## REPORT

October 24, 2012 08-0494 S

# Geotechnical Engineering Services

Proposed Courtyard by Marriott 321 Commercial Street Portland, Maine

#### **PREPARED FOR:**

J.B. Brown & Sons, Inc. Attention: Vin Veroneau 36 Danforth Street Portland, Maine 04101

#### 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

## www.swcole.com

#### TABLE OF CONTENTS

1.0 INTRODUCTIO	N	1
1.1 Scope and F	Purpose	1
1.2 Proposed Co	onstruction	1
2.0 EXPLORATIO	N AND TESTING	2
2.1 Explorations		2
2.1.1 Previo	bus Explorations	2
2.2 Testing		3
3.0 SITE AND SUE	BSURFACE CONDITIONS	3
3.1 Site Condition	ons	3
3.2 Subsurface	Conditions	3
3.3 Groundwate	r Conditions	5
3.4 Seismic and	Frost Considerations	5
4.0 EVALUATION	AND RECOMMENDATIONS	5
4.1 General Find	dings	5
4.2 Site and Sub	ograde Preparation	6
4.3 Excavation a	and Dewatering	6
4.4 Foundations	· · · · · · · · · · · · · · · · · · ·	7
4.4.1 Groute	ed Rammed Aggregate Piers	7
4.4.2 Driver	ו Piles	8
4.5 Foundation [	Drainage	9
4.6 Slab-On-Gra	ade Floors	9
4.7 Entrance Sla	abs and Sidewalks	
4.8 Backfill and	Compaction	
4.9 Site Retainin	ng Walls	
4.10 Weather Co	onsiderations	
4.11 Design Rev	view and Construction Testing	
5.0 CLOSURE		
Attachment A Sheet 1 Sheets 2 - 13	Limitations Exploration Location Plan Exploration Logs	

- Key to the Notes and Symbols Grain Size Analyses Sheet 14
- Sheets 15 17
- Sheet 18 Underdrain Detail
- Appendix A Previous Boring Logs





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October 24, 2012

J.B. Brown & Sons, Inc. Attention: Vin Veroneau 36 Danforth Street Portland, Maine 04101

Subject: Geotechnical Engineering Services Proposed Courtyard by Marriott 321 Commercial Street Portland, Maine

Dear Vin:

In accordance with our Proposal dated September 5, 2012, we have performed subsurface explorations for the Proposed Courtyard by Marriott at 321 Commercial Street 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 work was to obtain subsurface information at the site in order to develop geotechnical recommendations relative to foundations and earthwork associated with the proposed construction. Our scope of work included a review of previous exploration information, the making of two test boring and sixteen test pit explorations, soils laboratory testing, a geotechnical analysis of the subsurface findings and preparation of this report.

#### **1.2 Proposed Construction**

Based on information provided by Opechee Construction Corporation (project designbuilder), we understand proposed construction consists of a new Courtyard by Marriott hotel building with associated at-grade paved parking and landscape areas. We

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understand the proposed building will be a six-story, steel-framed structure with concrete decks and a masonry veneer. The building will have a finish floor elevation of about 14.5 feet (project datum) which will require tapered fills approaching 2.5 feet and tapered cuts approaching one foot. Structural loading information was not available at the time of our report. Proposed and existing site features are shown on the "Exploration Location Plan" attached as Sheet 1.

#### 2.0 EXPLORATION AND TESTING

#### 2.1 Explorations

Two test borings (B-101 and B-102) and sixteen test pits (TP-1 through TP-17, excluding TP-13) made at the site on September 26, 2012. Test pit TP-13 was not performed due to conflict with existing utilities. The test borings were made by Great Works Test Boring, Inc. of Rollinsford, New Hampshire and the test pits by Eastern Excavation, Inc. of Westbrook, Maine, both working under subcontract to S.W.COLE ENGINEERING, INC. The exploration locations were selected by S.W.COLE ENGINEERING, INC. in conjunction with Opechee Construction Corporation and established in the field by S.W.COLE ENGINEERING, INC. utilizing taped measurements from existing site features. The approximate exploration locations are shown on the "Exploration Location Plan" attached as Sheet 1.

Logs of the test borings are attached as Sheets 2 through 3. Rock core logs are attached as Sheet 4. Test pit logs are attached as Sheets 5 through 13 The ground surface elevations shown on the logs were estimated based on topographic information shown on Sheet 1. A key to the notes and symbols used on the logs is attached as Sheet 14.

#### 2.1.1 Previous Explorations

Fourteen test borings (B1 through B12, including B11A and B11B) were previously made at the site by Sebago Technics, Inc in 2010. Logs for these explorations and a sketch plan showing the approximate locations were provided by J.B. Brown & Sons, Inc. Borings B-1 through B-7 were within the proposed Courtyard project site. These boring logs are attached as Appendix A and the approximate locations are shown on the "Exploration Location Plan", attached as Sheet 1.



#### 2.2 Testing

The test borings were made using a combination of solid stem auger and cased, washboring drilling techniques. The soils were sampled at 2 to 5-foot intervals using a split spoon sampler and Standard Penetration Test (SPT) methods. SPT blow counts are shown on the logs.

Soil samples obtained from the test borings were returned to our laboratory for classification and testing. Laboratory testing includes grain size analyses, organic content testing, and moisture content testing. Results of the grain size analyses are attached as are attached as Sheets 15 through 17. Results of the organic content and moisture content testing are shown on the logs.

#### 3.0 SITE AND SUBSURFACE CONDITIONS

#### 3.1 Site Conditions

The site is located at 321 Commercial Street in Portland, Maine. Based on anecdotal information and historic right-of-way plans provided, we understand the site has had several industrial and commercial past site uses with associated buildings, utilities, railroad tracks, and roadways. We understand the rail lines previously crossed over portions of the site. The site structures have subsequently been razed and the site now consists of a gravel-surfaced parking lot with lightly vegetated areas along the periphery.

The site is generally bound by Commercial Street to the east, Maple Street to the south, a paved, upper tier parking lot the west, and a driveway/walkway to the north previously known as Foundary Lane. The site is relatively flat with existing topography varying from about elevation 12 feet (project datum) along Commercial Street, gently rising to about elevation 17 feet towards the western side. Existing site conditions and approximate topography around the site boundary are shown on the "Exploration Location Plan" attached as Sheet 1.

#### 3.2 Subsurface Conditions

Beneath a surficial layer of gravel, the explorations generally encountered a soils profile consisting of uncontrolled fill overlying bay mud with organics (harbor bottom deposits), overlying glacial outwash and glacial till soils, overlying bedrock. The principle soil strata



encountered are described below; not all the strata where encountered in each of the explorations. Refer to the attached logs for more detailed descriptions of the subsurface findings at the exploration locations.

<u>Uncontrolled Fill</u>: The explorations encountered a layer of uncontrolled fill material varying in thickness from about 8 to 16 feet, where penetrated. The fill generally consisted of loose to dense brown silty sand with varying portions of gravel and cobbles and miscellaneous debris (brick, concrete, asphalt, glass, organics, wood, coal clinker, ash, metal, paper, and plastic). Much of the fill observed at the test pits had a significant portion of brick. A petroleum odor was noted in the fill material at test pit TP-3. Relic foundation walls from prior structures were observed in test pits TP-1, TP-2, TP-11, TP-16.

<u>Bay Mud</u>: Underlying the uncontrolled fill, the borings encountered bay mud deposits (labeled harbor bottom deposits on the previous exploration logs) consisting of loose dark brown, gray, and black silty sand with varying portions of gravel, organics and wood fragments. Brick fragments were observed within the bay mud deposits at boring B-101 and at several previous borings. The bay mud extended to depths varying from about 16 to 26 feet below the ground surface.

<u>Glacial Outwash:</u> Underlying the uncontrolled fill, boring B-2 encountered glacial outwash soils consisting of loose to medium dense sand with varying portions of silt and gravel. The glacial outwash extended to a depth of about 26 feet below the ground surface.

<u>Glacial Till</u>: Underlying the bay mud and glacial outwash deposits, the borings encountered glacial till consisting of medium dense to dense gray and brown silty sand with varying portions of gravel. The glacial till was not encountered at borings B-5, B-6, and B-7. Where encountered, the glacial till extended to depths varying from about 22 to 31 feet below the ground surface.

<u>Bedrock:</u> Bedrock was encountered in the borings at depths varying from about 16 to 31 feet. The bedrock appears to be relatively weathered at the surface as indicated by penetration of the drilling equipment up to several feet in depth. Bedrock cores obtained at borings B-101 and B-102 consist of poor to good quality Schist with Rock Quality Designations (RQD) varying from 30 to 88 percent.



#### 3.3 Groundwater Conditions

Saturated soils were encountered at borings B-101 and B-102 at a depth of about 7 feet. Groundwater seepage was observed at test pit TP-10 at a depth of about 7 feet. Groundwater levels will fluctuate tidally, seasonally and following periods of precipitation and snowmelt.

#### 3.4 Seismic and Frost Considerations

The 25-year Air Freezing Index for the Portland, Maine area is about 1,250-Fahrenheit degree-days, which corresponds to a frost penetration depth on the order of 4.5 feet. Based on the subsurface findings at the test borings, we interpret the site soils to correspond to Seismic Soil Site Class D in accordance with 2009 IBC N-value and vane shear methods.

#### 4.0 EVALUATION AND RECOMMENDATIONS

#### 4.1 General Findings

Based on the subsurface findings, the proposed construction appears feasible from a geotechnical standpoint. We offer the following geotechnical considerations:

- The uncontrolled fills and loose bay mud with organics (harbor bottom deposits) are unsuitable for support of the proposed building. We recommend ground improvement by grouted rammed aggregate piers (RAP) be utilized across the building footprint to support spread footing foundations and on-grade floor slabs. Alternatively, we recommend the building and floor slab derive support from steel H-piles driven to end bearing on bedrock. In both cases, the foundation contractor will need to be prepared to pre-auger to overcome buried obstructions.
- Perimeter foundation underdrains should be provided for the proposed building.
- The uncontrolled fills are unsuitable for backfill in the building area and for foundation backfill. Imported Structural Fill and Crushed Stone will be needed for construction.
- Subgrades for proposed paved areas are anticipated to consist of existing uncontrolled fill. Uncontrolled fill pavement subgrades should be thoroughly proof-



rolled and densified. Areas that become soft or yielding during proofrolling must be removed and replaced with compacted subbase gravel prior to constructing the new pavement section.

#### 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. The soils that will be exposed will be subject to erosion.

In general, foundation subgrades will consist of loose to medium dense uncontrolled fill containing miscellaneous debris. Groundwater may be encountered, particularly in deeper excavations for foundations and utilities. We recommend that foundation subgrades be overexcavated by 6-inches and backfilled with compacted Crushed Stone. The Crushed Stone will help provide a stable working mat and a drainage media for dewatering.

Relic structures, slabs, and foundations will likely be encountered during construction. Relic structures and foundations should be demolished at least 4.5 below proposed finish grade. Voids left from existing foundations should be backfilled with compacted Granular Borrow or Structural Fill

Subgrades for proposed paved areas are anticipated to consist of existing uncontrolled fill. Uncontrolled fill pavement subgrades should be thoroughly proof-rolled and densified with 3 to 5 passes of a vibratory roller having a static weight of at least 10 tons. Areas that become soft or continue to yield during densification and areas which contain a significant amount of wood or organics should be overexcavated and replaced with compacted Structural Fill. Areas of exposed subgrade which are significantly voided should be choked/filled with compacted Crushed Stone prior to placing pavement gravels.

#### 4.3 Excavation and Dewatering

Excavation work will generally encounter uncontrolled fills. Miscellaneous debris including relic structures, slabs, foundations, and pavements will be encountered in the fills. Handling and disposal of excavation spoils must follow local, state and federal regulations. The uncontrolled fills may have premium disposal costs due to uncharacterized contaminants.



Groundwater in the existing fills may be encountered in excavations. Ditching with sump and pump dewatering methods should be adequate to control groundwater in shallow excavations. The layer of Crushed Stone provided below foundations will provide a drainage media from which to sump and pump. Controlling groundwater to a depth of at least one foot below subgrade will help to stabilize subgrades. Tidal influence of groundwater should be anticipated.

Excavations must be properly shored and/or sloped according to OSHA Regulations to prevent sloughing and caving of the sidewalls during construction.

