I have spoken with Dr. Tom Sandford of the University of Maine concerning the I-95 heaves and the University's possible involvement related the possibility of utilizing some thermocouples.

Dr. Sandford is in agreement with our geotechnical assessments. A summary of our conversation follows:

Findings

1. Water is likely the driving force of the heaving
2. Ground water and Infiltration are the likely sources of the water
3. Ice lens development is likely taking place at depth (select granular and till soils) and near the surface (within the 13" aggregate crushed base and upper granular select)
4. Ice lens development near the surface is likely the cause of these abrupt, isolated, short in length, tent shaped heaves over crack locations.
5. The use of Salt Brine may be the catalyst in promoting the growth of ice lens near the surface within the granular base material based upon recent research.
   a. Canadian Research (TRB Research Record 1596) suggests that Salt Brine may play a primary role in the formation of ice lenses in pavement granular layers during the freezing season. The formation of ice is due to the saline gradient and not temperature gradient. This saline gradient can substantially increase the frost susceptibility of granular materials.
   b. A mixture of water and salt brine enters the roadway structure through cracks in the pavement.
6. **Thermocouples will not determine if the heaving is related to the formation of ice lenses near the surface due to infiltration of water and salt brine because the ice formation is due to a saline gradient and not temperature gradient.**
7. With a projected frost penetration of 72” (non granular) and 104” (granular) there is likely no doubt that the freezing front extends to these depths and that some ice lens development is taking place at this depth. Thermocouples would confirm the frost penetration depth.
8. The primary source of information we would gain from the thermocouples is the movement of the freezing front as it relates to ambient conditions and calendar dates.
9. The university cost to place and monitor the thermocouples is estimated at $5000. A more definitive estimate could be provided if Maine DOT determines to do so.
Recommendations

1. The most definitive action to determine if the heaving is related to the formation of ice lenses near the surface due to infiltration of water and salt brine is to seal the cracks or grind and pave the cracks at several frost heave site locations and monitor these sites through the winter and spring months compared to the non-sealed sites.

2. The possible installation of thermocouples could be considered at one or two heave sites. This would provide frost penetration depths and would plot the movement of the freezing front as it relates to ambient conditions and calendar days.

I am attaching the Canadian Research paper mentioned above.

If you have any questions please do not hesitate to contact me.

Scott

Scott A. Hayden, C.G.
Soils Research Scientist
Maine Department of Transportation
Highway Program
219 Hogan Road, Bangor Maine 04401

Tel: 207.941.4538
Cell: 207.592.2985
Fax: 207.990.2667
Memorandum

DATE: August 31, 2010

TO: Jon Bither

DEPT: Region 5

FROM: Scott A. Hayden

DEPT: Highway Program

SUBJECT: Soils Investigation – Interstate 95 Northbound Heaving – Island Falls to Oakfield
Report # 2010-115

Field Reconnaissance

At the request of Ken Sweeny a field reconnaissance of a 10 mile segment of Interstate 95 (Northbound) between the Island Falls (Mile 276) and Oakfield (Mile 286) interchanges was conducted by Scott Hayden and Jon Bither on April 14, 2010 to identify specific frost heave sites for further investigation.

Approximately 12 heave sites were examined visually. Of these 12 locations, 6 heave sites (Table 1) were indentified for additional subsurface investigation. These 6 sites were chosen based upon heave severity, past heave history, and current site observations.

Table 1. Heave Investigation Sites

| Heave Site 1 – Mile Marker 277.7 | Heave Site 4 – Mile Marker 283.6 |
| Heave Site 2 – Mile Marker 279.9 | Heave Site 5 – Mile Marker 283.8 |
| Heave Site 3 – Mile Marker 283.0 | Heave Site 6 – Mile Marker 284.3 |

The topography and surficial geology in this area consists of gently rolling hills with till soils derived from limestone. Each heave site location is located on the flank of one of these hills. The heave sites are situated within partial or full cut sections except for Heave Site 4 (Photo 9). Pictures of each site location were taken and are included in the “Photo Observations” section of this memo.

In general the heaves are abrupt and tent shaped. A transverse crack denotes the apex of each heave. It is not known if the transverse crack developed prior to, or as a result of, the differential heaving. The heaves extend full-width. The longitudinal extent of the heaving is very limited or isolated, extending only a few feet. Water seepage from within the inslopes and in the ditches was observed at several heave site locations. According to Maine DOT personnel, heaving at these six sites is greatest during the middle of winter. The heaves dissipate during late winter, early spring. At the time of this site visit (4/14/2010) the heaving had generally diminished.
**Subsurface Investigation**

A subsurface investigation has been completed at each of the 6 heave sites listed in Table 1. The purpose of each investigation is to obtain subsurface soil, bedrock, and ground water information to determine the cause of the differential heaving. Subsurface explorations were conducted by Maine DOT using a CME 45C truck mounted drill rig. Bore hole logging was performed by Maine DOT. The boring locations, depth, sampling, and in-situ testing were determined by Maine DOT geotechnical personnel based upon field reconnaissance and standard geotechnical practices.

The subsurface explorations consisted of 27 power auger borings, using 5” solid stem augers, and 1 test pit. Power auger borings were conducted in the left and right travel lanes directly on the heave location. Additional borings were conducted upslope beyond the lateral extent of each heave. See boring plan view plots, boring profiles, and boring logs for additional boring location data.

Soil sampling and in-situ tests were performed using the Standard Penetration Test (SPT) Method at intervals of 2’- 4’ and 5’ - 7’. A 1-3/8” (ID) split-spoon sampler was used. The spoon was driven with a 140-lb hammer using a 30 inch drop. Blow counts were recorded per 6 inch driving interval. The N-value was estimated from the recorded blow counts.

Thirty-five soil samples were collected and tested at the Maine DOT Materials and Testing laboratory, located in Bangor Maine. Grain size and water content testing was conducted on each sample. Based upon laboratory test results, soil samples were classified according to the Unified Classification System, AASHTO Soil Classification and Maine DOT Frost Susceptibility Rating. See Laboratory Testing Summary Sheets and Grain Size Distribution Curves for detailed sample results.

**Existing Roadway Structure**

This 10 mile segment of I-95 Northbound (I-95-9(87)269) was built in the early 1980’s. Design plans indicate a 55 inch structure similar to the typical cross section below.

**Figure 1. I-95 Northbound Typical Cross Section**

<table>
<thead>
<tr>
<th></th>
<th>55”</th>
</tr>
</thead>
<tbody>
<tr>
<td>9” Hot Bituminous Pavement</td>
<td></td>
</tr>
<tr>
<td>13” Aggregate Base - Crushed</td>
<td></td>
</tr>
<tr>
<td>33” Select Granular Base Material</td>
<td></td>
</tr>
<tr>
<td>(Moderately Frost Susceptible)</td>
<td></td>
</tr>
<tr>
<td>Till / Fill</td>
<td></td>
</tr>
<tr>
<td>Subgrade Soils</td>
<td></td>
</tr>
<tr>
<td>(Highly Frost Susceptible)</td>
<td></td>
</tr>
</tbody>
</table>
**Frost Penetration Depth Estimates**

The Maine Design Freezing Index for this project site is approximately 2200. Based on Table 2 it is estimated that freezing ground temperatures fully penetrate the existing 55” roadway structure extending well into the underlying till/fill subgrade soils.

<table>
<thead>
<tr>
<th>Freezing Index</th>
<th>Total Frost Penetration</th>
<th>Frost Penetration into Subgrade</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Nongranular</td>
<td>Granular</td>
</tr>
<tr>
<td>Design 2200</td>
<td>72”</td>
<td>104”</td>
</tr>
</tbody>
</table>

**Frost Heave Development**

The development of a frost heave requires the presence of frost susceptible soils, ground temperatures below 32° F, and water. When water in a soil freezes this creates a 2% - 3% increase in soil volume which equates to a vertical expansion of only 1-2 inches. The vertical expansion in a frost heave can commonly range between 8” – 20”. This additional vertical expansion is caused by the continued development of planar ice lenses. As the ice lens grows it expands vertically displacing the overlying soil.

The soils underlying our vast highway system freeze each winter. Typically the formation of ice lenses and the associated vertical soil expansion is uniform over large distances creating little or no noticeable affect to drivers. However, heaving becomes noticeable and problematic when there is either a substantial differential in the vertical expansion of adjacent soils during the freeze or a substantial differential in the dissipation of ice lenses during the thaw. This type of frost heaving is referred to as “differential heaving” and it is responsible for the abrupt vertical pavement displacements commonly referred to as “frost heaves”.

As mentioned above differential heaving can develop as a freeze phenomena or thaw phenomena. According to Maine DOT personnel the differential heaving at the 6 heave sites develops progressively during the winter freeze and reaches its maximum during the coldest portion of winter. The heaving dissipates progressively during late winter, early spring. Thus the heaving at the 6 individual sites is related to the differential growth of ice lenses rather than a differential in the melting of ice lenses.
A differential in the growth of ice lenses can result from several subgrade conditions. Two common subgrade conditions are;

1. an abrupt contact between dissimilar soils
2. an abrupt contact between frost susceptible soils and shallow bedrock.

The above subgrade conditions occur naturally or can be the result of man-made activities.

**Figure 2. Differential Heaving Due to Dissimilar Soils or Shallow Bedrock**

On the left of figure 2 a cross pipe trench is illustrated in which dissimilar soils are in abrupt contact with each other. Non-frost susceptible material used to backfill the cross pipe trench is in direct contact with the adjacent highly frost susceptible native soils. During the winter freeze, the non-frost susceptible soils in the cross pipe trench heave very little. However, the adjacent highly frost susceptible native soils heave substantially. This creates an abrupt depression in the pavement surface over the cross pipe trench. *(A cross pipe trench was used for clarity and simplification purposes. Abrupt soils contacts between dissimilar soils can occur naturally resulting in the same type of heaving.)*

On the right side of figure 2 a naturally occurring subsurface soil condition is illustrated in which bedrock is encountered near or above subgrade. There is little or no frost susceptible soil cover overlying the shallow bedrock surface resulting in little or no heaving. However, the frost susceptible soils surrounding the shallow bedrock heave substantially. This creates a depression over the bedrock surface. A driver will notice a substantial bump as they enter and leave the shallow bedrock area.
Water is required for the formation of ice lenses. Its relationship to frost heaving is significant and cannot be over emphasized. Water can cause differential heaving even if subgrade conditions are void of dissimilar soils or void of shallow bedrock. The abundance of free water in a localized area can enhance the formation of ice lenses. This can cause the soils in the immediate area to heave more than the adjacent soils as illustrated in figure 3.

**Figure 3. Differential Heaving Due to an Isolated Abundant Water Source**

Investigation Results

Power auger borings at each of the 6 heave site locations encountered a uniform soil profile similar to the typical design cross section illustrated in figure 1. For detailed results please refer to the power auger boring profiles and boring logs.

**Existing Select Granular Base Material** - Based upon samples of the select granular base the following summary of engineering properties is provided:

- **Existing Base Material Type:** Silty Gravelly SAND
- **AASHTO Classification:** A-1-a, A-1-b
- **Frost Classification:** II on a scale of 0-IV
- **Percent Passing #200:** 11% - 27%
- **Average % Passing #200:** 16%
- **Permeability:** 0.4’ – 11’ per day
- **Average Permeability:** 4’ per day
- **Quality of Drainage (AASHTO):** Poor to Fair

Samples of the select granular base are primarily classified (AASHTO) as A-1-b soils. This material consists of moist to wet gravelly sands with an appreciable amount of fines. It is anticipated that the high percentage of fines is related to pre-construction, construction, and post-construction aggregate breakdown. Materials in this region commonly exemplify very low degradation values and breakdown readily. Due to the high percentage of fines the select granular material has a poor to fair quality of drainage. This material is moderately frost susceptible.
Subgrade Soils – The subgrade soils underlying the select granular base layer consist of silty sands and sandy silts. These soils were found to be moist to wet. In cut sections these subgrade soils consist of native till. In fill sections these subgrade soils consist of borrow. The till and borrow fill material are very similar. This is because the native source for the borrow material was likely till. Based upon samples of the subgrade soils the following summary of engineering properties is provided:

Silty Sands:

AASSHTO Classification: A-1-b and A-2-4
Frost Classification: II (on a scale of 0-IV)
Percent passing # 200 sieve: 19% – 36%
Ave % passing #200 sieve: 29%

Silty sand is the primary soil underlying the select granular base layer throughout the heave site locations. These soils generally perform well as a subgrade soil if properly drained. These soils are moderately frost susceptible.

Sandy Silts:

AASSHTO Classification: A-4
Frost Classification: III – IV (on a scale of 0-IV)
Percent passing # 200 sieve: 45% – 55%
Ave % passing #200 sieve: 52%

Sandy silt soils were encountered underlying the select granular base layer at Heave Site 4 and Heave Site 5. These sandy silts have a higher silt content than the silty sands encountered at the other locations. Sandy silt can perform adequately as a subgrade soil if properly compacted and drained. However, these soils will swell and lose much of their stability if they are not properly compacted and drained. These soils are highly frost susceptible.

Bedrock – The topography is this region consists of gently rolling hills. These hills are supported by relatively shallow bedrock (< 15’) surface. The bedrock surface is overlain by highly frost susceptible till soils.

Borings generally penetrated to a depth of 7’ ( 84 inches) at each of the 6 heave site locations without encountering a refusal. This likely indicates that bedrock is not present within the 55” roadway structure. However, two refusals were encountered in the right in slope at a depth of 7.1’ and 8.0’ at Heave Site 1. These refusals could be due bedrock or a cobble/boulder.

Saturated Soil Conditions – Saturated soil conditions were encountered at each of the 6 heave site locations. The saturation was present in both the select granular base layer and the underlying subgrade soils. In general the soils become saturated between 3’ – 7’ below the top of pavement. A “very wet layer”, as described in the boring logs, was commonly encountered at an average depth between 4’ and 5.5’ below the top of pavement. Inslopes and ditches were found to be moist to wet at the majority of heave site locations. Specific areas of wetness are described and illustrated in the following “Photo Observation” section.
Photo Observations

During the April 14 field reconnaissance pictures of each heave site location were taken to document site conditions.

