STATE OF VERMONT
AGENCY OF TRANSPORTATION

BORING LOG INFORMATION

BORING LOG — B-4 (Page 1 of 2)

GEODESIGN INCORPORATED
54 Main Street
Windsor, Vermont, 05089
GeoDesign, Inc.
Telephone: 802-674-2033 Fax: 802-674-5943

Project Name: Springfield STP 016-2 (10)S
Springfield, VT

File No.: 750-03.3
Checked By: RSA

Boring Company: M and W Soils Engineering
Foreman: Mike Hitchcock
GeoDesign Rep.: Jason Gaudette
Date Started: May 7, 2001 Date Finished: May 7, 01
N. Coordinate: E. Coordinate:
Ground Surface Elevation (feet): 458.0
Station: Offset: ft

Casing Type	Casing I.D./O.D.	Hammer Wt.	Hammer Fall	Rig Type
NW	3.0 in. / 2.0 in.	NA / 140 lbs	NA / 30 in.	Acker Skid

Groundwater Observations

Date and Time	Depth (ft)	Elevation (ft)	Notes
5/7/01 12:15 PM	20.0	438.0	Drilling

Depth (ft)	Casing Blows/ft	Sample Number	Type	Penetration (inches)	Recovery (inches)	Depth (ft)	Blows / 6 inch Interval 0-6	6-12	12-18	18-24	Casing Time (min./ft)	RECORD QD (Y/N)	Sample Description (Classification System: Burmister)	Symbol	Elevation & Depth (feet)	Strata Description
															457.5	Rooty Topsoil
		S1	SS	24.0	8.0	1.0	2	2	3	2			S1 Loose, light brown, fine to medium SAND, some Silt, trace Root Fibers		456.5	
		S2	SS	24.0	10.0	3.0	2	3	1	2			S2 Loose, light brown, fine to coarse SAND, trace Silt, trace Root Fibers		455.0	3.0 Sandy Fill with Gravel
5																
		S3	SS	24.0	8.0	3.0	3	4	3	3			S3 Loose, similar to SS sample S2 with piece of highly weathered rock in spoon tip			
		S4	SS	24.0	12.0	7.0	11	8	11	11			S4 Medium dense, similar to SS sample S3 except trace to little Silt, micaceous			
10		S5	SS	24.0	8.0	9.0	6	6	10	8			S5 Medium dense, similar to SS sample S4			
		S6	SS	24.0	12.0	11.0	9	12	16	11			S6 Dense, similar to SS sample S5 except little Gravel			
		S7	SS	24.0	14.0	13.0	11	8	16	17			S7 Medium dense, similar to SS sample S6 with slight oxidation			
15																
		S8	SS	24.0	18.0	15.0	18	20	12	12			S8 Dense, similar to SS sample S7			
		S9	SS	24.0	18.0	17.0	12	10	14	20			S9 Medium dense, similar to SS sample S8 with dark brown Silt lenses			
20		S10	SS	24.0	6.0	19.0	20	17	14	8			S10 Dense, similar to SS sample S9 except some Gravel, wet		437.0	
		S11	SS	18.0	12.0	21.0	17	40	59/4"	--			S11 Very dense, greenish gray, fine to medium SAND, some Silt, little fine Gravel			21.0 Glacial Till
25																

Remarks:
(0'): Ground surface elevation is estimated from topographic base plan based on locations taped from existing features and plotted by GeoDesign. Elevation data should be considered accurate only to the degree implied by the method used.
(19'): Possibly pushing cobble or piece of gravel during SS sample attempt.

Notes:
1) Stratification Lines Represent Approximate Boundary Between Material Types, Transitions May Be Gradual.
2) Water Level Readings Have Been Made At Times And Under Conditions Stated, Fluctuations Of Groundwater May Occur Due To Other Factors Than Those Present At The Time Measurements Were Made.
3) Sample Type Coding: A = Auger; C = Core; Pt = Piston Sampler; Sa = Split Barrel (split Spoon); St = Shelby Tube; V = Vane
4) Proportions Used: Trace = 1-10%; Little = 10-20%; Some = 20-35%; And = 35-50%

BORING LOG 750-03.GPJ GEODESIGN.GDT 7/2/01

Boring No.: B-4

BORING LOG — B-4 (Page 2 of 2)

GEODESIGN INCORPORATED
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GeoDesign, Inc.
Telephone: 802-674-2033 Fax: 802-674-5943

Project Name: Springfield STP 016-2 (10)S
Springfield, VT

File No.: 750-03.3
Checked By: RSA

Boring Company: M and W Soils Engineering
Foreman: Mike Hitchcock
GeoDesign Rep.: Jason Gaudette
Date Started: May 7, 2001 Date Finished: May 7, 01
N. Coordinate: E. Coordinate:
Ground Surface Elevation (feet): 458.0
Station: Offset: ft

Casing Type	Casing I.D./O.D.	Hammer Wt.	Hammer Fall	Rig Type
NW	3.0 in. / 2.0 in.	NA / 140 lbs	NA / 30 in.	Acker Skid

