

	STATE OF VERMONT AGENCY OF TRANSPORTATION MATERIALS & RESEARCH SECTION SUBSURFACE INFORMATION	BORING LOG		Boring No.: B-1	
		Bridge No. 93 over CAP Railroad Castleton BR# 015-2(10) (GeoDesign #750-08.14)		Page No.: 1 of 3 Pin No.: 12b)3B Checked By: SPK	
Boring Crew: J. Leanhart (TransTech), J. Gilman (GeoDesign) Date Started: 10/18/13 Date Finished: 10/22/13 VTSPP MADS: N 403295.98 ft E 1452512.75 ft Station: 18+86 Offset: 8.40 Ground Elevation: 410.9 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/WNJ Rig: CME S50X ATV CE = -1.5		Groundwater Observations (3) Date Depth (ft) Notes 10/21/13 27.8 in casing (2 days)	

Depth (ft)	Strat(1)	CLASSIFICATION OF MATERIALS (Description)	Moisture Content % (M ₁₀₀)	Moisture Content %	Gravel %	Sand %	Fine %	LL %	PL %	UC
0-5		Existing Bridge Deck (Approx.) Air Space Between Bridge Deck and Ground Surface (See Remark 5).								
5-15		S1 (15' to 17'): Very loose, brown fine to coarse SAND, some SILT, little fine gravel, trace Roof Fibers, wet. Rec. = 1.0 ft (AASHTO M145 Classification: A-2-4).	14.8	26.0	43.2	30.8	NP	NP		
15-20		S2 (17' to 18'): Loose, brown fine to coarse SAND, some SILT, little fine gravel, wet. Rec. = 0.5 ft (AASHTO M145 Classification: A-2-4).	14.8	26.9	41.3	31.8	NP	NP		
20-25		S3 (19' to 21'): Medium dense, brown fine to coarse SAND, some SILT, little fine to coarse gravel, wet. Rec. = 0.7 ft (AASHTO M145 Classification: A-2-4).	14.0	33.0	39.3	27.7	NP	NP		
25-30		S4 (21' to 23'): Very loose, brown fine to coarse SAND, some SILT, some fine gravel, wet. Rec. = 0.4 ft (AASHTO M145 Classification: A-1-b).	13.1	33.8	41.9	24.5	NP	NP		
30-35		S5 (23' to 25'): Soft, tan with gray seams, SILT & CLAY, trace fine to coarse sand, trace fine gravel, wet. Rec. = 0.9 ft (AASHTO M145 Classification: A-4).	11.1	37.7	0.8	2.8	98.6	32	8	
35-40		S6 (29' to 31'): Medium dense, gray fine to coarse SAND and SILT & CLAY, little fine to coarse gravel, wet. Rec. = 1.2 ft (AASHTO M145 Classification: A-4).	11.4	29.9	31.8	38.5	22	5		
40-45		S7 (34' to 36'): Medium dense, gray fine to coarse SAND and Clayey SILT, trace fine gravel, wet. Rec. = 1.2 ft	11.8							
45-50		S8 (39' to 41'): Medium dense, no recovery. Rec. = 0.0 ft	11.3							
50-55		S9 (44' to 48'): Medium dense, gray SILT & CLAY and fine to coarse SAND, little fine to coarse gravel, wet. Rec. = 1.2 ft (AASHTO M145 Classification: A-4).	11.2	29.6	28.1	44.3	25	6		
55-60		S10 (49' to 51'): Medium dense, gray SILT & CLAY and fine to coarse SAND,	11.4							

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 test 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		Boring No.: B-1	
		Bridge No. 93 over CAP Railroad Castleton BR# 015-2(10) (GeoDesign #750-08.14)		Page No.: 2 of 3 Pin No.: 12b)3B Checked By: SPK	
Boring Crew: J. Leanhart (TransTech), J. Gilman (GeoDesign) Date Started: 10/18/13 Date Finished: 10/22/13 VTSPP MADS: N 403295.98 ft E 1452512.75 ft Station: 18+86 Offset: 8.40 Ground Elevation: 410.9 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/WNJ Rig: CME S50X ATV CE = -1.5		Groundwater Observations (3) Date Depth (ft) Notes 10/21/13 27.8 in casing (2 days)	