Heave Site 1

Photo 1: Heave Site 1 – Station 5120+25

At Heave Site 1 the right inslope was saturated and moderate water seepage was present in the right ditch. The seepage along the right inslope and ditch appeared abruptly at station 5123+75 and continued downslope. There was no water seepage above this point. This could indicate the presence of a spring. See photos 2 and 3.

Photo 2: Possible Spring Activity
Station 5123+75

Photo 3: Possible Spring Activity
Station 5123+75
Photo 5 below depicts a wet spot located along the left inslope at Heave Site 2. A test pit was dug at this specific spot to further investigate the water seepage. The north sidewall of this test pit is shown in photo 6. As seen in the photo 6, the wet spot was caused by subsurface water flowing and day lighting along the contact between the select granular base layer and the underlying dense subgrade soil layer. A boring conducted in the left lane at this same station (5235+00) encountered a “very wet layer” between 3.0’ - 7.0’ below the top of the pavement (See Heave Site 2 Boring Profile, Boring HB-ISFA-108).
Heave Site 3

Photo 7: Heave Site 3 – Station 5398+40

Photo 8: Water seepage from right inslope and ditch
Heave Site 4

Photo 9: Heave Site 4 – Station 5431+67

Heave 4 - Station 5431+67
(Looking North)

Cattails
Heave Site 5

Photo 11: Heave Site 5 – Station 5445+70

Photo 12: Wet left inslope and ditch

Photo 13: Wet right inslope and ditch
Conclusions

The differential heaving at each of the 6 heave site locations reaches its maximum vertical displacement during the middle of winter. The heaves then begin to dissipate in late winter and early spring during the thaw. Based upon this, it can be first concluded that the heaving is related to the differential growth of ice lenses rather than a differential in the thawing of ice lenses.
Commonly this difference in vertical expansion is associated with an abrupt contact between dissimilar soils (natural or manmade) or an abrupt contact between frost susceptible soils and shallow bedrock. Based upon the subsurface borings the vertical and horizontal soil profile appears to be uniform and void of any abrupt contacts between dissimilar soils. Furthermore, boring data suggests there are no abrupt bedrock/soil contacts within the depth of 7’ below the existing pavement surface. Thus it appears that the differential heaving at the 6 heave site locations is not due to the presence of dissimilar soils or shallow bedrock.

It is anticipated that the abundant presence of WATER within the silty select granular base layer and the underlying silty subgrade soils is the primary cause for the differential heaves at each of the heave site locations. These abrupt, isolated, tent shaped heaves are likely formed as illustrated in Figure 3.

Subsurface water can exist in a variety of forms including water vapor, bound moisture, capillary moisture, and gravitational or free water. Water vapor and bound moisture are usually thought of as immobile and are considered negligible. Capillary moisture is water held in the pores of a soil above the ground water table (capillary fringe) under the force of surface tension and is related to the grain size distribution and density of the soil. When the soils are wet, water moves through the larger pores between sand particles faster than it moves through the smaller pores between clay particles. However, water eventually rises higher in a clay soil because the pores are smaller and closer together. Although the select granular base is relatively silty, capillary rise in this material is likely to be marginal. Thus the primary form of water affecting the heave sites is likely to consist of gravitational or free water which moves under the force of gravity and/or pressure.

Ground water and infiltration are two likely sources of gravitational or free water. Groundwater is the water existing in the natural ground in the zone of saturation below the water table. For our purposes, infiltration is water that enters into the structural section through joints and cracks in the pavement surface or from inadequate ditches along the side of the road. The main source for both groundwater and infiltration is precipitation. Studies have shown that fifty percent of the rainfall reaching a mature pavement enters the roadway structure through infiltration (FHWA Experimental Project No. 12). As previously mentioned, each heave location is marked by the presence of a large transverse crack. It is not known if these cracks existed prior to the original formation of these heaves. Regardless, these cracks now serve as a direct conduit for surface water to infiltrate the select granular base.

Based upon boring data, the depth to bedrock is greater than 7 feet below the top of payment in the heave areas. Thus it is doubtful that the differential heaving is related to a shallow soil/bedrock contact. However, as previously mentioned, the bedrock underlying the hills in this region is relatively shallow (<15’). Isolated spring activity originating from the relatively shallow bedrock surface could be a potential ground water source. Heavy water seepage at Heave Site 1 may be spring related?
Recommendations

The recommendations below have been proposed based on the following guidelines:

A. The existing Interstate pavement surface and underlying soils should not be disturbed. Any measures requiring excavation must be conducted beyond the edge of pavement.
B. The scope and extent of the following recommendations have been kept to a minimum to reduce expenditures. These minimal measures should be tried and monitored. More substantial measures can always be considered at a later date if necessary.
C. To minimize expenditures, Maine DOT maintenance personnel will conduct the work.

The following recommendations are proposed:

1. It is recommended that pavement cracks within 200’ of each heave location be crack sealed to prevent the infiltration of surface water.

2. It is recommended that 4 lateral drains be placed at each heave site location (listed below). The lateral drains should extend downward from the edge of payment to a depth of 6’. The trench should extend outward at a 1% grade (1:100) until it intercepts the existing inslope. A 3 inch layer of ¾ inch crushed stone (703.12) should be placed along the trench floor. Six inch Type B underdrain (706.09) should be placed (1% grade) on the 3” crushed stone layer full length extending 1 foot beyond the inslope and marked with an outlet delineator post. The trench should then be backfilled with an additional 9” of crushed stone. The remainder of the trench should be backfilled with dense graded crushed aggregate (304.013).


<table>
<thead>
<tr>
<th>Heave Site 1</th>
<th>Heave Site 3</th>
<th>Heave Site 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Station 5120+25 left and right&lt;br&gt;Station 5122+19 left and right&lt;br&gt;Station 5123+75 right</td>
<td>Station 5398+40 left and right&lt;br&gt;Station 5399+25 left and right</td>
<td>Station 5445+70 left and right&lt;br&gt;Station 5446+50 left and right</td>
</tr>
<tr>
<td>Heave Site 2</td>
<td>Heave Site 4</td>
<td>Heave Site 6</td>
</tr>
<tr>
<td>Station 5235+45 left and right&lt;br&gt;Station 5236+00 left and right</td>
<td>Station 5431+67 left and right&lt;br&gt;Station 5432+50 left and right</td>
<td>Station 5472+25 left and right&lt;br&gt;Station 5471+00 left and right</td>
</tr>
</tbody>
</table>

Estimated Cost Summary

<table>
<thead>
<tr>
<th>Description</th>
<th>Quantity</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crack Sealing</td>
<td>250’/location x 6 locations</td>
<td>$ 5,000</td>
</tr>
<tr>
<td>Lateral Drain Materials</td>
<td>25 lateral drains</td>
<td>$ 16,500</td>
</tr>
<tr>
<td>Labor (Maine DOT Maintenance)</td>
<td>12 days @ $3200.00</td>
<td>$ 38,400</td>
</tr>
</tbody>
</table>

Total Cost $ 59,900
Island Falls - I-95 Northbound
Heave # 1 : Station 5120+25
Plan View Boring Plots

Mile Marker: 277.7
Maintainence Heave Scale (1-5) : Scale = 3

Topo: Heave area located along flank of hill. Cut left and right

Note: 5120+00 - 5123+75 Water present in Rt ditch
    Possible water source (Spring?) beginning @ 5123+75 on the Rt
    5120+00 - 5122+10 Rt. Inslope moist to wet
    No water at base of Lt inslope

- **Flow Direction**
  - **Cut**
    - 5125+00
    - 5124+00
    - 5123+00
    - 5122+00
    - 5121+00
    - 5120+00

- **CL**

- **Cut**

- **Possible Spring 5123+75**
  - Water in ditch 5120+00 - 5123+75
  - Rt Inslope moist to wet
  - 5120+00 - 5122+10
  - X Moist Ref 7.1'
  - X Moist Ref 8.0'

- **Transverse Crack 5122+19**

- **No H20**

- **Slight Cut**
  - 5120+00

- **Heave/Transverse Crack 5120+25**

- **Lt Travel**
  - **Rt Travel**
  - **Breakdown**
  - **Inslope**
### Island Falls - I-95 Northbound

**Heave # 2 : Station 5235+45**  
**Plan View Boring Plots**

**Maintainence Heave Scale (1-5) : Scale = 5**

**Topo:** Located on a slight to moderate incline. Cut left and right  
   Elevated Turn - low left

**Note:** No water flowing in right or left ditch  
   Left inslope wet @ 5235+00, 30’ Left  
   Rt. Inslope moist

---

#### Inslope  Lt Travel  Rt Travel  Breakdown

<table>
<thead>
<tr>
<th></th>
<th>5236+50</th>
<th></th>
<th></th>
<th>Cut</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flow</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Direction</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5235+50</td>
<td>X</td>
<td></td>
<td></td>
<td>Wet 3.0’</td>
</tr>
<tr>
<td></td>
<td>Wet 3.0’</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5235+00</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>Heave/Transverse Crack@ 5235+45</td>
</tr>
<tr>
<td></td>
<td>Wet 3.0’</td>
<td>Wet 4.0’</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cut</td>
<td>5234+50</td>
<td></td>
<td></td>
<td>Cut</td>
</tr>
</tbody>
</table>
Heave 2 - Station 5235+45
Boring Profile

<table>
<thead>
<tr>
<th>Inslope</th>
<th>Left Travel Lane</th>
<th>CL</th>
<th>Right Travel Lane</th>
<th>Breakdown Lane</th>
<th>Inslope</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>5236+00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>HB-ISFA-109</td>
<td>5236+00</td>
<td>9.0' Left</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.6 Pavement</td>
<td>Pavement</td>
<td>Wet</td>
<td>SiGSa, A-1-b, II</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3.0 Wet</td>
<td></td>
<td>14%, 10.8, 5'/day</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>5.5 Very</td>
<td></td>
<td>Wet Layer 3.0' - 5.5'</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>7.0 Wet</td>
<td></td>
<td>SiGSa, A-2-4, II</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>34%, 9.4, 0.02'/day</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Inslope</th>
<th>Left Travel Lane</th>
<th>CL</th>
<th>Right Travel Lane</th>
<th>Breakdown Lane</th>
<th>Inslope</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>5235+45</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>HB-ISFA-107</td>
<td>5235+45</td>
<td>HEAVE</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>10' Left</td>
<td>Pavement</td>
<td>Wet</td>
<td>SiGSa, A-1-b, II</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.7 Pavement</td>
<td>Wet</td>
<td>17%, 8.4</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>3.0 Wet Layer 3.0' - 5.0'</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>5.0 Dry, Very Dense</td>
<td>GSaSi, A-4, IV</td>
<td>55%, 9.2, &lt;0.02'/day</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>7.0 GSaSi, A-2-4, II</td>
<td></td>
<td>35%, 10.1, 0.02'/day</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Inslope</th>
<th>Left Travel Lane</th>
<th>CL</th>
<th>Right Travel Lane</th>
<th>Breakdown Lane</th>
<th>Inslope</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>5235+03</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>HB-ISFA-108</td>
<td>5235+03</td>
<td>9.0' Left</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.65 Pavement</td>
<td>Wet</td>
<td>SiGSa, A-1-b, II</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>3.0 Very</td>
<td></td>
<td>Wet Layer 3.0' - 7.0'</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>4.8 Wet, Very Dense</td>
<td>GSaSi, A-2-4, II</td>
<td>35%, 10.1, 0.03'/day</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>7.0 GSiSa, A-2-4, II</td>
<td></td>
<td>35%, 10.1, 0.03'/day</td>
<td></td>
</tr>
</tbody>
</table>
Island Falls - I-95 Northbound
Heave # 3 : Station 5398+40
Plan View Boring Plots

Maintenence Heave Scale (1-5) : Scale = 4

Topo: On hillside flank
Slight Elevated turn right, right low

Note: Right inslope and right ditch wet

<table>
<thead>
<tr>
<th>Lt Travel</th>
<th>Rt Travel</th>
<th>Breakdown</th>
<th>Inslope</th>
</tr>
</thead>
<tbody>
<tr>
<td>5400+00</td>
<td>CL</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fill 5399+50</td>
<td></td>
<td>Cut</td>
<td></td>
</tr>
<tr>
<td>Flow Direction</td>
<td></td>
<td>Wet Inslope 5398+00 - 5399+25</td>
<td></td>
</tr>
<tr>
<td>Fill 5399+00</td>
<td>X</td>
<td></td>
<td>Fill</td>
</tr>
<tr>
<td>Cut 5398+50</td>
<td>X</td>
<td>X</td>
<td>Fill</td>
</tr>
<tr>
<td></td>
<td>Wet 3.3'</td>
<td>Wet 3.3'</td>
<td>Wet</td>
</tr>
<tr>
<td>Cut 5398+00</td>
<td></td>
<td></td>
<td>Heave/Tranverse Crack 5398+40 Fill</td>
</tr>
</tbody>
</table>
Heave 3 - Station 5398+40
Boring Profile

CL

<table>
<thead>
<tr>
<th>Inslope</th>
<th>Left Travel Lane</th>
<th>Right Travel Lane</th>
<th>Breakdown Lane</th>
<th>Inslope</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>5399+25</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>HB-ISFA-111</td>
<td>9.0' Right</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.7 Pavement</td>
<td>Moist</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>SiGSa, A-1-b, II</td>
<td>16%, 5.9, 1'/day</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>4.0</td>
<td>Wet Layer 4.0'-5.0'</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>5.0</td>
<td>Wet</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>GSisa, A-2-4, II</td>
<td>29%, 12.4, &lt; 0.02'/day</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>7.0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Inslope</th>
<th>Left Travel Lane</th>
<th>Right Travel Lane</th>
<th>Breakdown Lane</th>
<th>Inslope</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>5398+40</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>HEAVE</td>
<td>HB-ISFA-124</td>
<td>6.0' Left</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.7 Pavement</td>
<td>Wet</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>SiGSa, A-1-b, II</td>
<td>15%, 8.5, 3'/day</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>3.0</td>
<td>Water @ 3.3'</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>5.0</td>
<td>Wet</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>SiGSa, A-2-4, II</td>
<td>23%, 12.3, 0.2'/day</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>6.0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Inslope</th>
<th>Left Travel Lane</th>
<th>Right Travel Lane</th>
<th>Breakdown Lane</th>
<th>Inslope</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>5398+40</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>HB-ISFA-110</td>
<td>8.0' Right</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.7 Pavement</td>
<td>Wet</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>SiGSa, A-1-b, II</td>
<td>15%, 8.5, 3'/day</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>3.0</td>
<td>Wet Layer 3.3'-5.5'</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>5.5</td>
<td>Wet</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>SiGSa, A-2-4, II</td>
<td>23%, 12.3, 0.2'/day</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>7.0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Island Falls - I-95 Northbound
Heave # 4 : Station 5431+67
Plan View Boring Plots

