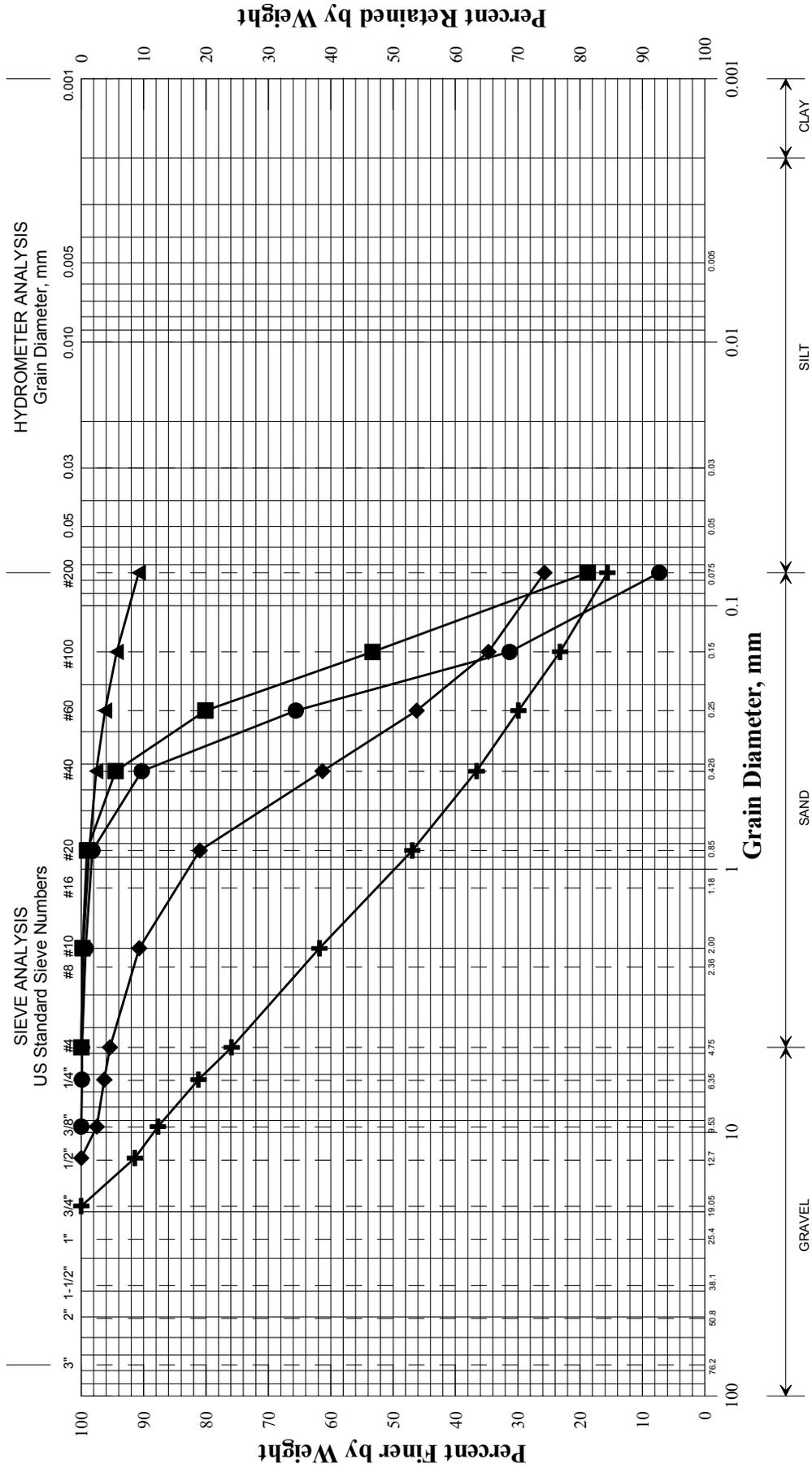


UNIFIED CLASSIFICATION

Boring/Sample No.	Station	Offset, ft	Depth, ft	Description	W, %	LL	PL	PI
+	19+00	8.0 RT	0.30-2.2	SAND, little silt, trace gravel.	17.8			
◆	19+00	8.0 RT	2.2-5.0	SAND, some gravel, little silt.	8.4			
■	10+00	9.0 RT	0.35-1.7	SAND, some gravel, little silt.	5.9			
●	10+00	9.0 RT	1.7-5.0	SAND, little silt, trace gravel.	5.1			
▲	13+26	14.0 RT	1.6-5.0	SAND, trace silt, trace gravel.	2.3			
×								

