REPORT

August 31, 2015
13-0545.1 S

Geotechnical Engineering Services

Proposed Mixed-Use Development
York Street and High Street
Portland, Maine

PREPARED FOR:
Opechee Construction Corporation
Attention: Jason Blais
11 Corporate Drive
Belmont, NH 03220

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

S.W.COLE ENGINEERING, INC.

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

www.swcole.com

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13-0545.1 S

August 31, 2015

Opechee Construction Corporation
Attention: Jason Blais
11 Corporate Drive
Belmont, NH 03220

Subject: Geotechnical Engineering Services
Proposed Mixed Use Development
York & High Streets
Portland, Maine

Dear Jason:

In accordance with our Agreement, dated July 30, 2015, we evaluated prior explorations relative to the current development concept for the subject project. This report summarizes our findings and geotechnical recommendations relative to foundations and earthwork associated with the proposed construction. The contents of this report 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 evaluate subsurface information from prior explorations on the site in order to develop recommendations for foundations and earthwork associated with the proposed construction. Our scope of services included a review of prior explorations by S.W.COLE and others, a geotechnical analysis of the subsurface findings and preparation of this report.

We also researched historical records of past site structures, land use and completed environmental screening and laboratory analysis on soil samples that exhibited petroleum contaminants. Our environmental services findings are presented under separate cover to J. B. Brown & Sons, dated February 28, 2014.

1.2 Site and Proposed Construction

The site consists of several parcels located between York Street and Danforth Street in Portland, Maine and is generally bound by York Street to the east, Danforth Street to the west, a row of houses fronting High Street to the south, and Maple Street to the north. Portions of the site are occupied by buildings that will be demolished in favor of the proposed construction. A previous gas station is situated on the corner of York and High Streets. A gravel parking lot occupies the west and central portion of the site off Danforth Street. Paved parking lots occupy the northern portion of the site off York and Maple Streets.

Based on the information provided, we understand development plans call for construction of a 5-story mixed use building along York Street with a 2-story parking garage behind. We understand the mixed use building will be retail on the ground level with 4 stories of apartments above. We understand the parking garage will have an on-grade level and an elevated deck with a future 3 to 4 story apartment building above. The finished floor elevation for the mixed use building is proposed at 30.8 feet requiring fills approaching 1-foot and cuts approaching 9 feet to achieve proposed grades. The parking garage will have a level entry off York Street at elevation 30 feet sloping up to elevation 37 feet toward Danforth Street on the west side of the site. The second deck of the parking garage will have a level entry off Danforth Street at elevation 48 feet.

Existing and proposed site features are shown on the Exploration Location Plan attached as Sheet 1.

2.0 EXPLORATION AND TESTING

2.1 Explorations

Seven test borings (B-201 through B-207) and fifteen auger probes (P-201 through P-215) were made at the site on November 12 and 13, 2013 by Great Works Test Borings, Inc. of Rollinsford, NH working under subcontract to S. W. Cole Engineering, Inc. (S.W.COLE). The exploration locations were selected and established in the field by S.W.COLE. Owen Haskell (project surveyor) surveyed the pre-marked exploration locations. Several exploration locations were subsequently re-established using taped measurements from existing features due to equipment access. The approximate exploration locations are shown on the “Exploration Location Plan”, attached as Sheet

1. Logs of the explorations are attached as Sheets 2 through 9. A key to the notes and symbols used on the logs is attached as Sheet 10. Elevations noted on the logs were estimated based on topographic information shown on Sheet 1.

A series of seven test borings (B-101 through B-107) were made in the northeast portion of the site in March 2010 by Sebago Technics, Inc. for a prior development proposal. The approximate locations of these borings is shown on Sheet 1. Logs of these explorations are attached in Appendix A.

2.2 Testing

The explorations were performed using a combination of solid-stem auger and cased wash-boring techniques. The soils in the test borings were sampled at 2 to 5 foot intervals using Standard Penetration Test (SPT) methods. SPT blow counts are shown on the logs. Rock core was obtained at B-202, B-203 and B-205 using a NQ2 diamond faced core barrel. Rock Quality Designation (RQD) is noted on the logs. Soils were not sampled at the auger probe locations.

3.0 SITE AND SUBSURFACE CONDITIONS

3.1 Surficial Conditions

The site is located in an urban area of Portland that has experienced several development episodes. Historical records research from our environmental services indicate the site generally evolved from residential use to commercial use with multiple structures that have since been demolished, replaced or modified to the current site setting. The site generally grades downward from a high elevation in the southwest to the north and east. Existing site features are shown on the Exploration Location Plan, attached as Sheet 1.

3.2 Subsurface Conditions

Underlying a surficial layer of pavement or gravel fill, the explorations encountered a subsurface profile generally consisting of fill overlying glacial outwash sands with varying fractions of silt and gravel overlying glacial till mantling bedrock. A north-south oriented ridge of shallow bedrock appears to exist along the western side of the proposed parking garage (see probes P-206, P-207 and P-208). The shallow bedrock ridge generally dives from south (High Street) to north (Maple Street). East of the shallow bedrock ridge, the

bedrock surface slopes moderately downward toward York Street. West of the shallow bedrock ridge, the bedrock surface slopes steeply downward toward Danforth Street. The principal strata encountered at the explorations are summarized below. Generalized subsurface sections across the site are attached as Sheet 1A. Refer to the attached logs for more detailed descriptions of the subsurface findings.

Fill: The borings encountered fill materials generally consisting of loose to medium dense sand with silt, gravel, brick, glass, concrete and ash extending to depths varying from about 2 to 11 feet below ground surface. A foundation remnant was encountered in B-201 within the surficial fill layer; other relic foundations, utilities and man-made objects likely exist beneath the site.

Glacial Outwash Sands: Underlying the fill, the borings generally encountered loose to medium dense glacial outwash sands with varying fractions of silt and gravel. This deposit varied in thickness from about 1 foot to 16 feet where penetrated in the test borings.

Glacial Till: Beneath the glacial outwash sands, the test borings generally encountered a medium dense to dense silty sand with gravel (glacial till) generally mantling bedrock. The glacial till deposit generally varied from 1 to 6 feet thick, except at B-102 where the deposit was about 22 feet thick and becomes loose overlying bedrock.

Bedrock: Refusal surfaces (probable bedrock) were encountered at depths of 4 to 29 feet below the ground surface, except at P-201, P-202 and B-106 where refusal was not encountered within the depths explored. Bedrock cores were obtained at borings B-202, B-203 and B-205 using a NQ2 diamond faced core barrel. The bedrock varied from hard, fractured, metavolcanic rock to hard, fractured schist. Fracture angles and RQD are noted on the logs.

3.3 Groundwater Conditions

Within the 100 series borings completed in the northeast portion of the site, groundwater was generally noted at depths of 7 to 15 feet. Within the 200 series explorations, the soils appeared saturated at depths of 4 to 11 feet. Groundwater also appeared dammed along the west side of the shallow bedrock ridge toward Danforth Street. Groundwater likely becomes perched on the relatively impervious glacial till and bedrock encountered at the explorations. Groundwater levels will fluctuate seasonally and with changes in site use.

4.0 CONCLUSIONS AND RECOMMENDATIONS

4.1 General Findings

Based on the subsurface findings, the proposed construction appears feasible from a geotechnical standpoint. The principle geotechnical considerations are as follows:

- Shallow bedrock encountered beneath the site will require blasting or hoe-ramming for removal. Considering the urban setting, we understand hoe-ramming will be the principal means of bedrock removal. Pre-construction surveys of structures and infrastructure within at least 500 feet of the site should be conducted prior to undertaking excavation, hoe-ramming and/or blasting activities.

- The Parking Garage is proposed over an area of shallow bedrock transitioning to overburden soils (see Sheet 1A). Foundations supporting walls and columns of the parking structure will need to extend to bedrock or be supported on ground improved with rammed aggregate piers (RAPs) extending to bedrock.

- If overhead clearance is limited in the parking garage, the unheated ground floor level should be underlain with non-frost susceptible Structural Fill to a depth of 4.5 feet or rigid insulation below the pavement gravels to preclude frost heaves which can adversely affect overhead clearance in parking garages.

- The Retail and Apartment Building is proposed over an area of fill overlying loose to medium dense outwash sands overlying glacial till. We recommend foundations for this building be supported on ground improved with RAPs with soil-supported floor slabs. Existing fills should be densified and soft areas repaired prior to constructing floor slabs.

- Excavations for the garage and retail/apartment building may require braced shoring along the southern edge of the site. We anticipate soldier piles socketed into bedrock will be feasible for shoring. The use of rakes or tie backs may be necessary based upon shoring wall heights. Open cut excavations may be feasible in areas not adjacent to existing streets, utilities and buildings.

- Building foundations, retaining walls and basements should be planned with gravity underdrains to provide positive drainage relief.

- Soils that will be excavated from the site will vary from granular fill with debris and ash, to granular fill with petroleum contaminants, to native sand with silt and gravel to glacial till. Based on our understanding of the proposed development, we anticipate the site will be lowered and is principally an export site. Fills with ash and contaminants have a premium cost for disposal and require specific handling; see our environmental services report.

- Imported select granular materials will be needed for foundation backfill, base materials for foundations, slabs and pavement. Crushed stone will be needed for drainage aggregate.

4.2 Excavation and Dewatering

Excavation work will generally encounter uncontrolled fills, native sands, glacial till, and bedrock. Relic foundations, relic utilities and environmentally impacted soils from past site usage may also be encountered across the site. Saturated soils and groundwater will be encountered in deeper excavations. Care must be exercised during construction to limit disturbance of the bearing soils. Earthwork and grading activities should ideally occur during drier, non-freezing, Summer and Fall seasons. Final cuts to subgrade in soil should be performed with a smooth-edged bucket to help minimize soil disturbance.

