Section 20. Soils Report

REPORT

January 16, 2015 14-1188 S

Geotechnical Engineering Services

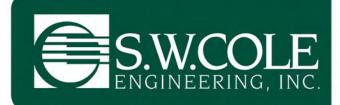
Proposed Retirement Residence 802 Ocean Avenue Portland, Maine

PREPARED FOR:

Hawthorn Development, LLC c/o Lenity Architecture Attention: Mark Lowen 3150 Kettle Court SE Salem, Oregon 97301

PREPARED BY:

S. W. Cole Engineering, Inc. 286 Portland Road Gray, Maine 04039 207-657-2866



- · Geotechnical Engineering
- · Construction Materials Testing
- · GeoEnvironmental Services
- · Ecological Services

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14-1188 S

January 16, 2015

Hawthorn Development, LLC c/o Lenity Architecture
Attention: Mark Lowen
3150 Kettle Court SE
Salem, Oregon 97301

Subject: Geotechnical Engineering Services

Proposed Retirement Residence

802 Ocean Avenue Portland, Maine

Dear Mark:

In accordance with our Revised Proposal dated November 11, 2014, we have performed subsurface explorations for the subject project in Portland, Maine. This report presents our findings and geotechnical recommendations and its contents are subject to the limitations set forth in Attachment A.

1.0 INTRODUCTION

1.1 Scope and Purpose

The purpose of our services was to obtain subsurface information at the site in order to develop geotechnical recommendations relative to foundations, earthwork and pavement associated with the proposed construction. Our scope of services included review of existing subsurface information, drilling test boring and auger probe explorations, a geotechnical analysis of the subsurface findings and preparation of this report.

1.2 Proposed Construction

Based on the site plan dated October 28, 2014 and the RFP dated October 29, 014, we understand development plans call for construction of a new retirement residence with associated paved access drive and parking areas on an undeveloped parcel located at

286 Portland Road, Gray, ME 04039-9586 • P: (207) 657.2866 • F: (207) 657.2840 • E: infogray@swcole.com



802 Ocean Avenue in Portland, Maine. We understand the residence will be four-story with 142 suites and will consist of wood-framed construction.

The building will have a finish floor elevation of 145 feet (project datum) requiring cuts in the west side of the footprint and fills in the east side of the footprint approaching 10 to 12 feet. Additionally, cuts and fills approaching about 15 feet will be required to achieve proposed site grades in paved parking and access drive areas. Two detached garages are proposed south and southeast of the main building.

Proposed and existing site features are shown on the "Exploration Location Plan" attached as Sheet 1.

2.0 EXPLORATION AND TESTING

2.1 Explorations

We performed thirteen explorations for the subject project as well as a review of explorations performed at the site for a previous development proposal. The approximate exploration locations are shown on the "Exploration Location Plan" attached as Sheet 1. Logs of the recent explorations are attached as Sheets 2 through 14. A key to the notes and symbols used on the log is attached as Sheet 15. Logs of the previous explorations are attached as Appendix A.

2.1.1 Recent Explorations

Five test borings (B-101 through B-105) and eight auger probes (P-201 through P-208) were made at the site on November 22, 2014, by Northern Test Boring, Inc of Gorham, Maine working under subcontract to S. W. Cole Engineering, Inc. (S.W.COLE). Bedrock was encountered at the ground surface at B-103 and P-208. The exploration locations were selected and established in the field using a Trimble GPS by S.W.COLE.

2.1.2 Previous Explorations

Seventeen test borings (B-1 through B-17) and eight auger probes (P-1 through P-8) were made at the site in 2004 for a previous development proposal.



2.2 Testing

The explorations were made using cased wash-boring, rock coring, solid stem auger, and air hammer drilling techniques. The soils were sampled at the test borings using a split spoon sampler and Standard Penetration Test (SPT) methods. SPT blow counts are shown on the logs. Soil and bedrock samples obtained from the explorations were returned to our laboratory for visual classification.

3.0 SITE AND SUBSURFACE CONDITIONS

3.1 Surficial Conditions

The site is located at 802 Ocean Avenue in Portland, Maine. The site consists of an undeveloped wood parcel located on the west side of Ocean Avenue. Bedrock outcrops are present across the site. The site generally slopes down to the east with existing topography varying from about elevation 160 to 125 feet within the footprint of proposed construction and elevation 140 to 115 feet along the proposed access drive. Some shallow drainage channels and lower laying areas of ponded water are present at the site, with flow generally draining to the east and southeast. A wetland is present in the northwestern limits of the site, which appears to feed shallow drainage channels. Existing site features and topography are shown on Sheet 1.

3.2 Subsurface Conditions

Underlying a surficial layer of forest duff and topsoil, the explorations generally encountered a thin layer of silty sand and/or silty glacial till overlying shallow bedrock. Bedrock was encountered at the explorations at depths varying from about ½ to 5 feet. The drilling equipment penetrated into an upper zone of weathered bedrock at some exploration locations. Based on rock coring performed as part of the 2004 exploration program, the bedrock is classified as migmatite and biotite-muscovite schist of varying quality. Refer to the attached logs for more detailed subsurface information.

3.3 Groundwater Conditions

The overburden soils encountered at the explorations were generally moist to saturated. Groundwater monitoring wells were installed in several borings made for the 2004 exploration program. Details of these monitoring wells are shown on the borings logs attached in Appendix A. Groundwater measurements obtained at the wells in January, 2005 are as follows:



Boring	Water Depth From Existing Ground Surface (ft)		
B-2	4.1 Below		
B-4	1.7 Above (Possible Artesian Condition)		
B-8 0.5 Above (Possible Artesian Condition)			
B-12	0.1 Above (Possible Artesian Condition)		
B-16	3.0 Below		
B-17 (Shallow)	2.7 Below		
B-17 (Deep)	1.1 Above (Possible Artesian Condition)		

An attempt was made to locate the monitoring wells at the site during the recent exploration program; however the wells had either been destroyed or were frozen, hindering measurement. Groundwater likely becomes perched on top of the shallow bedrock at the site. It should be anticipated that seasonal groundwater levels will fluctuate, especially during periods of snowmelt and precipitation.

3.4 Seismic and Frost Considerations

The 100-year Air Freezing Index for the Portland, Maine area is about 1,410-Fahrenheit degree-days, which corresponds to a frost penetration depth on the order of 4.5 feet. Based on the findings at the explorations, we interpret the site soils and bedrock to correspond to Seismic Site Class C in accordance with 2009 IBC/ASCE-7.

4.0 EVALUATION AND RECOMMENDATIONS

4.1 General Findings

Based on the subsurface findings, the proposed construction appears feasible from a geotechnical standpoint. Specifically, conventional spread footings and on-grade floor slabs appear suitable for the proposed buildings. The principle geotechnical considerations are as follows:

 Shallow bedrock is present across the site. The bedrock will require blasting to achieve proposed site grades. Blasting and subsequent preparation of blasted bedrock subgrades must be performed in a controlled manner to provide adequate support of the proposed buildings and pavements. Subgrades should be observed by the geotechnical engineer and may need to be overexcavated and replaced as



deemed necessary. Blasted bedrock subgrades must be thoroughly choked with Crushed Stone or blasted bedrock fines.

- Possible artesian groundwater conditions were observed in the monitoring wells.
 Groundwater seepage in anticipated from cut slopes. A continuous Crushed Stone Drainage blanket with perimeter underdrains is recommended below the entire building.
- Blasted bedrock may be processed on-site to reuse for compacted fills as well as
 pavement gravels and foundation backfill. The contractor should be prepared to
 break down larger rock particles as needed to meet the requirements of Rock
 Borrow, Structural Fill, Pavement Gravel and Crushed Stone. Some imported
 materials will be needed for construction.
- A sub-slab radon venting system must be installed beneath building. The radon system should be designed by a qualified indoor air quality consultant.

4.2 Site and Subgrade Preparation

We recommend that site preparation begin with the construction of an erosion control system to protect adjacent drainage ways and areas outside the construction limits. As much vegetation as possible should remain outside the construction areas to lessen the potential for erosion.

Following stripping and grubbing of the site, blasting will be required to achieve proposed grades. Blasting and subsequent preparation of blasted bedrock subgrades must be performed in a controlled manner to provide adequate support of the proposed buildings and pavement. Care must be taken to control overblasting below buildings and paved areas. We recommend vertical overblasting be limited to 1-foot below footings and 2-feet below slabs and paved areas.

S.W.COLE should observe blasted bedrock subgrades prior to placing any new fill or concrete. Depending how the rock fractures, some overblasted rock may be able to remain in place; however, the contractor should be prepared to overexcavate and remove loose and overblasted bedrock as deemed necessary by the geotechnical engineer's field observations. We recommend the contract documents contain unit rate provisions for



removal and replacement of overblasted bedrock. Blast rock fines or Crushed Stone should be thoroughly worked into the bedrock surface to choke any voids or fractures in the bedrock.

4.3 Excavation and Dewatering

Excavation work will generally encounter topsoil, a relatively thin layer of silty sand and silty glacial till and shallow bedrock. Final cuts to subgrade elevation in soil, if encountered, should be performed with a smooth-edged bucket to help minimize soil disturbance.

The bedrock encountered at the site is hard and sound and will require blasting for excavation. Blasting can adversely affect adjacent structures, water-wells, septic systems, up-gradient wetlands, and buried utilities. We recommend that blasting be performed by a licensed and qualified contractor and that a blasting plan be prepared sufficiently in advance of blasting activities to coordinate efforts with abutting properties and to serve notice to the general public. Pre-blast surveys of structures, wells, septic systems, pipelines, and protected natural resources within 500 feet of the blast area should be completed prior to blasting.

Groundwater seepage is anticipated in excavations. Sumping and pumping dewatering techniques should be adequate to control groundwater in shallower excavations. The layer of Crushed Stone recommended below foundations will provide a media from which to dewater. Controlling the water levels to below planned excavation depths will help stabilize subgrades during construction.

Excavations must be properly shored and/or sloped to prevent sloughing and caving of the sidewalls during construction. Temporary excavations should be sloped or shored in accordance with OSHA regulations.

4.4 Foundations

We recommend the proposed buildings be supported on spread footing foundations bearing on at least 12-inches of Crushed Stone overlying properly prepared subgrades. Building subgrades are anticipated to consist of blasted bedrock in the western portion of the footprint, transitioning to compacted Rock Borrow fill in the east.



For spread footings bearing on properly prepared subgrades, we recommend the following geotechnical parameters for design consideration:

Geotechnical Parameters for Spread Footings and Foundation Walls								
Design Frost Depth	4.5 feet							
Net Allowable Bearing Pressure	4.0 ksf or less							
Base Friction Factor	0.4							
At-Rest Lateral Earth Pressure Coeff.	0.5							
Total Unit Weight of Backfill	130 pcf							
Internal Friction Angle of Backfill	30 degrees							
Seismic Soil Site Class	C (2009 IBC/ASCE 7)							

For the anticipated foundation bearing conditions, we anticipate less than 1-inch of post-construction settlement with differential settlement approaching ½-inch.

4.5 Foundation Drainage

We recommend a perimeter foundation underdrain system be installed beneath the building. The underdrain pipe should consist of 4-inch diameter, perforated SDR-35 foundation drain pipe enveloped within the exterior side of the Crushed Stone provided below the footings. Non-woven geotextile, such as Mirafi 140N or equivalent, should be provided around the exterior side of the Crushed Stone layer prior to placing foundation backfill soils. The underdrain pipe must be connected to a positive gravity outlet protected from freezing, clogging and backflow. The Crushed Stone layer provided below the building footings and floor slabs should be continuous and hydraulically connected to the underdrains. General underdrain details are shown on Sheet 16.

4.6 Slab-On-Grade Floors and Soil-Gas Venting

We recommend on-grade concrete floors be supported on a minimum of 12 inches of compacted Crushed Stone overlying properly prepared subgrades. On-grade floor slabs founded on properly prepared subgrades may be designed considering a modulus of subgrade reaction of 100 pci. The structural engineer or concrete consultant must design steel reinforcing and joint spacing appropriate to slab thickness and function.

The presence of shallow bedrock beneath the proposed building increases the risk of radon intrusion in the building. Consequently, building design must include a sub-slab



radon venting system and positive building pressurization. The venting system should be designed by a qualified indoor air quality consultant.

We recommend a sub-slab vapor retarder overlying at least 1-inch of rigid insulation overlying the 12 inch thick Crushed Stone venting and drainage layer below on-grade floor slabs. The vapor retarder must have a permeance that is less than the floor cover or surface treatment that is applied to the slab. The vapor retarder must have sufficient durability to withstand puncture from construction activity. The vapor retarder material shall be placed according to the manufacturer's recommended method, including the taping and lapping of all joints and wall connections. The architect and/or flooring consultant should select the vapor retarder products compatible with flooring and adhesive materials.

The floor slab should be appropriately cured using moisture retention methods after casting. Typical floor slab curing methods should be used for at least 7 days. The architect or flooring consultant should assign curing methods consistent with current applicable American Concrete Institute (ACI) procedures with consideration of curing method compatibility to proposed surface treatments, flooring and adhesive materials.

4.7 Entrance Slabs and Sidewalks

Entrance slabs and sidewalks adjacent to buildings must be designed to reduce the effects of differential frost action between adjacent pavement, doorways, and entrances. We recommend that clean, non-frost susceptible Structural Fill be provided to a depth of 4.5 feet (or until sound bedrock is encountered) below the top of entrance slabs. This thickness of Structural Fill should extend the full width of the entrance slabs and outward at least 4.5 feet, thereafter transitioning up to the bottom of the adjacent sidewalk or pavement subbase gravel at a 3H:1V or flatter slope. General frost transition zone details for entrance slabs are illustrated on Sheet 16.

4.8 Backfill and Compaction

Based on the subsurface findings, the existing site soils are unsuitable for reuse as fill within building areas, but may be reused in paved areas during dry, non-freezing weather conditions. We recommend the following fill and backfill materials.



<u>Granular Borrow</u>: Imported compacted fill to raise site grades in paved areas should be sand, silty sand or sand and gravel meeting the requirements of MDOT Standard Specification 703.19 "Granular Borrow".

Rock Borrow: Blasted bedrock fill to raise site grades in building and paved areas should be processed to meet the requirements of MDOT Standard Specification 703.21 "Rock Borrow" with a maximum particle size of 3 feet in greatest dimension. The maximum particle size of Rock Borrow should be limited to 4-inches in the top 5 feet below the building.

<u>Structural Fill</u>: Fill to raise site grades in the top 5 feet below the building, over wet subgrades, backfill for foundations and retaining walls, and backfill below exterior slabs and patios should be non-frost susceptible sand and gravel meeting the gradation requirements for Structural Fill as given below.

Structural Fill						
Sieve Size	Percent Finer by Weight					
4 inch	100					
3 inch	90 to 100					
½ inch	25 to 90					
#40	0 to 30					
#200	0 to 5					

Structural Fill is recommended for use as:

- Fill to raise site grades over wet subgrades
- Backfill for foundations
- Fill and backfill below exterior patios and slabs to at least 4.5 feet below finish grade, or until sound bedrock is encountered

<u>Crushed Stone</u>: Crushed Stone, used below building footings and floor slabs should meet the gradation requirements of MDOT Standard Specifications 703.22 "Underdrain Backfill Type C". A nominally sized 3/4-inch crushed stone will meet this requirement.

