GEOTECHNICAL ENGINEERING SERVICES
PROPOSED BUILDING RENOVATION
258 COMMERCIAL STREET
PORTLAND, MAINE

10-0507 S **AUGUST 6, 2010**

PREPARED FOR:
Waterfront Maine, LP
Attention: Mr. Donal Carroll
14 Main Street #107
Brunswick, Maine 04011-2026

PREPARED BY:

S.W.COLE ENGINEERING, INC.
286 Portland Road
Gray, Maine 04039

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August 6, 2010

Waterfront Maine, LP
Attention: Mr. Donal Carroll
14 Main Street #107
Brunswick, Maine 04011-2026

Subject: Geotechnical Engineering Services
Proposed Building Renovation
258 Commercial Street
Portland, Maine

Dear Mr. Carroll:

In accordance with our Proposal dated July 8, 2010, we have coordinated and observed subsurface explorations and made a geotechnical evaluation for the proposed Building Renovation at 258 Commercial Street in Portland, Maine. This report summarizes our findings and recommendations, and its contents are subject to the limitations set forth in Attachment A.

1.0 INTRODUCTION

1.1 Scope of Work

The purpose of our work was to obtain subsurface information at the site in order to provide geotechnical recommendations for the proposed foundation support at the southeasterly end wall and proposed stairwell/elevator shaft only. Our assessment of the site has included two test borings, review of test borings previously made by others at the subject site as provided by Waterfront Maine, LP, laboratory testing and a geotechnical evaluation of the findings as they relate to the proposed construction.

1.2 Site Conditions

The site of the proposed building renovation is located at 258 Commercial Street in Portland, Maine. The existing multi-story brick building is currently partially used as a

self-storage facility and commercial space. The existing building was reportedly constructed in the mid 1800's. We understand that exploration and observations of the existing foundation for the structure were recently performed by others. We understand that test pits were dug adjacent to the structure to observe the foundation, and that information has been or will be provided to the project structural engineer. In general, the ground surface at the site is relatively flat and either paved or gravel-surfaced.

1.3 Proposed Construction

Based on information provided by Becker Structural Engineers (project structural engineer), we understand that the existing multi-story brick mill building is planned to be renovated. Proposed new use will include marine use on the ground floor and office space on the upper levels. The proposed renovation work includes adding openings in the brick wall on the southeasterly (water) side for new windows and a new stairway/elevator core in the central portion of the building. We understand that new foundations are anticipated near the ends of the southeasterly wall and beneath the new stairway/elevator core. The project design team has preliminarily anticipated that foundation structures will be founded on new piling. Structural loading information is not available at this time.

The general site location is shown on the "Site Location Map," attached as Sheet 1. The existing and proposed site conditions are shown on the "Exploration Location Plan," attached as Sheet 1A.

2.0 EXPLORATION AND TESTING

2.1 Exploration

Northern Test Boring, Inc. of Gorham, Maine, working under subcontract to S. W. COLE ENGINEERING, INC., made two test borings (B-101 and B-102) at the site on July 15 and 16, 2010. The exploration locations were selected and established in the field by S. W. COLE ENGINEERING, INC. Explorations were located based on taped measurements from existing site features. The borings were made utilizing cased-wash and rock coring drilling techniques. Samples were generally taken at 2 or 5-foot intervals using Standard Penetration Testing techniques. Penetrometer testing and vane shear testing were performed silty clay soils, where encountered.

Results of the testing are shown on the boring logs. Undisturbed samples of silty clay soils were obtained at each boring utilizing Shelby Tube sampling.

Logs of the test borings, based on our field observations and laboratory testing of samples, are attached as Sheets 2 through 7. A key to the notes and symbols used on the logs is attached as Sheet 8. Additionally, logs of test borings made at the site in March, 2010 by others (B-1 through B-4), as provided by Waterfront Maine, LP, are included in Appendix A.

The approximate locations of the test borings are shown on the "Exploration Location Plan," attached as Sheet 1A.

2.2 Laboratory Testing

Laboratory testing was performed on selected samples recovered from the test borings. Laboratory testing has included eleven soil Moisture Content tests (ASTM D 2216), two Unconfined Compressive Strength tests (ASTM D 2166), four Atterberg Limit tests (ASTM D 4318), and two Grain Size Analyses (ASTM C 117). The results of the soil Unconfined Compressive Strength, Moisture Content and Atterberg Limit tests are shown on the boring logs. The results of Grain Size Analyses are presented on Sheets 11 and 12.

3.0 SUBSURFACE CONDITIONS

3.1 Soil Conditions

The test borings generally encountered fill material, overlying glaciomarine soils, overlying glacial outwash soils, overlying glacial till, overlying bedrock. The principle strata are described below. Please refer to the attached boring and rock core logs for detailed information regarding the subsurface findings.

Fill: Uncontrolled, miscellaneous fill material was encountered at Borings B-101 and B-102 starting at the ground surface and extending to depths of about 16 and 14 feet, respectively. The fill material was observed to consist of loose to medium dense sand with varying proportions of clay, silt, gravel, and debris including ash, brick, and rubber. The encountered fill material was erratic in density, composition, and color.

Glaciomarine Deposit: Underlying the fill material, Borings B-101 and B-102 encountered a glaciomarine stratum extending to depths of 55.5 and 78.5 feet, respectively. The glaciomarine stratum generally consists of a loose and soft relic bay mud consisting of silt with varying proportions of clay, sand, shells and organics, transitioning to a relatively thick deposit of olive to gray silty clay with varying frequency of sand seams. Boring B-101 did not encounter the relic bay mud material overlying the silty clay. The silty clay deposit is generally medium to stiff in consistency.

Glacial Outwash: Underlying the glaciomarine deposit, Borings B-101 and B-102 encountered glacial outwash soils, both to depths of about 95 feet. The glacial outwash soils consist of medium dense to dense layered sands with varying proportions of silt and gravel.

Glacial Till: Underlying the glacial outwash soils, Borings B-101 and B-102 encountered glacial till soils to depths varying from 102.7 feet and 100.7 feet, respectively. The glacial till consists of dense gravelly silty sand. The glacial till was not sampled at Boring B-101, but is inferred to be present based on observation of the behavior and advancement of the drill tooling during the exploration.

Bedrock: Bedrock was encountered at Borings B-101 and B-102 at depths of 102.7 and 100.7 feet, respectively. Bedrock was penetrated in Boring B-101 by advance of roller cone to 107.7 feet, and then cored from 107.7 to 111.7 feet. Bedrock core obtained at Boring B-101 is classified as Phylite with a Rock Quality Designation (RQD) of 54%, corresponding to fair quality. Bedrock was penetrated in Boring B-102 by advance of roller cone to 102.0 feet, and was then cored from 102.0 to 109.3 feet. Bedrock core obtained at Boring B-102 is classified as Phylite with RQD ranging from 34 to 43%, corresponding to poor quality.

Previous test borings, performed by others, are included in Appendix A. We understand that these borings were not monitored by a geotechnical engineer or designated representative. It should also be noted that bedrock was not confirmed by rock coring at the previous explorations. Previous explorations should be used as a general observation for subsurface conditions only and not considered for basis of our recommendations.

