TEST BORING REPORT

Boring No. B15

Project	NORTHERN PASS TRANSMISSION LINE, N. WOODSTOCK TO PLYMOUTH, NH
Client	EVERSOURCE
Contractor	NEW ENGLAND BORING CONTRACTORS

File No. 40460-200
Sheet No. 1 of 1
Start December 8, 2015
Finish December 8, 2015
Driller M. Souze
H&A Rep. C. Smith
Elevation
Datum
Location See Plan

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	HW	S	-	Rig Make & Model: Mobile B47 Truck
Inside Diameter (in.)	4.0	1 3/8	-	Bit Type: Roller Bit
Hammer Weight (lb)	300	140	-	Drill Mud: None
Hammer Fall (in.)	24	30	-	Casing: HW Drive to 13.0 ft
				Hoist/Hammer: Cat-Head Safety Hammer
				PID Make & Model:

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	USCS Symbol	Stratum Change Elev/Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (Density/consistency, color, GROUP NAME, max. particle size†, structure, odor, moisture, optional descriptions GEOLOGIC INTERPRETATION)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
0	3 4	S1 12	0.0 1.0	SP-SM		Medium dense black poorly graded SAND with silt (SP-SM), mps 0.75 in., no structure, no odor, dry			15	30	45	10				
					1.0	-TOPSOIL-										
	12 18	S1A 5	1.0 2.0	SP		Medium dense brown poorly graded SAND (SP), mps 1.3 in., no structure, no odor, dry	10	5	15	30	40					
	14 22 27 27	S2 15	2.0 4.0	SP		-FILL- Similar to above except dense	15	5	15	25	40					
					4.0											
5	100/4"	S3 3	4.0 4.3	SW		Very dense well graded SAND with gravel (SW), mps 1.3 in., no structure, no odor, dry Refusal at 4.5 ft.	10	10	30	30	20					
	30	S3A	5.5			Drilled boulder 4.5 - 5.5 ft., drove a spoon 5.5 - 6.0 ft several times to collect more sample volume (Sample S3A)										
	43 100/2"	S4 8	6.0 6.0 6.7	SW		Very dense well graded SAND with gravel (SW) mps 1.0 in., no structure, no odor, wet -GLACIOFLUVIAL DEPOSITS- Note: Boulder 6.7 - 7.5 ft.	10	15	20	30	25					
					8.0											
10	12 38 48 28	S5 13	8.0 10.0	SP		Very dense poorly graded SAND with gravel (SP), mps 1.3 in., slightly bonded, no odor, wet -GLACIAL TILL-	15	5	15	20	40	5				
	50 85 100/4"	S6 10	13.0 14.3	SP		Very dense poorly graded SAND with gravel (SP), mps 1.3 in., slightly bonded, no odor, wet										
					14.3	BOTTOM OF EXPLORATION 14.3 FT										

Water Level Data

Date	Time	Elapsed Time (hr.)	Depth (ft) to: Bottom of Casing	Bottom of Hole	Water
12/8/2015	13:00	0.1	8.0	8.7	5.7

Sample ID
O - Open End Rod
T - Thin Wall Tube
U - Undisturbed Sample
S - Split Spoon Sample

Well Diagram
Riser Pipe
Screen
Filter Sand
Cuttings
Grout
Concrete
Bentonite Seal

Summary
Overburden (ft) 14.3
Rock Cored (ft) -
Samples 6S

Boring No. B15

Field Tests: **Dilatancy**: R - Rapid S - Slow N - None
Toughness: L - Low M - Medium H - High
Plasticity: N - Nonplastic L - Low M - Medium H - High
Dry Strength: N - None L - Low M - Medium H - High V - Very High

†**Note: Maximum particle size is determined by direct observation within the limitations of sampler size.**

Note: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

TEST BORING REPORT

Boring No. B15A

Project	NORTHERN PASS TRANSMISSION LINE, N. WOODSTOCK TO PLYMOUTH, NH
Client	EVERSOURCE
Contractor	NEW ENGLAND BORING CONTRACTORS

File No. 40460-200
Sheet No. 1 of 1
Start December 11, 2015
Finish December 11, 2015
Driller M. Souze
H&A Rep. C. Smith
Elevation
Datum
Location See Plan

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	HW	S	-	Rig Make & Model: Mobile B47 Truck
Inside Diameter (in.)	4.0	1 3/8	-	Bit Type: Roller Bit
Hammer Weight (lb)	300	140	-	Drill Mud: None
Hammer Fall (in.)	24	30	-	Casing: HW Drive to 13.0 ft
				Hoist/Hammer: Cat-Head Safety Hammer
				PID Make & Model:

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	USCS Symbol	Stratum Change Elev/Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (Density/consistency, color, GROUP NAME, max. particle size†, structure, odor, moisture, optional descriptions GEOLOGIC INTERPRETATION)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
0	5 17 11 14	S1 14	0.0 2.0	SP		Medium dense dark brown poorly graded SAND with gravel (SP), mps 1.3 in., no structure, no odor, dry Note: 4 inch layer of bituminous asphalt 1.0 - 1.3 ft bgs.	10	5	20	30	30	5				
	7 5 10 19	S2 8	2.0 4.0	SP		Similar to above except no asphalt -FILL-	5	10	20	25	35	5				
	17* 23* 20* 46*	S3 22	4.0 6.0	SW	4.0	Dense orange-brown well graded SAND with gravel (SW), mps 1.3 in., stratified, no odor, dry	5	10	25	35	25					
5	15 12 11 10	S4 13	6.0 8.0	SW		Medium dense brown well graded SAND (SW), mps 1.3 in., no structure, no odor, dry		10	25	35	30					
	10 10 8 8	S5 17	8.0 10.0	SW		Similar to above -GLACIOFLUVIAL DEPOSITS-		5	30	35	30					
10																
	24 12 10 7	S6 8	13.0 15.0	SP		Medium dense poorly graded SAND with gravel (SP), mps 1.3 in., no structure, no odor, wet	10	10	40	25	15					
15					15.0	BOTTOM OF EXPLORATION 15.0 FT *Indicates 3 inch spoon used with 300 lb hammer										

Water Level Data

Date	Time	Elapsed Time (hr.)	Depth (ft) to: Bottom of Casing	Bottom of Hole	Water
12/11/2015	10:15	0.25	13.0	14.0	Dry

Sample ID
O - Open End Rod
T - Thin Wall Tube
U - Undisturbed Sample
S - Split Spoon Sample

Well Diagram
Riser Pipe
Screen
Filter Sand
Cuttings
Grout
Concrete
Bentonite Seal

Summary
Overburden (ft) 15.0
Rock Cored (ft) -
Samples 6S

Boring No. B15A

Field Tests: **Dilatancy**: R - Rapid S - Slow N - None
Toughness: L - Low M - Medium H - High
Plasticity: N - Nonplastic L - Low M - Medium H - High
Dry Strength: N - None L - Low M - Medium H - High V - Very High

†**Note: Maximum particle size is determined by direct observation within the limitations of sampler size.**

Note: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

TEST BORING REPORT

Boring No. B16

Project	NORTHERN PASS TRANSMISSION LINE, N. WOODSTOCK TO PLYMOUTH, NH
Client	EVERSOURCE
Contractor	NEW ENGLAND BORING CONTRACTORS

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	HW	S	-	Rig Make & Model: Diedrich D120 Truck
Inside Diameter (in.)	4.0	1 3/8	-	Bit Type: Roller Bit
Hammer Weight (lb)	300	140	-	Drill Mud: None
Hammer Fall (in.)	24	30	-	Casing: HW Drive to 13.0 ft, open to 15.0 ft
				Hoist/Hammer: Winch Safety Hammer
				PID Make & Model:

File No. 40460-200
Sheet No. 1 of 1
Start December 8, 2015
Finish December 8, 2015
Driller K. Smith
H&A Rep. T. Erickson
Elevation
Datum
Location See Plan

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	USCS Symbol	Stratum Change Elev/Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (Density/consistency, color, GROUP NAME, max. particle size†, structure, odor, moisture, optional descriptions GEOLOGIC INTERPRETATION)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
0	2 4 6 12	S1 12	0.0 2.0	OL/ OH SP	0.2	-TOPSOIL- Loose brown and light brown poorly graded SAND with gravel (SP), mps 0.75 in., no structure, no odor, dry		15	15	30	5 35	95 5	R			
	7 9 10 10	S2 12	2.0 4.0	SP	1.8	-FILL- Medium dense tan poorly graded SAND (SP), mps 0.25 in., no structure, no odor, dry		10	35	40	15					
5	19* 15* 17* 23*	S3 14	4.0 6.0	SP		-GLACIOFLUVIAL DEPOSITS- Dense tan and light brown poorly graded SAND (SP), mps 0.25 in., alternating fine sand and medium/coarse sand layers, no odor, wet *Note: Sample S3 taken with 300 lb hammer and 3 inch diameter spoon for thermal testing.		5	20	35	40				
	7 9 8 12	S4 15	6.0 8.0	SW	6.0	Medium dense tan and light brown well graded SAND (SW), mps 0.5 in., occasional fine sand lenses, no odor, wet		10	30	30	30					
	7 10 10 10	S5 8	8.0 10.0	SW		Medium dense tan and light brown well graded SAND (SW), mps 0.25 in., no structure, no odor, wet		5	35	30	30					
10						-GLACIOFLUVIAL DEPOSITS-										
	13 18 15 15	S6 12	13.0 15.0	SW		Dense tan and light brown well graded SAND (SW), mps 0.25 in., no structure, no odor, wet		5	25	35	35					
15					15.0	BOTTOM OF EXPLORATION 15.0 FT										

Water Level Data

Date	Time	Elapsed Time (hr.)	Depth (ft) to: Bottom of Casing	Bottom of Hole	Water
12/8/2015	11:15	0.2	7.0	13.0	12.3

Sample ID
O - Open End Rod
T - Thin Wall Tube
U - Undisturbed Sample
S - Split Spoon Sample

Well Diagram
Riser Pipe
Screen
Filter Sand
Cuttings
Grout
Concrete
Bentonite Seal

Summary
Overburden (ft) 15.0
Rock Cored (ft) -
Samples 6S

Boring No. B16

Field Tests: **Dilatancy**: R - Rapid S - Slow N - None
Toughness: L - Low M - Medium H - High
Plasticity: N - Nonplastic L - Low M - Medium H - High
Dry Strength: N - None L - Low M - Medium H - High V - Very High

†**Note: Maximum particle size is determined by direct observation within the limitations of sampler size.**

Note: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

TEST BORING REPORT

Boring No. B16A

Project	NORTHERN PASS TRANSMISSION LINE, N. WOODSTOCK TO PLYMOUTH, NH
Client	EVERSOURCE
Contractor	NEW ENGLAND BORING CONTRACTORS

