Highway Program

Jeff Adams, Program Manager

Memorandum

DATE: January 15, 2008

TO: Rob Chester **DEPT:** Region 4

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

SUBJECT: Soils – Trenton Rte 3 15690.00, No.2008-102

Site Description

A subsurface investigation has been completed for intersection improvements located at the intersection of Routes 3 and 230. The proposed design will realign the intersection with the new airport access road. The investigation included the use of a drill rig. Stationing was estimated in the field using design plans and geographical references.

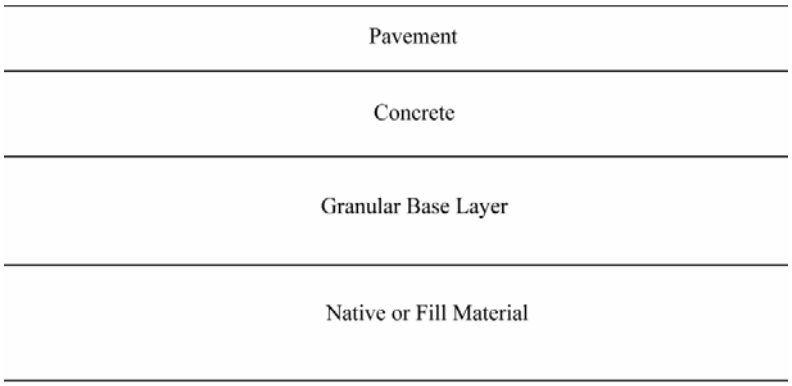
Boring Information

A total of 10 power augers were conducted along the project area (See Boring Logs). Boring locations were determined by the project designer.

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.

Roadway Structural Section

Based upon "as-builts" the roadway structure beneath Route 3 consists of pavement underlain by concrete underlain by gravel underlain by native soil and/or fill.



At the request of the designer only 1 boring (HB-TREN-102, station 291+90) was conducted within the lateral limits of the existing concrete layer. This boring encountered 4 inches of pavement underlain by 8 inches of concrete underlain by 16 inches of gravel underlain by sandy silt. All other borings were purposely conducted at offsets beyond the lateral limits of the concrete.

Existing Pavement Conditions

Pavement conditions vary from fair to good. Considering the nature of the subgrade soils the existing pavement is performing adequately.

	Route 3				Route 230		
Station	290+40	* 291+90	294+40	295+40	10+50	10+80	11+35
Pavement Thickness	3.6”	4.2”	7.2”	7.2”	4.8”	5.4”	4.8”

* Boring conducted within the lateral limits of the existing concrete layer

Base Material

The base material can be described as silty sandy gravel and silty gravelly sand with 13-16% passing the #200 sieve. Borings conducted at stations 294+40 and 295+40 encountered granular material extending to a depth of 5 feet. A summary follows:

Existing Base Material Type:	Silty Sandy Gravel, Silty Gravelly Sand
Samples:	S1, S6
Percent Passing #200:	13%-16%
Quality of Drainage (AASHTO):	Poor

	Route 3				Route 230		
Station	290+40	* 291+90	294+40	295+40	10+50	10+80	11+35
Gravel Thickness	26.4”	15.6”	52.8”	52.8”	9.6”	17.4”	22.8”

* Boring conducted within the lateral limits of the existing concrete layer

Subgrade Soils

The subgrade soils along this project originated as glacial-marine deposits (sandy silt, clay silt, silty clay). These soils are classified (AASHTO) as A-4 and A-6 respectively. These soils are very sensitive to changing moisture content. Wet to saturated soil conditions were encountered in 6 of the 10 borings.

The sandy silts are not well drained and will swell and lose much of their stability unless properly compacted and drained. These soils are highly frost susceptible.

The clay silts are poorly drained and can absorb water by capillary action. These soils are plastic and are subject to considerable volume changes with changing water content. They will become soft and unstable with increasing water content. Due to surface infiltration and capillary action it is anticipated that these soils will be moist to wet year round. Because of capillary action, moisture is being held above the ground water table against the force of gravity (capillary fringe). Thus it cannot be removed by gravity. The only way to affect the height of the capillary fringe is by lowering the water table (i.e. deep ditch or underdrain) or by providing a capillary break.

Due to presence of moisture sensitive soils and wet soil conditions, these subgrade soils could become problematic during construction, especially during the spring and early summer. Drainage will be critical during construction. Once the existing pavement layer is removed, the roadway could become unstable under traffic loading. Additional base material could be required to facilitate construction if the subgrade soils become unstable.