#### 4.4 Foundations

We recommend the proposed building and floor slabs derive support from driven steel H-piles or from spread footing foundations bearing on ground improved by grouted rammed aggregate piers (RAPs). The design of ground improvement by grouted RAPs should be performed as an engineered design-build submittal by a qualified geotechnical contractor. The uncontrolled fill present at the site contains a significant amount of debris which will likely require pre-augering to clear obstructions for RAP and H-Pile installation.

#### 4.4.1 Grouted Rammed Aggregate Piers

RAPs consist of aggregate columns that densify the soil column through the uncontrolled fill, bay mud and glacial outwash deposits to the top of the dense glacial till soils or bedrock. We recommend the RAP's be grouted through the zone of uncontrolled fill and bay mud soils due to the presence of voids in the fill and organics in the bay mud deposit. We offer the following geotechnical parameters for spread footings bearing on grouted RAP improved ground:

- Design Frost Depth = 4.5 feet
- Net Allowable Soil Bearing Pressure = 4 ksf or less
- Base Friction Factor = 0.40 (Concrete to Crushed Stone)
- Passive Lateral Earth Pressure Coefficient = 3.0
- At-Rest Lateral Earth Pressure Coefficient = 0.5
- Total Unit Weight of Backfill = 130 pcf (Compacted Structural Fill)
- Internal Friction Angle of Backfill = 30 degrees
- Seismic Soil Site Class = D (2009 IBC, N-value and Vane Shear methods)



We recommend at least 6-inches of compacted Crushed Stone be provided below the spread footings after ground improvement is performed. The crushed stone will help to provide a stable working mat for foundation construction and a media from which to dewater.

#### 4.4.2 Driven Piles

Working pile capacities must consider the strength of the materials with adequate factors of safety against yielding, corrosion, and damage during driving.

<u>Steel H-Piles:</u> Based on the subsurface findings, steel H-piles driven to end bearing on bedrock may be used to support the building foundations and a structural floor slab. We recommend the following H-pile sizes and allowable axial compressive capacities:

RECOMMENDED STEEL H-PILE CAPACITIES								
50 ksi Stool H Bilo Section	Allowable Axial Compressive Capacity							
SU KSI SLEELTI-FILE SECLIOT	(kips)							
HP 10X42 80								
HP 10X57	160							
HP 12X74	220							
Notes:								
1. Piles driven to practical refusal on hard, sound bedrock with cast driving tips and								
(1/8-inch) corrosion allowance								
2. Capacities greater than 80 kips require pile load test								

<u>Pile Spacing</u>: Piles should be spaced a minimum center-to-center distance of at least 3 pile diameters, but no less than 30 inches. Piles in groups should be driven from the interior outward to help preclude excessively hard driving conditions of the interior piles due to soil densification.

Lateral Resistance: We recommend that lateral loads be resisted by passive earth pressures acting on the grade beams and pile caps. Passive lateral resistance acting on grade beams and pile caps backfilled with compacted Structural Fill should consider a total unit weight of granular backfill of 130 pcf, an angle of internal friction of 30 degrees with an ultimate passive lateral earth pressure coefficient of 3.0. Additional resistance to lateral loads can be mobilized along the pile shafts, if needed. S.W.COLE



ENGINEERING, INC. can assist with lateral pile capacities, as deemed necessary by the structural engineer.

<u>Pile Load Testing</u>: For piles with a capacity over 40 tons (80 kips), we recommend the contractor coordinate a test pile program including monitoring of several piles with a Pile Driving Analyzer (PDA) to determine pile and driving equipment compatibility as well as to define the "set" criteria and allowable pile capacity. The test pile program should include PDA monitoring of the test piles during re-strikes in order to assess pile capacity and driving resistance after pore water pressures have relaxes. The pile driving contractor should submit a WEAP analysis and information relative to pile driving equipment prior to beginning driving. S.W.COLE ENGINEERING, INC. should be retained to observe pile driving.

#### 4.5 Foundation Drainage

We recommend an underdrain system be installed near footing grade around the perimeter footings. The underdrain pipe should consist of 4-inch diameter, perforated SDR-35 foundation drain pipe enveloped in 12-inches of Crushed Stone, fully wrapped in non-woven geotextile filter fabric. The underdrain pipe must be connected to a positive gravity outlet protected from freezing, clogging and backflow.

Exterior foundation backfill should be sealed with a surficial layer of clayey or loamy soil in areas that are not paved or occupied by entrance slabs. This is to reduce direct surface water infiltration into the backfill. Surface grades should be sloped away from the building for positive surface water drainage. General underdrain details are shown on Sheet 18.

#### 4.6 Slab-On-Grade Floors

We recommend on-grade concrete floors be supported on a minimum of 24 inches of compacted Structural Fill overlying RAP improved subgrades. On-grade floor slabs founded on properly prepared subgrades may be designed considering a modulus of subgrade reaction of 150 pci. If a pile supported structural floor slab option is selected, we recommend at least 12 inches of compacted Structural Fill be provided below the slab. The structural engineer or concrete consultant must design steel reinforcing and joint spacing appropriate to slab thickness and function.



We recommend a sub-slab vapor retarder particularly in areas of the building where the concrete slab will be covered with an impermeable surface treatment or floor covering that may be sensitive to moisture vapors. 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 direct contact with the sub-slab base material and 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 sand and gravel meeting the requirements of Structural Fill be provided to a depth of at least 4.5 feet 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 details of this frost transition zone are attached as Sheet 18.

#### 4.8 Backfill and Compaction

Based on the subsurface findings, the existing fill soils and native soils are unsuitable for reuse in building construction. We recommend the following imported fill and backfill materials.

<u>Structural Fill</u>: Fill to raise building grades, backfill for foundations, and base gravel below floor slabs should be clean, 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					
1/4 inch	25 to 90					
#40	0 to 30					
#200	0 to 5					

<u>Crushed Stone</u>: Crushed Stone, used beneath foundations and for underdrain aggregate, should meet the gradation requirements of MDOT Standard Specifications 703.22 "Underdrain Backfill Type C".

MDOT 703.22 Underdrain Backfill Type C – Crushed Stone								
Sieve Size Percent Finer by Weight								
1 inch	100							
³¼ inch	90-100							
³‰ inch	0-75							
#4	0-25							
#10	0-5							

<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 lift thicknesses for grading, fill and backfill activities should not exceed 12 inches. We recommend that fill and backfill in building areas be compacted to at least 95 percent of its maximum dry density as determined by ASTM D-1557. Crushed Stone should be compacted in loose lifts not exceeding 12 inches.

#### 4.9 Site Retaining Walls

Based on our understanding of the proposed site grading concepts, we anticipate that a mechanically stabilized earth retaining wall (MSE Wall) will be needed to provide grade separation along the western site boundary. We anticipate this MSE Wall will support a parking lot above it and will range in height from about 2 to 5 feet. Based on the subsurface findings, it appears this MSE Wall would be founded on uncontrolled fills. Since MSE Walls are tolerant of settlement, it is our opinion the MSE Wall can be supported on the uncontrolled fills, provided the fills are prepared properly. Specifically,



we recommend overexcavating the uncontrolled fills beneath this MSE wall to a depth of at least 1 foot, densifying the exposed uncontrolled fills and backfilling the overexcavated area with compacted Crushed Stone.

For MSE Walls bearing on properly prepared subgrades, we offer the following geotechnical parameters for design consideration:

- Reinforced Soil Unit Weight = 125 pcf
- Reinforced Soil Friction Angle = 30 degrees
- Retained Soil Unit Weight = 125 pcf
- Retained Soil Friction Angle = 28 degrees
- Foundation Soil Allowable Bearing Pressure = 1.5 ksf
- Foundation Soil Friction Angle = 28 degrees
- Foundation Soil Friction Factor = 0.4

#### 4.10 Weather Considerations

Earthwork and foundation construction activities should be limited during wet and freezing weather. The contractor should anticipate the need to moisture condition fills in order to facilitate compaction. 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.

#### 4.11 Design Review and Construction Testing

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

A soils and concrete testing program should also be implemented during construction to observe compliance with the design concepts, plans, and specifications. S.W.COLE ENGINEERING, INC. is available to observe RAP and driven pile installations for foundations as well as testing 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 construction.

Sincerely,

#### S.W.COLE ENGINEERING, INC.

Evan M. Walker, P.E. Geotechnical Engineer

*fim*othy J. Boyce, P.E. Senior Geotechnical Engineer

EMW:tjb



#### Attachment A Limitations

This report has been prepared for the exclusive use of J.B. Brown & Sons, Inc. for specific application to the Proposed Courtyard by Marriott located at 321 Commercial Street 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.





LOCATION:

CASING:

DRILLING CO. :

PROJECT / CLIENT: PROPOSED COURTYARD BY MARRIOTT / J.B. BROWN & SONS, INC.

321 COMMERCIAL STREET - PORTLAND, MAINE

SIZE I.D. HAMMER WT. HAMMER FALL

300 lbs

140 lbs

GREAT WORKS TEST BORING, INC.

4"

## **BORING LOG**

PETE MICHAUD

DRILLER:

24 in

30 in

BORING NO .:	B-101						
SHEET:	1 OF 1						
PROJECT NO .:	08-0494						
DATE START:	9/26/2012						
DATE FINISH:	9/26/2012						
ELEVATION:	13' +/-						
SWC REP.: NBS							
ER LEVEL INFORMATION							

WATER LEVEL INFORMATION
SOILS SATURATED BELOW

SOILS SATURATED BELOW 8' +/-

SAMPLER: SS 1 3/8" CORE BARREL: NQ2 2"

TYPE

HW

CASING BLOWS		SAN	1PLE		SAM	PLER BL	LOWS P	PER 6"		οτρατά ο τέςτ ράτα	
PER FOOT	NO.	PEN.	REC.	DEPTH @ BOT	0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA	
										BROWN GRAVELLY SAND WITH SOME SILT WITH BRICK (FILL)	
	1D	24"	12"	2.0'	8	10	8	5	2.0'	~ MEDIUM DENSE ~	
	20	24"	6"	4.0'	5	5	2	2		10025	
	20	24	0	4.0	5	5	2	2		~ LOUSE ~ BROWN GRAVELLY SILTY SAND WITH BRICK (FILL)	
										~ MEDIUM DENSE ~	
	3D	24"	0"	7.0'	7	12	16	10			
									8.0'		
										~ LOOSE ~	
	4D	24"	6"	11.0'	2	2	2	2		w = 25.0%	
										DARK GRAY-BROWN SILTY SAND SOME GRAVEL WITH BLACK ORGANICS	
										AND WOOD FRAGMENTS AND TRACE BICK (BAY MUD)	
	5D	24"	8"	17.0'	3	3	2	4		O = 3.1%, w = 21.9%	
	6D	24"	10"	22.01	F	10	14	10	20.5'		
	00	24	10	22.0	5	12	14	12		W = 0.2% GRAV SILTY GRAVELLY SAND (GLACIAL TILL)	
									24.0'	~ MEDIUM DENSE ~	
										GRAY SILTY GRAVELLY SAND WITH	
	7D	24"	10"	27.0'	12	28	22	17		OCCASIONAL COBBLES (GLACIAL TILL)	
										~ DENSE ~	
									29.0'		
									30.5'	WEATHERED BEDROCK - ADVANCE BY ROLLER CONE	
									00.0		
										BEDROCK	
	1R	60"	56"	35.5'						(SEE ROCK CORE LOG)	
					-						
	-										
	2R	60"	60"	40.5'					40 5'		
<del>.</del>	-0	00	00						-0.0		
SAMPLE	ES:			SOIL C	LASSI	FIED B'	Y:		REMAR	KS: _	
U = SPL C = 2" S				<b></b>	DRI	IIFR -	VISUA	IY			
S = 3" S	HELBY	TUBE		Х	SOI		I VISI	JALLY		APPROXIMATE BOUNDARY BETWEEN SOIL TYPES	
U = 3.5"	SHELE	BY TUE	E	X	LAB	ORATO	ORY TE	ST		AND THE TRANSITION MAY BE GRADUAL. BORING NO.: B-101	



## **BORING LOG**

BORING NO .:	B-102								
SHEET:	1 OF 1								
PROJECT NO .:	08-0494								
DATE START:	9/26/2012								
DATE FINISH:	9/26/2012								
ELEVATION:	13' +/-								
SWC REP.: NBS									
WATER LEVEL INFORMATION									
SOILS SATURATED BELOW 8' +/-									