File No. 40460-200
Sheet No. 1 of 1
Start December 8, 2015
Finish December 8, 2015
Driller K. Smith
H&A Rep. T. Erickson
Elevation
Datum
Location See Plan

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	HW	S	-	Rig Make & Model: Diedrich D120 Truck
Inside Diameter (in.)	4.0	1 3/8	-	Bit Type: Roller Bit
Hammer Weight (lb)	300	140	-	Drill Mud: None
Hammer Fall (in.)	24	30	-	Casing: Cased Driven to 11.0 ft, open to 15.0 ft
				Hoist/Hammer: Winch Safety Hammer
				PID Make & Model:

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	USCS Symbol	Stratum Change Elev/Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (Density/consistency, color, GROUP NAME, max. particle size†, structure, odor, moisture, optional descriptions GEOLOGIC INTERPRETATION)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
0	6 8 4 3	S1 15	0.0 2.0	OL/ OH	0.3	-TOPSOIL-					5	95	R			
				SP		Medium dense brown poorly graded SAND with gravel (SP), mps 0.75 in., no structure, no odor, dry		15	15	30	35	5				
	6 9 16 46	S2 10	2.0 4.0	SP		Medium dense brown poorly graded SAND with gravel (SP), mps 0.75 in., no structure, no odor, dry	5	25	20	30	20					
						-FILL- Note: Roller bit drilled through cobble from 3.0 - 3.9 ft.										
	47* 75* 65* 58*	S3 18	4.0 6.0													
5				SP	5.0	Very dense light brown poorly graded SAND with gravel (SP), mps 0.5 in., no structure, no odor, wet		20	35	35	10					
	33 50 100/5"	S4 14	6.0 7.4			-GLACIOFLUVIAL DEPOSITS- *Note: 300 lb hammer and 3 inch diameter split spoon used for sample S3.										
				SM	7.0	Very dense olive-brown silty SAND with gravel (SM), mps 1.0 in., loosely bonded, no odor, wet	5	30	15	20	15	15				
						-FLOW TILL DEPOSITS-										
					8.5	Note: Probable boulder from 7.4 - 8.5 ft.										
	14 25 27 29	S5 14	9.0 11.0	SP		Very dense light gray-brown poorly graded SAND (SP), mps 2 mm, occasional stratification, no odor, wet				10	85	5				
10						-GLACIOFLUVIAL DEPOSITS-										
	11 17 20 22	S6 16	13.0 15.0	SP		Dense light gray-brown poorly graded SAND (SP), mps 2 mm, occasionally stratified, no odor, wet				5	90	5				
15					15.0	BOTTOM OF EXPLORATION 15.0 FT										

Water Level Data

Date	Time	Elapsed Time (hr.)	Depth (ft) to: Bottom of Casing	Bottom of Hole	Water
12/8/2015	14:30	0.2	0.0	8.8	5.7

Sample ID

O - Open End Rod
T - Thin Wall Tube
U - Undisturbed Sample
S - Split Spoon Sample

Well Diagram

Riser Pipe
Screen
Filter Sand
Cuttings
Grout
Concrete
Bentonite Seal

Summary

Overburden (ft)	15.0
Rock Cored (ft)	-
Samples	6S

Boring No. B16A

Field Tests: **Dilatancy**: R - Rapid S - Slow N - None
Toughness: L - Low M - Medium H - High
Plasticity: N - Nonplastic L - Low M - Medium H - High
Dry Strength: N - None L - Low M - Medium H - High V - Very High

†**Note: Maximum particle size is determined by direct observation within the limitations of sampler size.**

Note: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

TEST BORING REPORT

Boring No. B17

Project	NORTHERN PASS TRANSMISSION LINE, N. WOODSTOCK TO PLYMOUTH, NH
Client	EVERSOURCE
Contractor	NEW ENGLAND BORING CONTRACTORS

File No. 40460-200
Sheet No. 1 of 1
Start December 8, 2015
Finish December 9, 2015
Driller M. Souze
H&A Rep. C. Smith
Elevation
Datum
Location See Plan

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	HW	S	-	Rig Make & Model: Mobile B47 Truck
Inside Diameter (in.)	4.0	1 3/8	-	Bit Type: Roller Bit
Hammer Weight (lb)	300	140	-	Drill Mud: None
Hammer Fall (in.)	24	30	-	Casing: HW Drive to 13.0 ft
				Hoist/Hammer: Cat-Head Safety Hammer
				PID Make & Model:

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	USCS Symbol	Stratum Change Elev/Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (Density/consistency, color, GROUP NAME, max. particle size†, structure, odor, moisture, optional descriptions GEOLOGIC INTERPRETATION)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
0	15 6 10 14	S1 10	0.0 2.0	SP		Medium dense black to brown poorly graded SAND with gravel (SP), mps 1 in., no structure, no odor, dry	10	5	15	30	35	5				
	9 14 10 11	S2 7	2.0 4.0	SP		Medium dense brown poorly graded SAND with gravel (SP), mps 1.3 in., no structure, no odor, dry -FILL-	10	5	15	35	35					
	22*	S3	4.0	SM		Medium dense black silty SAND (SM), mps 0.5 in., no structure, no odor, dry, 10% intermixed asphalt fragments and specks		5		5	65	25				
	18* 13* 18*	6 S3A 18	4.5 4.5 6.0	SM	4.5	Medium dense gray silty SAND (SM), mps 5 mm, interbedded, no odor, dry -ALLUVIAL DEPOSIT-				5	70	25				
5	32	S4	6.0	SM		Similar to above except very dense and red-brown				10	70	20				
	25 30 20	4 S4A 10	6.5 6.5 8.0	SP	6.5	Very dense brown poorly graded SAND with gravel (SP), mps 1.3 in., no structure, no odor, dry	15	5	20	35	25					
	41 43 70 53	S5 12	8.0 10.0	SW		Very dense brown well graded SAND with gravel (SW), mps 1.3 in., no structure, no odor, dry -GLACIOFLUVIAL DEPOSITS-	15	10	25	25	25					
10																
	11 12 9 6	S6 NR	13.0 15.0	SW		No recovery. Resampled with 3 inch spoon recovered brown well graded SAND with gravel (SW), mps 2 in., no structure, no odor, dry	25	15	20	25	15					
15					15.0	BOTTOM OF EXPLORATION 15.0 FT *Indicates 3 inch spoon used with 300 lb hammer.										

Water Level Data

Date	Time	Elapsed Time (hr.)	Depth (ft) to: Bottom of Casing	Bottom of Hole	Water
12/9/2015	09:00	0.1	10.0	15.0	Dry

Sample ID
O - Open End Rod
T - Thin Wall Tube
U - Undisturbed Sample
S - Split Spoon Sample

Well Diagram
Riser Pipe
Screen
Filter Sand
Cuttings
Grout
Concrete
Bentonite Seal

Summary
Overburden (ft) 15.0
Rock Cored (ft) -
Samples 6S

Boring No. B17

Field Tests: **Dilatancy**: R - Rapid S - Slow N - None
Toughness: L - Low M - Medium H - High
Plasticity: N - Nonplastic L - Low M - Medium H - High
Dry Strength: N - None L - Low M - Medium H - High V - Very High

†**Note: Maximum particle size is determined by direct observation within the limitations of sampler size.**

Note: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

TEST BORING REPORT

Boring No. B17A

Project	NORTHERN PASS TRANSMISSION LINE, N. WOODSTOCK TO PLYMOUTH, NH
Client	EVERSOURCE
Contractor	NEW ENGLAND BORING CONTRACTORS

File No. 40460-200
Sheet No. 1 of 1
Start December 9, 2015
Finish December 9, 2015
Driller K. Smith
H&A Rep. T. Erickson
Elevation Datum
Location See Plan

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	HW	S	-	Rig Make & Model: Diedrich D120 Truck
Inside Diameter (in.)	4.0	1 3/8	-	Bit Type: Roller Bit
Hammer Weight (lb)	300	140	-	Drill Mud: None
Hammer Fall (in.)	24	30	-	Casing: HW Drive to 13.0 ft, open to 15.0 ft
				Hoist/Hammer: Winch Safety Hammer
				PID Make & Model:

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	USCS Symbol	Stratum Change Elev/Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (Density/consistency, color, GROUP NAME, max. particle size†, structure, odor, moisture, optional descriptions GEOLOGIC INTERPRETATION)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
0	10 12 10 11	S1 8	0.0 2.0	SP		Medium dense brown poorly graded SAND with gravel (SP), mps 0.5 in., no structure, no odor, dry, trace ash and cinders -FILL-		15	10	35	40					
	8 8 8 8	S2 10	2.0 4.0	SP	1.8	65% ASH and CINDERS; 35% Dark brown poorly graded SAND with gravel (SP), mps 0.5 in., no structure, no odor, moist, traces of brick, coal, furnace brick particles and specks -FILL-		15	15	25	40	5				
	11* 4* 4* 4*	S3 16	4.0 6.0			65% ASH and CINDERS; 35% Dark brown silty SAND with gravel (SM), mps 1.0 in., no structure, no odor, wet, trace brick particles		15	10	25	35	15				
5				PT	5.6	Medium stiff brown and dark brown PEAT (PT), mps 0.25 in., cohesive, strong organic odor, wet, appears to be reworked, possible compost or organic waste		5	5			90	R			
	10 17 20 22	S4 14	6.0 8.0	SP	6.6	-FILL- Dense gray poorly graded SAND with gravel (SP), mps 1.25 in., no structure, no odor, wet	10	15	20	30	20	5				
	28 43 42 27	S5 4	8.0 10.0	SM	8.5	-GLACIOFLUVIAL DEPOSITS- Very dense olive silty SAND with gravel (SM), mps 1.25 in., slightly bonded, no odor, wet	20	15	15	10	25	15				
10						-GLACIAL TILL DEPOSITS-										
	22 22 28 68	S6 12	13.0 15.0	SM		Dense olive-brown silty SAND with gravel (SM), mps 1.25 in., bonded, no odor, wet, occasional interbedded stratified lenses (possible flow till deposit)	10	10	5	10	50	15				
15					15.0	BOTTOM OF EXPLORATION 15.0 FT Note: Sample S3 was taken with a 3 inch diameter split spoon and 140 lb drive hammer.										