It appears that the native subgrade soils may have been removed in the immediate area of the intersection and south of the intersection. Borings conducted (HB-TREN-106,107) on Route 3 at stations 294+40 and 295+40 did not encounter any sandy silt or clay silt. Granular material (S1, S2) was encountered to a depth 5 feet. In addition, borings (HB-TREN-108,109, 110) conducted on Route 230 failed to encounter native sandy silt or clay silt. Instead, silty sand (S5) was found to underlain the existing base member. This material may be till or fill?

Recommendations

1. Existing base quality and thickness, moisture sensitive subgrade soil conditions, and the lack of drainage are all major concerns with respect to future performance expectations.

2. Moisture sensitive subgrade soils could become problematic during construction, especially during the spring and early summer. Late summer or fall reconstruction is recommended.

3. It is recommended that the project area be well drained before the existing pavement surface is removed. The roadway could become unstable under traffic loading after the existing pavement surface is removed if moist to wet subgrade conditions continue to be present. Additional base material could be required to facilitate construction if the subgrade soils become unstable. The new pavement surface should be placed as soon as possible.

4. Underdrain is recommended throughout the entire project area.

5. If the existing concrete layer is removed, full depth reconstruction consisting of 24 inches of gravel and 6 inches of pavement will be necessary due to sensitive soils and high traffic volumes. The new gravel should consist of Type A.

6. If new base material is to be placed upon native soils a 6 once, non-woven needle punched separation geotextile should be placed between the native sandy silt/clay silt soils and the new base material.

State of Maine - Department of Transportation

Laboratory Testing Summary Sheet

Town(s): Trenton Project Number: 15690.00

Boring & Sample Identification Number	Station (Feet)	Offset (Feet)	Depth (Feet)	Reference Number	G.S.D.C. Sheet	W.C.	% Passing 200 Sieve	Classification		
								Unified	AASHTO	Frost
HB-TREN-102, S1	291+90	5.5 Rt.	1.0-2.3	210176	1	3.7	12.7	GM	A-1-a	I
HB-TREN-102, S2	291+90	5.5 Rt.	2.3-3.0	210177	1	26.0	59.7	ML	A-4	IV
HB-TREN-102, S3	291+90	5.5 Rt.	3.0-5.0	210178	1	12.3	57.8	ML	A-4	IV
HB-TREN-103, S4	291+90	17.5 Lt.	2.3-5.0	210179	1	22.0	91.6	CL	A-6	IV
HB-TREN-108, S5	10+50	33.0 Rt.	1.4-5.0	210180	1	12.4	40.3	SM	A-4	III
HB-TREN-110, S6	11+35	8.5 Lt.	0.50-2.4	210181	1	12.5	16.3	SM	A-1-b	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)