PROJECT / CLIENT:	PROPOSED	COURTYARD	BY MARRIOTT	/ J.B. BROWN & S	ONS, INC.						
LOCATION:	321 COMMERCIAL STREET - PORTLAND, MAINE										
DRILLING CO. :	GREAT WOR	KS TEST BOR	RING, INC.	DRILLER:	PETE MICHAUD						
				_							
	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL							
CASING:	HW	4"	300 lbs	24 in							
SAMPLER:	SS	1 3/8"	140 lbs	30 in							
CORE BARREL:	NQ2	2"									

CASING		SAN	IPLE		SAM	PLER BI	LOWS P	PER 6"		
PER FOOT	NO.	PEN.	REC.	DEPTH @ BOT	0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
			"				0.7			
	1D	24"	18"	2.0'	18	30	29	14		BROWN SILLY GRAVELLY SAND WITH BRICK (FILL) ~ DENSE ~
	2D	24"	8"	4.0'	13	14	15	20	4.0'	
										BROWN SILTY SAND WITH WOOD AND BRICK (FILL)
	3D	24"	4"	7.0'	5	6	6	7		~ MEDIUM DENSE ~
	4D	24"	0"	9.0'	7	5	2	2	8.0'	
	40	24	0	9.0	1	5	2	2		DARK BROWN - BLACK SILTY SAND SOME GRAVEL WITH ORGANICS
	50	24"	0"	12.0'	2	2	2	2		
	50	24	0	12.0	2	2	2	2	-	~ LOOSE ~
									16.0'	
	6D	24"	10"	17.0'	5	3	14	6	-	
									-	GRAY SILTY SAND AND GRAVEL (GLACIAL TILL)
										~ MEDIUM DENSE ~
	7D	24"	14"	22.0'	5	11	10	25	22.0'	
					_			_		WEATHERED BEDROCK - ADVANCE BY ROLLER CONE
									23.5'	
									-	
										BEDROCK
										(SEE ROCK CORE LOG)
									22.5	
									33.5	
										BOTTOM OF EXPLORATION @ 33.3'
	-0.			00" 0					DEMAS	
SAMPLE D = SPL	=5: .IT SPC	ON		SULC	LASSI	-IED BJ	r:		KEMAR	
C = 2" S	HELBY			V	DRI	LLER -	VISUAL			STRATIFICATION LINES REPRESENT THE (3)
S = 3" SHELBY TUBE         X         SOIL TECH VISUALLY           U = 3.5" SHELBY TUBE         X         LABORATORY TEST		ST		AND THE TRANSITION MAY BE GRADUAL. BORING NO.: B-102						



#### PROPOSED COURTYARD BY MARRIOTT J.B. BROWN & SONS, INC.

#### CORE BOX SUMMARY SHEET 1 OF 1

BORING(S	) NO:	B-101 & B-102	
			_

PROJ	ECT	NO a	& LO(	CATIO	ON:

LOGGED BY PJO

CHECKED BY EMW





#### PHOTO: B-101 (30.5-40.5') & B-102 (23.5-33.5')

BORING	RUN NO.	CORE SIZE	DEPTH & CORE INTERVAL (FT)	RECOVERY (FT)	RQD (%)	ROCK QUALITY	LITHOLOGIC DESCRIPTION
B-101	R1	NQ2	30.5-35.5 (5)	4.7	78	Good	Gray biotite-chlorite-plagioclase- quartz SCHIST. Moderately hard; fine grained; slightly weathered. Quartz veins and foliation parallel fractures at 60, 70 and 90 degrees from horizontal.
	R2		35.5-40.5 (5)	5.0	88	Good	Same as R1.
B-102	R1		23.5-25 (1.5)	1.3	38	Poor	Gray biotite-chlorite-plagioclase- quartz SCHIST. Moderately hard; fine grained; moderate to closely spaced fractures; slightly weathered.
	R2		25-27 (2)	1.6	40	Poor	Same as R1, highly fractured.
	R3		27-30.5 (3.5)	3.5	77	Good	Fracture surfaces stained with iron oxide. Fracture angles at 60-70 degrees from parallel.
	R4		30.5-33.5 (3.0)	2.3	55	Fair	Same as R3.



PROJECT/CLIENT: PROPOSED COURTYARD BY MARRIOTT / J.B. BROWN & SONS, INC. LOCATION: 321 COMMERCIAL STREET - PORTLAND, MAINE

				TEST PIT	TP-1			
		DATE:	<u>9/26/2012</u> S	URFACE ELEVATION:	14' +/-	LOCATION:	SEE ELP	
SAN	SAMPLE DEPTH STRATUM DESCRIPTION						TEST RESULTS	
NO.	DEPTH	(FT)						
		0.01	BROWN SAND	SOME SILT AND GRAVE	TRACE ORGA	NICS (FILL)		
-		1.8						
		1.2						
			32" THICK	BROWN SILT	Y SAND SOME	GRAVEL		
			CONCRETE AND	WITH BRI	CK, METAL, WC	DOD,		
			WALL		DAL CLINKER			
					(FILL)			
			RUNNING					
			PARALLEL WITH					
			MAPLE STREET					
		0.01						
-		8.2						
			AFFAREINT WALL FOC					
	COMPLETION DEPTH: 8.2' DEPTH TO WATER: NO FREE WATER OBSERVED							

				TEST PIT	TP-2		
		DATE:	9/26/2012	SURFACE ELEVATION:	13' +/-	LOCATION:	SEE ELP
SAM	SAMPLE DEPTH STRATUM DESCRIPTION						TEST RESULTS
NO.	DEPTH	(FT)					
		0.5'		BROWN SAND SOME SILT ANI	D GRAVEL	(FILL)	
			20" THICK CONCRETE WALL RUNNING NE-SW AT LEAST 18' LONG	DARK BROWN WITH BRICK	SILTY GRA (, METAL, C (FILL)	VELLY SAND ONCRETE	
		0.0	APPARENT WAL	FOOTING @ 6.5'			
	COMPLETION DEPTH: 6.5' DEPTH TO WATER: NO FREE WATER OBSERVED						



PROJECT/CLIENT: PROPOSED COURTYARD BY MARRIOTT / J.B. BROWN & SONS, INC. LOCATION: 321 COMMERCIAL STREET - PORTLAND, MAINE

			TEST PIT TP-3	
		DATE:	9/26/2012 SURFACE ELEVATION: 13' +/- LOCA	TION: SEE ELP
SAN	<b>NPLE</b>	DEPTH	STRATUM DESCRIPTION	TEST RESULTS
NO.	DEPTH	(FT)		
	$\square$	['	BROWN GRAVELLY SAND SOME SILT (FILL)	
		1.5'	WITH ASPHALT LAYER AT 1.5'	
<b>[</b>	<b> </b>	[		
S1	3'-5'	1 '	DARK GRAY-BROWN AND BLACK SILTY SAND SOME GRAVEL AND COBBI	LES
		1 '	WITH ASH, BRICK, WOODEN TIMBERS, METAL RAIL	
	┼──┦	'		
<b> </b>	+	1 '	~ PEIROLEUNI ODOR NOTED ~	
		1 '	(FILL)	
		6.0'		
┣──		C 0'	GRAY-BROWN SILTY SAND SOME GRAVEL WITH SILTY CLAY POCKETS	S
<b> </b>	++	6.9		
		1 '		
		1 '		
_		'		
	+			
	C	OMPLET	ION DEPTH: 6.9' DEPTH TO WATER: NO FI	REE WATER OBSERVED

				TEST	DIT	TD_/		
				IESI		16-4		
		DATE:	9/26/2012	SURFACE ELEVATI	ON:	15' +/-	LOCATION:	SEE ELP
SAN	<b>IPLE</b>	DEPTH		STRATUM DE	SCR	IPTION		TEST RESULTS
NO.	DEPTH	(FT)						
				BROWN SILTY SAND S	OME	GRAVEL (FIL	L)	
		1.0'						
				BROWN SILTY GRAVEL	VSA	ND WITH BR	ICK	
	PLASTIC DEBRIS. CONCRETE. GLASS					ion,		
		2.9'		(FILI	_)	,		
				REFUSAL ON ASPH	ALT L	AYER @ 2.9'		
						SOUTHWEST		
			REEIO	SIDES OF 1	EST	PIT	00011111201	
		JIVIPLET		2.9 (KEFUSAL)		DEPIHIC	J WATER: NO FREE W	AIER ODSERVED



PROJECT/CLIENT: PROPOSED COURTYARD BY MARRIOTT / J.B. BROWN & SONS, INC. LOCATION: 321 COMMERCIAL STREET - PORTLAND, MAINE

			TEST PIT TP-5		
		DATE:	9/26/2012 SURFACE ELEVATION: 15' +/-	LOCATION:	SEE ELP
SAN	<b>IPLE</b>	DEPTH	STRATUM DESCRIPTION		TEST RESULTS
NO.	DEPTH	(FT)			
			GRAY-BROWN GRAVELLY SAND SOME SILT	(FILL)	
		0.8			
			BROWN SILTY SAND SOME GRAVEL		
			WITH BRICK AND WOOD DEBRIS		
		3.8'	(FILL)		
		_ 0.0			
			REFUSAL @ 3.8' ON PROBABLE CONCRETE SLA	B/RUBBLE	
	C	OMPLETI	ION DEPTH:	O WATER: <u>NO FREE W</u>	ATER OBSERVED

				TEST PIT	TP-6		
		DATE:	9/26/2012	SURFACE ELEVATION:	14' +/-	LOCATION:	SEE ELP
SAMF	AMPLE DEPTH STRATUM DESCRIPTION						TEST RESULTS
NO.	DEPTH	(FT)					
						Ŧ	
		1.5'		WITH DISCONTINUOUS RELIC AS	PHALT LAY	.i /FR (FILL)	
				WITH BRICK, INTACT PIECES	OF BRICK	L WALL	
				WOODEN TIMBERS, MET	AL DEBRIS	S	
				(FILL)			
		7.0'					
	COMPLETION DEPTH:     7.0'     DEPTH TO WATER: NO FREE WATER OBSERVED						



PROJECT/CLIENT: PROPOSED COURTYARD BY MARRIOTT / J.B. BROWN & SONS, INC. LOCATION: 321 COMMERCIAL STREET - PORTLAND, MAINE

		TEST PIT TP-7		
	DATE:	9/26/2012 SURFACE ELEVATION: 12' +/- LOG	CATION: SEE ELP	
SAMPLE	DEPTH	STRATUM DESCRIPTION	TEST RESULTS	
NO. DEPTH	1 (FT)			
	0.2'	BROWN GRAVELLY SAND SOME SILT (FILL)		
	-	BROWN SILTY SAND SOME GRAVEL WITH WOOD, BRICK METAL, STYROFOAM (FILL)		
		5"-DIAMETER STEEL PIPE CROSSING BOTTOM OF TEST PIT EXPLORATION TERMINATED @ 5.5'		
C	OMPLETI	ION DEPTH: 5.5' DEPTH TO WATER: NO	O FREE WATER OBSERVED	

				TEST PIT	TP-8		
		DATE:	9/26/2012	SURFACE ELEVATION:	12' +/-	LOCATION:	SEE ELP
SAN	/IPLE	DEPTH		STRATUM DESC	RIPTION		TEST RESULTS
NO.	DEPTH	(FT)					
		0.5'	BRO	WN GRAVELLY SAND SOME SIL	TTRACE ORGA	ANICS (FILL)	
		6.2'		BROWN SILTY SAND SO WITH WOOD, BRICK, ROO CONCRETE PIE (FILL)	DME GRAVEL 'S, METAL PIPE CES	<u>=,</u>	
	COMPLETION DEPTH: 6.2' DEPTH TO WATER: NO FREE WATER OBSERVED						



PROJECT/CLIENT: PROPOSED COURTYARD BY MARRIOTT / J.B. BROWN & SONS, INC. LOCATION: 321 COMMERCIAL STREET - PORTLAND, MAINE

