



BORING LOG

Barlow Bridge #20
BHF 0286 (5) - TH-2 (VT-16)
GeoDesign #888-04.9

Boring No.: B-1
Page No.: 1 of 2
Pin No.: 121172
Checked By: JFW/DTH

Boring Crew: J.Leonhardt (QC/QA), A. Baribault (GeoDesign)
Date Started: 2/04/14 Date Finished: 2/07/14
VTSPG NAD83: N 819409.00 ft E 1723363.00 ft
Station: 12+47.4 Offset: 6.1 LT
Ground Elevation: 856 ft

Casing Sampler
Type: FJ SS
I.D.: 4 in 1.38 in
Hammer Wt: 140 lb. 140 lb.
Hammer Fall: 30 in. 30 in.
Hammer/Rod Type: Auto/NWJ
Rig: CME 550X ATV CE = 1.4

Groundwater Observations (3)

Date	Depth (ft)	Notes
02/04/14		See Remark 2.

Depth (ft)	Strat (l)	CLASSIFICATION OF MATERIALS (Description)	Run (lip dep.)	Core Rec. (ROD %)	Drill Rate minutes/ft	Blows/6" (N Value)(2)	Moisture Content %	Gravel %	Sand %	Fines %
5	X X X	S1 (0.5' to 2'): Refusal, light brown fine to coarse SAND, some Silt, little fine Gravel, frozen. Rec. = 0.4 ft PID = 6.2 (Ross=0)				100/5" (R)				
	X X X	S2 (2' to 4'): Dense, brown/tan fine to medium SAND and SILT, little (-) fine to coarse Gravel, frozen. Lower 8" mostly frozen Sand and Silt. Rec. = 1.5 ft PID = 0.1 (Ross=0)				73-17- 29-33 (46)		13.0	46.0	41.0
	X X X	S3 (4' to 6'): Medium dense, brown fine to coarse SAND, some Silt, little fine Gravel, trace (+) Brick, wet. Rec. = 1.3 ft PID = 0.6 (Ross=0.8)				8-8-7-4 (13)				
	X X X	S4 (6' to 8'): Very dense, brown fine to coarse SAND, some Silt, wet. Rec. = 1.0 ft PID = 0.1 (Ross=0)				1-20-34- 47 (54)				
10		S5 (8' to 10'): Loose, gray-brown fine to medium SAND and SILT, trace Brick (in upper 2'), wet. Strong petroleum odor. Rec. = 1.2 ft PID = 1957 (Ross=730)				2-6-2-1 (5)		5.0	74.0	23.0
		S6 (10' to 12'): Loose, gray fine to medium SAND, little (+) Silt, trace fine Gravel, trace Wood/Organic Fibers, wet. Strong petroleum odor. Rec. = 1.5 ft PID = 873 (Ross=327)				2-4-3-4 (7)				
15		S7 (12' to 14'): Loose, gray and brown layered fine to coarse SAND, little (-) Silt, stratified with trace Wood/Organic Fibers, wet. Strong petroleum odor. Rec. = 1.3 ft PID = 1622 (Ross=486)				2-4-6-3 (10)				
		S8 (14' to 16'): Medium dense, gray fine to coarse SAND and SILT, trace Wood, wet. Significant petroleum odor. Rec. = 1.1 ft PID = 44 (Ross=18)				4-5-3-3 (8)		44.0	17.0	39.0
20		S9 (16' to 18'): Loose, gray/white fine to coarse GRAVEL, some fine to coarse Sand, trace Silt, trace Wood, wet. Slight petroleum odor. (Probable Slough) Rec. = 0.2 ft PID = 72 (Ross=104)				4-4-4-5 (8)				
		S10 (18' to 20'): Loose, gray fine to coarse SAND and SILT, some fine Gravel, wet. Rec. = 0.6 ft PID = 58 (Ross=7.5)				4-4-5-5 (9)				
		S11 (20' to 22'): Loose, gray SILT, some fine Sand, wet. Rec. = 1.4 ft PID = 9.5 (Ross=0.6)				3-4-4-3 (8)		3.0	23.0	74.0
		S12 (24' to 26'): Loose, gray SILT, some fine Sand, wet. Rec. = 0.8 ft PID = 9.2 (Ross=0.6)				5-6-6-7 (12)				
30		S13 (29' to 31'): Loose, gray SILT, some fine Sand, wet. Rec. = 1.1 ft PID = 10.2 (Ross=0)				5-6-6-5 (12)		5.0	3.0	92.0
		S14 (34' to 36'): Medium dense, gray SILT, some fine Sand, wet. Rec. = 1.1 ft PID = 1.1 (Ross=0.1)				6-60/3" (R)				
35		S15 (39' to 41'): Medium dense, gray SILT, little fine Sand, wet. Rec. = 1.0 ft PID = 2.8 (Ross=0.2)								
40		S16 (44' to 46'): Refusal, gray SILT, little fine Sand, trace fine Gravel (in spoon shoe, likely fractured rock). Rec. = 0.8 ft PID = 0 (Ross=0)	C1	44	1.5					
45		C1A (44.8' to 47'): BOULDER.				1.8				
		C1B (47' to 48.8'): Gray fine SAND and SILT, wet. PID Not Recorded				0.1				
		S17 (49' to 51'): Medium dense, gray SILT, some fine Sand, wet.				0.1				