012740.00	PIN
Auburn	Town
WHITE, TERRY A	Reported by/Date
	2/3/2009

State of Maine Department of Transportation
GRAIN SIZE DISTRIBUTION CURVE



UNIFIED CLASSIFICATION

Boring/Sample No.	Station	Offset, ft	Depth, ft	Description	W, %	LL	PL	PI
+	15+00	9.0 RT	0.50-3.5	SAND, some gravel, little silt.	7.8			
◆	15+00	9.0 RT	3.5-5.0	SAND, some silt, trace gravel.	23.7			
■	16+90	8.0 LT	1.3-5.0	SAND, little silt.	24.4			
●	51+10	8.0 RT	1.8-5.0	SAND, trace silt, trace gravel.	6.2			
▲	49+10	9.0 RT	1.7-5.0	Clayey SILT, trace sand.	21.6			
×								

012740.00	PIN
Auburn	Town
WHITE, TERRY A	Reported by/Date
	2/3/2009

Driller: Northern Test Boring, Inc.	Elevation (ft.):	Auger ID/OD: 5" Dia.
Operator: Mike/Nick	Datum: NAVD 88	Sampler: Off Flights
Logged By: B. Wilder	Rig Type: Dietrick D-50	Hammer Wt./Fall: N/A
Date Start/Finish: 1/21/09-1/21/09	Drilling Method: Solid Stem Auger	Core Barrel: N/A
Boring Location: 32+00, CL	Casing ID/OD: N/A	Water Level*: None Observed

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

Sample Information										Visual Description and Remarks	Laboratory Testing Results/AASHTO and Unified Class.
Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows ((6 in.) Shear Strength (psf) or RQD (%))	N-value	Casing Blows	Elevation (ft.)	Graphic Log			
0	S1		0.25 - 1.70			SSA	-0.25	[Graphic Log Symbol]	PAVEMENT.	-0.25	G#175865 A-4, SM WC=19.0% G#175866 A-2-4, SM WC=8.8%
	S2		1.70 - 5.00				-1.70	[Graphic Log Symbol]	Brown, damp, fine to coarse SAND, little gravel.	-1.70	
								[Graphic Log Symbol]	Brown, moist, silty fine to medium SAND.	-1.70	
5							-5.00	[Graphic Log Symbol]	Bottom of Exploration at 5.00 feet below ground surface. NO REFUSAL	-5.00	
10											
15											
20											
25											

Remarks:
 Offsets are from Construction CL.

Driller: Northern Test Boring, Inc.	Elevation (ft.):	Auger ID/OD: 5" Dia.
Operator: Mike/Nick	Datum: NAVD 88	Sampler: Off Flights
Logged By: B. Wilder	Rig Type: Dietrick D-50	Hammer Wt./Fall: N/A
Date Start/Finish: 1/21/09-1/21/09	Drilling Method: Solid Stem Auger	Core Barrel: N/A
Boring Location: 32+00, 8.5 Lt.	Casing ID/OD: N/A	Water Level*: None Observed

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

Sample Information											Visual Description and Remarks	Laboratory Testing Results/AASHTO and Unified Class.
Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows ((6 in.) Shear Strength (psf) or RQD (%))	N-value	Casing Blows	Elevation (ft.)	Graphic Log				
0						SSA	-0.25		PAVEMENT.			
									Brown, damp, fine to coarse SAND, little gravel. ≈S1			
	S3		2.30 - 5.00				-2.30		Brown, wet, silty fine to medium SAND.		G#175867 A-4, SM WC=23.0%	
5						↓	-5.00		Bottom of Exploration at 5.00 feet below ground surface. NO REFUSAL			
10												
15												
20												
25												

Remarks:
 Offsets are from Construction CL.