				TEST F	PIT TP-9		
		DATE:	9/26/2012	SURFACE ELEVATION	ON: <u>12' +/-</u>	LOCATION:	SEE ELP
SAN	SAMPLE DEPTH STRATUM DESCRIPTION						TEST RESULTS
NO.	DEPTH	(FT)					
<b> </b>		0.01	BROWN AND E	BLACK SAND SOME SILT	TAND GRAVEL TRAC	E ORGANICS	
		0.8		(FILL	.)		
				BROWN SILTY SAND	TRACE GRAVEL		
				WITH WOOD A	ND BRICK		
				(=1)	、 、		
				(FILL	-)		
		Į !					
		6.4'					
		0.7					
		Į !					
	COMPLETION DEPTH: 6.4' DEPTH TO WATER: NO FREE WATER OBSERVED						

			TEST PIT	TP-10				
	DATE:	9/26/2012	SURFACE ELEVATION:	12' +/-	LOCATION:	SEE ELP		
SAMPLE	DEPTH		STRATUM DESCR			TEST RESULTS		
NO. DEPTH	⊣ (FT)							
	0.5'	BROV	/N SILTY SAND TRACE GRAVE	WITH TRA	CE ORGANICS			
			BROWN SILTY SAND SC WITH BRICK, METAL STYROFOAN (FILL)	ME GRAVE DEBRIS, 1	L			
	7.0'							
		GRAY	BROWN SILTY SAND SOME GR	AVEL WITH	TRACE BRICK			
	7.5'		AND BLACK ORGANIC	POCKETS				
	_							
	-							
C	COMPLETION DEPTH: 7.5' DEPTH TO WATER: SEEPAGE/PONDING @ 7.0'							



PROJECT/CLIENT: PROPOSED COURTYARD BY MARRIOTT / J.B. BROWN & SONS, INC. LOCATION: 321 COMMERCIAL STREET - PORTLAND, MAINE

	TEST PIT TP-11							
	DATE:	<u>9/26/2012</u> S	URFACE ELEVATION: <u>12' +/-</u>	LOCATION:	SEE ELP			
SAMPLE	DEPTH		STRATUM DESCRIPTION		TEST RESULTS			
NO. DEPTH	H (FT)							
	0.0'	BRO	OWN SILTY SAND TRACE GRAVEL (FILL)					
	0.0							
	2.8'	2' THICK CONCRETE WALL WITH CMU FACING RUNNING NE-SW APPARENT WALL FOC	BROWN SILTY SAND SOME G WITH BRICK, CMU PIECE METAL WIRE AND REBA (FILL)	GRAVEL ES, AR				
C	COMPLETION DEPTH: 5.3' DEPTH TO WATER: NO FREE WATER OBSERVED							

-									
				TEST		TP-12			
		DATE:	9/26/2012	SURFACE ELEVA		12' +/-	L	OCATION:	SEE ELP
SAN	1PLE	DEPTH		STRATUM D	ESCRI	PTION			TEST RESULTS
NO.	DEPTH	(FT)							
		0.5'		BROWN SILTY SAND	TRACE	GRAVEL (FI	ILL)		
<b>S</b> 1	2'-5'								
51	2-5			WITH BRICK	IND SOF				
				STEEL DRUM PIECES, PAF	PER, PL	ASTIC BAGS	S, WOOD		
				(FI	LL)				
		6 O'							
		0.0							
			R	EFUSAL @ 6.0' ON PROBAB	LE CON	NCRETE SLA	AB/RUBBLE		
	COMPLETION DEPTH: 6.0' (REFUSAL) DEPTH TO WATER: NO FREE WATER OBSERVED								



PROJECT/CLIENT: PROPOSED COURTYARD BY MARRIOTT / J.B. BROWN & SONS, INC. LOCATION: 321 COMMERCIAL STREET - PORTLAND, MAINE

				TEST PIT T	P-13			
	DATE: 9/26/2012 SURFACE ELEVATION: LOCATION: SEE ELP							
SAN	/IPLE	DEPTH		STRATUM DESCRIPTI	ON	TEST RESULTS		
NO.	DEPTH	(FT)						
			TP-13 NO	T PERFORMED DUE TO CONFLICT V	VITH EXISTING UTILITIES			
-								
	C	OMPLETI	ON DEPTH:		DEPTH TO WATER:			

			TEST PIT	TP-14		
	DAT	E: 9/26/2012	SURFACE ELEVATION:	12' +/-	LOCATION:	SEE ELP
SAMP	LE DEPT	н	STRATUM DESCRI	PTION		TEST RESULTS
NO. E	DEPTH (FT)					
		Q'	GRAY-BROWN GRAVELLY SAND	SOME SILT (FILL)		
		.0				
			BROWN SILTY GRAVEL	LY SAND		
			METAL PIPE METAL ME	CK WALL SEGMENTS	,	
			(FILL)			
	5.8					
	COMPLE	ETION DEPTH:	5.8'	DEPTH TO WATER	NO FREE W	ATER OBSERVED



PROJECT/CLIENT: PROPOSED COURTYARD BY MARRIOTT / J.B. BROWN & SONS, INC. LOCATION: 321 COMMERCIAL STREET - PORTLAND, MAINE

l				-		
	DAT	E: 9/26/2012	SURFACE ELEVATION: 13' +/-	LOCATION:	SEE ELP	
SAMP	'LE DEPT	н	STRATUM DESCRIPTION		TEST RESULTS	
NO. E	DEPTH (FT)					
	0.5	BRO	WN GRAVELLY SAND SOME SILT WITH TRACE	E ASPHALT (FILL)		
			BROWN SILTY GRAVELLY SAND WITH COBBLES AND BOULDERS, WOOD, CONCRETE, METAL WIRE, STYROFO (FILL)	BRICK, AM		
	6.3	1				
		3	"-DIAMETER STEEL PIPE CROSSING BOTTOM EXPLORATION TERMINATED @ 6.3	OF TEST PIT		
	COMPLETION DEPTH: 6.3' DEPTH TO WATER: NO FREE WATER OBSERVED					

				TEST PIT TP-16				
		DATE:	9/26/2012 S	URFACE ELEVATION: <u>17' +/-</u> LOCATI	ON: SEE ELP			
SAN	1PLE	DEPTH		STRATUM DESCRIPTION	TEST RESULTS			
NO.	DEPTH	(FT)						
			VEGETAT	ION AND BROWN SILTY SAND SOME GRAVEL				
		0.9'		WITH TRACE BRICK (FILL)				
			RELIC CONCRETE	BROWN SILTY GRAVELLY SAND				
			SLAB AND	WITH COBBLES,				
			FROST WALL	BRICK, METAL				
		3.9'						
			REFUSAL @ 3	9' ON RELIC ASPHALT LAYER OR CONCRETE SLAB				
	COMPLETION DEPTH: 3.9' (REFUSAL) DEPTH TO WATER: NO FREE WATER OBSERVED							



PROJECT/CLIENT: PROPOSED COURTYARD BY MARRIOTT / J.B. BROWN & SONS, INC. LOCATION: 321 COMMERCIAL STREET - PORTLAND, MAINE

				TEST PIT TF	P-17	
		DATE:	9/26/2012	SURFACE ELEVATION: 17	LOCATIO	N: SEE ELP
SAN	<b>IPLE</b>	DEPTH		STRATUM DESCRIPTI	ON	TEST RESULTS
NO.	DEPTH	(FT)				
			VEG	ETATION AND DARK BROWN SILTY S	AND SOME GRAVEL	
		1.0'		WITH ORGANICS (FILL	)	
				BROWN SILTY SAND SOME O WITH BRICK, INTACT BRICK WAI CONCRETE, WOOD, METAL, AND (FILL)	RAVEL L PIECES, ORGANICS	
		8.0'				_
			RE		ETE SLAB/KUBBLE	
	COMPLETION DEPTH: 8.0' (REFUSAL) DEPTH TO WATER: NO FREE WATER OBSERVED					



• Geotechnical Engineering • Field & Lab Testing • Scientific & Environmental Consulting

#### KEY TO THE NOTES & SYMBOLS Test Boring and Test Pit Explorations

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)
- q<sub>u</sub> unconfined compressive strength, kips/sq. ft. based on laboratory unconfined compressive test
- $S_v$  field vane shear strength, kips/sq. ft.
- L<sub>v</sub> lab vane shear strength, kips/sq. ft.
- q<sub>p</sub> unconfined compressive strength, kips/sq. ft. based on pocket penetrometer test
- O organic content, percent (dry weight basis)
- W<sub>L</sub> liquid limit Atterberg test
- W<sub>P</sub> plastic limit Atterberg test
- WOH advance by weight of hammer
- WOM 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. RQD is computed from recovered core samples.
- $\gamma_T$  total soil weight
- $\gamma_B$  buoyant soil weight
- f fines content (percent by weight passing U.S. No. 200 Sieve)

#### **Description of Proportions:**

0 to 5% TRACE 5 to 12% SOME 12 to 35% "Y" 35+% AND

**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.



**Report of Gradation** 

ASTM C-117 & C-136

	<u>STANDARD</u> DESIGNATION (mm/µm)	SIEVE SIZE	AMOUNT PA	<u>SSING (%)</u>	
Material Source	9'-11'			Tested By	CHARLES CROMWELL
Material Courses	B-101 4D			Date Completed	10/11/2012
Exploration	P 101 4D			Date Received	10/9/2012
Client	J.B. BROWN & SONS			Data Datainad	10/0/0010
· <b>,</b> · · · ·	GEOTECHNICAL ENGINEERING SERVICES		Lab ID	16025G	
Proiect Name	PORTLAND ME - PROPOSED COURTYAR		Proiect Number	08-0494	

150 mm	6"	100	
125 mm	5"	100	
100 mm	4"	100	
75 mm	3"	100	
50 mm	2"	100	
38.1 mm	1-1/2"	100	
25.0 mm	1"	100	
19.0 mm	3/4"	100	
12.5 mm	1/2"	97	
6.3 mm	1/4"	92	
4.75 mm	No. 4	89	11% Gravel
2.00 mm	No. 10	80	
850 um	No. 20	70	
425 um	No. 40	56	70.1% Sand
250 um	No. 60	41	
150 um	No. 100	30	
75 um	No. 200	18.9	18.9% Fines





**Report of Gradation** 

ASTM C-117 & C-136

	<u>STANDARD</u> DESIGNATION (mm/µm)	SIEVE SIZE	AMOUNT PA	<u>SSING (%)</u>	
Material Source 20'-22'				Tested By	CHARLES CROMWELL
Exploration Material Courses	B-101 6D			Date Completed	10/11/2012
Exploration				Date Received	10/8/2012
Client	LB BROWN & SONS			Lab ID	16013G
Project Name	PORTLAND ME - PROPOSED COURTYARE	) BY MARRIOT -		Project Number	08-0494

150 mm	6"	100	
125 mm	5"	100	
100 mm	4"	100	
75 mm	3"	100	
50 mm	2"	100	
38.1 mm	1-1/2"	100	
25.0 mm	1"	100	
19.0 mm	3/4"	100	
12.5 mm	1/2"	81	
6.3 mm	1/4"	76	
4.75 mm	No. 4	73	27.2% Gravel
2.00 mm	No. 10	68	
850 um	No. 20	62	
425 um	No. 40	53	49.4% Sand
250 um	No. 60	44	
150 um	No. 100	34	
75 um	No. 200	23.5	23.5% Fines





**Report of Gradation** 

ASTM C-117 & C-136

	<u>STA</u> DESIGNAT	<u>NDARD</u> TION (mm/µm)	SIEVE SIZE	AMOUNT PA	<u>SSING (%)</u>	
Material Source	erial Source 10'-12'				Tested By	CRAIG TURCOTTE
Exploration	B-102 5D				Date Completed	10/11/2012
	J.B. BROWN & SONS				Date Received	10/9/2012
Oliont	GEOTECHNICAL ENGINEERING SERVICES			Lab ID	16026G	
Project Name	PORTLAND ME - PROPOSED COURTYARD BY MARRIOT -				Project Number	08-0494

150 mm	6"	100	
125 mm	5"	100	
100 mm	4"	100	
75 mm	3"	100	
50 mm	2"	100	
38.1 mm	1-1/2"	100	
25.0 mm	1"	100	
19.0 mm	3/4"	100	
12.5 mm	1/2"	100	
6.3 mm	1/4"	95	
4.75 mm	No. 4	92	8.2% Gravel
2.00 mm	No. 10	83	
850 um	No. 20	70	
425 um	No. 40	47	78.7% Sand
250 um	No. 60	28	
150 um	No. 100	20	
75 um	No. 200	13.0	13% Fines