Notes: 1. Stratification lines represent approximate boundary between material types. Transition may be gradual.
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3. 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.



BORING LOG

Barlow Bridge #20
BHF 0286 (5) - TH-2 (VT-16)
GeoDesign #888-04.9

Boring No.: B-1
Page No.: 2 of 2
Pin No.: 121172
Checked By: JFW/DTH

Boring Crew: J.Leonhardt (QC/QA), A. Baribault (GeoDesign)
Date Started: 2/04/14 Date Finished: 2/07/14
VTSPG NAD83: N 819409.00 ft E 1723363.00 ft
Station: 12+47.4 Offset: 6.1 LT
Ground Elevation: 856 ft

Casing Sampler
Type: FJ SS
I.D.: 4 in 1.38 in
Hammer Wt: 140 lb. 140 lb.
Hammer Fall: 30 in. 30 in.
Hammer/Rod Type: Auto/NWJ
Rig: CME 550X ATV CE = 1.4

Groundwater Observations (3)

Date	Depth (ft)	Notes
02/04/14		See Remark 2.

Depth (ft)	Strat (l)	CLASSIFICATION OF MATERIALS (Description)	Run (lip dep.)	Core Rec. (ROD %)	Drill Rate minutes/ft	Blows/6" (N Value)(2)	Moisture Content %	Gravel %	Sand %	Fines %
		Rec. = 1.0 ft				(15)				
55		Hole stopped @ 51.5 ft								
60		Remarks: 1) Borehole advanced to 4 feet with 4.25" HSA, then to 29 feet with 4" FJ casing, open hole to 44.8 feet. Telescoped 3" FJ casing to 44.8 feet prior to start of rock core. 2) Moisture observations below 4 feet deep may not accurately reflect insitu conditions due to continuously adding water during borehole advance. 3) Strong petroleum odor observed from 8 to 14 feet, decreasing thereafter. Samples S5 through S8 preserved for VOC laboratory testing. 4) Slight roller bit grinding from 16 to 20 feet deep. 5) Wash water brown, turning gray-brown at approximately 12 feet. 6) Approximately 2.2 feet of boulder cored in C1, total penetration 4 feet (1.8 feet through soil). Also recovered approximately 9" of soil (gray fine SAND and SILT, wet). 7) Advanced 3" casing to refusal at 51.5 feet deep. While attempting to remove casing for attachment of washing tee, shoe wedged and casing broke at approximately 41 feet deep. 8) Borehole abandoned at 51.5 feet deep. Tremie grout to bottom of hole to backfill prior to removing casing. 9) Grout mix consisted on +/- 35 gallons water, 94 pounds Type I/II Portland Cement, 25 pounds Bentonite Powder. 10) Samples S1 through S16 screened in the field with an Ion Science PhoCheck 1000 model PID calibrated to a 100 PPM Isobutylene standard. Samples S1 through S16 also screened by Ross Environmental with PhoCheck Tiger calibrated to a benzene standard. 11) All sample descriptions shown are per the Burmister classification system and are based on visual descriptions made in the field by GeoDesign personnel. Where applicable, laboratory testing results shown are from testing performed by GeoTesting Express, with the Gravel/Sand/Fines breakdown shown per AASHTO M145. 12) Northing, easting, and ground surface elevation are estimated from an electronic site plan provided by TY Lin and taped measurements made from existing features in the field by GeoDesign personnel.								