3.2 Groundwater

Groundwater was measured in the open casing at Boring B-101 at a depth of 9.7 feet below ground surface after stabilizing for 18 hours. Damp soil conditions were encountered at Boring B-101 below a depth of about 5 feet. Saturated soil conditions were encountered in Boring B-102 below a depth of approximately 5 feet, and soils were damp below a depth of about 3 feet. Due to the short time period of exploration work and the introduction of water to boreholes during drilling, accurate groundwater level information could not be obtained. Long-term groundwater fluctuation information due to tidal influence and otherwise is not available. Water will likely be present at shallow depths seasonally and during periods of heavy precipitation and/or snowmelt.

4.0 EVALUATION AND RECOMMENDATIONS

4.1 General Findings

The soils encountered at the explorations generally consist of a relatively thick layer of variable density miscellaneous fill material overlying glaciomarine soils, glacial outwash, glacial till, and bedrock with depth. Based on our findings in conjunction with our understanding of the proposed construction, it is our opinion that the site soils are not suitable for support of the proposed new foundations utilizing shallow spread footing foundations. Deep foundations (i.e. piling) will be required to provide adequate support of the proposed construction. Based on the findings at the test borings and our understanding of the proposed construction, it is our opinion that drilled minipiles would be an appropriate application for proposed foundation support at the southeasterly end wall and stairwell/elevator shaft.

Site soils are frost susceptible and have poor drainage characteristics. These conditions must be considered in the planning and design of the project. Site soils are not suitable for reuse on site. Properly compacted, imported materials meeting the requirements of Structural Fill and Crushed Stone will be required (see section 4.6).

Excavations will encounter relatively loose fill materials and relatively shallow groundwater conditions. Significant dewatering effort and use of shoring and/or bracing may be needed depending on excavation depths.

4.2 Seismic and Frost Conditions

The design freezing index for the Portland, Maine, area is approximately 1250 Fahrenheit degree-days, which corresponds to a frost penetration on the order of 4.5 feet. All pile caps, grade beams, and other foundation elements exposed to freezing conditions should be cast at least 4.5 feet below exterior grade for frost protection.

Based on the N-value and vane shear methods, as well as our laboratory testing, we interpret the subsurface conditions to correspond to Seismic Site Class E according to the 2009 IBC. Additionally, liquefaction is not a design consideration at the site.

4.3 Foundation Design and Considerations

We understand drilled minipiles are being considered for support of new structural elements associated with the proposed building renovation. Based on the findings at the test borings and our understanding of the proposed construction, it is our opinion that drilled minipiles appear to be a feasible option for new foundation support at the southeasterly end wall and interior stairwell/elevator shaft.

Minipile design and construction are typically performed by a specialty contractor. We have had preliminary discussion with a reputable New England region minipiles contractor familiar with similar construction, with project details kept in confidence, in order to obtain preliminary information for consideration with foundation planning. Several considerations for planning are described below. We recommend that foundation contractors be required to submit qualifications including past experience with projects of similar size and with similar subsurface conditions as the proposed building renovation. Ultimately, minipile sizing, design, installation, and performance are the responsibility of the designer and/or contractor.

A Minipile typically consists of a small diameter (less than 12-inches), cased, drilled shaft in which at least one central reinforcing bar is placed and cementitious grout is pumped by tremie methods into to create a cast-in-place pile. The length of permanent steel casing is dependent on the subsurface conditions and loading conditions, with permanent casing typically extending through unsuitable materials, such as the fill material and silty clays encountered at the test borings. Minipiles obtain capacity by a grout “bond zone” within suitable granular soils and/or bedrock underlying any unsuitable materials. Based on the findings at the test borings, significant lengths of permanent steel casing should be anticipated for new minipiles.

Based on discussion with the contractor, we understand axial compressive minipile capacities of up to several hundred kips are feasible, depending on soil conditions and cross section design. Settlement, elastic and otherwise, of the deep foundation system will need to be evaluated by the minipile designer in conjunction with the project structural engineer.

The minipile designer should consider corrosion potential for minipile steel and grout due to the site marine soil and groundwater conditions and fill material conditions. Reduction in cross sectional area and capacity of the pile members should be applied as deemed necessary by the designer.

At this time, we do not have information relative to existing building foundation conditions. We understand test pits have previously been performed by others to document the existing foundation conditions. Current foundation conditions should be supplied to the structural engineer and minipile designer so appropriate connections and construction sequencing can be developed. Further test pit explorations may be needed to observe and document the existing foundations. S. W. COLE ENGINEERING, INC. is available to assist in coordination of further exploration work for observation of foundation conditions, if desired.

Planning of minipile installation must consider space constraints within the existing building. Typically, overhead room on the order of 8 feet or greater is needed for drilling equipment to operate. Additionally, significant floor loads should be anticipated from equipment. The contractor is responsible for equipment access coordination, however the project structural engineer and architect may be needed to provide assistance.

Drilling minipiles will create soil cutting spoils. The project environmental consultant should provide input with regards to special handling or considerations for spoils created from the drilling work, particularly within the encountered fill materials. Additionally, water or drilling mud is typically continuously cycled to flush cuttings during minipile drilling. A plan should be developed on how to handle the drilling fluids during and after construction.

Load testing should be performed on at least one installed, representative minipile to help with evaluation of design capacity. The contractor is responsible for establishing and submitting a load testing program in accordance with applicable building codes. S. W. COLE ENGINEERING, INC. should be on site to observe and document the load testing program.

Reduction of minipile capacity as well as effects on existing foundations due to potential downdrag forces from silty clay consolidation must be considered if site grading is significantly raised or if significant new loading is introduced in the vicinity of foundations. Further analysis of the silty clay soils should be performed if significant new loading is introduced.

The Portland, Maine waterfront area subsurface fill stratum often contains sizeable debris. Although not explicitly encountered at the test boring locations, the minipile contractor should anticipate encountering large debris including, but not limited to cobbles, boulders, concrete, relic foundations, and timbers within the fill stratum.

We recommend that lateral loads be resisted by passive earth pressures acting on the grade beams and pile caps. Passive lateral resistance acting on grade beams and pile caps backfilled with compacted Structural Fill should consider a total unit weight of granular backfill (γ_t) of 130 pcf, an angle of internal friction of 30 degrees with an ultimate passive lateral earth pressure coefficient (K_p) of 3.0. The minipile designer should be consulted if additional resistance to lateral loads is needed from the minipile members.

4.4 Site Preparation

We recommend that site preparation begin with the construction of an erosion control system to protect adjacent drainage ways and areas outside the construction limits. As much vegetation as possible should remain undisturbed adjacent to the construction site to lessen the potential for erosion. Planning should consider use of water and/or drilling fluids during minipile installation.

We recommend that pile cap and grade beam subgrades be overexcavated by at least 12 inches and replaced with a layer of compacted crushed stone overlying a non-woven geotextile, such as Mirafi 160N. The crushed stone will help to provide a stable working mat and a drainage media for dewatering. We recommend that

excavation to subgrades be completed with a smooth-edged bucket to lessen disturbance of subgrade soils.