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

Driller: Northern Test Boring, Inc.	Elevation (ft.):	Auger ID/OD: 5" Dia.
Operator: Mike/Nick	Datum: NAVD 88	Sampler: Off Flights
Logged By: B. Wilder	Rig Type: Dietrick D-50	Hammer Wt./Fall: N/A
Date Start/Finish: 1/21/09-1/21/09	Drilling Method: Solid Stem Auger	Core Barrel: N/A
Boring Location: 32+00, 7.0 Rt.	Casing ID/OD: N/A	Water Level*: None Observed

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

Sample Information										Visual Description and Remarks	Laboratory Testing Results/AASHTO and Unified Class.
Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows ((6 in.) Shear Strength (psf) or RQD (%))	N-value	Casing Blows	Elevation (ft.)	Graphic Log			
0	S4		0.35 - 3.00			SSA	-0.35		PAVEMENT. Brown, wet, fine to coarse SAND, little gravel, trace silt.	G#175868 A-2-4, SM WC=14.7%	
5						↙	-3.00		Brown, wet, silty fine to medium SAND. ≈S3		
5							-5.00		Bottom of Exploration at 5.00 feet below ground surface. NO REFUSAL		
10											
15											
20											
25											

Remarks:
 Offsets are from Construction CL.

Driller: Northern Test Boring, Inc.	Elevation (ft.):	Auger ID/OD: 5" Dia.
Operator: Mike/Nick	Datum: NAVD 88	Sampler: Off Flights
Logged By: B. Wilder	Rig Type: Dietrick D-50	Hammer Wt./Fall: N/A
Date Start/Finish: 1/21/09-1/21/09	Drilling Method: Solid Stem Auger	Core Barrel: N/A
Boring Location: 30+00, 8.5 Rt.	Casing ID/OD: N/A	Water Level*: None Observed

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

Sample Information										Visual Description and Remarks	Laboratory Testing Results/AASHTO and Unified Class.
Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows ((6 in.) Shear Strength (psf) or RQD (%))	N-value	Casing Blows	Elevation (ft.)	Graphic Log			
0						SSA	-0.35		PAVEMENT.		
	S5		1.70 - 5.00				-1.70		Brown, wet, fine to coarse SAND, little gravel, trace silt. ≈S4		
							-5.00		Brown, moist, silty fine to medium SAND.	G#175869 A-4, ML WC=23.4%	
5						↓	-5.00		Bottom of Exploration at 5.00 feet below ground surface. NO REFUSAL		
10											
15											
20											
25											

Remarks:
 Offsets are from Construction CL.

Driller: Northern Test Boring, Inc.	Elevation (ft.):	Auger ID/OD: 5" Dia.
Operator: Mike/Nick	Datum: NAVD 88	Sampler: Off Flights
Logged By: B. Wilder	Rig Type: Dietrick D-50	Hammer Wt./Fall: N/A
Date Start/Finish: 1/21/09-1/21/09	Drilling Method: Solid Stem Auger	Core Barrel: N/A
Boring Location: 30+00, 2.0 Rt.	Casing ID/OD: N/A	Water Level*: None Observed

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

Sample Information											Visual Description and Remarks	Laboratory Testing Results/AASHTO and Unified Class.
Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows ((6 in.) Shear Strength (psf) or RQD (%))	N-value	Casing Blows	Elevation (ft.)	Graphic Log				
0						SSA	-0.35		PAVEMENT.			
									Brown, wet, fine to coarse SAND, little gravel, trace silt. \approx S4		-0.35	
							-2.30		Brown, moist, silty fine to medium SAND. \approx S5		-2.30	
5						↙	-5.00		Bottom of Exploration at 5.00 feet below ground surface. NO REFUSAL		-5.00	
10												
15												
20												
25												

Remarks:
 Offsets are from Construction CL.