# **APPENDIX A**

# **PREVIOUS BORING LOGS**



SEBAG( TECHNI	o ics,				TI	EST	BORING REI	PORT					Page	BO	RING B1	NC	i. 2
PROJECT LOCATIO CLIENT CONTRAC DRILLER	N CTOR	OFFICE BU 321 COMM J. B. BROW MAINE TE M. PORTE	JILDING AI IERCIAL ST IVN & SONS ST BORING R	ND GARAG TREET, POR GS, INC.	E TLAND, M	AINE		STI PR FIE DA DA	JOB NO. DJECT MGR. LD REP. TE STARTED TE FINISHED		1004 K. F R. E 3/24 3/24	14 RECI STE /201	KER S 0				
Elevation		ft.	Datum	1	Boring	Location	See Plan	ilo R53	ammar Type	Dril	ling	Mud		Ca	sina	Adv	ance
Item		Casing HSA	Samp	ler Core Ba	Tru	ck Kilod	Tripod	Cat-Head	Safety		Ben	tonit	e	Тур	Met	hod	Dept
Inside Dia	meter (in.)	2.5	1.37:	5		v C	Geoprobe	Winch	Doughnut	õ	Poly	mer	F	ISA/S	PIN/3	0.0	
Hammer V	Veight (lb.)		140	510595	Tra	ick	Air Track	Roller Bit	Automatic	<ul> <li>✓</li> </ul>	Non	e					
Hammer F	all (in.)		30	3649433	Ski			Cutting Head Dhi	ing Notes:	Gri	avel	s	and			Field	d Tes
Depth (ft.)	Sampler Blows per 6 in.	Sample No. & Recovery (in.)	Sample Depth (ft.)	Well Diagram	Stratum Change (ft.)	USCS Symbol	Visual-Ma (density/consistency, colo structure, odor, mois	nual Identification & Descr r, GROUP NAME & SYMBOL, m ture, optional descriptions, geolog	ption aximum particle size gic interpretation)	% Coarse	% Fine	% Coarse	% Medium	% Fine	Dilatancy	Toughness	Plasticity
- 0 -	3 6 10	S1	0.0		1.5	GW	Medium dense, brown wel mortar fragments, mps =	l-graded GRAVEL with sand ( 1.3 in., moist -FILL-	GW), brick and	35	25	20	10	10	·····		
	6	8 	2.0			SM	Very loose, brown silty SA	ND (SM), mps = 0.01 in., di	imp								
					······································												• • • • • • • • • • • • • • • • • • • •
_ 5 _	7	\$2	5.0	· · · · · · · · · · · · · · · · · · ·		SM	Loose, brown to olive-bro in., brick, metal, wet	wn silty SAND with gravel (Si	M), mps = 1.25	15	15	10	15	20 2	5		
	4	13	7.0														
			,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,					-FILL-								*	
10	1	\$3	10.5			GP	Note: debris layer at 10.0	ft., advance HSA to 10.5 ft. n poorly-graded GRAVEL wit	h sand (GP),	5	45	25	15	5	5	1	****
	1 5 1	18	12.5	· · · · · · · · · · · · · · · · · ·	11.5	SW-SM	wood, bark, mps = 0.75 i Loose, gray to gray-brown SM), trace wood, brick, m	n., wet -FILL- n well-graded SAND with silt a sps = 0.5 in., wet	nd gravel (SW-		15	20	30	25 1	0		
	2010		· · · · · · · · · · · · · · · ·				-HA -HA	RBOR BOTTOM DEPOSITS	· · · · · · · · · · · · · · · · · · ·								
- 15 -				······································	15.0							х	16	25			
	1 1 6 10	15	18.0		16.9	SM	moderate anacrobic odor, Medium dense, gray silty slightly bonded, moist	wet -MARINE DEPOSITS- SAND with gravel (SM), mps	= 1.0 in.,	15	10	15	20	20	0		
			· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · ·				GLACIAL TILL DEPOSITS-									
<b>—</b> 20 <b>—</b>	14 15	\$5	20.0			GW-GM	Dense, gray well-graded C 1.25 in., moist to wet	GRAVEL with silt and sand (G	W-GM), mps =	25	25	15	15	10	0	 	 
	21 21	12	22.0				Note: probable gravel laye	er at 22.9 fi.	······································				· · · · · · · · · · ·		· · · · · · · ·		
		•• •• •• •• •• •• •• •• •• •• ••		· · · · · · · · · · · · · · · · · · ·	· ·····			GLACIAL TILL DEPOSITS-				· · · · · ·	·····	·····			****
- 25 -	7	<u>S6</u>	25.0	,		SW	Medium dense, gray well- wet	graded SAND with gravel (SV	/), mps = 1.25 in.	20	) 15	15	20	25	5		· · · · · ·
	9 5	8	27.0	· · · · · · · · · · · · · · · ·				GLACIAL TILL DEPOSITS-									
		·····			· ·· · · · · · · · · · · · · · · · · ·	· · · · · · · ·	Note: probable gravel laye	r at 28.9 ft.	··· ···· · · · · · · · · · · · ·		 		н у 9. н				
30		1		,		, <b>.</b>	Sample ID	Well Diagram			,		Jarv		1		
Date	Time	Elapsed	Bottom of	epth in feet Bottom of	to: Water		Open End Rod	Riser Pipe Screen Filter Sand	Overburden (Lin Rock Cored (Lin	ear ft.) ear ft.)	3			3	).1		
3/24/201	0 1030		Casing 30.0	Hole 31.2 4.7	10.8	U S G	Undisturbed Sample Split Spoon Sample Geoprobe	Cuttings Grout Grout	Number of Sam BORING NO.	oles				B1	1 <u>S</u>		
Field	Tests	Dilatancy:	R - Ra	apid S - Slo	w N - Non	FV Ie	Field Vane Plasticity:	N - Nonplastic L - Lo	M - Medium	H - Hi	igh V Hit						

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Depth (ft.)	Sampler Blows per in.	Sample No. & Recovery (in.)	Sample Depth (ft.)	Well Diagram	Stratum Change (ft.)	USCS Symbol	Visual-Manual Identification & Description (density/consistency, color, GROUP NAME & SYMBOL, maximum particle size*, structure, odor, moisture, optional descriptions, geologic interpretation)	% Coarse	% Fine	% Coarse	% Medium	% Fine	% Fines	Dilatancy	Toughness	Plasticity	Strength
30					30.1							+		+	+	+	_
	26	<u>\$7</u>	30.0				Very dense, gray to olive-brown weathered bedrock				~ • ••					~~~~	
	45 50/2"	11	31.2		31.2		-WEATHERED BEDROCK-										_
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NOTES:	1	. <u></u>		L	I	J	FILE NO. 10044 E	BORI	NG	NO.				B			
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Elevation		ft.	Datum		Boring	Location	See Plan										
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Hammer H	all (in.)	Fample	30	Sec. Addition				Cutting Head	Dining Roles.	Gr	ravel	5	and	1	1	ield	Test
Depth (ft.)	Sampler Blows per 6 in.	No. & Recovery (in.)	Sample Depth (ft.)	Well Diagram	Stratum Change (ft.)	USCS Symbol	Visual-t (density/consistency, co structure, odor, mo	Manual Identification & I Ior, GROUP NAME & SYME isture, optional descriptions,	Description OL, maximum particle size geologic interpretation)	, * % Coarse	% Fine	% Coarse	% Medium	% Fines	Dilatancy	Toughness	Plasticity Strength
- 0 -	3 	S1 17	0.0			SW	Medium dense, brown to (SW), brick fragments, r	dark brown well-graded S nps = 0.75 in., moist -FILL-	AND with gravel	5	20	20	30 2	5			
					-		Note: dark brown layer	in auger cuttings at 3.5 ft.								· · · · · · · · · · · · · · · · · · ·	
<u> </u>	7	\$2	5.0		5.3 5.8	SW SW-SM	Loose, similar to S1 to 5 Loose, brick fragments,	5.3 ft. ash own well-graded SAND w	ith silt and gravel (SW-		15	20	25 3		• • •		  
	5	20	7.0				SM), mps = 0.5 in., mc	ist to wet -FILL-									
- 10	2	<u>\$3</u>	10.0		10.2				d accurat (SW/SM)	5	20	20	20	25 1	0		
	2 3 3	15	12.0			SW-SM	mps = 0.75 in., wet	graded SAND with sitt an			20	20					
16							-GI Note: running sands in a	LACIAL OUTWASH DEP	OSITS-					······			
	1 4 2 3	S4 7	15.0			SW/SP	Loose, gray-brown well with poorly-graded SAN -GI	graded SAND with gravel ID (SP), mps = 0.75 in., v LACIAL OUTWASH DEF	(SW) interbedded vet OSITS-	5	15	25	30	20 5	i 	******	
		· · · · · · · · · · · · · · · · · · ·			2008-0000000000000000000000000000000000	· · · · · · · · · · · · · · · · · · ·	Note: probable gravel la	yer at 18.0 ft.				-					
_ 20 _	11 6 6	<u>\$5</u>	20.0		· · · · · · · · · · · · · · · · · · ·	SW/SP	Medium dense, gray-bro bedded with poorly-grac	wn well-graded SAND wi led SAND (SP), mps = 0.	th gravel (SW) inter- 75 in., wet	1(	0 15	20	30	20 3	5	-	
	<u>8</u>	13	22.0	· · · · · · · · · · · · · · · · · · ·			-Gi	LACIAL OUTWASH DEF	OSITS-			· · · · · ·	, .,		· · · · · · · · ·		
- 25 -	6 15	<u>S6</u>	25.0	· · · · · · · · · · · · · · · · · · ·	25.6	SP	Medium dense, gray po -G	oriy-graded SAND (SP), m LACIAL OUTWASH DEF	ps = 1 mm, wet 'OSITS-				10	90		<ul> <li>a a t</li> <li>a a t</li> <li>a a t</li> <li>a a t</li> </ul>	
	14 14	14	27.0	· · · · · · · · · · · · · · · · · · ·	26.8	SM	Medium dense, gray-bro mps = 1.0 in., moist Medium dense, weather	own to olive-brown silty S. -GLACIAL TILL DEPO ed bedrock	AND with gravel (SM), SITS-	- 1	0 5		15	40 3	0		
30					· · · · · · · · · · · ·			-WEATHERED BEDRO	CK-	· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·			• • • • • •		
		Water L	evel Data	epth in feet	to:		Sample ID	Well Diagram			S	umn	nary				
Date	Time	Elapsed Time (hr.)	Bottom of Casing 25.0	Bottom of Hole	Water 11.0	O T U S	Open End Rod Thin Wall Tube Undisturbed Sample Split Spoon Sample	Screen Filter Sand	Overburden (Lii Rock Cored (Lii Number of Sam	near ft. near ft. ples	) )			20	5.8  S		
3/22/201 Field	0 1340 1 Tests	Dilatancy: Toughnes	R - Ra s: <u>L - Lo</u> v	8.3 apid S - Sko v <u>M - Me</u> di	7.1 w N - Non um H - Hig	G FV e h	Geoprobe Field Vane Plasticity: Dry Strength: N	N - Nonplastic	BORING NO. al L - Low M - Medium Medium H - High	H - H V - Ve	ligh ry Hi	gh		B2			
		Toughnes	s: L - Lov *NC NOTE: So	v M - Medi OTE: Maxim Il identificat	um H - Hig um Particle ions based	n Size is d on visual	Dry Strength: N etermined by direct of I-manual methods of th	servation within the line USCS system as pra	nitations of sampler s	v - ve ize, chnics	, Inc	y।।					_

