VTrans Working to Get You There — Vermont Agency of Transportation

STATE OF VERMONT
AGENCY OF TRANSPORTATION
CONSTRUCTION AND MATERIALS
BUREAU CENTRAL LABORATORY

BORING LOG

Hinesburg HES 021-1(19)
(GeoDesign #750-09.18)
Hinesburg, VT

Boring No.: B1
Page No.: 1 of 1
Pin No.: 04b204
Checked By: JFW

Boring Crew: C. Aldrich (Platform), M. Hagedorn (GeoDesign)
Date Started: 5/29/15 Date Finished: 5/29/15
VTSPG NAD83:
Station: See Notes Offset: See Notes
Ground Elevation: 379 ft

	Casing	Sampler
Type:	AUGER	SS
I.D.:	2.25 in	1.38 in
Hammer Wt:	N.A.	140 lb.
Hammer Fall:	N.A.	30 in.
Hammer/Rod Type:		Auto/NWJ
Rig:	Geoprobe 7822DT	CE = 1.35

Groundwater Observations (3)

Date	Depth (ft)	Notes
05/29/15		None observed.

Depth (ft)	Strata(1)	CLASSIFICATION OF MATERIALS (Description)	Blows/6" (N Value)(2)	Moisture Content %	Gravel %	Sand %	Fines %
2.5		No sampling performed. (Inferred General Sand & Gravel Fill from auger cuttings.)					
		Hole stopped @ 3.0 ft Multiple refusals on inferred rock < 3' deep.					

Remarks:
1. Ground surface elevation, northing, easting, station, and offset shown are approximated from ties made from existing features in the field by GeoDesign personnel, the Preliminary Plan Set prepared by VHB and dated 4/30/2015, and an electronic site plan titled "z04b204sv.dgn" provided by VHB via email on June 26, 2015.
2. Auger grinding and chatter noted from 1' – 2' deep on inferred bedrock. Moved drill rig multiple times and re-drilled with same result.
3. Inferred shallow bedrock, unable to core rock at shallow depths with equipment available on site.
4. 5 borehole locations were attempted at the following approximate stations and offsets:

Northing	Easting	Station	Offset	Refusal Depth
1479486	670955	280+30	16'R	1.5'
1479488	670956	280+30	18'R	1.5'
1479488	670950	280+25	16'R	1.5'
1479478	670973	280+50	16'R	3'
1479463	671006	280+86	16'R	2'

5. Large bedrock outcropping noticed at approximate station 280+00 on east side of roadway.

Notes:
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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.

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BORING LOG

Hinesburg HES 021-1(19)
(GeoDesign #750-09.18)
Hinesburg, VT

Boring No.: B1-RC
Page No.: 1 of 1
Pin No.: 04b204
Checked By: JFW

Boring Crew: T. Farrell (SJB), M. Hagedorn (GeoDesign)
Date Started: 6/02/15 Date Finished: 6/02/15
VTSPG NAD83: N 670950.00 ft E 1479488.00 ft
Station: 280+25 Offset: 16 'RT
Ground Elevation: 379 ft

	Casing	Sampler
Type:	FJ	NA
I.D.:	4.25 in	
Hammer Wt:	140 lb.	N.A.
Hammer Fall:	30 in.	N.A.
Hammer/Rod Type:	Auto/NWJ	
Rig:	CME 550X ATV	CE = 1.35

Groundwater Observations (3)

Date	Depth (ft)	Notes
06/02/15		None observed.

Depth (ft)	Strata(1)	CLASSIFICATION OF MATERIALS (Description)	Run (Dip deg.)	Core Rec. % (RQD %)	Drill Rate minutes/ft	Blows/6" (N Value)(2)	Moisture Content %	Gravel %	Sand %	Fines %
		Inferred General Sand & Gravel Fill (From Auger Spoils)								
2.5		C1 (2.5'-5'): Fair quality, moderately hard to hard, fresh with slightly weathered joints, very close to moderate jointing gray with infrequent white inclusions DOLOSTONE. Moderate reaction to dilute HCl when powdered. Jointing near horizontal with occasional near vertical fractures.	C1	87 (67)	1.5 2.4					
5.0		C2 (5'-7.5'): Excellent quality, moderately hard to hard, fresh with slightly weathered joints, moderate jointing, gray with occasional white inclusions DOLOSTONE. Moderate reaction to dilute HCl when powdered. Jointing near horizontal.	C2	100 (100)	2.1 2.6					
7.5		Hole stopped @ 7.5 ft Cored 5' into inferred bedrock.								
10.0										
12.5										
15.0										
17.5										

Remarks:
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2. Casing hammered to refusal at 2.5' deep. Begin core C1 at 2.5' deep.
3. Noted water return to be completely from around the outside of the casing during core bit advance below 4' deep.
4. Core block encountered at 5'. Retrieved 2.2' of cored rock and proceeded to advance core run C2 from 5' to 7.5' deep.
5. Consistent milky gray return color throughout coring.
6. Backfilled with 1.5 gallons of bentonite chips and cuttings.

Notes:
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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.

GEODESIGN BORING LOG 750-09.18 HINESBURG.GPJ VERMONT AOT.GDT 7/31/15

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AGENCY OF TRANSPORTATION
CONSTRUCTION AND MATERIALS
BUREAU CENTRAL LABORATORY

BORING LOG

Hinesburg HES 021-1(19)
(GeoDesign #750-08.18)
Hinesburg, VT

Boring No.: B2
Page No.: 1 of 2
Pin No.: 94S284
Checked By: JFW

Boring Crew: C. Aldrich (Platform), A. Berthault (GeoDesign)
Date Started: 5/26/15 Date Finished: 5/26/15
VTSPC NAD83: N 671691.89 ft E 1479128.89 ft
Station: 287+68 Offset: 45' LT
Ground Elevation: 388 ft

	Casing	Sampler
Type:	AUGER	SS
I.D.:	4.25 in	1.38 in
Hammer Wt:	N.A.	140 lb.
Hammer Fall:	N.A.	30 in.
Hammer/Rod Type:	Auto/NWJ	
Rig:	Geoprobe 7822DT	CE = 1.35

Groundwater Observations (3)