Water Level Data

Date	Time	Elapsed Time (hr.)	Depth (ft) to: Bottom of Casing	Bottom of Hole	Water
12/9/2015	10:00	0.2	8.0	7.4	7.0

Sample ID
O - Open End Rod
T - Thin Wall Tube
U - Undisturbed Sample
S - Split Spoon Sample

Well Diagram
Riser Pipe
Screen
Filter Sand
Cuttings
Grout
Concrete
Bentonite Seal

Summary
Overburden (ft) 15.0
Rock Cored (ft) -
Samples 6S

Boring No. B17A

Field Tests: **Dilatancy**: R - Rapid S - Slow N - None
Toughness: L - Low M - Medium H - High
Plasticity: N - Nonplastic L - Low M - Medium H - High
Dry Strength: N - None L - Low M - Medium H - High V - Very High

†**Note: Maximum particle size is determined by direct observation within the limitations of sampler size.**

Note: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

TEST BORING REPORT

Boring No. B18

Project	NORTHERN PASS TRANSMISSION LINE, N. WOODSTOCK TO PLYMOUTH, NH
Client	EVERSOURCE
Contractor	NEW ENGLAND BORING CONTRACTORS

File No. 40460-200
Sheet No. 1 of 1
Start December 9, 2015
Finish December 9, 2015
Driller M. Souze
H&A Rep. C. Smith
Elevation
Datum
Location See Plan

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	HW	S	-	Rig Make & Model: Mobile B47 Truck
Inside Diameter (in.)	4.0	1 3/8	-	Bit Type: Roller Bit
Hammer Weight (lb)	300	140	-	Drill Mud: None
Hammer Fall (in.)	24	30	-	Casing: HW Drive to 13.0 ft
				Hoist/Hammer: Cat-Head Safety Hammer
				PID Make & Model:

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	USCS Symbol	Stratum Change Elev/Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (Density/consistency, color, GROUP NAME, max. particle size†, structure, odor, moisture, optional descriptions GEOLOGIC INTERPRETATION)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
0	2 6	S1 8	0.0 0.7	SM		Medium dense black silty SAND (SM), mps 0.25 in., no structure, no odor, dry		5	10	15	55	15				
	13 17	S1A 4	0.7 2.0	SP	0.7	-TOPSOIL- Medium dense brown poorly graded SAND with gravel (SP), mps 1.25 in., no structure, no odor, dry	10	5	15	30	35	5				
	68 39 17 20	S2 1	2.0 4.0	SP		-FILL- Note: Poor recovery pushed on cobble Very dense light brown poorly graded SAND with gravel (SP), mps 1.3 in., no structure, no odor, dry	10	5	10	20	55					
	18* 43* 90* 46*	S3 11	4.0 6.0	SP	4.0	-PROBABLE FILL- Very dense brown poorly graded SAND with gravel (SP), mps 2.5 in., no structure, no odor, dry Note: Redrive for extra sample volume	15	5	15	30	35					
5	30 21 62 40	S4 18	6.0 8.0	SW		Very dense gray to brown well graded SAND with gravel (SW), mps 1.3 in., no structure, no odor, dry -GLACIOFLUVIAL DEPOSITS-	20	10	25	25	20					
	10 7 8 9	S5 11	8.0 10.0	SP	8.0	Medium dense gray poorly graded SAND (SP), mps 5 mm, no structure, no odor, moist -GLACIOFLUVIAL DEPOSITS-				15	80	5				
10																
	8 8 9 11	S6 16	13.0 15.0			Similar to above except interbedded -GLACIOFLUVIAL DEPOSITS-				10	85	5				
15					15.0	BOTTOM OF EXPLORATION 15.0 FT *Indicates 3 inch spoon used with 300 lb hammer.										

Water Level Data

Date	Time	Elapsed Time (hr.)	Depth (ft) to: Bottom of Casing	Bottom of Hole	Water
12/9/2015	11:30	0.1	8.0	13.8	9.4**

**Water level dropping; not yet stable

Sample ID
O - Open End Rod
T - Thin Wall Tube
U - Undisturbed Sample
S - Split Spoon Sample

Well Diagram
Riser Pipe
Screen
Filter Sand
Cuttings
Grout
Concrete
Bentonite Seal

Summary
Overburden (ft) 15.0
Rock Cored (ft) -
Samples 6S

Boring No. B18

Field Tests: **Dilatancy**: R - Rapid S - Slow N - None
Toughness: L - Low M - Medium H - High
Plasticity: N - Nonplastic L - Low M - Medium H - High
Dry Strength: N - None L - Low M - Medium H - High V - Very High

†**Note: Maximum particle size is determined by direct observation within the limitations of sampler size.**

Note: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

TEST BORING REPORT

Boring No. B18A

Project	NORTHERN PASS TRANSMISSION LINE, N. WOODSTOCK TO PLYMOUTH, NH
Client	EVERSOURCE
Contractor	NEW ENGLAND BORING CONTRACTORS

File No. 40460-200
Sheet No. 1 of 1
Start December 9, 2015
Finish December 9, 2015
Driller K. Smith
H&A Rep. T. Erickson
Elevation
Datum
Location See Plan

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	HW	S	-	Rig Make & Model: Diedrich D120 Truck
Inside Diameter (in.)	4.0	1 3/8	-	Bit Type: Roller Bit
Hammer Weight (lb)	300	140	-	Drill Mud: None
Hammer Fall (in.)	24	30	-	Casing: HW Drive to 13.0 ft, uncased to 15.0 ft
				Hoist/Hammer: Winch Safety Hammer
				PID Make & Model:

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	USCS Symbol	Stratum Change Elev/Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (Density/consistency, color, GROUP NAME, max. particle size†, structure, odor, moisture, optional descriptions GEOLOGIC INTERPRETATION)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
0	2 3 3 6	S1 14	0.0 2.0	SP		Loose brown poorly graded SAND with gravel (SP), mps 0.25 in., no structure, no odor, dry -FILL-		15	10	35	40					
	2 8 13 18	S2 10	2.0 4.0	SP	1.8	Medium dense tan and brown poorly graded SAND with gravel (SP), mps 1.25 in., no structure, no odor, dry -FILL-	15	15	10	15	45					
	18* 20* 16* 16*	S3 12	4.0 6.0	SW	3.5	Dense tan and light brown well graded SAND with gravel (SW), mps 2.5 in., no structure, no odor, wet	10	10	25	30	25					
5	10 8 7 6	S4 6	6.0 8.0	SW		Medium dense tan well graded SAND with gravel (SW), mps 1.25 in., no structure, no odor, wet -GLACIOFLUVIAL DEPOSITS-	10	10	25	30	25					
	11 21 16 17	S5 14	8.0 10.0	SW		Dense tan well graded SAND with gravel (SW), mps 1.25 in., no structure, no odor, wet	10	10	25	30	25					
10																
	10 14 15 17	S6 8	13.0 15.0	SP	13.0	Medium dense tan poorly graded SAND (SP), mps 4 mm, occasionally stratified, no odor, wet -GLACIOFLUVIAL DEPOSITS-			10	50	40					
15					15.0	BOTTOM OF EXPLORATION 15.0 FT Note: Sample S3 taken with 3 inch diameter split spoon and 140 lb hammer.										

Water Level Data

Date	Time	Elapsed Time (hr.)	Depth (ft) to: Bottom of Casing	Bottom of Hole	Water
12/9/2015	14:00	0.2	10.0	14.2	13.0

Sample ID

O - Open End Rod
T - Thin Wall Tube
U - Undisturbed Sample
S - Split Spoon Sample

Well Diagram

Riser Pipe
Screen
Filter Sand
Cuttings
Grout
Concrete
Bentonite Seal

Summary

Overburden (ft)	15.0
Rock Cored (ft)	-
Samples	6S

Boring No. B18A

Field Tests: **Dilatancy**: R - Rapid S - Slow N - None
Toughness: L - Low M - Medium H - High
Plasticity: N - Nonplastic L - Low M - Medium H - High
Dry Strength: N - None L - Low M - Medium H - High V - Very High

†**Note: Maximum particle size is determined by direct observation within the limitations of sampler size.**

Note: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

TEST BORING REPORT

Boring No. B19

Project	NORTHERN PASS TRANSMISSION LINE, N. WOODSTOCK TO PLYMOUTH, NH
Client	EVERSOURCE
Contractor	NEW ENGLAND BORING CONTRACTORS

File No. 40460-200
Sheet No. 1 of 1
Start December 9, 2015
Finish December 9, 2015
Driller M. Souze
H&A Rep. C. Smith
Elevation
Datum
Location See Plan

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	HW	S	-	Rig Make & Model: Mobile B47 Truck
Inside Diameter (in.)	4.0	1 3/8	-	Bit Type: Roller Bit
Hammer Weight (lb)	300	140	-	Drill Mud: None
Hammer Fall (in.)	24	30	-	Casing: HW Drive to 13.0 ft
				Hoist/Hammer: Cat-Head Safety Hammer
				PID Make & Model:

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	USCS Symbol	Stratum Change Elev/Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (Density/consistency, color, GROUP NAME, max. particle size†, structure, odor, moisture, optional descriptions GEOLOGIC INTERPRETATION)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
0	10 7	S1 8	0.0 1.0	SP		Medium dense poorly graded SAND with gravel (SP), mps 2 in., no structure, no odor, dry	5	10	10	15	55	5				
					1.0	-FILL-										
	7 4	S1A 8	1.0 2.0	SP		Medium dense brown poorly graded SAND (SP), mps 5 mm, no structure, no odor, dry				10	85	5				
	5 5 9 8	S2 9	2.0 4.0	SP		Medium dense tan poorly graded SAND (SP), mps 5 mm, no structure, no odor, dry				10	85	5				
						-ALLUVIAL DEPOSITS-										
	8* 15*	S3 6	4.0 5.0	SP		Similar to above except dense and interbedded				20	75	5				
5	19* 17*	S3A 8	5.0 6.0	SP	5.0	Dense brown poorly graded SAND with gravel (SP), mps 3 in., no structure, no odor, dry	15	5	20	20	40					
	14 16 10 10	S4 13	6.0 8.0	SP		Note: 3 inch piece of gravel in tip. Similar to above except medium dense mps 1.3 in.	10	5	15	25	45					
	16 20 14 13	S5 10	8.0 10.0	SP		Dense brown poorly graded SAND with gravel (SP), mps 2 in., no structure, no odor, dry	10	5	20	30	35					
10						-GLACIOFLUVIAL DEPOSITS-										
	14 12 9 7	S6 9	13.0 15.0	SW		Medium dense brown well graded SAND with gravel (SW), mps 1.5 in., no structure, no odor, moist	15	10	25	25	25					
15					15.0	BOTTOM OF EXPLORATION 15.0 FT										
						*Indicates 3 inch spoon used with 300 lb hammer.										