Bedrock encountered at the site will require blasting or hoe-ramming for removal. We understand hoe-ramming will be the principal means for rock removal due to the urban setting. If blasting is employed, we recommend the depth of blasting be tightly controlled to limit the depth of overblast that may require excavation and backfilling with Structural Fill. If blasting is undertaking, we recommend that blasting be performed by a licensed, qualified contractor and that pre-blast surveys should be performed on surrounding structures, properties and infrastructure in accordance with City Ordinance. Final cuts to subgrade for foundations bearing on intact bedrock should be performed with a hoe-ram in order to attain the higher bedrock bearing pressures provided herein.

Shallow excavations appear feasible with conventional sump and pump dewatering techniques. Deeper excavations, such as for utilities, may require braced excavations and sheetpiling with pumping for groundwater control. Controlling the water levels to at least one foot below planned excavation depths will help stabilize subgrades.

Excavations must be properly shored or sloped in accordance with OSHA regulations to prevent sloughing and caving of the sidewalls during construction. Care must be taken to preclude undermining adjacent structures, utilities and roadways. Excavations for the garage and retail/apartment building may require braced shoring along the southern edge of the site. We anticipate soldier piles socketed into bedrock will be feasible for shoring. The use of rakes or tie-backs may be necessary based upon shoring wall heights. Open cut excavations may be feasible in areas not adjacent to existing streets, utilities and buildings.

The design, planning and construction of excavations, excavation support and dewatering are the responsibility of the contractor. We recommend the contract documents require engineered shop drawings of shoring and dewatering plans for excavations below groundwater.

4.3 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. Surficial organics, roots and topsoil should be completely removed from areas of proposed fill and construction. As much vegetation as possible should remain outside the construction areas to lessen the potential for erosion and site disturbance. S.W.COLE should observe exposed foundation, slab, and pavement subgrades prior to placement of new fills or concrete.

Parking Garage Subgrades: We anticipate the parking garage footings and ground floor pavement will be founded on subgrade conditions varying from native sandy soils to bedrock to uncontrolled fills.

If bedrock is blasted, we recommend blasted bedrock surfaces be choked with ¾ Crushed Stone to fill voids in the bedrock surface prior to installing footings or compacted pavement gravels. Loose and overblasted bedrock should be removed and replaced with

compacted Structural Fill. Perimeter wall and combined footings founded on intact bedrock should have a 6-inch layer of crushed stone to prevent hard points under the foundation that may crack the walls. Isolated interior column footings founded on intact bedrock may be cast directly on bedrock. Footings founded on uncontrolled fill or native sandy soils must be improved with Rammed Aggregate Piers (RAPs).

At least 6-inches of compacted Crushed Stone wrapped in non-woven geotextile, such as Mirafi 160N or equivalent, should be installed below perimeter footings. Footings supported on RAP improved ground should be underlain with at least 6 inches of compacted Crushed Stone.

Paved areas founded on uncontrolled fills or native sandy soils should be densified with 3 to 5 passes of a vibratory roller having a static weight of at least 10 tons; areas that become soft and yielding should be overexcavated and replaced with compacted Structural Fill.

Proposed Mixed-Used Building: We anticipate the mixed used building footings and ground floor slab will be founded on subgrade conditions varying from native sandy soils to uncontrolled fills.

Footings founded on uncontrolled fill or native sandy soils must be improved with Rammed Aggregate Piers (RAPs). Floor slab areas founded on uncontrolled fills or native sandy soils should be densified with 3 to 5 passes of a vibratory roller having a static weight of at least 10 tons; areas that become soft and yielding should be overexcavated and replaced with compacted Structural Fill.

At least 6-inches of compacted Crushed Stone wrapped in non-woven geotextile, such as Mirafi 160N or equivalent, should be installed below perimeter footings. Footings supported on RAP improved ground should be underlain with at least 6 inches of compacted Crushed Stone.

4.4 Foundations and Walls

The parking garage and mixed use building may be supported on spread footings founded on properly prepared subgrades. Footings founded on blasted bedrock should be choked with ¾-inch Crushed Stone to fill voids. Footings founded on uncontrolled

fills and native sandy soils must be improved with Rammed Aggregate Piers (RAPs). Footings founded on intact bedrock may use the higher undisturbed bedrock bearing pressure, provided herein. Footings founded on blasted or disturbed bedrock may be designed considering the lower bearing pressure provided herein.

For spread footings founded on properly prepared subgrades, we recommend the following geotechnical parameters for foundation and RAP design consideration:

Geotechnical Parameters for Spread Footings and Backfilled Walls	
Design Frost Depth **RAP improved soil & blasted bedrock **Undisturbed, intact bedrock	 4.5 feet 2.5 feet (pinned to bedrock)
Net Allowable Bearing Pressure **RAP improved soil & blasted bedrock **Undisturbed, intact bedrock	 4.0 ksf or less 8.0 ksf or less
Base Friction Factor	0.4
Total Unit Weight of Backfill	130 pcf (compacted Structural Fill)
At-Rest Lateral Earth Pressure Coefficient	0.5 (compacted Structural Fill)
Internal Friction Angle of Backfill	32° (compacted Structural Fill)
Total Post-Construction Settlement	½- inch of less
Differential Post-Construction Settlement	½-inch or less
Seismic Soil Site Class (2012 IBC)	D

We recommend the contract documents require an engineered submittal for RAPs to improve ground conditions to meet or exceed the geotechnical parameters for bearing pressure and settlement as presented herein. The RAP submittal should be prepared and sealed by a Professional Engineer licensed in the State of Maine and endorsed by the RAP installer and Geopier Foundation Company. S.W.COLE should be engaged to review the RAP submittal prior to installing RAPs. The RAP contractor should anticipate encountering relic foundations and debris in the site fills. Contract documents should contain unit rate provisions for overexcavation of debris.

4.5 Foundation Drainage

We recommend an underdrain system be installed on the outside edge of the geotextile fabric wrapped Crushed Stone layer recommended below perimeter footings. The underdrain pipe should consist of 4-inch diameter, perforated SDR-35 foundation drain pipe bedded in the layer of geotextile wrapped Crushed Stone provided below foundations. The underdrain pipe must have a positive gravity outlet protected from freezing, clogging and backflow. Surface grades should be sloped away from the building for positive surface water drainage.

4.6 Slab-On-Grade Floors

On-grade floor slabs in heated areas may be designed using a subgrade reaction modulus of 100 pci (pounds per cubic inch) provided the slab is underlain by at least 12-inches of compacted Structural Fill placed over properly prepared subgrades. The structural engineer or concrete consultant must design steel reinforcing and joint spacing appropriate to slab thickness and function.

We recommend installation of a sub-slab soil-gas and radon venting systems for enclosed building areas. We also recommend a sub-slab vapor retarder particularly in areas of enclosed 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 should 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, Sidewalks and Garage Floors

Entrance slabs and sidewalks adjacent to the building must be designed to reduce the effects of differential frost action between adjacent pavement, doorways, and entrances. We recommend that non-frost susceptible 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 width of the entrance slab and outward at least 4.5 feet, thereafter transitioning up to the bottom of the adjacent sidewalk or pavement gravels at a 3H:1V or flatter slope. Alternatively, the entrance slab may be founded on footings extending below the frost depth.

~~If overhead clearance is limited in the parking garage, the unheated ground floor level should be underlain with non-frost susceptible Structural Fill to a depth of 4.5 feet or rigid insulation below the pavement gravels to preclude frost heaves which can adversely affect overhead clearance in parking garages.~~

4.8 Backfill and Compaction

We recommend the following fill and backfill materials for construction:

Granular Borrow: Fill to raise grades below building and paved areas should be sand or silty sand meeting the requirements for 2014 Standard Specification MaineDOT 703.19 Granular Borrow.

Structural Fill: Fill to repair soft areas, backfill for foundations, slab base material and material within the frost transition zone below exterior slabs and sidewalks, and non-frost susceptible material below the unheated ground floor level of the parking garage 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
¼ inch	25 to 90
#40	0 to 30
#200	0 to 5

Crushed Stone: Crushed Stone, used beneath foundations and for underdrain aggregate, should meet the requirements of 2014 MaineDOT Standard Specification 703.13 Crushed Stone ¾-Inch.

Reuse of Site Soils: The uncontrolled fills should be exported and properly disposed off-site. The native sandy soils may be suitable for re-use as Granular Borrow. Blasted bedrock may be blended with sand to create Structural Fill and pavement gravels. Ash and environmentally impacted soils should be exported and properly disposed off-site.

Placement and Compaction: 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 and paved areas be compacted to at least 95 percent of its maximum dry density as determined by ASTM D-1557. We recommend that basement wall backfill be compacted to between 92 to 95 percent of its maximum dry density as determined by ASTM D-1557 to avoid overstressing the wall. Crushed Stone should be compacted with 3 to 5 passes of a vibratory plate compactor having a static weight of at least 500 pounds.

4.9 Weather Considerations

Construction activity should be limited during wet and freezing weather and the site soils may require drying before construction activities may continue. 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 Design Review and Construction Testing

S.W.COLE should review the construction documents to determine that our earthwork and foundation recommendations have been properly interpreted and implemented.

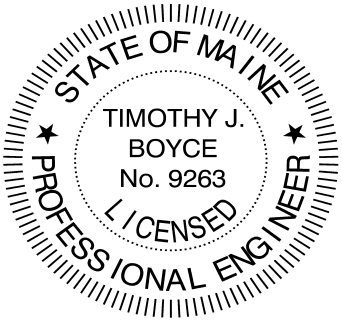
A testing and special inspections program should be implemented during construction to observe compliance with the design concepts, plans, and specifications. S.W.COLE should be retained to provide geotechnical observations during earthwork, RAP, foundation and paving construction activities, as well as providing testing and special inspection services for soils, concrete, masonry, steel, spray-applied fireproofing and asphalt 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 as design progresses and during construction.