Date	Depth (ft)	Notes
05/26/15	6.0	Wet Sample

Depth (ft)	Symbol (1)	CLASSIFICATION OF MATERIALS (Description)	Blows/6" or Pen/Rec (in)	Moisture Content %	Gravel %	Sand %	Fines %	LL %	PI %
0.0		S1 (0'-2'): S1A - Top 3": Topsoil. S1B - Bottom 21" - Soft, gray and tan mottled CLAY & SILT, some fine to medium Sand, trace (-) fine Gravel, trace Roots (upper 6"), moist. (Reworked Clay Till). Rec. = 1.3 ft (AASHTO M145 Classification: A-6.)	1-1-2-2 (3)	28.0	2.0	20.3	77.7	39	19
2.5		S2 (2' -4'): SiWf, gray and tan CLAY & SILT, little fine to coarse Sand, little fine to coarse Gravel, moist. Rec. = 2.0 ft (AASHTO M145 Classification: A-6.)	4-4-5-5 (10)	28.9	13.8	9.8	76.6	39	13
5.0		S3 (4' -6'): Medium, brown and tan Silty CLAY, trace fine to medium Sand, moist to very moist. Rec. = 2.0 ft (AASHTO M145 Classification: A-7-6.)	3-3-3-3 (6)	31.7	0.2	5.3	94.5	42	21
		S4 (6' -8'): Medium; S4A - (Upper 10"): Brown and gray CLAY & SILT, trace fine to medium Sand, very moist to wet. Rec. = 2.0 ft (AASHTO M145 Classification: A-6.)	WOH-3-4-4 (7)	37.1	0.1	5.2	94.7	36	16
7.5		S4B - Lower 6": Brown and gray SILT, some (+) fine to coarse Gravel, some fine to coarse Sand, trace Clay & Silt, moist. (AASHTO M145 Classification: A-4.)		13.2	38.3	17.2	43.5	NP	NP
		S5 (8' -10'): Medium dense, brown (top 2" -4") to gray fine to coarse SandS, some Silt, some fine to coarse Gravel, moist. Rec. = 1.5 ft (AASHTO M145 Classification: A-2-4.)	2-8-10-8 (18)	8.3	38.8	34.0	38.0	NP	NP
10.0		S6 (10' - 12'): Medium dense, gray fine to coarse SandS, some Silt, some fine to coarse Gravel, moist. Rec. = 1.3 ft (AASHTO M145 Classification: A-2-4.)	4-6-7-7 (13)	7.6	37.2	32.6	38.2	NP	NP
12.5									
15.0		S7 (15' -17'): Very dense, Gray fine to coarse SandS & SILT, some fine to coarse Gravel, moist. Rec. = 1.4 ft (AASHTO M145 Classification: A-4.)	9-18-47-50/5" (65)	7.5	34.2	38.6	37.2	NP	NP
17.5									
		Hole stopped @ 18.0 ft Hollow stem auger refusal.							

Notes:
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Hinesburg HES 021-1(19)
(GeoDesign #750-08.18)
Hinesburg, VT

Boring No.: B2
Page No.: 2 of 2
Pin No.: 94S284
Checked By: JFW

Boring Crew: C. Aldrich (Platform), A. Berthault (GeoDesign)
Date Started: 5/26/15 Date Finished: 5/26/15
VTSPC NAD83: N 671691.89 ft E 1479128.89 ft
Station: 287+68 Offset: 45' LT
Ground Elevation: 388 ft

	Casing	Sampler
Type:	AUGER	SS
I.D.:	4.25 in	1.38 in
Hammer Wt:	N.A.	140 lb.
Hammer Fall:	N.A.	30 in.
Hammer/Rod Type:	Auto/NWJ	
Rig:	Geoprobe 7822DT	CE = 1.35

Groundwater Observations (3)

Date	Depth (ft)	Notes
05/26/15	6.0	Wet Sample

Depth (ft)	Symbol (1)	CLASSIFICATION OF MATERIALS (Description)	Blows/6" or Pen/Rec (in)	Moisture Content %	Gravel %	Sand %	Fines %	LL %	PI %
20.0		Remarks: 1. Ground surface elevation, northing, easting, station, and offset shown are approximated from files made from existing features in the field by GeoDesign personnel, the Preliminary Plan Set prepared by VHB and dated 4/30/2015, and an electronic site plan titled "s04n20ex.dgn" provided by VHB via email on June 26, 2015. 2. Visual soil descriptions are per the Burmister system. Laboratory gradations where applicable were performed by VTrans and are per AASHTO M145. 3. Auger grinding at approximately 3.5' deep on Inferred Gravel. Auger grinding at approximately 7.5' to 17' through denser soil matrix. 4. Wet auger cuttings observed during advance below 6' deep. 5. Auger grinding/chatter at 17' deep. Water noted flowing from auger flights. 6. Hollow stem auger refusal on inferred bedrock at 18' deep. Attempted to core, but lost water around augers and unable to continue. Less than 1" advance with no recovery. 7. Backfilled with 2.5 bags bentonite and cuttings. 8. Hammer energy is assumed.							
22.5									
25.0									
27.5									
30.0									
32.5									
35.0									
37.5									

Notes:
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BORING LOG

Hinesburg HES 021-1(19)
(GeoDesign #750-08.18)
Hinesburg, VT

Pin No.: 04b204
Checked By: JFW

Boring Crew: T. Farrell (SJB), M. Hagedorn (GeoDesign)
Date Started: 6/03/15 Date Finished: 6/03/15
VTSPG NAD83: N 671501.00 ft E 1479134.00 ft
Station: 287+56 Offset: 46' LT
Ground Elevation: 388 ft

	Casing	Sampler
Type:	AUGER	SS
I.D.:	4.25 in	1.38 in
Hammer Wt:	N.A.	140 lb.
Hammer Fall:	N.A.	30 in.
Hammer/Rod Type:	Auto/NWJ	
Rig:	CME 550X ATV	CE = 1.35

Groundwater Observations (3)

Date	Depth (ft)	Notes
06/03/15	6.0	Inferred from B2.

Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)	Run (Dip deg.)	Core Rec. % (RQD %)	Drill Rate minutes/ft	Blows/6" (N Value)(2)	Moisture Content %	Gravel %	Sand %	Fines %	LL %	PI %
		Reworked Clay Fill (Inferred from B2)										
2.5		Sandy Clay & Silt (Inferred from B2)										
5.0		Silty Clay (Inferred from B2)										
7.5		Gravelly Sand & Silt (Inferred from B2)										
10.0												
12.5												
15.0		Glacial Till (Inferred from B2)										
17.5		S1 (18'-20'): Very dense, grey fine to coarse SAND, some fine to coarse Gravel, some Silt, moist. Rec. = 1.6 ft (AASHTO M145 Classification: A-1-b.)				25-37-36-30 (73)	5.6	44.5	31.0	24.5	NP	NP

Notes:
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GEODESIGN BORING LOG 750-08.18 HINESBURG.GPJ VERMONT AOT.GDT 7/20/15

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(GeoDesign #750-08.18)
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Pin No.: 04b204
Checked By: JFW

Boring Crew: T. Farrell (SJB), M. Hagedorn (GeoDesign)
Date Started: 6/03/15 Date Finished: 6/03/15
VTSPG NAD83: N 671501.00 ft E 1479134.00 ft
Station: 287+56 Offset: 46' LT
Ground Elevation: 388 ft

	Casing	Sampler
Type:	AUGER	SS
I.D.:	4.25 in	1.38 in
Hammer Wt:	N.A.	140 lb.
Hammer Fall:	N.A.	30 in.
Hammer/Rod Type:	Auto/NWJ	
Rig:	CME 550X ATV	CE = 1.35

Groundwater Observations (3)

Date	Depth (ft)	Notes
06/03/15	6.0	Inferred from B2.

Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)	Run (Dip deg.)	Core Rec. % (RQD %)	Drill Rate minutes/ft	Blows/6" (N Value)(2)	Moisture Content %	Gravel %	Sand %	Fines %	LL %	PI %
		S2 (20'-22') Dense, grey fine to coarse SAND, some fine to coarse Gravel, some Silt, moist. Rec. = 1.2 ft (AASHTO M145 Classification: A-1-b.)				40-27-14-21 (41)	7.4	35.7	38.0	25.3	NP	NP
22.5		C1 (22.1'-27.1'): Fair quality, moderately hard to hard, fresh, close to moderate jointing, grey with infrequent white banding DOLOSTONE. Moderate reaction to dilute HCl when powdered. Jointing from near horizontal to ~45 degrees.	C1	87 (74)	2.8 1.6 1.9 1.6 1.8							
25.0												
27.5		Hole stopped @ 27.1 ft Cored 5' into inferred bedrock.										
30.0												
32.5												
35.0												
37.5												

Remarks:
1. Ground surface elevation, northing, easting, station, and offset shown are approximated from ties made from existing features in the field by GeoDesign personnel, the Preliminary Plan Set prepared by VHB and dated 4/30/2015, and an electronic site plan titled "z04b204sx.dgn" provided by VHB via email on June 26, 2015.
2. Visual soil descriptions are per the Burmister system. Laboratory gradations where applicable were performed by VTrans and are per AASHTO M145.
3. Augered directly to 18' and began sampling. Infer the upper 18' of lithology from the adjacent boring B-2.
4. Inferred cobble/boulder between 20' and 20.5' deep from auger grinding.
5. Hollow stem auger refusal at 22.1' deep, set up to core.
6. Core block encountered almost immediately after beginning core run C1, removed and continued. Top of sample contains roller bit markings from cleanout.
7. Medium speed for first 0.5'; high speed for remainder of core run.
8. Consistent milky grey discharge for entire length of core.
9. Backfilled with bentonite and cuttings.
10. Hammer energy is assumed.