Driller: Northern Test Boring, Inc.	Elevation (ft.):	Auger ID/OD: 5" Dia.
Operator: Mike/Nick	Datum: NAVD 88	Sampler: Off Flights
Logged By: B. Wilder	Rig Type: Dietrick D-50	Hammer Wt./Fall: N/A
Date Start/Finish: 1/21/09-1/21/09	Drilling Method: Solid Stem Auger	Core Barrel: N/A
Boring Location: 30+00, 6.0 Lt.	Casing ID/OD: N/A	Water Level*: None Observed

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

Sample Information											Visual Description and Remarks	Laboratory Testing Results/AASHTO and Unified Class.
Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows ((6 in.) Shear Strength (psf) or RQD (%))	N-value	Casing Blows	Elevation (ft.)	Graphic Log				
0						SSA	-0.35		PAVEMENT.			
									Brown, wet, fine to coarse SAND, little gravel, trace silt. ≈S4			
	S6		2.00 - 5.00				-2.00		Light brown, damp, fine SAND, trace silt.		G#175870 A-2-4, SM WC=14.3%	
5						↓	-5.00		Bottom of Exploration at 5.00 feet below ground surface. NO REFUSAL			
10												
15												
20												
25												

Remarks:
 Offsets are from Construction CL.

Driller: Northern Test Boring, Inc.	Elevation (ft.):	Auger ID/OD: 5" Dia.
Operator: Mike/Nick	Datum: NAVD 88	Sampler: Off Flights
Logged By: B. Wilder	Rig Type: Dietrick D-50	Hammer Wt./Fall: N/A
Date Start/Finish: 1/21/09-1/21/09	Drilling Method: Solid Stem Auger	Core Barrel: N/A
Boring Location: 28+00, 7.0 Lt.	Casing ID/OD: N/A	Water Level*: None Observed

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

Sample Information										Visual Description and Remarks	Laboratory Testing Results/AASHTO and Unified Class.
Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows ((6 in.) Shear Strength (psf) or RQD (%))	N-value	Casing Blows	Elevation (ft.)	Graphic Log			
0	S7		0.35 - 2.20			SSA	-0.35		PAVEMENT.	G#175871 A-1-b, SM WC=23.6% LL=37 PL=23 PI=14 G#175872	
									Brown, damp, fine to coarse SAND, some gravel.		
	S8		2.20 - 5.00				-2.20		Olive, moist, stiff, clayey SILT.		
5							-5.00		Bottom of Exploration at 5.00 feet below ground surface. NO REFUSAL		
10											
15											
20											
25											

Remarks:
 Offsets are from Construction CL.

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

Driller: Northern Test Boring, Inc.	Elevation (ft.):	Auger ID/OD: 5" Dia.
Operator: Mike/Nick	Datum: NAVD 88	Sampler: Off Flights
Logged By: B. Wilder	Rig Type: Dietrick D-50	Hammer Wt./Fall: N/A
Date Start/Finish: 1/21/09-1/21/09	Drilling Method: Solid Stem Auger	Core Barrel: N/A
Boring Location: 28+00, CL	Casing ID/OD: N/A	Water Level*: None Observed

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

Sample Information											Visual Description and Remarks	Laboratory Testing Results/AASHTO and Unified Class.
Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows ((6 in.) Shear Strength (psf) or RQD (%))	N-value	Casing Blows	Elevation (ft.)	Graphic Log				
0						SSA	-0.35		PAVEMENT.		-0.35	
									Brown, damp, fine to coarse SAND, some gravel. \approx S7		-2.40	
							-2.40		Olive, moist, stiff, clayey SILT. \approx S8		-5.00	
5							-5.00		Bottom of Exploration at 5.00 feet below ground surface. NO REFUSAL			
10												
15												
20												
25												

Remarks:
 Offsets are from Construction CL.

Driller: Northern Test Boring, Inc.	Elevation (ft.):	Auger ID/OD: 5" Dia.
Operator: Mike/Nick	Datum: NAVD 88	Sampler: Off Flights
Logged By: B. Wilder	Rig Type: Dietrick D-50	Hammer Wt./Fall: N/A
Date Start/Finish: 1/21/09-1/21/09	Drilling Method: Solid Stem Auger	Core Barrel: N/A
Boring Location: 28+00, 7.5 Rt.	Casing ID/OD: N/A	Water Level*: None Observed

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

Sample Information										Visual Description and Remarks	Laboratory Testing Results/AASHTO and Unified Class.
Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows ((6 in.) Shear Strength (psf) or RQD (%))	N-value	Casing Blows	Elevation (ft.)	Graphic Log			
0						SSA	-0.35		PAVEMENT.	-0.35	
							-1.40		Brown, damp, fine to coarse SAND, some gravel. \approx S7	-1.40	
							-5.00		Olive, moist, stiff, clayey SILT. \approx S8	-5.00	
5						↓	-5.00		Bottom of Exploration at 5.00 feet below ground surface. NO REFUSAL	-5.00	
10											
15											
20											
25											

Remarks:
 Offsets are from Construction CL.