Maintainence Heave Scale (1-5) : Scale = 4

Topo: Base of hillside flank

Note: Right and Left ditch wet
Left inslope wetter than Right inslope. Cattails left.
Till not as dense. Water in the till not just at the boundary
Fill Section

<table>
<thead>
<tr>
<th>Lt Travel</th>
<th>Rt Travel</th>
<th>Breakdown</th>
<th>Inslope</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fill</td>
<td>CL</td>
<td></td>
<td>Fill</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5432+50</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Wet 4.0'</td>
</tr>
<tr>
<td>5432+00</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5431+50</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Wet 4.5'</td>
</tr>
<tr>
<td>5431+00</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Flow Direction: Wet Inslope Throughout

Heave/Transverse Crack 5431+67
Heave 4 - Station 5431+67
Boring Profile

<table>
<thead>
<tr>
<th>Inslope</th>
<th>Left Travel Lane</th>
<th>CL</th>
<th>Right Travel Lane</th>
<th>Breakdown Lane</th>
<th>Inslope</th>
</tr>
</thead>
<tbody>
<tr>
<td>5432+50</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Inslope</th>
<th>Left Travel Lane</th>
<th>CL</th>
<th>Right Travel Lane</th>
<th>Breakdown Lane</th>
<th>Inslope</th>
</tr>
</thead>
<tbody>
<tr>
<td>5431+67</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

HB-ISFA-114
5432+50
9.0' Right
0.6
Pavement
Moist
SiGSa, A-1-b, II
18%, 9.2, 3'/day
Wet Layer 4'-5'
4.5
Wet
GSaSi, A-4, III
45%, 12.0, < 0.02'/day
7.0

HB-ISFA-125
5431+67
8.0' Left
0.6
Pavement
Wet
SiGSa, A-1-b, II
17%, 9.6, 2'/day
Wet Layer 4.0' - 5.0'
4.0
Wet
GSiSa, A-2-4, II
36%, 10.6, < 0.02'/day
6.0

HB-ISFA-113
5431+67
9.0' Right
0.6
Pavement
Wet
SiGSa, A-1-b, II
14%, 9.3, 5'/day
Wet Layer 4.0' - 5.5'
4.5
Wet
GSiSa, A-2-4, II
36%, 10.6, < 0.02'/day
6.0

HB-ISFA-115
5431+67
27.0' Right
0.3
Sod
Wet
SiGSa, A-1-b, II
14%, 9.3, 5'/day
Wet Layer 5.0' - 6.0'
4.5
Wet
GSiSa, A-2-4, II
36%, 10.6, < 0.02'/day
6.0
Island Falls - I-95 Northbound
Heave # 5 : Station 5445+70
Plan View Boring Plots

Maintainence Heave Scale (1-5) : Scale = 4

Topo: On hillside flank

Note: Right and Left Inslopes are wet
    (Right slope slightly wetter than left)
    Wetness extends 5445+00 - 5446+50
    Cut Section Throughout

<table>
<thead>
<tr>
<th>Inslope</th>
<th>Lt Travel</th>
<th>Rt Travel</th>
<th>Breakdown</th>
<th>Inslope</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cut</td>
<td>CL</td>
<td>X</td>
<td>CL</td>
<td>Cut</td>
</tr>
<tr>
<td>5446+50</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wet</td>
<td></td>
<td></td>
<td>Wet 3.0'</td>
<td></td>
</tr>
<tr>
<td>5446+00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wet</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5445+70</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Wet</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Throughout</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5445+50</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wet</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5445+00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cut</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Flow Direction

5445+70 Heave/Transverse Crack

Wet Inslope Throughout
Wet 4.0'
Island Falls - I-95 Northbound
Heave # 6 : Station 5472+25
Plan View Boring Plots

Maintainence Heave Scale (1-5) : Scale = 4

Topo: On hillside flank

Note: Right and Left ditches wet
   Cattails in left ditch
   Fill left, Cut right

<table>
<thead>
<tr>
<th>Flow Direction</th>
<th>Lt Travel</th>
<th>Rt Travel</th>
<th>Breakdown</th>
<th>Inslope</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fill 5473+00</td>
<td>X</td>
<td>X</td>
<td></td>
<td>Cut</td>
</tr>
<tr>
<td></td>
<td>Wet 4.0'</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fill 5472+50</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fill 5472+25</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>Cut</td>
</tr>
<tr>
<td></td>
<td>Wet 4.0'</td>
<td>Wet 4.0'</td>
<td>Wet</td>
<td></td>
</tr>
<tr>
<td>Fill 5472+00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fill 5471+50</td>
<td></td>
<td></td>
<td></td>
<td>Cut</td>
</tr>
</tbody>
</table>

5472+25 Heave/Transverse Crack
### Heave 6 - Station 5472+25
#### Boring Profile

<table>
<thead>
<tr>
<th>Station</th>
<th>Left Travel Lane</th>
<th>Right Travel Lane</th>
<th>Breakdown Lane</th>
<th>Inslope</th>
</tr>
</thead>
<tbody>
<tr>
<td>5473+00</td>
<td><strong>CL</strong> HB-ISFA-121</td>
<td>0.6 Pavement</td>
<td>8.0' Right</td>
<td>Wet</td>
</tr>
<tr>
<td></td>
<td>5473+00</td>
<td>Wet SiGSa, A-1-b, II</td>
<td>19%, 11.0, 2'/day</td>
<td>Very Wet Layer</td>
</tr>
<tr>
<td></td>
<td>5472+25</td>
<td>Wet 4.5</td>
<td>4.5</td>
<td>Wet</td>
</tr>
<tr>
<td></td>
<td>5472+25</td>
<td>Wet 6.0 GSiSa, A-2-4, II</td>
<td>27%, 12.3, 0.4'/day</td>
<td>6.0 GSiSa, A-2-4, II</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Station</th>
<th>Left Travel Lane</th>
<th>Right Travel Lane</th>
<th>Breakdown Lane</th>
<th>Inslope</th>
</tr>
</thead>
<tbody>
<tr>
<td>5472+25</td>
<td><strong>HEAVE</strong> HB-ISFA-127</td>
<td>0.65 Pavement</td>
<td>8.0' Left</td>
<td>Wet</td>
</tr>
<tr>
<td></td>
<td>5472+28</td>
<td>Wet SiGSa, A-1-b, II</td>
<td>23%, 10.1, 1'/day</td>
<td>Wet</td>
</tr>
<tr>
<td></td>
<td>5472+25</td>
<td>Wet 5.1</td>
<td>5.1</td>
<td>Wet</td>
</tr>
<tr>
<td></td>
<td>5472+25</td>
<td>Wet 6.0 Moist GSiSa, A-2-4, II</td>
<td>27%, 12.3, 0.4'/day</td>
<td>5.5 Moist GSiSa, A-2-4, II</td>
</tr>
</tbody>
</table>
### Classification of Soil Samples

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

---

<table>
<thead>
<tr>
<th>Boring &amp; Sample Identification Number</th>
<th>Station (Feet)</th>
<th>Offset (Feet)</th>
<th>Depth (Feet)</th>
<th>Reference Number</th>
<th>G.S.D.C. Sheet</th>
<th>W.C. 200 Sieve</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>HB-ISFA-101, 1D</td>
<td>5120+25</td>
<td>9.0 Rt.</td>
<td>2.0-4.0</td>
<td>238076</td>
<td>1</td>
<td>5.2</td>
<td>13.8 SM A-1-b II</td>
</tr>
<tr>
<td>HB-ISFA-102, 1D</td>
<td>5120+25</td>
<td>9.0 Rt.</td>
<td>5.0-6.0</td>
<td>238077</td>
<td>1</td>
<td>9.5</td>
<td>31.9 SM A-2-4 II</td>
</tr>
<tr>
<td>HB-ISFA-102, 1D</td>
<td>5122+19</td>
<td>9.0 Rt.</td>
<td>2.0-4.0</td>
<td>238078</td>
<td>1</td>
<td>3.9</td>
<td>10.9 SW-SM A-1-a 0</td>
</tr>
<tr>
<td>HB-ISFA-103, 1D</td>
<td>5124+00</td>
<td>10.0 Rt.</td>
<td>2.0-4.0</td>
<td>238080</td>
<td>2</td>
<td>1.9</td>
<td>17.5 SM A-1-b II</td>
</tr>
<tr>
<td>HB-ISFA-104, 1D</td>
<td>5124+00</td>
<td>10.0 Rt.</td>
<td>5.0-7.0</td>
<td>238081</td>
<td>2</td>
<td>8.2</td>
<td>21.9 SM A-1-b II</td>
</tr>
<tr>
<td>HB-ISFA-107, 1D</td>
<td>5235+45</td>
<td>10.0 Lt.</td>
<td>2.0-4.0</td>
<td>238083</td>
<td>2</td>
<td>8.4</td>
<td>17.4 SM A-1-b II</td>
</tr>
<tr>
<td>HB-ISFA-107, 2D</td>
<td>5235+45</td>
<td>10.0 Lt.</td>
<td>5.0-7.0</td>
<td>238084</td>
<td>2</td>
<td>9.2</td>
<td>55.3 ML A-4 IV</td>
</tr>
<tr>
<td>HB-ISFA-108, 1D</td>
<td>5235+03</td>
<td>9.0 Lt.</td>
<td>2.0-4.0</td>
<td>238085</td>
<td>3</td>
<td>6.2</td>
<td>14.6 SM A-1-b II</td>
</tr>
<tr>
<td>HB-ISFA-108, 2D</td>
<td>5235+03</td>
<td>9.0 Lt.</td>
<td>5.0-7.0</td>
<td>238086</td>
<td>3</td>
<td>10.1</td>
<td>35.0 SM A-2-4 II</td>
</tr>
<tr>
<td>HB-ISFA-109, 1D</td>
<td>5236+00</td>
<td>9.0 Lt.</td>
<td>2.0-4.0</td>
<td>238087</td>
<td>4</td>
<td>10.8</td>
<td>14.2 SM A-1-b II</td>
</tr>
<tr>
<td>HB-ISFA-109, 2D</td>
<td>5236+00</td>
<td>9.0 Lt.</td>
<td>5.0-7.0</td>
<td>238088</td>
<td>4</td>
<td>9.4</td>
<td>33.6 SM A-2-4 II</td>
</tr>
<tr>
<td>HB-ISFA-110, 1D</td>
<td>5398+40</td>
<td>8.0 Rt.</td>
<td>2.0-4.0</td>
<td>238089</td>
<td>4</td>
<td>8.5</td>
<td>14.6 SM A-1-b II</td>
</tr>
<tr>
<td>HB-ISFA-110, 2D</td>
<td>5398+40</td>
<td>8.0 Rt.</td>
<td>5.0-7.0</td>
<td>238090</td>
<td>4</td>
<td>12.3</td>
<td>22.7 SM A-1-b II</td>
</tr>
<tr>
<td>HB-ISFA-111, 1D</td>
<td>5399+25</td>
<td>9.0 Rt.</td>
<td>2.0-4.0</td>
<td>238091</td>
<td>4</td>
<td>5.9</td>
<td>15.9 SM A-1-b II</td>
</tr>
<tr>
<td>HB-ISFA-111, 2D</td>
<td>5399+25</td>
<td>9.0 Rt.</td>
<td>5.0-7.0</td>
<td>238092</td>
<td>4</td>
<td>12.4</td>
<td>29.4 SM A-2-4 II</td>
</tr>
<tr>
<td>HB-ISFA-113, 1D</td>
<td>5431+67</td>
<td>9.0 Rt.</td>
<td>2.0-4.0</td>
<td>238093</td>
<td>5</td>
<td>9.3</td>
<td>14.2 SM A-1-b II</td>
</tr>
<tr>
<td>HB-ISFA-113, 2D</td>
<td>5431+67</td>
<td>9.0 Rt.</td>
<td>5.0-7.0</td>
<td>238094</td>
<td>5</td>
<td>10.6</td>
<td>35.7 SM A-2-4 II</td>
</tr>
<tr>
<td>HB-ISFA-114, 1D</td>
<td>5432+50</td>
<td>9.0 Rt.</td>
<td>2.0-4.0</td>
<td>238095</td>
<td>5</td>
<td>9.2</td>
<td>17.8 SM A-1-b II</td>
</tr>
<tr>
<td>HB-ISFA-114, 2D</td>
<td>5432+50</td>
<td>9.0 Rt.</td>
<td>5.0-7.0</td>
<td>238096</td>
<td>5</td>
<td>12.0</td>
<td>44.7 SM A-4 IV</td>
</tr>
<tr>
<td>HB-ISFA-116, 1D</td>
<td>5445+70</td>
<td>28.0 Rt.</td>
<td>4.0-6.0</td>
<td>238097</td>
<td>6</td>
<td>9.1</td>
<td>34.5 SM A-2-4 II</td>
</tr>
<tr>
<td>HB-ISFA-117, 1D</td>
<td>5445+70</td>
<td>9.0 Rt.</td>
<td>2.0-4.0</td>
<td>238098</td>
<td>6</td>
<td>12.0</td>
<td>19.2 SM A-1-b II</td>
</tr>
<tr>
<td>HB-ISFA-117, 2D</td>
<td>5445+70</td>
<td>9.0 Rt.</td>
<td>5.0-7.0</td>
<td>238099</td>
<td>6</td>
<td>8.7</td>
<td>53.8 ML A-4 IV</td>
</tr>
<tr>
<td>HB-ISFA-118, 1D</td>
<td>5446+50</td>
<td>9.0 Rt.</td>
<td>2.0-4.0</td>
<td>238100</td>
<td>6</td>
<td>5.5</td>
<td>13.1 SM A-1-a II</td>
</tr>
<tr>
<td>HB-ISFA-118, 2D</td>
<td>5446+50</td>
<td>9.0 Rt.</td>
<td>5.0-7.0</td>
<td>238101</td>
<td>6</td>
<td>36.0</td>
<td>49.6 SM A-4 IV</td>
</tr>
<tr>
<td>HB-ISFA-119, 1D</td>
<td>5472+25</td>
<td>28.0 Rt.</td>
<td>4.0-6.0</td>
<td>238102</td>
<td>7</td>
<td>12.8</td>
<td>20.7 SM A-1-b II</td>
</tr>
<tr>
<td>HB-ISFA-120, 1D</td>
<td>5472+25</td>
<td>8.0 Rt.</td>
<td>4.0-5.0</td>
<td>238103</td>
<td>7</td>
<td>12.3</td>
<td>27.0 SM A-2-4 II</td>
</tr>
<tr>
<td>HB-ISFA-121, 1D</td>
<td>5473+00</td>
<td>8.0 Rt.</td>
<td>4.0-5.3</td>
<td>238104</td>
<td>7</td>
<td>11.0</td>
<td>18.9 SM A-1-b II</td>
</tr>
<tr>
<td>HB-ISFA-121, 1D/A</td>
<td>5473+00</td>
<td>8.0 Rt.</td>
<td>5.3-6.0</td>
<td>238105</td>
<td>7</td>
<td>14.5</td>
<td>36.5 SM A-4 IV</td>
</tr>
<tr>
<td>HB-ISFA-122, 1D</td>
<td>5120+25</td>
<td>9.0 Lt.</td>
<td>4.0-6.0</td>
<td>238106</td>
<td>1</td>
<td>7.4</td>
<td>16.1 GM A-1-b I</td>
</tr>
<tr>
<td>HB-ISFA-123, 1D</td>
<td>5235+03</td>
<td>8.0 Rt.</td>
<td>4.0-6.0</td>
<td>238107</td>
<td>3</td>
<td>8.8</td>
<td>15.9 SM A-1-b II</td>
</tr>
<tr>
<td>HB-ISFA-125, 1D</td>
<td>5431+67</td>
<td>8.0 Lt.</td>
<td>4.0-6.0</td>
<td>238108</td>
<td>5</td>
<td>9.6</td>
<td>16.7 SM A-1-b II</td>
</tr>
<tr>
<td>HB-ISFA-126, 1D</td>
<td>5445+70</td>
<td>8.0 Lt.</td>
<td>4.0-6.0</td>
<td>238109</td>
<td>6</td>
<td>10.9</td>
<td>19.9 SM A-1-b II</td>
</tr>
<tr>
<td>HB-ISFA-127, 1D</td>
<td>5472+28</td>
<td>8.0 Lt.</td>
<td>4.0-6.0</td>
<td>238110</td>
<td>7</td>
<td>10.1</td>
<td>23.0 SM A-1-b II</td>
</tr>
</tbody>
</table>