Notes:
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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.

GEODESIGN BORING LOG 750-08.18 HINESBURG.GPJ VERMONT AOT.GDT 7/20/15

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BORING LOG

Hinesburg NES 021-1(19)
(GeoDesign #750-08.18)
Hinesburg, VT

Boring No.: B3
Page No.: 1 of 2
File No.: 040204
Checked By: JFW

Boring Crew: T. Ferrell (SJB), M. Hagedorn (GeoDesign)
Date Started: 6/02/15 Date Finished: 6/02/15
VTSPG mNAD83: N 671648.80 ft E 1478304.80 ft
Station: 287+75 Offset: 41' RT
Ground Elevation: 374 ft

	Casing	Sampler
Type:	AUGER	SS
I.D.:	4.25 in	1.38 in
Hammer Wt:	N.A.	140 lb.
Hammer Fall:	N.A.	30 in.
Hammer/Rod Type:	Auto/NWJ	
Rig:	CME 330X ATV	CE = 1.35

Groundwater Observations (3)

Date	Depth (ft)	Notes
06/02/15		None observed.

Depth (ft)	Sketch (1)	CLASSIFICATION OF MATERIALS (Description)	Run (No Rec.)	Sample No. or Core Run, in (Rec. in)	Drill Rate (min/ft)	Blows/6" (N Value/ft)	Moisture Content %	Gravel %	Sand %	Fines %	LL %	PI %
0.0												
2.5		S1 (2' – 4'): Medium dense, fine to coarse SAND, some Silt, some fine to coarse Gravel, little Rock, trace Clay & Silt, moist. (General FILL) Rec. = 1.8 ft (AASHTO M145 Classification: A-1-b.)				10-8-6-5 (16)	10.8	33.6	45.0	21.4	NP	NP
5.0		S2 (4' – 6'): Medium, brown mottled CLAY & SILT and fine to coarse SAND, trace fine to coarse Gravel, moist. Rec. = 1.8 ft (AASHTO M145 Classification: A-6.)				5-3-4-3 (7)	20.2	10.3	37.9	51.8	35	18
7.5		S3 (6' – 8'): S3A – (Upper 1'): Very stiff, brown mottled CLAY & SILT and fine to coarse SAND, trace (+) fine to coarse Gravel, moist. Rec. = 1.7 ft (AASHTO M145 Classification: A-6.)				10-13-12-11 (25)	20.9	10.5	38.4	53.1	33	15
		S3B – (Lower 1'): Medium dense, fan to brown fine to coarse SAND, some Silt, some fine to coarse Gravel, moist. (AASHTO M145 Classification: A-2-4.)					10.4	34.9	32.8	32.3	NP	NP
10.0		S4 (8' – 10'): Medium dense, brown mottled SILT and fine to coarse SAND, little fine Gravel, moist. Rec. = 1.8 ft (AASHTO M145 Classification: A-4.)				9-5-8-12 (13)	12.5	22.8	31.5	45.7	NP	NP
12.5		S5 (10' – 12'): Dense, gray SILT, some fine to coarse Sand, little fine to coarse Gravel, moist. Rec. = 1.8 ft (AASHTO M145 Classification: A-4.)				10-14-19-24 (33)	11.3	21.4	28.0	50.6	NP	NP
15.0		S6 (15' – 16.4'): Very dense, gray SILT, some (+) fine to coarse Sand, little fine to coarse Gravel, moist. Rec. = 1.2 ft. (AASHTO M145 Classification: A-4.)				13-19-31/5" (50/11")	9.7	22.6	27.8	49.6	NP	NP
17.5												

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Date Started: 6/02/15 Date Finished: 6/02/15
VTSPG mNAD83: N 671648.80 ft E 1478304.80 ft
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	Casing	Sampler
Type:	AUGER	SS
I.D.:	4.25 in	1.38 in
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Hammer/Rod Type:	Auto/NWJ	
Rig:	CME 330X ATV	CE = 1.35

Groundwater Observations (3)

Date	Depth (ft)	Notes
06/02/15		None observed.

Depth (ft)	Sketch (1)	CLASSIFICATION OF MATERIALS (Description)	Run (No Rec.)	Sample No. or Core Run, in (Rec. in)	Drill Rate (min/ft)	Blows/6" (N Value/ft)	Moisture Content %	Gravel %	Sand %	Fines %	LL %	PI %
20.0		S7 (20' – 20.8'): Refusal, gray SILT, some fine to coarse Sand, some fine Gravel, trace Clay & Silt, moist. Rec. = 0.8 ft (AASHTO M145 Classification: A-4.)				20-50/4" (50/4")	9.8	33.2	25.6	41.2	NP	NP
22.5		C1 (22.8'–27.8'): Fair quality, moderately hard to hard, fresh with slightly weathered joints, very close to moderate jointing, gray with infrequent white inclusions. DOLOSTONE. Moderate reaction to dilute HCl. Jointing near horizontal with occasional near vertical fractures.	1	S5 (38)	3.7							
25.0					2.3							
					1.8							
27.5					1.8							
30.0		Hole stopped @ 27.8 ft. Cored 5' into inferred bedrock.										
32.5												
35.0												
37.5												

Remarks:
1. Ground surface elevation, northing, easting, station, and offset shown are approximated from files made from existing features in the field by GeoDesign personnel, the Preliminary Plan Set prepared by VHB and dated 4/30/2015, and an electronic site plan titled "s0nb20rev.dgn" provided by VHB via email on June 29, 2015.
2. Visual soil descriptions are per the Burmister system. Laboratory gradations where applicable were performed by VTrans and are per AASHTO M145.
3. Auger shatter observed from 14' – 15' deep.
4. Inferred boulder at 18.5' deep. Originally assumed bedrock. Driller switched to 3" flush joint casing tunored through the augers and was able to advance casing past the obstruction. Remainder of borehole below 18.5' deep was advanced using wash rotary drilling methods.
5. During core run C1 advance, from 22.8' – 24.3' deep at low rotary head speed, 24.3' – 25.8' at medium speed, and from 25.8 to 27.8' at high speed.
6. Consistent milky gray return observed throughout coring.
7. Backfilled with cuttings and 1.5 gallons bentonite chips.
8. Hammer energy is assumed.

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

Rivesburg NES 021-1(19)
(GeoDesign #750-08.15)
Rivesburg, VT

Boring No.: B4
Page No.: 1 of 2
Pin No.: 04b204
Checked By: JFW

Boring Crew: C. Aldrich (Platform), A. Barlbault (GeoDesign)
Date Started: 5/26/15 Date Finished: 5/26/15
VTSPC NAD83: N 671742.00 ft E 1479153.00 ft
Station: 288+81 Offset: 41' RT
Ground Elevation: 374 ft

	Casing	Sampler
Type:	HSGR	SS
I.D.:	4.25 in	1.38 in
Hammer Wt:	N.A.	140 lb.
Hammer Fall:	N.A.	30 in.
Hammer/Rod Type:	Auto/NWJ	
Rig:	Geoprobe 7822DT	CE = 1.35

Groundwater Observations (3)

Date	Depth (ft)	Notes
05/26/15	11.8	Wet Sample.
05/26/15	11.5	In open hole.