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Depth (ft.)	Sampler Blows per 6 in.	Sample No. & Recovery (in.)	Sample Depth (ft.)	Well Diagram	Stratum Change (ft.)	USCS Symbol	Visual-Manual Identification & Description (density/consistency, color, GROUP NAME & SYMBOL, maximum particle size*, structure, odor, moisture, optional descriptions, geologic interpretation)	% Coarse	% Fine	% Coarse	% Medium	% Fine	% Fines	Dilatancy	Toughness	Plasticity	Strongth
<b>-</b> 30	30	\$7	30.0				Very dense red-brown to gray weathered bedrock										
	71															,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	
	68 119	6	32.0				-WEATHERED BEDROCK-					_					ļ.,
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SEBAGO TECHN	) ICS,	waw			TI	EST	BORING RE	EPORT					Pag	B	ORIN E	1G 1 3	NO.	
PROJECT LOCATIO CLIENT CONTRAI DRILLER	N N CTOR	OFFICE BU 321 COMM J. B. BROV MAINE TE M. PORTE	JILDING A IERCIAL ST VN & SONS ST BORING R	ND GARAGI 'REET, POR S, INC.	E TLAND, M.	AINE			STI JOB NO. PROJECT MGR. FIELD REP. DATE STARTED DATE FINISHED	-	100- K. H R. H 3/22 3/22	44 REC ESTI 2/20 2/20	KER 35 10					
Elevation		ft.	Datum		Boring	Location	See Plan											
ltem		Casing	Samp	ler Core Ba	arrel Rig Ma	ke & Mod	lel M	lobile B53	Hammer Type	Dril	ling	Mud			Casir	g A	dvar	ce
Type		HSA	SS			ick L	Tripod	Cat-Head	Douohout	-	Ben	itonii /mer		ESA/	SPIN	/35.0		spin
Hammer V	leight (lb.)	2.3	1.37.			ck	Air Track	Roller Bit	Automatic	2	Non	ie _						
Hammer F	all (in.)		30		🗌 🗌 Ski	d [_		Cutting Head	Drilling Notes:	1.0	avel 1		and			E	old	loct
Depth (ft.)	Sampler Blows per 6 in.	Sample No. & Recovery (in.)	Sample Depth (ft.)	Well Diagram	Stratum Change (ft.)	USCS Symbol	Visual- (density/consistency, c structure, odor, m	Manual Identification & I olor, GROUP NAME & SYME ioisture, optional descriptions,	Description BOL, maximum particle size*, , geologic interpretation)	% Coarse	% Fine	% Coarse	% Medium	% Fine	% Fines	Dilatancy	Toughness	Strength
_ 0 _	1 5 4 2	S1 11	0.0			SW	Loose, brown to dark b 0.75 in., brick fragmen	rown well-graded SAND w ts, moist -FILL-	ith gravel (SW), mps =	5	20	20	30	25				· · · · · · · · · · · · · · · · · · ·
<b></b> 5	7	<u>S2</u>	5.0	· · · · · · · · · · · · · · · · · · ·	5.3	SW	Verv loose, similar to S	1 to 5.3 ft.					· · · · · · · · · · · · · · · · · · ·					
	2 2 2	9	7.0			SM	Very loose, brown to y fragments, trace organic	ellow-brown silty SAND w cs, mps = 1.25 in., moist t -FILL-	ith gravel (SM), brick o wet	10	10	15	25	25	15			······
10	50/2"	<u>\$3</u>	10.0			SM	Similar to S2. Split sp	oon refusal on brick fragme								•••••••••••••••••••••••••••••••••••••••		
		L	10.2	· · · · · · · · · · · · · · · · · · ·														
_ 15 _		S4	15.0		15.2	MI	Medium stiff brown to	-FILL-	ML). trace brick			5	10	15	70	s	L	L
	4	24	17.0		16.7	SW-SM	fragments and organics Loose, gray-brown wel in., wet	, mps = 0.25 in., moist to HARBOR BOTTOM DEP( l-graded SAND with silt (S	wet DSITS- W-SM), mps = 0.25		5	20	35	25	15			
20			· · · · · · · · · · · · · · · · · · ·					HARBOR BOTTOM DEPO	OSITS-					16		-	••••••••••••••••••••••••••••••••••••••	• • • • • • • • • • •
	13 8 16 23	\$5 12	20.0		· · · · · · · · · · · · · · · · · · ·	ML	Medium dense, gray-br	own to gray sandy SIL1 (A	ML), mps = 1.3 m., wet									•••••
	· · · · · · · · · · · · · · · · · · ·		· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·			HARBOR BOTTOM DEP	OSITS-						· · · · ·	· · · · · · · · · · · · · · · · · · ·		
- 25 -	5 8 9	56	25.0		26.2	SP SW/ SM	Medium dense, dark br trace brick fragments a	own poorly-graded SAND nd organics, slight anaerob HARBOR BOTTOM DEP gravebrown well-graded S	(SP), mps = 2 mm, wet, ic odor OSITS-				30	70				
			27.0		n	0 YY - 3 Y]	gravel (SW-SM), mps	-GLACIAL TILL DEPOS	SITS-						······			
20					. <b>)</b>				· · · · · · · · · · · · · · · · · · ·				t		 			
		1	<u> </u>				Comple ID	Wall Disaram			1	um	1 nary					
Date	Time	Water L Elapsed Time (hr.)	evel Data D Bottom of Casing	epth in feet Bottom of Hole	to: Water	0 T U	Open End Rod Thin Wall Tube Undisturbed Sample	Filter Sand     Cuttings	Overburden (Line Rock Cored (Line Number of Sampl	ar ft.) ar ft.) es			y		31.3  7S			
3/22/201 3/22/201	0 1440 0 1550			17.0 26.0	13.8 16.6	G FV	Split Spoon Sample Geoprobe Field Vane	Grout Grout Concrete Bentonite Se	BORING NO.	- Hi	iah			В3				
	. 10313	Toughnes	s: L - Lov *NO	v M - Medi DTE: Maxim il identificat	um H - Hig um Particle	jh Size is de on visual	Dry Strength: I etermined by direct o -manual methods of 1	N - None L - Low M bservation within the line USCS system as pro-	- Medium H - High V mitations of sampler siz	- Ver e. nics,	y Hi , Inc.	gh						

SEBAGO TECHN	D ICS,				Т	EST	BORING REPORT					E		NG 33	NO.		_
INC.	<u>l</u>	1	1				Г	Gra	avel		Sand	je i	2	F	<u>of</u> ield	Tes	; st
Depth (ft.)	Sampler Blows per 6 in.	Sample No. & Recovery (in.)	Sample Depth (ft.)	Well Diagram	Stratum Change (ft.)	USCS Symbol	Visual-Manual Identification & Description (density/consistency, color, GROUP NAME & SYMBOL, maximum particle size*, structure, odor, moisture, optional descriptions, geologic interpretation)	% Coarse	% Fine	% Coarse	% Medium	% Fine	% Fines	Dilatancy	Toughness	Plasticity	Strength
30 -	4	\$7	30.0			SM	Medium dense, gray to gray-brown silty SAND with gravel (SM), mps =	10	15	10	20	25	20				
	7				31.3	. (14 C 4 16 (4 16 16 16 16 16 16 16	-GLACIAL TILL DEPOSITS-				s						
	17	13	32.0				Medium dense, gray-brown to white weathered bedrock										
	· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·		· ····	19		a serie de la construcción de la co La construcción de la construcción d		, 1				*** ****		· •••••		
							-WEATHERED BEDROCK-										
					35.0		an an ann ann ann ann ann ann ann ann a				~		· · · ·	A-		]	
- 35 -	50/0	NR	35.0	• ···			Split spoon refusal at 35.0 ft.						, .				
							Bottom of exploration at 35.0 ft. below ground surface					1 - 1471 1 - 1					
						ter and the s	ана саналами устана на прогима стана и сула Сула (Алана), и на сула Солбана Солбана и Малинии стана Солбана Сол		· · ·								
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NOTES:		1	L	1	1	_ <u></u>	FILE NO. 10044	BOR	RING	S NO				B	ـــــــــــــــــــــــــــــــــــــ		<u>.</u>
	<del></del>		*N(	DTE: Maxim	um Particle	Size is c	letermined by direct observation within the limitations of sampler s	ze.									_
			NOTE: So	il identificat	tions based	on visua	I-manual methods of the USCS system as practiced by Sebago Tec	hnice	s, In	c.					_	_	_

SEBAG TECHN	D ICS,				TI	EST	BORING RE	PORT				_	Dac	B	ORII	1G 1 84	10.	
INC. PROJEC LOCATIC CLIENT CONTRA DRILLER	T PN CTOR	OFFICE BU 321 COMM J. B. BROW MAINE TE M. PORTE	JILDING AI IERCIAL ST VN & SONS ST BORING R	ND GARAGE REET, POR	E TLAND, M.	AINE			STI JOB NO. PROJECT MGR. FIELD REP. DATE STARTED DATE FINISHED		100 K. I R. I 3/2 3/2	44 REC ESTI 3/20 3/20	KER ES 10		1			
Elevation Item Type Inside Dia Hammer V	meter (in.) Veight (lb.)	ft. Casing HSA 2.5	Datum Samp SS 1.37: 140	ler Core Ba	Boring Irrel Rig Ma I Tru I ATV	Location ke & Mod ck v ck	i See Plan iel Mo Tripod - Geoprobe - Air Track -	bile B53 Cat-Head Winch Roller Bit	Hammer Type       J     Safety       Doughnut     Automatic	Dril	ling Ber Poly Nor	Mud itonit ymer ie	e	Ty HSA/	Casir pe N /SPIN	ig Ad letho /25.0	dvan od De	ice epth
Depth (ft.)	all (in.) Sampler Blows per 6 in.	Sample No. & Recovery (in.)	Sample Depth (ft.)	Well Diagram	Stratum Change (ft.)	USCS Symbol	Visual-M (density/consistency, cole structure, odor, moi:	anual Identification & D or, GROUP NAME & SYMB sture, optional descriptions, s	escription DL, maximum particle size* geologic interpretation}	% Coarse	avel Buile	% Coarse	% Medium	% Fine	% Fines	Dilatancy	Loughness a	Strength Strength
- 0 -	3 9 8 7	<u>S1</u> 10	0.0			SW	Medium dense, brown we in., brick and mortar frag	Il-graded SAND with grav ments, steel, plastic, wet -FILL-	rel (SW), mps = 1.3	15	15	20	30	20				
_ 5 _	10	52	5.0			SW	Medium dense, brown we	Il-graded SAND with grav	rel (SW), mps = 1.3	15	15	20	30	20	// / // / // /	****		10000 000 000 10000 000 000 10000 000 000 10000 000 000 10000 000 000 10000 000 100000 10000 100000 10000 100000 10000 100000 1000
	8 7	9	7.0					-FILL-										
- 10 -	2 3 2 4	<u>\$3</u> 10	10.0		11.2 11.8	SW SW-SM	Loose, brown to gray and brick, ash, cotton, mps = Loose, well-graded SANI	l black well-graded SAND 1.3 in., wet -FILL- D with silt (SW-SM), mps	with gravel (SW), = 0.25 in., wet	20	20	20 20	25 35	15 30	10		-	
15							-Н.	ARBOR BOTTOM DEPO ARBOR BOTTOM DEPO	SITS-				•	• • • • •				
	8 5 2 5	S4 15	15.0 17.0		15.8	SW-SM ML	Loose, gray-brown well- mps = 0.75 in., wet Loose, gray to black sanc sand layers, wood, organ	graded SAND with silt and by SILT (ML), occasional ics, moderate anaerobic oc	l gravel (SW-SM), poorly-graded lor, mps = 1.0 in., wet	15	25	15	15 20	20	10 50	s	L	L
20	13	S5	20.0		19.5	SM	-H Medium dense, gray silty	ARBOR BOTTOM DEPO	SITS- mps = 1.25 in., wet,	15	5 10	10	20	15	30			
	8 7 9	14	22.0				occasional silt layers	GLACIAL TILL DEPOSI	TS-				·····			· · · · · · · · · · · · · · · · · · ·	· • • • • • • • • • • • • • • • • • • •	
_ 25 _	46 50/1"		25.0 25.6		24.0		Very dense, gray to gray	-brown weathered bedrock	К-									· · · · · · · · · · · · · · · · · · ·
							Split spoon refusal on be Bottom of exploration at	drock at 25.6 ft. 25.6 ft. below ground sur	face									
30 -		Water	evel Data				Sample ID	Well Diagram	· · · · · · · · · · · · · · · · · · ·		S	l	nary					
Date	Time	Elapsed Time (hr.)	Bottom of Casing	epth in feet Bottom of Hole	to: Water	O T U S	Open End Rod Thin Wall Tube Undisturbed Sample Split Spoon Sample	Riser Pipe Screen Filter Sand Cuttings Grout	Overburden (Lin Rock Cored (Lin Number of Sam	ear ft.) ear ft.) bles	)				24.0  6S			
3/23/201 Field	0 1135 0 1150 1 Tests	Dilatancy: Toughness	R - Ra	16.0 apid S - Slo v M - Mediu	5.2 w N - Non	G FV Ie	Geoprobe Field Vane Plasticity: Dry Strength: N	Concrete Concrete Bentonite Sea N - Nonplastic L - None L - Low M -	BORING NO.	H - Hi ′ - Ver	igh 'y Hi	gh		B4				
			*NOTE: So	DTE: Maximu	um Particle	Size is de	etermined by direct obs -manual methods of the	ervation within the lim	itations of sampler si cticed by Sebago Tec	ze. hnics,	, Inc							<u></u>