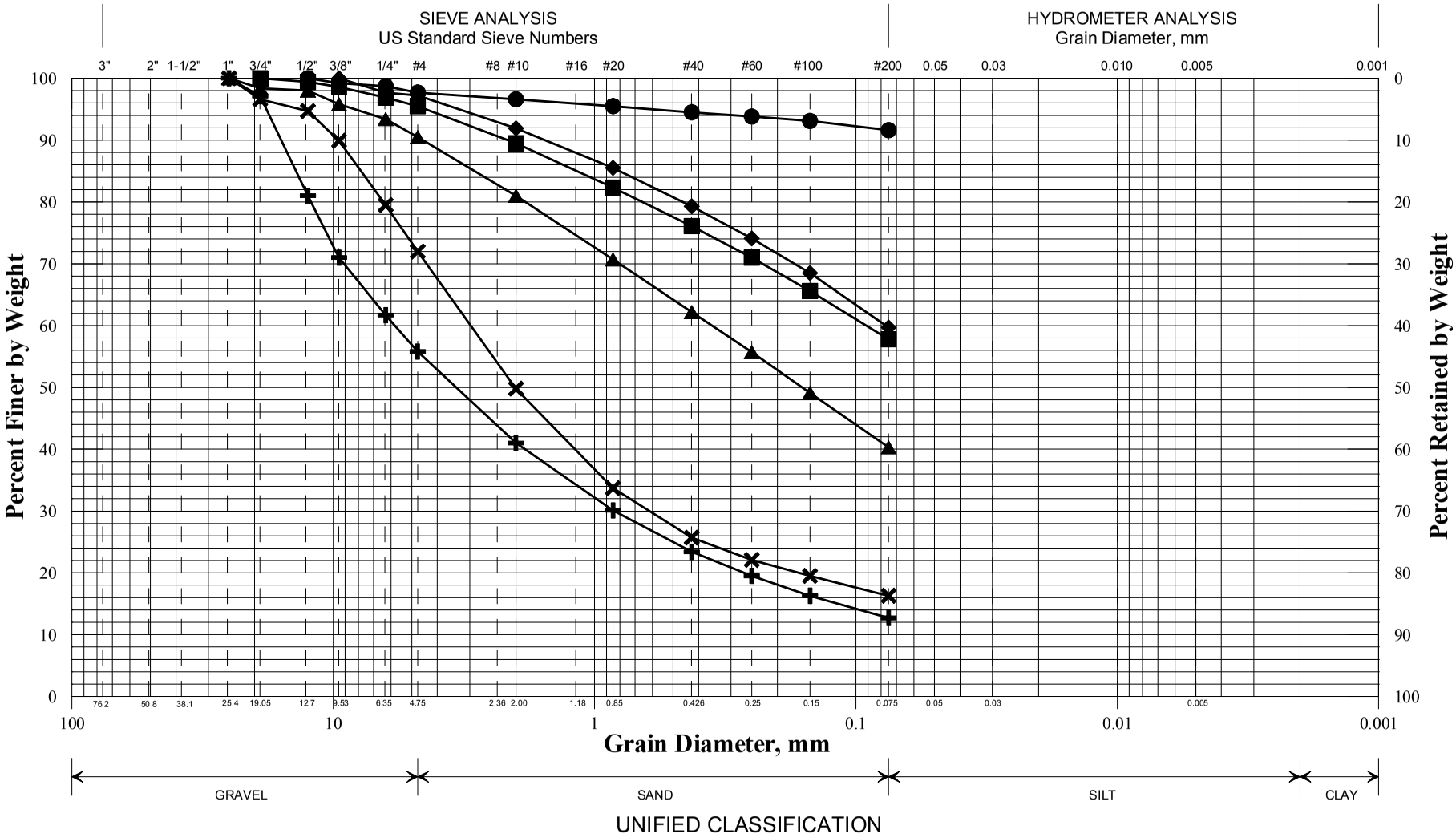
WC = water content as determined by AASHTO T 265-93 and/or ASTM D 2216-98

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

State of Maine Department of Transportation

GRAIN SIZE DISTRIBUTION CURVE



	Boring/Sample No.	Station	Offset, ft	Depth, ft	Description	W, %	LL	PL	PI
✚	HB-TREN-102/S1	291+90	5.5 RT	1.0-2.3	Sandy GRAVEL, little silt.	3.7			
◆	HB-TREN-102/S2	291+90	5.5 RT	2.3-3.0	Sandy SILT, trace gravel.	26.0			
■	HB-TREN-102/S3	291+90	5.5 RT	3.0-5.0	Sandy SILT, trace gravel.	12.3			
●	HB-TREN-103/S4	291+90	17.5 LT	2.3-5.0	Silty CLAY, trace sand, trace gravel.	22.0	29	18	11
▲	HB-TREN-108/S5	10+50	33.0 RT	1.4-5.0	Silty SAND, trace gravel.	12.4			
✖	HB-TREN-110/S6	11+35	8.5 LT	0.5-2.4	SAND, some gravel, little silt.	12.5			

PIN
015690.00
Town
Trenton
Reported by/Date
WHITE, TERRY A 1/11/2008

Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project:

Location: Trenton, Maine

Boring No.: HB-TREN-101

PIN: 15690.00

Driller:	MaineDOT	**Elevation (ft.)**		**Auger ID/OD:**	5" Dia.
Operator:	E. Giguere	**Datum:**	NAVD 88	**Sampler:**	Off Flights
Logged By:	B. Wilder	**Rig Type:**	CME 45C	**Hammer Wt./Fall:**	N/A
Date Start/Finish:	12/27/07-12/27/07	**Drilling Method:**	Solid Stem Auger	**Core Barrel:**	N/A
Boring Location:	290+40, 13.0' 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

Definitions:
WC = water content, percent
LL = Liquid Limit
PL = Plastic Limit
PI = Plasticity Index
G = Grain Size Analysis
C = Consolidation Test

Depth (ft.)	Sample Information: Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-value	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
0						SSA	-0.30		PAVEMENT.	
									0.30	
									Brown, wet, gravelly fine to coarse SAND.	
							-2.50		2.50	
									Olive, moist, clayey-SILT, trace sand, trace gravel.	
5							-5.00		5.00	
									Bottom of Exploration at 5.00 feet below ground surface.	
									NO REFUSAL	
10										
15										
20										
25										
30										

Remarks:

Offsets are from Existing CL of Roadway.