Sincerely,

S. W. Cole Engineering, Inc.



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

TJB:rec

Attachment A
Limitations

This report has been prepared for the exclusive use of Opechee Construction Corporation for specific application to the proposed Mixed-Use Development on York Street and High Street in Portland, Maine. S. W. Cole Engineering, Inc. (S.W.COLE) has endeavored to conduct the work in accordance with generally accepted soil and foundation engineering practices. No warranty, expressed or implied, is made.

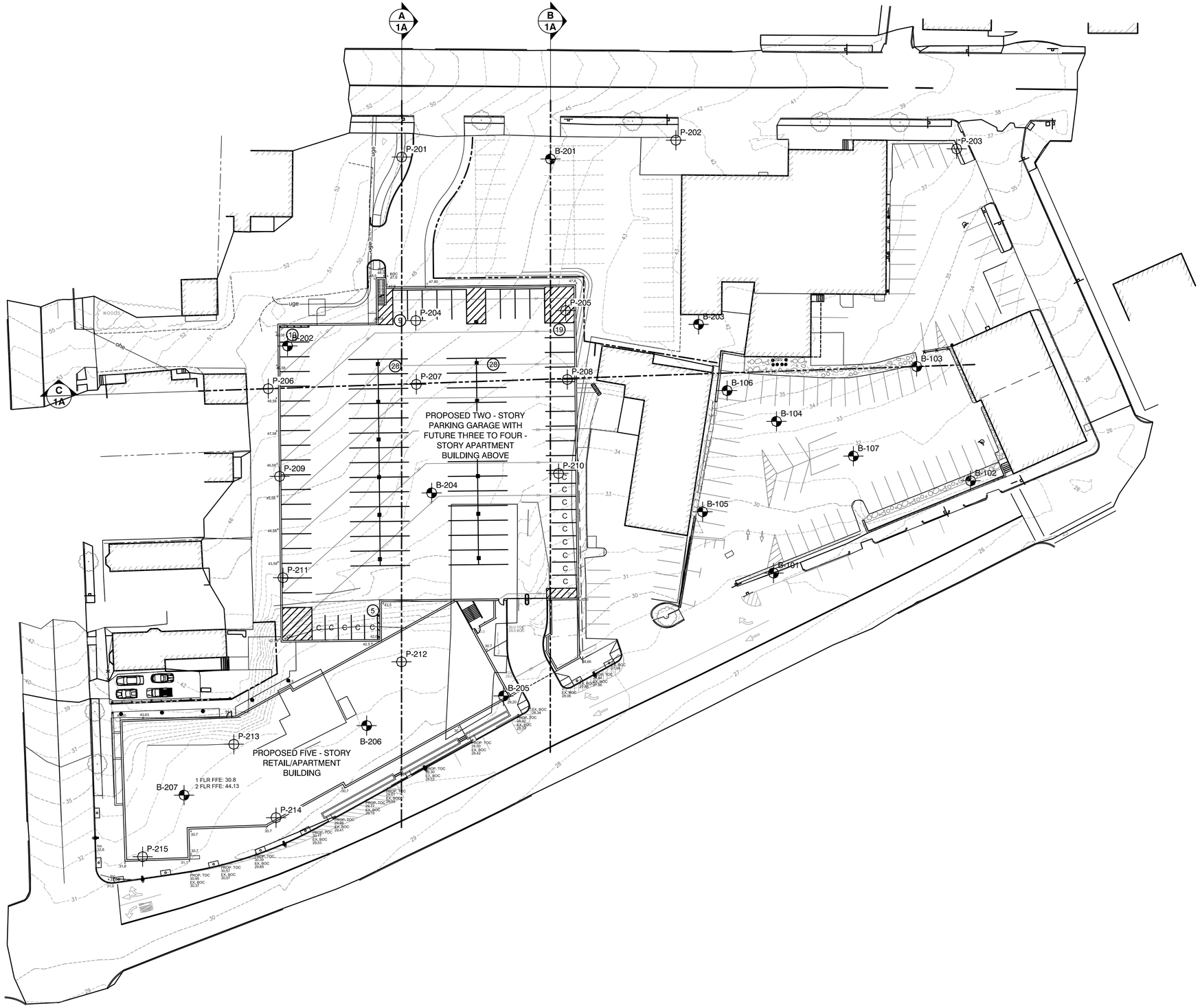
The soil profiles described in the report are intended to convey general trends in subsurface conditions. The boundaries between strata are approximate and are based upon interpretation of exploration data and samples.

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'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 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.



0 30 60 Feet

LEGEND:

APPROXIMATE BORING LOCATION

APPROXIMATE PROBE LOCATION

NOTES:

1. EXPLORATION LOCATION PLAN WAS PREPARED FROM A SCALE PRELIMINARY CONCEPT PLAN OF THE SITE PREPARED BY OPECHEE CONSTRUCTION CORPORATION, RECEIVED VIA E-MAIL JULY 20, 2015 IN AUTOCAD DWG FILE FORMAT.
2. BORINGS B-202 THROUGH B-207 AND PROBES P-202, P-203, P-206, P-209 THROUGH P-215 WERE LOCATED IN THE FIELD BY SURVEY BY OWEN HASKELL, INC. AND PROVIDED ON THE ABOVE REFERENCED PLAN. BORING B-201 AND PROBES P-201, P-204, P-205, P-207 AND P-208 WERE LOCATED IN THE FIELD BY TAPED MEASUREMENTS FROM EXISTING SITE FEATURES.
3. BORINGS B-101 THROUGH B-107 WERE PERFORMED BY SEBAGO TECHNICS, INC. THE LOCATIONS WERE PROVIDED ON A PLAN ENTITLED "BORING LOCATION PLAN," PROVIDED BY J.B.BROWN & SOND, DATED 5/10/2010.
4. THIS PLAN SHOULD BE USED IN CONJUNCTION WITH THE ASSOCIATED S.W. COLE ENGINEERING, INC. GEOTECHNICAL REPORT.
5. THE PURPOSE OF THIS PLAN IS ONLY TO DEPICT THE LOCATION OF THE EXPLORATIONS IN RELATION TO THE EXISTING CONDITIONS AND PROPOSED CONSTRUCTION AND IS NOT TO BE USED FOR CONSTRUCTION.

NO.	DATE	DESCRIPTION	BY
2	08/03/2015	FINAL REPORT SUBMISSION	CEM
1	02/28/2014	REVISED BASE PLAN, ADDED SECTION LINES, PRELIMINARY REPORT SUBMISSION	CEM
--	11/20/2013	DRAFT SUBMISSION	CEM

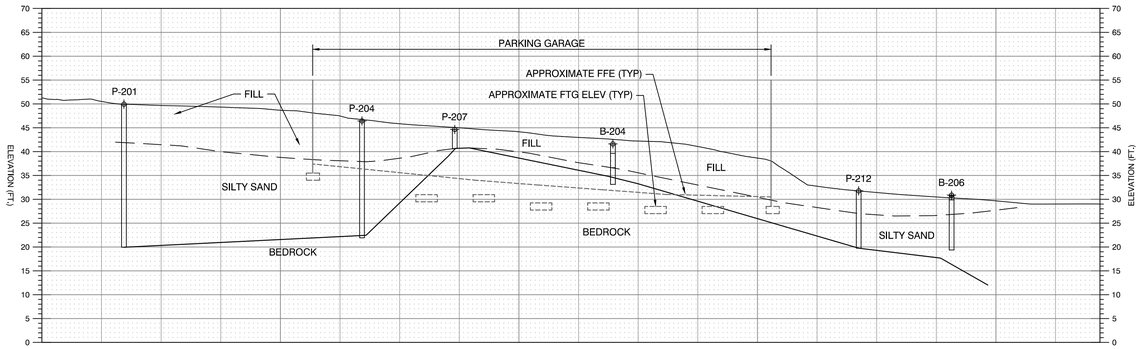
S.W.COLE ENGINEERING, INC.

OPECHEE CONSTRUCTION CORPORATION

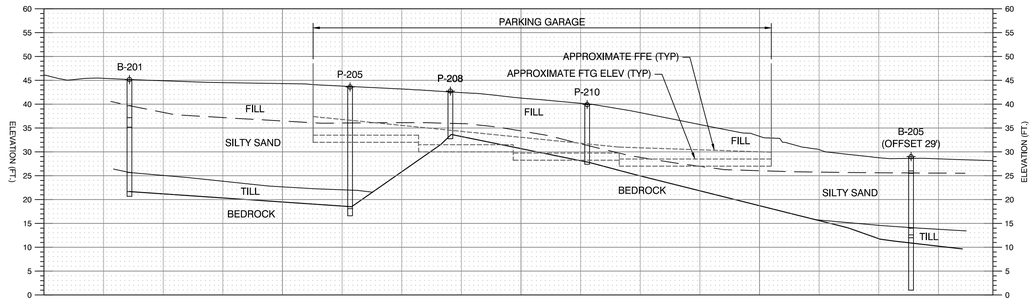
EXPLORATION LOCATION PLAN

PROPOSED MIXED USE DEVELOPMENT
YORK AND HIGH STREETS
PORTLAND, MAINE

Job No.: 13-0545.1 Scale: 1" = 30'
Date : 01/07/2014 Sheet: 1



SECTION A
SCALE: 1"=30' H.
1"= 15' V.



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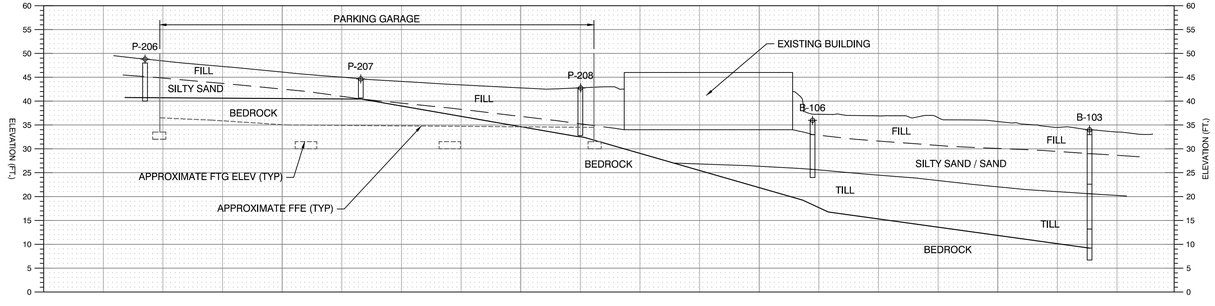

SECTION C
SCALE: 1"=30' H.
1"= 15' V.

