TEST BORING REPORT

HALEY ALDRICH

Project	Proposed Pier Improvements, IMT, Portland, Maine
Client	HNTB Corporation
Contractor	Northern Test Borings, Inc.

Boring No.	HA17-2
File No.	129950-002
Sheet No.	1 of 5
Start	21 June 2017
Finish	22 June 2017
Driller	M. Nadeau
H&A Rep.	M. Snow
Elevation	15.3
Datum	NGVD 29
Location	See Plan

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	HW	S	-	Rig Make & Model: Diedrich D-50
Inside Diameter (in.)	4.0	1.375	-	Bit Type: Roller Bit
Hammer Weight (lb)	140	140	-	Drill Mud: Polymer
Hammer Fall (in.)	30	30	-	Casing: HW to 85.0 ft
				Hole Hammer:
				Winch/Automatic Hammer
				PID Make & Model: MiniRAE 2000 10.6 eV

VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (Density/consistency, color, GROUP NAME, max. particle size*, structure, odor, moisture, optional descriptions; GEOLOGIC INTERPRETATION)

Depth (ft)	Sample Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	Stratum Change Elev./Depth (ft)	USCS Symbol	Description	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	Fines % Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
0				13.0 / 0.8		-BITUMINOUS CONCRETE-										
	14 29 30 32	S1 18	1.0 3.0		SM	Very dense brown silty SAND with gravel (SM), mps 2 in., no odor, dry -FILL-		23	11	28	23	15				
	15 14 22 26	S2 15	3.0 5.0		SM	Dense brown to black silty SAND with gravel (SM), mps 1.5 in., no odor, dry, contains coal, ash and few brick fragments	12	18	8	22	25	15				
5	10 16 14 15	S3 14	5.0 7.0		SM	Medium dense brown to black silty SAND with gravel (SM), mps 1 in., no odor, dry, contains coal, ash and brick fragments	7	21	11	26	20	15				
	8 7	S4 NR	7.0 8.0			No Recovery										
	2 3 3 4	S5 16	8.0 10.0		SW-SM	Loose brown well graded SAND with silt and gravel (SW-SM), mps 1 in., no odor, dry to moist Note: Encountered concrete at 10 ft. Augered to refusal on concrete. Moved location 2.5 ft west and drilled to 10 ft and continued sampling.	5	10	10	40	25	10				
10	1 2 3 4	S6 14	10.0 12.0		SW-SM	Loose brown well graded SAND with silt (SW-SM), trace fine gravel, mps 0.5 in., no odor, moist -FILL-		10	15	35	30	10				
	1 1 2 3	S7 15	12.0 14.0		SW-SM	Very loose brown well graded SAND with silt (SW-SM), trace fine gravel, mps 0.5 in., no odor, wet Note: Encountered obstruction with casing at 11.7 ft. Advanced rollerbit		5	15	40	30	10				
	5 3 2 2	S8 3	14.0 16.0		SW-SM	Loose brown well graded SAND with silt (SW-SM), mps 0.5 in., no odor, wet Note: S8 sampler blows lively impacted by rollerbit advancement from 11.7 to 15 ft prior to sampling.	20	10	35	25	10					
15	2 3 3 2	S9 12	16.0 18.0	-2.3 / 17.0	SW-SM	Loose brown well graded SAND with silt and gravel (SW-SM), mps 1 in., no odor, wet	5	10	10	40	25	10				
					SM/ML	Medium stiff gray-brown silty SAND grading to sandy SILT with organics, shells (SM/ML), mps 0.42 mm, strong organic odor, wet -HARBOR BOTTOM DEPOSIT-					20	70	80 30			
20																

Water Level Data

Date	Time	Elapsed Time (hr.)	Depth (ft) to: Bottom of Casing	Bottom of Hole	Water
					Tidal

Sample ID: D - Open End Rod; T - Thin Wall Tube; U - Undisturbed Sample; S - Split Spoon Sample

Well Diagram: Riser Pipe, Screen, Filter Sand, Cuttings, Grout, Concrrete, Bentonite Seal

Summary

Overburden (ft)	101.2
Rock Cored (ft)	-
Samples	20S, 1U
Boring No.	HA17-2

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 must be determined by direct observation within the limitations of sampling gear.

