SUMMIT
GEOENGINEERING SERVICES

GEOTECHNICAL REPORT

Proposed Hampton Inn Hotel
1200 Brighton Ave.
Portland, Maine

Prepared for:

Archetype Architects
48 Union Wharf
Portland, Maine 04101

Prepared by:

Summit Geoengineering Services
145 Lisbon St.
Lewiston, Maine

Project #15287
February 2016

SUMMIT
GEOENGINEERING SERVICES

February 11, 2016
SGS #15287

Archetype Architects
Attn: Bill Hopkins
48 Union Wharf
Portland, Maine 04101

Reference: Geotechnical Report, Proposed Hampton Inn Hotel
1200 Brighton Ave, Portland, Maine

Dear Bill;

Summit Geoengineering Services, Inc. (SGS) has completed a geotechnical investigation for the proposed hotel at the site referenced above. Our scope of services included the drilling of 4 borings within the proposed addition footprint and preparing this geotechnical report summarizing our findings and providing geotechnical recommendations.

Our scope of services for this project did not include an environmental site assessment or further investigation for the presence or absence of hazardous or toxic material on, below, or around the site. Any statements in this report, or on the soil boring logs, regarding odors or unusual and suspicious conditions observed are for informational purposes and are not intended to constitute an environmental assessment.

1.0 Project Description

The project consists of the construction of a new 4-story Hampton Inn Hotel. We understand that the new building has a footprint of approximately 7,000 square feet, will be wood-framed, and have a finish floor elevation of approximately 98 feet. We further understand that the new hotel will be slab-on-grade construction and will include an indoor pool on the first floor. Based on discussions with Structural Integrity, Inc. the following preliminary design loads are anticipated for the new structure:

Column Loads = Ranges from 60 to 75 kips (Dead and Live loads)
Line Loads = Ranges from 3.0 to 3.5 kip/linear foot (Live load only)

The site is located at the intersection of Brighton Avenue and Riverside Street in Portland, Maine, directly north of the inactive rock quarry. Currently, the site contains two Travel Lodge hotel buildings, oriented perpendicular to each other. There is also paved parking around both of the buildings and an exterior pool located between the two buildings. The proposed Hampton Inn hotel structure is located towards the southern portion of the site and overlaps part of the existing Travel Lodge structure oriented north-south. Grades within the area of the proposed structure are relatively flat and range from elevation 97 feet to 98 feet.

2.0 Exploration

2.1 Exploration

SGS observed the subsurface conditions at the site with the drilling of 4 borings on February 4, 2016. All explorations were performed by SGS using a Power Probe 9500-VTR tracked drill rig. Three of the four borings were drilled to refusal, ranging in depth from 18.3 feet to 41.3 feet below ground surface. The fourth boring (B-2) was terminated in the dense sand layer at a depth of 22 feet. All borings were advanced using 2 ¼" inside diameter hollow stem auger. During the borings, split spoon sampling was conducted in general accordance with ASTM D1586 to collect blow counts and soil samples.

Locations of the borings were marked by SGS prior to drilling by measuring from surrounding landmarks. These locations can be seen in the SGS Exploration Plan in Appendix A. The boring logs can be found in Exploration Logs in Appendix B.

3.0 Subsurface Conditions

3.1 Soil

The following subsurface layers and thicknesses were encountered in our geotechnical investigation, starting from the ground surface:

- Pavement, 4 inches (Boring B-1 and B-2 only)
- Topsoil, 6 inches to 12 inches (Boring B-3 and B-4 only)
- Fill, 9 feet to 24 feet (see table below for boring-specific depths)
- Native Sand, 8.5 feet to 16.9 feet
- Bedrock/Dense Refusal, 18.5 feet to 41.3 feet depth

3.1.1 Pavement. The pavement at the site was encountered at the Boring B-1 and B-2 locations and is 4" thick.

3.1.2 Topsoil. The topsoil at the site was encountered in Borings B-3 and B-4 (where the pavement wasn't present) and is described as dark brown fine sandy silt with roots, rootlets, and organic matter. The topsoil is loose, humid (upper portions frozen during the explorations), and classifies as ML in accordance with the Unified Soil Classification System (USCS).

3.1.3 Fill. The fill at the site varied significantly in composition and thickness between the explorations. In general, 3 different fill layers were encountered. Starting from the ground surface, the fill consisted of the following:

The uppermost fill layer was encountered in all of the borings except for B-4 and consists of light to dark brown silt with little to some sand and gravel. Standard Penetration Blow Counts (SPT-N) in this layer range from 6 to 29 with an average of 17. This layer of fill was likely

placed for the construction of the pavement or to raise the grade in lawn areas. It is humid to moist, loose to compact, and classifies a ML or SM in accordance with USCS.

The middle fill layer, encountered in all of the borings except for Boring B-4, consists of gray-blue silt with trace to little clay and sand and no to little gravel. This fill is humid, loose to compact, and SPT-N in this layer ranges from 5 to 10 and averages 8. It classifies as ML in accordance with USCS.