Depth (ft)	Strat(1)	CLASSIFICATION OF MATERIALS (Description)	Moisture Content % (M ₁₀₀)	Moisture Content %	Gravel %	Sand %	Fine %	LL %	PL %	UC
55-60		S11 (54' to 56'): Dense, gray SILT & CLAY and fine to coarse SAND, little fine to coarse gravel, wet. Rec. = 0.7 ft	13.0							
60-65		S12 (59' to 61'): Dense, gray SILT & CLAY and fine to coarse SAND, little fine to coarse gravel, wet. Rec. = 0.9 ft (AASHTO M145 Classification: A-4).	11.3	28.1	26.1	45.8	25	6		
65-70		S13 (64' to 66'): Dense, gray SILT & CLAY and fine to coarse SAND, little fine to coarse gravel, wet. Rec. = 1.2 ft	11.5							
70-75		S14 (74' to 76'): Dense, gray Clayey SILT, some fine to coarse sand, little fine gravel, wet. Rec. = 1.5 ft (AASHTO M145 Classification: A-4).	13.2	23.7	22.8	53.5	24	4		
75-80		S15 (84' to 86'): Dense, gray Clayey SILT, some fine to coarse sand, little fine gravel, wet. Rec. = 1.0 ft	10.9							
80-85		S16 (84' to 86'): Dense, gray SILT & CLAY, some fine to coarse sand, trace fine gravel, wet. Rec. = 1.5 ft (AASHTO M145 Classification: A-4).	15.1	17.7	23.7	58.6	26	6		

Notes: 1. Stratification lines represent approximate boundary between material types. Transition may be gradual.
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 3. Water test 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		Boring No.: B-1	
		Bridge No. 93 over CAP Railroad Castleton BR# 015-2(10) (GeoDesign #750-08.14)		Page No.: 3 of 3 Pin No.: 12b)3B Checked By: SPK	
Boring Crew: J. Leanhart (TransTech), J. Gilman (GeoDesign) Date Started: 10/18/13 Date Finished: 10/22/13 VTSPP MADS: N 403295.98 ft E 1452512.75 ft Station: 18+86 Offset: 8.40 Ground Elevation: 410.9 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/WNJ Rig: CME S50X ATV CE = -1.5		Groundwater Observations (3) Date Depth (ft) Notes 10/21/13 27.8 in casing (2 days)	

Depth (ft)	Strat(1)	CLASSIFICATION OF MATERIALS (Description)	Moisture Content % (M ₁₀₀)	Moisture Content %	Gravel %	Sand %	Fine %	LL %	PL %	UC
100-105		S17 (104' to 106'): Refusal, gray SILT & CLAY and fine to coarse SAND, little fine gravel, wet. Rec. = 0.9 ft	15.8							
110-115		S18 (114' to 116'): Refusal, gray SILT & CLAY and fine to coarse SAND, little fine gravel, wet. Rec. = 0.9 ft (AASHTO M145 Classification: A-4).	10.0	30.2	26.5	43.3	24	6		
120-125		S19 (120' to 122'): Very dense, gray SILT & CLAY and fine to coarse SAND, little fine gravel, wet. Rec. = 1.0 ft	8.7							
125-130		Hole stopped @ 122.0 ft Boring terminated at 122 feet deep with no refusal.								
130-145		Remarks: 1. Exploration locations were topped in the field by GeoDesign. Elevations were estimated based on topographic plan provided by V&B. 2. Sample moisture descriptions may not accurately reflect in-situ conditions due to wash-drive drilling methods. 3. Visual soil descriptions are per the Burmister system. Lab testing gradations reported are per AASHTO M145. 4. Samples S2 and S4 were not sampled in accordance with ASTM D 1566 procedures (borehole was not advanced between consecutive samples). 5. Boring was drilled through 6 inch core hole (performed by VTrans 10/18/13) and depths are measured from the bridge deck. Distance from deck to ground surface below was approximately 15 feet. 6. Driller advanced casing to 30 feet deep and then open hole below 30 feet deep; noted loss of water when drilling between 40 and 45 feet; drove casing to 50 feet deep. 7. Driller noted excessive rig chatter while advancing roller bit from 71 to 72 feet deep (possible cobble/gravel). 8. At end of day on 10/18/13 borehole advanced to 76 feet deep. On 10/21/13, casing advanced to 80 feet deep. 9. Driller reported borehole instability while attempting to sample S4 to 86 feet deep (cave in ~5'). Therefore, driller advanced casing to 86 feet. 10. At end of day on 10/21/13 borehole advanced to 86 feet deep with casing at 95 feet deep. 11. Soil samples were tested by VTrans soil laboratory and results were transmitted to GeoDesign for incorporation into boring logs.								