Driller: Northern Test Boring, Inc.	Elevation (ft.):	Auger ID/OD: 5" Dia.
Operator: Mike/Nick	Datum: NAVD 88	Sampler: Off Flights
Logged By: B. Wilder	Rig Type: Dietrick D-50	Hammer Wt./Fall: N/A
Date Start/Finish: 1/21/09-1/21/09	Drilling Method: Solid Stem Auger	Core Barrel: N/A
Boring Location: 21+00, 7.5 Lt.	Casing ID/OD: N/A	Water Level*: None Observed

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

Sample Information										Visual Description and Remarks	Laboratory Testing Results/AASHTO and Unified Class.
Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (6 in.) Shear Strength (psf) or RQD (%)	N-value	Casing Blows	Elevation (ft.)	Graphic Log			
0	S9		0.35 - 2.30			SSA	-0.35		PAVEMENT.		
									Brown, damp, fine to coarse SAND, some gravel.	G#175873 A-1-b, SM WC=5.5%	
	S10		2.30 - 5.00				-2.30		Brown, moist, silty fine to medium SAND.	G#175874 A-2-4, SM WC=18.9%	
5							-5.00		Bottom of Exploration at 5.00 feet below ground surface. NO REFUSAL		
10											
15											
20											
25											

Remarks:
 Offsets are from Construction CL.

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

Driller: Northern Test Boring, Inc.	Elevation (ft.):	Auger ID/OD: 5" Dia.
Operator: Mike/Nick	Datum: NAVD 88	Sampler: Off Flights
Logged By: B. Wilder	Rig Type: Dietrick D-50	Hammer Wt./Fall: N/A
Date Start/Finish: 1/22/09-1/22/09	Drilling Method: Solid Stem Auger	Core Barrel: N/A
Boring Location: 21+00, 8.0 Rt.	Casing ID/OD: N/A	Water Level*: 3.8' bgs.

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

Sample Information										Visual Description and Remarks	Laboratory Testing Results/AASHTO and Unified Class.
Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows ((6 in.) Shear Strength (psf) or RQD (%))	N-value	Casing Blows	Elevation (ft.)	Graphic Log			
0						SSA	-0.35		PAVEMENT. Brown, damp, fine to coarse SAND, some gravel. ≈S9 Brown, wet, silty fine to medium SAND. ≈S10		
5						↓	-5.00		Bottom of Exploration at 5.00 feet below ground surface. NO REFUSAL		
10											
15											
20											
25											

Remarks:
 Offsets are from Construction CL.

Driller: Northern Test Boring, Inc.	Elevation (ft.):	Auger ID/OD: 5" Dia.
Operator: Mike/Nick	Datum: NAVD 88	Sampler: Off Flights
Logged By: B. Wilder	Rig Type: Dietrick D-50	Hammer Wt./Fall: N/A
Date Start/Finish: 1/22/09-1/22/09	Drilling Method: Solid Stem Auger	Core Barrel: N/A
Boring Location: 19+00, 8.0 Rt.	Casing ID/OD: N/A	Water Level*: None Observed

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

Sample Information											Visual Description and Remarks	Laboratory Testing Results/AASHTO and Unified Class.
Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows ((6 in.) Shear Strength (psf) or RQD (%))	N-value	Casing Blows	Elevation (ft.)	Graphic Log				
0	S11		0.30 - 2.20			SSA	-0.30	[Graphic Log Pattern]	PAVEMENT.		G#175875 A-2-4, SP-SM WC=17.8%	
								[Graphic Log Pattern]	Brown, moist, fine to coarse SAND, some gravel.			
	S12		2.20 - 5.00				-2.20	[Graphic Log Pattern]	Brown, wet, fine to coarse SAND, little gravel, trace silt.		G#212235 A-1-b, SM WC=8.4%	
								[Graphic Log Pattern]				
5							-5.00	[Graphic Log Pattern]	Bottom of Exploration at 5.00 feet below ground surface. NO REFUSAL			
10												
15												
20												
25												

Remarks:
 Offsets are from Construction CL.