Notes: 1. Stratification lines represent approximate boundary between material types. Transition may be gradual.
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GEODESIGN BORING LOG 888-04.7 BARTON BR. 20.CP.1 VERMONT DOT LOT 5/12/14

GEODESIGN BORING LOG 888-04.7 BARTON BR. 20.CP.1 VERMONT DOT LOT 5/12/14



STATE OF VERMONT
 AGENCY OF TRANSPORTATION
 MATERIALS & RESEARCH SECTION
 SUBSURFACE INFORMATION

BORING LOG

Barton Bridge #20
 BHF 0286 (5) - TH-2 (VT-16)
 GeoDesign #888-04.9

Boring No.: B-1A
 Page No.: 1 of 1
 Pin No.: 12j172
 Checked By: JFW/DTH

Boring Crew: J.Leonhardt (QC/QA), J. Wimet (GeoDesign)
 Date Started: 2/07/14 Date Finished: 2/07/14
 VTSPG NAD83: N 819412.00 ft E 1723364.00 ft
 Station: 12+50.5 Offset: 5.5 LT
 Ground Elevation: 856 ft

Type: AUGER
 I.D.: 4.25 in
 Hammer Wt: N.A.
 Hammer Fall: N.A.
 Hammer/Rod Type: Auto/AWJ
 Rig: CME 550X ATV

Casing: 3" SS
 Sampler: 2.5 in
 140 lb.
 30 in.
 Auto/AWJ
 CE = 1.4

Groundwater Observations (3)

Date	Depth (ft)	Notes
02/08/14	9.0	Wet sample.

Depth (ft)	Strata (t)	CLASSIFICATION OF MATERIALS (Description)	Blows/6" (N Value)(2)	Moisture Content %	Gravel %	Sand %	Fines %
	x x x	0.4' Asphalt					
	x x x	Sand & Gravel Subbase (No Sample)					
5	x x x	S1) Brown with black and tan fine to coarse SAND, some fine to coarse Gravel, little Silt, frozen. Rec. = 0.75 ft	70-94/5"				
	x x x	S2) Gray brown to light brown fine to coarse SAND, some Silt (grading to trace Silt at bottom), little fine to coarse Gravel, trace (+) clay pipe pieces, frozen to slightly moist. Rec. = 2.0 ft	34-42-22-16				
	x x x	S3) Brown fine to coarse SAND, some Silt, some fine to coarse Gravel, moist. Middle 4" entirely fractured rock fragments. Rec. = 1.5 ft	5-25-36-18				
10	x x x	S4) Dark to tan Clayey SILT and fine SAND, little (+) fine to coarse Gravel (fractured), wet. Rec. = 1.0 ft	14-75-100/5"				
	x x x	Inferred Fill					
	x x x						
	x x x						
15	x x x	S5) Very loose, dark brown SILT and fine to coarse SAND, little Organic Fibers, wet. Strong Petroleum Odor. Rec. = 1.2 ft	1/12"-1-1				
			(1)				
		Hole stopped @ 16.0 ft					
20		Remarks: 1) Split spoon samples with the exception of S5 were taken with a 3" O.D. spoon to collect sample for resistivity testing. Sample S5 was taken with a standard 2" O.D. split spoon. 2) Heavy auger grinding and chatter noted between 9 and 11 feet deep. 3) Borehole backfilled with grout upon completion. Grout mix consisted of +/- 35 gallons water, 94 pounds Type I/II Portland Cement, 25 pounds Bentonite Powder. 4) Northing, easting, and ground surface elevation are estimated from an electronic site plan provided by TY Lin and taped measurements made from existing features in the field by GeoDesign personnel.					
25							
30							
35							
40							
45							