4.5 Excavation Work

Excavation work to expose existing foundations and to construct new foundation elements will generally encounter loose to medium dense miscellaneous fill material and possibly silty clay soils. The fill material and native soils can undergo substantial strength loss when subjected to construction traffic and excavation activities, particularly during periods of precipitation and shallow groundwater levels. Should the subgrade become yielding or difficult to work, disturbed areas should be excavated and backfilled with compacted Structural Fill (if dry) or Crushed Stone (if wet). Structural Fill should be placed in lifts and compacted to at least 95 percent of its maximum dry density as determined by ASTM D-1557.

Excavations must be sloped or adequately shored to prevent sloughing and caving of the sidewalls during construction. We recommend that temporary unsupported soil excavations be cut to a slope of 1.5 horizontal to 1 vertical or flatter. Due to the miscellaneous density and composition of the encountered fill material and the shallow groundwater conditions, stable unsupported excavations will be difficult to maintain. Sheeting or shoring may be needed depending on depth of excavation. In all cases, all excavations should be consistent with the OSHA trenching regulations.

The contractor should anticipate the need for significant dewatering of excavations. Ditching with gravity drainage and sumping and pumping should be adequate for shallow excavations. However, heavy precipitation or higher than normal tides will affect groundwater levels and may require significant sumping and pumping or other means of dewatering. Controlling the water level to at least 1-foot below subgrade elevation will reduce disturbance of the subgrade soils and provide a more stable working surface during construction.

At this time, we do not have information relative to existing building foundations. Excavation work performed adjacent to existing foundations, to tie in new foundation elements and otherwise, may need to be staged with short lengths excavated and exposed at a single time. Underpinning of existing foundations and shoring of the excavations may be needed.

4.6 Fill and Compaction

Although a wide range of fill soil materials can be used successfully, it has been our experience that granular soils with good drainage characteristics provide significant advantages particularly in wet conditions and during cold weather construction.

Soil fill used to backfill around foundations should be a clean, granular material meeting the following gradation:

Structural Fill	
Sieve Size	**Percent Finer by Weight**
4 inch	100
3 inch	90 to 100
¼ inch	25 to 90
No. 40	0 to 30
No. 200	0 to 5

Crushed stone used beneath pile caps and grade beams, and to replace any yielding, disturbed areas (if needed) should meet the requirements for Maine DOT Standard Specification 703.22 “Underdrain Backfill Type C.”

Structural Fill should be placed in horizontal lifts and be compacted. Lift thickness should be such that desired density is achieved throughout the lift thickness with 3 to 5 passes of the compaction equipment. We recommend that Structural Fill be compacted to at least 95 percent of its maximum dry density as determined by ASTM D-1557. Crushed Stone should be compacted to 100 percent of its dry rodded unit weight per ASTM C-25.

If proper compaction and placement of Structural Fill backfill or Crushed Stone is difficult due to space constraints or other limitations, use of flowable fill for foundation backfill should be considered.

4.7 Foundation Drainage

We anticipate the installation of new foundation underdrains will likely not be feasible due to site constraints and excavation work likely being discontinuous around the

foundation perimeter. Additionally, we anticipate connection of a new underdrain system for the elevator/stairway pit to not likely be feasible. Therefore, we recommend considering buoyant conditions for new foundation design.

4.8 Weather Considerations

If foundation construction takes place during cold weather conditions, subgrades and foundations must be protected from freezing conditions. Concrete must not be placed on frozen soil and once placed, the soil beneath the structure must be protected from freezing. Further, the native soils are moisture sensitive and subgrades will be susceptible to disturbance during wet conditions. Consequently, site work and construction activities should take appropriate measures to protect exposed subgrades, particularly when wet.

4.9 Additional Exploration and Evaluation

S. W. COLE ENGINEERING, INC. has provided geotechnical evaluation for the proposed foundation support at the southeasterly end wall and proposed stairwell/elevator shaft only. Additionally, we have not explored or observed the existing building foundation conditions at this time. We are available to provide exploration of existing building foundation conditions, if desired. Additionally, we would be pleased to assist with geotechnical evaluation for other portions of the project including pavement recommendations.

4.10 Quality Control

It is recommended that S. W. COLE ENGINEERING, INC. be retained to provide supplemental engineering and testing services during the construction phase of the project. An S. W COLE ENGINEERING, INC. representative should be on site to observe installation and load testing of minipile foundations. A materials testing program should be implemented to observe compliance with the design concepts, specifications, and design recommendations and to allow design changes in the event that subsurface conditions found differ from those anticipated prior to the start of construction. We would be pleased to provide a scope of services and budget for field and laboratory materials testing services at the appropriate time. S. W. COLE ENGINEERING, INC. is available to provide testing of soils, concrete, grout, masonry, fireproofing, steel, and asphalt materials.

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

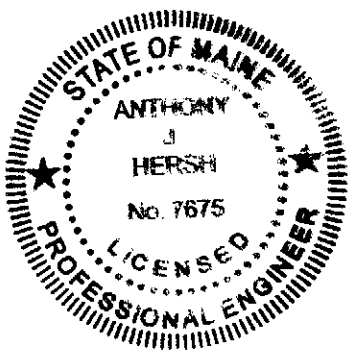
5.0 CLOSURE

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 the design progresses and during construction. If you have any questions or if we may be of further assistance, please do not hesitate to contact us.

Very truly yours,

S. W. COLE ENGINEERING, INC.

Evan M. Walker, E. I.
Geotechnical Engineer



Anthony J. Hersh, P.E.
Senior Geotechnical Engineer

EMW-AJH:emw/jlw

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Attachment A
Limitations

This report has been prepared for the exclusive use by Waterfront Maine, LP for specific application to the proposed Building Renovation at 258 Commercial Street in Portland, Maine. S. W. COLE ENGINEERING, INC. has endeavored to conduct the work in accordance with generally accepted soil and foundation engineering practices. No other warranty, expressed or implied, is made.