Depth (ft)	Sheet(1)	CLASSIFICATION OF MATERIALS (Description)	Blows/6" or Pen/Rec (ft)	Moisture Content %	% Gravel	% Sand	% Fines	% LL	% PI
0.0		S1 (0' -2'): Very loose/very soft, brown to gray-brown mottled SILT grading to CLAY & SILT toward bottom, some fine Sand, trace Roots and Grass (Upper 6"), moist. (Reworked Clay Fill) Rec. = 1.3 ft (AASHTO M145 Classification: A-6.)	WOH-1-1 (2)	22.8	0.2	21.2	78.6	31	13
2.5		S2 (2' -4'): Very soft, brown with occasional gray mottling CLAY & SILT, little fine to coarse Sand, little fine Gravel, trace Root Fibers, moist. (Reworked Clay Fill) Rec. = 1.2 ft (AASHTO M145 Classification: A-6.)	WOH-WOH-WOH-2 (2)	23.8	15.1	12.7	72.2	34	16
5.0		S3 (4' -6'): Loose / Medium, brown with gray and orange mottling fine to coarse SAND, some Clay & Silt, little fine to coarse Gravel (lower 6"), trace Cotton Fabric, moist. (Reworked Clay Fill) Rec. = 1.2 ft (AASHTO M145 Classification: A-2-6.)	3-3-4-6 (7)	16.1	25.3	44.2	30.5	33	17
7.5		S4 (6' -8'): Medium dense, tan and gray fine to coarse SAND and SILT, some fine to coarse Gravel, moist (some areas very moist). Rec. = 1.8 ft (AASHTO M145 Classification: A-4.)	5-7-8-8 (15)	9.8	33.5	30.3	36.2	NP	NP
10.0		S5 (8' -10'): Medium dense, tan and gray fine to coarse SAND & SILT, little fine to coarse Gravel, moist. Rec. = 1.5 ft (AASHTO M145 Classification: A-4.)	4-6-9-13 (15)	11.1	27.3	33.9	38.8	NP	NP
12.5		S6 (10' -12'): Dense, tan and gray SILT and fine to coarse SAND, little fine to coarse Gravel, moist (bottom 2" wet). Rec. = 2.0 ft (AASHTO M145 Classification: A-4.)	9-10-16-14 (34)	9.8	24.3	28.1	47.6	NP	NP
15.0		S7 (15' -17'): Dense, gray fine to coarse SAND, some SILT, some fine to coarse Gravel, wet. Rec. = 1.5 ft (AASHTO M145 Classification: A-2-4.)	14-14-18-18 (32)	9.4	38.8	38.8	32.2	NP	NP
17.5		S8 (17' -18.8'): Refusal, gray fine to coarse SAND, some SILT, some fine to coarse Gravel, moist. Rec. = 0.8 ft (AASHTO M145 Classification: A-2-4.)	47-50/3" (50)	7.8	38.4	34.7	26.9	NP	NP

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.

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AGENCY OF TRANSPORTATION
CONSTRUCTION AND MATERIALS
BUREAU CENTRAL LABORATORY

BORING LOG

Rivesburg NES 021-1(19)
(GeoDesign #750-08.15)
Rivesburg, VT

Boring No.: B4
Page No.: 2 of 2
Pin No.: 04b204
Checked By: JFW

Boring Crew: C. Aldrich (Platform), A. Barlbault (GeoDesign)
Date Started: 5/26/15 Date Finished: 5/26/15
VTSPC NAD83: N 671742.00 ft E 1479153.00 ft
Station: 288+81 Offset: 41' RT
Ground Elevation: 374 ft

	Casing	Sampler
Type:	HSGR	SS
I.D.:	4.25 in	1.38 in
Hammer Wt:	N.A.	140 lb.
Hammer Fall:	N.A.	30 in.
Hammer/Rod Type:	Auto/NWJ	
Rig:	Geoprobe 7822DT	CE = 1.35

Groundwater Observations (3)

Date	Depth (ft)	Notes
05/26/15	11.8	Wet Sample.
05/26/15	11.5	In open hole.

Depth (ft)	Sheet(1)	CLASSIFICATION OF MATERIALS (Description)	Blows/6" or Pen/Rec (ft)	Moisture Content %	% Gravel	% Sand	% Fines	% LL	% PI
20.0		S9 (18' -25.5'): Refusal, gray fine to coarse SAND, some fine to coarse Gravel, some Silt, moist. Rec. = 1.3 ft (AASHTO M145 Classification: A-2-4.)	41-81-50/5" (50)	7.1	40.2	33.0	25.8	NP	NP
22.5		Hole stopped @ 25.5 ft Split spoon refusal.							
25.0									
27.5									
30.0									
32.5									
35.0									
37.5									

Remarks:
1. Ground surface elevation, northing, easting, station, and offset shown are approximated from ties made from existing features in the field by GeoDesign personnel, the Preliminary Plan Set prepared by VHB and dated 4/30/2015, and an electronic site plan titled "s04b204sc.dgn" provided by VHB via email on June 26, 2015.
2. Visual soil descriptions are per the Burmister system. Laboratory gradations where applicable were performed by VTrans and are per AASHTO M145.
3. Auger grinding at 5.5' deep. Inferred gravel between 5.5' - 7'. Occasional auger grinding noted thereafter.
4. More difficult drilling at approximately 11.5' deep per driller. Auger chatter noted at 17' deep.
5. End boring at 25.5' in greater than 50 blow/6" penetration soil material.
6. Hammer energy is assumed.

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.

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BORING LOG

Hinesburg NES 021-1(19)
(GeoDesign #750-08.18)
Hinesburg, VT

Boring No.: B5
Page No.: 1 of 2
File No.: 04b304
Checked By: JFW

Boring Crew: C. Aldrich (Platform), A. Berthoudt (GeoDesign)
Date Started: 5/27/15 Date Finished: 5/28/15
VTSPC NAD83: N 671700.80 ft E 1478978.80 ft
Station: 288+81 Offset: 44' LT
Ground Elevation: 372 ft

	Casing	Sampler
Type:	HSSER	SS
I.D.:	2.25 in	1.38 in
Hammer Wt:	N.A.	140 lb.
Hammer Fall:	N.A.	30 in.
Hammer/Rod Type:	Auto/NMJ	
Rig:	Geoprobe 7822DT	CE = 1.35

Groundwater Observations (3)