Notes:
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GEODESIGN BORING LOG 888-04.7 BARTON BR 20.GPJ VERMONT AOT.GDT 5/12/14



BORING LOG

Barton Bridge #20
BHF 0286 (5) - TH-2 (VT-16)
GeoDesign #888-04.9

Boring No.: B-18
Page No.: 1 of 2
Pin No.: 12|172
Checked By: JFW/DTH

Boring Crew: J.Leonhardt (QC/QA), A. Baribault (GeoDesign)
Date Started: 2/25/14 Date Finished: 2/28/14
VTSPG NAD83: N 819410.00 ft E 1723365.00 ft
Station: 12+48.6 Offset: 4.3 LT
Ground Elevation: 856 ft

Type: FJ SS
I.D.: 4 in 1.38 in
Hammer Wt: 140 lb. 140 lb.
Hammer Fall: 30 in. 30 in.
Hammer/Rod Type: Auto/NWJ
Rig: CME 550X ATV CE = 1.4

Groundwater Observations (3)

Date	Depth (ft)	Notes
02/25/14		See Remark 1.

Depth (ft)	Strat(1)	CLASSIFICATION OF MATERIALS (Description)	Run (Dip deg.)	Drill Rate (min/ft)	Blows/6" (N Value)(2)	Moisture Content %	Gravel %	Sand %	Fines %
0-10	x x x	Inferred Fill from Boring B-1							
10-20	x x x	Inferred Silty Sand from Boring B-1							
20-80.3	x x x	Inferred Sandy Silt from Boring B-1							

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BORING LOG

Barton Bridge #20
BHF 0286 (5) - TH-2 (VT-16)
GeoDesign #888-04.9

Boring No.: B-18
Page No.: 2 of 2
Pin No.: 12|172
Checked By: JFW/DTH

Boring Crew: J.Leonhardt (QC/QA), A. Baribault (GeoDesign)
Date Started: 2/25/14 Date Finished: 2/28/14
VTSPG NAD83: N 819410.00 ft E 1723365.00 ft
Station: 12+48.6 Offset: 4.3 LT
Ground Elevation: 856 ft

Type: FJ SS
I.D.: 4 in 1.38 in
Hammer Wt: 140 lb. 140 lb.
Hammer Fall: 30 in. 30 in.
Hammer/Rod Type: Auto/NWJ
Rig: CME 550X ATV CE = 1.4

Groundwater Observations (3)

Date	Depth (ft)	Notes
02/25/14		See Remark 1.

Depth (ft)	Strat(1)	CLASSIFICATION OF MATERIALS (Description)	Run (Dip deg.)	Drill Rate (min/ft)	Blows/6" (N Value)(2)	Moisture Content %	Gravel %	Sand %	Fines %
54-56		S1 (54' to 56'): Medium dense, gray SILT, some fine Sand, wet. (PID = 64.5 PPM). Rec. = 1.0 ft			10-13-15-14 (28)				
59-61		S2 (59' to 61'): Medium dense, gray SILT, some fine Sand, wet. (PID = 25.0 PPM). Rec. = 0.8 ft			11-17-9-5 (26)				
64-66		S3 (64' to 66'): Very dense, gray SILT and fine SAND, wet. (PID = 24.9 PPM). Rec. = 1.7 ft			27-40-48-53 (88)		1.0	46.0	53.0
69-72		S4 (69' to 72'): Very dense, gray SILT, little fine Sand, trace coarse Gravel (1 pc near top of sample, in extra bag), wet. (PID = 1.0 PPM). Rec. = 1.7 ft			13-27-43-67 (70)		1.0	9.0	90.0
75-78.5		C1A (75'-75.5'): BOULDER. C1B (75.5'-78') Inferred soil.							
78-78.8		S5 (78' to 78.8'): Refusal, gray fine to coarse SAND, some Silt, little fine to coarse Gravel, very moist. (PID = 1.1 PPM). Rec. = 0.5 ft		1.3					
79-80.3		S6 (79' top 80.3'): Very dense, gray fine to coarse GRAVEL, some fine to coarse Sand, some Silt, moist. (PID = 2.5 PPM). Rec. = 1.2 ft		0.4					
80.3		Hole stopped @ 80.3 ft		0.3					
80-80.3					20-100/4" (R)		47.0	23.0	30.0
80-80.3					5-20-80-100/4" (80)				