Reuse of Existing Soils and Bedrock: The existing site overburden soils are moisture and frost susceptible and are unsuitable for reuse in the building area, but may be



reused to raise grades in landscape and paved areas during dry and non-freezing conditions.

Blasted bedrock may be reused to raise site grades provided it is processed to meet the requirements of Rock Borrow. Additionally, blasted bedrock may be processed on-site and blended with sand to create Structural Fill and pavement gravels.

<u>Placement and Compaction</u>: Fill should be placed in horizontal lifts and compacted such that the desired density is achieved throughout the lift thickness with 3 to 5 passes of the compaction equipment. Loose soil lift thicknesses for grading, fill and backfill activities should not exceed 12 inches. We recommend that soil fill and backfill in building and paved areas be compacted to at least 95 percent of its maximum dry density as determined by ASTM D-1557.

Rock Borrow should be placed in lifts not exceeding 3 feet and compacted and choked with Crushed Stone or blast fines such that voids are filled within the Rock Borrow mass prior to placing the next lift. Rock borrow lifts should be compacted with at least 3 passes each way of a vibratory roller having a static weight of at least 12-tons.

4.9 Weather Considerations

Considering the site is principally shallow rock, blasting and site grading with Rock Borrow may occur in variable weather conditions. Site grading with soil fills should ideally be performed in drier, non-freezing weather. The contractor should anticipate the need for water to temper fills in order to facilitate compaction during dry weather. If construction takes place during cold weather, subgrades, foundations and floor slabs must be protected during freezing conditions. Concrete and fill must not be placed on frozen soil; and once placed, the concrete and soil beneath the structure must be protected from freezing.

4.10 Paved Areas

We anticipate paved areas will be subjected primarily to passenger vehicle and light delivery truck traffic with occasional heavy delivery truck traffic. Considering the site soils, and proposed usage, we offer the following pavement section for consideration. Materials are based on Maine Department of Transportation 2014 Standard Specifications.



Asphalt Pavement Section	
Material	Thickness (Inches)
9.5 mm Hot Mix Asphalt (50 Gyration Design)	1 1/4
19.0 mm Hot Mix Asphalt (50 Gyration Design)	2 1/4
MDOT 703.06 Type A, Crushed Aggregate Base	3
MDOT 703.06 Type D, Crushed Aggregate Subbase	15

The base and subbase materials should be compacted to at least 95 percent of their maximum dry density as determined by ASTM D-1557. Hot mix asphalt pavement should be compacted to 92 to 97 percent of its theoretical maximum density as determined by ASTM D-2041. A tack coat should be used between successive lifts of bituminous pavement.

It should be understood that frost penetration can be on the order of 4.5 feet in this area. In the absence of full depth excavation of frost susceptible soils below paved areas and subsequent replacement with non-frost susceptible compacted fill, frost penetration into the subgrade will occur and some heaving and distress of pavement must be anticipated.

4.11 Fill Slopes and MSE Walls

Fill slopes should be constructed of properly compacted Rock Borrow or Granular Borrow overlying bedrock. The slopes should be constructed as oversized level benches to facilitate proper compaction which are then excavated to grade. Vegetation should be established on the slopes as soon as practicable. Temporary erosion control mesh or other means may be needed to stabilize the slopes during construction.

We understand mechanically stabilized earth walls (MSE Walls) may be needed for site grading. We recommend the following geotechnical parameters for design of MSE Walls:

Geotechnical Parameters for MSE Walls								
Wall Zone Unit Weight (pcf) Friction Angle								
Reinforced Soil	130	32						
Retained Soil	135	30						
Foundation Soil	125	28						



S.W.COLE should be retained to review MSE Wall designs and perform a global stability analysis of MSE Walls, as well as cut and fill slopes.

4.12 Design Review and Construction Testing

S.W.COLE should be retained to review the final design and specifications to determine that our earthwork, foundation and pavement recommendations have been properly interpreted and implemented.

A construction materials testing and special inspection program should also be implemented during construction to observe compliance with the design concepts, plans, and specifications. S.W.COLE is available to provide pre-blast surveys, subgrade observations for foundations as well as testing and special inspection services for soils, concrete, asphalt, steel, and spray-applied fireproofing construction materials.

5.0 CLOSURE

It has been a pleasure to be of assistance to you with this phase of your project. We look forward to working with you during the construction phase of the project.

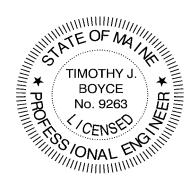
Sincerely,

S. W. Cole Engineering, Inc.

Evan M. Walker, P.E. Geotechnical Engineer

Timothy J. Boyce, P.E. Senior Geotechnical Engineer

EMW:tjb-mas



Attachment A Limitations

This report has been prepared for the exclusive use Hawthorn Development, LLC and Lenity Architecture for specific application to the proposed Retirement Residence at 802 Ocean Avenue in Portland, Maine. S. W. Cole Engineering, Inc. has endeavored to conduct the work in accordance with generally accepted soil and foundation engineering practices. No warranty, expressed or implied, is made.

The soil profiles described in the report are intended to convey general trends in subsurface conditions. The boundaries between strata are approximate and are based upon interpretation of exploration data and samples.

The analyses performed during this investigation and recommendations presented in this report are based in part upon the data obtained from subsurface explorations made at the site. Variations in subsurface conditions may occur between explorations and may not become evident until construction. If variations in subsurface conditions become evident after submission of this report, it will be necessary to evaluate their nature and to review the recommendations of this report.

Observations have been made during exploration work to assess site groundwater levels. Fluctuations in water levels will occur due to variations in rainfall, temperature, and other factors.

S. W. Cole Engineering, Inc.'s scope of work has not included the investigation, detection, or prevention of any Biological Pollutants at the project site or in any existing or proposed structure at the site. The term "Biological Pollutants" includes, but is not limited to, molds, fungi, spores, bacteria, and viruses, and the byproducts of any such biological organisms.

Recommendations contained in this report are based substantially upon information provided by others regarding the proposed project. In the event that any changes are made in the design, nature, or location of the proposed project, S. W. Cole Engineering, Inc. should review such changes as they relate to analyses associated with this report. Recommendations contained in this report shall not be considered valid unless the changes are reviewed by S. W. Cole Engineering, Inc.



MIKE NADEAU

DRILLER:

B-101 BORING NO.: SHEET: 1 OF 1 PROJECT NO.: 14-1188

DATE START: 11/22/2014 DATE FINISH: 11/22/2014

ELEVATION:

BORING NO.:

B-101

E. WALKER

SWC REP.: WATER LEVEL INFORMATION

ALL SOILS MOIST

	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	SSA	4" O.D.		
SAMPLER:	SS	1 3/8"	140 LBS.	30"

PROPOSED RETIREMENT RESIDENCE

802 OCEAN AVENUE, PORTLAND, MAINE

HAWTHORNE DEVELOPMENT, LLC

NORTHERN TEST BORING, INC.

CORE BARREL:

U = 3.5" SHELBY TUBE

LABORATORY TEST

DRILLING FIRM:

PROJECT:

LOCATION:

CLIENT:

CASING BLOWS		SAN	ИPLE		SAM	PLER BI	LOWS F	PER 6"	DEPTH	STRATA & TEST DATA
PER FOOT	NO.	PEN.	REC.	DEPTH @ BOT	0-6	6-12	12-18	18-24	DEI III	OTRATA & TEST DATA
	1D	8"	4"	0.6'	1	50-2"			0.6'	FOREST DUFF
									0.9'	WEATHERED BEDROCK - ADVANCE BY AUGER
										PETUON 0 0 0
										REFUSAL @ 0.9'
										BEDROCK
									1	
									=	
									1	
									1	
]	
									1	
		1	1	00:: -				1	DE: · · · =	
SAMPL	ES:			SOIL C	LASSI	HIED B	Y:		REMAR	CKS:
) = SPL	IT SPC	OON			DRI	LLER -	VISUAI	LY		STRATIFICATION LINES REPRESENT THE 2
		TUBE		Х		L TECH				APPROXIMATE BOUNDARY BETWEEN SOIL TYPES
	-	_		<u> </u>					1	

AND THE TRANSITION MAY BE GRADUAL.



MIKE NADEAU

DRILLER:

BORING NO.: **B-102**SHEET: 1 OF 1

PROJECT NO.: 14-1188

DATE START: 11/22/2014
DATE FINISH: 11/22/2014

ELEVATION:

SWC REP.: E. WALKER

WATER LEVEL INFORMATION

 TYPE
 SIZE I.D.
 HAMMER WT. HAMMER FALL

 CASING:
 SSA
 4" O.D.

 SAMPLER:
 SS
 1 3/8"
 140 LBS.
 30"

PROPOSED RETIREMENT RESIDENCE

802 OCEAN AVENUE, PORTLAND, MAINE

HAWTHORNE DEVELOPMENT, LLC

NORTHERN TEST BORING, INC.

CORE BARREL:

DRILLING FIRM:

PROJECT: CLIENT:

LOCATION:

CASING BLOWS		SAN	//PLE		SAMI	PLER B	LOWS F	PER 6"	DEPTH	STRATA & TEST DATA	
PER FOOT	NO.	PEN.	REC.	DEPTH @ BOT	0-6	6-12	12-18	18-24	DEI III	OTTATA O TEOL DATA	
									0.4'	FOREST DUFF	
	1D	14"	14"	1.2'	1	2	50-2"		1.0'	DARK BROWN SILTY SAND WITH ORGANICS	
									1.2'	WEATHERED BEDROCK - ADVANCE BY AUGER	
	1D	14"	14"	1.2'	1		50-2"		1.0'	DARK BROWN SILTY SAND WITH ORGANICS	
SAMPLE	ES:			SOIL C	LASSII	FIED B	Y:		REMARKS:		
) = SPL	IT SPC	OON			DRI	LLER -	VISUAL	_LY	STRATIFIC	CATION LINES REPRESENT THE 3	

C = 3" SHELBY TUBE U = 3.5" SHELBY TUBE DRILLER - VISUALLY
X SOIL TECH. - VISUALLY
LABORATORY TEST

APPROXIMATE BOUNDARY BETWEEN SOIL TYPES
AND THE TRANSITION MAY BE GRADUAL.

BORING NO.:

B-102



BORING NO.:	B-103
SHEET:	1 OF 1
PROJECT NO.:	14-1188

	NORTHERN TEST BORNIS INC	55	
LOCATION:	802 OCEAN AVENUE, PORTLAND, MAINE		
CLIENT :	HAWTHORNE DEVELOPMENT, LLC		
PROJECT:	PROPOSED RETIREMENT RESIDENCE		

DATE START: 11/22/2014

CLIENT:	HAWTHORN	IE DEVELOPMEN	NT, LLC			DATE FINISH:	11/22/2014	
LOCATION:	802 OCEAN	AVENUE, PORTL	LAND, MAINE		ELEVATION:			
DRILLING FIRM:	NORTHERN	TEST BORING, I	INC.	DRILLER:	MIKE NADEAU	LLLVATION.		
	TYPE	SIZE I.D. F	HAMMER WT. H	AMMER FALL	_	SWC REP.:	E. WALKER	
CASING:						WATER LEVEL INFOR	MATION	
SAMPLER:				_				
CORE BARREL:					_			
					_			
CASING	SAMPLE	SAMPLER BLO	OWS PER 6"					

BLUWS									DEPTH	STRATA & TEST DATA		
PER FOOT	NO.	PEN.	REC.	DEPTH @ BOT		6-12	12-18	18-24		OTIVATA (EST DATA		
				0								
										BEDROCK AT GROUND SURFACE		
									1			
									1			
SAMPL	L ES:			SOIL C	LASSIF	I FIED BY	' :		REMAR	KS:		
	-											
	D = SPLIT SPOON DRILLER - VISUALLY					LLER - '	VISUAL	.LY		STRATIFICATION LINES REPRESENT THE (4)		
C = 3" S				Χ		L TECH				APPROXIMATE BOUNDARY BETWEEN SOIL TYPES		
U = 3.5"	' SHELE	BY TUB	E		LAB	ORATO	RY TE	ST		AND THE TRANSITION MAY BE GRADUAL. BORING NO.: B-103		



PROJECT:

CLIENT:

BORING LOG

B-104 **BORING NO.:** SHEET: 1 OF 1 PROJECT NO.: 14-1188

DATE START: 11/22/2014 11/22/2014

DATE FINISH: **ELEVATION:**

E. WALKER

SWC REP.:

WATER LEVEL INFORMATION

ALL SOILS MOIST

802 OCEAN AVENUE, PORTLAND, MAINE LOCATION: DRILLING FIRM: NORTHERN TEST BORING, INC. DRILLER: MIKE NADEAU SIZE I.D. HAMMER WT. HAMMER FALL **TYPE** CASING: SSA 4" O.D. SAMPLER: SS 1 3/8" 140 LBS. 30" CORE BARREL:

PROPOSED RETIREMENT RESIDENCE

HAWTHORNE DEVELOPMENT, LLC

CASING BLOWS			STRATA & TEST DATA							
PER FOOT	NO.	PEN.	REC.	DEPTH @ BOT	0-6	6-12	12-18	18-24	DEI III	OTRATA & TEOL DATA
	1D	8"	8"	1.6'	13	50-2"			0.2'	FOREST DUFF / DARK BROWN SILTY SAND WITH ORGANICS
									1.1'	WEATHERED BEDROCK - ADVANCE BY AUGER
										DEFINAL OLD II
										REFUSAL @ 1.1' BEDROCK
SAMPLI	ES:	1	1	SOIL C	LASSII	FIED BY	/ :	<u>I</u>	REMAR	KS:
) = SPL	.IT SPC	OON			DRI	LLER -	VISUAL	.LY		STRATIFICATION LINES REPRESENT THE 5
) = 3" S	HELBY	/ TUBE		Χ	SOI	L TECH	I VISL	JALLY		APPROXIMATE BOUNDARY BETWEEN SOIL TYPES
J = 3.5"	SHELE	BY TUB	Ε		LAB	ORATO	DRY TE	ST		AND THE TRANSITION MAY BE GRADUAL. BORING NO.: B-104



PROJECT:

LOCATION:

DRILLING FIRM:

U = 3.5" SHELBY TUBE

LABORATORY TEST

CLIENT:

BORING LOG

MIKE NADEAU

DRILLER:

B-105 **BORING NO.:** SHEET: 1 OF 1 PROJECT NO.: 14-1188

DATE START: 11/22/2014 DATE FINISH: 11/22/2014

ELEVATION:

E. WALKER

SWC REP.:

WATER LEVEL INFORMATION

ALL SOILS MOIST

BORING NO.:

B-105

	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	SSA	4" O.D.		
SAMPLER:	SS	1 3/8"	140 LBS.	30"
CORE BARREL:				

PROPOSED RETIREMENT RESIDENCE

802 OCEAN AVENUE, PORTLAND, MAINE

HAWTHORNE DEVELOPMENT, LLC

NORTHERN TEST BORING, INC.