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

Bridge No. 93 over C&P Railroad
 Castleton BR# 015-2(10)
 (GeoDesign #750-09.14)

Boring No.: B-3
 Page No.: 1 of 1
 Pin No.: 12b138
 Checked By: SPK

Boring Crew: J. Leonhardt (TransTech), J. Gilman (GeoDesign)
 Date Started: 10/24/13 Date Finished: 10/24/13
 VTSPG NAD83: N 403314.31 ft E 1452548.87 ft
 Station: 19+08 Offset: 10.50
 Ground Elevation: 389.3 ft

Type: FJ Sampler: 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 = ~1.5

Groundwater Observations (3)

Date	Depth (ft)	Notes
10/24/13		See Remark 2

Depth (ft)	Strata(1)	CLASSIFICATION OF MATERIALS (Description)	Blows/6" (N Value)(2)	Moisture Content %	Gravel %	Sand %	Fines %	LL %	PI %
0-2	X X X	S1 (0' to 2'): Loose, brown to gray SILT & CLAY and fine to coarse SAND, little fine to coarse Gravel, trace Wood, trace Glass, moist. Rec. = 0.9 ft (AASHTO M145 Classification: A-4.)	1-1-5-5 (6)	13.7	29.1	25.1	45.8	25	6
2-4	X X X	S2 (2' to 4'): Loose, gray fine to coarse SAND and SILT, little fine to coarse Gravel, moist. Rec. = 1.8 ft (AASHTO M145 Classification: A-4.)	4-5-4-5 (9)	9.6	30.1	31.7	38.2	NP	NP
4-6	X X X	S3 (4' to 6'): Medium dense, gray SILT & CLAY, some fine to coarse SAND, some fine to coarse Gravel, wet. Rec. = 1.0 ft (AASHTO M145 Classification: A-4.)	4-6-11-12 (17)	11.7	31.1	24.5	44.4	24	6
6-8	X X X	S4 (6' to 8'): Medium dense, gray SILT & CLAY and fine to coarse SAND, trace fine Gravel, trace Glass, wet. Rec. = 1.3 ft (AASHTO M145 Classification: A-4.)	6-7-11-12 (18)	19.7	15.1	30.4	54.5	27	5
8-10	X X X	S5 (8' to 10'): Dense, gray SILT & CLAY and fine to coarse SAND, some fine to coarse Gravel, wet. Rec. = 1.0 ft	5-33-11-12 (44)	11.3					
14-16		S6 (14' to 16'): Medium dense, gray SILT & CLAY and fine to coarse SAND, some fine to coarse Gravel, wet. Rec. = 1.0 ft (AASHTO M145 Classification: A-4.)	6-8-20-18 (28)	11.4	33.5	25.6	40.9	25	6
19-21		S7 (19' to 21'): Medium dense, gray SILT & CLAY and fine to coarse SAND, some fine to coarse Gravel, wet. Rec. = 1.0 ft	5-9-13-15 (22)	11.9					
24-26		S8 (24' to 26'): Medium dense, gray SILT & CLAY and fine to coarse SAND, little fine to coarse Gravel, wet. Rec. = 0.3 ft	7-10-13-17 (23)	15.7					
29-31		S9 (29' to 31'): Medium dense, gray SILT & CLAY and fine to coarse SAND, little fine to coarse Gravel, wet. Rec. = 1.4 ft (AASHTO M145 Classification: A-4.)	7-11-13-16 (24)	12.8	29.5	25.5	45.0	25	6
34-36		S10 (34' to 36'): Medium dense, gray SILT & CLAY and fine to coarse SAND, little fine to coarse Gravel, wet. Rec. = 1.3 ft	15-12-16-20 (28)	11.8					