Remarks:
1) Boring advanced to define depth to bedrock after casing forced termination of B-1. For stratigraphy above 54 feet, refer to log of B-1. Sample moisture observations may not reflect actual insitu conditions due to wash-drive drilling methods.
2) First attempt resulted in auger refusal at 8"; boring advanced to 5 feet deep with HSA, wash and drive to 14 feet and casing moved out of alignment due to possible cobbles or obstruction between 8 and 10 feet deep. Hole reamed with HSA and casing reset prior to continuing.
3) No sampling or environmental screening performed. Strong petroleum odor and sheen on wash water return from approximately 8 to 14 feet deep.
4) Wash water return brown turning gray-brown and then gray by 19 feet. Polymer E-2 Mud added to drilling fluid at approximately 25 feet deep.
5) Driller noted change in roller bit resistance from 61 to 61.5 feet deep.
6) Encountered roller bit resistance at 72.5 feet deep. Switched to a carbide button roller bit and advanced borehole to 75 feet with occasional slight chatter and consistent advancement rate (4 min/foot) through inferred boulder.
7) Installed 3-inch FJ Casing with spin shoe to 62 feet in open hole, advanced while spinning/washing to 75 feet. Advanced rock core to 78 feet through inferred soil from 75.5 to 78 feet.
8) All sample descriptions shown are per the Burmister classification system and are based on visual descriptions made in the field by GeoDesign personnel. Where applicable, laboratory testing results shown are from testing performed by GeoTesting Express, with the Gravel/Sand/Fines breakdown shown per AASHTO M145.
9) Northing, easting, and ground surface elevation are estimated from an electronic site plan provided by TY Lin and taped measurements made from existing features in the field by GeoDesign personnel.

Notes:
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GEODESIGN BORING LOG 888-04.7 BARTON BR 20.GPJ VERMONT AOT.GDT 5/12/14

GEODESIGN BORING LOG 888-04.7 BARTON BR 20.GPJ VERMONT AOT.GDT 5/12/14

	STATE OF VERMONT AGENCY OF TRANSPORTATION MATERIALS & RESEARCH SECTION SUBSURFACE INFORMATION	BORING LOG Borlon Bridge #20 BH# 0286 (5) - TH-2 (VT-16) GeoDesign #888-04.9	Boring No.: B-2 Page No.: 1 of 3 Pln No.: 121172 Checked By: JFW/DTH
	Boring Crew: J. Leachardt (QC/QA), J. Wimala (GeoDesign) Date Started: 2/11/14 Date Finished: 2/25/14 VSPG M4083: N 819488.00 ft E 1273373.00 ft Station: 13+07.1 Offset: 2.5 LT Ground Elevation: 856 ft	Type: AUGER SS Casing: 4 in. 1.38 in. Sampler: 140 lb. 140 lb. Hammer: 30 in. 30 in. Hammer/Rod Type: Auto/HWJ Rig: CHE 550X ATY CE = 1.4	Groundwater Observations (3) Date Depth (ft) Notes 02/11/14 See Remark 2.