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

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Boring No. HA17-2; File No. 129950-002; Sheet No. 3 of 5

VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (Density/consistency, color, GROUP NAME, max. particle size*, structure, odor, moisture, optional descriptions; GEOLOGIC INTERPRETATION)

Depth (ft)	Sample Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	Stratum Change Elev./Depth (ft)	USCS Symbol	Description	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	Fines % Fines	Dilatancy	Toughness	Plasticity	Strength
50	7 7 11 12	S16 18	50.0 52.0		SP-SM	Medium dense brown to rust-brown to gray (layered) poorly-graded SAND with silt (SP-SM), mps 2 mm, no odor, wet -MARINE DEPOSIT- (Sand)			15	75	10					
55	10 11 10 11	S17 14	55.0 57.0		SP	Medium dense brown to rust-brown poorly-graded SAND (SP), mps 0.25 in., no odor, wet			5	15	75	5				
60	7 10 15 11	S18 13	60.0 62.0		SP	Medium dense brown to rust-brown poorly-graded SAND (SP), mps 0.42 mm, no odor, wet					95	5				
65	6 8 11 11	S19 14	65.0 67.0		SP	Medium dense brown to rust-brown poorly-graded SAND (SP), mps 0.42 mm, no odor, wet					95	5				
70	8 8 9 9	S20 14	70.0 72.0		SP-SM	Medium dense gray poorly-graded SAND with silt (SP-SM), mps 2 mm, no odor, wet, one 1-in. silt layer -MARINE DEPOSIT- (Sand)			15	75	10					
				-69.3 / 74.0		Note: Gravel in wash water at 74 ft.										
75	16 18 23 19	S21 10	75.0 77.0		SP-SM	Dense gray poorly-graded SAND with silt and gravel (SP-SM), mps 1 in., no odor, wet, well bonded -GLACIAL TILL-	5	15	15	10	40	15				

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

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VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (Density/consistency, color, GROUP NAME, max. particle size*, structure, odor, moisture, optional descriptions; GEOLOGIC INTERPRETATION)

Depth (ft)	Sample Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	Stratum Change Elev./Depth (ft)	USCS Symbol	Description	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	Fines % Fines	Dilatancy	Toughness	Plasticity	Strength
10	39 95 50/3"	S28 10	10.0 111.2	96.5 / 111.2	SM	Very dense gray silty SAND with gravel (SM), mps 1 in., no odor, wet -GLACIAL TILL-	5	10	10	30	30	15				
						BOTTOM OF EXPLORATION 111.2 FT (NO REFUSAL) Note: All soil samples within the till unit were screened with a photoionization detector. No elevated readings were encountered during screening.										

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VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (Density/consistency, color, GROUP NAME, max. particle size*, structure, odor, moisture, optional descriptions; GEOLOGIC INTERPRETATION)

Depth (ft)	Sample Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	Stratum Change Elev./Depth (ft)	USCS Symbol	Description	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	Fines % Fines	Dilatancy	Toughness	Plasticity	Strength
20	5 2 3 4	S10 12	20.0 22.0		OL/SM	Medium stiff dark gray to gray-brown interlayered SILT with organics and silty SAND (OL/SM), mps 2 mm, strong organic odor, wet, contains shells -HARBOR BOTTOM DEPOSIT-				15	35	50				
25	WOH 2 1 3	S11 24	25.0 27.0		OL/SM	Soft dark gray-brown interlayered SILT with organics and silty SAND (OL/SM), mps 2 mm, strong organic odor, wet, contains shells				15	35	50				
30	WOH WOH 2 2	S12 24	30.0 32.0		OL	Very soft gray-brown ORGANIC SILT with sand (OL), mps 0.42 mm, organic odor, wet, contains shells					25	75				
35	WOH 2 2 2	S13 24	35.0 37.0	-20.3 / 35.0	CL	Note: Attempt vane shear test at 35 ft, no penetration, vane refusal at 35 ft. Soft dark gray lean CLAY (CL), mps 0.075 mm, no odor, wet -MARINE DEPOSIT- (Clay)						100				
40		S14 24	40.0 42.0		CL	Very stiff gray lean CLAY (CL), mps 0.075 mm, no odor, wet, occasional gray silty fine sand seams (0.25 in.) Note: 55x110 mm vane raw torque readings: V1 (40.5-41.0 ft): >300 lin. lbs; Su>1,165 psf					5	95				
45	1 2 3 6	S15 18	45.0 47.0	-34.3 / 49.0	CL	Medium stiff dark gray lean CLAY (CL) with frequent brown and gray silty fine sandy layers (0.5 to 1-in. thick), mps 0.42 mm, no odor, wet					15	85				