Hole stopped @ 36.0 ft
 Boring terminated at 36 feet deep with no refusal.

Remarks:

1. Exploration locations were taped in the field by GeoDesign. Elevations were estimated based on topographic plan provided by VHB.
2. Sample moisture descriptions may not accurately reflect in-situ conditions due to wash-drive drilling methods. Unable to discern ground water elevation due to continuously adding water to the borehole during roller bit advance.
3. Visual soil descriptions are per the Burmister system. Lab testing gradations reported are per AASHTO M145.
4. Samples S2 and S4 were not sampled in accordance with ASTM D 1586 procedures (borehole was not advanced between consecutive samples).
5. Soil samples were tested by VTTrans soil laboratory and results were transmitted to GeoDesign for incorporation into boring logs.

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 MATERIALS & RESEARCH SECTION SUBSURFACE INFORMATION	BORING LOG		Boring No.:	B-4
		Bridge No. 93 over C&P Railroad CastIron BR# 015-2(10) (GeoDesign #750-09.14)		Page No.:	1 of 3
Boring Crew: J. Leonhardt (TransTech), J. Gilman (GeoDesign) Date Started: 10/16/13 Date Finished: 10/17/13 VSPG MADS: N 403336.83 ft E 1452518.45 ft Station: 19+28 Offset: 10.50 Ground Elevation: 388.9 ft		Casing Sampler Type: FJ SS L.D.: 4 in. 1.38 in. Hammer Wt: 140 lb. 140 lb. Hammer Fall: 30 in. 30 in. Rig: CME 550X ATV CE = ~1.5		Groundwater Observations (3) Date Depth (ft) Notes 10/17/13 See Remark 2	