SEBAG TECHN	o ICS,				TI	EST	BORING RE	EPORT					Pag	B	ORII E	NG N 85	Ó.	1
PROJEC LOCATIC CLIENT CONTRA DRILLER	T DN CTOR	OFFICE BU 321 COMM J. B. BROW MAINE TE M. PORTE	JILDING A ERCIAL ST /N & SONS ST BORINC R	ND GARAG FREET, POR 38, INC.	E TLAND, M.	AINE		· · · · · · · · · · · · · · · · · · ·	STI JOB NO. PROJECT MGR. FIELD REP. DATE STARTED DATE FINISHED		100 K. I R. I 3/2 3/2	44 REC ESTI 3/20 3/20	KER ES 10					
Elevation		ft.	Datum		Boring	Location	See Plan											
litem Type		Casing	Samp	ler Core Ba	arrel Rig Ma	ke & Moo	lel M	lobile B53	Hammer Type	Dril	ling Ben	Mud	е	TVI	be M	g Ad ethoo	vanc d De	;e oth
Inside Dia	meter (in.)	2.5	1.37	5		v [	Geoprobe	Winch	Doughnut		Poly	/mer	- þ	HSA/	SPIN	/21.9		
Hammer \	Veight (lb.)		140		Tra	ck	Air Track	Roller Bit	Drilling Notes:	<u></u>	Nor	ie						
nammer		Sampla		100202120000			,	Coxing riesd	Drining Hoteo.	Gr	avel	S	and			Fie	ld Te	est
Depth (ft.	Sampler Blows per 6 in.	No. & Recovery (in.)	Sample Depth (ft.)	Well Diagram	Stratum Change (ft.)	USCS Symbol	Visual- (density/consistency, c structure, odor, m	Manual Identification & D wlor, GROUP NAME & SYMB wisture, optional descriptions,	Description OL, maximum particle size geologic interpretation)	% Coarse	% Fine	% Coarse	% Medium	% Fine	% Fines	Dilatancy	Plasticity	Strength
- 0 -	8 	<u>S1</u> 9	0.0	· · · · · · · · · · · · · · · · · · ·		sw	Medium dense, brown v in., brick and mortar fr	well-graded SAND with grav agments, wet -FILL-	vel (SW), mps = 1.3	10	25	20	30	15				· · · · · · · · · · · · · · · · · · ·
- 5 -										· · · · · · · · · · · · · · · · · · ·								
	8 16 11 9	S2 11	5.0			SW	Medium dense, brown t (SW), brick, wood, ash	to gray and black well-grade	d SAND with gravel	10	15	20	30	20	5	1999.000 - 1997 - 1999.000 - 1997 - 1999.000 - 1999.000 - 1999.000 - 1999.000 - 1999.000 - 1999.000		
10 -	279 · · · · · · · · · · · · · · · · · · ·	······ · · · · · · · · · · · · · · · ·				· · · · · · · · · · · · · · · · · · ·		-FILL-							· · · · · · · · · · · · · · · · · · ·		- 44	····
	3 WOH 1 1	\$3 19	10.0 12.0		10.3	SW SM	Similar to S2, mps = 0 Very loose, gray silty S	AND with gravel (SM), m	ps = 0.5 in., wet		15	15	20	30	20			
						· · · · · · · · · · · · · · · · · · ·												***
- 15 -	2 2 3 50/4"	S4 21	15.0 16.8		16.2	SM SW-SM	Loose, gray to gray-bro	own silty SAND (SM), mps HARBOR BOTTOM DEPO n well-graded SAND with si	= 0.5 in., wet SITS- ilt and gravel (SW-SM),	15	5	15 15	25 25	30 20	25 10			
				· · · · · · · · · · · · · · · · · · ·			wood, siag, inps - 1.5						••••					
_ 20 _	1 4 50/5"	S5 17	20.0 21.4	· · · · · · · · · · · · · · · · · · ·	21.0	SM	Loose, gray to dark bro trace organics, slight ar Very dense, olive-brow	war silty SAND (SM), mps merobic odor m weathered bedrock -WEATHERED BEDROC	= 0.75 in., wet,	15	10	10	20	15	30			***
						· · · · · · · · · · · · · · · · · · ·	HSA refusal on bedrocl Bottom of exploration a	k at 21.9 ft. at 21.9 ft. below ground surf	face		** ******							
- 25 -	···· ·· · · · · · · · · · · · · · · ·													*****				
				ала алана арала алана						· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·							
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		Water	evel Data		I		Sample ID	Well Diagram			s	 umn	hary					
Date	Time	Elapsed Time (hr.)	Bottom of Casing	Bottom of Hole	to: Water	O T U c	Open End Rod Thin Wall Tube Undisturbed Sample	Riser Pipe Screen Filter Sand Cuttings Grout	Overburden (Lir Rock Cored (Lir Number of Sam	iear ft.) iear ft.) ples					21.0  5S			
5/23/201	- 1000	**		9.0	/.4	G	Geoprobe	Concrete	BORING NO.					В5		-		
Field	Tests	Dilatancy: Toughness	R - Ra :: L - Low *NC	l ipid S - Slo v M - Mediu DTE: Maximu	W N - Non Jm H - Hig Jm Particle :	FV e h Size is de	Field Vane Plasticity: Dry Strength: 1 termined by direct of	N - Nonplastic L N - Nonplastic L N - None L - Low M - bservation within the lim	M Low M - Medium Medium H - High M nitations of sampler s	H - Hi / - Ver ize.	gh y Hi	gh						

SEBAGO TECHNI	) ICS,				T	EST		PORT				F	age	BOR ] 1	ING N B6	IO.	1
PROJECT LOCATIO CLIENT CONTRAC DRILLER	N N	OFFICE BU 321 COMM J. B. BROW MAINE TE M. PORTE	JILDING AI ERCIAL ST /N & SONS ST BORING R	ND GARAGI REET, POR IS, INC.	E TLAND, M	AINE			STI JOB NO. PROJECT MGR. FIELD REP. DATE STARTED DATE FINISHED	-	1004 K. R R. E 3/23 3/23	4 ECK STE /201	ER S D				
Elevation Item Type Inside Dial Hammer W	meter (in.) Jeight (lb.)	ft. Casing HSA 2.5	Datum Sampl SS 1.37: 140	ler Core Ba	Boring arrel Rig Ma 7ru 1 AT	Location ke & Moc ck	A See Plan Iel Mol Tripod Geoprobe Air Track	bile B53 Cat-Head Winch Roller Bit	Hammer Type	Drill	ling I Beni Poly Non	Mud tonite mer e	н	Casi Type SA/SPI	ng Ad Metho N/18.2	lvan d De	ce Pth
Depth (ft.)	Sampler Blows per 6 in.	Sample No. & Recovery (in.)	Sample Depth (ft.)	Well Diagram	Stratum Change (ft.)	USCS Symbol	Visual-M: (density/consistency, colo structure, odor, mois	anual Identification & E or, GROUP NAME & SYMB sture, optional descriptions,	Pescription OL, maximum particle size geologic interpretation)	% Coarse	% Fine leve	% Coarse	% Medium % Fine	% Fines	Pilatancy	l oughness	Strength 3
_ 0 _	7 11 17 14	S1 11	0.0			SW	Medium dense, brown we in., brick fragments, wet Note: debris layer from 2.	Il-graded SAND with gra -FILL- 5 to 3.8 ft bricks, wood	vel (SW), mps = 1.25	15	15	20	25 2	5			
5 <b>_</b> _	5 	<u>\$2</u>	5.0	······································		SW	Medium dense, brown we in., brick, wood, moist	sll-graded SAND with gra	vel (SW), mps = 1.25	15	15	20	25 2	5			
	7	10	7.0				Note: layer of bricks, wo	od at 7.0 fi. -FILL-									
- 10 -	3 6 4 2		10.0			SW-SM	Loose, dark brown to bla SM), wood, ash, mps = Note: debris layer at 12.4	ck well-graded SAND wit 1.0 in., wet -FILL- ft.	h silt and gravel (SW-	10	15	20	25 2	0 10			
- 15 -	8 22 50/2 <sup>st</sup>	S4 14	15.0		15.8 16.2	GW SW	Dense, brown to gray and brick fragments, wood, a Very dense, gray-brown i trace wood, ash, mps = Split spoon refusal at 16.	1 black well-graded GRA' sh, mps = 1.25 in., wet to gray well-graded SANI 1.0 in., wet -HARBOR 1 2 ft. -WEATHERED BEDROG	/EL with sand (GW), -FILL- D with gravel (SW), 30TTOM DEPOSITS- CK-	30	20	15	20 1	0 5			
- 20 -					18.2		HSA refusal on bedrock a Bottom of exploration at	at 18.2 ft. 18.2 ft. below ground sur	face								
- 25 -																	
	, , , , , , , , , , , , , , , , , , ,	Water L	evel Data		4 <b>1 1 1 1 1 1 1 1 1 1</b>		Sample ID	Well Diagram			s	umm	iary				
Date 3/23/201	Time	Elapsed Time (hr.)	D Bottom of Casing 	Bottom of Hole	Water		Open End Rod Thin Wall Tube Undisturbed Sample Split Spoon Sample	Riser Pipe         Screen         Filter Sand         Cuttings         Grout	Overburden (Lir Rock Cored (Lir Number of Sam	iear ft.) iear ft.) ples	)			16. 45	2		
Field	d Tests	Dilatancy: Toughnes	R - Ra s: L - Lov *No	apid S - Slo v M - Medi DTE: Maxim	w N - Nor um H - Hig um Particle	G FV ne gh Size is d	Geoprobe Field Vane Plasticity: Dry Strength: N etermined by direct obs	Concrete Bentonite Ser N - Nonplastic - None L - Low M - servation within the lin	Al L - Low M - Medium Medium H - High Mitations of sampler s	H - Hi / - Ver ize.	igh 'y Hii	gh		B6			