Water Level Data

Date	Time	Elapsed Time (hr.)	Depth (ft) to: Bottom of Casing	Bottom of Hole	Water
12/9/2015	13:45	0.1	8.0	15.0	Dry

Sample ID

O - Open End Rod
T - Thin Wall Tube
U - Undisturbed Sample
S - Split Spoon Sample

Well Diagram

Riser Pipe
Screen
Filter Sand
Cuttings
Grout
Concrete
Bentonite Seal

Summary

Overburden (ft) 15.0
Rock Cored (ft) -
Samples 6S

Boring No. B19

Field Tests: **Dilatancy**: R - Rapid S - Slow N - None
Toughness: L - Low M - Medium H - High
Plasticity: N - Nonplastic L - Low M - Medium H - High
Dry Strength: N - None L - Low M - Medium H - High V - Very High

†**Note: Maximum particle size is determined by direct observation within the limitations of sampler size.**

Note: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

TEST BORING REPORT

Boring No. B19A

Project	NORTHERN PASS TRANSMISSION LINE, N. WOODSTOCK TO PLYMOUTH, NH
Client	EVERSOURCE
Contractor	NEW ENGLAND BORING CONTRACTORS

File No. 40460-200
Sheet No. 1 of 2
Start December 11, 2015
Finish December 11, 2015
Driller M. Souze
H&A Rep. C. Smith
Elevation
Datum
Location See Plan

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	HW	S	NX	Rig Make & Model: Mobile B47 Truck
Inside Diameter (in.)	4.0	1 3/8	1.9	Bit Type: Roller Bit
Hammer Weight (lb)	300	140	-	Drill Mud: None
Hammer Fall (in.)	24	30	-	Casing: HW Drive to 5.0 ft
				Hoist/Hammer: Cat-Head Safety Hammer
				PID Make & Model:

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	USCS Symbol	Stratum Change Elev/Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (Density/consistency, color, GROUP NAME, max. particle size†, structure, odor, moisture, optional descriptions GEOLOGIC INTERPRETATION)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
0	1 1 2 1	S1 8	0.0 2.0	SM		Very loose black silty SAND (SM), mps 0.25 in., no structure, no odor, dry, trace root ribers -FOREST MAT-		5	10	15	40	30				
	4 7 16 30	S2 2	2.0 4.0	SP	2.0	Medium dense brown poorly graded SAND with gravel (SP), mps 1.3 in., no structure, no odor, dry -GLACIOFLUVIAL DEPOSITS-	5	10	15	25	40	5				
	19* 112*	S3 12	4.0 5.0	SP	5.0	Very dense gray poorly graded SAND (SP), mps 1.3 in., stratified, no odor, moist TOP OF BEDROCK 5.0 FT			5	15	75	5				
5						Note: Advanced roller bit through bedrock from 5.0 - 10.0 ft., exhibiting occasional weathered zones.										
10						SEE CORE BORING REPORT FOR ROCK DETAILS										
15																

Water Level Data

Date	Time	Elapsed Time (hr.)	Depth (ft) to: Bottom of Casing	Bottom of Hole	Water
12/11/2015	14:00	0.1	NA	15.0	Dry

Sample ID
O - Open End Rod
T - Thin Wall Tube
U - Undisturbed Sample
S - Split Spoon Sample

Well Diagram
Riser Pipe
Screen
Filter Sand
Cuttings
Grout
Concrete
Bentonite Seal

Summary
Overburden (ft) 5
Rock Cored (ft) 10
Samples 3S, 1C

Boring No. B19A

Field Tests: **Dilatancy**: R - Rapid S - Slow N - None
Toughness: L - Low M - Medium H - High
Plasticity: N - Nonplastic L - Low M - Medium H - High
Dry Strength: N - None L - Low M - Medium H - High V - Very High

†**Note: Maximum particle size is determined by direct observation within the limitations of sampler size.**

Note: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

HALEY ALDRICH

CORE BORING REPORT

Boring No. **B19A**
File No. 40460-200
Sheet No. 2 of 2

Depth (ft)	Drilling Rate (min./ft)	Run No.	Run Depth (ft)	Recovery/RQD in.	Recovery/RQD %	Weath-ering	Elev./ Depth (ft)	Visual Description and Remarks
								SEE TEST BORING REPORT FOR OVERBURDEN DETAILS
10	3	C1	10.0	60	100	Fresh		Hard, fresh, blue-gray, medium grained GRANITE. Joints horizontal, widely spaced, rough, stepped, discolored, open.
			15.0	60	100			Note: Secondary quartz mineralization.
	3							
	3							-BEDROCK-
	3							
	3							
15							15.0	BOTTOM OF EXPLORATION 15.0 FT
								*Indicates 3 inch spoon used with 300 lb hammer
20								
25								
30								
35								
40								

TEST BORING REPORT

Boring No. B20

Project	NORTHERN PASS TRANSMISSION LINE, N. WOODSTOCK TO PLYMOUTH, NH
Client	EVERSOURCE
Contractor	NEW ENGLAND BORING CONTRACTORS

File No. 40460-200
Sheet No. 1 of 1
Start December 10, 2015
Finish December 10, 2015
Driller M. Souze
H&A Rep. C. Smith
Elevation Datum
Location See Plan

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	HW	S	-	Rig Make & Model: Mobile B47 Truck
Inside Diameter (in.)	4.0	1 3/8	-	Bit Type: Roller Bit
Hammer Weight (lb)	300	140	-	Drill Mud: None
Hammer Fall (in.)	24	30	-	Casing: HW Drive to 9.0 ft
				Hoist/Hammer: Cat-Head Safety Hammer
				PID Make & Model:

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	USCS Symbol	Stratum Change Elev/Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (Density/consistency, color, GROUP NAME, max. particle size†, structure, odor, moisture, optional descriptions GEOLOGIC INTERPRETATION)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
0	3 4 5 7	S1 15	0.0 2.0	SP-SM	0.5	-POSSIBLE FILL- Note: Top 6 inches appears to be reworked.	10	10	10	35	25	10				
						Loose dark brown poorly graded SAND with silt and gravel (SP-SM), mps 1 in., no structure, no odor, dry										
	8 9 9 11	S2 14	2.0 4.0	SW		Medium dense yellow-brown well graded SAND with gravel (SW), mps 0.75 in., no structure, no odor, dry	5	10	25	35	25					
						-GLACIOFLUVIAL DEPOSITS-										
	8* 10* 14* 15*	S3 20	4.0 6.0	SW		Similar to above except moist and mps 1 in.	10	10	25	35	20					
5																
	4 8 7	S4 13	6.0 7.3	SW		Medium dense brown well graded SAND (SW), mps 0.25 in., no structure, no odor, wet		10	30	35	25					
	5	S4A 7	7.3 8.0	SM	7.3	Medium dense gray silty SAND (SM), mps 2 mm, interbedded, no odor, wet					55	45				
	5 5 6 10	S5 18	8.0 10.0			Similar to above					55	45				
10						-GLACIOFLUVIAL DEPOSITS-											
	5 5 7 6	S6 20	13.0 15.0	SM		Medium dense gray-brown silty SAND (SM), mps 2 mm, interbedded, no odor, wet				5	55	40				
15					15.0	BOTTOM OF EXPLORATION 15.0 FT										
						*Indicates 3 inch spoon used with 300 lb hammer										

Water Level Data

Date	Time	Elapsed Time (hr.)	Depth (ft) to: Bottom of Casing	Bottom of Hole	Water
12/10/2015	09:30	0.5	7.0	7.5	5.4

Sample ID
O - Open End Rod
T - Thin Wall Tube
U - Undisturbed Sample
S - Split Spoon Sample

Well Diagram
Riser Pipe
Screen
Filter Sand
Cuttings
Grout
Concrete
Bentonite Seal

Summary
Overburden (ft) 15.0
Rock Cored (ft) -
Samples 6S

Boring No. B20

Field Tests: **Dilatancy**: R - Rapid S - Slow N - None
Toughness: L - Low M - Medium H - High
Plasticity: N - Nonplastic L - Low M - Medium H - High
Dry Strength: N - None L - Low M - Medium H - High V - Very High

†**Note: Maximum particle size is determined by direct observation within the limitations of sampler size.**

Note: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

HALEY ALDRICH

TEST BORING REPORT

Boring No. B20A

Project	NORTHERN PASS TRANSMISSION LINE, N. WOODSTOCK TO PLYMOUTH, NH
Client	EVERSOURCE
Contractor	NEW ENGLAND BORING CONTRACTORS

File No. 40460-200
Sheet No. 1 of 1
Start December 10, 2015
Finish December 10, 2015
Driller K. Smith
H&A Rep. T. Erickson
Elevation
Datum
Location See Plan

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	HW	S	-	Rig Make & Model: Diedrich D120 Truck
Inside Diameter (in.)	4.0	1 3/8	-	Bit Type: Roller Bit
Hammer Weight (lb)	300	140	-	Drill Mud: None
Hammer Fall (in.)	24	30	-	Casing: HW Drive to 13.0 ft, uncased to 15.0 ft
				Hoist/Hammer: Winch Safety Hammer
				PID Make & Model:

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	USCS Symbol	Stratum Change Elev/Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (Density/consistency, color, GROUP NAME, max. particle size†, structure, odor, moisture, optional descriptions GEOLOGIC INTERPRETATION)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
0	3 3 3 10	S1 15	0.0 2.0	OL/ OH SP	0.3	-TOPSOIL- Loose tan and light brown poorly graded SAND (SP), mps 0.5 in., no structure, no odor, dry		10	10	15	5 60	95 5	R			
	25 44 23	S2 10	2.0 3.5			-FILL- Similar to above except very dense										
	18	S2A	3.5	SP	3.5	Very dense tan poorly graded SAND (SP), mps 0.75 in., very slightly stratified (color only, not grain size), no odor, dry	5	5	15	35	40					
	25* 28* 38* 73*	6 S3 16	4.0 4.0 6.0	SP		Very dense tan and light brown poorly graded SAND (SP), mps 0.5 in., no structure, no odor, wet		10	20	35	35					
5	32 40 73 59	S4 20	6.0 8.0	SP		Very dense tan and light brown poorly graded SAND with gravel (SP), mps 0.75 in., no structure, no odor, wet	5	10	20	35	30					
						-GLACIOFLUVIAL DEPOSITS-										
	43 46 31 44	S5 10	8.0 10.0	SP		Very dense tan and light brown poorly graded SAND (SP), mps 0.75 in., no structure, no odor, wet		10	20	35	35					
10					10.0											
	5 4 3 7	S6 12	13.0 15.0	SP		Loose tan and light brown poorly graded SAND (SP), mps 2 mm, occasionally stratified, no odor, wet				30	70					
						-GLACIOFLUVIAL DEPOSITS-										
15					15.0	BOTTOM OF EXPLORATION 15.0 FT										
						Note: *Sample S3 was taken with a 3 inch diameter split spoon and 140 lb hammer for thermal samples.										