The bottom fill layer was only encountered in Boring B-1B and is described as olive gray to black silty clay with intermixed organics, brick and metal pieces with occasional fine sand/silt seams. The layer starts at depth 7.5 feet and extends to 24 feet below ground surface. Silt/sand seams encountered at 15.5' and 16.2' contained a strong petroleum odor. For samples which had enough cohesion to perform pocket penetrometer tests (a rough estimate of unconfined compressive strength), values ranged from 1,000 psf to 5,500 psf. SPT-N in the layer ranged from 2 to 8 with an average of 5.

The middle and bottom two fill layers, which are predominantly fine-grained soils, were likely a product of the nearby quarry pit with some miscellaneous intermixed debris. The following table summarizes the fill thicknesses encountered in the borings:

FILL THICKNESSES				
Fill Layer	**Boring Locations**			
	B-1	**B-2**	**B-3**	**B-4**
Upper	1.5'	2'	3.5'	N/A
Middle	5'	17'	5.5'	9'
Bottom	17'	N/A	N/A	N/A

3.1.4 Native Sand. The native sand was encountered in all of the borings at depths ranging from 9.5 to 24.5 feet below ground surface and is described as white to light brown fine to coarse sand with trace to little silt. The layer ranges in thickness from 8.5 feet to 16.9 feet, directly overlies bedrock, and contains cobble/boulders throughout. SPT-N in the layer ranges from 21 to 44 and averaged 33. It classifies as SP-SM in accordance with USCS.

3.2 Groundwater

On the day of the explorations, groundwater was not observed in any of the borings. Water indicated on the boring logs was encountered in confined seams at depths greater than 15 feet in Boring B-1. It is likely that this water is infiltrated surface water restricted to within these seams. We anticipate that groundwater is present at the bedrock surface.

3.3 Bedrock

Auger refusal, presumed to be bedrock, was encountered at the site ranging from 18.5 feet to 41.3 feet below existing ground surface. Bedrock is shallower at the southern portion of the site, adjacent to the bedrock quarry, and slopes down in a northerly direction. Mapping by the Maine

Geological Survey indicates the bedrock is part of the Berwick Formation (SOb) consisting of fine-grained medium gray quartz-plagioclase biotite gneiss and granofels.

4.0 Evaluation

For the proposed development at the site, the primary geotechnical concerns are as follows:

- Presence of fill of miscellaneous composition in the northeast corner of the proposed building, starting at a depth of approximately 5 feet below ground surface and extending to 24 feet.
- Presence of relatively loose existing fill throughout the building footprint at the anticipated bottom of footing (BOF) elevation, creating the potential for immediate settlement issues.
- Existing structures/foundations within the proposed building footprint.
- Potential for erosion or global stability concerns due to close proximity to the steep-sloped rock quarry pit.

Soft, unsuitable fill soils were encountered in Boring B-1A and B-1B near the northeast corner of the proposed hotel building, starting at a depth of approximately 5 feet. The fill consists of large wood pieces, organics, soft clay, and intermixed brick/metal pieces. These types of materials are compressible and are prone to long-term degradation and it is undesirable to have them directly beneath footings or slabs. Based on our explorations, we anticipate that these soft, unsuitable soils are confined to an area near the northeast corner of the building. We provide subgrade preparation recommendations in Section 5.1.

We recommend that all wood pieces and soft/organic soils be removed from beneath all footings. We anticipate that some removal and replacement will be required for footings near the northeast corner of the building (proximity of Borings B-1A and B-1B). We are unsure of the extent or depth of the wood and soft/organic soils. We recommend that SGS be retained to perform a subgrade inspection for the footing trenches in the northeast corner of the building to determine the depth and lateral extent of over excavation that is required.

Throughout most of the proposed building footprint, a loose, blue-gray silt fill soil was found at or near the proposed BOF elevation. This silt fill is likely a product of the nearby quarry pit. With proper proofrolling and subgrade preparation methods (as presented in Section 5.1), the footings for the new building can be constructed on geotextile and crushed stone which is placed directly on top of the silt fill.

Based on building layout concepts provided to us, the proposed hotel building footprint will overlap part of the existing Travel Lodge building oriented north-south as well as portions of the existing parking lot and the exterior pool. As discussed in Section 5.1, we recommend that all existing structures, foundation elements, pavement, and miscellaneous tanks/assemblies be removed in their entirety from within the proposed building footprint.

Localized surface erosion near the edge of the quarry (similar to the landslide visible at the time of our explorations on the west side of the quarry) can be detrimental to building foundations. Furthermore, since there is overburden soil on top of the bedrock near the edge of the quarry,

global stability becomes a potential concern for the new construction. Based on building layout concepts provided to us, the proposed hotel building footprint is located at least 40 feet away from the edge of the quarry pit to the south of the site. This 40 foot requirement is also set forth in the 2015 IBC building code. As long at this 40' distance is maintained, global stability will not be a concern for the new construction.