NO.	DATE	DESCRIPTION	BY
1	08/03/2015	FINAL REPORT SUBMISSION	CEM
0	02/28/2014	PRELIMINARY REPORT SUBMISSION	CEM

S.W.COLE ENGINEERING, INC.

OPECHEE CONSTRUCTION CORPORATION

SUBSURFACE SECTIONS

PROPOSED MIXED USE DEVELOPMENT
YORK AND HIGH STREETS
PORTLAND, MAINE

Job No.: 13-0545.1 Scale: As Noted
Date : 02/28/2014 Sheet: 1A

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.: **B-201**
SHEET: 1 OF 1
PROJECT NO.: 13-0545

PROJECT: PROPOSED MIXED USE DEVELOPMENT
CLIENT : J.B. BROWN & SONS
LOCATION: YORK STREET AND DANFORTH STREET PORTLAND, MAINE
DRILLING FIRM: GREAT WORKS TEST BORING INC DRILLER: PETER MICHAUD

DATE START: 11/13/2013
DATE FINISH: 11/13/2013
ELEVATION: 45'
SWC REP.: K. GIMPEL

	TYPE	SIZE	HAMMER WT.	HAMMER FALL
CASING:	HW	4"		
SAMPLER:	SS	1 3/8" I.D.	140-LB	30"
CORE BARREL:	NQ 2"			

WATER LEVEL INFORMATION
SOILS APPEARED SATURATED BELOW 6' +/-

CASING BLOWS PER FOOT	SAMPLE NO.	PEN.	REC.	DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
SSA										
	1D	24"	12"	2.0'	15	21	17	9		BROWN GRAVELLY SILTY SAND
										WITH BRICKS (FILL)
	2D	18"	6"	3.5'	12	25	30			[PROBABLE RELIC FOUNDATION WALL AT 3.5' - OFFSET 3' AND RESUMED DRILLING]
									5.5'	
	3D	24"	19"	7.0'	2	8	8	11		BROWNISH GRAY SANDY SILT WITH SILTY SAND SEAMS
									8.0'	~MEDIUM DENSE~
	4D	24"	24"	9.0'	7	7	15	15		GRAY SILTY SAND SOME GRAVEL
									10.0'	~MEDIUM DENSE~
HW										
CASING	5D	24"	3"	12.0'	3	3	3	2		GRAY SILTY SAND
										~LOOSE~
	6D	24"	4"	17.0'	8	7	5	3		~MEDIUM DENSE~
									19.5'	
	7D	12"	0"	21.0'	50	50				PROBABLE GLACIAL TILL SOILS
									23.5'	
									24.5'	PROBABLE WEATHERED ROCK [ADVANCE BY ROLLER CONE]
										REFUSAL AT 24.5'
										(PROBABLE BEDROCK)

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

SOIL CLASSIFIED BY:
[ ] DRILLER - VISUALLY
[X] SOIL TECH. - VISUALLY
[ ] LABORATORY TEST

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

BORING NO.: **B-201**

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.: **B-202**
SHEET: 1 OF 1
PROJECT NO.: 13-0545

PROJECT: PROPOSED MIXED USE DEVELOPMENT
CLIENT : J.B. BROWN & SONS
LOCATION: YORK STREET AND DANFORTH STREET PORTLAND, MAINE
DRILLING FIRM: GREAT WORKS TEST BORING INC DRILLER: PETER MICHAUD

DATE START: 11/13/2013
DATE FINISH: 11/13/2013
ELEVATION: 49'
SWC REP.: K. GIMPEL

	TYPE	SIZE	HAMMER WT.	HAMMER FALL
CASING:	HW	4" O.D.		
SAMPLER:	SS	1 3/8" I.D.	140-LB	30"
CORE BARREL:	NQ 2"			

WATER LEVEL INFORMATION
SOILS APPEARED SATURATED BELOW 6' +/-

CASING BLOWS PER FOOT	SAMPLE NO.	PEN.	REC.	DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
SSA									1.0'	BROWN GRAVELLY SILTY SAND (FILL)
	1D	24"	15"	2.0'	11	12	7	9	1.8'	BROWN SILTY SAND SOME GRAVEL WITH BRICK (FILL)
									3.0'	~MEDIUM DENSE~ BROWN SAND AND SILT SOME GRAVEL
	2D	24"	16"	4.0'	6	8	9	8	4.0'	~MEDIUM DENSE~ BROWN SILTY SAND AND GRAVEL
										BROWN SILTY SAND
										WITH OCCASIONAL SAND SEAMS
	3D	24"	20"	7.0'	3	4	5	6		~MEDIUM DENSE~
	4D	24"	22"	9.0'	5	5	5	10		…WITH TRACE CLAY
									9.5'	
HW										GRAY SILTY SAND SOME GRAVEL
CASING	5D	24"	14"	12.0'	4	7	7	8	12.0'	~MEDIUM DENSE~
										BROWN SAND TRACE SILT
										~MEDIUM DENSE~
	6D	24"	17"	17.0'	11	11	11	16		
									18.0'	
										GRAY GRAVEL AND SILTY SAND (TILL)
										~DENSE~
	7D	24"	10"	22.0'	23	19	33	35	22.0'	
									24.0'	WEATHERED ROCK
										[ADVANCE BY ROLLER CONE]
										GRAY METAVOLCANIC ROCK, HARD, SLIGHTLY WEATHERED
										FINE-MEDIUM GRAINED, IRON OXIDE STAINING ON FRACTURES
										FRACTURES AT 65 TO 75 DEGREES
	R1	48"	36"	28.0'					28.0'	RQD = 21%
										BOTTOM OF EXPLORATION AT 28.0'
										(BEDROCK)

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

SOIL CLASSIFIED BY:
[ ] DRILLER - VISUALLY
[X] SOIL TECH. - VISUALLY
[ ] LABORATORY TEST

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

BORING NO.: **B-202**

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.: **B-203**
SHEET: 1 OF 1
PROJECT NO.: 13-0545

PROJECT: PROPOSED MIXED USE DEVELOPMENT
CLIENT : J.B. BROWN & SONS
LOCATION: YORK STREET AND DANFORTH STREET PORTLAND, MAINE
DRILLING FIRM: GREAT WORKS TEST BORING INC DRILLER: PETER MICHAUD

DATE START: 11/13/2013
DATE FINISH: 11/13/2013
ELEVATION: 42'
SWC REP.: K. GIMPEL

	TYPE	SIZE	HAMMER WT.	HAMMER FALL
CASING:	HW	4" O.D.		
SAMPLER:	SS	1 3/8" I.D.	140-LB	30"
CORE BARREL:	NQ 2"			

WATER LEVEL INFORMATION
SOILS APPEARED SATURATED BELOW 8' +/-

CASING BLOWS PER FOOT	SAMPLE NO.	PEN.	REC.	DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
SSA									0.1'	BROWN SILTY SAND WITH ORGANICS (LAWN AREA)
	1D	24"	16"	2.0'	7	7	6	4		BROWN SILTY SAND SOME GRAVEL TRACE ORGANICS AND BRICKS (FILL)
	2D	24"	15"	4.0'	4	4	4	3		~ LOOSE TO VERY LOOSE ~
	3D	24"	20"	7.0'	2	1	2	1	8.0'	
	4D	24"	18"	9.0'	1	3	7	10	9.5'	GRAY SILTY SAND [PETROLEUM ODOR] ~LOOSE~
HW CASING	5D	24"	16"	12.0'	6	20	18	8	14.0'	BROWN SILTY SAND ~DENSE~
	6D	24"	17"	17.0'	16	20	17	16	19.0'	BROWN SILTY SAND TRACE GRAVEL WITH OCCASIONAL WEATHERED ROCK FRAGMENTS ~DENSE~
	7D	24"	14"	22.0'	6	7	8	13	23.0'	GRAY SAND SOME SILT ~MEDIUM DENSE~
	8D	24"	14"	27.0'	15	14	13	12	28.0'	BROWN GRAVELLY SILTY SAND WITH OCCASIONAL COBBLES (TILL) ~ MEDIUM DENSE ~
									30.0'	WEATHERED ROCK [ADVANCE BY ROLLER CONE]
	R1	60"	60"	35.0'					35.0'	LIGHT GRAY METAVOLCANIC ROCK, HARD, SLIGHTLY WEATHERED FINE-MEDIUM GRAINED, IRON OXIDE STAINING ON FRACTURES FRACTURES AT 15 TO 80 DEGREES RQD = 32%
										BOTTOM OF EXPLORATION AT 35.0' (BEDROCK)

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

SOIL CLASSIFIED BY:
[ ] DRILLER - VISUALLY
[X] SOIL TECH. - VISUALLY
[ ] LABORATORY TEST

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

BORING NO.: **B-203**

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.: **B-204**
SHEET: 1 OF 1
PROJECT NO.: 13-0545

PROJECT: PROPOSED MIXED USE DEVELOPMENT
CLIENT : J.B. BROWN & SONS
LOCATION: YORK STREET AND DANFORTH STREET PORTLAND, MAINE
DRILLING FIRM: GREAT WORKS TEST BORING INC DRILLER: JEFF LEE