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

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

Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project:

Location: Trenton, Maine

Boring No.: HB-TREN-102

PIN: 15690.00

Driller:	MaineDOT	**Elevation (ft.)**		**Auger ID/OD:**	5" Dia.
Operator:	E. Giguere	**Datum:**	NAVD 88	**Sampler:**	Off Flights
Logged By:	B. Wilder	**Rig Type:**	CME 45C	**Hammer Wt./Fall:**	N/A
Date Start/Finish:	12/27/07-12/27/07	**Drilling Method:**	Solid Stem Auger	**Core Barrel:**	N/A
Boring Location:	291+90, 5.5' 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

Definitions:
WC = water content, percent
LL = Liquid Limit
PL = Plastic Limit
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C = Consolidation Test

Depth (ft.)	Sample Information: Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-value	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
0						SSA	-0.35		PAVEMENT. 0.35	
							-1.00		CONCRETE. 1.00	G#210176 A-1-a, GM WC=3.7%
	S1		1.00 - 2.30				-2.30		Brown, damp, gravelly fine to coarse SAND, trace silt. 2.30	G#210177
	S2		2.30 - 3.00				-3.00		Dark brown, moist, SILT, trace fine sand and organics. 3.00	A-4, ML WC=26.0%
	S3		3.00 - 5.00						Olive, moist, fine sandy-SILT, trace clay.	G#210178
5							-5.00		5.00	A-4, ML WC=12.3%
									Bottom of Exploration at 5.00 feet below ground surface. NO REFUSAL	
10										
15										
20										
25										
30										

Remarks:

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Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project:

Location: Trenton, Maine

Boring No.: HB-TREN-103

PIN: 15690.00

Driller:	MaineDOT	**Elevation (ft.)**		**Auger ID/OD:**	5" Dia.
Operator:	E. Giguere	**Datum:**	NAVD 88	**Sampler:**	Off Flights
Logged By:	B. Wilder	**Rig Type:**	CME 45C	**Hammer Wt./Fall:**	N/A
Date Start/Finish:	12/27/07-12/27/07	**Drilling Method:**	Solid Stem Auger	**Core Barrel:**	N/A
Boring Location:	291+90, 17.5' Lt.	**Casing ID/OD:**	N/A	**Water Level*:**	None Observed

Definitions:
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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

Definitions:
WC = water content, percent
LL = Liquid Limit
PL = Plastic Limit
PI = Plasticity Index
G = Grain Size Analysis
C = Consolidation Test

Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-value	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
0						SSA	-0.60		PAVEMENT.	
									0.60	
									Brown, moist, gravelly fine to coarse SAND, trace silt. ≅S1	
	S4		2.30 - 5.00				-2.30		2.30	G#210179 A-6, CL WC=22.0% LL=29 PL=18 PI=11
									Light brown, wet, clayey-SILT, trace fine sand.	
5							-5.00		5.00	
									Bottom of Exploration at 5.00 feet below ground surface. NO REFUSAL	
10										
15										
20										
25										
30										

Remarks:

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Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project:

Location: Trenton, Maine

Boring No.: HB-TREN-104

PIN: 15690.00

Driller:	MaineDOT	**Elevation (ft.)**		**Auger ID/OD:**	5" Dia.
Operator:	E. Giguere	**Datum:**	NAVD 88	**Sampler:**	Off Flights
Logged By:	B. Wilder	**Rig Type:**	CME 45C	**Hammer Wt./Fall:**	N/A
Date Start/Finish:	12/27/07-12/27/07	**Drilling Method:**	Solid Stem Auger	**Core Barrel:**	N/A
Boring Location:	20+40, 16.0' Rt.	**Casing ID/OD:**	N/A	**Water Level*:**	None Observed

Definitions:
D = Split Spoon Sample
MD = Unsuccessful Split Spoon Sample attempt
U = Thin Wall Tube Sample
R = Rock Core Sample
V = Insitu Vane Shear Test
SSA = Solid Stem Auger

Definitions:
S_u = Insitu Field Vane Shear Strength (psf)
T_v = Pocket Torvane Shear Strength (psf)
q_p = Unconfined Compressive Strength (ksf)
$S_{u(lab)}$ = Lab Vane Shear Strength (psf)
WOH = weight of 140lb. hammer
WOR = weight of rods

