

**GZA** GZA Environmental, Inc. Bennington Bypass North Boring No.: \_\_\_\_\_  
 Engineers and Scientists Bennington, Vermont Page: \_\_\_\_\_ of \_\_\_\_\_  
 File No.: 15634  
 Contractor: New Hampshire Boring Auger/ Casing Sampler Check: \_\_\_\_\_  
 Foreman: \_\_\_\_\_ Type: \_\_\_\_\_  
 Logged by: \_\_\_\_\_ L.D. (mm): \_\_\_\_\_  
 Date Start/Finish: \_\_\_\_\_ Hammer Wt.: \_\_\_\_\_  
 Boring Location: See Exploration Location Plan Datum: NGVD  
 GS Elev.: \_\_\_\_\_ Rig Type: \_\_\_\_\_

Sample Information							GROUNDWATER READINGS				
Depth (feet)	Depth (meters)	No.	Rec. (m)	Depth (m)	Blows/0.15m	N Value	Date	Time	Depth	Casing	Stab
1.	2.	3.	4.	5.	6.	7.					

- 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
  - 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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DESCRIPTION OF SOIL SAMPLES

1. 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	Very Soft
Loose	4-10	Soft
Medium Dense	10-30	Medium Stiff
Dense	30-50	Stiff
Very Dense	50+	Very Stiff
		Hard

WOR - indicates weight of rods  
 WOH - indicates weight of hammer

2. Color: Visual perception.

3. Soil Components:

3.1 **Description:** The components of a soil sample are described by visually estimating the percentage of each component by weight of the total sample.

a. **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).

b. **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

c. **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.



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d. **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:

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

Material		Standard Sieve Limit	
		Upper	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

The Gravel/Sand portions of a granular soil are further divided based on the following visually estimated proportions:

Gravel/Sand	Proportion
fine to coarse	> 10% all fractions
coarse	< 10% fine and medium
medium to coarse	< 10% fine
medium	< 10% fine and coarse
fine to medium	< 10% coarse
fine	< 10% medium to coarse

b. **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

c. **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 • Spongy, water squeezes out
Fine Grained Peat	• Little vegetative matter • Spongy
Organic Silt	• H <sub>2</sub> 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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STATE OF VERMONT  
 AGENCY OF TRANSPORTATION

Town Of	BENNINGTON	Bridge No.	BI2
Highway No.	VT RTE 279	Log Sta.	
		Surv. Sta.	
VT ROUTE 279 OVER FURNACE BROOK			

BORING INFORMATION SHEET (2 OF 2)

Designed By	J.J. MANUSE	Drawn By	D.J. HENDERSON
Checked By	B.J. CARLSON	Bridge Design Supervisor	K.M. WOJTKOWSKI
Date	04/07	Date	04/07
PROJECT	BENNINGTON	PROJECT NO.	AC NH FO19-1(53)
TVGA CAD Drawing No.	FBBIS02.dgn	Date	04/10/2007
Bridge Sheet No.	BR505	Sheet	197 of 577