Driller: Northern Test Boring, Inc.	Elevation (ft.):	Auger ID/OD: 5" Dia.
Operator: Mike/Nick	Datum: NAVD 88	Sampler: Off Flights
Logged By: B. Wilder	Rig Type: Dietrick D-50	Hammer Wt./Fall: N/A
Date Start/Finish: 1/22/09-1/22/09	Drilling Method: Solid Stem Auger	Core Barrel: N/A
Boring Location: 10+00, 9.0 Rt.	Casing ID/OD: N/A	Water Level*: None Observed

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

Sample Information										Visual Description and Remarks	Laboratory Testing Results/AASHTO and Unified Class.
Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows ((6 in.) Shear Strength (psf) or RQD (%))	N-value	Casing Blows	Elevation (ft.)	Graphic Log			
0	S13		0.35 - 1.70			SSA	-0.35	[Graphic Log Symbol]	PAVEMENT.	G#212236 A-1-b, SM WC=5.9%	
	S14		1.70 - 5.00				-1.70	[Graphic Log Symbol]	Brown, moist, fine to coarse SAND, little gravel.	G#212237 A-2-4, SP-SM WC=5.1%	
							-5.00	[Graphic Log Symbol]	Gold, damp, fine SAND.		
5									Bottom of Exploration at 5.00 feet below ground surface. NO REFUSAL		
10											
15											
20											
25											

Remarks:
 Offsets are from Construction CL.

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

Driller: Northern Test Boring, Inc.	Elevation (ft.):	Auger ID/OD: 5" Dia.
Operator: Mike/Nick	Datum: NAVD 88	Sampler: Off Flights
Logged By: B. Wilder	Rig Type: Dietrick D-50	Hammer Wt./Fall: N/A
Date Start/Finish: 1/22/09-1/22/09	Drilling Method: Solid Stem Auger	Core Barrel: N/A
Boring Location: 13+26, 14.0 Rt.	Casing ID/OD: N/A	Water Level*: None Observed

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

Sample Information										Visual Description and Remarks	Laboratory Testing Results/AASHTO and Unified Class.
Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows ((6 in.) Shear Strength (psf) or RQD (%))	N-value	Casing Blows	Elevation (ft.)	Graphic Log			
0						SSA	-0.35		PAVEMENT.	-0.35	G#212238 A-3, SP-SM WC=2.3%
	S15		1.60 - 5.00				-1.60		Brown, moist, fine to coarse SAND, little gravel. \approx S13	-1.60	
							-5.00		Gold, damp, fine SAND.	-5.00	
5						↓	-5.00		Bottom of Exploration at 5.00 feet below ground surface. NO REFUSAL	-5.00	
10											
15											
20											
25											

Remarks:
 Offsets are from Construction CL.

Driller: Northern Test Boring, Inc.	Elevation (ft.):	Auger ID/OD: 5" Dia.
Operator: Mike/Nick	Datum: NAVD 88	Sampler: Off Flights
Logged By: B. Wilder	Rig Type: Dietrick D-50	Hammer Wt./Fall: N/A
Date Start/Finish: 1/22/09-1/22/09	Drilling Method: Solid Stem Auger	Core Barrel: N/A
Boring Location: 15+00, 9.0 Rt.	Casing ID/OD: N/A	Water Level*: None Observed

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

Sample Information										Visual Description and Remarks	Laboratory Testing Results/AASHTO and Unified Class.
Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows ((6 in.) Shear Strength (psf) or RQD (%))	N-value	Casing Blows	Elevation (ft.)	Graphic Log			
0	S16		0.50 - 3.50			SSA	-0.50		PAVEMENT. Brown, moist, fine to coarse SAND, some gravel.	G#212239 A-1-b, SM WC=7.8%	
	S17		3.50 - 5.00				-3.50		Dark brown, wet, fine to medium SAND, little gravel, little silt, brick fragments.	G#212240 A-2-4, SM WC=23.7%	
5							-5.00		Bottom of Exploration at 5.00 feet below ground surface. NO REFUSAL		
10											
15											
20											
25											

Remarks:
 Offsets are from Construction CL.