CASING BLOWS		SAMPLER BLOWS PER 6"		DEST!	CTDATA O TECT DATA					
PER FOOT	NO.	PEN.	REC.	DEPTH @ BOT	0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
	1D	10"	8"	0.8'	2	50-4"			0.4'	FOREST DUFF
									0.8'	DARK BROWN SILTY SAND WITH ORGANICS
									1.8'	WEATHERED BEDROCK - ADVANCE BY AUGER
									`	
										REFUSAL @ 1.8'
										BEDROCK
									4	
									4	
									-	
									-	
									-	
									-	
-										
									1	
									1	
									4	
									4	
									4	
								<u> </u>		
SAMPLE	ES:			SOIL C	LASSII	FIED BY	/ :		REMAR	RKS:
D = SPL				\		LLER -				STRATIFICATION LINES REPRESENT THE (6)
C = 3" S	HELBY	TUBE		Х	SOI	L TECH	VISL	JALLY		APPROXIMATE BOUNDARY BETWEEN SOIL TYPES

AND THE TRANSITION MAY BE GRADUAL.



BORING NO.:	P-201
SHEET:	1 OF 1
PROJECT NO.:	14-1188
DATE START:	11/22/2014
DATE FINISH:	11/22/2014

PROJECT:	PROPOSED RETIREMENT RESIDENCE			
CLIENT :	HAWTHORNE DEVELOPMENT, LLC			
LOCATION:	802 OCEAN AVENUE, PORTLAND, MAINE			
DRILLING FIRM:	NORTHERN TEST BORING, INC.	DRILLER:	MIKE NADEAU	

SWC REP.: E. WALKER

TYPE SIZE I.D. HAMMER WT. HAMMER FALL SSA 4" O.D.

WATER LEVEL INFORMATION

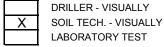
ELEVATION:

SAMPLER: CORE BARREL:

CASING:

CASING BLOWS		SAN	MPLE		SAMI	PLER BI	_OWS F	PER 6"	DEPTH	STRATA & TEST DATA
PER FOOT	NO.	PEN.	REC.	DEPTH @ BOT	0-6	6-12	12-18	18-24		OTTAIA G TEOT DATA
										FOREST DUFF
									1.2'	DARK BROWN SILTY SAND WITH ORGANICS
									-	REFUSAL @ 1.2'
									-	BEDROCK
										BESINGON
										NOTE: NO SAMPLING - AUGER PROBE
									.	
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									-	
									1	
SAMPLE	-0.			SOIL C	1 75611	EIED D	/.		REMARKS:	

D = SPLIT SPOON C = 3" SHELBY TUBE U = 3.5" SHELBY TUBE



STRATIFICATION LINES REPRESENT THE
APPROXIMATE BOUNDARY BETWEEN SOIL TYPES
AND THE TRANSITION MAY BE GRADUAL.

BC

BORING NO.: P-201



BURING NU.:	P-202
SHEET:	1 OF 1
PROJECT NO.:	14-1188
DATE START:	11/22/2014
DATE FINISH:	11/22/2014

PROJECT:	PROPOSED RETIREMENT RESIDENCE		
CLIENT :	HAWTHORNE DEVELOPMENT, LLC		
LOCATION:	802 OCEAN AVENUE, PORTLAND, MAINE		
ORILLING FIRM:	NORTHERN TEST BORING, INC.	DRILLER:	MIKE NADEAU

SWC REP.: E. WALKER

TYPE SIZE I.D. HAMMER WT. HAMMER FALL SSA 4" O.D.

DRILLER - VISUALLY

LABORATORY TEST

SOIL TECH. - VISUALLY

WATER LEVEL INFORMATION

ELEVATION:

SAMPLER:

D = SPLIT SPOON

C = 3" SHELBY TUBE

U = 3.5" SHELBY TUBE

CASING:

CORE BARREL:

CASING BLOWS		SAN	MPLE		SAME	PLER BI	_OWS P	ER 6"	DEPTH STRATA & TEST DATA	
PER FOOT	NO.	PEN.	REC.	DEPTH @ BOT	0-6	6-12	12-18	18-24	טבו ווו	
										FOREST DUFF
									2.6'	ORANGE-BROWN SILTY SAND
									3.1'	WEATHERED BEDROCK
										REFUSAL @ 3.1' BEDROCK
										BESILOGIA
										NOTE: NO SAMPLING - AUGER PROBE
									1	
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									-	
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									-	
									1	
									1	
SAMPLI	ES:	.1	1	SOIL C	LASSIF	FIED BY	/ :	1	REMAR	KS:
, <u></u> .				55.20		,	-		,,	

STRATIFICATION LINES REPRESENT THE

AND THE TRANSITION MAY BE GRADUAL.

APPROXIMATE BOUNDARY BETWEEN SOIL TYPES

BORING NO.:

P-202



BORING NO.: P-203

SHEET: 1 OF 1

PROJECT NO.: 14-1188

DATE START: 11/22/2014

DATE FINISH: 11/22/2014

ELEVATION:

PROJECT:	PROPOSED RETIREMENT RESIDENCE			
CLIENT :	HAWTHORNE DEVELOPMENT, LLC			
LOCATION:	802 OCEAN AVENUE, PORTLAND, MAINE			
DRILLING FIRM:	NORTHERN TEST BORING, INC.	DRILLER:	MIKE NADEAU	

SWC REP.: E. WALKER

TYPE SIZE I.D. HAMMER WT. HAMMER FALL SSA 4" O.D.

SOIL TECH. - VISUALLY

LABORATORY TEST

WATER LEVEL INFORMATION

SAMPLER: CORE BARREL:

C = 3" SHELBY TUBE

U = 3.5" SHELBY TUBE

CASING:

CASING BLOWS		SAN	//PLE		SAMI	PLER BI	LOWS F	PER 6"	DEPTH	STRATA & TEST DATA
PER FOOT	NO.	PEN.	REC.	DEPTH @ BOT	0-6	6-12	12-18	18-24	DEFIN	STRATA & TEST DATA
										FOREST DUFF
									2.0'	ORANGE-BROWN SILTY SAND
										REFUSAL @ 2.0'
										BEDROCK
										NOTE: NO SAMPLING - AUGER PROBE
									-	
									-	
]	
									-	
]	
									1	
]	
									1	
SAMPLI	ES:		1	SOIL C	LASSIF	FIED BY	/ :	ı	REMAR	RKS:
D = SPL	IT SPC	OON			DRII	LLER -	VISUAL	.LY		STRATIFICATION LINES REPRESENT THE (9)

APPROXIMATE BOUNDARY BETWEEN SOIL TYPES

BORING NO.:

P-203

AND THE TRANSITION MAY BE GRADUAL.



BORING NO.:	P-204
SHEET:	1 OF 1
PROJECT NO.:	14-1188
DATE START.	11/22/2014

PROJECT:	PROPOSED RETIREMENT RESIDENCE			
CLIENT :	HAWTHORNE DEVELOPMENT, LLC			
LOCATION:	802 OCEAN AVENUE, PORTLAND, MAINE			
DRILLING FIRM:	NORTHERN TEST BORING, INC.	DRILLER:	MIKE NADEAU	

SWC REP.: E. WALKER

11/22/2014

TYPE SIZE I.D. HAMMER WT. HAMMER FALL SSA 4" O.D.

DRILLER - VISUALLY

LABORATORY TEST

SOIL TECH. - VISUALLY

WATER LEVEL INFORMATION

DATE FINISH:

SAMPLER: CORE BARREL:

D = SPLIT SPOON

C = 3" SHELBY TUBE

U = 3.5" SHELBY TUBE

CASING:

CASING BLOWS	SAMPLE				SAMPLER BLOWS PER 6"				DEPTH	STRATA & TEST DATA	
PER FOOT	NO.	PEN.	REC.	DEPTH @ BOT	0-6	6-12	12-18	18-24	DEFIN	STRATA & TEST DATA	
										FOREST DUFF	
									1.9'	DARK BROWN SILTY SAND WITH ORGANICS	
									-	REFUSAL @ 1.9'	
										BEDROCK	
										NOTE NO CAMPANO AMOSE PROPE	
										NOTE: NO SAMPLING - AUGER PROBE	
									1		
]		
SAMPLI	EQ.	1		SOIL C	η Δοςιι	IED BY	/.	I.	REMAR	DKS.	
JOANIFLI	LJ.			JOIL C	LASSIF	יבט פו			I VEIVIAR	tho.	

STRATIFICATION LINES REPRESENT THE

AND THE TRANSITION MAY BE GRADUAL.

APPROXIMATE BOUNDARY BETWEEN SOIL TYPES

BORING NO.:

P-204



BORING NO.: **P-205**SHEET: 1 OF 1

PROJECT NO.: 14-1188

DATE START: 11/22/2014

DATE FINISH: 11/22/2014

PROJECT: PROPOSED RETIREMENT RESIDENCE

CLIENT: HAWTHORNE DEVELOPMENT, LLC

LOCATION: 802 OCEAN AVENUE, PORTLAND, MAINE

DRILLING FIRM: NORTHERN TEST BORING, INC. DRILLER: MIKE NADEAU

TYPE SIZE I.D. HAMMER WT. HAMMER FALL

SWC REP.: E. WALKER

P-205

BORING NO.:

SSA 4" O.D.

WATER LEVEL INFORMATION

ELEVATION:

SAMPLER:

CASING

U = 3.5" SHELBY TUBE

LABORATORY TEST

CASING:

CORE BARREL:

CASING BLOWS		SAN	MPLE		SAME	SAMPLER BLOWS PER 6"			DEDTU	STRATA & TEST DATA	
PER FOOT	NO.	PEN.	REC.	DEPTH @ BOT	0-6	6-12	12-18	18-24	DEPTH	SIRAIA & IESI DAIA	
										FOREST DUFF	
									ļ <u>.</u>	DARK BROWN SILTY SAND WITH ORGANICS	
									2.6'		
									1	REFUSAL @ 2.6'	
										BEDROCK	
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SAMPLI	ES:			SOIL C	LASSIF	FIED BY	Y:		REMAR	RKS:	
) = SPL	IT SDC	NON			ויפח	IED	VISUAL			STRATIFICATION LINES REPRESENT THE (11)	
) = 3PL) = 3" S				Х			I VISL			APPROXIMATE BOUNDARY BETWEEN SOIL TYPES	

AND THE TRANSITION MAY BE GRADUAL.



SSA

4" O.D.

BORING LOG

SHEET:	1 OF 1
PROJECT NO.:	14-1188
DATE START:	11/22/2014
DATE FINISH:	11/22/2014
ELEVATION:	

P-206

E. WALKER

PROJECT: PROPOSED RETIREMENT RESIDENCE

CLIENT: HAWTHORNE DEVELOPMENT, LLC

LOCATION: 802 OCEAN AVENUE, PORTLAND, MAINE

DRILLING FIRM: NORTHERN TEST BORING, INC. DRILLER: MIKE NADEAU

TYPE SIZE I.D. HAMMER WT. HAMMER FALL

WATER LEVEL INFORMATION

SWC REP.:

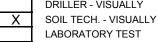
BORING NO.:

SAMPLER: CORE BARREL:

CASING:

CASING BLOWS		SAN	//PLE		SAME	SAMPLER BLOWS PER 6"			DEPTH	STRATA & TEST DATA
PER FOOT	NO.	PEN.	REC.	DEPTH @ BOT	0-6	6-12	12-18	18-24	DECIN	STICKIA & TEST DATA
										FOREST DUFF
										DARK BROWN TO BROWN SILTY SAND
									3.4'	
										REFUSAL @ 3.4'
										BEDROCK
										NOTE: NO SAMPLING - AUGER PROBE
SAMPLI	ES:			SOIL C	LASSIF	FIED BY	/ :		REMAR	KS:
D = SPL C = 3" S				X			VISUAL			STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES

C = 3" SHELBY TUBE U = 3.5" SHELBY TUBE



APPROXIMATE BOUNDARY BETWEEN SOIL TYPES
AND THE TRANSITION MAY BE GRADUAL.

BORING NO.:

P-206



BORING NO.:	P-207
SHEET:	1 OF 1
PROJECT NO.:	14-1188
DATE START:	11/22/2014

PROJECT:	PROPOSED RETIREMENT RESIDENCE			
CLIENT :	HAWTHORNE DEVELOPMENT, LLC			
LOCATION:	802 OCEAN AVENUE, PORTLAND, MAINE			
DRILLING FIRM:	NORTHERN TEST BORING, INC.	DRILLER:	MIKE NADEAU	

DATE FINISH: 11/22/2014 **ELEVATION:**

SIZE I.D. HAMMER WT. HAMMER FALL TYPE

SWC REP.: E. WALKER

WATER LEVEL INFORMATION

CASING:	SSA	4" O.D.	
SAMPLER:			<u></u>
CORE BARREL:			

SING		SAN	//PLE		SAMPLER BLOWS PER 6"				DEPTH	STRATA & TEST DATA
ER OT	NO.	PEN.	REC.	DEPTH @ BOT	0-6	6-12	12-18	18-24		
										FOREST DUFF
									1.9'	BROWN SILTY SAND, TRACE GRAVEL
										REFUSAL @ 1.9'
										BEDROCK
									1	525.000.0
										NOTE: NO SAMPLING - AUGER PROBE
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									1	
									1	
	ES:		I	SOIL C				I	REMAR	

D = SPLIT SPOON DRILLER - VISUALLY

C = 3" SHELBY TUBE SOIL TECH. - VISUALLY U = 3.5" SHELBY TUBE LABORATORY TEST

STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

BORING NO.:

P-207



BORING NO.:	P-208
SHEET:	1 OF 1
PROJECT NO.:	14-1188

PROJECT:	PROPOSED RETIREMENT RESIDENCE		
CLIENT:	HAWTHORNE DEVELOPMENT, LLC		
LOCATION:	802 OCEAN AVENUE, PORTLAND, MAINE		
DRILLING FIRM:	NORTHERN TEST BORING, INC.	DRILLER:	MIKE NADEAU

SIZE I.D. HAMMER WT. HAMMER FALL

DATE START: 11/22/2014 DATE FINISH: 11/22/2014

NORTHERN TEST BORING, INC. DRILLER: MIKE NADEAU

> SWC REP.: E. WALKER

> > P-208

BORING NO.:

CASING: SSA 4" O.D. SAMPLER:

U = 3.5" SHELBY TUBE

LABORATORY TEST

WATER LEVEL INFORMATION

ELEVATION:

SAMELLIN.	
CORE BARREL:	

TYPE

CASING BLOWS PER			1PLE	DEPTH		PLER BL			DEPTH STRATA & TEST DATA	
FOOT	NO.	PEN.	REC.	@ BOT	0-6	6-12	12-18	18-24		
									-	
									1	
									BEDROCK AT GROUND SURFACE	
									-	
									-	
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SAMPLI	ES:			SOIL C	LASSIF	FIED BY	' :		REMARKS:	
D = SPL C = 3" S				X		LER - \			STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES	

AND THE TRANSITION MAY BE GRADUAL.



KEY TO THE NOTES & SYMBOLS <u>Test Boring and Test Pit Explorations</u>

All stratification lines represent the approximate boundary between soil types and the transition may be gradual.