5.0 Foundation Recommendations

5.1 Allowable Bearing Pressure

If the recommendations from this report are followed, the new hotel can be constructed using conventional shallow footings and slab-on-grade construction. Based on our explorations and an approximate proposed finish floor elevation of 98 feet, we anticipate that all interior and exterior footings will be supported on existing silt fill. We recommend that all footings be proportioned using a maximum allowable bearing pressure of 2,000 psf. Total settlement is expected to be less than 1.0" and differential settlement is expected to remain within tolerable limits. The allowable bearing pressure above is based on the following conditions:

- All existing structures, foundation elements, pavement, pools, topsoil, and miscellaneous tanks/assemblies/drainage structures are removed in their entirety from within the proposed building footprint. Any voids created by the removal of these elements should be backfilled with Structural Fill (SF, see Section 5.2 for gradation requirements), placed in maximum 12" lifts and compacted to 95% of the optimum dry density in accordance with ASTM D1557.
- All exterior footings exposed to freezing temperatures are constructed at a depth of 3' below exterior finish grade, constructed on a minimum of 12" of ¾" crushed stone wrapped in geotextile fabric.
- All interior footings in heated areas are constructed a minimum of 2 feet below finished floor elevation. Interior footings should also be constructed on a minimum of 12" of ¾" crushed stone wrapped in geotextile fabric.
- Exposed soil at the bottom of footing excavations is proofrolled with a minimum of 4 passes with a 3 ton (minimum operating weight) vibratory plate compactor. Proofrolling should be performed on dry, unfrozen soils. If soft or unsuitable soil is encountered at the bottom of the excavation, it should be removed and replaced with ¾" crushed stone prior to proofrolling. If significant amounts of soft, unsuitable soils are encountered, SGS should be notified.
- Footing trenches near the northeast corner of the proposed building corner should be monitored carefully for soft, unsuitable soils. SGS should be retained to perform a subgrade inspection for the footing trenches in this area prior to the placement of geotextile and crushed stone.
- All placed fill within the building footprint consists of Structural Fill (SF) or ¾" crushed stone. SF should be placed in a maximum of 12" lifts and compacted to 95% of its optimum dry density in accordance with ASTM D1557. Crushed stone should also be placed in 12" maximum lifts and compacted with a walk-behind plate compactor.

5.2 Slab-on-Grade

5.2.1 Building Slab

We understand that the proposed finish floor is approximately elevation 98 feet. Based on this, we anticipate that existing silt fill will be exposed in the slab excavation. We recommend that the building slab be constructed on a minimum of 12" of SF. All existing structures, foundation elements, pavement, pools, topsoil, and miscellaneous tanks/assemblies/drainage structures are removed in their entirety from within the proposed building slab footprint. Any voids created by the removal of these elements should be backfilled with SF (Structural Fill, see table below for gradation requirements), placed in maximum 12" lifts and compacted to a minimum of 95% of its optimum dry density in accordance with ASTM D1557.

5.2.2 Exterior Slabs

Exterior concrete slabs should be constructed on a minimum of 30" of Structural Fill (SF). Soil exposed in the excavation below the SF for the exterior slabs should be proofrolled with a minimum of 4 passes in each of two perpendicular directions with a 5 ton minimum (operating weight) roller or a heavy plate compactor. Any exposed soft or unsuitable soil should be removed and replaced with ¾" crushed stone or compacted SF.

The portion of SF passing the 3" sieve shall meet the following gradation requirements:

STRUCTURAL FILL (SF)	
Sieve Size	**Percent finer**
3 inch	100
½ inch	35 to 80
¼ inch	25 to 65
No. 40	0 to 30
No. 200	0 to 7

Reference: MDOT Specification 703.06, Type D

The maximum particle size should be limited to 4 inches. Structural Fill should be placed in 6 to 12 inch lifts and should be compacted to a minimum of 95% of its maximum dry density, determined in accordance with ASTM D1557.

For the conditions described above, the slab can be designed using a subgrade modulus value of 150 pci.

Exterior slabs attached to the building should be constructed on frost wall foundations to preclude differential movement between the building threshold and the entry pad, which could block doors.

5.3 Frost Protection and Foundation Backfill

The design air freezing index for the Portland area is approximately 1,200 degree F days (10 year, 90% probability). Based on this, a total of 4 feet of frost protection should be provided for the exterior footings. Since the footings will be constructed on 12 inches of drained crushed stone, the bottom of exterior footings should be constructed at a depth of 3 feet below the exterior finished grade. The intent of reducing the depth of the footings is to provide a contact buffer between the bottom of footing and existing fill soil to reduce the applied pressure.

We recommend that the exterior of all foundation elements exposed to freezing temperatures be backfilled with Foundation Backfill (FB). The interior of all foundation elements should be backfilled with SF. The portion of FB passing the 3" sieve size should meet the following gradation requirements:

FOUNDATION BACKFILL (FB)	
Sieve Size	**Percent finer**
3 inch	100
¼ inch	25 to 100
No. 40	0 to 50
No. 200	0 to 7

Reference: MDOT Specification 703.06, Type E

Maximum particle size should be limited to 6 inches. Foundation backfill should be placed in 6 to 12 inch lifts and compacted to 95% of its optimum dry density determined in accordance with ASTM D1557.

5.4 Seismic Site Class and Design Criteria

Based on the blow counts measured during the boring explorations, the site classifies as Site Class D "stiff soil" in accordance with the 2012 International Building Code. The following seismic site coefficients should be used:

SEISMIC DESIGN COEFFICIENTS – 2012 IBC	
Seismic Coefficient	**Site Class D**
Short period spectral response (S_S)	0.246
1 second spectral response (S_1)	0.079
Maximum factored spectral response (S_{MS})	0.393
1 second factored spectral response (S_{M1})	0.190
Design short period spectral response (S_{DS})	0.262
Design 1 second spectral response (S_{D1})	0.127

No liquefiable soils were encountered in our subsurface exploration.