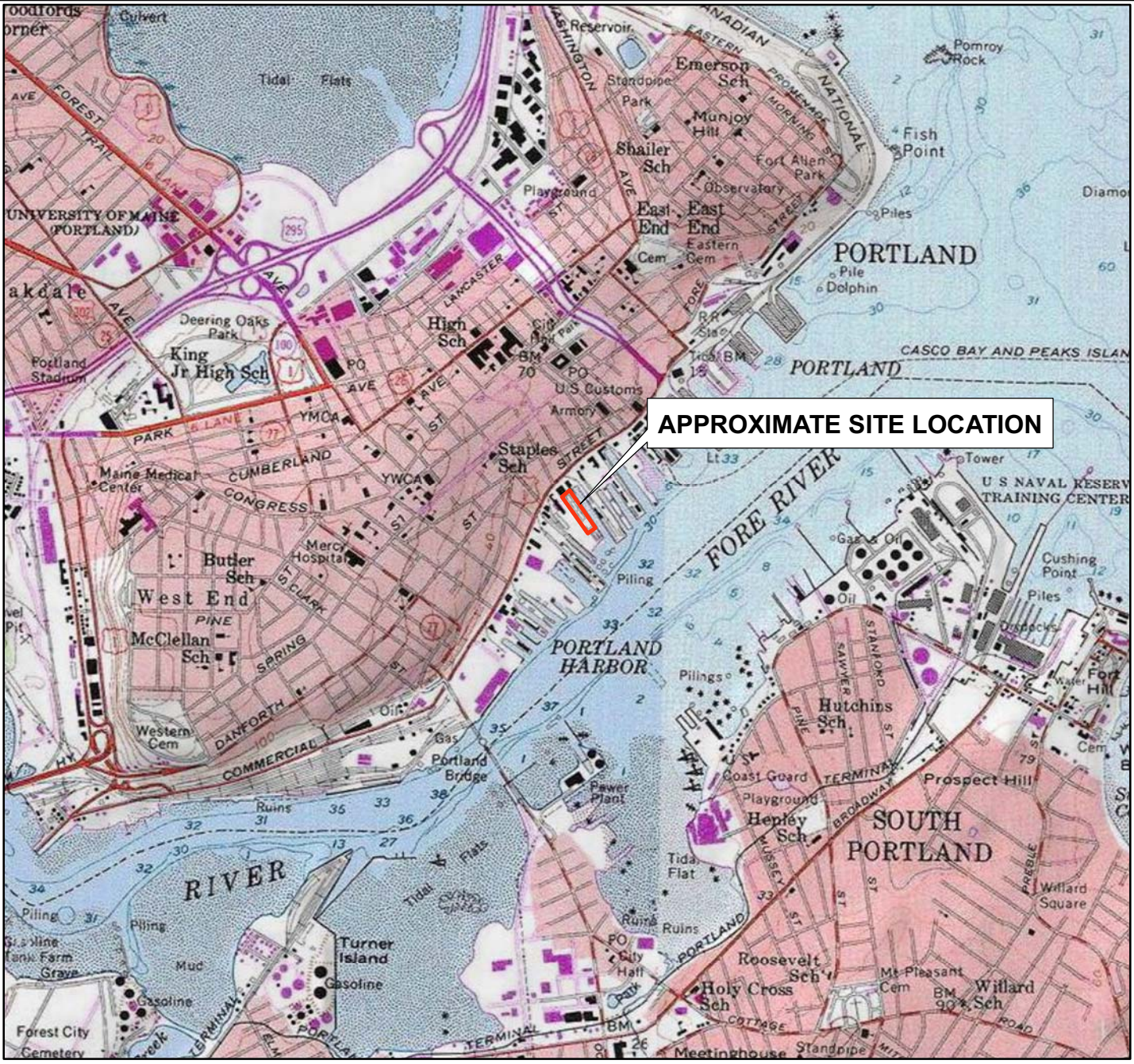
The soil profiles described in the report are intended to convey general trends in subsurface conditions. The boundaries between strata are approximate and are based upon interpretation of exploration data and samples.

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

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

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

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



2,000 0 2,000 4,000

Scale in Feet

NOTE:
SITE LOCATION MAP PREPARED FROM ESRI ArcGIS ONLINE AND DATA PARTNERS INCLUDING USGS AND © 2007 NATIONAL GEOGRAPHIC SOCIETY.

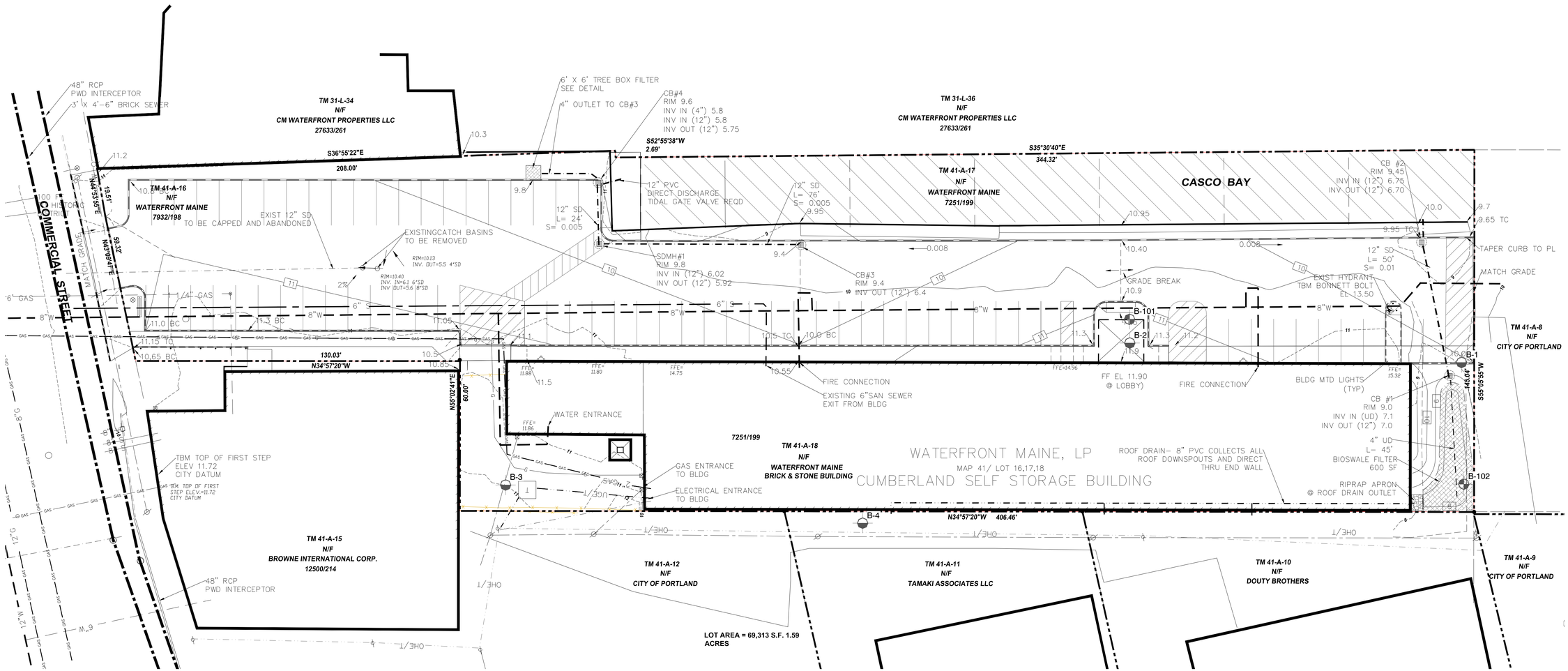
S.W.COLE ENGINEERING, INC.

WATERFRONT MAINE, LP

SITE LOCATION MAP

PROPOSED BUILDING RENOVATION
258 COMMERCIAL STREET
PORTLAND, MAINE

Job No.	10-0507	Scale	1:24000
Date:	08/04/2010	Sheet	1



LEGEND:

- APPROXIMATE BORING LOCATION
- APPROXIMATE BORING LOCATION BY OTHERS

NOTES:

1. EXPLORATION LOCATION PLAN WAS PREPARED FROM A 1"=20' SCALE PLAN OF THE SITE ENTITLED "GRADING & UTILITIES PLAN," PREPARED BY CARROLL ASSOCIATES, DATED 05/03/2010, REVISED 06/01/2010.
2. THE BORINGS WERE LOCATED IN THE FIELD BY TAPED MEASUREMENTS FROM EXISTING SITE FEATURES.
3. THIS PLAN SHOULD BE USED IN CONJUNCTION WITH THE ASSOCIATED S.W. COLE ENGINEERING, INC. GEOTECHNICAL REPORT, DATED AUGUST 5, 2010.
4. 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.