Water Level Data

Date	Time	Elapsed Time (hr.)	Depth (ft) to: Bottom of Casing	Bottom of Hole	Water
12/10/2015	10:00	0.2	0.0	13.2	7.9

Sample ID

O - Open End Rod
T - Thin Wall Tube
U - Undisturbed Sample
S - Split Spoon Sample

Well Diagram

Riser Pipe
Screen
Filter Sand
Cuttings
Grout
Concrete
Bentonite Seal

Summary

Overburden (ft) 15.0
Rock Cored (ft) -
Samples 6S

Boring No. B20A

Field Tests: **Dilatancy**: R - Rapid S - Slow N - None
Toughness: L - Low M - Medium H - High
Plasticity: N - Nonplastic L - Low M - Medium H - High
Dry Strength: N - None L - Low M - Medium H - High V - Very High

†**Note: Maximum particle size is determined by direct observation within the limitations of sampler size.**

Note: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

TEST BORING REPORT

Boring No. B21

Project	NORTHERN PASS TRANSMISSION LINE, N. WOODSTOCK TO PLYMOUTH, NH
Client	EVERSOURCE
Contractor	NEW ENGLAND BORING CONTRACTORS

File No. 40460-200
Sheet No. 1 of 1
Start December 10, 2015
Finish December 10, 2015
Driller M. Souze
H&A Rep. C. Smith
Elevation
Datum
Location See Plan

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	HW	S	-	Rig Make & Model: Mobile B47 Truck
Inside Diameter (in.)	4.0	1 3/8	-	Bit Type: Roller Bit
Hammer Weight (lb)	300	140	-	Drill Mud: None
Hammer Fall (in.)	24	30	-	Casing: HW Drive to 8.0 ft
				Hoist/Hammer: Cat-Head Safety Hammer
				PID Make & Model:

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	USCS Symbol	Stratum Change Elev/Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (Density/consistency, color, GROUP NAME, max. particle size†, structure, odor, moisture, optional descriptions GEOLOGIC INTERPRETATION)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
0						4 inch of Bituminous ASPHALT										
	10 18 18 13	S1 2	0.3 2.0	SP	0.3	Dense brown poorly graded SAND with gravel (SP), mps 1 in., no structure, no odor, dry Note: Poor recovery.	5	10	20	35	25	5				
	7 9	S2 4	2.0 3.0	SP		-FILL- Medium dense brown poorly graded SAND (SP), mps 1 in., no structure, no odor, dry	5	5	15	35	40					
	6 7	S2A 6	3.0 4.0	SM	3.0	Medium dense brown silty SAND (SM), mps 2 mm, interbedded, no odor, wet					55	45				
	14* 18* 19* 17*	S3 10	4.0 6.0	SM		Similar to above except dense				10	70	20				
5																
	9 9 10 11	S4 8	6.0 8.0	SM		Medium dense gray silty SAND (SM), mps 2 mm, interbedded, no odor, wet -GLACIOFLUVIAL DEPOSITS-				5	55	40				
	3 4 7 71	S5 24	8.0 10.0	ML		Medium dense sandy SILT (ML), mps 2 mm, interbedded fine sand, no odor, wet					40	60				
10																
	8 9 11 9	S6 10	13.0 15.0	SM		Medium dense gray silty SAND (SM), mps 2 mm, interbedded, no odor, wet				5	70	25				
15					15.0	BOTTOM OF EXPLORATION 15.0 FT *Indicates 3 inch spoon used with 300 lb hammer										

Water Level Data

Date	Time	Elapsed Time (hr.)	Depth (ft) to: Bottom of Casing	Bottom of Hole	Water
12/10/2015	11:30	0.5	8.0	15.0	7.4**

**Water level dropping not stable

Sample ID
- O - Open End Rod
- T - Thin Wall Tube
- U - Undisturbed Sample
- S - Split Spoon Sample

Well Diagram
- Riser Pipe
- Screen
- Filter Sand
- Cuttings
- Grout
- Concrete
- Bentonite Seal

Summary
- Overburden (ft) 15.0
- Rock Cored (ft) -
- Samples 6S

Boring No. B21

Field Tests: **Dilatancy**: R - Rapid S - Slow N - None
Toughness: L - Low M - Medium H - High
Plasticity: N - Nonplastic L - Low M - Medium H - High
Dry Strength: N - None L - Low M - Medium H - High V - Very High

†**Note: Maximum particle size is determined by direct observation within the limitations of sampler size.**

Note: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

TEST BORING REPORT

Boring No. B21A

Project	NORTHERN PASS TRANSMISSION LINE, N. WOODSTOCK TO PLYMOUTH, NH
Client	EVERSOURCE
Contractor	NEW ENGLAND BORING CONTRACTORS

File No. 40460-200
Sheet No. 1 of 1
Start December 10, 2015
Finish December 10, 2015
Driller K. Smith
H&A Rep. T. Erickson
Elevation
Datum
Location See Plan

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	HW	S	-	Rig Make & Model: Diedrich D120 Truck
Inside Diameter (in.)	4.0	1 3/8	-	Bit Type: Roller Bit
Hammer Weight (lb)	300	140	-	Drill Mud: None
Hammer Fall (in.)	24	30	-	Casing: HW Drive to 9.0 ft, uncased to 15.0 ft
				Hoist/Hammer: Winch Safety Hammer
				PID Make & Model:

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	USCS Symbol	Stratum Change Elev/Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (Density/consistency, color, GROUP NAME, max. particle size†, structure, odor, moisture, optional descriptions GEOLOGIC INTERPRETATION)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
0	7 9 10 10	S1 16	0.0 2.0	SP		Medium dense light brown poorly graded SAND with gravel (SP), mps 0.25 in., no structure, no odor, wet -FILL-		15	15	35	30	5				
	3 14 5 13	S2 6	2.0 4.0	SP		Medium dense light brown poorly graded SAND with gravel (SP), mps 1.0 in., silty fine sand lens from 3.5 - 3.7 ft, no odor, wet	5	10	30	35	15	5				
	21* 30* 33* 43*	S3 20	4.0 6.0	SP	4.0	Very dense olive-brown poorly graded SAND with gravel (SP), mps 1.3 in., loosely to moderately bonded, no odor, wet	10	10	15	25	40					
5	25 29 31 33	S4 18	6.0 8.0	SP		Very dense gray and gray-brown poorly graded SAND with gravel (SP), mps 1.0 in., well bonded, no odor, wet -GLACIAL TILL DEPOSITS-	10	10	15	25	40					
	23 31 70 115	S5 12	8.0 10.0	SP		Very dense gray-brown poorly graded SAND with gravel (SP), mps 1.25 in., well bonded, no odor, wet	20	25	15	25	15					
10																
	100/2"	S6 0	13.0 13.2			No recovery Note: Drill bit advanced to 15.0 ft through numerous cobbles as indicated by drilling action.										
15					15.0	BOTTOM OF EXPLORATION 15.0 FT Note: Sample S3 taken with 3 inch diameter split spoon and 140 lb hammer for thermal sample.										

Water Level Data

Date	Time	Elapsed Time (hr.)	Depth (ft) to: Bottom of Casing	Bottom of Hole	Water
12/10/2015	14:00	0.2	0.0	12.3	2.9

Sample ID
O - Open End Rod
T - Thin Wall Tube
U - Undisturbed Sample
S - Split Spoon Sample

Well Diagram
Riser Pipe
Screen
Filter Sand
Cuttings
Grout
Concrete
Bentonite Seal

Summary
Overburden (ft) 15.0
Rock Cored (ft) -
Samples 6S

Boring No. B21A

Field Tests: **Dilatancy**: R - Rapid S - Slow N - None **Toughness**: L - Low M - Medium H - High **Plasticity**: N - Nonplastic L - Low M - Medium H - High **Dry Strength**: N - None L - Low M - Medium H - High V - Very High

†**Note: Maximum particle size is determined by direct observation within the limitations of sampler size.**

Note: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

TEST BORING REPORT

Boring No. B22

Project	NORTHERN PASS TRANSMISSION LINE, N. WOODSTOCK TO PLYMOUTH, NH
Client	EVERSOURCE
Contractor	NEW ENGLAND BORING CONTRACTORS

File No. 40460-200
Sheet No. 1 of 1
Start December 10, 2015
Finish December 10, 2015
Driller M. Souze
H&A Rep. C. Smith
Elevation
Datum
Location See Plan

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	HW	S	-	Rig Make & Model: Mobile B47 Truck
Inside Diameter (in.)	4.0	1 3/8	-	Bit Type: Roller Bit
Hammer Weight (lb)	300	140	-	Drill Mud: None
Hammer Fall (in.)	24	30	-	Casing: HW Drive to 9.0 ft
				Hoist/Hammer: Cat-Head Safety Hammer
				PID Make & Model:

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	USCS Symbol	Stratum Change Elev/Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (Density/consistency, color, GROUP NAME, max. particle size†, structure, odor, moisture, optional descriptions GEOLOGIC INTERPRETATION)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
0	5 7 6 6	S1 12	0.0 2.0	SP		Medium dense yellow-brown poorly graded SAND with gravel (SP), mps 1.25 in., no structure, no odor, dry	10	10	15	35	30					
	5 4	S2 9	2.0 3.0	SP		Similar to above except appears to be disturbed and loose -FILL-	10	5	20	30	35					
	5 8	S2A 10	3.0 4.0	SM	3.0	Loose brown silty SAND (SM), mps 5 mm, interbedded, no odor, dry -ALLUVIAL DEPOSITS-				10	75	15				
	17* 15* 14* 12*	S3 15	4.0 6.0	SW	4.0	Medium dense brown well graded SAND (SW), mps 0.5 in., 2 inch pocket of silty sand (SM), no odor, dry		5	30	35	30					
5	6 4 4 7	S4 17	6.0 8.0	SP		Loose tan poorly graded SAND (SP), mps 0.25 in., one 5 inch pocket of silty sand (interbedded), no odor, dry -GLACIOFLUVIAL DEPOSITS-		5	15	35	45					
	7 6 5 4	S5 16	8.0 10.0	SP		Medium dense tan poorly graded SAND (SP), mps 0.25 in., coarsening downward, no odor, dry			15	35	50					
10																
	4 6 10 16	S6 11	13.0 15.0	SP		Similar to above		5	15	30	50					
15					15.0	BOTTOM OF EXPLORATION 15.0 FT *Indicates 3 inch spoon used with 300 lb hammer										

Water Level Data

Date	Time	Elapsed Time (hr.)	Depth (ft) to: Bottom of Casing	Bottom of Hole	Water
12/10/2015	14:30	0.25	9.0	13.0	11.1

Sample ID
O - Open End Rod
T - Thin Wall Tube
U - Undisturbed Sample
S - Split Spoon Sample

Well Diagram
Riser Pipe
Screen
Filter Sand
Cuttings
Grout
Concrete
Bentonite Seal

Summary
Overburden (ft) 15.0
Rock Cored (ft) -
Samples 6S

Boring No. B22

Field Tests: **Dilatancy**: R - Rapid S - Slow N - None
Toughness: L - Low M - Medium H - High
Plasticity: N - Nonplastic L - Low M - Medium H - High
Dry Strength: N - None L - Low M - Medium H - High V - Very High

†**Note: Maximum particle size is determined by direct observation within the limitations of sampler size.**

Note: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

TEST BORING REPORT

Boring No. B22A

Project	NORTHERN PASS TRANSMISSION LINE, N. WOODSTOCK TO PLYMOUTH, NH
Client	EVERSOURCE
Contractor	NEW ENGLAND BORING CONTRACTORS