Groundwater Observations

Date and Time	Depth (ft)	Elevation (ft)	Notes
5/7/01 12:15 PM	20.0	438.0	Drilling

Depth (ft)	Casing Blows/ft	Sample Number	Type	Penetration (inches)	Recovery (inches)	Depth (ft)	Blows / 6 inch Interval 0-6	6-12	12-18	18-24	Casing Time (min./ft)	RECORD QD (Y/N)	Sample Description (Classification System: Burmister)	Symbol	Elevation & Depth (feet)	Strata Description
																Glacial Till (Continued)
30															427.0	
																31.0 Possible Bedrock
																31.1 Bottom of Borehole at 31.1 ft
35																
40																
45																
50																

Remarks:
(31'): High drilling restance on probable bedrock.
(31.1'): 30' of 2" I.D. inclinometer casing installed. 20 gallons of bentonite/cement (7:2 ratio) grout tremied from bottom of hole to a depth of 3'. Bentonite chips poured into hole from 3' depth to surface.

Notes:
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2) Water Level Readings Have Been Made At Times And Under Conditions Stated, Fluctuations Of Groundwater May Occur Due To Other Factors Than Those Present At The Time Measurements Were Made.
3) Sample Type Coding: A = Auger; C = Core; Pt = Piston Sampler; Sa = Split Barrel (split Spoon); St = Shelby Tube; V = Vane
4) Proportions Used: Trace = 1-10%; Little = 10-20%; Some = 20-35%; And = 35-50%

BORING LOG 750-03.GPJ GEODESIGN.GDT 7/2/01

Boring No.: B-4

BORING LOG — B-5 (Page 1 of 1)

GEODESIGN INCORPORATED
54 Main Street
Windsor, Vermont, 05089
GeoDesign, Inc.
Telephone: 802-674-2033 Fax: 802-674-5943

Project Name: Springfield STP 016-2 (10)S
Springfield, VT

File No.: 750-03.3
Checked By: RSA

Boring Company: M and W Soils Engineering
Foreman: Mike Hitchcock
GeoDesign Rep.: Jason Gaudette
Date Started: April 19, 2001 Date Finished: Apr 19, 01
N. Coordinate: E. Coordinate:
Ground Surface Elevation (feet): 439.0
Station: Offset: ft

Casing Type	Casing I.D./O.D.	Hammer Wt.	Hammer Fall	Rig Type
NW	3.0 in. / 2.0 in.	NA / 140 lbs	NA / 30 in.	Acker Soil Max Truck

Groundwater Observations

Date and Time	Depth (ft)	Elevation (ft)	Notes
4/19/01 1:20 PM	2.0	437.0	Drilling

Depth (ft)	Casing Blows/ft	Sample Number	Type	Penetration (inches)	Recovery (inches)	Depth (ft)	Blows / 6 inch Interval 0-6	6-12	12-18	18-24	Casing Time (min./ft)	RECORD QD (Y/N)	Sample Description (Classification System: Burmister)	Symbol	Elevation & Depth (feet)	Strata Description
															438.5	Asphalt
															0.5	Sandy Fill
															436.0	
															3.0	Glacial Till
5		S1	SS	16.0	14.0	3.0	13	31	46	--			S1 Very dense, greenish gray, fine to medium SAND, some Silt, trace fine Gravel			
		S2	SS	12.0	6.0	5.0	16	29	39/1"	--			S2 Very dense, similar to SS sample S1		432.5	
															6.5	Bedrock (Phyllite-Schist)
		C1	C	60.0	51.0	7.7				10	83-63		C1 Moderately hard, light to dark steel gray, moderate to close fractures, slightly weathered.			
10										8						
										8						
										7						
										69/						
		C2	C	60.0	49.0	12.7				10	82-63		C2 Similar rock type to Core sample C1 with 2" thick quartz veins			
15										13						
										14						
										8						
										12					421.3	
															17.7	Bottom of Borehole at 17.7 ft
20																
25																

Remarks:
(0'): Ground surface elevation is estimated from topographic base plan based on locations taped from existing features and plotted by GeoDesign. Elevation data should be considered accurate only to the degree implied by the method used.
(0-3'): Soil classification based on visual observations of HSA cuttings.
(0-7.5'): HSA augured (3.25 I.D.) to 7.5' prior to installing NW casing.
(6.5'): Hard drilling on possible bedrock. Installed NW casing to 7.5' Roller bit used to flush out hole to 7.7' depth prior to rock coring.
(11-13'): Gradual loss of water (approximately 15 gallons) observed between 11-13' depth through possible rock fractures.