Date	Depth (ft)	Notes
05/28/15	12.0	In open hole.
05/28/15	10.0	Wet sample

Depth (ft)	Sheet(1)	CLASSIFICATION OF MATERIALS (Description)	Blows/6" or Pen/Rec (in) (Rec%)	Moisture Content %	Gravel %	Sand %	Fines %	LL %	PI %
0.0		S1 (0' – 2'): S1A – Top 12": Topsoil. S1B – Bottom 3": Loose, brown SILT, some fine to coarse Sand, trace fine Gravel, trace Clay & Silt, trace Root Fibers, moist. (General Fill) Rec. = 1.3 ft (AASHTO M145 Classification: A-4.)	2-1-1-4 (7)	20.9	12.0	28.1	59.9	NP	NP
2.5		S2 (2' – 4'): SHY, brown CLAY & SILT, little fine to medium Sand, trace Root Fiber, moist. (Reworked Clay Fill) Rec. = 1.8 ft (AASHTO M145 Classification: A-6.)	3-4-5-6 (9)	24.9	0.5	14.5	85.0	38	19
5.0		S3 (4' – 6'): Medium, gray-brown CLAY & SILT, trace fine to medium Sand, moist. (Reworked Clay Fill) Rec. = 1.9 ft (AASHTO M145 Classification: A-6.)	2-2-3-4 (5)	30.4		9.5	90.5	32	14
		S4 (6' – 8'): Soft, gray-brown CLAY & SILT, trace fine to medium Sand, trace Root Fiber, moist. (Reworked Clay Fill) Rec. = 1.8 ft (AASHTO M145 Classification: A-6.)	1-1-2-2 (3)	35.4	0.1	2.3	97.6	33	13
7.5									
		S5 (8' – 10'): Soft, brown with gray mottling CLAY & SILT, trace (-) fine to medium Sand, trace Root Fibers, wet. (Possible Subsoil) (Texture = 0.22 – 0.25 tsf). Rec. = 2.0 ft (AASHTO M145 Classification: A-6.)	WOH-1-1-1 (2)	41.2	0.1	1.0	98.9	38	19
10.0		S6 (10' – 12'): Very soft, gray Silty CLAY, trace (-) fine to medium Sand, possible layering, wet. Rec. = 2.0 ft (AASHTO M145 Classification: A-6.)	WOH-WOH-WOH-WOH (0)	44.7		0.8	99.2	40	21
12.5									
		Inferred Sandy Clay & Silt (Inferred from transition encountered in B5-S1)							
15.0		S7 (15' – 17'): Medium dense, gray SILT and fine to coarse SAND, some fine to coarse Gravel, wet. Rec. = 0.8 ft (AASHTO M145 Classification: A-4.)	6-4-6-3 (10)	19.5	30.3	30.7	39.0	NP	NP
17.5									

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.

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AGENCY OF TRANSPORTATION
CONSTRUCTION AND MATERIALS
BUREAU CENTRAL LABORATORY

BORING LOG

Hinesburg NES 021-1(19)
(GeoDesign #750-08.18)
Hinesburg, VT

Boring No.: B5
Page No.: 2 of 2
File No.: 04b304
Checked By: JFW

Boring Crew: C. Aldrich (Platform), A. Berthoudt (GeoDesign)
Date Started: 5/27/15 Date Finished: 5/28/15
VTSPC NAD83: N 671700.80 ft E 1478978.80 ft
Station: 288+81 Offset: 44' LT
Ground Elevation: 372 ft

	Casing	Sampler
Type:	HSSER	SS
I.D.:	2.25 in	1.38 in
Hammer Wt:	N.A.	140 lb.
Hammer Fall:	N.A.	30 in.
Hammer/Rod Type:	Auto/NMJ	
Rig:	Geoprobe 7822DT	CE = 1.35

Groundwater Observations (3)

Date	Depth (ft)	Notes
05/28/15	12.0	In open hole.
05/28/15	10.0	Wet sample

Depth (ft)	Sheet(1)	CLASSIFICATION OF MATERIALS (Description)	Blows/6" or Pen/Rec (in) (Rec%)	Moisture Content %	Gravel %	Sand %	Fines %	LL %	PI %
20.0		S8 (20' – 21.6'): Subsoil, gray fine to coarse SAND, some Silt, little fine to coarse Gravel, moist. Rec. = 1.3 ft (AASHTO M145 Classification: A-2-4.)	30-50-50/3" (80)	11.9	25.3	46.2	28.5	NP	NP
22.5									
25.0		S9 (25' – 25.4'): Subsoil, gray SILT and fine to coarse SAND, trace fine Gravel, wet. Rec. = 0.4 ft (AASHTO M145 Classification: A-4.)	50/4.5" (11)	13.2	12.9	38.2	48.9	NP	NP
		Hole stopped @ 25.4 ft Split spoon refusal.							
27.5									
30.0									
32.5									
35.0									
37.5									

Remarks:
1. Ground surface elevation, northing, easting, station, and offset shown are approximated from files made from existing features in the field by GeoDesign personnel, the Preliminary Plan Set prepared by VHB and dated 4/30/2015, and an electronic site plan titled "s04b304en.dgn" provided by VHB via email on June 26, 2015.
2. Visual soil descriptions are per the Burmister system. Laboratory gradations where applicable were performed by VTrans and are per AASHTO M145.
3. Sample S1 from 0' – 2' was performed with approximately 4" of soil already in spoon left over from a previous borehole.
4. Borehole temporarily stopped after sampling S4 at 8' deep due to a thunder storm on May 27, 2015. Resumed on May 28.
5. SPT N-values by be artificially high for sample S7 at 15' deep due to drill string being out of vertical alignment. Able to straighten augers for samples below 15' deep.
6. Increased auger resistance noted during auger advance below 15' deep.
7. Hole remained open to 13.5' deep after removing augers with standing water at 12' deep.
8. Backfilled with cuttings and bentonite chips (1.5 bags).
9. Hammer energy is assumed.

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.

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CONSTRUCTION AND MATERIALS
BUREAU CENTRAL LABORATORY

BORING LOG

Hinesburg HES 021-1(19)
(GeoDesign #750-09.18)
Hinesburg, VT

Boring No.: B5-ST
Page No.: 1 of 1
Pin No.: 04b204
Checked By: JFW

Boring Crew: C. Aldrich (Platform), A. Baribault (GeoDesign)
Date Started: 5/28/15 Date Finished: 5/29/15
VTSPG NAD83: N 671701.00 ft E 1479080.00 ft
Station: 288+81 Offset: 42' LT
Ground Elevation: 372 ft

	Casing	Sampler
Type:	FJ	TUBE
I.D.:	4 in	2.87 in
Hammer Wt:	N.A.	N.A.
Hammer Fall:	N.A.	N.A.
Hammer/Rod Type:	N.A./N.A.	
Rig:	Geoprobe 7822DT	CE = NA

Groundwater Observations (3)

Date	Depth (ft)	Notes
05/28/15	12.0	Inferred from B5.

Depth (ft)	Strata(1)	CLASSIFICATION OF MATERIALS (Description)	Blows/6" (N Value)(2)	Moisture Content %	Gravel %	Sand %	Fines %
2.5		Fill (Inferred from B5)					
5.0							
7.5							
10.0		Silty Clay (Inferred from B5)					
		ST-1 (10'-12'): Grey CLAY & SILT, little fine Gravel, trace fine to coarse Sand, moist. (See Remark 5). Rec. = 2.0 ft					
12.5		Hole stopped @ 12.0 ft No refusal.					
15.0							
17.5							

Remarks:
1. Ground surface elevation, northing, easting, station, and offset shown are approximated from ties made from existing features in the field by GeoDesign personnel, the Preliminary Plan Set prepared by VHB and dated 4/30/2015, and an electronic site plan titled "z04b204sv.dgn" provided by VHB via email on June 26, 2015.
2. B5-ST Located 2' East of B5.
3. Advanced 4" casing to 10' with pneumatic direct push hammer. Cleaned out casing with a hand auger and bucket (was not cleaned using wash rotary methods).
4. Backfilled with cuttings and 1.5 bags bentonite chips.
5. ST-1 soil description based on discussion with GeoTesting Express personnel upon extruding the bottom portion of the tube.