File No. 40460-200
Sheet No. 1 of 1
Start December 10, 2015
Finish December 11, 2015
Driller K. Smith
H&A Rep. T. Erickson
Elevation Datum
Location See Plan

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	HW	S	-	Rig Make & Model: Diedrich D120 Truck
Inside Diameter (in.)	4.0	1 3/8	-	Bit Type: Roller Bit
Hammer Weight (lb)	300	140	-	Drill Mud: None
Hammer Fall (in.)	24	30	-	Casing: HW Drive to 9.0 ft, uncased to 15.0 ft
				Hoist/Hammer: Winch Safety Hammer
				PID Make & Model:

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	USCS Symbol	Stratum Change Elev/Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (Density/consistency, color, GROUP NAME, max. particle size†, structure, odor, moisture, optional descriptions GEOLOGIC INTERPRETATION)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
0	1 3 6	S1 16	0.0 1.5	OL/ OH SP	0.1	-TOPSOIL- Loose brown poorly graded SAND (SP), mps 0.25 in., no structure, no odor, dry		5	5	10	5 80	95	R			
	8	S1A 6	1.5 2.0	SP	1.5	-FILL- Medium dense tan poorly graded SAND (SP), mps 0.25 in., no structure, no odor			5	5	90					
	16 15 18 23	S2 <1	2.0 4.0			No recovery, gravel in tip of spoon										
5	16* 13* 16* 21*	S3 16	4.0 6.0	SP		Dense tan and brown poorly graded SAND (SP), mps 0.75 in., no structure, no odor, dry		10	5	5	80					
	10 10 8 10	S4 16	6.0 8.0	SP		Medium dense yellow-brown poorly graded SAND (SP), mps 2 mm, no structure, no odor, dry -GLACIOFLUVIAL DEPOSITS-				5	90	5				
10	8 6 7 8	S5 12	8.0 10.0	SP		Medium dense light brown poorly graded SAND (SP), mps 2 mm, no structure, no odor, wet				5	95					
15	9 9 10 12	S6 14	13.0 15.0	SP		Medium dense gray-brown poorly graded SAND (SP), mps 2 mm, stratified, no odor, wet				15	85					
					15.0	BOTTOM OF EXPLORATION 15.0 FT Note: *Sample S3 taken with 3 inch diameter split spoon and 140 lb hammer.										

Water Level Data

Date	Time	Elapsed Time (hr.)	Depth (ft) to: Bottom of Casing	Bottom of Hole	Water
12/11/2015	09:15	0.2	0.0	12.6	10.1

Sample ID
O - Open End Rod
T - Thin Wall Tube
U - Undisturbed Sample
S - Split Spoon Sample

Well Diagram
Riser Pipe
Screen
Filter Sand
Cuttings
Grout
Concrete
Bentonite Seal

Summary
Overburden (ft) 15.0
Rock Cored (ft) -
Samples 6S

Boring No. B22A

Field Tests: **Dilatancy**: R - Rapid S - Slow N - None
Toughness: L - Low M - Medium H - High
Plasticity: N - Nonplastic L - Low M - Medium H - High
Dry Strength: N - None L - Low M - Medium H - High V - Very High

†**Note: Maximum particle size is determined by direct observation within the limitations of sampler size.**

Note: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

TEST BORING REPORT

Boring No. B23

Project	NORTHERN PASS TRANSMISSION LINE, N. WOODSTOCK TO PLYMOUTH, NH
Client	EVERSOURCE
Contractor	NEW ENGLAND BORING CONTRACTORS

File No. 40460-200
Sheet No. 1 of 1
Start December 11, 2015
Finish December 11, 2015
Driller K. Smith
H&A Rep. T. Erickson
Elevation
Datum
Location See Plan

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	HW	S	-	Rig Make & Model: Diedrich D120 Truck
Inside Diameter (in.)	4.0	1 3/8	-	Bit Type: Roller Bit
Hammer Weight (lb)	300	140	-	Drill Mud: None
Hammer Fall (in.)	24	30	-	Casing: HW Drive to 4.0 ft, uncased to 15.0 ft
				Hoist/Hammer: Winch Safety Hammer
				PID Make & Model:

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	USCS Symbol	Stratum Change Elev/Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (Density/consistency, color, GROUP NAME, max. particle size†, structure, odor, moisture, optional descriptions GEOLOGIC INTERPRETATION)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
0	2 3 3 12	S1 16	0.0 2.0	OL/ OH SP	0.3	-TOPSOIL- Loose brown poorly graded SAND (SP), mps 0.25 in., no structure, no odor, wet		10	5	5	5 75	95 5	R			
	17 36 47 60	S2 16	2.0 4.0	SP	1.8	-FILL- Very dense light brown poorly graded SAND (SP), mps 0.5 in., occasional minor stratification, no odor, dry -GLACIOFLUVIAL DEPOSITS-		5		30	60	5				
	46* 47* 48* 66*	S3 20	4.0 6.0	SP- SM	3.6	Very dense olive poorly graded SAND with silt and gravel (SP-SM), mps 1.3 in., occasional silt/clay lenses, occasional stratified sand with gravel, well bonded, no odor, moist -GLACIAL TILL DEPOSITS-	15	5	10	15	45	10				
5	37 60 31 42	S4 20	6.0 8.0	SM	7.0	Very dense red-brown and dark brown silty SAND (SM), mps 2 mm, structure appears to be of highly weathered cobble or boulder fragment, no odor, wet -GLACIAL TILL DEPOSITS-				5	75	20				
	19 49 63 103	S5 13	8.0 10.0	SM	7.6	Very dense olive and gray-brown silty SAND with gravel (SM), mps 1.25 in., very well bonded, occasional sand/gravel or silt/sand layers, no odor, wet -GLACIAL TILL DEPOSITS-	15	15	10	15	25	20				
10																
	54 37 48 116	S6 12	13.0 15.0	CL	14.0	Hard olive and gray lean CLAY (CL), mps <1 mm, dessicated, mottled, infrequent fine sand partings, no odor, wet						100	S	H	L	H
15					15.0	-GLACIOLACUSTRINE DEPOSITS- BOTTOM OF EXPLORATION 15.0 FT										

Note: Sample S3 taken with 3 inch diameter split spoon and 140 lb hammer.

Water Level Data

Date	Time	Elapsed Time (hr.)	Depth (ft) to: Bottom of Casing	Bottom of Hole	Water
12/11/2015	12:00	0.3	0.0	12.3	3.8

Sample ID
O - Open End Rod
T - Thin Wall Tube
U - Undisturbed Sample
S - Split Spoon Sample

Well Diagram
Riser Pipe
Screen
Filter Sand
Cuttings
Grout
Concrete
Bentonite Seal

Summary
Overburden (ft) 15.0
Rock Cored (ft) -
Samples 6S

Boring No. B23

Field Tests: **Dilatancy**: R - Rapid S - Slow N - None
Toughness: L - Low M - Medium H - High
Plasticity: N - Nonplastic L - Low M - Medium H - High
Dry Strength: N - None L - Low M - Medium H - High V - Very High

†**Note: Maximum particle size is determined by direct observation within the limitations of sampler size.**

Note: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

TEST BORING REPORT

Boring No. B23A

Project	NORTHERN PASS TRANSMISSION LINE, N. WOODSTOCK TO PLYMOUTH, NH
Client	EVERSOURCE
Contractor	NEW ENGLAND BORING CONTRACTORS

File No. 40460-200
Sheet No. 1 of 1
Start December 14, 2015
Finish December 14, 2015
Driller M. Souze
H&A Rep. C. Smith
Elevation
Datum
Location See Plan

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	HW	S	-	Rig Make & Model: Mobile B47 Truck
Inside Diameter (in.)	4.0	1 3/8	-	Bit Type: Roller Bit
Hammer Weight (lb)	300	140	-	Drill Mud: None
Hammer Fall (in.)	24	30	-	Casing: HW Drive to 9.0 ft
				Hoist/Hammer: Cat-Head Safety Hammer
				PID Make & Model:

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	USCS Symbol	Stratum Change Elev/Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (Density/consistency, color, GROUP NAME, max. particle size†, structure, odor, moisture, optional descriptions GEOLOGIC INTERPRETATION)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
0					0.5	6 inch Bituminous ASPHALT										
	25	S1	0.5	SP		Medium dense brown poorly graded SAND with gravel (SP), mps 1.3 in., no structure, no odor, dry	10	5	15	30	40					
	17	4	1.0	SP-						5	85	10				
	10	S1A	1.0	SM		Medium dense poorly graded SAND with silt (SP-SM), mps 5 mm, no structure, no odor, dry										
	12	9	2.0	SP-						5	85	10				
	16	S2	2.0	SM		Very dense poorly graded SAND with silt (SP-SM), mps 1.3 in., stratified										
	42	14	3.7			6 inch pocket of poorly graded GRAVEL with sand (GP), 5.5 - 6.0 ft, no										
	55			GP		odor, dry	60	15		5	20					
	100/3"															
	10*	S3	4.0	SM		Medium dense gray silty SAND (SM), mps 3 in., interbedded and <4 inch					85	15				
	10*	9	6.0			pocket of poorly graded SAND with gravel (SP), slightly bonded										
5	14*						10	5	15	35	30	5				
	13*						10	5	15	15	40	15				
	16	S4	6.0	SW		Dense brown well graded SAND with gravel (SW), transitioning to a gray	15	5	25	30	25					
	21	3	8.0	SM		silty SAND (SM), stratified, no odor, wet					70	30				
	25					Note: Poor recovery.										
	27															
	70	S5	8.0	SM		Very dense gray silty SAND with gravel (SM), mps 1.3 in., no structure, no	5	10	15	20	35	15				
	40	18	10.0			odor, dry										
	41															
10	31					-GLACIOFLUVIAL DEPOSITS-										
	25	S6	13.0	SP		Very dense gray poorly graded SAND (SP), mps 5 mm, no structure, no				20	75	5				
	39	22	15.0			odor, dry										
	42															
	55															
15					15.0	BOTTOM OF EXPLORATION 15.0 FT										

*Indicates 3 inch spoon used with 300 lb hammer

Water Level Data

Date	Time	Elapsed Time (hr.)	Depth (ft) to: Bottom of Casing	Bottom of Hole	Water
12/14/2015	10:10	0.25	7.0	13.0	Dry

Sample ID
O - Open End Rod
T - Thin Wall Tube
U - Undisturbed Sample
S - Split Spoon Sample

Well Diagram
Riser Pipe
Screen
Filter Sand
Cuttings
Grout
Concrete
Bentonite Seal

Summary
Overburden (ft) 15.0
Rock Cored (ft) -
Samples 6S

Boring No. B23A

Field Tests: **Dilatancy**: R - Rapid S - Slow N - None **Toughness**: L - Low M - Medium H - High **Plasticity**: N - Nonplastic L - Low M - Medium H - High **Dry Strength**: N - None L - Low M - Medium H - High V - Very High