5.5 Groundwater Considerations

Groundwater was not encountered in any of the borings on the day of our explorations. We anticipate that groundwater is below the bedrock surface.

In order to account for changes in local and regional hydrology, infiltration of stormwater, and to ensure the 12" layer of crushed stone remains dry, we recommend that perimeter underdrains be included in the construction of the hotel. We recommend that underdrains consist of 4-inch diameter, perforated PVC pipe surrounded by a minimum of 6 inches of crushed stone wrapped in filter fabric. The underdrains should be placed at the base of the foundation and outlet to a free draining location or pumped if necessary.

6.0 Construction Consideration

Based on the groundwater levels observed from our explorations, we do not anticipate that groundwater will be encountered within the building excavations during construction. Diversion and control of surface water should be performed to prevent water flow from adjacent wet areas or from rain or snowmelt from entering the excavations.

We recommend that all wood pieces and soft/organic soils be removed from beneath all footings. We anticipate that some removal and replacement will be required for footings near the northeast corner of the building (proximity of Borings B-1A and B-1B). We are unsure of the extent or depth of the wood and soft/organic soils. We recommend that SGS be retained to perform a subgrade inspection for the footing trenches in the northeast corner of the building to determine the depth and lateral extent of over excavation that is required.

The silt fill subgrade is susceptible to softening if it is disturbed when wet. Disturbed, wet, and soft areas beneath the foundations should be removed and replaced with SF, ¾" crushed stone, and/or geotextile.

Footings and slabs should not be constructed on frozen soils. All frozen soil should be removed and replaced with compacted SF, and should not be allowed to re-freeze prior to concrete placement. After concrete has been placed, the subgrade should be protected from freezing using soil cover or insulated blankets.

Due to the high fines content, native soils and existing fill at the site is not suitable for reuse as SF or FB.

All existing structures, foundation elements, pavement, pools, topsoil, and miscellaneous tanks/assemblies/drainage structures are removed in their entirety from within the proposed building footprint. Any voids created by the removal of these elements should be backfilled with SF placed in maximum 12" lifts and compacted to 95% of the optimum dry density in accordance with ASTM D1557.

Excavations deeper than 4 feet should be sloped no greater than 1.5H to 1V for fill or previously disturbed soils. These slopes are based on the current OSHA Excavation Guidelines.

7.0 Closure

Our recommendations are based on professional judgment and generally accepted principles of geotechnical engineering. Some changes in subsurface conditions and the proposed development at the site from those presented in this report may occur. Should these conditions differ materially from those described in this report, or should building loads and configurations change significantly, SGS should be notified so that we can re-evaluate our recommendations. The final foundation plan should be made available to SGS for review to confirm its accordance with the recommendations in this report.

We recommend that SGS be retained to perform a subgrade inspection for the footing excavation in the northeast corner of the building prior to placement of the geotextile and crushed stone. We further recommend that a qualified geotechnical consultant be retained to monitor and test soil materials used during construction and confirm that soil conditions and construction methods are consistent with this report.

We appreciate the opportunity to serve you during this phase of your project. If there are any questions or additional information is required, please do not hesitate to call.

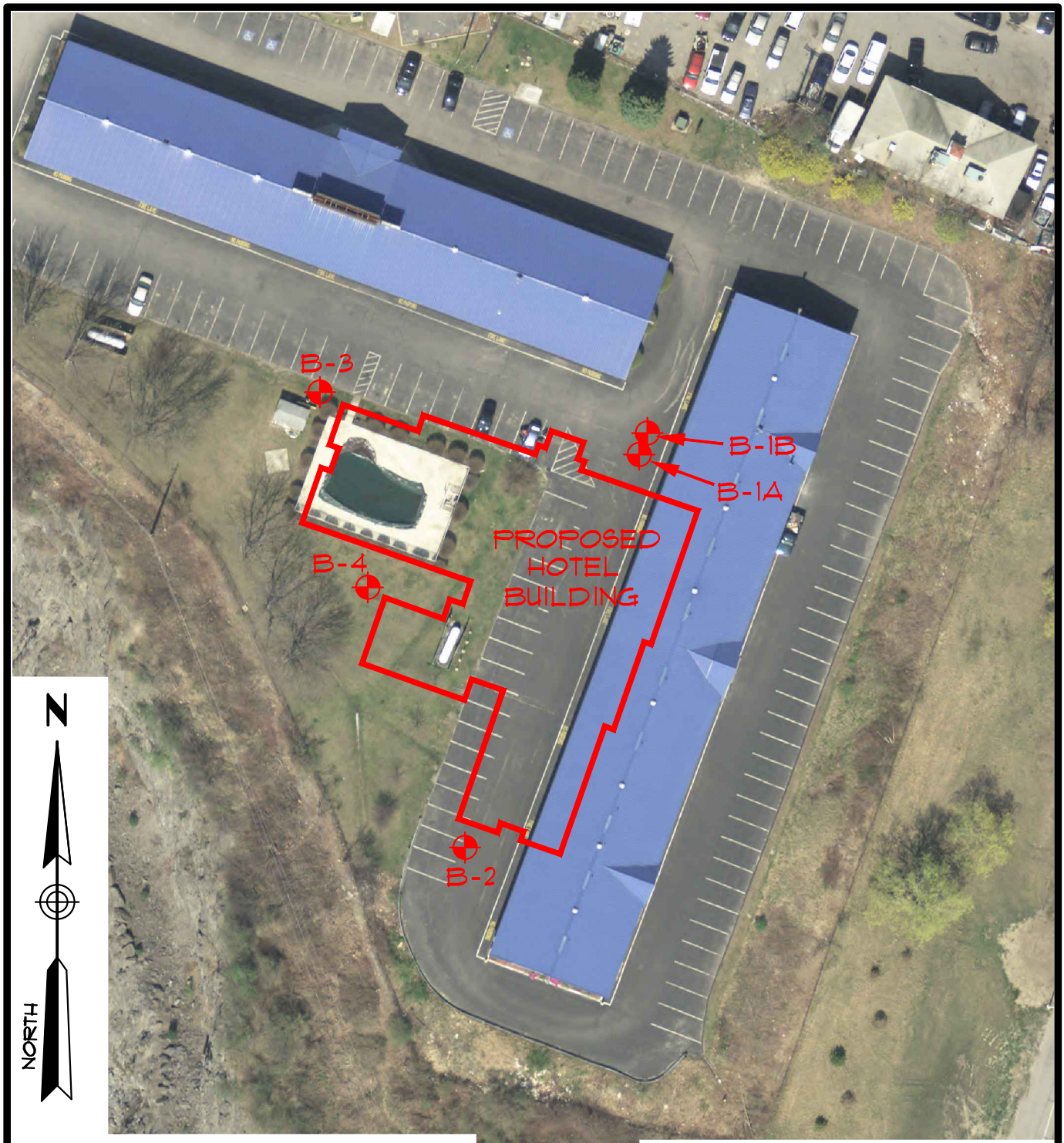
Sincerely,
Summit Geoengineering Services, Inc.