TP2, S1 5235+03 30.0 Lt. 1.0-3.0 238111 3 11.3 4.7 SP A-1-b 0

TP2, S2 5235+03 30.0 Lt. 3.0-4.0 238112 3 17.3 38.7 SM A-4 III

---
### GRAVITY ANALYSIS

#### US Standard Sieve Numbers

<table>
<thead>
<tr>
<th>Diameter (mm)</th>
<th>Sieve Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.05</td>
<td>#4</td>
</tr>
<tr>
<td>0.03</td>
<td>#8</td>
</tr>
<tr>
<td>0.010</td>
<td>#10</td>
</tr>
<tr>
<td>0.005</td>
<td>#16</td>
</tr>
<tr>
<td>0.001</td>
<td>#20</td>
</tr>
<tr>
<td></td>
<td>#40</td>
</tr>
<tr>
<td></td>
<td>#60</td>
</tr>
<tr>
<td></td>
<td>#100</td>
</tr>
<tr>
<td></td>
<td>#200</td>
</tr>
</tbody>
</table>

#### GRAIN SIZE DISTRIBUTION CURVE

### HYDROMETER ANALYSIS

**Grain Diameter, mm**

**Percent Retained by Weight**

### UNIFIED CLASSIFICATION

- **GRAVEL**
- **SAND**
- **SILT**
- **CLAY**

### GRAIN DISTRIBUTION CURVE

#### Description

- SAND, some gravel, little silt.
- SAND, some silt, little gravel.
- SAND, little silt, little gravel.
- SAND, some gravel, little silt.
- SILT, some sand, little gravel.

### Table

<table>
<thead>
<tr>
<th>Boring/Sample No.</th>
<th>Station</th>
<th>Offset, ft</th>
<th>Depth, ft</th>
<th>Description</th>
<th>W, %</th>
<th>LL</th>
<th>PL</th>
<th>PI</th>
</tr>
</thead>
<tbody>
<tr>
<td>+</td>
<td>HB-ISFA-103/1D</td>
<td>5124+00</td>
<td>10.0 RT</td>
<td>2.0-4.0, SAND, some gravel, little silt.</td>
<td>1.9</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>◆</td>
<td>HB-ISFA-103/2D</td>
<td>5124+00</td>
<td>10.0 RT</td>
<td>5.0-7.0, SAND, some silt, little gravel.</td>
<td>8.2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>■</td>
<td>HB-ISFA-104/1D</td>
<td>5122+19</td>
<td>22.0 RT</td>
<td>5.0-7.0, SAND, little silt, little gravel.</td>
<td>6.8</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>○</td>
<td>HB-ISFA-107/1D</td>
<td>5235+45</td>
<td>10.0 LT</td>
<td>2.0-4.0, SAND, some gravel, little silt.</td>
<td>8.4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>▲</td>
<td>HB-ISFA-107/2D</td>
<td>5235+45</td>
<td>10.0 LT</td>
<td>5.0-7.0, SILT, some sand, little gravel.</td>
<td>9.2</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Sheet Information

- **PIN:** 016819.00
- **Town:** Houlton, Oakfield, Smyrna, Ludlow, New
- **Reported by/Date:** WHITE, TERRY A 7/21/2010
State of Maine Department of Transportation
GRAIN SIZE DISTRIBUTION CURVE

SIEVE ANALYSIS
US Standard Sieve Numbers

HYDROMETER ANALYSIS
Grain Diameter, mm

State of Maine Department of Transportation
GRAIN SIZE DISTRIBUTION CURVE

SIEVE ANALYSIS
US Standard Sieve Numbers

HYDROMETER ANALYSIS
Grain Diameter, mm

UNIFIED CLASSIFICATION

<table>
<thead>
<tr>
<th>Description</th>
<th>W, %</th>
<th>LL</th>
<th>PL</th>
<th>PI</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAND, some gravel, trace silt.</td>
<td>11.3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sandy SILT, some gravel.</td>
<td>17.3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SAND, some gravel, little silt.</td>
<td>6.2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SAND, some silt, some gravel.</td>
<td>10.1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SAND, some gravel, little silt.</td>
<td>8.8</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
State of Maine Department of Transportation
GRAIN SIZE DISTRIBUTION CURVE

SIEVE ANALYSIS
US Standard Sieve Numbers

HYDROMETER ANALYSIS
Grain Diameter, mm

GRAVEL SAND SILT

SHEET 5

Boring/Sample No. Station Offset, ft Depth, ft Description W, % LL PL PI
+ HB-ISFA-125/1D 5431+67 8.0 LT 4.0-6.0 SAND, some gravel, little silt. 9.6
◆ HB-ISFA-113/1D 5431+67 9.0 RT 2.0-4.0 SAND, some gravel, little silt. 9.3
■ HB-ISFA-113/2D 5431+67 9.0 RT 5.0-7.0 Silty SAND, some gravel. 10.6
● HB-ISFA-114/1D 5432+50 9.0 RT 2.0-4.0 SAND, some gravel, little silt. 9.2
▲ HB-ISFA-114/2D 5432+50 9.0 RT 5.0-7.0 Sandy SILT, little gravel. 12.0

PIN
016819.00

Town
Houlton, Oakfield, Smyrna, Ludlow, New

Reported by/Date
WHITE, TERRY A  7/22/2010
State of Maine Department of Transportation

GRAIN SIZE DISTRIBUTION CURVE

SIEVE ANALYSIS
US Standard Sieve Numbers

HYDROMETER ANALYSIS
Grain Diameter, mm

GRAVEL  SAND  SILT

GRAIN SIZE DISTRIBUTION CURVE

Percent Finer by Weight

Percent Retained by Weight

Grain Diameter, mm

UNIFIED CLASSIFICATION

Boring/Sample No.  Station  Offset, ft  Depth, ft  Description  W, %  LL  PL  PI

HB-ISFA-119/1D  5472+28  28.0 RT  4.0-6.0  SAND, some gravel, some silt.  12.8

HB-ISFA-120/1D  5472+25  8.0 RT  4.0-5.0  SAND, some silt, some gravel.  12.3

HB-ISFA-127/1D  5472+28  8.0 LT  4.0-6.0  SAND, some gravel, some silt.  10.1

HB-ISFA-121/1D  5473+00  8.0 RT  4.0-5.3  SAND, some gravel, little silt.  11.0

HB-ISFA-121/1D/A  5473+00  8.0 RT  5.3-6.0  Silty SAND, little gravel.  14.5

PIN
016819.00

Town
Houlton, Oakfield, Smyrna, Ludlow, New

Reported by/Date
WHITE, TERRY A  7/22/2010
**Maine Department of Transportation**  
**Soil/Rock Exploration Log**  
**US CUSTOMARY UNITS**  

<table>
<thead>
<tr>
<th>Driller:</th>
<th>MaineDOT</th>
<th>Elevation (ft.):</th>
<th>NAVD88</th>
<th>Auger ID/OD:</th>
<th>5&quot; Dia.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operator:</td>
<td>Giguere/Giles</td>
<td>Datum:</td>
<td>CME 45C</td>
<td>Hammer Wt./Fall:</td>
<td>140#/30&quot;</td>
</tr>
<tr>
<td>Logged By:</td>
<td>B. Wilder</td>
<td>Rig Type:</td>
<td>Standard Split Spoon</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boring Location:</td>
<td>5120+25, 9.0 Rt. Travel Lane</td>
<td>Casing ID/OD:</td>
<td>N/A</td>
<td>Water Level:</td>
<td>None Observed</td>
</tr>
</tbody>
</table>

**Hammer Efficiency Factor: 0.84**  
**Hammer Type: Automatic □ Hydraulic □ Rope & Cathead □**

**Definitions:**
- D = Split Spoon Sample
- SSA = Solid Stem Auger
- MD = Unsuccessful Split Spoon Sample attempt
- U = Thin Wall Tube Sample
- MU = Unsuccessful Thin Wall Tube Sample attempt
- V = Insitu Vane Shear Test, PP = Pocket Penetrometer
- MV = Unsuccessful Insitu Vane Shear Test attempt

**Sample Information**

<table>
<thead>
<tr>
<th>Depth (ft.)</th>
<th>Sample No.</th>
<th>Pen./Rec. (in.)</th>
<th>Sample Depth (ft.)</th>
<th>Blows (/6 in.)</th>
<th>Shear Strength (psf)</th>
<th>N-uncorrected</th>
<th>Casings Blows</th>
<th>Elevation (ft.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SSA -0.70</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1D</td>
<td>24/17</td>
<td>2.00 - 4.00</td>
<td>11/12/12/14</td>
<td>24</td>
<td>34</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>2D/A</td>
<td>5.00 - 7.00</td>
<td>8/24/21/12</td>
<td>45</td>
<td>63</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Visual Description and Remarks**

- SSA -0.70
- PAVEMENT.
- Brown, damp, medium dense, gravelly fine to coarse SAND, some silt, (Fill).

**Laboratory Testing Results/AASHTO and Unified Class.**

<table>
<thead>
<tr>
<th>G#238076</th>
<th>A-1-b, SM</th>
<th>WC=5.2%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bottom of Exploration at 7.00 feet below ground surface.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NO REFUSAL</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Remarks:**

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:** 1-95 Northbound Lane  
**Location:** Island Falls, Maine  
**Boring No.:** HB-ISFA-102  
**PIN:** 16819.00

**Driller:** MaineDOT  
**Elevation (ft.):** NAVD88  
**Auger ID/OD:** 5" Dia.

**Operator:** Gigueres/Giles  
**Datum:** CME 45C  
**Sampler:** Standard Split Spoon  
**Logged By:** B. Wilder  
**Hammer Wt./Fall:** 140#/30'

**Date Start/Finish:** 5/3/10-5/3/10  
**Drilling Method:** Solid Stem Auger  
**Core Barrel:** N/A  
**Boring Location:** 5122+19, 9.0 Rt. Travel Lane  
**Casing ID/OD:** N/A  
**Water Level:** 7.5' bgs.

**Hammer Efficiency Factor:** 0.84  
**Hammer Type:** Automatic  
**Hydraulic**  
**Rope & Cathead**

---

**Definitions:**  
R = Rock Core Sample  
SSA = Solid Stem Auger  
HSA = Hollow Stem Auger  
RC = Roller Cone  
W=O= = weight of rods or casing  
W1IP = Weight of one person  
N=uncorrected = N-value corrected for hammer efficiency

**Sample Information**

<table>
<thead>
<tr>
<th>Depth (ft.)</th>
<th>Sample No. (Pen./Rec.)</th>
<th>Sample Depth (ft.)</th>
<th>Blows (/6 in.)</th>
<th>Shear Strength (psf)</th>
<th>Optional</th>
<th>N-uncorrected N60</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>1D 24/16</td>
<td>2.00 - 4.00</td>
<td>9/11/14/9</td>
<td>25</td>
<td>35</td>
<td>SSA -0.70</td>
</tr>
<tr>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>2D 15.6/12</td>
<td>5.00 - 6.30</td>
<td>11/21/50(3.6&quot;)</td>
<td>---</td>
<td></td>
<td>SSA -5.50</td>
</tr>
<tr>
<td>20</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Visual Description and Remarks**

- **0 ft:** PAVEMENT.
- **5 ft:** Brown, damp, gravelly fine to coarse SAND, little silt, (Fill).
- **5 ft:** Wet layer from 4.5'-5.5' bgs.
- **10 ft:** Grey-brown, moist, dense, silty fine to coarse SAND, some gravel, (Till). Boulder from 6.3'-7.0' bgs.
- **10 ft:** Dryer with depth.
- **Bottom of Exploration at 10.00 feet below ground surface.** NO REFUSAL

---

**Remarks:**

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.
### Remarks:

- 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.