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Boring No. HA17-2; File No. 129950-002; Sheet No. 4 of 5

VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (Density/consistency, color, GROUP NAME, max. particle size*, structure, odor, moisture, optional descriptions; GEOLOGIC INTERPRETATION)

Depth (ft)	Sample Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	Stratum Change Elev./Depth (ft)	USCS Symbol	Description	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	Fines % Fines	Dilatancy	Toughness	Plasticity	Strength
80	7 6 9 9	S22 12	80.0 82.0		SP-SM	Medium dense gray poorly-graded SAND with silt (SP-SM), trace gravel, mps 1 in., no odor, wet, moderately bonded -GLACIAL TILL-	5	5	10	25	40	15				
85	9 5 8 10	S23 10	85.0 87.0		SW	Medium dense gray well graded SAND with gravel (SW), mps 1 in., no odor, wet, slightly to moderately bonded	10	15	15	30	25	5				
90	11 7 10 14	S24 12	90.0 92.0		SM	Medium dense gray silty SAND with gravel (SM), mps 2 in., no odor, wet Note: Drill action indicates gravel/cobbles from 92 to 95 ft.	15	10	5	10	45	15				
95	72 88 (82 79	S25 20	95.0 97.0	-80.3 / 95.0	SM	Very dense dark gray silty SAND with gravel (SM), mps 2 in., no odor, wet -GLACIAL TILL-	20	10	10	10	35	15				
100	35 163 50/1"	S26 13	100.0 102.0		SM	Very dense dark gray silty SAND with gravel (SM), mps 2 in., no odor, wet, color changes to brown at approximately 100.5 ft. Note: Drill action indicates gravel/cobbles from 102 to 105 ft.	20	10	10	10	35	15				
105	50 115 25/2"	S27 12	105.0 107.0		SM	Very dense gray-brown silty SAND with gravel (SM), mps 1.5 in., no odor, wet Note: Drill action indicates gravel/cobbles from 107 to 110 ft.	20	10	10	10	35	15				

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

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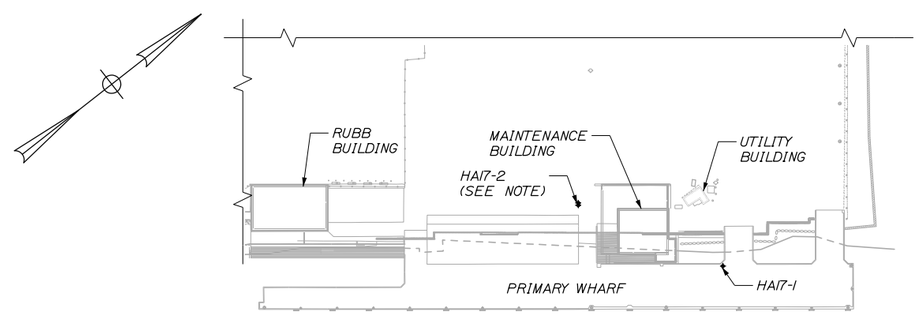

BORING LOCATION PLAN

SCALE: 1" = N.T.S.

99% DESIGN
December 15, 2017

HALEY ALDRICH

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

STP 2194(206)

WIN 021942.06

PROJ. MANAGER		BY	DATE
DESIGN-DETAILED	J. Burns	P. Bishop	12\17
CHECKED-REVIEWED	T. Poulin	C. Morin	12\17
DESIGN2-DETAILED2			
DESIGN3-DETAILED3			
REVISIONS 1			
REVISIONS 2			
REVISIONS 3			
REVISIONS 4			
FIELD CHANGES			

SIGNATURE

P.E. NUMBER

DATE

PORTLAND INTERNATIONAL MARINE TERMINAL
MAINE INTERMODAL PORT PRODUCTIVITY PROJECT
WHARF INFILL & BUILDING REMOVAL
PORTLAND CUMBERLAND COUNTY

BORING LOGS II

SHEET NUMBER

G05

5 OF 21

Filename: 005_Boring Logs 2 (G05).dgn Division: Username: Date:12/15/2017