DATE START: 11/12/2013
DATE FINISH: 11/12/2013
ELEVATION: 42'
SWC REP.: E. WALKER

	TYPE	SIZE	HAMMER WT.	HAMMER FALL
CASING:	SSA	4.5" O.D.		
SAMPLER:	SS	1 3/8" I.D.	140-LB	30"
CORE BARREL:	N/A			

WATER LEVEL INFORMATION

CASING BLOWS PER FOOT	SAMPLE NO.	SAMPLE PEN.	SAMPLE REC.	SAMPLE DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
SSA										BROWN GRAVELLY SAND SOME SILT (FILL) TRACE ORGANICS TOP 6"
	1D	24"	16"	2.0'	5	9	9	8	2.0'	~ MEDIUM DENSE ~
	2D	24"	14"	4.0'	5	4	3	2		DARK BROWN SILT AND SAND SOME GRAVEL (FILL)
									5.0'	~ LOOSE ~
	3D	24"	18"	7.0'	6	14	13	17		BROWN WITH ORANGE AND DARK BROWN STAINING
										SILTY SAND SOME GRAVEL WITH WEATHERED BEDROCK FRAGMENTS
									8.5'	(GLACIAL TILL) ~ MEDIUM DENSE ~
										REFUSAL AT 8.5'
										(PROBABLE BEDROCK)

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

SOIL CLASSIFIED BY:
[ ] DRILLER - VISUALLY
[X] SOIL TECH. - VISUALLY
[ ] LABORATORY TEST

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

BORING NO.: **B-204**

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.: **B-205**
SHEET: 1 OF 1
PROJECT NO.: 13-0545

PROJECT: PROPOSED MIXED USE DEVELOPMENT
CLIENT : J.B. BROWN & SONS
LOCATION: YORK STREET AND DANFORTH STREET PORTLAND, MAINE
DRILLING FIRM: GREAT WORKS TEST BORING INC DRILLER: JEFF LEE

DATE START: 11/12/2013
DATE FINISH: 11/12/2013
ELEVATION: 29'
SWC REP.: K. GIMPEL

	TYPE	SIZE	HAMMER WT.	HAMMER FALL
CASING:	HW	4" O.D.		
SAMPLER:	SS	1 3/8" I.D.	140-LB	30"
CORE BARREL:	NQ 2"			

WATER LEVEL INFORMATION
SOILS APPEARED SATURATED BELOW 4' +/-

CASING BLOWS PER FOOT	SAMPLE NO.	PEN.	REC.	DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
SSA									0.1'	2-INCHES ASPHALT PAVEMENT
	1D	24"	16"	2.5'	4	2	2	2	3.0'	BROWN SILTY SAND SOME GRAVEL WITH BRICKS (FILL)
									3.5'	BROWN SILTY SAND (FILL)
	2D	24"	21"	4.5'	2	2	5	5		GRAY SILTY SAND [PETROLEUM ODOR] ~MEDIUM DENSE BECOMING…
	3D	24"	15"	7.0'	5	8	11	11		
	4D	24"	17"	12.0'	3	2	3	2		…LOOSE~
									15.0'	
HW									16.4'	~DENSE~ BROWN GRAVELLY SILTY SAND (TILL)
CASING	5D	17"	16"	16.4'	13	15	50/5"		17.0'	WEATHERED ROCK
TO 16'										GRAY SCHIST, HARD, SLIGHTLY WEATHERED, MEDIUM GRAINED FRACTURES AT 35 TO 75 DEGREES
	R1	60"	39"	23.0'						RQD = 65%
	R2	60"	50"	28.0'					28.0'	RQD = 63%
										BOTTOM OF EXPLORATION AT 28.0' (BEDROCK)

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

SOIL CLASSIFIED BY:
[ ] DRILLER - VISUALLY
[X] SOIL TECH. - VISUALLY
[ ] LABORATORY TEST

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

BORING NO.: **B-205**

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.: **B-206**
SHEET: 1 OF 1
PROJECT NO.: 13-0545

PROJECT: PROPOSED MIXED USE DEVELOPMENT
CLIENT : J.B. BROWN & SONS
LOCATION: YORK STREET AND DANFORTH STREET PORTLAND, MAINE
DRILLING FIRM: GREAT WORKS TEST BORING INC DRILLER: JEFF LEE

DATE START: 11/12/2013
DATE FINISH: 11/12/2013
ELEVATION: 31'
SWC REP.: K. GIMPEL

	TYPE	SIZE	HAMMER WT.	HAMMER FALL
CASING:	SSA	4.5" O.D.		
SAMPLER:	SS	1 3/8" I.D.	140-LB	30"
CORE BARREL:	N/A			

WATER LEVEL INFORMATION
NO FREE WATER OBSERVED

CASING BLOWS PER FOOT	SAMPLE NO.	SAMPLE PEN.	SAMPLE REC.	SAMPLE DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
SSA									0.2'	2.5-INCHES ASPHALT PAVEMENT
									1.0'	BROWN GRAVELLY SAND TRACE SILT (FILL)
	1D	24"	17"	2.5'	6	8	8	12		
										BROWN GRAVELLY SILTY SAND
	2D	24"	20"	4.5'	9	15	16	16		~MEDIUM DENSE~
	3D	24"	22"	7.0'	12	15	9	12		
	4D	18"	18"	11.5'	12	11	12	25/0"	11.5'	
										REFUSAL AT 11.5'
										(PROBABLE BEDROCK)

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

SOIL CLASSIFIED BY:
[ ] DRILLER - VISUALLY
[X] SOIL TECH. - VISUALLY
[ ] LABORATORY TEST

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

BORING NO.: **B-206**

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.: **B-207**
SHEET: 1 OF 1
PROJECT NO.: 13-0545

PROJECT: PROPOSED MIXED USE DEVELOPMENT
CLIENT : J.B. BROWN & SONS
LOCATION: YORK STREET AND DANFORTH STREET PORTLAND, MAINE
DRILLING FIRM: GREAT WORKS TEST BORING INC DRILLER: JEFF LEE

DATE START: 11/12/2013
DATE FINISH: 11/12/2013
ELEVATION: 32'
SWC REP.: K. GIMPEL

	TYPE	SIZE	HAMMER WT.	HAMMER FALL
CASING:	SSA	4.5" O.D.		
SAMPLER:	SS	1 3/8" I.D.	140-LB	30"
CORE BARREL:	N/A			

WATER LEVEL INFORMATION
SOILS APPEARED SATURATED BELOW 11'+/-

CASING BLOWS PER FOOT	SAMPLE NO.	SAMPLE PEN.	SAMPLE REC.	SAMPLE DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
SSA									0.3'	4-INCHES ASPHALT PAVEMENT
									1.0'	BROWN GRAVELLY SAND TRACE SILT (FILL)
	1D	24"	18"	2.5'	6	6	7	8		BROWN SILTY SAND SOME GRAVEL TRACE ASH (FILL)
	2D	24"	17"	4.5'	7	5	9	8	4.5'	
									5.5'	~MEDIUM DENSE~ BROWN SILTY SAND SOME GRAVEL
	3D	24"	24"	7.0'	5	4	6	7	6.5'	~MEDIUM DENSE~ GRAY SILTY SAND TRACE GRAVEL
									8.0'	~MEDIUM DENSE~ BROWN SAND TRACE SILT
	4D	24"	15"	9.0'	7	8	9	7	8.5'	~MEDIUM DENSE~ BROWN GRAVELLY SAND SOME SILT
										~MEDIUM DENSE~ BROWN GRAVELLY SILTY SAND
									11.0'	WITH WEATHERED ROCK FRAGMENTS
	5D	24"	8"	12.0'	7	6	4	3		GRAY SILTY SAND TRACE CLAY ~MEDIUM DENSE~
									16.0'	
	6D	24"	16"	17.0'	5	10	32	32		BROWN GRAVELLY SILTY SAND (TILL) ~DENSE~
									19.0'	
										REFUSAL AT 19.0' PROBABLE BEDROCK

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

SOIL CLASSIFIED BY:
[ ] DRILLER - VISUALLY
[X] SOIL TECH. - VISUALLY
[ ] LABORATORY TEST

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

BORING NO.: **B-207**

S.W.COLE ENGINEERING, INC.

PROBE DATA

PROJECT: PROPOSED MIXED-USE DEVELOPMENT
CLIENT: J.B.BROWN & SONS
LOCATION: DANFORTH AND YORK STREETS, PORTLAND, MAINE

PROBE NUMBER	GROUND SURFACE ELEVATION (FT)	DEPTH TO REFUSAL (FT)	ESTIMATED THICKNESS OF FILL SOILS (FT)
P-201	50	30 NR	8
P-202	43	30 NR	9
P-203	37	28.5	9
P-204	46	24.5	9
P-205	44	27	7
P-206	49	8	5
P-207	45	4	4
P-208	43	10	5
P-209	46	4	3
P-210	40	12.5	9
P-211	42	8	5
P-212	32	12	3
P-213	32	13	5
P-214	31	19	5
P-215	32	21	8

NOTES: P-201: 30-foot depth was not refusal, but probable dense till or bedrock
P-202: 30-foot depth was not refusal, but probable dense till or bedrock
P-205: Bedrock at 25.5'
P-207: Refusal at 4-feet below ground surface, offset and had refusal at 6.5'

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_u	-	unconfined compressive strength, kips/sq. ft. - based on laboratory unconfined compressive test
S_v	-	field vane shear strength, kips/sq. ft.
L_v	-	lab vane shear strength, kips/sq. ft.
q_p	-	unconfined compressive strength, kips/sq. ft. based on 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 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.
γ_T	-	total soil weight
γ_B	-	buoyant soil weight

Description of Proportions:

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

REFUSAL: **Test Boring Explorations** - 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: **Test Pit Explorations** - 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.