Mathew Hardison, EI
Geotechnical Engineer

William M. Peterlein, PE
Principal Geotechnical Enginee

APPENDIX A

BORING LOCATION PLAN



PLAN REFERENCE

AERIAL IMAGE (2012) WAS OBTAINED FROM MAINE OFFICE OF G.I.S.

LEGEND

B-2 SUMMIT TEST BORING (FEBRUARY 4, 2016)

TEST BORING LOCATION PLAN
PROPOSED HAMPTON INN

1200 BRIGHTON AVENUE - PORTLAND, MAINE

PREPARED FOR

ARCHETYPE

DATE: FEB. 11, 2016	DRAWN BY: KRF	CHECKED BY: WMP
JOB: 15287	SCALE: 1" = 60'	FILE: 15287 BOR

145 LISBON ST. - SUITE 601
LEWISTON, ME 04240
Tel.: (207) 576-3313

173 PLEASANT STREET
ROCKLAND, ME 04841
Tel.: (207) 318-7761

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APPENDIX B

BORING LOGS

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EXPLORATION COVER SHEET

The exploration logs are prepared by the geotechnical engineer from both field and laboratory data. Soil descriptions are based upon the Unified Soil Classification System (USCS) per ASTM D2487 and/or ASTM D2488 as applicable. Supplemental descriptive terms for estimated particle percentage, color, density, moisture condition, and bedrock may also be included to further describe conditions.

Drilling and Sampling Symbols:

SS = Split Spoon Sample
UT = Thin Wall Shelby Tube
SSA = Solid Stem Auger
HSA = Hollow Stem Auger
RW = Rotary Wash
SV = Shear Vane
PP = Pocket Penetrometer
RC = Rock Core Sample
Hyd = Hydraulic Advancement of Drilling Rods
Push = Direct Push of Drilling Rods
WOH = Weight of Hammer
WOR = Weight of Rod
PI = Plasticity Index
LL = Liquid Limit
W = Natural Water Content
USCS = Unified Soil Classification System

Water Level Measurements:

Water levels indicated on the boring logs are the levels measured in the boring at the times indicated. In pervious soils, the indicated elevations are considered reliable groundwater levels. In impervious soils, the accurate determination of groundwater elevations may not be possible, even after several days of observations. Groundwater monitoring wells may be required to record accurate depths and fluctuation.

Gradation Description and Terminology:

Boulders:	Over 12 inches	Trace:	Less than 5%
Cobbles:	12 inches to 3 inches	Little:	5% to 15%
Gravel:	3 inches to No.4 sieve	Some:	15% to 30%
Sand:	No.4 to No. 200 sieve	Silty, Sandy, etc.:	Greater than 30%
Silt:	No. 200 sieve to 0.005 mm		
Clay:	less than 0.005 mm		

Density of Granular Soils and Consistency of Cohesive Soils:

CONSISTENCY OF COHESIVE SOILS		DENSITY OF GRANULAR SOILS	
SPT N-value blows/ft	**Consistency**	**SPT N-value blows/ft**	**Relative Density**
0 to 2	Very Soft	0 to 4	Very Loose
2 to 4	Soft	5 to 10	Loose
5 to 8	Firm	11 to 30	Compact
9 to 15	Stiff	31 to 50	Dense
16 to 30	Very Stiff	>50	Very Dense
>30	Hard		