0 10 20 40 60 80

SCALE IN FEET

S.W.COLE ENGINEERING, INC.

WATERFRONT MAINE, LP

EXPLORATION LOCATION PLAN

PROPOSED BUILDING RENOVATION
258 COMMERCIAL STREET
PORTLAND, MAINE

Job No.	10-0507	Scale	1"=20'
Date :	08/05/2010	Sheet	1A

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.: **B-101**
SHEET: 1 OF 3
PROJECT NO.: 10-0507

PROJECT / CLIENT: PROPOSED BUILDING RENOVATION / WATERFRONT ME, LP
LOCATION: 258 COMMERCIAL STREET, PORTLAND, MAINE
DRILLING CO. : NORTHERN TEST BORING, INC.
DRILLER: NICK VOLTOLINA / MIKE NADEAU

DATE START: 7/15/2010
DATE FINISH: 7/16/2010
ELEVATION: NOT AVAILABLE
SWC REP.: NMC / EMW

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

WATER LEVEL INFORMATION
SOILS DAMP @ 5', WATER MEASURED IN CASING AT 9.7' ON 7/16/10(18 HOUR STABILIZATION)

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
PUSH									3" +/-	BITUMINOUS PAVEMENT
	1D	9"	4"	1.2'	7	50/3"			1.5'	BROWN SILTY SAND AND GRAVEL (FILL) ~ MEDIUM DENSE ~
									2.5'	DARK BROWN SILT AND SAND TRACE GRAVEL WITH BRICK (FILL) ~MEDIUM DENSE~
	2D	24"	10"	4.0'	5	14	6	3		BROWN SILTY SAND (FILL)
									5.0'	~ LOOSE ~
										BROWN SILT AND SAND WITH SOME GRAVEL WITH SILTY CLAY POCKETS
	3D	24"	18"	7.0'	2	3	5	17	7.0'	WITH BRICK FRAGMENTS (FILL) ~ LOOSE ~
	4D	24"	10"	9.0'	5	5	27	5		BROWN SAND AND GRAVEL SOME SILT
									10.0'	WITH BRICK AND ASH DEBRIS (FILL) ~ LOOSE ~
	5D	24"	16"	12.0'	2	2	2	2		DARK BROWN SILTY GRAVELLY SAND WITH RUBBER AND BRICK DEBRIS (FILL)
										~ LOOSE ~
									16.0'	
	6D	24"	1"	17.0'	6	1	1/12"			GRAY SILTY CLAY
										q_P = 3.0 ksf
	7D	24"	18"	22.0'	1	2	1	2		w = 38.4%
										~ MEDIUM TO STIFF ~
	1S	24"	24"	27.0'						W_L = 48 W_P = 22
	1V			27.6'	3 5/8" X 7" VANE					S_V = 0.94 KSF / 0.19 KSF
	1V'			28.2'	3 5/8" X 7" VANE					S_V = 0.97 KSF / 0.22 KSF
	8D	24"	24"	32.0'	WOM/24"					w = 39.8%
	2V			35.6'	3 5/8" X 7" VANE					S_V = 0.59 KSF / 0.02 KSF - POSSIBLY DISTURBED
	2V'			36.2'	3 5/8" X 7" VANE					S_V = 1.08 KSF / 0.02 KSF

SAMPLES:
D = SPLIT SPOON
C = 2" SHELBY TUBE
S = 3" SHELBY TUBE
U = 3.5" SHELBY TUBE

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

REMARKS: CONTINUED…

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

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.: **B-101**
SHEET: 2 OF 3
PROJECT NO.: 10-0507
DATE START: 7/15/2010
DATE FINISH: 7/16/2010
ELEVATION: NOT AVAILABLE
SWC REP.: NMC / EMW

PROJECT / CLIENT: PROPOSED BUILDING RENOVATION / WATERFRONT ME, LP
LOCATION: 258 COMMERCIAL STREET, PORTLAND, MAINE
DRILLING CO. : NORTHERN TEST BORING, INC.
DRILLER: NICK VOLTOLINA / MIKE NADEAU

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

WATER LEVEL INFORMATION
SOILS DAMP @ 5', WATER MEASURED IN CASING AT 9.7' ON 7/16/10(18 HOUR STABILIZATION)

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
PUSH										w = 38.4%
	2S	24"	24"	42.0'						W_L = 44 W_P = 20 q_u = 2.3 KSF w = 34.2%
	3V			42.6'	3 5/8" X 7" VANE					S_V = 1.19 KSF / 0.26 KSF
	3V'			43.2'	3 5/8" X 7" VANE					S_V = 1.46 KSF / 0.30 KSF GRAY SILTY CLAY
										~MEDIUM TO STIFF ~
	9D	24"	24"	47.0'	WOH/12"		1/12"			w = 35.9%
	4V			50.6'	3 5/8" X 7" VANE					S_V = 1.19 KSF / 0.08 KSF
	4V'			51.2'	3 5/8" X 7" VANE					S_V = 1.30 KSF / 0.28 KSF
									55.5'	
										w = 21.1%
	10D	24"	18"	57.0'	3	3	3	3	57.0'	GRAY SILT AND FINE SAND ~ LOOSE ~
	11D	24"	17"	62.0'	11	14	15	16	65.0'	BROWN SAND WITH SOME SILT AND TRACE GRAVEL ~ MEDIUM DENSE ~
	12D	24"	15"	67.0'	12	20	10	11		BROWN SANDY GRAVEL WITH SOME SILT
	13D	24"	0"	72.0'	12	12	17	18	75.0'	~ MEDIUM DENSE ~
	14D	24"	20"	77.0'	17	18	21	21		BROWN SILTY SAND WITH SOME GRAVEL ~ DENSE ~

SAMPLES:
D = SPLIT SPOON
C = 2" SHELBY TUBE
S = 3" SHELBY TUBE
U = 3.5" SHELBY TUBE

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

REMARKS: CONTINUED…

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

BORING NO.: **B-101**

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.: **B-101**
SHEET: 3 OF 3
PROJECT NO.: 10-0507

PROJECT / CLIENT: PROPOSED BUILDING RENOVATION / WATERFRONT ME, LP
LOCATION: 258 COMMERCIAL STREET, PORTLAND, MAINE
DRILLING CO. : NORTHERN TEST BORING, INC.
DRILLER: NICK VOLTOLINA / MIKE NADEAU

DATE START: 7/15/2010
DATE FINISH: 7/16/2010
ELEVATION: NOT AVAILABLE
SWC REP.: NMC / EMW

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

WATER LEVEL INFORMATION
SOILS DAMP @ 5', WATER MEASURED IN CASING AT 9.7' ON 7/16/10(18 HOUR STABILIZATION)