Depth (ft)	Strat (ft)	CLASSIFICATION OF MATERIALS (Description)	Pen (blows)	Core Rec. %	Moist. Content %	Gravel %	Sand %	Fines %
0	0	6" Asphalt						
0	0	8" Concrete						
0	0	S1 (2' to 4'): Very dense, light brown with gray and dark brown fine to coarse SAND, some (+) SIL, trace fine Gravel, frozen to moist. (PID = 4.5 PPM) Rec. = 2.0 ft	25-53 34			9.0	46.0	45.0
5	5	S2 (4' to 6'): Medium dense, dark brown to brown fine to coarse SAND (grading to fine to medium Sand) and SIL, trace fine Gravel, slightly moist. (PID = 1.9 PPM) Rec. = 2.0 ft	4-2-2-20 (8)					
10	10	S3 (6' to 8'): Loose, SSA - Top 6": Dark brown fine to coarse SAND and SIL, little fine Gravel, wet. S3B - Bottom 2": Gray fine SAND and SIL, some fine to coarse Gravel, wet. (PID = 1.0 PPM) Rec. = 0.8 ft	50-57 (8)			64.0	24.0	12.0
15	15	S4 (8' to 10'): Refusal, piece of fractured coarse GRAVEL stuck in spoon tip. (INFERRED BOULDER FILL) Rec. = 0.1 ft	10-12-8 (8)					
15	15	S5 (10' to 12'): Very dense, dark brown fine to coarse SAND and fine to coarse GRAVEL, little SIL, trace Organics, wet. (PID = 0.8 PPM) Rec. = 0.7 ft	3-20-19 (8)					
20	20	S6 (12' to 14'): Medium dense, dark brown fine to coarse SAND and fine GRAVEL, little (-) SIL, wet. (PID = 0.5 PPM) Rec. = 0.4 ft	6-12-4 (8)			5.0	30.0	65.0
20	20	S7 (14' to 16'): Dense, gray-brown fine to coarse SAND and fine GRAVEL, little SIL, wet. (PID = 0.3 PPM) Rec. = 0.4 ft	4-4-3-5 (8)					
25	25	S8 (16' to 18'): Medium dense, gray SILT, some fine Sand, wet. (PID = 0.8 PPM) Rec. = 0.8 ft	5-8-8-8 (12)					
25	25	S9 (18' to 20'): Loose, gray SILT, some fine Sand, wet. (PID = 0.6 PPM) Rec. = 0.6 ft	5-5-6-4 (11)					
25	25	S10 (20' to 22'): Medium dense, gray SILT, some fine Sand, wet. (PID = 0.5 PPM) Rec. = 1.1 ft	6-5-6-4 (11)			5.0	10.0	85.0
30	30	S11 (24' to 26'): Medium dense, gray SILT, some fine Sand, wet. (PID = 0.4 PPM) Rec. = 1.3 ft	6-5-6-4 (10)					
30	30	S12 (28' to 31'): Medium dense, gray SILT, little fine Sand, wet. (PID = 0.3 PPM) Rec. = 1.4 ft	5-5-3-4 (10)					
35	35	S13 (34' to 36'): Medium dense, gray SILT, little fine Sand, wet. (PID = 0.3 PPM) Rec. = 1.3 ft	5-5-3-4 (8)					
40	40	S14 (39' to 41'): Loose, gray SILT, little fine Sand, wet. Rec. = 1.0 ft	5-5-6-3 (8)					
45	45	S15 (44' to 46'): Medium dense, gray SILT, little fine Sand, wet. Rec. = 1.3 ft	10-8-8-8 (10)			2.0	8.0	90.0
45	45	S16 (49' to 51'): Medium dense, gray SILT, little fine Sand, wet. Rec.	5-9-10-					

Notes: 1. Stratification lines represent approximate boundary between material types. Transition may be gradual.
 2. If values have not been corrected for hammer energy, CE is the hammer energy correction factor.
 3. Water level readings have been made of fines and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

	STATE OF VERMONT AGENCY OF TRANSPORTATION MATERIALS & RESEARCH SECTION SUBSURFACE INFORMATION	BORING LOG Borlon Bridge #20 BH# 0286 (5) - TH-2 (VT-16) GeoDesign #888-04.9	Boring No.: B-2 Page No.: 2 of 3 Pln No.: 121172 Checked By: JFW/DTH
	Boring Crew: J. Leachardt (QC/QA), J. Wimala (GeoDesign) Date Started: 2/11/14 Date Finished: 2/25/14 VSPG M4083: N 819488.00 ft E 1273373.00 ft Station: 13+07.1 Offset: 2.5 LT Ground Elevation: 856 ft	Type: AUGER SS Casing: 4 in. 1.38 in. Sampler: 140 lb. 140 lb. Hammer: 30 in. 30 in. Hammer/Rod Type: Auto/HWJ Rig: CHE 550X ATY CE = 1.4	Groundwater Observations (3) Date Depth (ft) Notes 02/11/14 See Remark 2.