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SOIL BORING LOG

Project:	Proposed Hampton Inn	Boring #:	B-1A
Location:	1200 Brighton Ave.	Project #:	15287
City, State:	Portland, ME	Sheet:	1 of 2
		Chkd by:	

Drilling Co:	Summit Geoengineering Services	Boring Elevation:	99.0 ft. +/-
Driller:	C. Coolidge, P.E.	Reference:	"Boundary & Topographic Survey" by Owen Haskell, Inc. dated 7/2/14
Summit Staff:	M. Hardison, E.I.	Date started: 2/4/2016	Date Completed: 2/4/2016

DRILLING METHOD		SAMPLER	
Vehicle:	Tracked	Length:	24" SS
Model:	AMS Power Probe	Diameter:	2"OD/1.5"ID
Method:	H.S.A.	Hammer:	140 lb
Hammer Style:	Auto	Method:	ASTM D1586

ESTIMATED GROUND WATER DEPTH

Date	Depth	Elevation	Reference
2/4/2016	-	-	dry to bottom of hole, augers pulled

Depth (ft.)	No.	Pen/Rec (in)	Depth (ft)	blows/6"	N_{60}	SAMPLE DESCRIPTION	Geological/ Test Data	Geological Stratum
						4" Pavement		PAVEMENT
1	S-1	24/16	0.5 to 2.5	4		Light brown Silty fine to medium SAND, trace fine		
				13		Gravel, humid, dense, SM		FILL
2				10				
				8				
3								
4								
5								
	S-2	24/3	5 to 7	23		Wood (likely buried stump or tree trunk)		
6				50/4"				
						Unsuccessful attempt to auger through wood, moved rig		
7						ahead 5 feet, see Boring B-1B for new location.		
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								

Granular Soils		Cohesive Soils		% Composition
Blows/ft.	Density	Blows/ft.	Consistency	ASTM D2487
0-4	V. Loose	<2	V. soft	
5-10	Loose	2-4	Soft	< 5% Trace
11-30	Compact	5-8	Firm	5-15% Little
31-50	Dense	9-15	Stiff	15-30% Some
>50	V. Dense	16-30	V. Stiff	> 30% With
		>30	Hard	

NOTES: PP = Pocket Penetrometer, MC = Moisture Content
LL = Liquid Limit, PI = Plastic Index

Bedrock Joints
Shallow = 0 to 35 degrees
Dipping = 35 to 55 degrees
Steep = 55 to 90 degrees

Boulders = diameter > 12 inches, Cobbles = diameter < 12 inches and > 3 inches
Gravel = < 3 inch and > No 4, Sand = < No 4 and >No 200, Silt/Clay = < No 200

Soil Moisture Condition
Dry: S = 0%
Humid: S = 1 to 25%
Damp: S = 26 to 50%
Moist: S = 51 to 75%
Wet: S = 76 to 99%
Saturated: S = 100%

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SOIL BORING LOG

Boring #: **B-1B**

Project:	Proposed Hampton Inn	Project #:	15287
Location:	1200 Brighton Ave.	Sheet:	2 of 2
City, State:	Portland, ME	Chkd by:	

Drilling Co:	Summit Geoengineering Services	Boring Elevation:	99.0 ft. +/-
Driller:	C. Coolidge, P.E.	Reference:	"Boundary & Topographic Survey" by Owen Haskell, Inc. dated 7/2/14
Summit Staff:	M. Hardison, E.I.	Date started: 2/4/2016	Date Completed: 2/4/2016

DRILLING METHOD		SAMPLER	
Vehicle:	Tracked	Length:	24" SS
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Method:	H.S.A.	Hammer:	140 lb
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Date	Depth	Elevation	Reference
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Depth (ft.)	No.	Pen/Rec (in)	Depth (ft)	blows/6"	N_{60}	SAMPLE DESCRIPTION	Geological/ Test Data	Geological Stratum
1						See Boring B-1A		
2								
3								
4								
5								
	S-2	24/18	5 to 7	2		Dark gray Clayey SILT, little Sand and Gravel, trace		
6				3		rootlets and organics, humid, loose, ML, possible		FILL
				3		quarry spoils		
7				6				
8								
9								
10								
	S-3	24/18	10 to 12	1		Gray Silty CLAY, soft, intermixed Sand and Gravel,	PP = 1,000 to	
11				1		damp, CL	1,500 psf	
				1		Brown SILT, organics and rootlets, little Sand and Clay,		
12				2		humid to damp, very loose, ML		
13								
14								
15								
	S-4	24/14	15 to 17	1		Olive gray Silty CLAY, soft to firm, Silt/Sand seams at	PP = 3,000 psf	
16				2		15.5' and 16.2' depth, oil sheen in water from seam	to 5,500 psf	
				4		at 15.5'		
17				4		Black SAND, very strong petroleum odor, loose, wet,		
18						SP		
19								
20								
	S-5	24/6	20 to 22	1		Black to dark gray Silty CLAY, intermixed brick and		
21				4		metal pieces, soft to firm, damp, CL		
				4				
22				2				
						Rod probed to refusal, increased resistance at 24.5'		
41						End of Probe at 41.3' depth, Probe refusal		BEDROCK