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
	15D	24"	5"	82.0'	7	12	12	15		BROWN SAND WITH SOME SILT
	16D	24"	16"	87.0'	11	14	17	10		~ MEDIUM DENSE ~
	17D	24"	8"	92.0'	7	8	11	12	95.0'	
										PROBABLE GLACIAL TILL SOILS WITH FREQUENT COBBLES ADVANCE BY ROLLER CONE
									102.7'	
										BEDROCK - ADVANCE BY ROLLER CONE
									107.7'	
										BEDROCK - SEE ROCK CORE LOG
	R1			111.7'					111.7'	RQD = 54%
										BOTTOM OF EXPLORATION AT 111.7'

SAMPLES:
D = SPLIT SPOON
C = 2" SHELBY TUBE
S = 3" SHELBY TUBE
U = 3.5" SHELBY TUBE

SOIL CLASSIFIED BY:

	DRILLER - VISUALLY
X	SOIL TECH. - VISUALLY
X	LABORATORY TEST

REMARKS:

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

BORING NO.: **B-101**

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.: **B-102**
SHEET: 1 OF 3
PROJECT NO.: 10-0507

PROJECT / CLIENT: PROPOSED BUILDING RENOVATION / WATERFRONT ME, LP
LOCATION: 258 COMMERCIAL STREET, PORTLAND, MAINE
DRILLING CO. : NORTHERN TEST BORING, INC. DRILLER: MIKE NADEAU

DATE START: 7/15/2010
DATE FINISH: 7/16/2010
ELEVATION: NOT AVAILABLE
SWC REP.: EMW

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

WATER LEVEL INFORMATION
SOILS APPEAR DAMP BELOW 3'
SOILS APPEAR SATURATED BELOW 5'

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
PUSH										
	1D	24"	16"	2.0'	7	8	8	9		DARK BROWN AND BLACK SILTY SAND WITH SOME GRAVEL WITH BRICK FRAGMENTS (FILL) ~ MEDIUM DENSE ~
									5.0'	
	2D	24"	6"	7.0'	5	4	4	4		DARK BROWN AND BLACK SILTY GRAVELLY SAND WITH BRICK FRAGMENTS AND ASH (FILL) ~ LOOSE ~
									10.0'	
	3D	24"	8"	12.0'	4	5	3	3		DARK GRAY AND BLACK SANDY GRAVEL WITH SOME SILT WITH BRICK FRAGMENTS (FILL) ~ LOOSE ~
									14.0'	
	4D	24"	16"	17.0'	2	1	1	1		GRAY SANDY SILT WITH SOME CLAY WITH TRACE ORGANICS AND SHELL FRAGMENTS ~ LOOSE ~
									20.0'	
	5D	24"	18"	22.0'	2	3	3	4		GRAY CLAYEY SILT WITH SOME SAND q_p = 0.5 KSF WITH FREQUENT SHELL FRAGMENTS AND TRACE ORGANICS ~ MEDIUM ~
									26.0'	
	6D	24"	22"	27.0'	3	4	5	4		q_p = 2.5 KSF OLIVE SILTY CLAY ~ STIFF ~
									30.0'	
	1V				3 5/8" X 7" VANE					S_V = 0.58 KSF / 0.12 KSF
	1V'				3 5/8" X 7" VANE					S_V = 0.59 KSF / 0.13 KSF ~ MEDIUM ~ GRAY SILTY CLAY w = 49.0% W_L = 49 W_P = 23 q_u = 1.1 KSF w = 48.8%
	1S	24"		37.0'	WOM/24"					

SAMPLES:
D = SPLIT SPOON
C = 2" SHELBY TUBE
S = 3" SHELBY TUBE
U = 3.5" SHELBY TUBE

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

REMARKS: CONTINUED…

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

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.: **B-102**
SHEET: 2 OF 3
PROJECT NO.: 10-0507

PROJECT / CLIENT: PROPOSED BUILDING RENOVATION / WATERFRONT ME, LP
LOCATION: 258 COMMERCIAL STREET, PORTLAND, MAINE
DRILLING CO. : NORTHERN TEST BORING, INC. DRILLER: MIKE NADEAU

DATE START: 7/15/2010
DATE FINISH: 7/16/2010
ELEVATION: NOT AVAILABLE
SWC REP.: EMW

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

WATER LEVEL INFORMATION
SOILS APPEAR DAMP BELOW 3'
SOILS APPEAR SATURATED BELOW 5'

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
PUSH	2V			40.8'	3 5/8" X 7" VANE					S_V = 0.63 KSF / 0.19 KSF
	2V'			41.6'	3 5/8" X 7" VANE					S_V = 0.56 KSF / 0.21 KSF ~ MEDIUM ~
										GRAY SILTY CLAY
	7D	24"	24"	47.0'	WOR/12"		WOM/12"			w = 43.2%
	3V			50.8'	3 5/8" X 7" VANE					S_V = 0.71 KSF / 0.21 KSF
	3V'			51.6'	3 5/8" X 7" VANE					S_V = 0.92 KSF / 0.19 KSF
	2S	24"		57.0'	WOR	WOM/12"		WO2M		W_L = 43 W_P = 21
	4V			60.8'	3 5/8" X 7" VANE					S_V = 0.92 KSF / 0.07 KSF
	4V'			61.6'	3 5/8" X 7" VANE					S_V = 1.06 KSF / 0.13 KSF
	8D	24"	24"	67.0'	WOR	WOM/18"				w = 39.6%
	5V			70.8'	3 5/8" X 7" VANE					S_V = 0.86 KSF / 0.15 KSF
	5V'			71.6'	3 5/8" X 7" VANE					S_V = 1.16 KSF / 0.19 KSF - POSSIBLE SAND SEAM
	9D	24"	20"	77.0'	WOR	WOM	WO2M/12"			w = 28.5% ~ FREQUENT SAND SEAMS ~
									78.5'	ORANGE-BROWN SILTY SANDY GRAVEL ~ DENSE ~

SAMPLES:
D = SPLIT SPOON
C = 2" SHELBY TUBE
S = 3" SHELBY TUBE
U = 3.5" SHELBY TUBE

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

REMARKS: CONTINUED…

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

BORING NO.: **B-102**

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.: **B-102**
SHEET: 3 OF 3
PROJECT NO.: 10-0507

PROJECT / CLIENT: PROPOSED BUILDING RENOVATION / WATERFRONT ME, LP
LOCATION: 258 COMMERCIAL STREET, PORTLAND, MAINE
DRILLING CO. : NORTHERN TEST BORING, INC. DRILLER: MIKE NADEAU

DATE START: 7/15/2010
DATE FINISH: 7/16/2010
ELEVATION: NOT AVAILABLE
SWC REP.: EMW

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

WATER LEVEL INFORMATION
SOILS APPEAR DAMP BELOW 3'
SOILS APPEAR SATURATED BELOW 5'