---

**Visual Description and Remarks**

- **Bottom of Exploration at 7.00 feet below ground surface.**

- **NO REFUSAL**

### Soil Information (Sample No.)

<table>
<thead>
<tr>
<th>Depth (ft.)</th>
<th>Sample No.</th>
<th>Pen./Rec. (in.)</th>
<th>Sample Depth (ft.)</th>
<th>Blows (/6 in.)</th>
<th>Shear Strength (psf) or RQD (%)</th>
<th>N-uncorrected</th>
<th>Casing Blows</th>
<th>Elevation (ft.)</th>
<th>Graphic Log</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>1D</td>
<td>24/12</td>
<td>2.00 - 4.00</td>
<td>18/20/18/15</td>
<td>38</td>
<td>53</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2D</td>
<td>24/19</td>
<td>5.00 - 7.00</td>
<td>5/21/27/25</td>
<td>48</td>
<td>67</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Depth (ft.)</td>
<td>Sample No.</td>
<td>Pen./Rec. (in.)</td>
<td>Sample Depth (ft.)</td>
<td>Blows (/6 in.)</td>
<td>Shear Strength (psf)</td>
<td>RQD (%)</td>
<td>N-uncorrected</td>
<td>Casing Blows</td>
<td>Elevation (ft.)</td>
</tr>
<tr>
<td>------------</td>
<td>------------</td>
<td>----------------</td>
<td>--------------------</td>
<td>----------------</td>
<td>---------------------</td>
<td>---------</td>
<td>--------------</td>
<td>--------------</td>
<td>----------------</td>
</tr>
<tr>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>1D</td>
<td>24/18</td>
<td>5.00 - 7.00</td>
<td>8/34/45/50</td>
<td>79</td>
<td>111</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Remarks:**

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.

**Visual Description and Remarks**

- **Brown, dry, dense, gravelly fine to coarse SAND, some silt, (Fill).**
- **Moist layer from 4.8-5.5' bgs.**
- **Brown, moist, very dense, silty fine to coarse SAND, little gravel, (Till).**

**Bottom of Exploration at 7.00 feet below ground surface.** NO REFUSAL
### Soil/Rock Exploration Log

**Maine Department of Transportation**  
**US CUSTOMARY UNITS**

**Project:** I-95 Northbound Lane  
**Location:** Island Falls, Maine

**Boring No.:** HB-ISFA-105  
**PIN:** 16819.00

**Driller:** MaineDOT  
**Elevation (ft.):** NVD88  
**Auger ID/OD:** 5" Dia.

**Operator:** Giguere/Giles  
**Datum:** CME 45C  
**Hammer Wt./Fall:** 140#/30"

**Logged By:** B. Wilder  
**Rig Type:** Standard Split Spoon

**Date Start/Finish:** 5/3/10-5/3/10  
**Drilling Method:** Solid Stem Auger

**Boring Location:** 5122+19, 33.0 Rt. Shoulder  
**Core Barrel:** N/A  
**Water Level:** None Observed

**Hammer Efficiency Factor:** 0.84  
**Hammer Type:** Automatic

**Definitions:**  
- **R** = Rock Core Sample  
- **S** = Split Spoon Sample  
- **MD** = Unsuccessful Split Spoon Sample attempt  
- **SSA** = Solid Stem Auger  
- **HSA** = Hollow Stem Auger  
- **U** = Thin Wall Tube Sample  
- **RC** = Roller Cone  
- **MU** = Unsuccessful Thin Wall Tube Sample attempt  
- **V** = Insitu Vane Shear Test  
- **PP** = Pocket Penetrometer  
- **MV** = Unsuccessful Insitu Vane Shear Test attempt  
- **W** = Insitu Vane Shear Test  
- **WC** = Water content, percent  
- **WC lab** = Lab Vane Shear Strength (psf)  
- **WC uncorr** = Unconfined Compressive Strength (lbf)  
- **LL** = Liquid Limit  
- **PI** = Plasticity Index  
- **G** = Grain Size Index  
- **RQD** = Raw field SPT N-value  
- **N-p** = Unconfined Compressive Strength (ksf)  
- **N60** = SPT N-value corrected for hammer efficiency

**Sample Information**

<table>
<thead>
<tr>
<th>Depth (ft.)</th>
<th>Sample No.</th>
<th>Pen./Rec. (in.)</th>
<th>Sample Depth (ft.)</th>
<th>Blows (/6 in.)</th>
<th>Shear Strength (psf)</th>
<th>RQD (%)</th>
<th>N-uncorrected</th>
<th>Blows</th>
<th>Elevation (ft.)</th>
<th>Graphic Log</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SSA</td>
<td>0.30</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>MD</td>
<td>1.2/0</td>
<td>5.00 - 5.10</td>
<td>25(1.2&quot;)</td>
<td>---</td>
<td>-5.50</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-8.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SSA</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Visual Description and Remarks:**

- Cobble from 5.1-5.3' bgs.  
- Brown, moist, very dense, silty fine to coarse SAND, little gravel, (Till).

**Bottom of Exploration at 8.00 feet below ground surface.**

**REFUSAL.**

**Remarks:**

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

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

---

**Boring No.:** HB-ISFA-105  
**Page 1 of 1**
**Soil/Rock Exploration Log**

**US CUSTOMARY UNITS**

**Project:** 1-95 Northbound Lane  
**Location:** Island Falls, Maine  
**Boring No.:** HB-ISFA-106  
**PIN:** 16819.00

<table>
<thead>
<tr>
<th>Driller:</th>
<th>MaineDOT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elevation (ft.):</td>
<td>NAVD88</td>
</tr>
<tr>
<td>Auger ID/OD:</td>
<td>5&quot; Dia.</td>
</tr>
<tr>
<td>Operator:</td>
<td>Giguere/Giles</td>
</tr>
<tr>
<td>Datum:</td>
<td>CME 45C</td>
</tr>
<tr>
<td>Sampler:</td>
<td>N/A</td>
</tr>
<tr>
<td>Logged By:</td>
<td>B. Wilder</td>
</tr>
<tr>
<td>Rig Type:</td>
<td>NA</td>
</tr>
<tr>
<td>Hammer Wt./Fall:</td>
<td>N/A</td>
</tr>
<tr>
<td>Date Start/Finish:</td>
<td>5/3/10-5/3/10</td>
</tr>
<tr>
<td>Drilling Method:</td>
<td>Solid Stem Auger</td>
</tr>
<tr>
<td>Core Barrel:</td>
<td>N/A</td>
</tr>
<tr>
<td>Boring Location:</td>
<td>5122+29, 34.0 Rt. Shoulder</td>
</tr>
<tr>
<td>Casing ID/OD:</td>
<td>N/A</td>
</tr>
<tr>
<td>Water Level*:</td>
<td>None Observed</td>
</tr>
</tbody>
</table>

**Hammer Efficiency Factor:** 0.84  
**Hammer Type:** Automatic, Hydraulic, Rope & Cathead

**Definitions:**
- R = Rock Core Sample
- SSA = Solid Stem Auger
- SOD = Silt, Organic Debris
- U = Unsuccessful Split Spoon Sample attempt
- V = Unsatisfactory Vane Shear Test
- MU = Unsuccessful Thin Wall Tube Sample attempt
- MV = Unsuccessful Insitu Vane Shear Test attempt
- D = Split Spoon Sample
- SSA = Solid Stem Auger
- HSA = Hollow Stem Auger
- RC = Roller Cone
- MU = Unsatisfactory Thin Wall Tube Sample attempt
- V = Unsatisfactory Vane Shear Test
- MU = Unsuccessful Thin Wall Tube Sample attempt
- MV = Unsuccessful Insitu Vane Shear Test attempt
- Water Level*:  

**Sample Information**

<table>
<thead>
<tr>
<th>Depth (ft.)</th>
<th>Sample No.</th>
<th>Pen./Rec. (in.)</th>
<th>Sample Depth (ft.)</th>
<th>Blows (/6 in.)</th>
<th>Shear Strength (psf)</th>
<th>N-uncorrected</th>
<th>N60</th>
<th>Elevation (ft.)</th>
<th>Graphic Log</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Visual Description and Remarks**

- **Bottom of Exploration at 7.10 feet below ground surface.**
- **REFUSAL.**

- **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.*
### Soil/Rock Exploration Log

**US CUSTOMARY UNITS**

**Driller:** MaineDOT  
**Operator:** Giguere/Giles  
**Datum:** NAVD88  
**Logged By:** B. Wilder  
**Datum:** Standard Split Spoon  
**Date Start/Finish:** 5/3/10-5/3/10  
**Boring Location:** 5235+45, 10.0 Lt. NB Passing Lane  
**Casing ID/OD:** N/A  
**Auger ID/OD:** 5" Dia.  
**Hammer Wt./Fall:** 140#/30"  
**Core Barrel:** N/A  
**Water Level:** 3.8' bgs.  

**Hammer Efficiency Factor:** 0.84  
**Rig Type:** CME 45C  
**Elevation (ft.):**   

**Definitions:**
- R = Rock Core Sample
- SSA = Solid Stem Auger Sample
- S_{lab} = Lab Vane Shear Strength (psf)
- T_v = Pocket Torvane Shear Strength (psf)
- WC = water content, percent
- LL = Liquid Limit
- PI = Plasticity Index
- G = Grain Size Analysis
- N_60 = SPT N-value
- HSA = Hollow Stem Auger Sample
- MU = Unsuccessful Thin Wall Tube Sample attempt
- MV = Unsuccessful In-situ Vane Sample attempt
- WO1P = Weight of one person
- WOHR/C = weight of rods or casing
- MU = Unsuccessful Thin Wall Tube Sample attempt
- MV = Unsuccessful In-situ Vane Sample attempt
- PI = Plasticity Index
- G = Grain Size Analysis
- N_60 = SPT N-value
- WOHR/C = weight of rods or casing
- MU = Unsuccessful Thin Wall Tube Sample attempt
- MV = Unsuccessful In-situ Vane Sample attempt
- PI = Plasticity Index
- G = Grain Size Analysis
- N_60 = SPT N-value

### Sample Information

<table>
<thead>
<tr>
<th>Depth (ft.)</th>
<th>Sample No.</th>
<th>Pen./Rec. (in.)</th>
<th>Sample Depth (ft.)</th>
<th>Blows (/6 in.)</th>
<th>Shear Strength (psf) or RQD (%)</th>
<th>N_60</th>
<th>Casing Blows</th>
<th>Elevation (ft.)</th>
<th>Graphic Log</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1D</td>
<td>24/12</td>
<td>2.00 - 4.00</td>
<td>4/9/7/7</td>
<td>16</td>
<td>22</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>2D</td>
<td>24/18</td>
<td>5.00 - 7.00</td>
<td>19/23/21/33</td>
<td>44</td>
<td>62</td>
<td></td>
<td>-5.00</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-7.00</td>
<td></td>
</tr>
</tbody>
</table>

**Visual Description and Remarks**

- **PVEMENT.**
  - Brown, wet, medium dense, gravelly fine to coarse SAND, some silt, (Fill).
  - Wet layer from 3.0-5.0' bgs.
  - Light brown, dry, very dense, silty fine to coarse SAND, little gravel, (Till).

**Remarks:**

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**

**Project:** I-95 Northbound Lane  
**Location:** Island Falls, Maine  
**Boring No.:** HB-ISFA-107  
**PIN:** 16819.00  

**Remarks:**

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.
### Soil/Rock Exploration Log

#### US CUSTOMARY UNITS

<table>
<thead>
<tr>
<th>Depth (ft.)</th>
<th>Sample No.</th>
<th>Pen./Rec. (in.)</th>
<th>Sample Depth (ft.)</th>
<th>Blows (/6 in.)</th>
<th>Shear Strength</th>
<th>N-uncorrected</th>
<th>Casing Blows</th>
<th>Elevation (ft.)</th>
<th>Graph Log</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>1D</td>
<td>24/15</td>
<td>2.00 - 4.00</td>
<td>8/11/8/8</td>
<td>19</td>
<td>27</td>
<td></td>
<td>SSA -0.65</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SSA -0.65</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SSA -0.65</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SSA -0.65</td>
<td></td>
</tr>
<tr>
<td>25</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SSA -0.65</td>
<td></td>
</tr>
</tbody>
</table>

#### Visual Description and Remarks
- **Depth:** 0.65 ft.
- **Description:** PAVEMENT.
- **Remarks:** Brown, wet, medium dense, gravelly fine to coarse SAND, little silt, (Fill).

- **Depth:** 4.80 ft.
- **Description:** Brown, very dense, silty fine to coarse SAND, some gravel, (Till).

- **Depth:** 7.00 ft.
- **Remarks:** Bottom of Exploration at 7.00 feet below ground surface.
- **Remarks:** NO REFUSAL

---

**Definitions:**
- **R:** Rock Core Sample
- **S:** Insitu Field Vane Shear Strength (psf)
- **T:** Pocket Vane Shear Strength (psf)
- **WC:** Water content, percent
- **W:** Weight of rods or casing
- **W1P:** Weight of one person
- **SSA:** Solid Stem Auger
- **HSA:** Hollow Stem Auger
- **RC:** Roller Cone
- **W1P:** Weight of one person
- **U:** Thin Wall Tube Sample
- **MU:** Unsuccessful Thin Wall Tube Sample attempt
- **V:** Insitu Vane Shear Test, PP = Pocket Penetrometer
- **MV:** Unsuccessful Insitu Vane Shear Test attempt
- **PAVEMENT:** Brown, wet, medium dense, gravelly fine to coarse SAND, little silt, (Fill).
- **(Till):** Brown, very dense, silty fine to coarse SAND, some gravel, (Till).