Key to Symbols Used:

w - water content, percent (dry weight basis)

qu - unconfined compressive strength, kips/sq. ft. - laboratory test

 S_{ν} - field vane shear strength, kips/sq. ft. L lab vane shear strength, kips/sq. ft.

qp - unconfined compressive strength, kips/sq. ft. – pocket penetrometer test

O - organic content, percent (dry weight basis)

W_L - liquid limit - Atterberg test
 W_P - plastic limit - Atterberg test
 WOH - advance by weight of man
 WOR - advance by weight of rods

HYD - advance by force of hydraulic piston on drill

RQD - Rock Quality Designator - an index of the quality of a rock mass.

 γ_T - total soil weight γ_B - buoyant soil weight

<u>Description of Proportions:</u> <u>Description of Stratified Soils</u>

		Parting:	0 to 1/16" thickness
Trace:	0 to 5%	Seam:	1/16" to 1/2" thickness
Some:	5 to 12%	Layer:	½" to 12" thickness
"Y"	12 to 35%	Varved:	Alternating seams or layers

"Y" 12 to 35% Varved: Alternating seams or layers

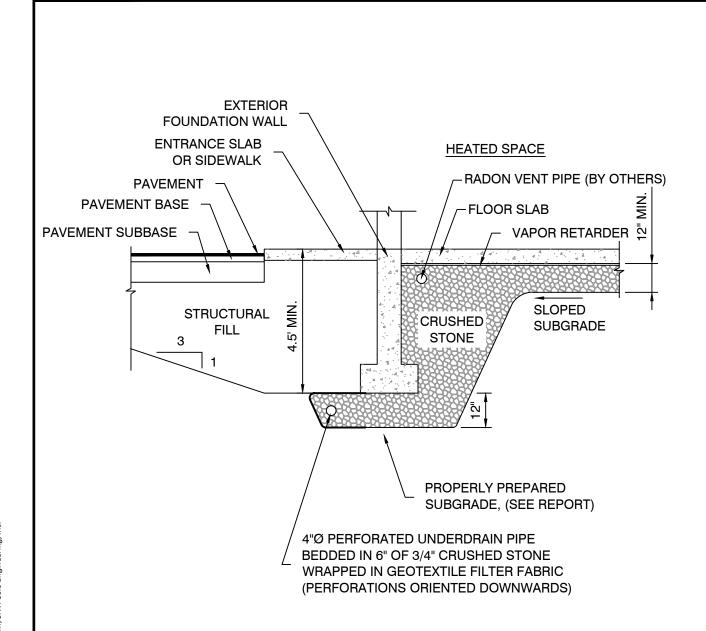
And 35+% Occasional: one or less per foot of thickness

Frequent: more than one per foot of thickness

REFUSAL: <u>Test Boring Explorations</u> - Refusal depth indicates that depth at which, in the drill foreman's opinion, sufficient resistance to the advance of the casing, auger, probe rod or sampler was encountered to render further advance impossible or impracticable by the procedures and equipment being used.

REFUSAL: <u>Test Pit Explorations</u> - Refusal depth indicates that depth at which sufficient resistance to the advance of the backhoe bucket was encountered to render further advance impossible or impracticable by the procedures and equipment being used.

Although refusal may indicate the encountering of the bedrock surface, it may indicate the striking of large cobbles, boulders, very dense or cemented soil, or other buried natural or man-made objects or it may indicate the encountering of a harder zone after penetrating a considerable depth through a weathered or disintegrated zone of the bedrock.



NOTE:

- 1. UNDERDRAIN INSTALLATION AND MATERIAL GRADATION RECOMMENDATIONS ARE CONTAINED WITHIN THIS REPORT.
- 2. DETAIL IS PROVIDED FOR ILLUSTRATIVE PURPOSES ONLY, NOT FOR CONSTRUCTION.



HAWTHORN DEVELOPMENT, LLC

UNDERDRAIN DETAIL

PROPOSED RETIREMENT RESIDENCE 802 OCEAN AVENUE PORTLAND, MAINE

Job No.: 14-1188 Scale: Not to Scale

Date: 12/05/2014 Sheet: 16





PROJECT / CLIENT:

BORING LOG

B-1 BORING NO.: SHEET: 1 OF 1 PROJECT NO.: 04-1228 DATE START: 12/9/2004 DATE FINISH: 12/9/2004 **ELEVATION:** 140.8

LOCATION:	OCEAN AVENUE, PORTLAND, MAINE			
DRILLING CO.:	GREAT WORKS TEST BORING INC.	DRILLER:	JEFF LEE	

PFK SWC REP.:

TYPE SIZE I.D. HAMMER WT. HAMMER FALL CASING: HW300 lb 18" SAMPLER:

WATER LEVEL INFORMATION OVERBURDEN SOILS SATURATED

2" NQ2 CORE BARREL:

CASING BLOWS	SAMPLE SAMPLER BLOWS PER 6"		DEPTH	STRATA & TEST DATA						
PER FOOT	NO.	PEN.	REC.	DEPTH @ BOT	0-6	6-12	12-18	18-24	DEFIII	STRATA & TEST DATA
										FOREST DUFF / TOPSOIL
										OVERLYING BROWN SILTY SAND WITH ORGANICS AND COBBLES GLACIAL TILL
										OLAVIAL TILL
									5.0'	
										BEDROCK INTERPEDDED WHITE TO LICHT CRAY
										INTERBEDDED WHITE TO LIGHT GRAY MIGMATITE AND BIOTITE-MUSCOVITE SCHIST
	1R	60"	53"	10.0'						RQD = 37%
	2R	60"	59"	15.0'					15.0'	RQD = 60%
										BOTTOM OF EXPLORATION AT 15.0'
									1	
AMPL	ES:			SOIL C	LASSI	FIED BY	/ :		REMAR	RKS:
= SPI	.IT SPC	OON			DRII	IFR-	VISUAL	ΙY		STRATIFICATION LINES REPRESENT THE 2
		TUBE		Х	l .		I VISL			APPROXIMATE BOUNDARY BETWEEN SOIL TYPES
= 3.5"	SHELE	3Y TUB	E		LAB	ORATO	RY TE	ST		AND THE TRANSITION MAY BE GRADUAL. BORING NO.: B-1



OCEAN AVENUE, PORTLAND, MAINE

PROJECT / CLIENT:

LOCATION:

BORING LOG

B-2 / MW BORING NO.: SHEET: 1 OF 1

PROJECT NO.: 04-1228

DATE START: 12/9/2004 DATE FINISH: 12/9/2004 158.7

PFK

WATER LEVEL INFORMATION 1" PIEZOMETER INSTALLED

DRILLING CO.: GREAT WORKS TEST BORING INC. DONNY BOLSTRIDGE DRILLER: **ELEVATION:** TYPE SIZE I.D. HAMMER WT. HAMMER FALL SWC REP.: CASING: HW300 lb 18" SAMPLER: 2" NQ2 CORE BARREL:

CASING BLOWS		SAN	//PLE		SAMF	PLER BL	OWS P	ER 6"	5555	OTDATA 8 TEST DATA
PER FOOT	NO.	PEN.	REC.	DEPTH @ BOT	0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
				0					1.0'	FOREST DUFF / TOPSOIL
										BEDROCK
										[ADVANCED BORING BY AIR HAMMER TO 21.5']
									21.5'	
										INTERBEDDED WHITE TO LIGHT GRAY
										MIGMATITE AND BIOTITE-MUSCOVITE SCHIST
	1R	60"	58"	26.5'						RQD = 77 %
		00	00	20.0						TAGE 17 /V
	2R	58"	58"	31.3'					31.3'	RQD = 63 %
										BOTTOM OF EXPLORATION AT 31.3'
										PIEZOMETER DETAILS: SCREEN 26.3' - 31.3'
										FILTER SAND 21' - 31.3'
										BENTONITE 19' - 21'
CANADA	-0:			00" 0	1 400:	, , , , , , , , , , , , , , , , , , ,	<i>i</i> .		DE1445	SAND TO SURFACE
SAMPLE	: 5:			SOIL C	LASSIF	-IFD RA	':		REMAR	
D = SPL					ŀ		VISUAL			STRATIFICATION LINES REPRESENT THE (3)
C = 3" S U = 3.5"				X			VISU RY TES			APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL. BORING NO.: B-2 / MW
										BORING NO D-2 / MIVV



PROJECT / CLIENT:

BORING LOG

SHEET:	1 OF 1
PROJECT NO.:	04-1228
DATE START:	12/9/2004
DATE FINISH:	12/9/2004
ELEVATION:	144.4
SWC REP.:	PFK
WATER LEVEL INCOR	MATION

BORING NO.:

B-3

LOCATION:	OCEAN AVE	NUE, PORTLA	ND, MAINE			DATE FINISH:	12/9/2004
DRILLING CO.:	GREAT WOR	KS TEST BOI	RING INC.	DRILLER: _	JEFF LEE	ELEVATION:	144.4
	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL		SWC REP.:	PFK
CASING:	HW	4"	300 lb	18"		WATER LEVEL INFORM	MATION
SAMPLER:						OVERBURDEN SOILS SA	TURATED
CORE BARREL:	NQ2	2"		_			

CASING BLOWS		SAN	//PLE		SAMF	PLER BI	LOWS P	PER 6"	DEDTU	STRATA & TEST DATA
PER FOOT	NO.	PEN.	REC.	DEPTH @ BOT	0-6	6-12	12-18	18-24	DEPTH	SIRAIA & IESI DATA
									<u>2.5'</u> 4.5'	PROBABLE WEATHERED BEDROCK
									7.0'	BEDROCK
	1R	60"	60"	12.0'						INTERBEDDED WHITE TO LIGHT GRAY MIGMATITE AND BIOTITE-MUSCOVITE SCHIST RQD = 62 %
	2R	60"	59"	17.0'					17.0'	RQD = 72 %
										BOTTOM OF EXPLORATION AT 17.0'
SAMPLI D = SPL C = 3" S U = 3.5"	IT SPO	TUBE		SOIL C	DRII SOII	LLER - '	Y: VISUAL I VISU DRY TE:	LY JALLY		STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL. BORING NO.: B-3



PROJECT / CLIENT:

LOCATION:

DRILLING CO.:

BORING LOG

DRILLER:

JEFF LEE

BORING NO.: **B-4 / MW**SHEET: 1 OF 1

PROJECT NO.: 04-1228

DATE START: 12/9/2004

ELEVATION: 137

12/10/2004

SWC REP.: PFK / KBG

WATER LEVEL INFORMATION
1" PIEZOMETER INSTALLED

DATE FINISH:

 TYPE
 SIZE I.D.
 HAMMER WT. HAMMER FALL

 CASING:
 HW
 4"
 300 lb
 18"

 SAMPLER:
 SS
 1 3/8"
 1 3/8"

 CORE BARREL:
 NQ2
 2"

OCEAN AVENUE, PORTLAND, MAINE

GREAT WORKS TEST BORING INC.

CASING BLOWS		SAN	/IPLE		SAMF	PLER BI	LOWS F	PER 6"	DEDTU	STRATA & TEST DATA	
PER FOOT	NO.	PEN.	REC.	DEPTH @ BOT	0-6	6-12	12-18	18-24	DEPTH	SIRAIA & IESI DAIA	
				0					1.0'	FOREST DUFF / TOPSOIL	
	1D	24"	12"	2.0'	WOH	1/12"	2	3		RUST BROWN SILTY SAND WITH COBBLES - GLACIAL TILL	
									3.0'	~LOOSE~	
	2D	3"	3"	5.2'	50/3"					PROBABLE WEATHERED BEDROCK	
										[ADVANCED BORING BY ROLLER CONE TO 12.0']	
	3D	3"	3"	10.2'	50/3"						
									40.01		
									12.0'		
									-	BEDROCK INTERBEDDED WHITE TO LIGHT GRAY	
										MIGMATITE AND BIOTITE-MUSCOVITE SCHIST	
									1	WIGWATTE AND BIOTTE-WIGGOOVTE GOTIOT	
	1R	60"	59"	17.0'					=	RQD = 40 %	
									1		
									1		
	2R	63"	58"	22.3'					22.3'	RQD = 83 %	
										BOTTOM OF EXPLORATION AT 22.3'	
									-		
										PIEZOMETER DETAILS: SCREEN 17.5' - 22.5'	
										FILTER SAND 15' - 22.5'	
										BENTONITE 13' - 15'	
										SAND TO SURFACE	
										5.1.12 TO GOTATION	
									1		
									1		
									1		
						_					
SAMPLI	SAMPLES: SOIL CLASSIFIED BY:						/ :		REMAR	RKS:	
D 0E:	= SPLIT SPOON DRILLER - VISUALLY									OTDATIFICATION UNITO DEDDECENT THE	
D = SPL										STRATIFICATION LINES REPRESENT THE APPROXIMATE POLICIPARY PETWEEN SOIL TYPES	
C = 3" S				X	i i		I VISU			APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL	
0 - 3.5	= 3.5" SHELBY TUBE LABORATORY TEST				// I I E	01		AND THE TRANSITION MAY BE GRADUAL. BORING NO.: B-4 / MW			



BORING LOG

BORING NO.: B-5

SHEET: 1 OF 1

PROJECT NO.: 04-1228

DATE START: 12/10/2004

DATE FINISH: 12/10/2004

PROJECT / CLIENT:			
LOCATION:	OCEAN AVENUE, PORTLAND, MAINE		
DRILLING CO.:	GREAT WORKS TEST BORING INC.	DRILLER:	DONNY BOLSTRIDGE
		_	

SWC REP.: KBG

153.2

 TYPE
 SIZE I.D.
 HAMMER WT. HAMMER FALL

 CASING:
 HW
 4"
 300 lb
 18"

 SAMPLER:

WATER LEVEL INFORMATION
OVERBURDEN SOILS SATURATED

ELEVATION:

CORE BARREL: NQ2 2"

CASING BLOWS		SAM	1PLE		SAME	PLER BI	OWS P	PER 6"	DEDTU	STRATA & TEST DATA
PER FOOT	NO.	PEN.	REC.	DEPTH @ BOT	0-6	6-12	12-18	18-24	DEPTH	SIRAIA & IESI DAIA
										TOPSOIL OVERLYING BROWN SILTY SAND AND GRAVEL - GLACIAL TILL
										TO TOOL OVER EACH OF SHOWING SHOWING SHOWING THEE
									4.0' 5.0'	PROBABLE WEATHERED BEDROCK
										BEDROCK
										[BORING ADVANCED BY AIR HAMMER TO 15']
									15.0'	
										INTERBEDDED WHITE TO LIGHT GRAY MIGMATITE AND BIOTITE-MUSCOVITE SCHIST
	1R	60"	53"	20.0'						RQD = 83 %
	IK	00	55	20.0						NQD - 03 //
	o D	00"	F0"	05.01					05.01	DOD 00.00
	2R	60"	58"	25.0'					25.0'	RQD = 63 %
										BOTTOM OF EXPLORATION AT 25.0'
SAMPLI	AMPLES: SOIL CLASSIFIED BY:				' :		REMAR	KS:		
	D = SPLIT SPOON DRILLER - VISUALLY SOIL TECH VISUALLY			STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES						
	= 3" SHELBY TUBE X SOIL TECH VISUALLY LABORATORY TEST					AND THE TRANSITION MAY BE GRADUAL. BORING NO.: B-5				