Notes:
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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 750-09.18 HINESBURG.GPJ VERMONT AOT.GDT 7/31/15

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CONSTRUCTION AND MATERIALS BUREAU CENTRAL LABORATORY

BORING LOG

Rosenburg NHS 004-1(10) (GeoDesign #730-03.10) Rosenburg, VT

Boring No.:	B3
Page No.:	1 of 3
File No.:	[illegible]
Checked By:	JJW

Boring Crew:	C. Aldrich (Platform), A. Barthault (GeoDesign)
Date Started:	5/20/15
Date Finished:	5/20/15
VTSPG NAD83:	N 671812.00 ft E 1475870.00 ft
Station:	200+70
Offset:	11' RT
Ground Elevation:	375 ft

	Casing	Sampler
Type:	HW/NQ	SS
I.D.:	2.25 in	1.38 in
Hammer Wt:	N/A	140 lb.
Hammer Fall:	N/A	N/A
Hammer/Rod Type:	Auto/AWJ	
Rig:	Geoprobe 7822DT	CE = 1.35

Groundwater Observations (3)		
Date	Depth (ft)	Notes
05/20/15	12.0	Wet Sample

Classification of Materials (Description)	Core Rec % (Run)	RQD %	Blows/6" (N Value)	Moisture Content %	Gravel %	Sand %	Fines %	LL %	PI %
Asphalt									
S1 (0.5' - 2.5'): Dense, black (upper 4") and brown fine to coarse Sand, some fine Gravel, some degraded Asphalt (upper 4"), little Silt, dry. (General Fill) Rec. = 1.3 ft (AASHTO M145 Classification: A-1-b.)			10-18-15-12 (33)	3.3	43.3	44.4	12.3	NP	NP
S2 (5' - 7'): Silt - (Upper 18"): medium dense, brown fine to coarse GRAVEL, some fine to coarse Sand, some Silt, trace Silt & Clay, moist. (General Fill) Rec. = 1.3 ft (AASHTO M145 Classification: A-1-b.)			4-8-6-3 (14)	8.9	38.1	27.0	22.0	NP	NP
S2B (lower 6") - Silt, brown SILT & CLAY, some fine to medium Sand, trace Roots/Wood, moist. S2B: Torvane = 0.20 - 0.24 tsf. (AASHTO M145 Classification: A-4.)				25.5	1.0	20.9	78.1	26	8
S3 (10' - 12'): Medium, brown with gray mottling SILT & CLAY, some fine to medium Sand, trace fine to coarse Gravel (lower 3"), trace Roots/Shale, very moist (wet lower 3"). Torvane = 0.28 - 0.42 tsf. Rec. = 1.3 ft (AASHTO M145 Classification: A-4.)			1-2-4-6 (6)	19.9	1.0	25.7	73.3	23	6
S4 (12' - 14'): Soft, SILT & CLAY and fine to coarse SAND, some fine Gravel, wet. (AASHTO M145 Classification: A-4). Rec. = 0.1 ft			1-2-1-2 (3)	22.2	31.7	29.6	38.7		
S5 (15' - 17'): Very soft, gray CLAY & SILT, (occasional possible layers SILT, some fine Sand, trace (-) fine to coarse Sand, wet. Torvane (soft areas) = 1.8 - 2.2 tsf; Torvane (medium areas) = 0.25 - 0.28 tsf. Rec. = 1.7 ft (AASHTO M145 Classification: A-6.)			WOH-WOH-1-2 (1)	30.8	0.4	2.9	96.7	40	18
S6 (17' - 18.5'): Very dense, gray SILT and fine to coarse SAND, little fine to coarse Gravel, moist. Rec. = 1.5 ft (AASHTO M145 Classification: A-4.)			14-18-35-50/0.5 (53)		16.4	31.7	51.9	NP	NP
C1 (18.5' - 21.5'): SILT and fine to coarse SAND, little fine to coarse Gravel.	17 ([illegible])	2							
S7 (30' - 31.7'): Very dense, gray SILT and fine to coarse SAND, little fine Gravel (some pulverized), moist. Rec. = 1.4 ft (AASHTO M145 Classification: A-4.)			39-33-43-50/0.5 (76)	9.2	21.0	30.6	48.4	NP	NP
S8 (35' - 36.5'): Very dense, gray SILT, some fine to coarse Sand, little fine to coarse Gravel (some fractured), moist. Rec. = 1.5 ft (AASHTO M145 Classification: A-4.)			35-39-50/0.5 ([illegible])	10.7	21.8	25.4	52.8	18	3

Hole stopped @ 36.5 ft
No refusal.

Remarks:
1. Ground surface elevation, northing, easting, station, and offset shown are approximated from ties made from existing features in the field by GeoDesign personnel, the Preliminary Plan Set prepared by VHB and dated 4/30/2015, and an electronic site plan titled "[illegible].dgn" provided by VHB via email on June 26, 2015.
2. Visual soil descriptions are per the Burmister system. Laboratory gradations where applicable were performed by VTrans and are per AASHTO M145.
3. Grinding on inferred cobbles/gravel within fill soils from approximately 2' to 7' deep.
4. The last blow of sample S2 penetrated approximately 4" past the intended sample depth.
5. HSA refusal at 18.5' deep in dense glacial till soils. Initially believed to be bedrock, so augers were removed and replaced with 3" flush joint casing to prepare for rock coring.
6. Wash water return light brown from ~18' to 18.5' deep. Switched to core barrel and attempted C1 from 18.5' to 21.5' deep through dense glacial till soils.
7. Casing driven to 18.5' deep and advanced open hole with AWJ rods and a carbide roller bit below this depth. All samples continued to be taken with an AWJ rod string.
8. Wash water return gray below 25' deep with water loss between 20' and 25' deep.
9. Driller accidentally passed the 25' depth without sampling. Similar drilling effort, with occasional grinding on inferred gravel/cobbles was noted.
10. No return water was observed below 30' deep.
11. Borehole backfilled with cuttings and 3 bags of bentonite chips.
12. Hammer energy is assumed.

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.

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BORING CENTRAL LABORATORY

BORING LOG

[illegible] NHS [illegible]
([illegible])
[illegible], VT

Boring No.:	B7
Page No.:	1 of 3
Pin No.:	[illegible]
Checked By:	JHW

Boring Crew:	C. [illegible] ([illegible]), [illegible] ([illegible])
Date Started:	5/27/15
Date Finished:	5/27/15
VTSPG NAD83:	N [illegible] ft E [illegible] ft
Station:	[illegible]
Offset:	[illegible] LT
Ground Elevation:	[illegible] ft

	Casing	Sampler
Type:	[illegible]	SS
I.D.:	2.25 in	1.38 in
Hammer Wt:	N.A.	140 lb.
Hammer Fall:	N.A.	30 in.
Hammer/Rod Type:	Auto/[illegible]	
Rig:	[illegible]	CE = 1.35

Groundwater Observations (3)

Date	Depth (ft)	Notes
05/27/15	15.0	Wet Sample.
05/27/15	7.0	In augers.

Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)	Blows/6" (N Value)	Moisture Content %	Gravel %	Sand %	Fines %	LL %	PI %
		S1 (0' - 2'): Top 2" Topsoil. Bottom 22" - Very soft, brown CLAY & SILT, little fine to medium Sand, little Grass fibers, moist, (Reworked Clay fill) Rec. = 1.1 ft (AASHTO M145 Classification: A-4)	WOH-WOH-1-1 (1)	28.8	0.4	11.1	88.5	31	10
2.5		S2 (2' - 4'): Soft, brown CLAY & SILT, trace fine to medium Sand, moist, Rec. = 2.0 ft (AASHTO M145 Classification: A-7-6)	1-1-2-2 (3)	37.1	0.1	2.1	97.8	41	19
5.0		S3 (4' - 6'): Soft, brown Silty CLAY, trace (-) fine Sand, trace Organics, moist, Rec. = 2.0 ft (AASHTO M145 Classification: A-7-6)	WOH-1-1-2 (2)	39.7		1.2	98.8	50	33
7.5		S4 (6' - 8'): Very soft, brown Silty CLAY, trace (-) fine Sand, moist, Rec. = 2.0 ft (AASHTO M145 Classification: A-7-6)	WOH-1/12"-1 (1)	47.1		0.8	99.2	58	31
		S5 (8' - 10'): Very soft, brown Silty CLAY, trace fine (-) Sand, moist, Rec. = 2.0 ft (AASHTO M145 Classification: A-7-6)	WOH-WOH-WOH-WOH (0)	46.1		1.8	98.2	48	25
10.0		S6 (10' - 12'): Very soft, gray CLAY & SILT, occasional Silt seams, trace (-) fine Sand, moist, (Torvane: 0.10 - 0.15 tsf) Rec. = 2.0 ft (AASHTO M145 Classification: A-6)	WOH-WOH-WOH-WOH (0)	47.2		0.4	99.6	38	17
12.5									
15.0		S7 (15' - 17'): Very soft, gray Clayey SILT and fine to coarse SAND, little fine Gravel, wet, Rec. = 2.0 ft (AASHTO M145 Classification: A-4)	WOH-WOH-WOH-2 (0)	12.1	20.5	30.7	48.8	16	2
17.5									

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.

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BORING CENTRAL LABORATORY

BORING LOG

[illegible] NHS [illegible]
([illegible])
[illegible], VT

Boring No.:	B7
Page No.:	2 of 3
Pin No.:	[illegible]
Checked By:	JHW

Boring Crew:	C. [illegible] ([illegible]), [illegible] ([illegible])
Date Started:	5/27/15
Date Finished:	5/27/15
VTSPG NAD83:	N [illegible] ft E [illegible] ft
Station:	[illegible]
Offset:	[illegible] LT
Ground Elevation:	[illegible] ft

	Casing	Sampler
Type:	[illegible]	SS
I.D.:	2.25 in	1.38 in
Hammer Wt:	N.A.	140 lb.
Hammer Fall:	N.A.	30 in.
Hammer/Rod Type:	Auto/[illegible]	
Rig:	[illegible]	CE = 1.35

Groundwater Observations (3)

Date	Depth (ft)	Notes
05/27/15	15.0	Wet Sample.
05/27/15	7.0	In augers.

Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)	Blows/6" (N Value)	Moisture Content %	Gravel %	Sand %	Fines %	LL %	PI %
		S8 (20' - 21.5'): Refusal, gray SILT and fine to coarse SAND, little fine to coarse Gravel, moist, Rec. = 1.0 ft (AASHTO M145 Classification: A-4)	17-[illegible]-76 (R)	7.3	24.9	31.9	43.2	NP	NP
22.5									
25.0		S9 (25' - 25.5'): Refusal, gray SILT and fine to coarse SAND, little fine to coarse Gravel, moist, Rec. = 0.5 ft (AASHTO M145 Classification: A-4)	[illegible] (R)	9.0	21.0	28.4	50.6	NP	NP
27.5									
30.0		S10 (30' - 30.5'): Refusal, gray SILT and fine to coarse SAND, trace fine Gravel, moist, Rec. = 0.5 ft (AASHTO M145 Classification: A-4)	29-[illegible] (R)	8.1	15.4	31.9	52.7	NP	NP
32.5									
35.0		S11 (35' - 35.5'): Refusal, gray SILT, some fine to coarse SAND, little fine to coarse Gravel, wet, Rec. = 1.3 ft (AASHTO M145 Classification: A-4)	38-[illegible] (R)	9.6	23.1	25.1	51.8	NP	NP
37.5		Hole stopped @ 35.5 ft. Split spoon refusal.							

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.

VTrans — Working to Get You There — Vermont Agency of Transportation

STATE OF VERMONT
AGENCY OF TRANSPORTATION
CONSTRUCTION AND MATERIALS
BORING CENTRAL LABORATORY

BORING LOG

[illegible] NHS [illegible]
([illegible])
[illegible], VT

Boring No.:	B7
Page No.:	3 of 3
Pin No.:	[illegible]
Checked By:	JHW

Boring Crew:	C. [illegible] ([illegible]), [illegible] ([illegible])
Date Started:	5/27/15
Date Finished:	5/27/15
VTSPG NAD83:	N [illegible] ft E [illegible] ft
Station:	[illegible]
Offset:	[illegible] LT
Ground Elevation:	[illegible] ft

	Casing	Sampler
Type:	[illegible]	SS
I.D.:	2.25 in	1.38 in
Hammer Wt:	N.A.	140 lb.
Hammer Fall:	N.A.	30 in.
Hammer/Rod Type:	Auto/[illegible]	
Rig:	[illegible]	CE = 1.35

Groundwater Observations (3)

Date	Depth (ft)	Notes
05/27/15	15.0	Wet Sample.
05/27/15	7.0	In augers.

Depth (ft): 42.5, 45.0, 47.5, 50.0, 52.5, 55.0, 57.5

CLASSIFICATION OF MATERIALS (Description)

Remarks:
1. Ground surface elevation, northing, easting, station, and offset shown are approximated from ties made from existing features in the field by [illegible] personnel, the Preliminary Plan Set prepared by [illegible] and dated 4/30/2015, and an electronic site plan titled "[illegible]" provided by [illegible] via email on June 26, 2015.
2. Visual soil descriptions are per the Burmister system. Laboratory gradations where applicable were performed by VTrans and are per AASHTO M145.
3. Soft/very soft soils unable to get readings with Pocket Penetrometer.
4. Auger grinding at 17.5' deep at the inferred transition to glacial till soils.
5. Auger grinding from 20' - 22' deep with heavier grinding noted at 31' deep.
6. Backfilled with a mixture of bentonite chips and cuttings from hole. Approximately 1.5 bags of chips used.
7. Hammer energy is assumed.

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.

STATE OF VERMONT
AGENCY OF TRANSPORTATION
CONSTRUCTION AND MATERIALS
BUREAU CENTRAL LABORATORY

BORING LOG

Hinesburg HES 021-1(19)
(GeoDesign #750-09.18)
Hinesburg, VT

Boring No.: B7-ST
Page No.: 1 of 1
Pin No.: 04b204
Checked By: JFW

Boring Crew: C. Aldrich (Platform), M. Hagedorn (GeoDesign)
Date Started: 5/27/15 Date Finished: 5/27/15
VTSPG NAD83: N 671777.00 ft E 1479011.00 ft
Station: 289+82 Offset: 64' LT
Ground Elevation: 367 ft

	Casing	Sampler
Type:	FJ	TUBE
I.D.:	4 in	2.87 in
Hammer Wt:	N.A.	N.A.
Hammer Fall:	N.A.	N.A.
Hammer/Rod Type:	N.A./N.A.	
Rig:	Geoprobe 7822DT	CE = NA

Groundwater Observations (3)

Date	Depth (ft)	Notes
05/27/15	7.0	Inferred from B7.