Depth (ft)	Strat (ft)	CLASSIFICATION OF MATERIALS (Description)	Pen (blows)	Core Rec. %	Moist. Content %	Gravel %	Sand %	Fines %
0	0	= 0.7 ft						
55	55	S17 (54' to 56'): Dense, gray SILT, little fine Sand, wet. Rec. = 0.6 ft	10 (19)					
60	60	S18 (58' to 61'): Dense, gray SILT, little fine Sand, wet. Rec. = 0.8 ft	13-15-15-19 (14)					
65	65	S19A (64' to 64.8'): Refusal, gray fine to coarse SAND, some SIL, little fine to coarse Gravel, wet. Rec. = 1.3 ft S19B (64.8' to 65.4'): Refusal, gray SILT, little fine Sand, wet.	12-20-22-15 (14) 7-48-50-57 (6)	23.0	40.0 4.0	37.0 36.0		
70	70	S20 (69' to 71'): Very dense, gray SILT, little fine Sand wet. (PID = 4.7 PPM) Rec. = 1.7 ft	24-38-56-55 (35)			13.0	87.0	
75	75	C1A (72.5' to 74.5'): Phyllite & Limestone Boulder.	C1 (20-50)	77	2	2		
75	75	C1B (74.5' to 75'): Glacial Till.	2					
75	75	C2A (75' to 77.1'): Limestone Boulder.	C2 (20-80)	70	1.8	1.8		
75	75	C2B (77.1' to 78'): Inferred soil (no recovery). Hole stopped @ 78.0 ft	0.8					

Notes: 1. Stratification lines represent approximate boundary between material types. Transition may be gradual.
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	STATE OF VERMONT AGENCY OF TRANSPORTATION MATERIALS & RESEARCH SECTION SUBSURFACE INFORMATION	BORING LOG Borlon Bridge #20 BH# 0286 (5) - TH-2 (VT-16) GeoDesign #888-04.9	Boring No.: B-2 Page No.: 3 of 3 Pln No.: 121172 Checked By: JFW/DTH
	Boring Crew: J. Leachardt (QC/QA), J. Wimala (GeoDesign) Date Started: 2/11/14 Date Finished: 2/25/14 VSPG M4083: N 819488.00 ft E 1273373.00 ft Station: 13+07.1 Offset: 2.5 LT Ground Elevation: 856 ft	Type: AUGER SS Casing: 4 in. 1.38 in. Sampler: 140 lb. 140 lb. Hammer: 30 in. 30 in. Hammer/Rod Type: Auto/HWJ Rig: CHE 550X ATY CE = 1.4	Groundwater Observations (3) Date Depth (ft) Notes 02/11/14 See Remark 2.

Depth (ft)	Strat (ft)	CLASSIFICATION OF MATERIALS (Description)	Pen (blows)	Core Rec. %	Moist. Content %	Gravel %	Sand %	Fines %
105	105	Remarks: 1) First attempt ended in refusal of 8 inches deep on concrete. Note piece of rebar in drill cuttings. Move 4 feet north and auger through 5 inches of asphalt and 6 inches of concrete. Borehole advanced with a 4.25" HSA to 4 feet deep prior to switching to 4" O.D. casing and wash-drilling methods. 2) Moisture observations below 6 feet deep may not accurately reflect in-situ conditions due to continuously adding water during borehole advance. 3) Note frequent rig chatter from 8 to 10 feet deep through possible bouldery/cobbly soils. 4) Driller advanced casing to 20 feet deep. Borehole progressed open-hole with the roller bit below 20 feet deep. 5) Note approximately 8 inches of slough at the bottom of the borehole prior to sampling S17 at 54 feet deep. Found sampler through slough with 8 blows of the hammer. SPT N-value not per ASTM Standard. 6) After sampling S17, drive 4-inch casing to 40 feet deep prior to continuing advancement of the borehole. 7) Driller notes roller bit appears to be bouncing on denser soils beginning at 59 feet deep. 8) Note approximately 18 inches of slough of the bottom of the borehole prior to sampling S18 at 58 feet deep. Found sampler through slough with 10 blows of the hammer. SPT N-value not per ASTM Standard. 9) After sampling S18, drive 4-inch casing to 50 feet deep. Driller infers casing to have broken at 35 feet deep during advance. 10) Inferred bedrock or possible boulders with soil infilling at joints approximately 8 inches thick below 72.5 feet deep. 11) Borehole backfilled with grout, approximately 50 gal water, 180 pounds type 1/8 portland cement, and 40 pounds bentonite powder. 12) Samples S1 through S15 screened in the field with an Ion Science ProCheck 1000 model PID calibrated to a 100 PPM isotoluene standard. 13) All sample descriptions shown are per the Burmister classification system and are based on visual descriptions made in the field by GeoDesign personnel. Where applicable, laboratory testing results shown are from testing performed by GeoTesting Express, with the Gravel/Sand/Fines breakdown shown per AASHTO M145. 14) Horthing, casing, and ground surface elevation are estimated from an electronic site plan provided by TY Lin and taped measurements made from existing features in the field by GeoDesign personnel.						
125	125	ESTIMATED BOTTOM OF PILE AT ABOUT NO 2 EL 731.5						