BORING LOG

B-6 BORING NO.: SHEET: 1 OF 1 PROJECT NO.: 04-1228 DATE START: 12/13/2004 DATE FINISH: 12/13/2004 **ELEVATION:** 153 +/-

KBG

		,					
PROJECT / CLIENT:						DATE START:	12/1
LOCATION:	OCEAN AVE	NUE, PORTLA	AND, MAINE		DATE FINISH:	12/1	
DRILLING CO.:	GREAT WOR	KS TEST BOI	RING INC.	DRILLER:	DONNY BOLSTRIDGE	ELEVATION:	15
	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL		SWC REP.:	K
CASING:	HW	4"	300 lb	18"		WATER LEVEL INFORI	MATION
SAMPLER:						NO FREE WATER OBS	ERVED
CORE BARREL:	NQ2	2"	•				•

CASING BLOWS		SAM	MPLE		SAME	PLER BI	LOWS F	PER 6"	DEPTH	STRATA & TEST DATA
PER FOOT	NO.	PEN.	REC.	DEPTH @ BOT	0-6	6-12	12-18	18-24	DLFIN	STRATA & TEST DATA
									0.5'	FOREST DUFF / TOPSOIL
									_	BEDROCK [ADVANCED BORING BY AIR HAMMER TO 15.0']
	1R	60"	56"	20.0'						INTERBEDDED WHITE TO LIGHT GRAY MIGMATITE AND BIOTITE-MUSCOVITE SCHIST RQD = 47 %
	2R	60"	58"	25.0'					25.0'	RQD = 83 %
										BOTTOM OF EXPLORATION AT 25.0'
D = SPL C = 3" S	SAMPLES: SOIL CLASSIFIED BY: D = SPLIT SPOON C = 3" SHELBY TUBE J = 3.5" SHELBY TUBE LABORATORY TEST				VISUAL I VISL	JALLY	REMAR	STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL. BORING NO.: B-6		



BORING LOG

BORING NO.: B-7

SHEET: 1 OF 1

PROJECT NO.: 04-1228

DATE START: 12/10/2004

DATE FINISH: 12/10/2004

ELEVATION: 156.7

LOCATION: OCEAN AVENUE, PORTLAND, MAINE

DRILLING CO.: GREAT WORKS TEST BORING INC. DRILLER: DONNY BOLSTRIDGE

SWC REP.: KBG

 TYPE
 SIZE I.D.
 HAMMER WT. HAMMER FALL

 CASING:
 HW
 4"
 300 lb
 18"

 SAMPLER:

WATER LEVEL INFORMATION NO FREE WATER OBSERVED

CORE BARREL: NQ2 2"

CASING BLOWS		SAN	/IPLE		SAMF	PLER BL	_OWS P	ER 6"	DEPTH	STRATA & TEST DATA
PER FOOT	NO.	PEN.	REC.	DEPTH @ BOT	0-6	6-12	12-18	18-24	DEF IN	SINAIA & TEST DATA
										PROBABLE WEATHERED BEDROCK
										[ADVANCED BORING BY AIR HAMMER TO 20']
										,
									10.0'	BEDROCK
									20.0'	
										INTERBEDDED WHITE TO LIGHT GRAY
										MIGMATITE AND BIOTITE-MUSCOVITE SCHIST
	1R	60"	59"	25.0'						RQD = 87 %
	2R	60"	52"	30.0'					30.0'	RQD = 78 %
										BOTTOM OF EXPLORATION AT 30.0'
SAMPLI	ES:		ı	SOIL C	LASSIF	FIED BY	/ :		REMAR	KS:
D = SPL	IT SPO	ON			DRII	LER - '	VISUAL	LY		STRATIFICATION LINES REPRESENT THE 8
C = 3" S U = 3.5"				Χ	ŀ		VISU ORY TE			APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL. BORING NO.: B-7
										BOILING NO B-1



OCEAN AVENUE, PORTLAND, MAINE

GREAT WORKS TEST BORING INC.

PROJECT / CLIENT:

LOCATION:

CASING:

SAMPLER:

DRILLING CO.:

BORING LOG

DONNY BOLSTRIDGE

BORING NO.: **B-8 / MW** SHEET: 1 OF 1

PROJECT NO.: 04-1228

DATE START: 12/13/2004 DATE FINISH: 12/13/2004 **ELEVATION:** 140.8

KBG

WATER LEVEL INFORMATION 1" PIEZOMETER INSTALLED

TYPE SIZE I.D. HAMMER WT. HAMMER FALL SWC REP.: HW 4" 300 lb 18" 2" NQ2 CORE BARREL:

DRILLER:

CASING BLOWS		SAM	MPLE		SAME	PLER BI	_OWS P	ER 6"	DEPTH	STRATA & TEST DATA
PER FOOT	NO.	PEN.	REC.	DEPTH @ BOT	0-6	6-12	12-18	18-24	DEPIN	SIRAIA & IESI DATA
										FOREST DUFF / TOPSOIL
									2.0'	OVERLYING BROWN SILTY SAND WITH ORGANICS
										BEDROCK [ADVANCED BORING BY AIR HAMMER TO 15.0']
									15.0'	
										INTERBEDDED WHITE TO LIGHT GRAY MIGMATITE AND BIOTITE-MUSCOVITE SCHIST
	1R	60"	59"	20.0'						RQD = 78 %
	2R	60"	58"	25.0'					25.0'	RQD = 82 %
										BOTTOM OF EXPLORATION AT 25.0'
										PIEZOMETER DETAILS: SCREEN 20' - 25' FILTER SAND 16' - 25' BENTONITE 14' - 16' SAND TO SURFACE
D = SPL C = 3" S	AMPLES: SOIL CLASSIFIED BY: = SPLIT SPOON = 3" SHELBY TUBE = 3.5" SHELBY TUBE LABORATORY TEST					LLER - ' L TECH	VISUAL	LY JALLY		KS: STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL. BORING NO.: B-8 / MW



NQ2

PROJECT / CLIENT:

CORE BARREL:

D = SPLIT SPOON

C = 3" SHELBY TUBE

U = 3.5" SHELBY TUBE

BORING LOG

BORING NO.: B-9

SHEET: 1 OF 1

PROJECT NO.: 04-1228

DATE START: 12/10/2004

DATE FINISH: 12/10/2004

ELEVATION: 136.6

KBG

10

B-9

BORING NO.:

OCEAN AVENUE, PORTLAND, MAINE LOCATION: DRILLING CO.: GREAT WORKS TEST BORING INC. JEFF LEE DRILLER: **TYPE** SIZE I.D. HAMMER WT. HAMMER FALL CASING: HW 4" 300 lb 18" SAMPLER: SS 1 3/8"

DRILLER - VISUALLY

LABORATORY TEST

SOIL TECH. - VISUALLY

2"

WATER LEVEL INFORMATION
OVERBURDEN SATURATED
ARTESIAN WATER FLOW AFTER 1R OBTAINED

SWC REP.:

CASING		SAN	//PLE	DEET	SAMF	PLER BI	LOWS P	ER 6"	DEPTH	STRATA & TEST DATA
PER FOOT	NO.	PEN.	REC.	DEPTH @ BOT	0-6	6-12	12-18	18-24		
									1.0'	
	1D	24"	15"	2.0'	2	3	2	2		BROWN TO ORANGE SILTY SAND WITH ORGANICS
										OCCASIONAL COBBLES - GLACIAL TILL
									4.0'	
	2D	0"	0"	5.0'	50/0"					PROBABLE WEATHERED BEDROCK
									6.0'	
										BEDROCK INTERPEDED WHITE TO HOUT ORAY
										INTERBEDDED WHITE TO LIGHT GRAY MIGMATITE AND BIOTITE-MUSCOVITE SCHIST
										MIGMATTE AND BIOTTE-MOSCOVITE SCHIST
	1R	60"	59"	11.0'					-	RQD = 63 %
	IIX	00	33	11.0					=	NQD = 03 //
									-	
	2R	60"	59"	16.0'					16.0'	RQD = 98 %
										BOTTOM OF EXPLORATION AT 16.0'
									=	
									ļ	
									=	
									=	
									1	
									1	
									=	
									1	
									1	
									1	
									1	
SAMPLE	AMPLES: SOIL CLASSIFIED BY:					FIED BY	/ :		REMAR	RKS:
										OTDATISIOATION UNISO DEDDESCRIT THE

STRATIFICATION LINES REPRESENT THE

AND THE TRANSITION MAY BE GRADUAL.

APPROXIMATE BOUNDARY BETWEEN SOIL TYPES



BORING LOG

BORING NO.: B-10

SHEET: 1 OF 1

PROJECT NO.: 04-1228

DATE START: 12/13/2004

DATE FINISH: 12/14/2004

ELEVATION: 151.2

LOCATION:	OCEAN AVENU	JE, PORTLA	ND, MAINE		
DRILLING CO.:	GREAT WORK	S TEST BOF	RING INC.	DRILLER:	DONNY BOLSTRIDGE
				_	
	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL	

SWC REP.: KBG
WATER LEVEL INFORMATION

 CASING:
 HW
 4"
 300 lb
 18"
 WATER LEVEL INFORMATION

 SAMPLER:
 NO FREE WATER OBSERVED

 CORE BARREL:
 NQ2
 2"

CASING BLOWS		SAN	//PLE		SAME	PLER BI	_OWS P	ER 6"	DEDTU	STRATA & TEST DATA
PER FOOT	NO.	PEN.	REC.	DEPTH @ BOT	0-6	6-12	12-18	18-24	DEPTH	SIRAIA & IESI DAIA
									0.01	FOREST DUFF / TOPSOIL
									2.0'	OVERLYING BROWN SILTY SAND WITH ORGANICS BEDROCK
										[ADVANCED BORING BY AIR HAMMER TO 20.0']
										[ADVANCED BONING BT AIRTHANNINER TO 20.0]
									20.0'	
										INTERBEDDED WHITE TO LIGHT GRAY TO LIGHT GREEN
										MIGMATITE AND BIOTITE-MUSCOVITE-CHLORITE SCHIST
	1R	60"	58"	25.0'						RQD = 68 %
										INTERBEDDED WHITE TO LIGHT GRAY
										MIGMATITE AND BIOTITE-MUSCOVITE SCHIST
	2R	60"	60"	30.0'					30.0'	RQD = 92 %
										BOTTOM OF EXPLORATION AT 30.0'
SAMPLI	ES:			SOIL C	LASSIF	FIED BY	/ :		REMAR	KS:
D = SPL	= SPLIT SPOON DRILLER - VISUALLY			STRATIFICATION LINES REPRESENT THE (11)						
	C = 3" SHELBY TUBE X SOIL TECH VISUALLY U = 3.5" SHELBY TUBE LABORATORY TEST					APPROXIMATE BOUNDARY BETWEEN SOIL TYPES				
U = 3.5"	SHELE	sy iUB	E	<u> </u>	LAB	URATO	JRY TES	51		AND THE TRANSITION MAY BE GRADUAL. BORING NO.: B-10



BORING LOG

SHEET:	1 OF 1
PROJECT NO.:	04-1228
DATE START:	12/14/2004
DATE FINISH:	12/14/2004
ELEVATION:	149.9
SWC REP.:	KBG
WATER LEVEL INCOR	MATION

BORING NO.:

B-11

LOCATION:	OCEAN AVE	NUE, PORTLA	AND, MAINE			DATE FINISH:	12/14/2004		
DRILLING CO.:	GREAT WOR	KS TEST BOI	RING INC.	DRILLER:	JEFF LEE	ELEVATION:	149.9		
	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL		SWC REP.:	KBG	_	
CASING:	HW	4"	300 lb	18"		WATER LEVEL INFOR	MATION		
SAMPLER:					_	NO FREE WATER OBS	SERVED		
CODE BADDEL :	NO2	2"			·	<u> </u>			

CASING BLOWS		SAN	/IPLE		SAME	PLER BL	OWS P	ER 6"	DEDTU	STRATA & TEST DATA
PER FOOT	NO.	PEN.	REC.	DEPTH @ BOT	0-6	6-12	12-18	18-24	DEPTH	SIRAIA & IESI DATA
										FOREST DUFF / TOPSOIL
									1.5'	
									4.0'	PROBABLE WEATHERED BEDROCK
										BEDROCK
										(ADVANCED DODING BY DOLLED COME TO COM
									9.0'	[ADVANCED BORING BY ROLLER CONE TO 9.0']
									1	WHITE TO LIGHT GRAY MIGMATITE WITH
										GRAY BIOTITE-MUSCOVITE SCHIST LAYERS
	1R	60"	56"	14.0'						RQD = 68 %
	Ш	00	30	14.0						1\QD = 00 /0
										INTERBEDDED WHITE TO GRAY MIGMATITE AND BIOTITE-MUSCOVITE SCHIST
	2R	60"	58"	19.0'						RQD = 73 %
	211	- 00	- 00	10.0						Neb 10 %
	3R	60"	59"	24.0'					24.0'	RQD = 65 %
										BOTTOM OF EXPLORATION AT 24.0'
SAMPLI	ES:			SOIL C	LASSIF	FIED BY	′ :		REMAR	KS:
D = 801	- COULT COOCN			STRATIFICATION LINES REPRESENT THE (12)						
	D = SPLIT SPOON DRILLER - VISUALLY C = 3" SHELBY TUBE X SOIL TECH VISUALLY			APPROXIMATE BOUNDARY BETWEEN SOIL TYPES						
U = 3.5"					į.	ORATO				AND THE TRANSITION MAY BE GRADUAL. BORING NO.: B-11
									<u> </u>	1



LOCATION:

CASING:

DRILLING CO.:

BORING LOG

DRILLER:

JEFF LEE

B-12 / MW BORING NO.: SHEET: 1 OF 1

PROJECT NO.: 04-1228

DATE START: 12/10/2004 DATE FINISH: 12/10/2004 **ELEVATION:** 138.4

KBG SWC REP.:

WATER LEVEL INFORMATION 1" PIEZOMETER INSTALLED

TYPE SIZE I.D. HAMMER WT. HAMMER FALL HW4" 300 lb 18" SAMPLER: SS 1 3/8" 2" CORE BARREL: NQ2

OCEAN AVENUE, PORTLAND, MAINE

GREAT WORKS TEST BORING INC.