†**Note: Maximum particle size is determined by direct observation within the limitations of sampler size.**

Note: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

TEST BORING REPORT

Boring No. B24

Project	NORTHERN PASS TRANSMISSION LINE, N. WOODSTOCK TO PLYMOUTH, NH
Client	EVERSOURCE
Contractor	NEW ENGLAND BORING CONTRACTORS

File No. 40460-200
Sheet No. 1 of 1
Start December 11, 2015
Finish December 11, 2015
Driller K. Smith
H&A Rep. T. Erickson
Elevation Datum
Location See Plan

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	HW	S	-	Rig Make & Model: Diedrich D120 Truck
Inside Diameter (in.)	4.0	1 3/8	-	Bit Type: Roller Bit
Hammer Weight (lb)	300	140	-	Drill Mud: None
Hammer Fall (in.)	24	30	-	Casing: HW Drive to 13.0 ft, uncased to 15.0 ft
				Hoist/Hammer: Winch Safety Hammer
				PID Make & Model:

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	USCS Symbol	Stratum Change Elev/Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (Density/consistency, color, GROUP NAME, max. particle size†, structure, odor, moisture, optional descriptions GEOLOGIC INTERPRETATION)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
0	4 7 6 7	S1 18	0.0 2.0	OL/ OH SP	0.2	-TOPSOIL- Medium dense brown poorly graded SAND (SP), mps 0.25 in., no structure, no odor, dry		10	10	20	5 55	95 5	R			
					1.7	-FILL-										
	8 13 10 6	S2 6	2.0 4.0	SP		Medium dense tan poorly graded SAND (SP), mps 0.25 in., no structure, no odor, dry -FILL-		5	10	20	65					
	41* 39* 41* 33*	S3 20	4.0 6.0	SP	4.5	Very dense tan poorly graded SAND (SP), mps 4 mm, occasional stratification, no odor, dry				15	85					
5	27 12 10 12	S4 15	6.0 8.0	SP		Medium dense tan and light gray poorly graded SAND (SP), mps 2 mm, stratified with occasional very fine sand layers, no odor, wet -GLACIOFLUVIAL DEPOSITS-				10	85	5				
	12 12 12 15	S5 12	8.0 10.0	SP		Medium dense tan and light brown poorly graded SAND (SP), mps 2 mm, stratified, no odor, wet				5	90	5				
10					10.5	Note: Drilling action indicated a strata change at 10.5 ft.										
	16 82 100/3"	S6 6	13.0 14.3	SP		Very dense light brown poorly graded SAND with gravel (SP), mps 1.25 in., slightly bonded, no odor, wet -GLACIAL TILL DEPOSITS-										
15					15.0	BOTTOM OF EXPLORATION 15.0 FT										
						Note: Advanced roller bit to 15.0 ft through probable glacial till.										
						Note: *Sample S3 taken with 140 lb hammer and 3 inch diameter split spoon.										

Water Level Data

Date	Time	Elapsed Time (hr.)	Depth (ft) to: Bottom of Casing	Bottom of Hole	Water
12/11/2015	14:30	0.2	0.0	13.0	7.8

Sample ID
O - Open End Rod
T - Thin Wall Tube
U - Undisturbed Sample
S - Split Spoon Sample

Well Diagram
Riser Pipe
Screen
Filter Sand
Cuttings
Grout
Concrete
Bentonite Seal

Summary
Overburden (ft) 15.0
Rock Cored (ft) -
Samples 6S

Boring No. B24

Field Tests: **Dilatancy**: R - Rapid S - Slow N - None
Toughness: L - Low M - Medium H - High
Plasticity: N - Nonplastic L - Low M - Medium H - High
Dry Strength: N - None L - Low M - Medium H - High V - Very High

†**Note: Maximum particle size is determined by direct observation within the limitations of sampler size.**

Note: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

TEST BORING REPORT

Boring No. B24A

Project	NORTHERN PASS TRANSMISSION LINE, N. WOODSTOCK TO PLYMOUTH, NH
Client	EVERSOURCE
Contractor	NEW ENGLAND BORING CONTRACTORS

File No. 40460-200
Sheet No. 1 of 2
Start December 15, 2015
Finish December 15, 2015
Driller M. Souze
H&A Rep. C. Smith
Elevation
Datum
Location See Plan

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	HW	S	NX	Rig Make & Model: Mobile B47 Truck
Inside Diameter (in.)	4.0	1 3/8	2.0	Bit Type: Roller Bit
Hammer Weight (lb)	300	140	-	Drill Mud: None
Hammer Fall (in.)	24	30	-	Casing: HW Drive to 8.5 ft
				Hoist/Hammer: Cat-Head Safety Hammer
				PID Make & Model:

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	USCS Symbol	Stratum Change Elev/Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (Density/consistency, color, GROUP NAME, max. particle size†, structure, odor, moisture, optional descriptions GEOLOGIC INTERPRETATION)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
0	5	S1	0.0	SM	0.5	Loose dark brown silty SAND (SM), mps 1 in., no structure, no odor, dry	5	5	10	10	55	15				
	6	6	0.5	SM		-FILL-					75	25				
	6 4 3	S1A 18	0.5 2.0			Loose dark brown to red-brown silty SAND (SM), mps 2 mm, no structure, no odor, dry										
	4 6	S2 10	2.0 3.0	SM		-ALLUVIAL DEPOSITS-					75	25				
					3.0	Similar to above except medium dense										
	11 11	S2A 8	3.0 4.0	SP		Medium dense brown poorly graded SAND (SP), mps 0.5 in., no structure, no odor, dry				20	80					
	6* 6*	S3 24	4.0 6.0	SW		Medium dense brown well graded SAND (SW), mps 1.5 in., one 4 inch pocket of sandy SILT (ML), no odor, dry	5		30	30	30	5				
5	16* 14*					-GLACIOFLUVIAL DEPOSITS-										
	21 47 49 100	S4 15	6.0 8.0	SM	6.0	Very dense gray silty SAND with gravel (SM), mps 1.3 in., no structure, no odor, dry	10	5	15	25	30	15				
						-GLACIAL TILL-										
					8.0	TOP OF BEDROCK 8.0 FT										
						SEE CORE BORING REPORT FOR ROCK DETAILS										

Water Level Data

Date	Time	Elapsed Time (hr.)	Depth (ft) to: Bottom of Casing	Bottom of Hole	Water
12/15/2015	13:40	0.1	5	15	12

Sample ID
O - Open End Rod
T - Thin Wall Tube
U - Undisturbed Sample
S - Split Spoon Sample

Well Diagram
Riser Pipe
Screen
Filter Sand
Cuttings
Grout
Concrete
Bentonite Seal

Summary
Overburden (ft) 8.0
Rock Cored (ft) 5
Samples 4S, 1C

Boring No. B24A

Field Tests: **Dilatancy**: R - Rapid S - Slow N - None **Toughness**: L - Low M - Medium H - High **Plasticity**: N - Nonplastic L - Low M - Medium H - High **Dry Strength**: N - None L - Low M - Medium H - High V - Very High

†**Note: Maximum particle size is determined by direct observation within the limitations of sampler size.**

Note: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

HALEY ALDRICH

CORE BORING REPORT

Boring No. **B24A**
File No. 40460-200
Sheet No. 2 of 2

Depth (ft)	Drilling Rate (min./ft)	Run No.	Run Depth (ft)	Recovery/RQD in.	Recovery/RQD %	Weath-ering	Elev./ Depth (ft)	Visual Description and Remarks
								SEE TEST BORING REPORT FOR OVERBURDEN DETAILS
10	2	C1	10.0	44	73	Fresh to Slight		Moderately hard, slightly weathered, light gray aphanitic to medium grained SCHIST with granofels layers. Foliation dipping at high angles. Joints moderately dipping, moderately to closely spaced, rough, planar to undulating, discolored, open.
	2		15.0	24	40			
	2							-MADRID FORMATION-
	2							
	2							
15							15.0	BOTTOM OF EXPLORATION 15.0 FT
								*Indicates 3 inch spoon used with 300 lb hammer
20								
25								
30								
35								
40								

TEST BORING REPORT

Boring No. B25

Project	NORTHERN PASS TRANSMISSION LINE, N. WOODSTOCK TO PLYMOUTH, NH
Client	EVERSOURCE
Contractor	NEW ENGLAND BORING CONTRACTORS

File No. 40460-200
Sheet No. 1 of 1
Start December 15, 2015
Finish December 15, 2015
Driller M. Souze
H&A Rep. C. Smith
Elevation
Datum
Location See Plan

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	HW	S	-	Rig Make & Model: Mobile B47 Truck
Inside Diameter (in.)	4.0	1 3/8	-	Bit Type: Roller Bit
Hammer Weight (lb)	300	140	-	Drill Mud: None
Hammer Fall (in.)	24	30	-	Casing: HW Drive to 13.0 ft
				Hoist/Hammer: Cat-Head Safety Hammer
				PID Make & Model:

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	USCS Symbol	Stratum Change Elev/Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (Density/consistency, color, GROUP NAME, max. particle size†, structure, odor, moisture, optional descriptions GEOLOGIC INTERPRETATION)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
0	7 19 23 17	S1 14	0.0 2.0	SP		Dense dark brown poorly graded SAND (SP), mps 1.3 in., no structure, no odor, dry, asphalt 0.2 - 0.4 and 1.0 - 1.2 ft -FILL-	5	5	10	20	55	5				
	15 14 13 11	S2 2 S2A 15	2.0 2.2 2.2 4.0	SM	2.2	Black 80% ASH & CINDERS and slag, no odor, dry Medium dense dark gray silty SAND (SM), mps 2 mm, interbedded, no odor, moist				5	65	30				
5	3* 2* 1* 1*	S3 24	4.0 6.0	ML		Soft gray sandy SILT (ML), mps 1.3 in., occasional pockets of silty SAND (SM), no odor, moist					30	70				
	1 2 2 3	S4 24	6.0 8.0	ML		Similar to above except wet					40	60				
	2 1 2 2	S5 24	8.0 10.0	ML		Similar to above except wet -ALLUVIAL DEPOSITS-					30	70				
10																
	2 1 1 3	S6 24	13.0 15.0	OL/ OH	13.0	Very soft dark brown sandy ORGANIC SOIL (OL/OH), mps 1.3 in. (wood fragment), occasionally interbedded with fine sand, organic odor, wet, trace wood and root fibers -ORGANIC DEPOSITS-				5	35	60				
15					15.0	BOTTOM OF EXPLORATION 15.0 FT Note: *Indicates 3 inch spoon used with 300 lb hammer.										