APPENDIX A

1007 B
57 YORK ST

B106
B104
B103
B105
B107
B101
B102

1 1st FLOOR PLAN

0 20 40
SCALE IN FEET

BOLING LOCATIONS

SERAGO TECHNICS, INC

SEBAGO TECHNICS, INC.
One Chabot Street
P.O. Box 1339
WESTBROOK, ME 04098-1339

Phone (207) 856-0277 FAX (207) 856-2206

LETTER OF TRANSMITTAL

18862

DATE	JOB NO.
May 10, 2010	10043

ATTENTION Vincent Veroneau, President

RE: Proposed Office Building
57 York Street
Portland, Maine

TO J. B. Brown & Sons
36 Danforth Street
Portland, ME 04101

WE ARE SENDING YOU ☒ Attached ☐ Under separate cover via _____ the following items:

☐ Shop drawings ☐ Prints ☐ Plans ☐ Samples ☐ Specifications
☐ Copy of letter ☐ Change order ☒ Boring Logs + Plan

COPIES	DATE	NO.	DESCRIPTION
1	3/26/10		Logs of Borings B101 to B107
			Summary Table
			Boring Locations

THESE ARE TRANSMITTED as checked below:

☐ For approval ☐ Approved as submitted ☐ Resubmit _____ copies for approval
☒ For your use ☐ Approved as noted ☐ Submit _____ copies for distribution
☐ As requested ☐ Returned for corrections ☐ Return _____ corrected prints
☐ For review and comment ☐ _____
☐ FOR BIDS DUE _____ ☐ PRINTS RETURNED AFTER LOAN TO US

REMARKS _____

COPY TO _____

SIGNED: Ken Ruhm

If enclosures are not as noted, kindly notify us at once.

TABLE I
SUMMARY OF BORINGS
PROPOSED OFFICE BUILDING
57 YORK STREET
PORTLAND, MAINE

Boring Number	Depth (Ft)	Depth to Water (Ft)	Strata Thickness (Ft)					
			Fill	Glaciomarine Sand/Silt	Glacial Outwash	Glacial Till	Weathered Bedrock	Bedrock
B101	20.0	9.5	8.5	--	5.0	6.5	--	0.0*
B102	34.0	14.7	5.3	1.3	--	21.7	5.7	0.0*
B103	27.3	8.4	5.0	6.4	9.4	4.0	2.5	0.0*
B104	15.0	NE	11.0	--	--	3.4	0.6	0.0*
B105	11.6	8.3	4.0	--	6.2	0.7	0.7	0.0*
B106	12.0	7.3	3.0	--	9.0*	--	--	--
B107	25.4	NE	3.5	--	14.8	7.1	--	0.0*

NOTES:

1. NE INDICATES GROUNDWATER NOT ENCOUNTERED WITHIN DEPTH OF BORING.
2. -- INDICATES STRATUM NOT ENCOUNTERED WITHIN DEPTH OF BORING.
3. * INDICATES DEPTH OF PENETRATION INTO STRATUM.

SEBAGO TECHNICS, INC.

TEST BORING REPORT

BORING NO. **B101**

Page 1 of 1

PROJECT	OFFICE BUILDING	STI JOB NO.	10043
LOCATION	57 YORK STREET, PORTLAND, MAINE	PROJECT MGR.	K. RECKER
CLIENT	J. B. BROWN & SONS	FIELD REP.	R. ESTES
CONTRACTOR	MAINE TEST BORINGS, INC.	DATE STARTED	3/26/2010
DRILLER	M. PORTER	DATE FINISHED	3/26/2010

Elevation ft. Datum — Boring Location See Plan

Item	Casing	Sampler	Core Barrel
Type	HSA	SS	
Inside Diameter (in.)	2.5	1.375	
Hammer Weight (lb.)		140	
Hammer Fall (in.)		30	

Rig Make & Model: Mobile B53

- ☑ Truck ☐ Tripod ☐ Cat-Head
- ☐ ATV ☐ Geoprobe ☑ Winch
- ☐ Track ☐ Air Track ☐ Roller Bit
- ☐ Skid ☐ ☑ Cutting Head

Hammer Type: ☑ Safety ☐ Doughnut ☐ Automatic

Drilling Mud: ☐ Bentonite ☐ Polymer ☑ None

Casing Advance: Type Method Depth — HSA/SPIN/20.0

Drilling Notes:

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)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
0					0.2		-BITUMINOUS CONCRETE-										
	3	S1	0.5		0.7	SW	Loose, brown well-graded SAND with gravel (SW), mps = 0.75 in., moist	5	20	25	35	15					
	45				1.4		-CONCRETE-										
	22					SW	Dense, dark brown well-graded SAND with gravel (SW), mps = 0.75 in.,	5	10	20	40	25					
	13	8	2.5				ash, brick and cement fragments, moist										
							-FILL-										
5	4	S2	5.0		5.3												
	1					SP-SM	Very loose, dark brown to gray-brown poorly-graded SAND with silt			5	35	50	10				
	1						(SP-SM), brick fragments, mps = 4 mm, moist to wet										
	1	14	7.0														
							-FILL-										
					8.5												
10	5	S3	10.0			SW	Medium dense, yellow-brown to gray-brown well-graded SAND (SW),			10	30	60					
	5						mps = 3 mm, moist										
	8																
	11	16	12.0														
							-GLACIAL OUTWASH DEPOSITS-										
					13.5												
15	3	S4	15.0			SM	Very loose, gray silty SAND with gravel (SM), mps = 1.0 in.,	10	5	15	20	30	20				
	2						slightly bonded, moist to wet										
	1																
	1	8	17.0														
							-GLACIAL TILL DEPOSITS-										
					20.0												
20	50/0	NR	20.0				Split-spoon refusal at 20.0 ft. on probable bedrock										
							Bottom of exploration at 20.0 ft. below ground surface										
25																	
30																	

Water Level Data

Date	Time	Elapsed Time (hr.)	Depth in feet to: Bottom of Casing	Bottom of Hole	Water
3/26/2010	0820	--	--	14.0	9.5

Sample ID

O	Open End Rod
T	Thin Wall Tube
U	Undisturbed Sample
S	Split Spoon Sample
G	Geoprobe
FV	Field Vane

Well Diagram

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

Summary

Overburden (Linear ft.)	20.0
Rock Cored (Linear ft.)	--
Number of Samples	4S
BORING NO.	B101

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

*NOTE: Maximum Particle Size is determined by direct observation within the limitations of sampler size.

NOTE: Soil identifications based on visual-manual methods of the USCS system as practiced by Sebago Technics, Inc.

SEBAGO TECHNICS, INC.

TEST BORING REPORT

BORING NO. **B102**

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PROJECT	OFFICE BUILDING	STI JOB NO.	10043
LOCATION	57 YORK STREET, PORTLAND, MAINE	PROJECT MGR.	K. RECKER
CLIENT	J. B. BROWN & SONS	FIELD REP.	R. ESTES
CONTRACTOR	MAINE TEST BORINGS, INC.	DATE STARTED	3/25/2010
DRILLER	M. PORTER	DATE FINISHED	3/25/2010

Elevation ft. Datum — Boring Location See Plan

Item	Casing	Sampler	Core Barrel
Type	HSA	SS	
Inside Diameter (in.)	2.5	1.375	
Hammer Weight (lb.)		140	
Hammer Fall (in.)		30	

Rig Make & Model: Mobile B53

- ☑ Truck ☐ Tripod
- ☐ ATV ☐ Geoprobe
- ☐ Track ☐ Air Track
- ☐ Skid ☐
- ☐ Cat-Head
- ☑ Winch
- ☐ Roller Bit
- ☑ Cutting Head

Hammer Type: ☑ Safety ☐ Doughnut ☐ Automatic

Drilling Mud: ☐ Bentonite ☐ Polymer ☑ None

Casing Advance: Type Method Depth — HSA/SPIN/34.0

Drilling Notes:

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)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
0	2	S1	0.0			SW-SM	Medium dense, yellow-brown well-graded SAND with silt and gravel (SW-SM), mps = 1.0 in., moist	10	10	20	35	25	10				
	4																
	8				1.5		-FILL-										
	8	10	2.0			SW	Medium dense, dark brown well-graded SAND (SW), mps = 1.0 in., moist	5	5	25	40	25					
							-FILL-										
5	3	S2	5.0		5.3	SW	Medium dense, dark brown well-graded SAND (SW), brick, glass fragments, mps = 0.75 in., moist -FILL-		10	25	40	25					
	6																
	9					ML/SP	Stiff, olive-brown to yellow-brown mottled SILT (ML), interbedded with										
	17	20	7.0		6.6		poorly-graded SAND (SP), mps > 1 mm, moist to wet										
							-MARINE DEPOSITS-										
						SW	Medium dense, light brown to yellow-brown well-graded SAND with gravel (SW), mps = 1.0 in., moist	10	30	20	25	15					
					9.0		-GLACIAL TILL DEPOSITS-										
10	17	S3	10.0			SW-SM	Dense, olive-brown to yellow-brown well-graded SAND with silt and gravel (SW-SM), mps = 1.3 in., slightly bonded, moist to wet	20	15	15	20	20	10				
	22																
	21																
	18	18	12.0														
							-GLACIAL TILL DEPOSITS-										
15	15	S4	15.0			SW-SM	Dense, olive-brown to yellow-brown well-graded SAND with silt and gravel (SW-SM), mps = 1.0 in., slightly bonded, moist to wet	10	20	15	20	25	10				
	28																
	21				16.2		-GLACIAL TILL DEPOSITS-										
	18	20	17.0			SW	Dense, dark brown to red-yellow well-graded SAND (SW), mps = 0.25 in., moist			25	40	30	5				
							-GLACIAL TILL DEPOSITS-										
20	4	S5	20.0		20.1												
	7					SM	Medium dense, gray silty SAND with gravel (SM), mps = 0.75 in., slightly bonded, moist	5	15	15	20	25	20				
	6																
	10	19	22.0														
							-GLACIAL TILL DEPOSITS-										
25	1	S6	25.0			SM	Very loose, gray silty SAND with gravel (SM), mps = 0.75 in., wet		15	15	20	25	25				
	WOH																
	1																
	1	19	27.0				-GLACIAL TILL DEPOSITS-										
					28.3												
							-WEATHERED BEDROCK-										
30																	

Water Level Data

Date	Time	Elapsed Time (hr.)	Depth in feet to: Bottom of Casing	Bottom of Hole	Water
3/25/2010	1700	--	--	18.0	14.7

Sample ID

O	Open End Rod
T	Thin Wall Tube
U	Undisturbed Sample
S	Split Spoon Sample
G	Geoprobe
FV	Field Vane

Well Diagram

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

Summary

Overburden (Linear ft.)	28.3
Rock Cored (Linear ft.)	--
Number of Samples	7S
BORING NO.	B102

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

*NOTE: Maximum Particle Size is determined by direct observation within the limitations of sampler size.