ASING LOWS		SAN	//PLE		SAMI	PLER BI	LOWS F	PER 6"	DEPTH	STRATA & TEST DATA
PER	NO.	PEN.	REC.	DEPTH @ BOT	0-6	6-12	12-18	18-24	DEFIN	STRATA & TEST DATA
									1.0'	FOREST DUFF / TOPSOIL
	1D	24"	8"	2.0'	1	1	2	2	2.0'	BROWN SILTY SAND WITH ORGANICS
										BEDROCK
									6.0'	[ADVANCED BORING BY ROLLER CONE TO 6']
										BEDROCK GRAY BIOTITE-MUSCOVITE
	1R	60"	60"	11.0'						RQD = 30 %
										INTERBEDDED WHITE TO GRAY MIGMATITE AND BIOTITE-MUSCOVITE SCHIS
	2R	60"	59"	16.0'					16.0'	RQD = 73 %
										BOTTOM OF EXPLORATION AT 16.0'
										PIEZOMETER DETAILS: SCREEN 11' - 16' FILTER SAND 10' - 16' BENTONITE 8' - 10' SAND TO SURFACE
AMPL	ES:	ON		SOIL C	_		Y: VISUAL		REMAR	STRATIFICATION LINES REPRESENT THE

C = 3" SHELBY TUBE U = 3.5" SHELBY TUBE

SOIL TECH. - VISUALLY LABORATORY TEST

APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

BORING NO.:



OCEAN AVENUE, PORTLAND, MAINE

PROJECT / CLIENT:

LOCATION:

BORING LOG

SHEET:	1 OF 1
PROJECT NO.:	04-1228
DATE START:	12/14/2004
DATE FINISH:	12/15/2004
ELEVATION:	152.9
SWC REP.:	KBG

BORING NO.:

B-13

DRILLING CO.:	GREAT WOR	KS TEST BOR	RING INC.	DRILLER:	DONNY BOLSTRIDGE	ELEVATION:	15
	TYPE	SIZE I.D.	HAMMER WT	. HAMMER FALL		SWC REP.:	K
CASING:	HW	4"	300 lb	18"		WATER LEVEL INFOR	MATION
SAMPLER:					_	NO FREE WATER OBS	SERVED
CORE BARREL:	NQ2	2"					

CASING BLOWS		SAN	IPLE		SAME	PLER BI	OWS P	ER 6"	DEPTH	STRATA & TEST DATA
PER FOOT	NO.	PEN.	REC.	DEPTH @ BOT	0-6	6-12	12-18	18-24		
										BEDROCK
									3.0'	[ADVANCED BORING BY AIR HAMMER TO 3.0']
										WHITE TO LIGHT GRAY MIGMATITE AND GRAY BIOTITE-MUSCOVITE SCHIST
	1R	60"	60"	8.0'						RQD = 52 %
										WHITE TO LIGHT GRAY MIGMATITE
	2R	60"	60"	13.0'						RQD = 89 %
	3R	60"	56"	18.0'						RQD = 82 %
	4R	60"	54"	23.0'						RQD = 72 %
	5R	60"	60"	28.0'					28.0'	RQD = 82 %
										BOTTOM OF EXPLORATION AT 28.0'
SAMPLE	SAMPLES: SOIL CLASSIFIED BY:				' :		REMAR	KS:		
D = SPL	D = SPLIT SPOON DRILLER - VISUALLY				VISUAL	.LY		STRATIFICATION LINES REPRESENT THE (14)		
C = 3" S				Χ	i .	_ TECH				APPROXIMATE BOUNDARY BETWEEN SOIL TYPES
5 = 5.5	= 3.5" SHELBY TUBE LABORATORY TEST			AND THE TRANSITION MAY BE GRADUAL. BORING NO.: B-13						



BORING LOG

SHEET:	1 OF 1		
PROJECT NO.:	04-1228		
DATE START:	12/13/2004		
DATE FINISH:	12/13/2004		
ELEVATION:	147.8		
SWC REP.:	KBG		
WATER LEVEL INFOR	MATION		

BORING NO.:

B-14

PROJECT / CLIENT:						DATE START:	12/13/2004
LOCATION:	OCEAN AVE	NUE, PORTLA	ND, MAINE			DATE FINISH:	12/13/2004
DRILLING CO.:	GREAT WOR	RKS TEST BOR	RING INC.	DRILLER:	JEFF LEE	ELEVATION:	147.8
	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL		SWC REP.:	KBG
CASING:	HW	4"	300 lb	18"		WATER LEVEL INFOR	MATION
SAMPLER:						SOIL OVERBURDEN SA	TURATED
CODE DADDEL:	NO2	2"					

CASING BLOWS		SAN	/IPLE		SAMF	PLER BI	_OWS P	PER 6"	DEPTH	STRATA & TEST DATA
PER FOOT	NO.	PEN.	REC.	DEPTH @ BOT	0-6	6-12	12-18	18-24	DEPIN	STRATA & TEST DATA
									2.0'	FOREST DUFF / TOPSOIL OVERLYING BROWN SILTY SAND
										BEDROCK
										[ADVANCED BORING BY ROLLER CONE TO 9']
									9.0'	
										GRAY BIOTITE-MUSCOVITE SCHIST WITH
										WHITE TO LIGHT GRAY MIGMATITE LAYERS
	1R	60"	60"	14.0'						RQD = 45 %
										WHITE TO LIGHT GRAY MIGMATITE WITH
										GRAY BIOTITE-MUSCOVITE SCHIST LAYERS
	2R	60"	60"	19.0'						RQD = 80 %
	3R	60"	60"	24.0'					24.0'	RQD = 75 %
										DOTTOM OF EVEL OPATION AT 24.0
										BOTTOM OF EXPLORATION AT 24.0'
									-	
									=	
SAMPLI	SAMPLES: SOIL CLASSIFIED BY:				/ :		REMAR	RKS:		
D = SPI	D = SPLIT SPOON DRILLER - VISUALLY				VISUAI	LY		STRATIFICATION LINES REPRESENT THE (15)		
C = 3" S	= 3" SHELBY TUBE X SOIL TECH VISUALLY			APPROXIMATE BOUNDARY BETWEEN SOIL TYPES						
U = 3.5"	= 3.5" SHELBY TUBE LABORATORY TEST			AND THE TRANSITION MAY BE GRADUAL. BORING NO.: B-14						



LOCATION:

BORING LOG

BORING NO.: B-15 SHEET: 1 OF 1 PROJECT NO.: 04-1228

DATE START: 12/13/2004 12/13/2004 DATE FINISH:

ELEVATION: 142.3

SWC REP.: KBG WATER LEVEL INFORMATION

OVERBURDEN SOILS SATURATED

DRILLING CO.:	GREAT WOR	KS TEST BOI	RING INC.	DRILLER:	JEFF LEE
			_		
	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL	
CASING:	HW	4"	300 lb	18"	
SAMPLER:	SS	1 3/8"			
CORE BARREL:	NQ2	2"			

OCEAN AVENUE, PORTLAND, MAINE

CASING										
PER	NO.	PEN.	REC.	DEPTH	0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
FOOT				@ BOT						FOREST DUFF / TOPSOIL
	1D	24"	3"	2.0'	1	1	1	5	1.5'	~LOOSE~
									3.0'	BROWN SILTY SAND TRACE GRAVEL
										BROWN SILTY SAND SOME GRAVEL
	2D	5"	5"	5.3'	50/5"				4.8'	WITH OCCASIONAL COBBLES
									6.0'	PROBABLE WEATHERED BEDROCK
									-	BEDROCK
									11.0'	[ADVANCED BORING BY ROLLER CONE TO 11.0']
									-	BROWN SULFIDIC SCHIST AND GRAY BIOTITE-MUSCOVITE SCHIST
	1R	60"	58"	16.0'					-	RQD = 23 %
									-	GRAY BIOTITE-MUSCOVITE SCHIST AND WHITE TO LIGHT GRAY MIGMATITE
	2R	60"	60"	21.0'					21.0'	RQD = 93 %
										BOTTOM OF EXPLORATION AT 21.0'
SAMPLES: SOIL CLASSIFIED BY: D = SPLIT SPOON C = 3" SHELBY TUBE U = 3.5" SHELBY TUBE LABORATORY TEST					LLER - L TECH	VISUAL I VISL	JALLY		KS: STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL. BORING NO.: B-15	



BORING LOG

SHEET:	1 OF 1
PROJECT NO.:	04-1228
DATE START:	12/15/2004
DATE FINISH:	12/15/2004
ELEVATION:	155.2
SWC REP.:	KBG
MATER LEVEL INCOR	MATION

BORING NO.: B-16 / MW

PROJECT / CLIENT: LOCATION:		NUE, PORTLAI	ND, MAINE			DATE START: _ DATE FINISH:	12/15/2004 12/15/2004
DRILLING CO.:	GREAT WOR	KS TEST BOR	ING INC.	DRILLER:	JEFF LEE	ELEVATION:	155.2
	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL		SWC REP.:	KBG
CASING:	HW	4"	300 lb	18"		WATER LEVEL INFORM	MATION
SAMPLER:			_			1" PIEZOMETER INST	ALLED
CORE BARREL:	NQ2	2"	_	_			

CASING BLOWS		SAN	1PLE		SAMF	PLER BI	-OWS P	ER 6"	DEPTH	STRATA & TEST DATA
PER FOOT	NO.	PEN.	REC.	DEPTH @ BOT	0-6	6-12	12-18	18-24	DLFIII	SINAIA & ILSI DAIA
										FOREST DUFF / TOPSOIL
									3.0'	OVERLYING BROWN SILTY SAND WITH ORGANICS
									3.5'	PROBABLE WEATHERED BEDROCK
										BEDROCK
										[ADVANCED BORING BY AIR HAMMER TO 18.0']
									18.0'	
										WHITE TO LIGHT GRAY MIGMATITE WITH GRAY BIOTITE-MUSCOVITE SCHIST LAYERS
	1R	60"	58"	23.0'						RQD = 78 %
	2R	60"	59"	28.0'					28.0'	RQD = 65 %
										DOTTOM OF EVEN OPATION AT 20 C
										BOTTOM OF EXPLORATION AT 28.0'
										PIEZOMETER DETAILS: SCREEN 23' - 28'
										FILTER SAND 22' - 28"
										BENTONITE 20' - 22'
										SAND TO SURFACE
SAMPLE	AMPLES: SOIL CLASSIFIED BY:		REMAR	KS:						
D = SPL	IT SPO	ON			DRII	LER - '	VISUAL	.LY		STRATIFICATION LINES REPRESENT THE (17)
C = 3" S			_	Χ			VISU			APPROXIMATE BOUNDARY BETWEEN SOIL TYPES
U = 3.5"	SHELE	I IUB	L		LAB	UKATC	RY TES	51		AND THE TRANSITION MAY BE GRADUAL. BORING NO.: B-16 / MW



LOCATION:

DRILLING CO.:

BORING LOG

JEFF LEE

DRILLER:

BORING NO.: **B-17 / MW**SHEET: 1 OF 1

PROJECT NO.: 04-1228

DATE START: 12/14/2004

DATE FINISH: 12/14/2004

ELEVATION: 114.5

SWC REP.: KBG

WATER LEVEL INFORMATION
NESTED 1" PIEZOMETERS INSTALLED

 TYPE
 SIZE I.D.
 HAMMER WT. HAMMER FALL

 CASING:
 HW
 4"
 300 lb
 18"

 SAMPLER:
 SS
 1 3/8"

 CORE BARREL:
 NQ2
 2"

OCEAN AVENUE, PORTLAND, MAINE

GREAT WORKS TEST BORING INC.

CASING BLOWS		SAN	//PLE		SAME	PLER BI	LOWS P	PER 6"	DEPTH	STRATA & TEST DATA
PER FOOT	NO.	PEN.	REC.	DEPTH @ BOT	0-6	6-12	12-18	18-24	DET TIT	OTIVATA O TEOLOGIA
										FOREST DUFF / TOPSOIL
									2.0'	
									10.0'	BEDROCK [ADVANCED BORING BY ROLLER CONE TO 10.0']
										INTERBEDDED GRAY GRANITIC GNEISS AND SCHIST
	1R	60"	60"	15.0'						RQD = 45 %
	2R	60"	57"	20.0'					20.0'	RQD = 65 %
										BOTTOM OF EXPLORATION AT 20.0' PIEZOMETER DETAILS: SCREEN 15' - 20'
										FILTER SAND 14' - 20' BENTONITE 11' - 14' SCREEN 5' - 10' FILTER SAND 4' - 11' BENTONITE TO SURFACE
SAMPLES: SOIL CLASSIFIED BY: D = SPLIT SPOON DRILLER - VISUALLY C = 3" SHELBY TUBE X SOIL TECH VISUALLY U = 3.5" SHELBY TUBE LABORATORY TEST				VISUAL I VISL	JALLY	REMAR	STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL. BORING NO.: B-17 / MW			



PROJECT:			_	BORING NO.:	B-1
CLIENT:				PROJECT NO.:	04-1228
LOGGED BY:	MTT	DATE:	1/10/2005	SHEET NO.:	1 OF 1
HECKED BY:	GWB	DATE:	1/13/2005	CORE SIZE:	NQ2

CHECK			GWB				DATE: 1/13/2003 CORE SIZE: NQZ
DEPTH BELOW SURFACE (FT)	CORE RUN	CORE INTERVAL (IN)	CORE RECOVERY (IN)	RQD (%)	ROCK QUALITY	GRAPHIC LOG	ROCK DESCRIPTION AND IDENTIFICATION
- - - - - - - - - - - - - - - - - - -	R1	60"	53"	22"/60" 37%	POOR		INTERBEDDED WHITE TO LIGHT GRAY MIGMATITE AND BIOTITE-MUSCOVITE SCHIST, HARD, MODERATELY WEATHERED, FRACTURES @ 15 TO 40 DEGREES FROM HORIZONTAL. HIGHLY FRACTURED ZONE ZONE OF CORE LOSS
	R2	60"	59"	36"/60" 60%	FAIR		INTERBEDDED WHITE TO LIGHT GRAY MIGMATITE AND BIOTITE-MUSCOVITE SCHIST, HARD, MODERATELY WEATHERED, FRACTURES @ 15 TO 40 DEGREES FROM HORIZONTAL. HIGHLY FRACTURED ZONE ZONE OF CORE LOSS
							BOTTOM OF EXPLORATION @ 15.0'



PROJECT:				BORING NO.:	B-2
CLIENT:				PROJECT NO.:	04-1228
_				_	
LOGGED BY:	MTT	DATE:	1/10/2005	SHEET NO.:	1 OF 1
HECKED BY:	GWB	DATE:	1/13/2005	CORE SIZE:	NQ2
_					

CHECK	ED BY:		GWB				DATE: 1/13/2005	CORE SIZE:	NQ2
DEPTH BELOW SURFACE (FT)	CORE RUN	CORE INTERVAL (FT)	CORE RECOVERY (FT)	RQD (%)	ROCK QUALITY	GRAPHIC LOG	ROCK DESCRIPTION AND IDENT	TIFICATION .	
21.5'	R1	60"	58"	46"/60" 77%	G O O D		INTERBEDDED WHITE TO LIGHT GRAY MIGMA' BIOTITE-MUSCOVITE SCHIST, HARD, SLIGHTL' FRACTURES @ 10 TO 40 DEGREES FROM HOR	Y WEATHERED,	
26.5'							ZONE OF CORE LOSS		
31.3	R2	58"	58"	37"/58" 63%	FAIR		INTERBEDDED WHITE TO LIGHT GRAY MIGMA' BIOTITE-MUSCOVITE SCHIST, HARD, SLIGHTLY FRACTURES @ 10 TO 40 DEGREES FROM HOR	Y WEATHERED,	
							BOTTOM OF EXPLORATION @ 31.3		24