**Remarks:**
- 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.*

---

**Laboratory Testing:**
- **AASHTO and Unified Class:**
  - **G238085:** A-1-b, SM
  - **WC = 6.2%**
  - **G238086:** A-2-4, SM
  - **WC = 10.1%**

---

**Hammer Efficiency Factor:** 0.84

**Hammer Type:** Automatic □ Hydraulic □ Rope & Cathead □
### Soil/Rock Exploration Log

**Project:** I-95 Northbound Lane  
**Location:** Island Falls, Maine  
**Boring No.:** HB-ISFA-109  
**PIN:** 16819.00

<table>
<thead>
<tr>
<th>Depth (ft.)</th>
<th>Sample No.</th>
<th>Pen./Rec. (in.)</th>
<th>Sample Depth (ft.)</th>
<th>Bows (/6 in.)</th>
<th>Shear Strength (psf) or RQD (%)</th>
<th>N-uncorrected</th>
<th>N60</th>
<th>Casing Blows</th>
<th>Elevation (ft.)</th>
<th>Graphic Log</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SSA -0.60</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>1D</td>
<td>24/16</td>
<td>2.00 - 4.00</td>
<td>4/6/6/6</td>
<td>12</td>
<td>17</td>
<td></td>
<td></td>
<td>-0.60</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Visual Description and Remarks:**

**Bottom of Exploration at 7.00 feet below ground surface.**  
NO REFUSAL

- **1D:** Brown, wet, medium dense, fine to coarse SAND, some silt, little gravel, (Fill).  
  - Very wet layer from 3.0-5.5' bgs.
- **2D:** Brown, wet, dense, silty fine to coarse SAND, some gravel, (Till).  
  - -5.50

**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.*
### Sample Information

<table>
<thead>
<tr>
<th>Depth (ft.)</th>
<th>Sample No.</th>
<th>Pen./Rec. (in.)</th>
<th>Sample Depth (ft.)</th>
<th>Blows (/6 in.)</th>
<th>Shear Strength (psf)</th>
<th>RQD (%)</th>
<th>N-uncorrected</th>
<th>N60</th>
<th>Casing Blows</th>
<th>Elevation (ft.)</th>
<th>Graphic Log</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.70</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>1D</td>
<td>24/17</td>
<td>2.00 - 4.00</td>
<td>5/8/8/7</td>
<td></td>
<td>16</td>
<td>22</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-5.50</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>2D</td>
<td>24/20</td>
<td>5.00 - 7.00</td>
<td>9/12/16/20</td>
<td></td>
<td>28</td>
<td>39</td>
<td></td>
<td></td>
<td>-7.00</td>
<td></td>
</tr>
</tbody>
</table>

#### Visual Description and Remarks

- **Depth of Exploration at 7.00 feet below ground surface.**

- **NO REFUSAL**

- **Bottom of Exploration at 7.00 feet below ground surface.**

- **PAVEMENT.**

- **Brown, wet, medium dense, gravelly, fine to coarse SAND, some silt, (Fill).**

- **Wet layer from 3.3-5.5' bgs.**

- **Olive-brown, wet, medium dense, silty fine to coarse SAND, some gravel, (Till).**

- **Gr#238089 A-1-3, SM WC=8.5%**

- **Gr#238090 A-1-1, SM WC=12.3%**

---

**Definitions:**

- **R** = Rock Core Sample
- **SSA** = Solid Stem Auger
- **RC** = Roller Cone
- **WOC** = weight of casing
- **WOH** = weight of hammer
- **WOP** = weight of one person
- **WOR/C** = weight of rods or casing
- **WC** = water content, percent
- **LL** = Liquid Limit
- **PL** = Plastic Limit
- **PI** = Plasticity Index
- **G** = Grain Size Analysis
- **C** = Consolidation Test

---

**Remarks:**

- 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.
<table>
<thead>
<tr>
<th>Depth (ft.)</th>
<th>Sample No.</th>
<th>Pen./Rec. (in.)</th>
<th>Sample Depth (ft.)</th>
<th>Blows (/6 in.)</th>
<th>Shear Strength (psf) or RQD (%)</th>
<th>N-uncorrected</th>
<th>N60</th>
<th>Casing Blows</th>
<th>Elevation (ft.)</th>
<th>Graphic Log</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SSA</td>
<td>-0.70</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>1D</td>
<td>24/18</td>
<td>2.00 - 4.00</td>
<td>13/9/9/12</td>
<td>18</td>
<td>25</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>2D</td>
<td>24/20</td>
<td>5.00 - 7.00</td>
<td>15/15/12/17</td>
<td>27</td>
<td>38</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Visual Description and Remarks:**

- **SSA** - Solid Stem Auger
- **PAVEMENT.**
- **Brown, moist, medium dense, gravelly, fine to coarse SAND, some silt, (Fill).**
- **Wet layer from 4.0-5.0’ bgs.**
- **Bottom of Exploration at 7.00 feet below ground surface.**
- **NO REFUSAL**

**Remarks:**

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.
<table>
<thead>
<tr>
<th>Depth (ft.)</th>
<th>Sample No.</th>
<th>Pen./Rec. (in.)</th>
<th>Sample Depth (ft.)</th>
<th>Blows (/6 in.)</th>
<th>Shear Strength (psf) or RQD (%)</th>
<th>N-uncorrected</th>
<th>Casing Blows</th>
<th>Elevation (ft.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>24/17</td>
<td>4.00 - 6.00</td>
<td>4/11/12/13</td>
<td>23</td>
<td>32</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Visual Description and Remarks**

<table>
<thead>
<tr>
<th>Depth (ft.)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>SSA -0.30</td>
</tr>
<tr>
<td>5</td>
<td>-4.50</td>
</tr>
<tr>
<td>6</td>
<td>-6.00</td>
</tr>
</tbody>
</table>

Brown, wet, medium dense, gravelly, fine to coarse SAND, some silt, (Fill).

Olive-brown, wet, medium dense, silty fine to coarse SAND, some gravel, (Till).

Bottom of Exploration at 6.00 feet below ground surface. NO REFUSAL.

**Definitions:**
- R = Rock Core Sample
- SSA = Solid Stem Auger
- SOD = Split Spoon Sample
- HSA = Hollow Stem Auger
- MD = Unsuccessful Split Spoon Sample attempt
- U = Thin Wall Tube Sample
- RC = Roller Cone
- MU = Unsuccessful Thin Wall Tube Sample attempt
- V = In situ Vane Test
- PP = Pocket Penetrometer
- MV = Unsuccessful In situ Vane Test attempt
- WC = water content, percent
- Tc = Pocket Torvane Shear Strength (psf)
- N-uncorrected = Raw field SPT N-value
- WOR/C = weight of rods or casing
- WO1P = Weight of one person
- N60 = SPT N-value corrected for hammer efficiency
- N60 = (Hammer Efficiency Factor/60%) * N-uncorrected
- G = Grain Size Analysis
- MU = Unsuccessful Thin Wall Tube Sample attempt
- MU = Unsuccessful In situ Vane Test attempt
- MV = Unsuccessful In situ Vane Test attempt
- LL = Liquid Limit
- PI = Plasticity Index
- C = Consolidation Test
- HFA = Hydraulic Fracture Analysis
- U =Thin Wall Tube Sample
- RC = Roller Cone
- MV = Unsuccessful In situ Vane Test attempt
- N60 = SPT N-value corrected for hammer efficiency
- C = Consolidation Test

**Remarks:**

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:** 1-95 Northbound Lane  
**Location:** Island Falls, Maine  
**Boring No.:** HB-ISFA-113  
**PIN:** 16819.00  

**Driller:** MaineDOT  
**Elevation (ft.):** NAVD88  
**Auger ID/OD:** 5" Dia.  

**Operator:** Giguere/Giles  
**Datum:** CME 45C  
**Sampler:** Standard Split Spoon  

**Logged By:** B. Wilder  
**Rig Type:** 140#/30"  

**Date Start/Finish:** 5/3/10-5/3/10  
**Drilling Method:** Solid Stem Auger  
**Core Barrel:** N/A  

**Boring Location:** 5431+67, 9.0 Rt. Travel Lane  
**Casing ID/OD:** N/A  
**Water Level:**  

**Hammer Efficiency Factor:** 0.84  
**Hammer Type:** Automatic  

**Definitions:**  
- **R** = Rock Core Sample  
- **SSA** = Solid Stem Auger  
- **S_u** = In situ Field Vane Shear Strength (psf)  
- **T_v** = Pocket Vane Shear Strength (psf)  
- **WC** = Water content, percent  
- **HSA** = Hollow Stem Auger  
- **T_v** = Unconfined Compressive Strength (ksf)  
- **LL** = Liquid Limit  
- **RC** = Roller Cone  
- **N-uncorrected** = Raw field SPT N-value  
- **PI** = Plasticity Index  
- **WON** = weight of rods or casing  
- **WONP** = Weight of person  
- **WOR/C** = weight of rods or casing  
- **MV** = Unsuccessful Insitu Vane Shear Test attempt  
- **G** = Grain Size Analysis  
- **MU** = Unsuccessful Thin Wall Tube Sample attempt  
- **WOH** = weight of 140lb. hammer  
- **WO1P** = Weight of one person  
- **WOH** = Hammer Efficiency Factor (60%)*W-uncorrected  
- **WO1P** = Weight of one person  
- **C** = Consolidation Test  

**Sample Information**  

<table>
<thead>
<tr>
<th>Depth (ft.)</th>
<th>Sample No.</th>
<th>Pen./Rec. (in.)</th>
<th>Sample Depth (ft.)</th>
<th>Blows (/6 in.)</th>
<th>Shear Strength (psf)</th>
<th>RQD (%)</th>
<th>N-uncorrected</th>
<th>Casing Blows</th>
<th>Elevation (ft.)</th>
<th>N60</th>
<th>Graphic Log</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
<td></td>
<td>SSA</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>1D</td>
<td>24/18</td>
<td>2.00 - 4.00</td>
<td>7/7/7/92</td>
<td>14</td>
<td>20</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.50</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.6%</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SSA</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>2D</td>
<td>24/19</td>
<td>5.00 - 7.00</td>
<td>6/7/5/8</td>
<td>12</td>
<td>17</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SSA</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.00</td>
<td></td>
<td></td>
<td>SSA</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Remarks:**  

- 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.

**Visual Description and Remarks**  

- Brown, wet, medium dense, gravelly, fine to coarse SAND, some silt, (Fill).
- Wet layer from 4.0-5.5' bgs.
- Brown, wet, medium dense, silty fine to coarse SAND, some gravel, (Till).

**Bottom of Exploration at 7.00 feet below ground surface.**  
**NO REFUSAL**
# Soil/Rock Exploration Log
## US CUSTOMARY UNITS

### Project:
I-95 Northbound Lane

### Location:
Island Falls, Maine

### Driller:
MaineDOT

### Operator:
Giguere/Giles

### Logged By:
B. Wilder

### Date Start/Finish:
5/3/10-5/3/10

### Drilling Method:
Solid Stem Auger

### Boring Location:
5432+50, 9.0 Rt. Travel Lane

### Hammer Location:
5432+50, 9.0 Rt. Travel Lane

### Auger ID/OD:
5" Dia.

### Datum:
NAVD88

### Rig Type:
CME 45C

### Sampler:
Standard Split Spoon

### Hammer Wt./Fall:
140#/30"

### Core Barrel:
N/A

### Water Level:
None Observed

### Hammer Efficiency Factor:
0.84

### Operator:
Giguere/Giles

### Rig Type:
CME 45C

### Elevation (ft.):
NAVD88

### Definitions:
- R = Rock Core Sample
- SSA = Solid Stem Auger
- HSA = Hollow Stem Auger
- S = In Situ Field Vane Shear Strength (psf)
- T = Pocket Torvane Shear Strength (psf)
- WC = Water Content, Percent
- O = Unconfined Compressive Strength (ksf)
- LL = Liquid Limit
- ML = Plastic Limit
- PI = Plasticity Index
- MV = Unsuccessful In Situ Vane Shear Test Attempt
- MV = Unsuccessful In Situ Vane Shear Test Attempt
- WO1P = Weight of one Person

### Visual Description and Remarks:

#### 0 ft.
- SSA = -0.60
- Visual Description: PAVEMENT.

#### 5 ft.
- SSA = -4.50
- Visual Description: Brown, wet, medium dense, silty fine to coarse SAND, little gravel, (Till).

#### 7 ft.
- SSA = -7.00
- Visual Description: Bottom of Exploration at 7.00 feet below ground surface. NO REFUSAL

---

### Sample Information

<table>
<thead>
<tr>
<th>Depth (ft.)</th>
<th>Sample No.</th>
<th>Pen./Rec. (in.)</th>
<th>Sample Depth (ft.)</th>
<th>Blows (/6 in.)</th>
<th>Shear Strength</th>
<th>Gravel or ROQ (%)</th>
<th>N-uncorrected</th>
<th>N60</th>
<th>Casing Blows</th>
<th>Elevation (ft.)</th>
<th>Graphic Log</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1D</td>
<td>24/17</td>
<td>2.00 - 4.00</td>
<td>7/13/7/8</td>
<td>20</td>
<td>28</td>
<td>SSA = -0.60</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2D</td>
<td>24/18</td>
<td>5.00 - 7.00</td>
<td>12/12/10/12</td>
<td>22</td>
<td>31</td>
<td>SSA = -4.50</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Remarks:

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.

---

### Laboratory Testing

- Test Results: AASHTO and Unified Class.