NOTE: Soil identifications based on visual-manual methods of the USCS system as practiced by Sebago Technics, Inc.

SEBAGO TECHNICS, INC.

TEST BORING REPORT

BORING NO. **B102**

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)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
30	10	S7	30.0				Medium dense, olive-brown to gray-brown moderately to highly weathered bedrock										
	10																
	13																
	42	14	32.0				-WEATHERED BEDROCK-										
					34.0												
35							HSA refusal at 34.0 ft. Bottom of exploration at 34.0 ft. below ground surface										
40																	
45																	
50																	
55																	

NOTES:

FILE NO. 10043

BORING NO. B102

*NOTE: Maximum Particle Size is determined by direct observation within the limitations of sampler size.

NOTE: Soil identifications based on visual-manual methods of the USCS system as practiced by Sebago Technics, Inc.

SEBAGO TECHNICS, INC.

TEST BORING REPORT

BORING NO. B103

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PROJECT	OFFICE BUILDING	STI JOB NO.	10043
LOCATION	57 YORK STREET, PORTLAND, MAINE	PROJECT MGR.	K. RECKER
CLIENT	J. B. BROWN & SONS	FIELD REP.	R. ESTES
CONTRACTOR	MAINE TEST BORINGS, INC.	DATE STARTED	3/25/2010
DRILLER	M. PORTER	DATE FINISHED	3/25/2010

Elevation ft. Datum — Boring Location See Plan

Item	Casing	Sampler	Core Barrel
Type	HSA	SS	
Inside Diameter (in.)	2.5	1.375	
Hammer Weight (lb.)		140	
Hammer Fall (in.)		30	

Rig Make & Model: Mobile B53

- ☑ Truck ☐ Tripod ☐ Cat-Head
- ☐ ATV ☐ Geoprobe ☑ Winch
- ☐ Track ☐ Air Track ☐ Roller Bit
- ☐ Skid ☐ ☑ Cutting Head

Hammer Type: ☑ Safety ☐ Doughnut ☐ Automatic

Drilling Mud: ☐ Bentonite ☐ Polymer ☑ None

Casing Advance: Type Method Depth — HSA/SPIN/27.3

Drilling Notes:

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)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
0	5	S1	0.0			SW	Medium dense, yellow-brown to brown well-graded SAND with gravel	20	15	20	25	20					
	6				1.0		(SW), mps = 1.0 in., moist -FILL-										
	9					SW	Medium dense, brown to dark brown well-graded SAND with gravel		15	20	35	25	5				
	12	15	2.0				(SW), mps = 0.25 in., ash, brick fragments, moist										
							-FILL-										
5					5.0												
	1	S2	5.0			ML/SP	Medium stiff, olive-brown to yellow-brown SILT (ML), interbedded with					30	70	S	L	L	
	3						poorly-graded SAND (SP), mottled, mps < 1 mm, moist										
	3																
	3	24	7.0														
							-MARINE DEPOSITS-										
10	1	S3	10.0			ML/SP	Medium stiff, olive-brown SILT (ML), interbedded with poorly-graded					30	70	S	L	L	
	1						SAND (SP), slightly mottled, mps < 1 mm, wet										
	4				11.4		-MARINE DEPOSITS-										
	16	24	12.0			SP	Medium dense, red-yellow poorly-graded SAND (SP), mps < 1 mm, wet				5	95					
							-GLACIAL OUTWASH DEPOSITS-										
					13.4												
15	8	S4	15.0			SW-SP	Medium dense, brown to yellow-brown well-graded SAND (SW)	10	10	20	20	40					
	8						interbedded with poorly-graded SAND (SP), occasional gravel layers,										
	6						mps = 1.0 in., wet										
	10	24	17.0														
							-GLACIAL OUTWASH DEPOSITS-										
20	7	S5	20.0			SW	Medium dense, brown well-graded SAND (SW), mps = 4 mm, wet				30	55	15				
	13				20.8		-GLACIAL OUTWASH DEPOSITS-										
	18					SM	Dense, gray silty SAND (SM), mps = 0.5 in., moist to wet, slightly		5	20	30	30	15				
	72	20	22.0				bonded										
							-GLACIAL TILL DEPOSITS-										
25					24.8												
	29	S6	25.0				Very dense, olive-brown to gray moderately weathered bedrock fragments										
	32																
	33						-WEATHERED BEDROCK-										
	40	8	27.0														
					27.3												
							HSA refusal at 27.3 ft.										
							Bottom of exploration at 27.3 ft. below ground surface										
30																	

Water Level Data

Date	Time	Elapsed Time (hr.)	Depth in feet to: Bottom of Casing	Bottom of Hole	Water
3/25/2010	1530		--	12.7	8.4

Sample ID

O	Open End Rod
T	Thin Wall Tube
U	Undisturbed Sample
S	Split Spoon Sample
G	Geoprobe
FV	Field Vane

Well Diagram

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

Summary

Overburden (Linear ft.)	24.8
Rock Cored (Linear ft.)	--
Number of Samples	6S
BORING NO.	B103

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

*NOTE: Maximum Particle Size is determined by direct observation within the limitations of sampler size.

NOTE: Soil identifications based on visual-manual methods of the USCS system as practiced by Sebago Technics, Inc.

SEBAGO TECHNICS, INC.

TEST BORING REPORT

BORING NO. **B104**

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PROJECT	OFFICE BUILDING	STI JOB NO.	10043
LOCATION	57 YORK STREET, PORTLAND, MAINE	PROJECT MGR.	K. RECKER
CLIENT	J. B. BROWN & SONS	FIELD REP.	R. ESTES
CONTRACTOR	MAINE TEST BORINGS, INC.	DATE STARTED	3/26/2010
DRILLER	M. PORTER	DATE FINISHED	3/26/2010

Elevation ft. Datum — Boring Location See Plan

Item	Casing	Sampler	Core Barrel
Type	HSA	SS	
Inside Diameter (in.)	2.5	1.375	
Hammer Weight (lb.)		140	
Hammer Fall (in.)		30	

Rig Make & Model: Mobile B53

- ☑ Truck ☐ Tripod
- ☐ ATV ☐ Geoprobe
- ☐ Track ☐ Air Track
- ☐ Skid ☐
- ☐ Cat-Head
- ☑ Winch
- ☐ Roller Bit
- ☑ Cutting Head

Hammer Type: ☑ Safety ☐ Doughnut ☐ Automatic

Drilling Mud: ☐ Bentonite ☐ Polymer ☑ None

Casing Advance: Type Method Depth — HSA/SPIN/15.0

Drilling Notes:

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)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
0	6	S1	0.0			SW	Dense, dark brown to brown well-graded SAND with gravel (SW), mps =	15	15	20	30	20					
	16						1.3 in., brick, concrete, glass and bituminous concrete fragments, moist										
	15																
	11	17	2.0														
							-FILL-										
5	2	S2	5.0			SW	Very loose, gray-brown well-graded SAND with gravel (SW), concrete	15	20	25	20	15	5				
	2						and brick fragments, mps = 1.25 in., wet										
	1																
	1	9	7.0														
							-FILL-										
10	2	S3	10.0			SW	Loose, yellow-brown well-graded SAND with gravel (SW), brick	10	5	5	20	60					
	5				11.0		fragments, mps = 1.25 in., wet -FILL-										
	5					SM	Loose, olive-brown silty SAND with gravel (SM), mps = 1.3 in., wet,	10	10	15	20	25	20				
	3	14	12.0				slightly bonded										
							-GLACIAL TILL DEPOSITS-										
					14.4												
15					15.0		Note: weathered bedrock in auger cuttings- WEATHERED BEDROCK-										
	50/0	NR	15.0				Split-spoon refusal at 15.0 ft.										
							Bottom of exploration at 15.0 ft. below ground surface										
20																	
25																	
30																	

Water Level Data

Date	Time	Elapsed Time (hr.)	Depth in feet to: Bottom of Casing	Bottom of Hole	Water
3/26/2010	1015	--	--	15.0	Dry

Sample ID

O	Open End Rod
T	Thin Wall Tube
U	Undisturbed Sample
S	Split Spoon Sample
G	Geoprobe
FV	Field Vane

Well Diagram

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

Summary

Overburden (Linear ft.)	14.4
Rock Cored (Linear ft.)	--
Number of Samples	3S
BORING NO.	B104

Field Tests

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

*NOTE: Maximum Particle Size is determined by direct observation within the limitations of sampler size.

NOTE: Soil identifications based on visual-manual methods of the USCS system as practiced by Sebago Technics, Inc.

SEBAGO TECHNICS, INC.