Notes:
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2) Water Level Readings Have Been Made At Times And Under Conditions Stated, Fluctuations Of Groundwater May Occur Due To Other Factors Than Those Present At The Time Measurements Were Made.
3) Sample Type Coding: A = Auger; C = Core; Pt = Piston Sampler; Sa = Split Barrel (split Spoon); St = Shelby Tube; V = Vane
4) Proportions Used: Trace = 1-10%; Little = 10-20%; Some = 20-35%; And = 35-50%

BORING LOG 750-03.GPJ GEODESIGN.GDT 7/2/01

Boring No.: B-5

BORING LOG — B-6 (Page 1 of 2)

GEODESIGN INCORPORATED
54 Main Street
Windsor, Vermont, 05089
GeoDesign, Inc.
Telephone: 802-674-2033 Fax: 802-674-5943

Project Name: Springfield STP 016-2 (10)S
Springfield, VT

File No.: 750-03.3
Checked By: RSA

Boring Company: M and W Soils Engineering
Foreman: Mike Hitchcock
GeoDesign Rep.: Jason Gaudette
Date Started: April 20, 2001 Date Finished: Apr 20, 01
N. Coordinate: E. Coordinate:
Ground Surface Elevation (feet): 437.0
Station: Offset: ft

Casing Type	Casing I.D./O.D.	Hammer Wt.	Hammer Fall	Rig Type
NW	3.0 in. / 2.0 in.	NA / 140 lbs	NA / 30 in.	Acker Soil Max Truck

Groundwater Observations

Date and Time	Depth (ft)	Elevation (ft)	Notes
4/20/01 7:15 AM	5.0	432.0	Drilling

Depth (ft)	Casing Blows/ft	Sample Number	Type	Penetration (inches)	Recovery (inches)	Depth (ft)	Blows / 6 inch Interval 0-6	6-12	12-18	18-24	Casing Time (min./ft)	RECORD QD (Y/N)	Sample Description (Classification System: Burmister)	Symbol	Elevation & Depth (feet)	Strata Description
															436.5	Asphalt
															0.5	Sandy Fill
															435.0	
															2.0	Layered Sands
		S1	SS	24.0	16.0	3.0	11	15	17	23			S1 Dense, greenish gray, layered, fine SAND and SILT (up to 1/2" thickness), trace coarse Sand. Bottom 2" well.			
5																
		S2	SS	24.0	18.0	5.0	14	19	17	19			S2 Top 6" Dense, green gray, fine to medium SAND, little to some Silt			
		S3	SS	18.0	16.0	7.0	26	51	58.4"	--			Bottom 10" Similar layered fine SAND and Silt to SS sample S1			
													S3 Top 14" Very dense, similar to Bottom 10" of SS sample S2			
10													Bottom 2" Similar to Top above			
		S4	SS	19.0	18.0	10.0	13	25	42	25/1"			S4 Very dense, greenish brown, fine to coarse SAND, little to some Silt, layered		425.0	
															12.0	Glacial Till
															422.0	
15		SS	SS	5.0	4.0	14.0	70/5"	--	--	--			S5 Very dense, fine to medium SAND, some Silt, trace fine Gravel		15.0	Bedrock (Phyllite/Schist and Quartzite)
		C1	C	60.0	54.0	15.6				11	83-63		C1 Moderately hard, light to dark gray, moderate to very close fracturing, schistose/slaty, metasedimentary.			
										10						
										12						
										9						
20										11						
		C2	C	60.0	60.0	20.6				10	106-62		C2 Top 4" Similar rock type to above with sulphide mineralization. Mid 42" light to dark gray, banded metasedimentary, few to moderate fracturing, fresh. Bottom 14" Similar to to Top 4"			
										8						
										8						
										9						
25																Bottom of Borehole at 25.6 ft

Remarks:
(0'): Ground surface elevation is estimated from topographic base plan based on locations taped from existing features and plotted by GeoDesign. Elevation data should be considered accurate only to the degree implied by the method used.
(0-15.7'): HSA augured (3.25" I.D.) to 15.7' prior to installing NW casing.
(15'): Hard Grinding resistance observed during HSA auger advance on possible bedrock. HSA advanced to 15.7' prior to NW casing installation. Roller bit used to clean/flush out hole to 15.7' prior to installing casing.
(15.8-25.8'): Rock cored using 6X (1.42" diameter) core barrel sampler. C1 sample stopped at 3' due to plugged bit.

Notes:
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3) Sample Type Coding: A = Auger; C = Core; Pt = Piston Sampler; Sa = Split Barrel (split Spoon); St = Shelby Tube; V = Vane
4) Proportions Used: Trace = 1-10%; Little = 10-20%; Some = 20-35%; And = 35-50%

BORING LOG 750-03.GPJ GEODESIGN.GDT 7/2/01

Boring No.: B-6

PROJECT NAME:	SPRINGFIELD
PROJECT NUMBER:	STP 016-2 (10)S
FILE NAME: 00b124\structures\sb124bor.xls	PLOT DATE: 6/18/2004
PROJECT MANAGER: R. R. WHITCOMB	DRAWN BY: L. ASHWORTH
DESIGNED BY: G. ROY	CHECKED BY: G. ROY
BORING LOG INFORMATION SHEET #3	SHEET 29 OF 72