---

### Page 1 of 1

Boring No.: HB-ISFA-114
### Soil/Rock Exploration Log

**Location:** Island Falls, Maine

**Project:** I-95 Northbound Lane

**Boring No.:** HB-ISFA-115

**PIN:** 16819.00

**Driller:** MaineDOT

**Operator:** Giguere/Giles

**Logged By:** B. Wilder

**Date Start/Finish:** 5/3/10-5/3/10

**Boring Location:** 5431+67, 27.0 Rt. Shoulder

<table>
<thead>
<tr>
<th>Depth (ft.)</th>
<th>Sample Information</th>
<th>Visual Description and Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>24/18 4.00 - 6.00 6/7/7/6 14 20 /</td>
<td>Brown, wet, medium dense, gravelly, fine to coarse SAND, some silt, (Fill).</td>
</tr>
<tr>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>25</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Definitions:**
- R = Rock Core Sample
- SSA = Solid Stem Auger
- SOD. = Standard Split Spoon
- T = Pocket Torsvane Shear Strength (psf)
- WC = water content, percent
- TC = Torsvane Shear Strength (psf)
- LL = Liquid Limit
- DF = Double Flume Measured Water Content, percent
- PI = Plasticity Index
- GC = Grain Size Index
- G = Gravel Content
- SU = Insitu Field Vane Shear Strength (psf)
- UU = Unconfined Compressive Strength (ksi)
- U = Thin Wall Tube Sample
- MV = Unsuccessful In situ Vane Shear Test attempt
- MU = Unsuccessful Thin Wall Tube Sample attempt
- WP = Pocket Penetrometer
- N = SPT N-value
- RC = Roller Cone
- W2 = Weight of 20 lb. hammer
- W1 = Weight of 10 lb. hammer
- WO1P = Weight of one person
- WP = Pocket Penetrometer
- WC = Weight of rods or casing
- WOH = Weight of 140 lb hammer
- W = Insitu Vane Shear Test
- N60 = SPT N-uncorrected corrected for hammer efficiency
- N60 = (Hammer Efficiency Factor/60%)*N-uncorrected
- C = Consolidation Test
- N = SPT N-value
- HSA = Hollow Stem Auger

**Remarks:**
- 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. 

---

**Measured Depth:** 5.00 feet below ground surface.

**Remarks:**
- NO REFUSAL.
<table>
<thead>
<tr>
<th>Depth (ft.)</th>
<th>Sample No.</th>
<th>Pen./Rec. (in.)</th>
<th>Sample Depth (ft.)</th>
<th>Blows (/6 in.)</th>
<th>Shear Strength (psf) or RQD (%)</th>
<th>SSA</th>
<th>Casing Blows</th>
<th>Elevation (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-0.30</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>1D</td>
<td>24/20</td>
<td>4.00 - 6.00</td>
<td>4/14/21/23</td>
<td>35</td>
<td>49</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* 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.

**Definitions:**
- **R** = Rock Core Sample
- **SSA** = Solid Stem Auger
- **SM** = Hammer Efficiency Factor
- **WC** = Water content, percent
- **S_u** = In situ Field Vane Shear Strength (psf)
- **S_u(lab)** = Lab Vane Shear Strength (psf)
- **q_c** = Unconfined Compressive Strength (ksf)
- **WL** = Liquid Limit
- **PI** = Plasticity Index
- **G** = Grain Size Index
- **N_u** = SPT N-value corrected for hammer efficiency
- **N_(uncorrected)** = Raw field SPT N-value
- **q_(uncorrected)** = N-value corrected for hammer efficiency
- **G** = Unsuccessful Sample attempt
- **E** = Successful Sample attempt
- **T_v** = Pocket Penetrometer Torvane Shear Strength (psf)
- **W** = Wet layer
- **B** = Bottom of Exploration
- **V** = Visual Description and Remarks
- **T** = Bottom of Exploration at 6.00 feet below ground surface.
- **NO REFUSAL**

**Remarks:**
- Stratification lines represent approximate boundaries between soil types; transitions may be gradual.

**Graphic Log:**
- Visual Description and Remarks
- Laborator Testing Results/AASHTO and Unified Class.

**Sample Information:**
- Depth (ft.)
- Sample No.
- Pen./Rec. (in.)
- Sample Depth (ft.)
- Blows (/6 in.)
- Shear Strength (psf) or RQD (%)
- SSA
- Casing Blows
- Elevation (ft)
- Graphic Log

**Visual Description and Remarks:**
- Brown, moist, dense, gravelly, fine to coarse SAND, some silt, (Fill).
- Wet layer from 4.0-5.0' bgs.
- Brown, dry, very dense, silty fine to coarse SAND, some gravel, (Till).
- Bottom of Exploration at 6.00 feet below ground surface.
- NO REFUSAL

**Laboratory Testing Results/AASHTO and Unified Class:**
- G#238097
- A-2-4, SM
- WC=9.1%
## Soil/Rock Exploration Log

### US CUSTOMARY UNITS

**Project:** 1-95 Northbound Lane  
**Location:** Island Falls, Maine  
**PIN:** HB-ISFA-117  
**Boring No.:** HB-ISFA-117  
**Driller:** MaineDOT  
**Elevation (ft.):** NAVD88  
**Auger ID/OD:** 5” Dia.  
**Operator:** Giguere/Giles  
**Datum:** CME 45C  
**Sampler:** Standard Split Spoon  
**Logged By:** B. Wilder  
**Rig Type:** CME 45C  
**Hammer Wt./Fall:** 140#/30”  
**Date Start/Finish:** 5/3/10-5/3/10  
**Drilling Method:** Solid Stem Auger  
**Water Level**: None Observed  
**Core Barrel:** N/A  
**Boring Location:** 5445+70, 9.0 Rt. Travel Lane  
**Casing ID/OD:** N/A  
**Hammer Efficiency Factor:** 0.84  

#### Definitions:
- D = Split Spoon Sample
- M = Unsuccessful Split Spoon Sample attempt
- U = Thin Wall Tube Sample
- MJ = Unsuccessful Thin Wall Tube Sample attempt
- V = In situ Vane Shear Test
- MU = Unsuccessful In situ Vane Shear Test attempt
- RC = Roller Cone
- PP = Pocket Penetrometer
- SSA = Solid Stem Auger
- HSA = Hollow Stem Auger
- WO1P = Weight of one person
- WOH = weight of 140lb. hammer
- WC = water content, percent
- q = Unconfined Compressive Strength (lbf/sq in.)
- T_v = Pocket Torvane Shear Strength (psf)
- S_u = In situ Field Vane Shear Strength (psf)
- S_u(lab) = Lab Vane Shear Strength (psf)
- PL = Plastic Limit
- LL = Liquid Limit
- PI = Plasticity Index
- MV = Unsuccessful In situ Vane Shear Test attempt
- G = Grain Size Analysis

### Sample Information

<table>
<thead>
<tr>
<th>Depth (ft.)</th>
<th>Sample No.</th>
<th>Pen./Rec. (in.)</th>
<th>Sample Depth (ft.)</th>
<th>Blows (/6 in.)</th>
<th>Shear Strength (psf)</th>
<th>N-uncorrected N60</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
<td></td>
<td>24/15</td>
<td>0.00</td>
<td>20</td>
<td>SSA</td>
</tr>
<tr>
<td>5</td>
<td>1D</td>
<td>2.00 - 4.00</td>
<td>24/24</td>
<td>5.00</td>
<td>14</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>7/15/35/37</td>
<td>50</td>
<td>70</td>
</tr>
</tbody>
</table>

**Visual Description and Remarks:**
- **PAVEMENT.**
  - Brown, wet, medium dense, gravelly, fine to coarse SAND, some silt, (Fill).
  - No REFUSAL
- **Wet layer at 5.0' bgs.**
  - Brown, dry, very dense, silty fine to coarse SAND, some gravel, (Till).

### Laboratory Testing Results/AASHTO and Unified Class.
- **G#238098**
  - A-1-b, SM
  - WC=12.0%
- **G#238099**
  - A-4, ML
  - WC=8.7%

### Remarks:
- 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.

---

### Visual Description and Remarks:

#### Bottom of Exploration at 7.00 feet below ground surface.

**Remarks:**

- 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

**Project:** I-95 Northbound Lane  
**Location:** Island Falls, Maine  
**Boring No.:** HB-ISFA-118  
**PIN:** 16819.00

#### Log Information
- **Driller:** MaineDOT  
- **Operator:** Giguere/Giles  
- **Logged By:** B. Wilder  
- **Date Start/Finish:** 5/3/10-5/3/10  
- **Boring Location:** 5446+50, 9.0 Rt. Travel Lane  
- **Datum:** NAVD88  
- **Sampling:** Standard Split Spoon  
- **Hammer Wt./Fall:** 140#/30"  
- **Water Level:** None Observed

#### Soil/Rock Exploration Log

<table>
<thead>
<tr>
<th>Depth (ft.)</th>
<th>Sample No.</th>
<th>Pen./Rec. (in.)</th>
<th>Sample Depth (ft.)</th>
<th>Blows (/6 in.)</th>
<th>Shear Strength (psf) or RQD (%)</th>
<th>N-uncorrected</th>
<th>N60</th>
<th>Casing Blows</th>
<th>Elevation (ft.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1D</td>
<td>24/18</td>
<td>2.00 - 4.00</td>
<td>14/11/13/15</td>
<td>24</td>
<td>34</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>2D</td>
<td>24/16</td>
<td>5.00 - 7.00</td>
<td>9/8/13/14</td>
<td>21</td>
<td>29</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Visual Description and Remarks
- **PAVEMENT.**
  - Brown, wet, medium dense, gravelly, fine to coarse SAND, some silt, (Fill).
  - G#238100 A-1-a, SM WC=5.5%
- **Bottom of Exploration at 7.00 feet below ground surface.**
  - NO REFUSAL.

#### Laboratory Testing Results/Unified Class.
- **G#238101**  
  - A-4, SM  
  - WC=36.0%

#### Definitions:
- R = Rock Core Sample  
- SSA = Solid Stem Auger  
- SSA(lab) = Lab Vane Shear Strength (psf)  
- WC = water content, percent  
- TL = Liquid Limit  
- Pi = Plasticity Index  
- G = Grain Size Analysis

#### Remarks:
- 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.*
**Soil/Rock Exploration Log**

**US CUSTOMARY UNITS**

<table>
<thead>
<tr>
<th>Depth (ft.)</th>
<th>Sample No.</th>
<th>Pen./Rec. (in.)</th>
<th>Sample Depth (ft.)</th>
<th>Blows (/6 in.)</th>
<th>Shear Strength (psf)</th>
<th>RQD (%)</th>
<th>N-uncorrected</th>
<th>N60</th>
<th>Casing Blows</th>
<th>Elevation (ft.)</th>
<th>Visual Description and Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>1D</td>
<td>24/18</td>
<td>4.00 - 6.00</td>
<td>5/10/13/33</td>
<td>23</td>
<td>32</td>
<td>SSA</td>
<td>-0.30</td>
<td></td>
<td></td>
<td>Brown, wet, medium dense, gravelly, fine to coarse SAND, some silt, (Fill).</td>
</tr>
<tr>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Definitions:**

- R = Rock Core Sample
- SSA = Solid Stem Auger
- T_s = Pocket Torvane Shear Strength (psf)
- S_u = In-situ Field Vane Shear Strength (psf)
- S_u(lab) = Lab Vane Shear Strength (psf)
- q_c = Unconfined Compressive Strength (lbf/in²)
- WC = water content, percent
- LL = Liquid Limit
- PI = Plasticity Index
- G = Grain Size Analysis
- SPT N-value
- q_p = Unconfined Compressive Strength (ksf)
- N = SPT N-value corrected for hammer efficiency
- N_G = Hammer Efficiency Factor(80%)*N-uncorrected
- N_P = Plastic Limit
- C = Consolidation Test

**Remarks:**

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**

**Project:** I-95 Northbound Lane

**Location:** Island Falls, Maine

**Boring No.:** HB-ISFA-119

**PIN:** 16819.00
<table>
<thead>
<tr>
<th>Depth (ft.)</th>
<th>Sample No.</th>
<th>Pen./Rec. (in.)</th>
<th>Sample Depth (ft.)</th>
<th>Blows (/6 in.)</th>
<th>Shear Strength (psf) or RQD (%)</th>
<th>N-uncorrected</th>
<th>Casing Blows</th>
<th>Elevation (ft.)</th>
<th>Graphic Log</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SSA</td>
<td>SSA -0.60</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>1D/A</td>
<td>24/18</td>
<td>4.00 - 6.00</td>
<td>6/9/13/15</td>
<td>22</td>
<td>31</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SSA</td>
<td>-5.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SSA</td>
<td>-6.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SSA</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SSA</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Remarks:**

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.

**Visual Description and Remarks**

- **PAVEMENT.**
  - (1D) 4.0-5.0' bgs.
  - Brown, wet, medium dense, fine to coarse SAND, some gravel, some silt, (Fill).

- **(1D/A) 5.0-6.0' bgs.**
  - Brown, moist, medium dense, silty fine to coarse SAND, little gravel, (Till).

- **Bottom of Exploration at 6.00 feet below ground surface.**

**NO REFUSAL.**

- **(G#)238103**
  - A-2-4, SM
  - WC=12.3%
### Soil/Rock Exploration Log

**Location:** Island Falls, Maine

**Maine Department of Transportation**

**Project:** I-95 Northbound Lane

**Boring No.:** HB-ISFA-121

**PIN:** 16819.00

<table>
<thead>
<tr>
<th>Depth (ft.)</th>
<th>Sample No.</th>
<th>Pen./Rec. (in.)</th>
<th>Sample Depth (ft.)</th>
<th>Blows (/6 in.)</th>
<th>Shear Strength (psf)</th>
<th>SSA</th>
<th>Casing Blows</th>
<th>Elevation (ft.)</th>
<th>Graphic Log</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>1D/A</td>
<td>24/17</td>
<td>4.00 - 6.00</td>
<td>5/6/13/27</td>
<td>19</td>
<td>27</td>
<td>SSA</td>
<td>-5.30</td>
<td>-6.00</td>
</tr>
</tbody>
</table>

**Remarks:**

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

**Definitions:**

- **R** = Rock Core Sample
- **D** = Split Spoon Sample
- **HSA** = Solid Stem Auger
- **MD** = Unsuccessful Split Spoon Sample attempt
- **U** = Thin Wall Tube Sample
- **RC** = Roller Cone
- **MU** = Unsuccessful Thin Wall Tube Sample attempt
- **V** = Insitu Vane Shear Test, **PP** = Pocket Penetrometer
- **MV** = Unsuccessful Insitu Vane Shear Test attempt
- **WOR/C** = weight of rods or casing
- **W1P** = Weight of one person

**Technical Details:**

- **Visual Description and Remarks**
  - PAVEMENT.
  - **(1D)** 4.0-5.3' bgs.
    - Brown, wet, medium dense, gravelly, fine to coarse SAND, some silt, (Fill).
  - **(1D/A)** 5.3-6.0' bgs.
    - Brown, wet, medium dense, silty fine to coarse SAND, little gravel, (Till).