TEST BORING REPORT

BORING NO. **B105**

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PROJECT	OFFICE BUILDING	STI JOB NO.	10043
LOCATION	57 YORK STREET, PORTLAND, MAINE	PROJECT MGR.	K. RECKER
CLIENT	J. B. BROWN & SONS	FIELD REP.	R. ESTES
CONTRACTOR	MAINE TEST BORINGS, INC.	DATE STARTED	3/26/2010
DRILLER	M. PORTER	DATE FINISHED	3/26/2010

Elevation ft. Datum — Boring Location See Plan

Item	Casing	Sampler	Core Barrel
Type	HSA	SS	
Inside Diameter (in.)	2.5	1.375	
Hammer Weight (lb.)		140	
Hammer Fall (in.)		30	

Rig Make & Model: Mobile B53

- ☑ Truck ☐ Tripod ☐ Cat-Head
- ☐ ATV ☐ Geoprobe ☑ Winch
- ☐ Track ☐ Air Track ☐ Roller Bit
- ☐ Skid ☐ ☑ Cutting Head

Hammer Type: ☑ Safety ☐ Doughnut ☐ Automatic

Drilling Mud: ☐ Bentonite ☐ Polymer ☑ None

Casing Advance: Type Method Depth — HSA/SPIN/11.6

Drilling Notes:

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)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test: Dilatancy	Toughness	Plasticity	Strength
0	7	S1	0.0			GW	Medium dense, brown well-graded GRAVEL with sand (GW), mps = 1.5 in., moist	30	25	20	15	10					
	7				1.8		-FILL-										
	7					SW	Medium dense, dark brown well-graded SAND with gravel (SW), mps = 1.3 in., bituminous concrete fragments, moist to wet	15	20	20	25	15	5				
	7	6	2.0														
					4.0		-FILL-										
5	3	S2	5.0			SP	Medium dense, yellow-brown to tan poorly-graded SAND (SP), mps = 3 mm, moist			5	25	70					
	5																
	6																
	6	21	7.0				-GLACIAL OUTWASH DEPOSITS-										
10	7	S3	10.0		10.2												
	50/5"	11	10.9		10.9		Medium dense, yellow-brown to olive-brown silty SAND with gravel (SM), mps = 1.0 in., wet -GLACIAL TILL DEPOSITS-	10	10	15	20	25	20				
					11.6		Note: weathered bedrock in auger cuttings -WEATHERED BEDROCK-										
							HSA refusal at 11.6 ft.										
							Bottom of exploration at 11.6 ft. below ground surface										
15																	
20																	
25																	
30																	

Water Level Data

Date	Time	Elapsed Time (hr.)	Depth in feet to: Bottom of Casing	Bottom of Hole	Water
3/26/2010	1150	--	--	9.9	8.3

Sample ID

- O Open End Rod
- T Thin Wall Tube
- U Undisturbed Sample
- S Split Spoon Sample
- G Geoprobe
- FV Field Vane

Well Diagram

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

Summary

Overburden (Linear ft.)	10.9
Rock Cored (Linear ft.)	--
Number of Samples	3S
BORING NO.	B105

Field Tests

Dilatancy: R - Rapid S - Slow N - None

Toughness: L - Low M - Medium H - High

Plasticity: N - Nonplastic L - Low M - Medium H - High

Dry Strength: N - None L - Low M - Medium H - High V - Very High

*NOTE: Maximum Particle Size is determined by direct observation within the limitations of sampler size.

NOTE: Soil identifications based on visual-manual methods of the USCS system as practiced by Sebago Technics, Inc.

SEBAGO TECHNICS, INC.

TEST BORING REPORT

BORING NO. **B106**

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PROJECT	OFFICE BUILDING	STI JOB NO.	10043
LOCATION	57 YORK STREET, PORTLAND, MAINE	PROJECT MGR.	K. RECKER
CLIENT	J. B. BROWN & SONS	FIELD REP.	R. ESTES
CONTRACTOR	MAINE TEST BORINGS, INC.	DATE STARTED	3/26/2010
DRILLER	M. PORTER	DATE FINISHED	3/26/2010

Elevation ft. Datum — Boring Location See Plan

Item	Casing	Sampler	Core Barrel
Type	HSA	SS	
Inside Diameter (in.)	2.5	1.375	
Hammer Weight (lb.)		140	
Hammer Fall (in.)		30	

Rig Make & Model: Mobile B53

- ☑ Truck ☐ Tripod ☐ Cat-Head
- ☐ ATV ☐ Geoprobe ☑ Winch
- ☐ Track ☐ Air Track ☐ Roller Bit
- ☐ Skid ☑ Cutting Head

Hammer Type: ☑ Safety ☐ Doughnut ☐ Automatic

Drilling Mud: ☐ Bentonite ☐ Polymer ☑ None

Casing Advance: Type Method Depth — HSA/SPIN/10.0

Drilling Notes:

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)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
0	1	S1	0.0			SW	Loose, dark brown to brown well-graded SAND with gravel (SW), mps = 1.3 in., moist	20	15	15	25	25					
	1																
	8																
	11	13	2.0														
							-FILL-										
					3.0												
5	14	S2	5.0			SM-SP	Medium dense, olive-brown to yellow-brown silty SAND with gravel (SM), interbedded with poorly-graded SAND (SP), mps = 1.25 in., moist to wet	10	10	10	20	30	20				
	16																
	12																
	25	9	7.0														
							-GLACIAL OUTWASH DEPOSITS-										
10	5	S3	10.0		10.3	SP-SM	Similar to S2 from 10.0 to 10.3 ft.										
	4					SP	Loose, yellow-brown poorly-graded SAND (SP), occasional silt seams, mps = 1.0 in., wet				5	90	5				
	5																
	4	20	12.0				-GLACIAL OUTWASH DEPOSITS-										
							Bottom of exploration at 12.0 ft. below ground surface										
							No refusal										
15																	
20																	
25																	
30																	

Water Level Data

Date	Time	Elapsed Time (hr.)	Depth in feet to: Bottom of Casing	Bottom of Hole	Water
3/26/2010	1110	--	10.0	10.2	7.7
3/26/2010	1115		--	9.1	7.3

Sample ID

O	Open End Rod
T	Thin Wall Tube
U	Undisturbed Sample
S	Split Spoon Sample
G	Geoprobe
FV	Field Vane

Well Diagram

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

Summary

Overburden (Linear ft.)	12.0
Rock Cored (Linear ft.)	--
Number of Samples	3S
BORING NO.	B106

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

*NOTE: Maximum Particle Size is determined by direct observation within the limitations of sampler size.

NOTE: Soil identifications based on visual-manual methods of the USCS system as practiced by Sebago Technics, Inc.

SEBAGO TECHNICS, INC.

TEST BORING REPORT

BORING NO. **B107**

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PROJECT	OFFICE BUILDING	STI JOB NO.	10043
LOCATION	57 YORK STREET, PORTLAND, MAINE	PROJECT MGR.	K. RECKER
CLIENT	J. B. BROWN & SONS	FIELD REP.	R. ESTES
CONTRACTOR	MAINE TEST BORINGS, INC.	DATE STARTED	3/26/2010
DRILLER	M. PORTER	DATE FINISHED	3/26/2010

Elevation ft. Datum — Boring Location See Plan

Item	Casing	Sampler	Core Barrel
Type	HSA	SS	
Inside Diameter (in.)	2.5	1.375	
Hammer Weight (lb.)		140	
Hammer Fall (in.)		30	

Rig Make & Model: Mobile B53

- [x] Truck
- [ ] Tripod
- [ ] ATV
- [ ] Geoprobe
- [ ] Track
- [ ] Air Track
- [ ] Skid
- [ ] Cat-Head
- [x] Winch
- [ ] Roller Bit
- [x] Cutting Head

Hammer Type: [x] Safety [ ] Doughnut [ ] Automatic

Drilling Mud: [ ] Bentonite [ ] Polymer [x] None

Casing Advance: Type Method Depth — HSA/SPIN/25.0

Drilling Notes:

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)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
0	16	S1	0.0			SW	Medium dense, brown well-graded SAND with gravel (SW), mps = 1.0	20	15	20	30	15					
	17						in., brick, concrete and bituminous concrete fragments, moist										
	12																
	8	13	2.0				-FILL-										
					3.5												
5	4	S2	5.0			SP-SW	Loose, yellow-brown to tan poorly-graded SAND (SP), interbedded with		5	15	30	50					
	5						well-graded SAND (SW), mps = 0.25 in., moist										
	5																
	6	16	7.0														
							-GLACIAL OUTWASH DEPOSITS-										
10	6	S3	10.0			SW	Medium dense, yellow-brown to tan well-graded SAND (SW), mps =		5	25	40	30					
	8						0.25 in., moist										
	9																
	12	15	12.0				-GLACIAL OUTWASH DEPOSITS-										
15	5	S4	15.0			SW	Medium dense, yellow-brown well-graded SAND (SW), mps = 0.25 in.,		5	25	40	30					
	7						wet										
	8																
	9	18	17.0				-GLACIAL OUTWASH DEPOSITS-										
					18.3												
20	11	S5	20.0			SM	Dense, gray silty SAND with gravel (SM), mps = 1.3 in., moist to wet,	10	10	15	20	25	20				
	16						slightly bonded										
	15																
	5	18	22.0				-GLACIAL TILL DEPOSITS-										
25	50/5"	S6	25.0		25.2		Similar to S5 from 25.0 to 25.2 ft.										
		5	25.4		25.4	SP	Dense, light brown poorly-graded SAND (SP), mps = 4 mm, wet				5	90	5				
							-GLACIAL TILL DEPOSITS-										
							Split-spoon refusal at 25.4 ft. on probable bedrock										
							Bottom of exploration at 25.4 ft. below ground surface										
30																	

Water Level Data

Date	Time	Elapsed Time (hr.)	Depth in feet to: Bottom of Casing	Bottom of Hole	Water
3/26/2010	0855		15.0	15.0	14.3
3/26/2010	0920		--	14.0	Dry

Sample ID

O	Open End Rod
T	Thin Wall Tube
U	Undisturbed Sample
S	Split Spoon Sample
G	Geoprobe
FV	Field Vane

Well Diagram

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

Summary

Overburden (Linear ft.)	25.4
Rock Cored (Linear ft.)	--
Number of Samples	6S
BORING NO.	B107

Field Tests

Dilatancy: R - Rapid S - Slow N - None

Toughness: L - Low M - Medium H - High

Plasticity: N - Nonplastic L - Low M - Medium H - High

Dry Strength: N - None L - Low M - Medium H - High V - Very High

*NOTE: Maximum Particle Size is determined by direct observation within the limitations of sampler size.

NOTE: Soil identifications based on visual-manual methods of the USCS system as practiced by Sebago Technics, Inc.