Depth (ft)	Strat(1)	CLASSIFICATION OF MATERIALS (Description)	Moisture Content (%)	Gravel %	Sand %	Fines %	LL %	PL %	U _c
2-5-13	(10)	S1 (0' to 2'): Medium dense, dark brown SILT, some fine to coarse Sand, some fine to coarse Gravel, loose Root Fibers/Wood, moist. Rec. = 0.6 ft (AASHTO M145 Classification: A-4.)	7.5	57.5	28.2	36.5	HP	HP	
12-12-14-7	(10)	S2 (2' to 4'): Medium dense, brown fine to coarse SAND, some fine to coarse Gravel, some SILT, dry. Rec. = 1.6 ft (AASHTO M145 Classification: A-1-b.)	7.6	38.1	40.0	21.9	HP	HP	
12-28-30	(10)	S3 (4' to 6'): SILT, gray with dark gray seams, SILT & CLAY, trace fine Gravel, trace fine to coarse Sand, wet (dark some higher plasticity). Rec. = 1.2 ft	30.5	1.5	0.9	97.6			
12-10-20	(10)	S4 (6' to 8'): Medium dense, gray SILT & CLAY, some fine to coarse Sand, little fine to coarse Gravel, wet (top 3" similar description as S3). Rec. = 1.3 ft (AASHTO M145 Classification: A-4.)	11.2	15.5	24.2	52.6	23	5	
8-14-14	(10)	S5 (8' to 10'): Medium dense, gray SILT & CLAY, some fine to coarse Sand, little fine to coarse Gravel, wet. Rec. = 0.4 ft							
6-8-11-13	(18)	S8 (14' to 16'): Medium dense, gray fine to coarse SAND, some fine to coarse Gravel, some Clayey SILT, wet. Rec. = 0.2 ft							
8-10-12-13	(22)	S7 (19' to 21'): Medium dense, gray SILT and fine to coarse SAND, some fine to coarse Gravel, wet. Rec. = 1.0 ft (AASHTO M145 Classification: A-4.)	12.4	30.4	27.3	42.3	HP	HP	
14-12-18-16	(28)	S8 (24' to 26'): Medium dense, no recovery. Rec. = 0.0 ft							
7-9-12-19	(21)	S9 (29' to 31'): Medium dense, gray SILT & CLAY and fine to coarse SAND, little fine to coarse Gravel, wet. Rec. = 1.5 ft (AASHTO M145 Classification: A-4.)	12.1	23.2	26.6	50.2	28	6	
7-12-17-19	(28)	S10 (34' to 36'): Medium dense, gray SILT & CLAY and fine to coarse SAND, little fine to coarse Gravel, wet. Rec. = 1.0 ft	11.8						
6-9-15-18	(24)	S11 (39' to 41'): Medium dense, gray SILT & CLAY and fine to coarse SAND, little fine to coarse Gravel, wet. Rec. = 1.4 ft							
8-12-18-21	(30)	S12 (44' to 46'): Dense, gray SILT, some fine to coarse Sand, some fine to coarse Gravel, wet. Rec. = 0.8 ft (AASHTO M145 Classification: A-4.)	11.2	30.2	26.0	43.8	HP	HP	
16-13-		S13 (49' to 51'): Dense, no recovery. Rec. = 0.0 ft							

Notes: 1. Stratification lines represent approximate boundary between material types. Boundaries may be gradant. 2. If Values have not been corrected for hammer energy, CE is the hammer energy correction factor. 3. Higher blow 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		Boring No.:	B-4
		Bridge No. 93 over C&P Railroad CastIron BR# 015-2(10) (GeoDesign #750-09.14)		Page No.:	2 of 3
Boring Crew: J. Leonhardt (TransTech), J. Gilman (GeoDesign) Date Started: 10/16/13 Date Finished: 10/17/13 VSPG MADS: N 403336.83 ft E 1452518.45 ft Station: 19+28 Offset: 10.50 Ground Elevation: 388.9 ft		Casing Sampler Type: FJ SS L.D.: 4 in. 1.38 in. Hammer Wt: 140 lb. 140 lb. Hammer Fall: 30 in. 30 in. Rig: CME 550X ATV CE = ~1.5		Groundwater Observations (3) Date Depth (ft) Notes 10/17/13 See Remark 2	

Depth (ft)	Strat(1)	CLASSIFICATION OF MATERIALS (Description)	Moisture Content (%)	Gravel %	Sand %	Fines %	LL %	PL %	U _c
11-16-22-28	(38)	S14 (59' to 61'): Dense, gray fine to coarse SAND, some Clayey SILT, wet. Rec. = 0.1 ft							
10-15-18-20	(32)	S15 (64' to 65'): Hard, gray SILT & CLAY, some fine to coarse Sand, little fine Gravel, wet. Rec. = 1.5 ft (AASHTO M145 Classification: A-4.)	13.5	22.8	25.4	51.8	26	6	
12-17-22-25	(38)	S16 (74' to 76'): Hard, gray SILT & CLAY, some fine to coarse Sand, little fine Gravel, wet. Rec. = 1.5 ft	17.2						
15-20-26-30	(36)	S17 (84' to 86'): Refusal, gray Clayey SILT, some fine to coarse Sand, little fine Gravel, wet. Rec. = 1.7 ft (AASHTO M145 Classification: A-4.)	13.6	12.8	21.9	65.3	20	3	
20-26-48-37	(64)	S18 (94' to 96'): Very dense, gray Clayey SILT, some fine to coarse Sand, little fine Gravel, wet. Rec. = 1.5 ft	9.7						
Note stopped @ 96.0 ft Boring terminated at 96 feet deep with no refusal.									