Water Level Data

Date	Time	Elapsed Time (hr.)	Depth (ft) to: Bottom of Casing	Bottom of Hole	Water
12/15/2015	10:00	0.25 **Slowly	4.0 dropping	15.0	5.5 **

Sample ID
O - Open End Rod
T - Thin Wall Tube
U - Undisturbed Sample
S - Split Spoon Sample

Well Diagram
Riser Pipe
Screen
Filter Sand
Cuttings
Grout
Concrete
Bentonite Seal

Summary
Overburden (ft) 15.0
Rock Cored (ft) -
Samples 6S

Boring No. B25

Field Tests: **Dilatancy**: R - Rapid S - Slow N - None **Toughness**: L - Low M - Medium H - High **Plasticity**: N - Nonplastic L - Low M - Medium H - High **Dry Strength**: N - None L - Low M - Medium H - High V - Very High

†**Note: Maximum particle size is determined by direct observation within the limitations of sampler size.**

Note: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

TEST BORING REPORT

Boring No. B25A

Project	NORTHERN PASS TRANSMISSION LINE, N. WOODSTOCK TO PLYMOUTH, NH
Client	EVERSOURCE
Contractor	NEW ENGLAND BORING CONTRACTORS

File No. 40460-200
Sheet No. 1 of 1
Start December 14, 2015
Finish December 14, 2015
Driller K. Smith
H&A Rep. T. Erickson
Elevation
Datum
Location See Plan

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	HW	S	-	Rig Make & Model: Diedrich D120 Truck
Inside Diameter (in.)	4.0	1 3/8	-	Bit Type: Roller Bit
Hammer Weight (lb)	300	140	-	Drill Mud: None
Hammer Fall (in.)	24	30	-	Casing: HW Drive to 9.0 ft, uncased to 15.0 ft
				Hoist/Hammer: Winch Safety Hammer
				PID Make & Model:

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	USCS Symbol	Stratum Change Elev/Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (Density/consistency, color, GROUP NAME, max. particle size†, structure, odor, moisture, optional descriptions GEOLOGIC INTERPRETATION)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
0	8 19 17 13	S1 20	0.0 2.0	SP		Dense gray and brown poorly graded SAND with gravel (SP), mps 1.25 in., no structure, no odor, dry, ash and cinders layer present from 1.4 - 1.8 ft	10	15	15	25	30	5				
					1.8	-FILL-										
	7 7 7 11	S2 16	2.0 4.0	SP-SM		Medium dense light brown poorly graded SAND with silt (SP-SM), mps 4 mm, stratified with infrequent silt layers, no odor, dry			10	10	70	10				
5	11* 12* 9* 7*	S3 18	4.0 6.0	SM		Medium dense light brown and brown silty SAND (SM), mps 1.5 in. (dropstone), occasionally stratified, no odor, wet, organic silt mixed with sand 5.2 - 5.7 ft depth	5		5	5	60	25				
						-ALLUVIAL DEPOSITS-										
	1 1 2 4	S4 18	6.0 8.0	SM		Very loose light brown silty SAND (SM), mps 4 mm, occasional organic matter (roots), no odor, wet				5	55	40				
	4 4 2 4	S5 14	8.0 10.0	SM		Loose light brown silty SAND (SM), mps 0.25 in., occasional coarse sand lenses, no odor, wet		10	10	10	40	30				
10						Note: Drilling action indicates a strata change at 12.5 ft.										
					12.5											
	21 20 16 15	S6 10	13.0 15.0	SM		Dense olive-brown silty SAND (SM), mps 1.25 in., varved with occasional sand and gravel lenses, no odor, wet	5	5	5	5	35	45				
						-GLACIOLACUSTRINE DEPOSITS-										
15					15.0	BOTTOM OF EXPLORATION 15.0 FT										
						Note: *Sample S4 taken with 3 inch diameter split spoon and 140 lb hammer.										

Water Level Data

Date	Time	Elapsed Time (hr.)	Depth (ft) to: Bottom of Casing	Bottom of Hole	Water
12/14/2015	12:00	0.2	0.0	12.7	7.4

Sample ID
O - Open End Rod
T - Thin Wall Tube
U - Undisturbed Sample
S - Split Spoon Sample

Well Diagram
Riser Pipe
Screen
Filter Sand
Cuttings
Grout
Concrete
Bentonite Seal

Summary
Overburden (ft) 15.0
Rock Cored (ft) -
Samples 6S

Boring No. B25A

Field Tests: **Dilatancy**: R - Rapid S - Slow N - None **Toughness**: L - Low M - Medium H - High **Plasticity**: N - Nonplastic L - Low M - Medium H - High **Dry Strength**: N - None L - Low M - Medium H - High V - Very High

†**Note: Maximum particle size is determined by direct observation within the limitations of sampler size.**

Note: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

TEST BORING REPORT

Boring No. B26

Project	NORTHERN PASS TRANSMISSION LINE, N. WOODSTOCK TO PLYMOUTH, NH
Client	EVERSOURCE
Contractor	NEW ENGLAND BORING CONTRACTORS

File No. 40460-200
Sheet No. 1 of 1
Start December 14, 2015
Finish December 14, 2015
Driller M. Souze
H&A Rep. C. Smith
Elevation
Datum
Location See Plan

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	HW	S	-	Rig Make & Model: Mobile B47 Truck
Inside Diameter (in.)	4.0	1 3/8	-	Bit Type: Roller Bit
Hammer Weight (lb)	300	140	-	Drill Mud: None
Hammer Fall (in.)	24	30	-	Casing: HW Drive to 9.0 ft
				Hoist/Hammer: Cat-Head Safety Hammer
				PID Make & Model:

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	USCS Symbol	Stratum Change Elev/Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (Density/consistency, color, GROUP NAME, max. particle size†, structure, odor, moisture, optional descriptions GEOLOGIC INTERPRETATION)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
0	2 2 4 10	S1 16	0.0 2.0	SM	0.2	-TOPSOIL- Loose brown silty SAND (SM), mps 2 mm, no structure, no odor, dry				5	65	30				
	15 11 7 5	S2 13	2.0 4.0	SM		Similar to above except medium dense and cobble 2.0 - 2.5 ft -GLACIOFLUVIAL DEPOSITS-					65	35				
5	2* 4* 3* 3*	S3 24	4.0 6.0	ML		Loose gray sandy SILT (ML), mps 2 mm, interbedded, no odor, moist					40	60				
	4 3 4 4	S4 24	6.0 8.0	SM		Loose gray silty SAND (SM), mps 2 in., interbedded, no odor, wet				5	55	40				
10	4 6 7 5	S5 24	8.0 10.0	SM		Medium dense gray silty SAND (SM), mps 1.3 in., interbedded, no odor, wet					60	40				
					12.0	TOP OF BEDROCK 12.0 FT Note: Advanced roller bit through probable bedrock from 12.0 - 15.0 ft. Drill action indicates weathered zone from 13.0 - 14.0 ft. -BEDROCK-										
15					15.0	BOTTOM OF EXPLORATION 15.0 FT *Indicates 3 inch spoon used with 300 lb hammer										

Water Level Data

Date	Time	Elapsed Time (hr.)	Depth (ft) to: Bottom of Casing	Bottom of Hole	Water
12/14/2015	14:10	0.25	9.0	15.0	7.5**

**Water level not stable

Sample ID
O - Open End Rod
T - Thin Wall Tube
U - Undisturbed Sample
S - Split Spoon Sample

Well Diagram
Riser Pipe
Screen
Filter Sand
Cuttings
Grout
Concrete
Bentonite Seal

Summary
Overburden (ft) 15.0
Rock Cored (ft) -
Samples 5S

Boring No. B26

Field Tests: **Dilatancy**: R - Rapid S - Slow N - None **Toughness**: L - Low M - Medium H - High **Plasticity**: N - Nonplastic L - Low M - Medium H - High **Dry Strength**: N - None L - Low M - Medium H - High V - Very High

†**Note: Maximum particle size is determined by direct observation within the limitations of sampler size.**

Note: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

TEST BORING REPORT

Boring No. B26A

Project	NORTHERN PASS TRANSMISSION LINE, N. WOODSTOCK TO PLYMOUTH, NH
Client	EVERSOURCE
Contractor	NEW ENGLAND BORING CONTRACTORS

File No. 40460-200
Sheet No. 1 of 1
Start December 14, 2015
Finish December 14, 2015
Driller M. Souze
H&A Rep. C. Smith
Elevation
Datum
Location See Plan

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	HW	S	-	Rig Make & Model: Mobile B47 Truck
Inside Diameter (in.)	4.0	1 3/8	-	Bit Type: Roller Bit
Hammer Weight (lb)	300	140	-	Drill Mud: None
Hammer Fall (in.)	24	30	-	Casing: HW Drive to 3.0 ft
				Hoist/Hammer: Cat-Head Safety Hammer
				PID Make & Model:

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	USCS Symbol	Stratum Change Elev/Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (Density/consistency, color, GROUP NAME, max. particle size†, structure, odor, moisture, optional descriptions GEOLOGIC INTERPRETATION)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
0	9 14 15 12	S1 15	0.0 2.0	SP		Medium dense brown poorly graded SAND with gravel (SP), mps 1.3 in., no structure, no odor, dry, 3 inch layer of asphalt 0.9 - 1.1 ft bgs	10	5	15	40	25	5				
						-FILL-										
	7 5 7 9	S2 14	2.0 4.0	SP- SM	2.0					30	60	10				
5	5* 10* 10* 11*	S3 12	4.0 6.0	SP		Medium dense brown poorly graded SAND (SP), mps 1.3 in., no structure, no odor, dry			5	45	50					
	12 6 6 6	S4 17	6.0 8.0	SP		Medium dense gray poorly graded SAND (SP), mps 5 mm, occasionally stratified, no odor, dry			5	25	70					
	7 6 7 6	S5 22	8.0 10.0	SP		Similar to above			5	25	70					
10						-GLACIOFLUVIAL DEPOSITS-											
	6 7 8 10	S6 6	13.0 15.0	SP		Similar to above			5	20	75					
15					15.0	BOTTOM OF EXPLORATION 15.0 FT										
						*Indicates 3 inch spoon used with 300 lb hammer										

Water Level Data

Date	Time	Elapsed Time (hr.)	Depth (ft) to: Bottom of Casing	Bottom of Hole	Water
12/14/2015	12:30	0.5	13	14.0	13.0

Sample ID

O - Open End Rod
T - Thin Wall Tube
U - Undisturbed Sample
S - Split Spoon Sample

Well Diagram

Riser Pipe
Screen
Filter Sand
Cuttings
Grout
Concrete
Bentonite Seal

Summary

Overburden (ft) 15.0
Rock Cored (ft) -
Samples 6S

Boring No. B26A

Field Tests: **Dilatancy**: R - Rapid S - Slow N - None
Toughness: L - Low M - Medium H - High
Plasticity: N - Nonplastic L - Low M - Medium H - High
Dry Strength: N - None L - Low M - Medium H - High V - Very High

†**Note: Maximum particle size is determined by direct observation within the limitations of sampler size.**

Note: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.