Driller: Northern Test Boring, Inc.	Elevation (ft.):	Auger ID/OD: 5" Dia.
Operator: Mike/Nick	Datum: NAVD 88	Sampler: Off Flights
Logged By: B. Wilder	Rig Type: Dietrick D-50	Hammer Wt./Fall: N/A
Date Start/Finish: 1/22/09-1/22/09	Drilling Method: Solid Stem Auger	Core Barrel: N/A
Boring Location: 16+90, 8.0 Lt.	Casing ID/OD: N/A	Water Level*: 3.2' bgs.

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

Sample Information										Visual Description and Remarks	Laboratory Testing Results/AASHTO and Unified Class.
Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows ((6 in.) Shear Strength (psf) or RQD (%))	N-value	Casing Blows	Elevation (ft.)	Graphic Log			
0						SSA	-0.50		PAVEMENT.		
	S18		1.30 - 5.00				-1.30		Brown, moist, fine to coarse SAND, some gravel. ≈S16		
									Brown, saturated, fine to medium SAND.		
5							-5.00		Bottom of Exploration at 5.00 feet below ground surface. NO REFUSAL		
10											
15											
20											
25											

Remarks:
 Offsets are from Construction CL.

Driller: Northern Test Boring, Inc.	Elevation (ft.):	Auger ID/OD: 5" Dia.
Operator: Mike/Nick	Datum: NAVD 88	Sampler: Off Flights
Logged By: B. Wilder	Rig Type: Dietrick D-50	Hammer Wt./Fall: N/A
Date Start/Finish: 1/22/09-1/22/09	Drilling Method: Solid Stem Auger	Core Barrel: N/A
Boring Location: 51+10, 8.0 Rt.	Casing ID/OD: N/A	Water Level*: None Observed

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

Sample Information										Visual Description and Remarks	Laboratory Testing Results/AASHTO and Unified Class.
Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows ((6 in.) Shear Strength (psf) or RQD (%))	N-value	Casing Blows	Elevation (ft.)	Graphic Log			
0						SSA	-0.35		PAVEMENT.	-0.35	
	S19		1.80 - 5.00				-1.80		Brown, moist, fine to coarse SAND, some gravel. \approx S16	-1.80	G#212242 A-3, SP-SM WC=6.2%
							-5.00		Gold, damp, fine SAND.	-5.00	
5						↓			Bottom of Exploration at 5.00 feet below ground surface. NO REFUSAL		
10											
15											
20											
25											

Remarks:
 Offsets are from Construction CL.

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

Driller: Northern Test Boring, Inc.	Elevation (ft.):	Auger ID/OD: 5" Dia.
Operator: Mike/Nick	Datum: NAVD 88	Sampler: Off Flights
Logged By: B. Wilder	Rig Type: Dietrick D-50	Hammer Wt./Fall: N/A
Date Start/Finish: 1/22/09-1/22/09	Drilling Method: Solid Stem Auger	Core Barrel: N/A
Boring Location: 49+10, 9.0 Rt.	Casing ID/OD: N/A	Water Level*: None Observed

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

Sample Information										Visual Description and Remarks	Laboratory Testing Results/AASHTO and Unified Class.
Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows ((6 in.) Shear Strength (psf) or RQD (%))	N-value	Casing Blows	Elevation (ft.)	Graphic Log			
0						SSA	-0.35		PAVEMENT.		
	S20		1.70 - 5.00				-1.70		Brown, moist, fine to coarse SAND, some gravel. ≈S16		
							-5.00		Olive, moist, clayey SILT, trace fine sand.	G#212243 CL, A-6 WC=21.6%	
5							-5.00		Bottom of Exploration at 5.00 feet below ground surface. NO REFUSAL		
10											
15											
20											
25											

Remarks:
 Offsets are from Construction CL.