Definitions:
WC = water content, percent
LL = Liquid Limit
PL = Plastic Limit
PI = Plasticity Index
G = Grain Size Analysis
C = Consolidation Test

Depth (ft.)	Sample Information: Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-value	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
0						SSA			Brown, moist, gravelly fine to coarse SAND, trace silt. ≅S1	
							-2.50		2.50	
									Light brown, moist, clayey-SILT, trace fine sand. ≅S4	
5							-5.00		5.00	
									Bottom of Exploration at 5.00 feet below ground surface. NO REFUSAL	
10										
15										
20										
25										
30										

Remarks:

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Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project:

Location: Trenton, Maine

Boring No.: HB-TREN-105

PIN: 15690.00

Driller:	MaineDOT	**Elevation (ft.)**		**Auger ID/OD:**	5" Dia.
Operator:	E. Giguere	**Datum:**	NAVD 88	**Sampler:**	Off Flights
Logged By:	B. Wilder	**Rig Type:**	CME 45C	**Hammer Wt./Fall:**	N/A
Date Start/Finish:	12/27/07-12/27/07	**Drilling Method:**	Solid Stem Auger	**Core Barrel:**	N/A
Boring Location:	20+55, 12.0' Rt.	**Casing ID/OD:**	N/A	**Water Level*:**	None Observed

Definitions:
D = Split Spoon Sample
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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
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Definitions:
WC = water content, percent
LL = Liquid Limit
PL = Plastic Limit
PI = Plasticity Index
G = Grain Size Analysis
C = Consolidation Test

Depth (ft.)	Sample Information: Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-value	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
0						SSA	-0.25		PAVEMENT.	
									0.25	
									Brown, moist, gravelly fine to coarse SAND, trace silt. ≅S1	
							-2.50		2.50	
									Light brown, moist, gravelly fine to coarse SAND, trace silt. ≅S6	
5							-5.00		5.00	
									Bottom of Exploration at 5.00 feet below ground surface.	
									NO REFUSAL	
10										
15										
20										
25										
30										

Remarks:

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Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project:

Location: Trenton, Maine

Boring No.: HB-TREN-106

PIN: 15690.00

Driller:	MaineDOT	**Elevation (ft.)**		**Auger ID/OD:**	5" Dia.
Operator:	E. Giguere	**Datum:**	NAVD 88	**Sampler:**	Off Flights
Logged By:	B. Wilder	**Rig Type:**	CME 45C	**Hammer Wt./Fall:**	N/A
Date Start/Finish:	12/27/07-12/27/07	**Drilling Method:**	Solid Stem Auger	**Core Barrel:**	N/A
Boring Location:	294+40, 18.0' 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)
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Definitions:
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LL = Liquid Limit
PL = Plastic Limit
PI = Plasticity Index
G = Grain Size Analysis
C = Consolidation Test

Depth (ft.)	Sample Information: Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-value	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
0						SSA	-0.60		PAVEMENT.	
									0.60	
							-1.50		Brown, moist, gravelly fine to coarse SAND, trace silt. ≅S1	
									1.50	
									Light brown, damp, gravelly fine to coarse SAND, trace silt. ≅S6	
5							-5.00		5.00	
									Bottom of Exploration at 5.00 feet below ground surface.	
									NO REFUSAL	
10										
15										
20										
25										
30										

Remarks:

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Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project:

Location: Trenton, Maine

Boring No.: HB-TREN-107

PIN: 15690.00

Driller:	MaineDOT	**Elevation (ft.)**		**Auger ID/OD:**	5" Dia.
Operator:	E. Giguere	**Datum:**	NAVD 88	**Sampler:**	Off Flights
Logged By:	B. Wilder	**Rig Type:**	CME 45C	**Hammer Wt./Fall:**	N/A
Date Start/Finish:	12/27/07-12/27/07	**Drilling Method:**	Solid Stem Auger	**Core Barrel:**	N/A
Boring Location:	295+40, 13.0' 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

Definitions:
WC = water content, percent
LL = Liquid Limit
PL = Plastic Limit
PI = Plasticity Index
G = Grain Size Analysis
C = Consolidation Test

Depth (ft.)	Sample Information: Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-value	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
0						SSA	-0.60		PAVEMENT.	
									0.60	
							-1.40		Brown, moist, gravelly fine to coarse SAND, trace silt. ≅S1	
									1.40	
									Light brown, wet, gravelly fine to coarse SAND, trace silt. ≅S6	
5							-5.00		5.00	
									Bottom of Exploration at 5.00 feet below ground surface.	
									NO REFUSAL	
10										
15										
20										
25										
30										