Notes: 1. Stratification lines represent approximate boundary between material types. Boundaries may be gradant. 2. If Values have not been corrected for hammer energy, CE is the hammer energy correction factor. 3. Higher blow 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 Crew: J. Leonhardt (TransTech), J. Gilman (GeoDesign) Date Started: 10/16/13 Date Finished: 10/17/13 VSPG MADS: N 403336.83 ft E 1452518.45 ft Station: 19+28 Offset: 10.50 Ground Elevation: 388.9 ft		Casing Sampler Type: FJ SS L.D.: 4 in. 1.38 in. Hammer Wt: 140 lb. 140 lb. Hammer Fall: 30 in. 30 in. Rig: CME 550X ATV CE = ~1.5		Groundwater Observations (3) Date Depth (ft) Notes 10/17/13 See Remark 2	

Depth (ft)	Strat(1)	CLASSIFICATION OF MATERIALS (Description)	Moisture Content (%)	Gravel %	Sand %	Fines %	LL %	PL %	U _c
Remarks: 1. Exploration locations were topped in the field by GeoDesign. Elevations were estimated based on topographic plan provided by VTR. 2. Sample moisture descriptions may not accurately reflect in-situ conditions due to wash-drive drilling methods. Unable to discern ground water elevation due to continuously adding water to the borehole during roller bit advance. 3. Visual soil descriptions are per the Burmister system. Lab testing gradations reported are per AASHTO M145. 4. Samples S2 and S4 were not sampled in accordance with ASTM D 1586 procedures (borehole was not advanced between consecutive samplings). 5. Driller advanced casing to 9 feet deep and then open hole below 9 feet deep. 6. At end of day on 10/16/13, borehole advanced to 46 feet deep. 7. Borehole covered to approximately 25 feet deep overnight. Driller advanced casing to 19 feet deep and cleaned out to resume advance. 8. Driller noted rig chatter when advancing roller bit 48 to 49 feet deep, and 71 to 71.5 feet deep (possible cobble/gravel). 9. Driller drove split spoon samples S15 and S16 and waited 5 minutes to withdraw to improve recovery. 10. Soil samples were tested by VTrans soil laboratory and results were transmitted to GeoDesign for incorporation into boring logs. 11. While cohesive soils were present in sample S3 at 4' deep, not enough was available to perform Atterberg Limits testing.									

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	STATE OF VERMONT AGENCY OF TRANSPORTATION MATERIALS & RESEARCH SECTION SUBSURFACE INFORMATION	BORING LOG		Boring No.: B-6
		Bridge No. 93 over C&P Railroad Castleton BR# 015-2(10) (GeoDesign #750-09.14)	Page No.: 1 of 3 Pin No.: 12b138 Checked By: SPK	
Boring Crew: Leonhardt (TransTech), JGG/JFW (GeoDesign) Date Started: 10/22/13 Date Finished: 10/24/13 VTSFG NAD83: N 403359.36 ft E 1452541.92 ft Station: 19+54 Offset: 8.30 Ground Elevation: 413.4 ft	Type: FJ SS L.O.: 4 in. 1.38 in. Hammer Wt: 140 lb. 140 lb. Hammer Fall: 30 in. 30 in. Hammer/Rod Type: Auto/MWJ Rig: CME 550X ATY CE = ~1.5	Casing Sampler Date: 10/24/13 Depth (ft): See Remark 2	Groundwater Observations (3) Date: 10/24/13 Depth (ft): Notes:	