B-3	BORING NO.:				PROJECT:
04-1228	PROJECT NO.:				CLIENT:
	_				
1 OF 1	SHEET NO.:	1/10/2005	DATE:	MTT	LOGGED BY:
NQ2	CORE SIZE:	1/13/2005	DATE:	GWB	CHECKED BY:
	·		<u> </u>		

DEPTH BELOW SURFACE (FT)	CORE RUN	CORE INTERVAL (IN)	CORE RECOVERY (IN)	RQD (%)	ROCK QUALITY	GRAPHIC LOG	ROCK DESCRIPTION AND IDENTIFICATION
7.0'	R1	60"	60"	37"/60" 62%	FAIR		INTERBEDDED WHITE TO LIGHT GRAY MIGMATITE AND BIOTITE-MUSCOVITE SCHIST, HARD, MODERATELY WEATHERED, FRACTURES @ 25 TO 50 DEGREES FROM HORIZONTAL.
12.0'	R2	60"	59"	46"/60" 72%	F A I R		INTERBEDDED WHITE TO LIGHT GRAY MIGMATITE AND BIOTITE-MUSCOVITE SCHIST, HARD, MODERATELY WEATHERED, FRACTURES @ 25 TO 50 DEGREES FROM HORIZONTAL.
							BOTTOM OF EXPLORATION @ 17.0'



PROJECT:			BORING NO.:	B-4	
CLIENT:				PROJECT NO.:	04-1228
LOCCED BY:	NATT	DATE	1/10/2005	CHEET NO .	1.05.1
LOGGED BY:	MTT	DATE:	1/10/2005	_ SHEET NO.:_	1 OF 1
CHECKED BY:	GWB	DATE:	1/13/2005	CORE SIZE:	NQ2

CHECK	KED BY:		GWB				DATE: 1/13/2005 CORE SIZE: NQ2
DEPTH BELOW SURFACE (FT)	CORE RUN	CORE INTERVAL (IN)	CORE RECOVERY (IN)	RQD (%)	ROCK QUALITY	GRAPHIC LOG	ROCK DESCRIPTION AND IDENTIFICATION
12.0'	R1	60"	59"	24"/60" 40%	POOR		HIGHLY FRACTURED ZONE INTERBEDDED WHITE TO LIGHT GRAY MIGMATITE AND BIOTITE-MUSCOVITE SCHIST, HARD, VERY WEATHERED TO MODERATELY WEATHERED, FRACTURES @ 20 TO 60 DEGREES FROM HORIZONTAL ZONE OF CORE LOSS
17.0'							
	R2	63"	58"	52"/63" 83%	G O O D		INTERBEDDED WHITE TO LIGHT GRAY MIGMATITE AND BIOTITE-MUSCOVITE SCHIST, HARD SLIGHTLY WEATHERED, FRACTURES @ 20 TO 60 DEGREES FROM HORIZONTAL
22.3'							ZONE OF CORE LOSS
							BOTTOM OF EXPLORATION @ 22.3'
							26



PROJECT:				BORING NO.:	B-5
CLIENT:				PROJECT NO.:	04-1228
LOGGED BY:	MTT	DATE:	1/10/2005	SHEET NO.:	1 OF 1
CHECKED BY:	GWB	DATE:	1/13/2005	CORE SIZE:	NQ2

CHECK	ED BY:		GWB				DATE: 1/13/2005 CORE SIZE: NQ2
DEPTH BELOW SURFACE (FT)	CORE RUN	CORE INTERVAL (IN)	CORE RECOVERY (IN)	RQD (%)	ROCK QUALITY	GRAPHIC LOG	ROCK DESCRIPTION AND IDENTIFICATION
15.0'	R1	60"	53"	50"/60" 83%	GOOD		INTERBEDDED WHITE TO LIGHT GRAY MIGMATITE AND BIOTITE-MUSCOVITE SCHIST, HARD, SLIGHTLY WEATHERED, FRACTURES @ 20 TO 40 DEGREES FROM HORIZONTAL
20.0'							ZONE OF CORE LOSS
	R2	60"	58"	38"/60" 63%	FAIR		INTERBEDDED WHITE TO LIGHT GRAY MIGMATITE AND BIOTITE-MUSCOVITE SCHIST, HARD, SLIGHTLY WEATHERED, FRACTURES @ 20 TO 40 DEGREES FROM HORIZONTAL
25.0'							ZONE OF CORE LOSS
							BOTTOM OF EXPLORATION @ 25.0'



PROJECT:			BORING NO.:	B-6	
CLIENT:				PROJECT NO.:	04-1228
LOGGED BY:	MTT	DATE:	1/10/2005	SHEET NO.:	1 OF 1
CHECKED BY:	GWB	DATE:	1/13/2005	CORE SIZE:	NQ2

	CED B1.		GWB				DATE: 1/13/2003 CORE SIZE: NQZ
DEPTH BELOW SURFACE (FT)	CORE RUN	CORE INTERVAL (IN)	CORE RECOVERY (IN)	RQD (%)	ROCK QUALITY	GRAPHIC LOG	ROCK DESCRIPTION AND IDENTIFICATION
15.0'	R1	60"	56"	28"/60" 47%	POOR		INTERBEDDED WHITE TO LIGHT GRAY MIGMATITE AND BIOTITE-MUSCOVITE SCHIST, HARD, MODERATELY WEATHERED, FRACTURES @ 10 TO 35 DEGREES FROM HORIZONTAL HIGHLY FRACTURED ZONE ZONE OF CORE LOSS
20.0' —	R2	60"	58"	50"/60" 83%	G O O D		INTERBEDDED WHITE TO LIGHT GRAY MIGMATITE AND BIOTITE-MUSCOVITE SCHIST, HARD, SLIGHTLY WEATHERED, FRACTURES @ 10 TO 35 DEGREES FROM HORIZONTAL HIGHLY FRACTURED ZONE ZONE OF CORE LOSS
							BOTTOM OF EXPLORATION @ 25.0'



PROJECT:				BORING NO.:	B-7
CLIENT:				PROJECT NO.:	04-1228
				_	
LOGGED BY:	MTT	DATE:	1/10/2005	SHEET NO.:	1 OF 1
CHECKED BY:	GWB	DATE:	1/13/2005	CORE SIZE:	NQ2

CHECK			GWB				DATE. 1/13/2003 CORE SIZE. NQZ
DEPTH BELOW SURFACE (FT)	CORE RUN	CORE INTERVAL (IN)	CORE RECOVERY (IN)	RQD (%)	ROCK QUALITY	GRAPHIC LOG	ROCK DESCRIPTION AND IDENTIFICATION
20.0°	R1	60"	59"	52"/60" 87%	GOOD		INTERBEDDED WHITE TO LIGHT GRAY MIGMATITE AND BIOTITE-MUSCOVITE SCHIST, HARD, SLIGHTLY WEATHERED, FRACTURES @ 10 TO 35 DEGREES FROM HORIZONTAL
25.0'						1 //	ZONE OF CORE LOSS
	R2	60"	52"	47"/60" 78%	G O O D	111/1/11/11/11/11	INTERBEDDED WHITE TO LIGHT GRAY MIGMATITE AND BIOTITE-MUSCOVITE SCHIST, HARD, SLIGHTLY WEATHERED, FRACTURES @ 10 TO 35 DEGREES FROM HORIZONTAL
30.0'							ZONE OF CORE LOSS
							BOTTOM OF EXPLORATION @ 30.0'



B-8	BORING NO.:				PROJECT:
04-1228	PROJECT NO.:				CLIENT:
	_				
1 OF 1	SHEET NO.:	12/21/2004	DATE:	GWB	LOGGED BY:
NQ2	CORE SIZE:	1/13/2005	DATE:	GWB	CHECKED BY:

	CD D1.		GWB				DATE: 1/13/2003 CORE SIZE: NQZ
DEPTH BELOW SURFACE (FT)	CORE RUN	CORE INTERVAL (IN)	CORE RECOVERY (IN)	RQD (%)	ROCK QUALITY	GRAPHIC LOG	ROCK DESCRIPTION AND IDENTIFICATION
15.0°	R1	60"	59"	47"/60" 78%	GOOD		INTERBEDDED WHITE TO LIGHT GRAY MIGMATITE AND BIOTITE-MUSCOVITE SCHIST, HARD, MODERATELY WEATHERED BECOMING SLIGHTLY WEATHERED, FRACTURES @ 0 TO 55 DEGREES FROM HORIZONTAL.
20.0'							ZONE OF CORE LOSS
	R2	60"	58"	49"/60" 82%	0009		INTERBEDDED WHITE TO LIGHT GRAY MIGMATITE AND BIOTITE-MUSCOVITE SCHIST, HARD, SLIGHTLY WEATHERED, FRACTURES @ 10 TO 35 DEGREES FROM HORIZONTAL. ZONE OF CORE LOSS
							BOTTOM OF EXPLORATION @ 25.0'
							(30)



PROJECT:				BORING NO.:	B-9
CLIENT:				PROJECT NO.:	04-1228
				_	<u> </u>
LOGGED BY:	MTT	DATE:	1/10/2005	SHEET NO.:	1 OF 1
CHECKED BY:	GWB	DATE:	1/13/2005	CORE SIZE:	NQ2

	CD D1.		GWB				DATE: 1/13/2003 CORE SIZE: NQZ
DEPTH BELOW SURFACE (FT)	CORE RUN	CORE INTERVAL (IN)	CORE RECOVERY (IN)	RQD (%)	ROCK QUALITY	GRAPHIC LOG	ROCK DESCRIPTION AND IDENTIFICATION
	R1	60"	59"	38"/60" 63%	FAIR		HIGHLY FRACTURED ZONE INTERBEDDED WHITE TO LIGHT GRAY MIGMATITE AND BIOTITE-MUSCOVITE SCHIST, HARD, MODERATELY TO MODERATELY WEATHERED, FRACTURES @ 15 TO 35 DEGREES FROM HORIZONTAL
11.0'							ZONE OF CORE LOSS
	R2	60"	59"	59"/60" 98%	EXCELLENT		INTERBEDDED WHITE TO LIGHT GRAY MIGMATITE AND BIOTITE-MUSCOVITE SCHIST, HARD, MODERATELY TO MODERATELY WEATHERED, FRACTURES @ 15 TO 35 DEGREES FROM HORIZONTAL
16.0'							ZONE OF CORE LOSS
							BOTTOM OF EXPLORATION @ 16.0'

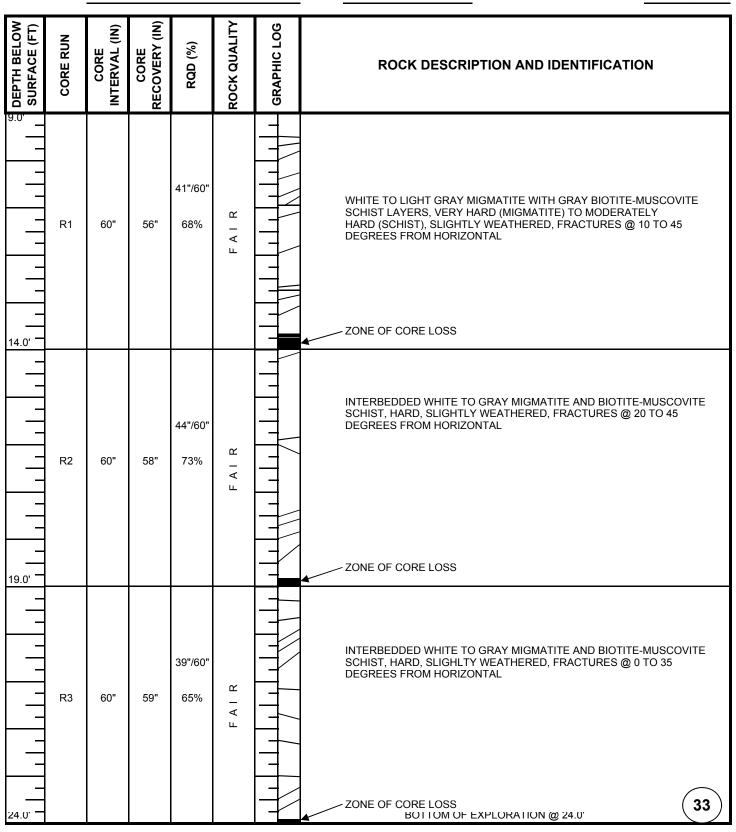


PROJECT:				BORING NO.:	B-10	
CLIENT:				PROJECT NO.:	04-1228	
LOGGED BY:	GWB	DATE:	12/21/2004	SHEET NO.:	1 OF 1	
CHECKED BY:	GWB	DATE:	1/13/2005	CORE SIZE:	NQ2	

CHECK			GWB				DATE: 1/13/2003 CORE SIZE: NQZ
DEPTH BELOW SURFACE (FT)	CORE RUN	CORE INTERVAL (IN)	CORE RECOVERY (IN)	RQD (%)	ROCK QUALITY	GRAPHIC LOG	ROCK DESCRIPTION AND IDENTIFICATION
	R1	60"	58"	41"/60" 68%	FAIR		INTERBEDDED WHITE TO LIGHT GRAY TO LIGHT GREEN MIGMATITE AND BIOTITE-MUSCOVITE-CHLORITE SCHIST, HARD, SLIGHTLY WEATHERED, FRACTURES @ 10 TO 25 DEGREES FROM HORIZONTAL
25.0' —	R2	60"	60"	55"/60" 92%	EXCELLENT		INTERBEDDED WHITE TO LIGHT GRAY MIGMATITE AND BIOTITE-MUSCOVITE SCHIST, HARD, SLIGHTLY WEATHERED, FRACTURES @ 5 TO 25 DEGREES FROM HORIZONTAL
							BOTTOM OF EXPLORATION @ 30.0'



B-11	BORING NO.:				PROJECT:
04-1228	PROJECT NO.:				CLIENT:
	_				
1 OF 1	SHEET NO.:	12/20/2004	DATE:	GWB	LOGGED BY:
NQ2	CORE SIZE:	1/13/2005	DATE:	GWB	CHECKED BY:





PROJECT:				BORING NO.:	B-12	
CLIENT:				PROJECT NO.:	04-1228	
_				_		
LOGGED BY:	GWB	DATE:	12/21/2004	SHEET NO.:	1 OF 1	
CHECKED BY:	GWB	DATE:	1/13/2005	CORE SIZE:	NQ2	
_				_		_

CITEOR			GWD				DATE. NQZ
DEPTH BELOW SURFACE (FT)	CORE RUN	CORE INTERVAL (IN)	CORE RECOVERY (IN)	RQD (%)	ROCK QUALITY	GRAPHIC LOG	ROCK DESCRIPTION AND IDENTIFICATION
6.0°	R1	60"	60"	18"/60" 30%	POOR		GRAY BIOTITE-MUSCOVITE, MODERATELY HARD, MODERATELY WEATHERED, HIGHLY FRACTURED, FRACTURES @ 5 TO 40 DEGREES FROM HORIZONTAL
	R2	60"	59"	44"/60" 73%	FAIR		INTERBEDDED WHITE TO GRAY MIGMATITE AND BIOTITE-MUSCOVITE SCHIST, HARD, SLIGHTLY WEATHERED, FRACTURES @ 0 TO 35 DEGREES FROM HORIZONTAL
							BOTTOM OF EXPLORATION @ 16.0'