Depth (ft)	Strata(1)	CLASSIFICATION OF MATERIALS (Description)	Blows/6" (N Value)(2)	Moisture Content %	Gravel %	Sand %	Fines %
		Reworked Clay Fill (Inferred from B7)					
2.5		Silty Clay (Inferred from B7).					
5.0							
7.5		ST-1 (8'-10'): Grey Silty CLAY, moist. (Torvane performed at 10': 0.24 tsf) Rec. = 2.0 ft					
10.0		Hole stopped @ 10.0 ft No refusal.					
12.5							
15.0							
17.5							

Remarks:
1. Ground surface elevation, northing, easting, station, and offset shown are approximated from ties made from existing features in the field by GeoDesign personnel, the Preliminary Plan Set prepared by VHB and dated 4/30/2015, and an electronic site plan titled "z04b204sv.dgn" provided by VHB via email on June 26, 2015.
2. Exploration performed to obtain a Shelby Tube adjacent to Borehole B7 in the soft clay layer observed between 8' - 12' deep.
3. Borehole located 5' South-Southeast of B7.
4. Pushed casing to 3' deep. Casing advanced below 3' deep using a pneumatic direct push hammer.
5. Backfilled with a mixture of bentonite chips and cuttings from hole. Approximately 1.0 bag of chips used.

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 750-09.18 HINESBURG.GPJ VERMONT AOT.GDT 7/31/15

STATE OF VERMONT
AGENCY OF TRANSPORTATION
CONSTRUCTION AND MATERIALS
BUREAU CENTRAL LABORATORY

BORING LOG

Hinesburg NCS 021-1(19)
(GeoDesign #750-08.18)
Hinesburg, VT

Boring No.: 08
Page No.: 1 of 2
Pin No.: 04b284
Checked By: JFW

Boring Crew: C. Aldrich (Platform), A. Barthault (GeoDesign)
Date Started: 5/28/15 Date Finished: 5/28/15
VTSPG NAD83: N 671863.00 ft E 1478923.00 ft
Station: 280+50 Offset: 10' LT
Ground Elevation: 377 ft

	Casing	Sampler
Type:	AUGER	SS
I.D.:	2.25 in	1.38 in
Hammer Wt:	N.A.	140 lb.
Hammer Fall:	N.A.	30 in.
Hammer/Rod Type:	Auto/NWJ	
Rig:	Geoprobe 7822DT	CE = 1.35

Groundwater Observations (S)

Date	Depth (ft)	Notes
05/28/15	13.0	Wet sample.

Depth (ft)	Sheet(s)	CLASSIFICATION OF MATERIALS (Description)	Blows/6" (N Value/60)	Moisture Content %	Gravel %	Sand %	Fines %	LL %	PI %
		Asphalt							
		S1 (0.7' – 2.7'): Medium dense, brown fine to coarse SAND, some fine to coarse Gravel, little Asphalt Fragments (upper 4"), trace Silt, dry. (General Fill) Roc. = 1.8 ft (AASHTO M145 Classification: A-1-b.)	17-19-17-11 (29)	13.5	47.4	43.0	9.6	NP	NP
2.5									
5.0		S2 (5' – 7'): Medium dense, brown and gray fine to coarse GRAVEL (possible limestone, angular), some fine to coarse Sand, little Clayey Silt in upper 3", moist. (General Fill) (AASHTO M145 Classification: A-1-b). Roc. = 0.7 ft	9-10-9-6 (34)	7.4	62.8	22.1	15.9		
		S3 (7' – 9'): Medium, brown Clayey SILT, some fine to medium Sand, trace fine Gravel, trace Roots/Wood, top portion wet. Torvane = 0.32 – 0.45 tsf. Roc. = 1.8 ft (AASHTO M145 Classification: A-4.)	1-2-2-2 (4)	23.8	3.7	31.5	64.8	21	3
7.5									
10.0		S4 (10' – 12'): Soft, gray with brown mottling Clayey SILT, little fine to medium Sand, trace (-) fine Gravel, trace Roots/Wood (decayed pieces, very faint odor), moist. Torvane = 5.0 –0.5 tsf bottom half; Torvane = 0.33 – 0.38 tsf top half. Roc. = 2.0 ft (AASHTO M145 Classification: A-4.)	WOH-1-2-3 (5)	25.8	0.9	16.4	82.7	21	2
12.5		S5 (12' – 14'): Medium dense gray SILT, some fine to coarse Sand, little fine to coarse Gravel (lower 4"), trace Clay & Silt, wet (lower 4"). Roc. = 1.3 ft (AASHTO M145 Classification: A-4.)	2-4-6-4 (10)	19.1	17.1	25.5	57.4	NP	NP
15.0		S6 (15' – 17'): Dense, gray SILT, some fine to coarse Sand, some fine to coarse Gravel, trace Clay & Silt, moist to wet. Roc. = 1.1 ft (AASHTO M145 Classification: A-4.)	13-21-17-18 (38)	11.5	27.8	25.5	46.9	NP	NP
17.5		S7 (17' – 19'): Dense, gray Clayey SILT, some fine to coarse Sand, little fine to coarse Gravel, moist. Roc. = 1.3 ft (AASHTO M145 Classification: A-4.)	10-16-18-20 (34)	9.3	16.3	24.8	38.9	17	3

Notes:
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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.

STATE OF VERMONT
AGENCY OF TRANSPORTATION
CONSTRUCTION AND MATERIALS
BUREAU CENTRAL LABORATORY

BORING LOG

Hinesburg NCS 021-1(19)
(GeoDesign #750-08.18)
Hinesburg, VT

Boring No.: 08
Page No.: 2 of 2
Pin No.: 04b284
Checked By: JFW

Boring Crew: C. Aldrich (Platform), A. Barthault (GeoDesign)
Date Started: 5/28/15 Date Finished: 5/28/15
VTSPG NAD83: N 671863.00 ft E 1478923.00 ft
Station: 280+50 Offset: 10' LT
Ground Elevation: 377 ft

	Casing	Sampler
Type:	AUGER	SS
I.D.:	2.25 in	1.38 in
Hammer Wt:	N.A.	140 lb.
Hammer Fall:	N.A.	30 in.
Hammer/Rod Type:	Auto/NWJ	
Rig:	Geoprobe 7822DT	CE = 1.35

Groundwater Observations (S)

Date	Depth (ft)	Notes
05/28/15	13.0	Wet sample.

Depth (ft)	Sheet(s)	CLASSIFICATION OF MATERIALS (Description)	Blows/6" (N Value/60)	Moisture Content %	Gravel %	Sand %	Fines %	LL %	PI %
22.5		S8 (20' – 22'): Very dense, gray SILT, some fine to coarse Sand, some fine to coarse Gravel, trace Silt & Clay, moist. Roc. = 2.0 ft (AASHTO M145 Classification: A-4.)	21-28-44-28 (72)	8.7	28.5	24.3	47.2	NP	NP
25.0		S9 (24' – 26'): Very dense, gray SILT, some fine to coarse Sand, some fine to coarse Gravel, moist. Roc. = 2.0 ft (AASHTO M145 Classification: A-4.)	18-28-33-27 (61)	10.8	28.1	21.8	52.1	17	2
		Hole stopped @ 26.0 ft No refusal.							
27.5									
30.0									
32.5									
35.0									
37.5									

Remarks:
1. Ground surface elevation, northing, easting, station, and offset shown are approximated from files made from existing features in the field by GeoDesign personnel, the Preliminary Plan Set prepared by VHB and dated 4/30/2015, and an electronic site plan titled "s04b284ex.dgn" provided by VHB via email on June 26, 2015.
2. Visual soil descriptions are per the Burmister system. Laboratory gradations where applicable were performed by VTrans and are per AASHTO M145.
3. Auger grinding on inferred cobbles/gravel from approximately 4' – 6' deep. Augers slightly out of alignment while sampling S3, but were able to be brought back to vertical prior to sampling S4.
4. Increased drilling resistance beginning at 15' deep at the inferred transition to glacial till soils.
5. Water/wet cuttings observed during auger advance between 20' and 24' deep.
6. Borehole backfilled with cuttings and 1.5 bags of bentonite chips, 0.75 bags asphalt patch.
7. Hammer energy is assumed.

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.