Depth (ft)	Strat (1)	CLASSIFICATION OF MATERIALS (Description)	Moisture Content (%)	Gravel %	Sand %	Fines %	LL %	PL %
0-2	Existing Bridge Deck (Approx.)	Air Space Between Bridge Deck and Ground Surface (See Remark 4).						
2-1	S1 (13' to 15')	Very loose, tan brown fine to coarse SAND, some SIL, little fine to coarse Gravel, trace Asphalt, dry. Rec. = 0.8 ft (ASHTO M145 Classification: A-2-4).	2-1-1 (2)	9.0	22.8	44.9	32.5	NP
2-2	S2 (15' to 17')	Loose, tan brown SILT, some fine to coarse Sand, little fine Gravel, little Asphalt, dry. Rec. = 1.0 ft (ASHTO M145 Classification: A-4).	2-2-2 (4)	17.4	17.8	15.9	66.3	NP
2-3	S3 (17' to 19')	Very loose, brown fine to coarse SAND, some SIL, little fine to coarse Gravel, wet. Rec. = 0.5 ft (ASHTO M145 Classification: A-1-B).	2-3-3 (5)	16.8	19.9	57.1	21.4	NP
2-4	S4 (19' to 21')	Loose, tan brown SILT and fine to coarse SAND, little fine Gravel, wet. Rec. = 0.8 ft (ASHTO M145 Classification: A-4).	2-4-2 (4)	20.9	23.6	32.6	43.8	NP
2-5	S5 (21' to 23')	Loose, (Top 10") similar description as S4; (Bottom 12") tan brown with reddish layers Clayey SILT, trace fine to medium Sand, wet. Rec. = 1.8 ft (ASHTO M145 Classification: A-3).	2-5-3 (8)	31.6	1.2	96.8	26	1
2-6	S6 (24' to 26')	Medium, gray with dark gray layers, SILT & CLAY, trace fine to coarse Sand, trace fine Gravel, wet. Rec. = 2.0 ft (ASHTO M145 Classification: A-4).	2-6-2 (2)	37.2	1.5	1.1	97.4	31
2-7	S7 (26' to 31')	Medium dense, gray Clayey SILT and fine to coarse SAND, little fine to coarse Gravel, wet. Rec. = 0.7 ft	2-7-9-14 (15)	24.3				
2-8	S8 (34' to 36')	Medium dense, gray fine to coarse SAND, some SIL, some fine to coarse Gravel, wet. Rec. = 0.3 ft (ASHTO M145 Classification: A-2-4).	8-11-16 (23)	11.3	38.7	31.6	29.7	NP
2-9	S9 (39' to 41')	Medium dense, gray Clayey SILT and fine to coarse SAND, little fine to coarse Gravel, wet. Rec. = 1.1 ft (ASHTO M145 Classification: A-4).	6-12-14 (28)	12.5	27.0	26.2	46.8	27
2-10	S10 (44' to 46')	Dense, gray layered Clayey SILT (grading locally to SILT & CLAY) and fine to coarse SAND, little fine to coarse Gravel (occasionally decomposed), wet. Rec. = 0.75 ft	8-11-19 (30)	11.4				
2-11	S11 (49' to 51')	Medium dense, gray SILT & CLAY (grading locally to Clayey	8-10-15 (11.0)					

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 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 MATERIALS & RESEARCH SECTION SUBSURFACE INFORMATION	BORING LOG		Boring No.: B-6
		Bridge No. 93 over C&P Railroad Castleton BR# 015-2(10) (GeoDesign #750-09.14)	Page No.: 2 of 3 Pin No.: 12b138 Checked By: SPK	
Boring Crew: Leonhardt (TransTech), JGG/JFW (GeoDesign) Date Started: 10/22/13 Date Finished: 10/24/13 VTSFG NAD83: N 403359.36 ft E 1452541.92 ft Station: 19+54 Offset: 8.30 Ground Elevation: 413.4 ft	Type: FJ SS L.O.: 4 in. 1.38 in. Hammer Wt: 140 lb. 140 lb. Hammer Fall: 30 in. 30 in. Hammer/Rod Type: Auto/MWJ Rig: CME 550X ATY CE = ~1.5	Casing Sampler Date: 10/24/13 Depth (ft): See Remark 2	Groundwater Observations (3) Date: 10/24/13 Depth (ft): Notes:	

