

GZA GeoEnvironmental, Inc. Bennington Bypass North Boring No.: _____	
Engineers and Scientists Bennington, Vermont Page: _____ of _____	
File No.: 15634	
Contractor: New Hampshire Boring	Auger/ Casing Sampler Check: _____
Format: _____	GROUNDWATER READINGS
Logged by: _____	Date _____ Time _____ Depth _____ Casing _____ Stab _____
Date Start/Finish: _____	I.D. (mm): _____
Boring Location: See Exploration Location Plan	Hammer Wt.: _____
GS Elev.: _____	Datum: NGVD Hammer Fall: _____
Rig Type: _____	

Depth (feet)	Depth (meters)	Sample Information					Sample Description & Classification	Stratum Desc.	Equipment Installed	
		No.	Rec. (m)	Depth (m)	Blows/0.15m	N Value				
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.

- Numbers in this column are the depth in feet below ground surface.
 - Number in this column are the depth in meters below ground surface.
 - The sample number and type are designated in this column.
e.g., S-1
Sample number
Sample type (S = Split Spoon Sample)
 - The values shown are the length of the soil sample recovered, in meters.
 - The numbers in this column designate the depth, in meters, from the ground surface of the sample identified in column 3.
 - Numbers in this column report the number of blows required to drive a split spoon sampler (35 mm inside diameter) 0.15 meters with a 63.5 kg hammer free-falling 0.76 m.
 - The Standard Penetration Test N-value, which is the sum of the blows recorded over the second and third 0.15 meter interval (column 6), is recorded in this column for soil samples.
 - Description of soil samples include:
 - the relative density or consistency;
 - color;
 - a listing of the Major or Minor soil components based on particle size distribution and plasticity;
 - other pertinent characteristics; and
 - AASHTO classifications based on visual perception.
- For example:
- Medium dense, brown, fine to medium SAND, trace Silt, stratified.
- A solid line indicates a boundary between geologic deposits.
A dashed line indicates a gradation change within a geologic deposit.
- Geologic deposit (e.g., Lacustrine).
 - Pertinent observations made while advancing the test boring are identified in this column opposite the depth the observation was made. The observation is explained at the bottom of the page under "Notes" next to the appropriate number.
 - Equipment installed within the borehole and graphically presented in this column. If no equipment was installed, this column is blank.



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BORING LOG LEGEND

DESCRIPTION OF SOIL SAMPLES

- Density or Consistency:

The density or consistency listed is determined from the Standard Penetration Test N-Value according to the following table:

Density of Granular Soils	SPT N-Value	Consistency of Cohesive Soils
Very Loose	0-4	0-2
Loose	4-10	2-4
Medium Dense	10-30	4-8
Dense	30-50	8-15
Very Dense	50+	15-30
		30+
		Very Soft
		Soft
		Medium
		Stiff
		Very Stiff
		Hard

WOR - indicates weight of rods
WOH - indicates weight of hammer
 - Color: Visual perception.
 - Soil Components:
 - Description:** The components of a soil sample are described by visually estimating the percentage of each component by weight of the total sample.
 - Major Component:** The major soil component (>50 Percent) is written with upper case letters for granular soil (e.g., SAND, GRAVEL) and a combination of the upper and lower case letters for fine grained soil (e.g., Silty CLAY, Clayey SILT).
 - Minor Component:** The minor soil components (<50 Percent) are written with the first letter of each soil type in upper case, and the remaining letters in the lower case (e.g., Gravel, Silt). The minor components are identified and prefaced in the description based on the following percentages:

Description	Percentage
and	35-50
some	20-35
little	10-20
trace	0-10
 - Note:** The actual percentage of gravel soils may differ from that measured when sampling with a standard split spoon sampler and/or auger type sampler because of the relatively small sampler diameter. Also, it is not possible to identify the presence of boulders and cobbles using a standard split spoon sampler and/or auger type sampler.
- Fill: Fill is a material placed by other than natural processes. It is described by its major component(s) and additional significant components are listed.

3.2 Definitions:

 - Granular Soil:** A granular soil sample is defined by the following particle sizes as referenced to a standard sieve.

Material	Standard Upper	Sieve Limit Lower
GRAVEL	-coarse 3 inch	3/4 inch
	-fine 3/4 inch	No. 4
SAND	-coarse No. 4	No. 10
	-medium No. 10	No. 40
	-fine No. 40	No. 200
 - Cohesive:** A cohesive soil is classified by visually estimating the degree of plasticity based upon the minimum diameter thread which a sample can be rolled with the finger in the palm of the hand.

Material	Degree of Plasticity	Smallest Diameter Thread (inches)
SILT	Non-plastic	None
Clayey SILT	Slight	1/4
SILT and CLAY	Low	1/8
CLAY and SILT	Medium	1/16
Silty CLAY	High	1/32
CLAY	Very High	1/64



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- Organic Soils:** An organic soil sample is classified by observation of the sample structure.

Material	Description
Topsoil	• Typically well-graded fine granular soil with organic matter.
Fibrous Peat	• Can see vegetative structure
Fine Grained Peat	• Spongy, water squeezes out
	• Little vegetative matter
Organic Silt	• Spongy
	• H ₂ S odor
	• Shell fragments
	• Often contains Sand
4. Other Pertinent Characteristics:
- Soil Structure:** Produced by deposition of sediments.
- | | |
|--------------|---|
| Stratified | - Random soil deposits of varying components or color |
| Varved | - Alternating soil deposits of varying thickness (i.e., clays or silts) |
| Stratum | - Soil deposit > 12 inches thick |
| Layer | - Soil deposit 3 inches to 12 inches thick |
| Seam | - Soil deposit 1/8 inch to 3 inches thick |
| Parting/Lens | - Soil deposit < 1/8 inch thick |
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BORING LOG LEGEND

STATE OF VERMONT AGENCY OF TRANSPORTATION

Town Of	BENNINGTON	Bridge No.	BI5, BI5N, BI5S
Highway No.	VT RTE 279	Log Sta.	
		Surv. Sta.	
VT ROUTE 279 & RAMPS OVER ROARING BRANCH OF WALLOOMSAC RIVER			
BORING INFORMATION (SHEET 2 OF 2)			
Designed By	GZA	Drawn By	L.R. DELL
Checked By	GZA	Date	03/06
		Bridge Design Supervisor	K.M. WOJTKOWSKI
		Date	03/06
PROJECT	BENNINGTON	PROJECT NO.	AC NH FO19-(5)
TVGA CAD Drawing No.	INFOSHT.dgn	Date	02/02/2009
Bridge Sheet No.	BR206	Sheet	193 of 367