PROJECT:				BORING NO.:	B-13
CLIENT:				PROJECT NO.:	04-1228
				_	
LOGGED BY:	GWB	DATE:	12/20/2004	SHEET NO.:	1 OF 2
CHECKED BY:	GWB	DATE:	1/13/2005	CORE SIZE:	NQ2

CHECK	ED BY:		GWB				DATE: 1/13/2005 CORE SIZE: NQ2
DEPTH BELOW SURFACE (FT)	CORE RUN	CORE INTERVAL (IN)	CORE RECOVERY (IN)	RQD (%)	ROCK QUALITY	GRAPHIC LOG	ROCK DESCRIPTION AND IDENTIFICATION
3.0'	R1	60"	60"	31"/60" 52%	FAIR		WHITE TO LIGHT GRAY MIGMATITE AND GRAY BIOTITE- MUSCOVITE SCHIST, VERY HARD TO MODERATELY HARD, MODERATELY TO SLIGHTLY WEATHERED, FRACTURES @ 10 TO 35 DEGREES FROM HORIZONTAL
13.0'	R2	60"	60"	53"/60" 89%	G O O D		WHITE TO LIGHT GRAY MIGMATITE, VERY HARD, SLIGHTLY WEATHERED, FRACTURES @ 5 TO 25 DEGREES FROM HORIZONTAL
	R3	60"	56"	49"/60" 82%	G O O D		WHITE TO LIGHT GRAY MIGMATITE, VERY HARD, SLIGHTLY WEATHERED, FRACTURES @ 5 TO 20 DEGREES FROM HORIZONTAL
18.0'							ZONE OF CORE LOSS 35



PROJECT:				BORING NO.:	B-13	
CLIENT:				PROJECT NO.:	04-1228	
OGGED BY:	GWB	DATE:	12/20/2004	SHEET NO.:	2 OF 2	
HECKED BY:	GWB	DATE:	1/13/2005	CORE SIZE:	NQ2	

CHECKED BY		GWB				DATE: 1/13/2005 CORE SIZE: NQ2
DEPTH BELOW SURFACE (FT) CORE RUN	CORE INTERVAL (IN)	CORE RECOVERY (IN)	RQD (%)	ROCK QUALITY	GRAPHIC LOG	ROCK DESCRIPTION AND IDENTIFICATION
18.0'	60"	54"	43"/60" 72%	FAIR		WHITE TO LIGHT GRAY MIGMATITE, VERY HARD, SLIGHTLY WEATHERED, FRACTURES @ 0 TO 25 DEGREES FROM HORIZONTAL
23.0'						ZONE OF CORE LOSS
	60"	60"	49"/60" 82%	G O O D		WHITE TO LIGHT GRAY MIGMATITE, VERY HARD, SLIGHTLY WEATHERED, FRACTURES @ 0 TO 40 DEGREES FROM HORIZONTAL
						BOTTOM OF EXPLORATION @ 28.0'



37

BOTTOM OF EXPLORATION @ 24.0'

									BORING NO.:	
С	LIENT:								PROJECT NO.:	04-1228
LOGG	ED BY:		GWB				DATE:	12/20/2004	SHEET NO.:	1 OF 1
CHECK	ED BY:		GWB				DATE:	1/13/2005	CORE SIZE:	NQ2
DEPTH BELOW SURFACE (FT)	CORE RUN	CORE INTERVAL (IN)	CORE RECOVERY (IN)	RQD (%)	ROCK QUALITY	GRAPHIC LOG		ROCK DESCR	IPTION AND IDENTIFICATION	
9.0'	R1	60"	60"	27"/60" 45%	POOR		M H	IGMATITE LAYERS, VE ARD (SCHIST), MODER	ITE SCHIST WITH WHITE TO LIGHT O RY HARD (MIGMATITE) TO MODERA ATELY TO SLIGHTLY WEATHERED, DEGREES FROM HORIZONTAL.	GRAY TELY
	R2	60"	60"	48"/60" 80%	G O O D		S(H/	CHIST LAYERS, VERY I	MIGMATITE WITH GRAY BIOTITE-MU: HARD (MIGMATITE) TO MODERATEL LY WEATHERED, FRCATURES @ 0 T ONTAL.	Y
	R3	60"	60"	45"/60" 75%	G O O D		S(H/	CHIST LAYERS, VERY I	MIGMATITE WITH GRAY BIOTITE-MU: HARD (MIGMATITE) TO MODERATEL\ LY WEATHERED, FRCATURES @ 10 ONTAL.	Y



PROJECT:		BORING NO.:	B-15			
CLIENT:				PROJECT NO.:	04-1228	
			_			
LOGGED BY:	GWB	DATE:	12/21/2004	SHEET NO.:	1 OF 1	
CHECKED BY:	GWB	DATE:	1/13/2005	CORE SIZE:	NQ2	

	•						
DE	CORE RUN	CORE INTERVAL (IN)	CORE RECOVERY (IN)	RQD (%)	ROCK QUALITY	GRAPHIC LOG	ROCK DESCRIPTION AND IDENTIFICATION
11.0'	R1	60"	58"	14"/60" 23%	VERY POOR		BROWN SULFIDIC SCHIST (11.0' TO 12.8') AND GRAY BIOTITE-MUSCOVITE SCHIST (12.8' TO 16.0'), SOFT BECOMING MODERATELY HARD, MODERATELY WEATHERED, HIGHLY FRACTURED, FRACTURES @ 0 TO 50 DEGREES FROM HORIZONTAL. HIGHLY FRACTURED ZONE ZONE OF CORE LOSS
	R2	60"	60"	56"/60" 93%	EXCELLENT	1	GRAY BIOTITE-MUSCOVITE SCHIST (16.0' TO 17.3') AND WHITE TO LIGHT GRAY MIGMATITE (17.3' TO 21.0'), MODERATELY HARD BECOMING VERY HARD, SLIGHTLY WEATHERED, FRACTURES @ 5 TO 15 DEGREES FROM HORIZONTAL.
							BOTTOM OF EXPLORATION @ 21.0'



PROJECT:				BORING NO.:	B-16
CLIENT:				PROJECT NO.:	04-1228
LOGGED BY:	GWB	DATE:	12/20/2004	SHEET NO.:	1 OF 1
_				-	-
CHECKED BY:	GWB	DATE:	1/13/2005	CORE SIZE:	NQ2

	CD D1.		GWB				DATE. 1/13/2003 CORE SIZE. NQZ
DEPTH BELOW SURFACE (FT)	CORE RUN	CORE INTERVAL (IN)	CORE RECOVERY (IN)	RQD (%)	ROCK QUALITY	GRAPHIC LOG	ROCK DESCRIPTION AND IDENTIFICATION
18.0'	R1	60"	58"	47"/60" 78%	GOOD		WHITE TO LIGHT GRAY MIGMATITE WITH GRAY BIOTITE-MUSCOVITE SCHIST LAYERS, VERY HARD (MIGMATITE) TO MODERATELY HARD (SCHIST), SLIGHTLY WEATHERED, FRACTURES @ 5 TO 25 DEGREES FROM HORIZONTAL
23.0'							ZONE OF CORE LOSS
	R2	60"	59"	39"/60" 65%	FAIR		WHITE TO LIGHT GRAY MIGMATITE WITH GRAY BIOTITE-MUSCOVITE SCHIST LAYERS, VERY HARD (MIGMATITE) TO MODERATELY HARD (SCHIST), SLIGHTLY WEATHERED, FRACTURES @ 0 TO 35 DEGREES FROM HORIZONTAL
28.0'							BOTTOM OF EXPLORATION @ 28.0'
							39



PROJECT:				BORING NO.:	B-17
CLIENT:				PROJECT NO.:	04-1228
				_	
LOGGED BY:	GWB	DATE:	12/21/2004	SHEET NO.:	1 OF 1
CHECKED BY:	GWB	DATE:	1/13/2005	CORE SIZE:	NQ2

	CD D1.		GWB				DATE: 1/13/2005 CORE SIZE: NQZ
DEPTH BELOW SURFACE (FT)	CORE RUN	CORE INTERVAL (IN)	CORE RECOVERY (IN)	RQD (%)	ROCK QUALITY	GRAPHIC LOG	ROCK DESCRIPTION AND IDENTIFICATION
15.0'	R1	60"	60"	27"/60" 45%	POOR		INTERBEDDED GRAY GRANITIC GNEISS AND SCHIST, HARD, SLIGHTLY WEATHERED, FRACTURES @ 5 TO 40 DEGREES FROM HORIZONTAL
20.0'	R2	60"	57"	39"/60" 65%	FAIR		INTERBEDDED GRAY GRANITIC GNEISS AND SCHIST, HARD, SLIGHTLY WEATHERED, FRACTURES @ 5 TO 35 DEGREES FROM HORIZONTAL. HIGHLY FRACTURED ZONE ZONE OF CORE LOSS
-							BOTTOM OF EXPLORATION @ 20.0'

S. W. COLE ENGINEERING, INC.

		AUGER	PRC	BE L				
	/CLIENT:				PROJECT NUMBER 04-1228 AUGER PROBE SIZE O.D. SOLID STEM			
LIENT:	N.I.	OCEANIAVENIJE DODTI AND MA	A INIT		AUGER	R PROBE SIZE O.D.	SOLID STEM	
OCATIO		OCEAN AVENUE, PORTLAND, MA	NC					
RILLING	FIRIVI:	GREAT WORKS TEST BORING, II	NC.					
	BORING NO.	. P-1			BORING NO.	P-2		
	BOILING NO.				BONING NO.	1 -2		
	GROUND ELE	EV. 141 +/-			GROUND ELEV.	142 +/-		
	DATE	12/15/2004			DATE	12/15/2004		
DEPTH		STRATUM DESCRIPTION		DEPTH	STR	ATUM DESCRIPT	ΓΙΟΝ	
(FT)				(FT)	7			
		FOREST DUFF / TOPSOIL						
	01/	ERLYING BROWN SILTY SAND			FORE	PT DUEE / TODOO!		
		ITH ORGANICS AND COBBLES				ST DUFF / TOPSOIL	VID.	
	VVI	TH ORGANICS AND COBBLES				G BROWN SILTY SAN		
0.41					WITH ORG	SANICS AND COBBLE	:5	
2.4'								
		REFUSAL AT 2.4'						
		(PROBABLE BEDROCK)		4.0'				
					PROBABLE	WEATHERED BEDRO	OCK	
				9.0'				
						EFUSAL AT 9.0'		
					(PROI	BABLE BEDROCK)		
	l		1	ı ———				

	DRILLER - VISUALLY
Х	SOIL TECHNICIAN - VISUALLY
	LABORATORY TESTS



S. W. COLE ENGINEERING, INC. AUGER PROBE LOG

			AUGER PRO	DBE LO			4 4000	
ROJECT LIENT:	Γ/CLIENT:					ROJECT NUMBER <u>0</u> . PROBE SIZE O.D.		
LIENT: OCATION: RILLING FIRM:		OCEAN AVENUE, POR		AUGER	FROBE 312E O.D	SOLID STEIN		
								_
	BORING NO.	P-3	_	В	ORING NO.	P-4		
	GROUND ELE	EV. 134 +/- 12/15/2004			ROUND ELEV. ATE	142 +/- 12/15/2004		
DEPTH (FT)		STRATUM DESCRIPTION	ON	DEPTH (FT)	STR	ATUM DESCRIPT	TION	
3.0'	1	FOREST DUFF / TOPSOIL ERLYING BROWN SILTY SAND TH ORGANICS AND COBBLES		3.0'	OVERLYING	ET DUFF / TOPSOIL G BROWN SILTY SAN SANICS AND COBBLE		
0.0		REFUSAL AT 3.0' (PROBABLE BEDROCK)		5.0'	PROBABLE \	WEATHERED BEDRO	OCK	
						FUSAL AT 5.0' BABLE BEDROCK)		
	ĺ							

	DRILLER - VISUALLY
Х	SOIL TECHNICIAN - VISUALLY
	LABORATORY TESTS



S. W. COLE ENGINEERING, INC.

		AUGER P	RC	BE LO			
							4-1228
		OCEAN AVENUE DODELAND MAIN	AUGER	PROBE SIZE O.D.	SOLID STEM		
		OCEAN AVENUE, PORTLAND, MAIN GREAT WORKS TEST BORING, INC					
RILLING	5 FIRIVI:	GREAT WORKS TEST BORING, INC	•				
	BORING NO.	P-5	T		BORING NO.	P-6	
	BORING NO.				BORING NO.	1-0	
	GROUND ELE	EV. 132 +/-			GROUND ELEV.	139 +/-	
	DATE	12/15/2004			DATE	12/15/2004	
DEPTH (FT)		STRATUM DESCRIPTION		DEPTH (FT)	STR/	ATUM DESCRIPT	ΓΙΟΝ
			-01		FORES	T DUFF / TOPSOIL	
		FOREST DUFF / TOPSOIL				G BROWN SILTY SAN	ND
	OVI	ERLYING BROWN SILTY SAND		1.5'		ANICS AND COBBLE	
	1	TH ORGANICS AND COBBLES		2.0'		WEATHERED BEDRO	
2.7'	1	TH GROWING AND GODDEEG		2.0	TROBRELL	VEXTUENCED BEBICE	7011
					RE	FUSAL AT 2.0'	
	1	REFUSAL AT 2.7'				BABLE BEDROCK)	
	1	(PROBABLE BEDROCK)			(, ,,,,,	, ISLE SES. (3 S. ()	
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	DRILLER - VISUALLY
Х	SOIL TECHNICIAN - VISUALLY
	LABORATORY TESTS



S. W. COLE ENGINEERING, INC.

				AUGEF	RPRC	BE L	OG		
ROJECT/CLIENT: LIENT: OCATION:		OCEAN AVENUE, PORTLAND, MAINE						PROJECT NUMBER 04- AUGER PROBE SIZE O.D.	
RILLING	FIRM:	GREA ⁻	T WORKS TES	T BORING, I	INC.				
	BORING NO.	_	P-7				BORING NO.	P-8	
	GROUND ELE	≣V	135 +/- 12/15/2004				GROUND ELEV. DATE	142 +/- 12/15/2004	
DEPTH (FT)		STRAT	UM DESCRIP	ΓΙΟΝ		DEPTH (FT)	STR	RATUM DESCRIP	TION
(,						(1.1)	FORE	ST DUFF / TOPSOIL	
		FOREST I	OUFF / TOPSOIL					ST DOFF / TOFSOIL NG BROWN SILTY SAI	ND
	ov		BROWN SILTY SA	ND		1.5'	WITH OR	GANICS AND COBBLE	ES .
	WI	TH ORGAN	IICS AND COBBLE	ES .					
								EFUSAL AT 1.5'	
							(PRO	BABLE BEDROCK)	
5.2'									
		REFU	ISAL AT 5.2'						
			BLE BEDROCK)						

	DRILLER - VISUALLY
Х	SOIL TECHNICIAN - VISUALLY
	LABORATORY TESTS