Granular Soils		Cohesive Soils		% Composition
Blows/ft.	Density	Blows/ft.	Consistency	ASTM D2487
0-4	V. Loose	<2	V. soft	
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Humid: S = 1 to 25%
Damp: S = 26 to 50%
Moist: S = 51 to 75%
Wet: S = 76 to 99%
Saturated: S = 100%

SUMMIT
GEOENGINEERING SERVICES

SOIL BORING LOG

Project:	Proposed Hampton Inn	Boring #:	B-2
Location:	1200 Brighton Ave.	Project #:	15287
City, State:	Portland, ME	Sheet:	1 of 1
		Chkd by:	

Drilling Co:	Summit Geoengineering Services	Boring Elevation:	98.5 ft. +/-
Driller:	C. Coolidge, P.E.	Reference:	"Boundary & Topographic Survey" by Owen Haskell, Inc. dated 7/2/14
Summit Staff:	M. Hardison, E.I.	Date started: 2/4/2016	Date Completed: 2/4/2016

DRILLING METHOD		SAMPLER	
Vehicle:	Tracked	Length:	24" SS
Model:	AMS Power Probe	Diameter:	2"OD/1.5"ID
Method:	H.S.A.	Hammer:	140 lb
Hammer Style:	Auto	Method:	ASTM D1586

ESTIMATED GROUND WATER DEPTH

Date	Depth	Elevation	Reference
2/4/2016	-	-	dry to bottom of hole, augers pulled

Depth (ft.)	No.	Pen/Rec (in)	Depth (ft)	blows/6"	N_{60}	SAMPLE DESCRIPTION	Geological/ Test Data	Geological Stratum
						4" Pavement		PAVEMENT
1	S-1	24/16	0.5 to 2.5	7		Light brown Silty fine to medium SAND, little Gravel,		
				10		humid, compact, SM		FILL
2				9				
				6				
3								
4								
5								
	S-2	24/16	5 to 7	3		Gray-blue SILT, trace Clay and fine Sand, humid,		
6				5		loose, ML		
				5				
7				5				
8								
9								
10								
	S-3	24/18	10 to 12	4		same as above, little Clay, trace intermixed wood		
11				5		pieces, compact		
				5				
12				4				
13								
14								
15								
	S-4	24/18	15 to 17	2		same as above, loose		
16				4				
				3				
17				5				
18								
19								
20								
	S-5	24/20	20 to 22	10		White to light brown fine to coarse SAND, trace to little		
21				10		Silt, compact, SP		NATIVE SAND
				11				
22				10				
						End of Boring at 22', no refusal		

Granular Soils		Cohesive Soils		% Composition
Blows/ft.	Density	Blows/ft.	Consistency	ASTM D2487
0-4	V. Loose	<2	V. soft	
5-10	Loose	2-4	Soft	< 5% Trace
11-30	Compact	5-8	Firm	5-15% Little
31-50	Dense	9-15	Stiff	15-30% Some
>50	V. Dense	16-30	V. Stiff	> 30% With
		>30	Hard	

NOTES: PP = Pocket Penetrometer, MC = Moisture Content
LL = Liquid Limit, PI = Plastic Index

Bedrock Joints
Shallow = 0 to 35 degrees
Dipping = 35 to 55 degrees
Steep = 55 to 90 degrees

Boulders = diameter > 12 inches, Cobbles = diameter < 12 inches and > 3 inches
Gravel = < 3 inch and > No 4, Sand = < No 4 and >No 200, Silt/Clay = < No 200

Soil Moisture Condition
Dry: S = 0%
Humid: S = 1 to 25%
Damp: S = 26 to 50%
Moist: S = 51 to 75%
Wet: S = 76 to 99%
Saturated: S = 100%

SUMMIT GEOENGINEERING SERVICES

SOIL BORING LOG

Project:	Proposed Hampton Inn	Boring #:	B-3
Location:	1200 Brighton Ave.	Project #:	15287
City, State:	Portland, ME	Sheet:	1 of 1
		Chkd by:	

Drilling Co:	Summit Geoengineering Services	Boring Elevation:	98.5 ft. +/-
Driller:	C. Coolidge, P.E.	Reference:	"Boundary & Topographic Survey" by Owen Haskell, Inc. dated 7/2/14
Summit Staff:	M. Hardison, E.I.	Date started: 2/4/2016	Date Completed: 2/4/2016

DRILLING METHOD		SAMPLER	
Vehicle:	Tracked	Length:	24" SS
Model:	AMS Power Probe	Diameter:	2"OD/1.5"ID
Method:	H.S.A.	Hammer:	140 lb
Hammer Style:	Auto	Method:	ASTM D1586