Notes: 1. Stratification lines represent approximate boundary between material types. Transition may be gradual.
 2. If values have not been corrected for hammer energy, CE is the hammer energy correction factor.
 3. Water level readings have been made of fines and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



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BORING LOG

Barton Bridge #20
 BHF 0286 (5) - TH-2 (VT-16)
 GeoDesign #888-04.9

Boring No.: B-2A
 Page No.: 1 of 1
 Pin No.: 12172
 Checked By: JFW/DTH

Boring Crew: J.Leonhardt (QC/QA), A. Baribault (GeoDesign)
 Date Started: 2/25/14 Date Finished: 2/25/14
 VTSPG NAD83: N 819472.00 ft E 1723373.00 ft
 Station: 13+11.1 Offset: 3.0 LT
 Ground Elevation: 856 ft

Casing Sampler
 Type: AUGER 3" SS
 I.D.: 4.25 in 2.5 in
 Hammer Wt: 140 lb. 140 lb.
 Hammer Fall: 30 in. 30 in.
 Hammer/Rod Type: Auto/NWJ
 Rig: CME 550X ATV CE = 1.4

Groundwater Observations (3)

Date	Depth (ft)	Notes
02/25/14	7.0	Wet sample at 7'

Depth (ft)	Strata(1)	CLASSIFICATION OF MATERIALS (Description)	Blows/6" (N Value)(2)	Moisture Content %	Gravel %	Sand %	Fines %
5	× × ×	S1 (2' to 4'): Light brown fine to coarse SAND, some fine to coarse Gravel, little to some silt, trace Brick, frozen. Rec. = 2.0 ft	35-56-62-67				
	× × ×	S2 (4' to 6'): Light brown fine to coarse SAND, some Silt, little fine to coarse Gravel, trace Brick, frozen. Rec. = 1.5 ft	9-10-13-10				
	× × ×	S3 (6' to 8'): Loose, brown fine SAND and SILT, moist (upper 12") to wet (lower 12"). Rec. = 2.0 ft	8-6-3-3				
10		S4 (8 to 10'): Very loose, brown to gray-brown SILT, some fine Sand, little Wood and Organics, wet. Inferred recent alluvium. Upper 2" Possible Fill (no separate sample). Rec. = 2.0 ft	1-2-3-2				
Hole stopped @ 10.0 ft							
15	Remarks: 1) Split spoon samples were taken using a 3" O.D. split spoon to collect sample for resistivity testing. Sample S4 not cleaned out prior to sampling (augers at 6 feet). 2) Approximately 6" Asphalt, significant auger grinding from 6" to 10" through inferred concrete (no rebar encountered) with smooth drilling thereafter. 3) Borehole backfilled with cuttings and capped with asphalt cold patch. 4) Northing, easting, and ground surface elevation are estimated from an electronic site plan provided by TY Lin and taped measurements made from existing features in the field by GeoDesign personnel.						
20							
25							
30							
35							
40							
45							

Notes: 1. Stratification lines represent approximate boundary between material types. Transition may be gradual.
 2. N Values have not been corrected for hammer energy. CE is the hammer energy correction factor.
 3. 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.

GEODESIGN BORING LOG 888-04.7 BARTON BR 20.GPJ VERMONT AOT.GDT 5/12/14