Remarks:

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Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project:

Location: Trenton, Maine

Boring No.: HB-TREN-108

PIN: 15690.00

Driller:	MaineDOT	**Elevation (ft.)**		**Auger ID/OD:**	5" Dia.
Operator:	E. Giguere	**Datum:**	NAVD 88	**Sampler:**	Off Flights
Logged By:	B. Wilder	**Rig Type:**	CME 45C	**Hammer Wt./Fall:**	N/A
Date Start/Finish:	12/27/07-12/27/07	**Drilling Method:**	Solid Stem Auger	**Core Barrel:**	N/A
Boring Location:	10+50, 33.0' 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

Definitions:
WC = water content, percent
LL = Liquid Limit
PL = Plastic Limit
PI = Plasticity Index
G = Grain Size Analysis
C = Consolidation Test

Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-value	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
0						SSA	-0.40		PAVEMENT. 0.40	
							-0.60		Unbound PAVEMENT. 0.60	
	S5		1.40 - 5.00				-1.40		Brown, moist, gravelly fine to coarse SAND, trace silt. ≅S1 1.40	G#210180 A-4, SM WC=12.4%
									Light brown, wet, silty fine to medium SAND, little gravel, (Till).	
5							-5.00		5.00	
									Bottom of Exploration at 5.00 feet below ground surface. NO REFUSAL	
10										
15										
20										
25										
30										

Remarks:

Offsets are from Existing CL of Roadway.

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

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

Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project:

Location: Trenton, Maine

Boring No.: HB-TREN-109

PIN: 15690.00

Driller:	MaineDOT	**Elevation (ft.)**		**Auger ID/OD:**	5" Dia.
Operator:	E. Giguere	**Datum:**	NAVD 88	**Sampler:**	Off Flights
Logged By:	B. Wilder	**Rig Type:**	CME 45C	**Hammer Wt./Fall:**	N/A
Date Start/Finish:	12/27/07-12/27/07	**Drilling Method:**	Solid Stem Auger	**Core Barrel:**	N/A
Boring Location:	10+80, 13.0' 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:
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$S_{u(lab)}$ = Lab Vane Shear Strength (psf)
WOH = weight of 140lb. hammer
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Definitions:
WC = water content, percent
LL = Liquid Limit
PL = Plastic Limit
PI = Plasticity Index
G = Grain Size Analysis
C = Consolidation Test

Depth (ft.)	Sample Information: Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-value	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
0						SSA	-0.45		PAVEMENT.	
									0.45	
									Brown, moist, gravelly fine to coarse SAND, trace silt. ≅S1	
							-1.90		1.90	
									Light brown, moist, silty fine to medium SAND, little gravel, (Till). ≅S5	
5							-5.00		5.00	
									Bottom of Exploration at 5.00 feet below ground surface.	
									NO REFUSAL	
10										
15										
20										
25										
30										

Remarks:

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Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project:

Location: Trenton, Maine

Boring No.: HB-TREN-110

PIN: 15690.00

Driller:	MaineDOT	**Elevation (ft.)**		**Auger ID/OD:**	5" Dia.
Operator:	E. Giguere	**Datum:**	NAVD 88	**Sampler:**	Off Flights
Logged By:	B. Wilder	**Rig Type:**	CME 45C	**Hammer Wt./Fall:**	N/A
Date Start/Finish:	12/27/07-12/27/07	**Drilling Method:**	Solid Stem Auger	**Core Barrel:**	N/A
Boring Location:	11+35, 8.5' Lt.	**Casing ID/OD:**	N/A	**Water Level*:**	None Observed

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G = Grain Size Analysis
C = Consolidation Test

Depth (ft.)	Sample Information: Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-value	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
0	S6		0.50 - 2.40			SSA	-0.40		PAVEMENT.	
							-0.50		0.40	G#210181
									Unbound PAVEMENT.	A-1-b, SM
									0.50	WC=12.5%
							-2.40		Light brown, saturated, gravelly fine to coarse SAND, trace silt.	
									2.40	
									Light brown, saturated, silty fine to medium SAND, little gravel, (Till). ≅S5	
5							-5.00		5.00	
									Bottom of Exploration at 5.00 feet below ground surface.	
									NO REFUSAL	
10										
15										
20										
25										
30										

Remarks:

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