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
	10D	24"	4"	82.0'	35	16	13	14	85.0'	ORANGE-BROWN SILTY SANDY GRAVEL ~ MEDIUM DENSE ~
	11D	24"	17"	85.0'	30	11	17	24	90.0'	BROWN SAND WITH SOME SILT ~ DENSE ~
	12D	24"	16"	92.0'	15	14	15	17	95.0'	BROWN SILT AND FINE TO MEDIUM SAND WITH FREQUENT MEDIUM TO COARSE SAND SEAMS ~ DENSE ~
	13D	24"	17"	97.0'	17	22	28	38	100.0'	BROWN GRAVELLY SILTY SAND (GLACIAL TILL) ~ DENSE ~
	14D	8"	2"	102.0'	25	50/2"			100.7'	GRAY GRAVELLY SILTY SAND (GLACIAL TILL) ~ DENSE ~
									102.0'	PROBABLE WEATHERED BEDROCK - ADVANCE BY ROLLER CONE
	R1			104.4'						RQD = 34% BEDROCK - SEE ROCK CORE LOGS
	R2			109.3'					109.3'	RQD = 43%
										BOTTOM OF EXPLORATION @ 107.4'

SAMPLES:
D = SPLIT SPOON
C = 2" SHELBY TUBE
S = 3" SHELBY TUBE
U = 3.5" SHELBY TUBE

SOIL CLASSIFIED BY:

	DRILLER - VISUALLY
X	SOIL TECH. - VISUALLY
X	LABORATORY TEST

REMARKS:

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

BORING NO.: **B-102**

S.W.COLE ENGINEERING, INC.

ROCK CORE LOG

PROJECT: PROPOSED BUILDING RENOVATION / PORTLAND, MAINE
BORING NO.: B-101
CLIENT: WATERFRONT ME, LP
PROJECT NO.: 10-0507

LOGGED BY P. Otto DATE: 7/20/2010 SHEET 1 OF 1
CHECKED BY G. Bucklin DATE: 7/20/2010 CORE SIZE NQ2

DEPTH BELOW SURFACE (FT)	CORE RUN	CORE INTERVAL (FT)	CORE RECOVERY (FT)	RQD (%)	ROCK QUALITY	GRAPHIC LOG	ROCK DESCRIPTION AND IDENTIFICATION
107.7'							ADVANCED BORING BY ROLLER CONE 102.7' TO 107.7'
108	R1	4.0	3.6	54	FAIR		Phylite with interbedded quartz, contains calcite veins, muscovite mica and trace pyrite; fine grained; medium to moderately hard; slightly weathered, slight iron oxide staining on fracture surfaces and exterior of core. Foliated at 60-75 degrees. Low to moderate fracture angles at 10-40 degrees from horizontal.
109							
110							
111							
111.7'							PROBABLE ZONE OF CORE LOSS
							BOTTOM OF EXPLORATION AT 111.7'

S.W.COLE ENGINEERING, INC.

ROCK CORE LOG

PROJECT: PROPOSED BUILDING RENOVATION / PORTLAND, MAINE
BORING NO.: B-102
CLIENT: WATERFRONT ME, LP
PROJECT NO.: 10-0507

LOGGED BY P. Otto DATE: 7/20/2010 SHEET 1 OF 1
CHECKED BY G. Bucklin DATE: 7/20/2010 CORE SIZE NQ2

DEPTH BELOW SURFACE (FT)	CORE RUN	CORE INTERVAL (FT)	CORE RECOVERY (FT)	RQD (%)	ROCK QUALITY	GRAPHIC LOG	ROCK DESCRIPTION AND IDENTIFICATION
102.0'							
103							
104	R1	2.4	2.4	34	POOR		Light gray Phylite, contains weathered garnets and quartz veins; fine grained; medium hard; slightly weathered. Fractures and cracks parallel to and cross cut foliation at 20, 60, 65 70, 80 and 85 degrees from horizontal.
105							
106							
107	R2	4.9	4.9	43	POOR		
108							
109							
109.3'							BOTTOM OF EXPLORATION AT 109.3'

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.

S.W.COLE ENGINEERING, INC.

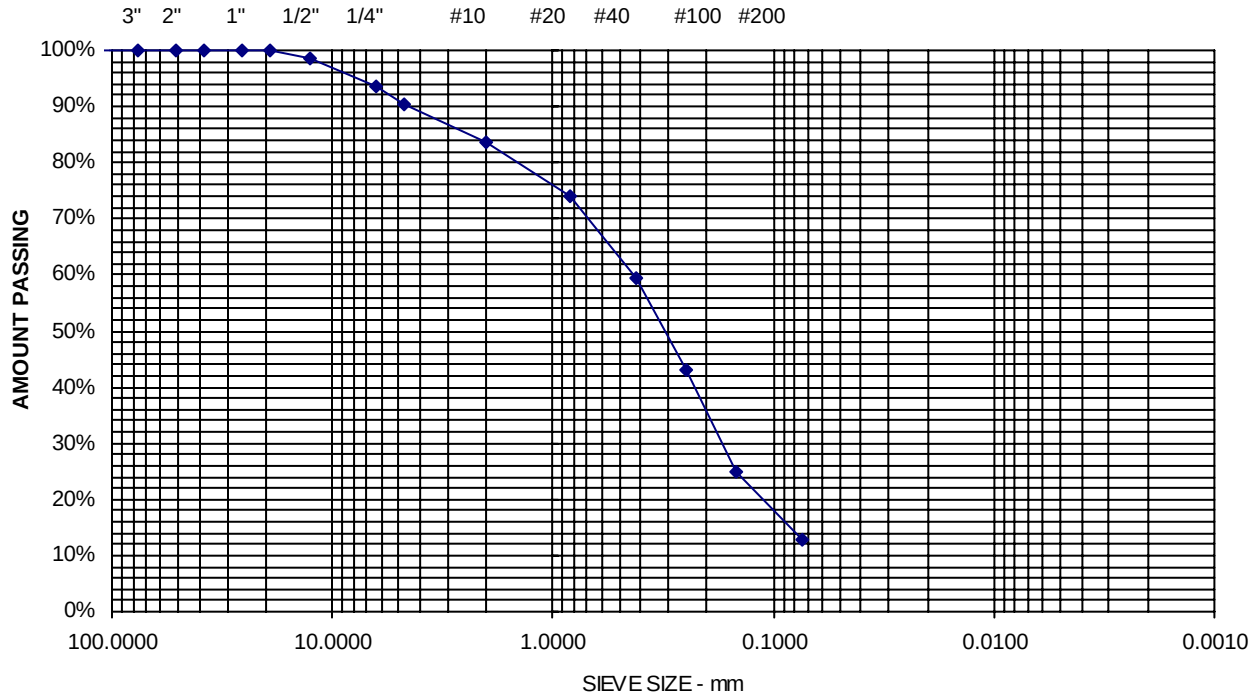
Report of Gradation

ASTM C-117 & C-136

Project Name	PORTLAND, ME - BUILDING RENOVATION - 258 COMMERCIAL STREET - GEOTECHNICAL ENGINEERING SERVICES	Project Number	10-0507
Client	WATERFRONT MAINE, LP	Lab ID	12795G
		Date Received	7/20/2010
		Date Completed	7/22/2010
Material Source	**B-101 14D 75' TO 77'**	Tested By	ANDREW MYERS

STANDARD DESIGNATION (mm/µm)	SIEVE SIZE	AMOUNT PASSING (%)	
150 mm	**6"**	**100**	
125 mm	**5"**	**100**	
100 mm	**4"**	**100**	
75 mm	**3"**	**100**	
50 mm	**2"**	**100**	
38.1 mm	**1-1/2"**	**100**	
25.0 mm	**1"**	**100**	
19.0 mm	**3/4"**	**100**	
12.5 mm	**1/2"**	**99**	
6.3 mm	**1/4"**	**94**	
4.75 mm	**No. 4**	**91**	9.5% Gravel
2.00 mm	**No. 10**	**83**	
850 um	**No. 20**	**74**	
425 um	**No. 40**	**59**	77.9% Sand
250 um	**No. 60**	**43**	
150 um	**No. 100**	**25**	
75 um	**No. 200**	**12.6**	12.6% Fines

SILTY SAND WITH SOME GRAVEL



Comments:

S.W.COLE ENGINEERING, INC.