ESTIMATED GROUND WATER DEPTH

Date	Depth	Elevation	Reference
2/4/2016	-	-	dry to bottom of hole, augers pulled

Depth (ft.)	No.	Pen/Rec (in)	Depth (ft)	blows/6"	N_{60}	SAMPLE DESCRIPTION	Geological/ Test Data	Geological Stratum
	S-1	24/16	0 to 2	6		Dark brown Sandy SILT, frozen, rootlets, loose, ML		TOPSOIL
1				18		Dark brown fine Gravelly SILT, little to some Sand,		
				11		moist, ML		FILL
2				7				
3								
4								
5								
	S-2	24/20	5 to 7	2		Gray-blue SILT, trace Clay and fine Sand, humid,		
6				2		loose, slightly mottled, ML		
				3				
7				3				
8								
9								
10								
	S-3	24/20	10 to 12	7		White to light brown fine to coarse SAND, trace to little		NATIVE SAND
11				9		Silt, compact, slightly mottled, SP-SM		
				15				
12				17				
13								
14								
15								
	S-4	24/22	15 to 17	16		Olive brown mottled SILT (seam), trace Clay and Sand		
16				22		White to light brown fine to coarse SAND, trace to little		
				19		Silt, compact, slightly mottled, cobble at 16.2', SP-SM		
17				22				
18								
19						End of Boring at 18.3', Auger Refusal - Presumed Cobble		(LIKELY) COBBLE
20								
21								
22								

Granular Soils		Cohesive Soils		% Composition
Blows/ft.	Density	Blows/ft.	Consistency	ASTM D2487
0-4	V. Loose	<2	V. soft	
5-10	Loose	2-4	Soft	< 5% Trace
11-30	Compact	5-8	Firm	5-15% Little
31-50	Dense	9-15	Stiff	15-30% Some
>50	V. Dense	16-30	V. Stiff	> 30% With
		>30	Hard	

NOTES: PP = Pocket Penetrometer, MC = Moisture Content
LL = Liquid Limit, PI = Plastic Index

Bedrock Joints
Shallow = 0 to 35 degrees
Dipping = 35 to 55 degrees
Steep = 55 to 90 degrees

Boulders = diameter > 12 inches, Cobbles = diameter < 12 inches and > 3 inches
Gravel = < 3 inch and > No 4, Sand = < No 4 and >No 200, Silt/Clay = < No 200

Soil Moisture Condition
Dry: S = 0%
Humid: S = 1 to 25%
Damp: S = 26 to 50%
Moist: S = 51 to 75%
Wet: S = 76 to 99%
Saturated: S = 100%

SUMMIT GEOENGINEERING SERVICES

SOIL BORING LOG

Boring #: **B-4**

Project:	Proposed Hampton Inn	Project #:	15287
Location:	1200 Brighton Ave.	Sheet:	1 of 1
City, State:	Portland, ME	Chkd by:	

Drilling Co:	Summit Geoengineering Services	Boring Elevation:	98.1 ft. +/-
Driller:	C. Coolidge, P.E.	Reference:	"Boundary & Topographic Survey" by Owen Haskell, Inc. dated 7/2/14
Summit Staff:	M. Hardison, E.I.	Date started: 2/4/2016	Date Completed: 2/4/2016

DRILLING METHOD		SAMPLER	
Vehicle:	Tracked	Length:	24" SS
Model:	AMS Power Probe	Diameter:	2"OD/1.5"ID
Method:	H.S.A.	Hammer:	140 lb
Hammer Style:	Auto	Method:	ASTM D1586

ESTIMATED GROUND WATER DEPTH

Date	Depth	Elevation	Reference
2/4/2016	-	-	dry to bottom of hole, augers pulled

Depth (ft.)	No.	Pen/Rec (in)	Depth (ft)	blows/6"	N_{60}	SAMPLE DESCRIPTION	Geological/ Test Data	Geological Stratum
	S-1	24/12	0 to 2	WH		Dark brown fine Sandy SILT, trace roots and rootlets,		
1				2		organics, humid, ML		TOPSOIL
				3		Brown SILT, little to some Sand, little Gravel, humid,		
2				3		moist, loose, ML		FILL
3								
4								
5								
	S-2	24/20	5 to 7	2		same as above, slightly mottled		
6				3				
				3				
7				3				
8								
9								
10								
	S-3	24/18	10 to 12	36		White to light brown fine to coarse SAND, trace to little		
11				28		Silt, compact, slightly mottled, cobble fragments, SP-SM		NATIVE SAND
				16				
12				16				
13						dense drilling, cobbles encountered during auger advance		
14								
15								
	S-4	24/12	15 to 17	50/1"		no recovery, likely cobble		
16								
17						advanced auger through cobble		
18								
19						End of Boring at 18.5', Auger Refusal - Presumed Bedrock		BEDROCK
20								
21								
22								

Granular Soils		Cohesive Soils		% Composition
Blows/ft.	Density	Blows/ft.	Consistency	ASTM D2487
0-4	V. Loose	<2	V. soft	
5-10	Loose	2-4	Soft	< 5% Trace
11-30	Compact	5-8	Firm	5-15% Little
31-50	Dense	9-15	Stiff	15-30% Some
>50	V. Dense	16-30	V. Stiff	> 30% With
		>30	Hard	

NOTES: PP = Pocket Penetrometer, MC = Moisture Content
LL = Liquid Limit, PI = Plastic Index

Bedrock Joints
Shallow = 0 to 35 degrees
Dipping = 35 to 55 degrees
Steep = 55 to 90 degrees

Boulders = diameter > 12 inches, Cobbles = diameter < 12 inches and > 3 inches
Gravel = < 3 inch and > No 4, Sand = < No 4 and >No 200, Silt/Clay = < No 200

Soil Moisture Condition
Dry: S = 0%
Humid: S = 1 to 25%
Damp: S = 26 to 50%
Moist: S = 51 to 75%
Wet: S = 76 to 99%
Saturated: S = 100%