- **Bottom of Exploration at 6.00 feet below ground surface.**
  - NO REFUSAL.
### Soil/Rock Exploration Log

**Location:** Island Falls, Maine  
**Elevation (ft.):** NAVD88  
**Driller:** MaineDOT  
**Auger ID/OD:** 5" Dia.

---

<table>
<thead>
<tr>
<th>Depth (ft.)</th>
<th>Sample No.</th>
<th>Pen./Rec. (in.)</th>
<th>Sample Depth (ft.)</th>
<th>Blows (/6 in.)</th>
<th>Shear Strength (psf) or RQD (%)</th>
<th>N-uncorrected N60</th>
<th>N60</th>
<th>Casing Blows</th>
<th>Elevation (ft.)</th>
<th>Graphic Log</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SSA -0.50</td>
<td></td>
<td></td>
<td></td>
<td>SSA -0.50</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>1D</td>
<td>24/18</td>
<td>4.00 - 6.00</td>
<td>5/5/7/25</td>
<td>12</td>
<td>17</td>
<td></td>
<td></td>
<td>SSA -5.20</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SSA -6.00</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SSA -6.00</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SSA -6.00</td>
<td></td>
</tr>
<tr>
<td>25</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SSA -6.00</td>
<td></td>
</tr>
</tbody>
</table>

**Visual Description and Remarks:**

- **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.**

**Bottom of Exploration at 6.00 feet below ground surface.**

- **NO REFUSAL**

---

**Definitions:**

- R = Rock Core Sample  
- SSA = Solid Stem Auger  
- HSA = Hollow Stem Auger  
- D = Split Spoon Sample  
- Tc = Pocket Vane Shear Strength (psf)  
- qc = Unconfined Compressive Strength (ksf)  
- MD = Unsuccesful Split Spoon Sample attempt  
- U = Thin Wall Tube Sample  
- RC = Roller Cone  
- MU = Unsuccesful Thin Wall Tube Sample attempt  
- WOH = weight of 140lb. hammer  
- V = In situ Vane Shear Test, PP = Pocket Penetrometer  
- WOR = weight of rods or casing  
- MV = Unsuccessful In situ Vane Shear Test attempt  
- WORC = weight of one person  
- PI = Plasticity Index  
- MU = Unsuccessful Thin Wall Tube Sample attempt  
- WO1P = Weight of one person

---

- **Laboratory Testing Results/ AASHTO and Unified Class.**
- **G#238105**  
- **A-1-b, GM**  
- **WC=7.4%**

---

**Remarks:**

Brown, wet, medium dense, gravelly, fine to coarse SAND, some silt, (Fill).

Brown, moist, medium dense, silty fine to coarse SAND, some gravel, (Till).

Bottom of Exploration at 6.00 feet below ground surface.
<table>
<thead>
<tr>
<th>Depth (ft.)</th>
<th>Sample No.</th>
<th>Pen./Rec. (in.)</th>
<th>Sample Depth (ft.)</th>
<th>Blows (/6 in.)</th>
<th>Shear Strength (psf)</th>
<th>SSA</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>ID</td>
<td>24/20</td>
<td>4.00 - 6.00</td>
<td>5/7/9/14</td>
<td>16</td>
<td>22</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Visual Description and Remarks**

**PAVEMENT.**

Brown, wet, medium dense, gravelly, fine to coarse SAND, some silt, (Fill). Wet layer from 4.0-5.0' bgs.

**Bottom of Exploration at 6.00 feet below ground surface.**

NO REFUSAL

---

Definitions:
- $R = \text{Rock Core Sample}$
- $S = \text{Solid Stem Auger}$
- $H = \text{Hollow Stem Auger}$
- $DC = \text{Drift Core Sample}$
- $SP = \text{Split Spoon Sample}$
- $SS = \text{Solid Stem Auger}$
- $WC = \text{Water Content, percent}$
- $T = \text{Torvane Shear Strength (psf)}$
- $SSA = \text{Solid Stem Auger}$
- $WC = \text{Water Content, percent}$
- $T = \text{Torvane Shear Strength (psf)}$
- $WC = \text{Water Content, percent}$
- $T = \text{Torvane Shear Strength (psf)}$
- $WC = \text{Water Content, percent}$
- $T = \text{Torvane Shear Strength (psf)}$
- $WC = \text{Water Content, percent}$

**Remarks:**

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.
### Soil/Rock Exploration Log

**US CUSTOMARY UNITS**

<table>
<thead>
<tr>
<th>Depth (ft.)</th>
<th>Sample No.</th>
<th>Pen./Rec. (in.)</th>
<th>Sample Depth (ft.)</th>
<th>Blows (/6 in.)</th>
<th>Shear Strength (psf) or RQD (%)</th>
<th>N-uncorrected</th>
<th>Casing Blows</th>
<th>Elevation (ft.)</th>
<th>Visual Description and Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>PAVEMENT.</strong></td>
</tr>
<tr>
<td>5</td>
<td>1D</td>
<td>24/2</td>
<td>4.00 - 6.00</td>
<td>4/6/22/20</td>
<td>28</td>
<td>39</td>
<td></td>
<td></td>
<td>Brown, wet, medium dense, gravelly, fine to coarse SAND, some silt, (Fill).</td>
</tr>
<tr>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Olive-brown, wet, medium dense, silty fine to coarse SAND, some gravel, (Till).</td>
</tr>
<tr>
<td>20</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Bottom of Exploration at 6.00 feet below ground surface.</td>
</tr>
<tr>
<td>25</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>NO REFUSAL</td>
</tr>
</tbody>
</table>

**Definitions:**
- P = Penetrometer
- RC = Roller Cone
- SSA = Solid Stem Auger
- T v = Torvane Shear Strength (psf)
- W = Water Content, percent
- WC = Water Content, percent
- WC = Unconfined Compressional Strength (kip/ft²)
- LL = Liquid Limit
- PI = Plasticity Index
- G = Grain Size Analysis
- MV = Unsuccessful In situ Vane Shear Test Attempt
- WO = Weight of one person
- N60 = SPT N-value corrected for hammer efficiency

**Notations:**
- "*" 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.

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

**Locations:**
- Island Falls, Maine
### Soil/Rock Exploration Log

**US CUSTOMARY UNITS**

<table>
<thead>
<tr>
<th>Depth (ft.)</th>
<th>Sample No.</th>
<th>Pen./Rec. (in.)</th>
<th>Sample Depth (ft.)</th>
<th>Blows (/6 in.)</th>
<th>Shear Strength or RQD (%)</th>
<th>N-uncorrected</th>
<th>Casing Blows</th>
<th>Elevation (ft.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>1D</td>
<td>24/18</td>
<td>4.00 - 6.00</td>
<td>4/6/12/13</td>
<td>18</td>
<td>25</td>
<td></td>
<td>-0.60</td>
</tr>
<tr>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Visual Description and Remarks**

- **PAVEMENT:**
  - Brown, wet, medium dense, gravelly, fine to coarse SAND, some silt, (Fill).
  - Wet layer from 4.0-5.0' bgs.

- **Bottom of Exploration at 6.00 feet below ground surface.**
  - NO REFUSAL

**Definitions:**
- **T_v:** Pocket Torvane Shear Strength (psf)
- **WC:** water content, percent
- **LL:** Plastic Limit
- **G:** Grain Size Analysis
- **Pu:** Insitu Field Vane Shear Strength (psf)
- **S_u:** In-situ Field Vane Shear Strength (psf)
- **q_u:** Unconfined Compressive Strength (kSF)
- **N_u:** N-uncorrected = Raw field SPT N-value
- **N_60:** SPT N-uncorrected corrected for hammer efficiency
- **N_60*/:** (Hammer Efficiency Factor/60%)*N-uncorrected
- **G:** Gravel Size Analysis
- **C:** Consolidation Test

**Remarks:**

- 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**

**MaineDOT**

**Elevation (ft.)**

**Auger ID/OD:** 5" Dia.

**Operator:** Gigauere/Giles

**Datum:** NAVD88

**Sampler:** Standard Split Spoon

**Logged By:** B. Wilder

**Rig Type:** CME 45C

**Hammer Wt./Fall:** 140#/30'

**Date Start/Finish:** 5/4/10-5/4/10

**Drilling Method:** Solid Stem Auger

**Core Barrel:** N/A

**Boring Location:** 5445+70, 8.0 Lt. Passing Lane

**Casing ID/OD:** N/A

**Water Level:** None Observed

**Hammer Efficiency Factor:** 0.84

**Hammer Type:** Automatic

**Definitions:**
- R = Rock Core Sample
- S = Solid Stem Auger
- SSA = Solid Stem Auger
- HSA = Hollow Stem Auger
- MD = Unsuccessful Split Spoon Sample attempt
- U = Thin Wall Tube Sample
- MU = Unsuccessful Thin Wall Tube Sample attempt
- V = Insitu Vane Shear Test
- MV = Unsuccessful Insitu Vane Shear Test attempt
- T = Pocket Torvane Shear Strength (psf)
- WP = Pocket Penetrometer
- WOR/C = weight of rods or casing
- WC = water content, percent
- qc = Unconfined Compressive Strength (lbf/sq in)
- qc(lab) = Lab Shear Strength (psf)
- T = Pocket Shear Strength (psf)
- PI = Plasticity Index
- LL = Liquid Limit
- PL = Plastic Limit
- G = Grain Size
- GPR = Pocket Penetrometer
- N60 = SPT N-uncorrected corrected for hammer efficiency
- N60 = SPT N-uncorrected
- N60 = SPT N-uncorrected corrected for hammer efficiency
- N60 = SPT N-uncorrected
- RQD = Raw field SPT N-value
- N60 = SPT N-uncorrected
- N60 = SPT N-uncorrected
- N60 = SPT N-uncorrected corrected for hammer efficiency
- GPR = Pocket Penetrometer
- N60 = SPT N-uncorrected corrected for hammer efficiency
- C = Consolidation Test

**Visual Description and Remarks:**

- **Depth:** 5' below ground surface.
- **Sample Information:**
  - **1D 24/18:** 
    - **Sample Depth:** 4.00 - 6.00
    - **Blows (/6 in.):** 5/13/19/14
    - **Shear Strength:** 32
    - **Vane:** 45
    - **Visual Description:** Brown, wet, medium dense, gravelly, fine to coarse SAND, some silt, (Fill).
    - **Remarks:** Wet layer from 4.0-5.0' bgs.

- **10' Depth:**
  - **Sample Depth:** 6.00
  - **Blows (/6 in.):** 5/13/19/14
  - **Shear Strength:** 32
  - **Vane:** 45
  - **Visual Description:** Brown, wet, medium dense, silty fine to coarse SAND, some gravel, (Till).

- **15' Depth:**
  - **Sample Depth:** 9.00
  - **Blows (/6 in.):** 5/13/19/14
  - **Shear Strength:** 32
  - **Vane:** 45
  - **Visual Description:** Bottom of Exploration at 6.00 feet below ground surface.
  - **Remarks:** NO REFUSAL.
### Soil/Rock Exploration Log

#### US CUSTOMARY UNITS

**Project:** I-95 Northbound Lane  
**Location:** Island Falls, Maine

**Hammer Efficiency Factor:** 0.84  
**Hammer Type:** Automatic  
**Operator:** Giguere/Giles  
**Datum:** NAVD88

**Logged By:** B. Wilder  
**Rig Type:** CME 45C  
**Date Start/Finish:** 5/4/10-5/4/10  
**Boring Location:** 5472+28, 8.0 Lt. Passing Lane

**Driller:** MaineDOT  
**Operator:** Giguere/Giles  
**Datum:** NAVD88  
**Auger ID/OD:** 5" Dia.

**Sampled:** Standard Split Spoon  
**Drilling Method:** Solid Stem Auger  
**Core Barrel:** N/A  
**Water Level:** None Observed

**Definitions:**  
- R = Rock Core Sample  
- S = In-situ Field Vane Shear Strength (psf)  
- SSA = Solid Stem Auger  
- T = Pocket Torvane Shear Strength (psf)  
- WC = Water Content, percent  
- qc = Unconfined Compressive Strength (lbf/ft²)  
- LL = Liquid Limit  
- PI = Plasticity Index  
- G = Grain Size Analysis  
- MV = Unsuccessful In-situ Vane Shear Test attempt  
- MU = Unsuccessful Split Spoon Sample attempt  
- MU = Unsuccessful Thin Wall Tube Sample attempt  
- N = Number of Successful samples  
- N60 = SPT N-value corrected for hammer efficiency  
- N60 = SPT N-value corrected for hammer efficiency  
- N60 = SPT N-value corrected for hammer efficiency  
- N60 = SPT N-value corrected for hammer efficiency

**Remarks:**  
- Stratification lines represent approximate boundaries between soil types; transitions may be gradual.

#### Visual Description and Remarks

- **Bottom of Exploration at 6.00 feet below ground surface.**  
- NO REFUSAL

- **Brown, wet, medium dense, gravelly, fine to coarse SAND, some silt, (Fill).**

- **Brown, wet, medium dense, silty fine to coarse SAND, some gravel, (Till).**

- **G#238110 A-1-b, SM WC=10.1%**

#### Sample Information

<table>
<thead>
<tr>
<th>Depth (ft.)</th>
<th>Sample No.</th>
<th>Pen./Rec. (in.)</th>
<th>Sample Depth (ft.)</th>
<th>Blows (/6 in.)</th>
<th>Shear Strength (psf) or RQD (%)</th>
<th>N-uncorrected</th>
<th>N60</th>
<th>Casing Blows</th>
<th>Elevation (ft.)</th>
<th>Visual Description and Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
<td></td>
<td>SSA</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>1D</td>
<td>24/17</td>
<td>4.00 - 6.00</td>
<td>8/12/12/14</td>
<td>24</td>
<td>34</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Brown, wet, medium dense, gravelly, fine to coarse SAND, some silt, (Fill).**

- **Brown, wet, medium dense, silty fine to coarse SAND, some gravel, (Till).**

- **Bottom of Exploration at 6.00 feet below ground surface.**

* 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