meter (in.) Veight (ib.) all (in.)	OFFICE BI 321 COMM J. B. BROV MAINE TE M. PORTE ft. Casing HSA 2.5	UILDING A IERCIAL S WN & SONS ST BORING R Datum	ND GARAG FREET, POR GS, INC.	E TLAND, M	AINE			STI JOB NO. PROJECT MGR.		100- K. I	44 REC	Page KER		1
meter (in.) Veight (ib.) all (in.) Sampler	ft. Casing HSA 2.5	Datum						FIELD REP. DATE STARTED DATE FINISHED		R. E 3/25 3/25	ESTE 5/201 5/201	2S 0 0		
meter (in.) Veight (ib.) all (in.) Sampler	Casing HSA 2.5	Samo		Boring	Location	See Plan								
all (in.) Sampler		SS 1.37 140	S	arrel Rig Ma	ke & Mod ck [ ∨ [ ck ]	lel Mob Tripod Geoprobe	ile B53 Cat-Head Winch Roller Bit	Hammer Type Safety Doughnut Automatic	Dril	ling Ben Poly Non	Mud tonit /mer ie	e F	Ca Type ISA/SI	sing Me PIN/
Sampler		30	000000	Ski	d [		Cutting Head	Drilling Notes:	Gr	avel		and		Τ
Blows per ( in.	Sample No. & Recovery (in.)	Sample Depth (ft.)	Well Diagram	Stratum Change (ft.)	USCS Symbol	Visual-Ma (density/consistency, color structure, odor, moist	nual Identification & D r, GROUP NAME & SYMB ture, optional descriptions, g	escription DL, maximum particle size geologic interpretation)	. Coarse	% Fine	% Coarse	% Medium	% Fine % Fines	Cite to the second
alar di salar si sa sa di s				0.3		-В	ITUMINOUS CONCRET	`E-						
19 35	S1	0.5		1.5	SW	Very dense, yellow-brown	well-graded SAND with -FILL-	gravel (SW), mps =	5	25	25	30	15	
35 21	19	2.5	· · · · · · · · · · · · · · · · · · ·		sw	Very dense, dark brown w in., brick fragments, ash, r	ell-graded SAND with gr noist	avel (SW), mps = 0.75		20	20 20	30 30	25 5	
, , , , , , , , , , , , , , , , , , ,	· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·		· · · · · · · · · · · · · · · · · · ·	·		-FILL-							
10		5.0			SW	Medium dense brown to d	ark brown well-oraded S	AND with gravel (SW)	15	20	40	20	15	_
10 10 9 8	11	7.0			on	mps = 1.3 in., brick and r	nortar, wood, ash, moist							
										•				
•••••••••••••••			······				-ribb-							
			ngo											••••••••••
2	\$3	10.0			SW	Very loose, brown to dark	brown well-graded SAN	D with gravel (SW),	25	20	20	25	10	
1						wood, brick and mortar fra	igments, mps = $1.3$ in.,	wet						
4	6	12.0	· · · · · · · · · · · · · · · · · · ·		****	Notes debris inver from 12	-FILL-							
						Note: depris layer from 12		······						*****
				13.8										
					)				• • • • • • • • • • • • • • • • • • • •					
2	S4	15.0			ML	Loose, gray sandy SILT (N	ML), mps = $3 \text{ mm}$ , brick	, wood, ash, moist to				10	20 7	0
2	24	17.0	· · · · · · · · ·	16.7	<u>.</u>	-HA Soft, black organic soil, w	RBOR BOTTOM DEPO	SITS-	• <b></b>  ••	+			- + 10	00
			· · · · · · · · · · · · · · · · · · ·							n	~~~~~	••••		
			·····			-HA	RBOR BOTTOM DEPO	SITS-	·····	n				
	· · · · · · · · · · · · ·			<u>19.2</u> 19.4		۲.	WEATHERED BEDROC	K-						
						HSA refusal on bedrock at	19.4 ft.							
						Bottom of exploration at 1	9.4 ft. below ground surf	ace		**	-			
·····														
			······································	· · · · · · · · · · · · · · · · · · ·					*****					
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an a						· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·						e	
	Water L	evel Data	l	I		Sample ID	Well Diagram			s	l umn	hary		
Time	Elapsed Time (hr.)	Bottom of	Bottom of	to: Water	O T	Open End Rod Thin Wall Tube	Riser Pipe     Screen     Filter Sand	Overburden (Lin Rock Cored (Lin	ear ft.) ear ft.)	) I			19	1.2
0 1255			15.2	11.5	U S	Undisturbed Sample Split Spoon Sample	Cuttings Grout	Number of Sam	oles				4	S
		<u> </u>			FV	Field Vane	Bentonite Sea						B7	
	19 35 35 21 10 10 10 9 8 2 1 4 2 2 1 4 4 2 2 1 2 2 1 2 2 1 2 2 1 2 2 1 2 2 1 2 2 1 2 1 2 2 1 1 4 4 1 2 1 1 1 0 9 8 8 1 1 1 9 9 8 8 1 1 1 9 9 8 8 1 1 1 1	19       S1         35       19         21       19         10       S2         10       9         8       11         2       S3         1       1         2       S3         1       1         2       S3         1       1         2       S4         1       2         2       S4         1       1         2       2         3       1         3       1         1       1         1       1         1       1         1       1         1       1 <td>19     S1     0.5       35     35       21     19     2.5       10     52     5.0       10     52     5.0       10     9     1       7     7     7       2     S3     10.0       1     1     1       4     6     12.0       2     S4     15.0       1     1     1       2     24     17.0       2     24     17.0       2     24     17.0       3     3     3       4     6     12.0       1     1     1       2     24     17.0       3     3     3       3     3     3       4     6     12.0       1     1     1       2     24     17.0       3     3     3       4     5     1       5     1     1       1     1     1       2     24     17.0       3     3     3       4     5     1       5     1     1       1     1       1     1<!--</td--><td>19     S1     0.5       35     19     2.5       10     S2     5.0       10     S2     5.0       10     S2     5.0       10     S2     5.0       9     11     7.0       2     S3     10.0       1     1     1       4     6     12.0       2     S4     15.0       1     1     1       2     24     17.0       2     24     17.0       2     24     17.0       3     3     3       4     6     12.0       1     1     1       2     24     17.0       3     3     3       3     3     3       4     6     12.0       1     1     1       2     24     17.0       3     3     3       4     6     10.0       1     1     1       2     24     17.0       3     3     16       4     5     15.0       5     -     -       5     -     -       6     16    &lt;</td><td>19       S1       0.5         35       19       2.5         21       19       2.5         10       S2       5.0         11       7.0       10.0         2       S3       10.0         1       1       1.0.0         2       S3       10.0         1       1       1.0.0         2       S4       15.0         1       1.3.8         2       S4       15.0         1       1.1.5         2       24       17.0         19.2       19.4         19.2       19.4         19.2       19.4         19.2       19.4         19.2       19.4         19.2       19.4         19.4       19.2         19.4       19.2         19.4       19.4         19.4       19.4         19.4       19.4</td><td>19       S1       0.5       SW       SW         33       19       2.5       SW       SW         21       19       2.5       SW       SW         10       S2       5.0       SW       SW         10       S2       5.0       SW       SW         2       S3       10.0       SW       SW         2       S3       10.0       SW       SW         1       7.0       SW       SW       SW         2       S3       10.0       SW       SW         1       4       6       12.0       SW       SW         2       S4       15.0       ML       I1.6.7       OL         1       1       10.0       SW       I1.6.7       OL       I1.6.7       OL         2       S4       15.0       I1.6.7       OL       I1.6.7       OL       I1.6.7       OL       I1.6.7       I1.6</td><td>19       Si       0.5       SW       Very dense, yellow-brown         35       -       -       1.5       -        1.7  </td><td>19       S1       0.5      </td><td>19       S1       0.5       SW       Very date, yellow-prom well-griedd SAND with gaved (SW), mps = 0.75, in, with mail         21       10       2.5       10       2.5       10       2.5       11       10       2.5       11       10</td><td>19         S1         0.5         SW         Very data, path years and yeard (SW), mp = 5         5           33         19         2.3         10         1</td><td>Image: State of the s</td><td>ing       S1       O.3       SN       Very data, yellow throw will guided SAND, will guid</td><td>is       0.5       SV       Very dear, place term will gridd SMD with grind (SW, mps **       5       32       32       31         33      </td><td>109       31       0.5       SW       Very force, plane data bases with grade (SW), esp = 1       5       6       7       <th7< th="">       7       <th7< th="">       7       7       <th7< td="" th<=""></th7<></th7<></th7<></td></td>	19     S1     0.5       35     35       21     19     2.5       10     52     5.0       10     52     5.0       10     9     1       7     7     7       2     S3     10.0       1     1     1       4     6     12.0       2     S4     15.0       1     1     1       2     24     17.0       2     24     17.0       2     24     17.0       3     3     3       4     6     12.0       1     1     1       2     24     17.0       3     3     3       3     3     3       4     6     12.0       1     1     1       2     24     17.0       3     3     3       4     5     1       5     1     1       1     1     1       2     24     17.0       3     3     3       4     5     1       5     1     1       1     1       1     1 </td <td>19     S1     0.5       35     19     2.5       10     S2     5.0       10     S2     5.0       10     S2     5.0       10     S2     5.0       9     11     7.0       2     S3     10.0       1     1     1       4     6     12.0       2     S4     15.0       1     1     1       2     24     17.0       2     24     17.0       2     24     17.0       3     3     3       4     6     12.0       1     1     1       2     24     17.0       3     3     3       3     3     3       4     6     12.0       1     1     1       2     24     17.0       3     3     3       4     6     10.0       1     1     1       2     24     17.0       3     3     16       4     5     15.0       5     -     -       5     -     -       6     16    &lt;</td> <td>19       S1       0.5         35       19       2.5         21       19       2.5         10       S2       5.0         11       7.0       10.0         2       S3       10.0         1       1       1.0.0         2       S3       10.0         1       1       1.0.0         2       S4       15.0         1       1.3.8         2       S4       15.0         1       1.1.5         2       24       17.0         19.2       19.4         19.2       19.4         19.2       19.4         19.2       19.4         19.2       19.4         19.2       19.4         19.4       19.2         19.4       19.2         19.4       19.4         19.4       19.4         19.4       19.4</td> <td>19       S1       0.5       SW       SW         33       19       2.5       SW       SW         21       19       2.5       SW       SW         10       S2       5.0       SW       SW         10       S2       5.0       SW       SW         2       S3       10.0       SW       SW         2       S3       10.0       SW       SW         1       7.0       SW       SW       SW         2       S3       10.0       SW       SW         1       4       6       12.0       SW       SW         2       S4       15.0       ML       I1.6.7       OL         1       1       10.0       SW       I1.6.7       OL       I1.6.7       OL         2       S4       15.0       I1.6.7       OL       I1.6.7       OL       I1.6.7       OL       I1.6.7       I1.6</td> <td>19       Si       0.5       SW       Very dense, yellow-brown         35       -       -       1.5       -        1.7  </td> <td>19       S1       0.5      </td> <td>19       S1       0.5       SW       Very date, yellow-prom well-griedd SAND with gaved (SW), mps = 0.75, in, with mail         21       10       2.5       10       2.5       10       2.5       11       10       2.5       11       10</td> <td>19         S1         0.5         SW         Very data, path years and yeard (SW), mp = 5         5           33         19         2.3         10         1</td> <td>Image: State of the s</td> <td>ing       S1       O.3       SN       Very data, yellow throw will guided SAND, will guid</td> <td>is       0.5       SV       Very dear, place term will gridd SMD with grind (SW, mps **       5       32       32       31         33      </td> <td>109       31       0.5       SW       Very force, plane data bases with grade (SW), esp = 1       5       6       7       <th7< th="">       7       <th7< th="">       7       7       <th7< td="" th<=""></th7<></th7<></th7<></td>	19     S1     0.5       35     19     2.5       10     S2     5.0       10     S2     5.0       10     S2     5.0       10     S2     5.0       9     11     7.0       2     S3     10.0       1     1     1       4     6     12.0       2     S4     15.0       1     1     1       2     24     17.0       2     24     17.0       2     24     17.0       3     3     3       4     6     12.0       1     1     1       2     24     17.0       3     3     3       3     3     3       4     6     12.0       1     1     1       2     24     17.0       3     3     3       4     6     10.0       1     1     1       2     24     17.0       3     3     16       4     5     15.0       5     -     -       5     -     -       6     16    <	19       S1       0.5         35       19       2.5         21       19       2.5         10       S2       5.0         11       7.0       10.0         2       S3       10.0         1       1       1.0.0         2       S3       10.0         1       1       1.0.0         2       S4       15.0         1       1.3.8         2       S4       15.0         1       1.1.5         2       24       17.0         19.2       19.4         19.2       19.4         19.2       19.4         19.2       19.4         19.2       19.4         19.2       19.4         19.4       19.2         19.4       19.2         19.4       19.4         19.4       19.4         19.4       19.4	19       S1       0.5       SW       SW         33       19       2.5       SW       SW         21       19       2.5       SW       SW         10       S2       5.0       SW       SW         10       S2       5.0       SW       SW         2       S3       10.0       SW       SW         2       S3       10.0       SW       SW         1       7.0       SW       SW       SW         2       S3       10.0       SW       SW         1       4       6       12.0       SW       SW         2       S4       15.0       ML       I1.6.7       OL         1       1       10.0       SW       I1.6.7       OL       I1.6.7       OL         2       S4       15.0       I1.6.7       OL       I1.6.7       OL       I1.6.7       OL       I1.6.7       I1.6	19       Si       0.5       SW       Very dense, yellow-brown         35       -       -       1.5       -        1.7	19       S1       0.5	19       S1       0.5       SW       Very date, yellow-prom well-griedd SAND with gaved (SW), mps = 0.75, in, with mail         21       10       2.5       10       2.5       10       2.5       11       10       2.5       11       10	19         S1         0.5         SW         Very data, path years and yeard (SW), mp = 5         5           33         19         2.3         10         1	Image: State of the s	ing       S1       O.3       SN       Very data, yellow throw will guided SAND, will guid	is       0.5       SV       Very dear, place term will gridd SMD with grind (SW, mps **       5       32       32       31         33	109       31       0.5       SW       Very force, plane data bases with grade (SW), esp = 1       5       6       7 <th7< th="">       7       <th7< th="">       7       7       <th7< td="" th<=""></th7<></th7<></th7<>