Depth (ft)	Strat (1)	CLASSIFICATION OF MATERIALS (Description)	Moisture Content (%)	Gravel %	Sand %	Fines %	LL %	PL %
0-2	S18	and fine to coarse SAND, some fine to coarse Gravel, wet. Rec. = 1.5 ft	15 (25)					
8-12	S12 (50' to 61')	Dense, gray SILT & CLAY (grading locally to Clayey SILT) and fine to coarse SAND, some fine to coarse Gravel, wet. Rec. = 0.85 ft (ASHTO M145 Classification: A-4).	8-12-18 (30)	10.3	29.6	26.7	43.7	24
11-15	S13 (60' to 71')	Dense, gray SILT & CLAY (grading locally to Clayey SILT) and fine to coarse SAND, some fine to coarse Gravel, wet. Rec. = 1.33 ft	11-15-21 (36)	11.9				
10-16	S14 (70' to 81')	Dense, gray SILT & CLAY (grading locally to Clayey SILT) and fine to coarse SAND, little fine to coarse Gravel, wet. Rec. = 1.17 ft (ASHTO M145 Classification: A-4).	10-16-19-22 (34)	12.5	23.0	26.7	50.3	25
8-15	S15 (80' to 91')	Dense, gray SILT & CLAY (grading locally to Clayey SILT) and fine to coarse SAND, little fine to coarse Gravel, wet. Rec. = 1.0 ft	8-15-19 (34)	13.5				
Hole stopped @ 91.0 ft Boring terminated at 91 feet deep with no refusal.								

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	STATE OF VERMONT AGENCY OF TRANSPORTATION MATERIALS & RESEARCH SECTION SUBSURFACE INFORMATION	BORING LOG		Boring No.: B-6
		Bridge No. 93 over C&P Railroad Castleton BR# 015-2(10) (GeoDesign #750-09.14)	Page No.: 3 of 3 Pin No.: 12b138 Checked By: SPK	
Boring Crew: Leonhardt (TransTech), JGG/JFW (GeoDesign) Date Started: 10/22/13 Date Finished: 10/24/13 VTSFG NAD83: N 403359.36 ft E 1452541.92 ft Station: 19+54 Offset: 8.30 Ground Elevation: 413.4 ft	Type: FJ SS L.O.: 4 in. 1.38 in. Hammer Wt: 140 lb. 140 lb. Hammer Fall: 30 in. 30 in. Hammer/Rod Type: Auto/MWJ Rig: CME 550X ATY CE = ~1.5	Casing Sampler Date: 10/24/13 Depth (ft): See Remark 2	Groundwater Observations (3) Date: 10/24/13 Depth (ft): Notes:	

Depth (ft)	Strat (1)	CLASSIFICATION OF MATERIALS (Description)	Moisture Content (%)	Gravel %	Sand %	Fines %	LL %	PL %
REFERENCE: 1. Exploration locations were taped in the field by GeoDesign. Elevations were estimated based on topographic plan provided by VHB. 2. Sample moisture descriptions may not accurately reflect in-situ conditions due to wash-drive drilling methods. Unable to discern ground water elevation due to continuously adding water to the borehole during roller bit advance. 3. Samples S2 and S4 were not sampled in accordance with ASTM D 1586 procedures (borehole was not advanced between consecutive samples). 4. Boring was drilled through 8 inch core hole (performed by VTrans 10/16/13) and depths are measured from the bridge deck. Distance from deck to ground surface below was 13 feet. 5. At end of day on 10/22/13, borehole advanced to 41 feet deep. 6. After sampling S13 at 60' deep noted rods beginning to bind on inferred cobbles between 50' and 60' deep. Driller advanced casing to 60' deep prior to continuing with borehole advance to S14 at 78' deep. 7. At end of day on 10/23/13, borehole advanced to 91 feet deep. 8. Soil samples were tested by VTrans soil laboratory and results were transmitted to GeoDesign for incorporation into boring logs.								

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