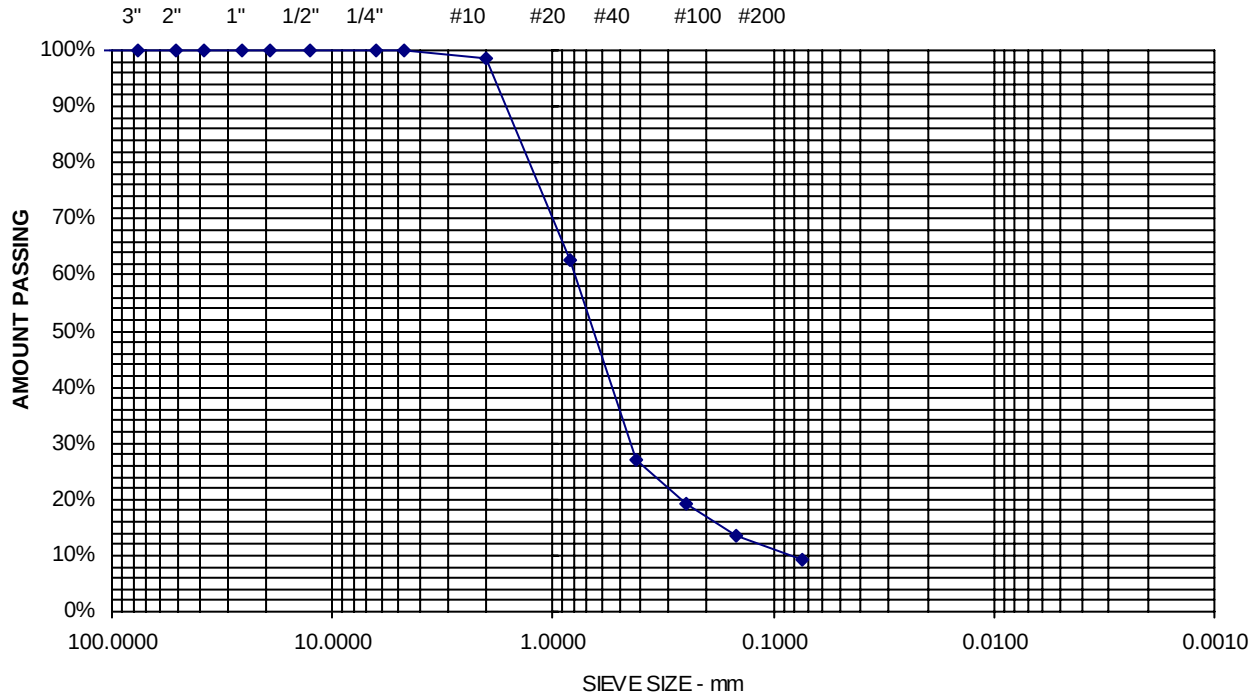
Report of Gradation

ASTM C-117 & C-136

Project Name	PORTLAND, ME - BUILDING RENOVATION - 258 COMMERCIAL STREET - GEOTECHNICAL ENGINEERING SERVICES	Project Number	10-0507
Client	WATERFRONT MAINE, LP	Lab ID	12796G
		Date Received	7/20/2010
		Date Completed	7/22/2010
Material Source	**B-102 11D 85' TO 87'**	Tested By	ANDREW MYERS

STANDARD DESIGNATION (mm/µm)	SIEVE SIZE	AMOUNT PASSING (%)	
150 mm	**6"**	**100**	
125 mm	**5"**	**100**	
100 mm	**4"**	**100**	
75 mm	**3"**	**100**	
50 mm	**2"**	**100**	
38.1 mm	**1-1/2"**	**100**	
25.0 mm	**1"**	**100**	
19.0 mm	**3/4"**	**100**	
12.5 mm	**1/2"**	**100**	
6.3 mm	**1/4"**	**100**	
4.75 mm	**No. 4**	**100**	0% Gravel
2.00 mm	**No. 10**	**99**	
850 um	**No. 20**	**63**	
425 um	**No. 40**	**27**	90.9% Sand
250 um	**No. 60**	**19**	
150 um	**No. 100**	**13**	
75 um	**No. 200**	**9.1**	9.1% Fines

SAND WITH SOME SILT



Comments:

APPENDIX A

Northern Test Boring, Inc. Boring Log

Client: Waterfront Maine	Project Name: Cumberland Storage Building
Location: Portland, Maine	Driller: Mike Nadeau

	Casing	Sample	Core	Ground Water Observation
Type	HW	SS		11.7'
Size	4"	1 3/8"		Start Date: 3/15/10 Finish Date: 3/15/10
Hammer Wt.	300	140		
Hammer Fall	30"	30"		

No.	Pen	Rec	Sample Depth	Sample Blow Counts				Depth	Stratum Description
S-1	24"	9"	0'-2'	3	3	3	4		Brown Fine-Medium Sand and Gravel Mixed with Brick
S-2	24"	15"	5'-7'	3	4	3	5	5'	
S-3	24"	19"	10'-12'	4	6	6	7	10'	Grey Fine-Medium Sand Trace Silt (Native)
S-4	24"	15"	15'-17'	2	2	1	2	15'	
S-5	24"	6"	20'-22'	1	2	2	3	20'	Grey Sandy Silt
S-6	24"	22"	25'-27'	2	2	3	6	25'	Grey Silty Fine Sand Some Clay
S-7	24"	21"	30'-32'	2	2	2	2	30'	
S-8	24"	20"	35'-37'	1	1	1	1	35'	Grey Silty Clay
S-9	24"	22"	40'-42'	1	1	1	1	40'	
S-10	24"	21"	45'-47'	1	1	1	1	45'	
S-11	24"	22"	50'-52'	1	1	1	1	50'	

Northern Test Boring, Inc. Boring Log

Client: Waterfront Maine	Project Name: Cumberland Storage Building
Location: Portland, Maine	Driller: Mike Nadeau

	Casing	Sample	Core	Ground Water Observation
Type	HW	SS		11.7'
Size	4"	1 3/8"		Start Date: 3/15/10 Finish Date: 3/15/10
Hammer Wt.	300	140		
Hammer Fall	30"	30"		

No.	Pen	Rec	Sample Depth	Sample Blow Counts				Depth	Stratum Description
S-12	24"	20"	55'-57'	1	1	2	2	55'	Grey Clayey Silt
S-13	24"	21"	60'-62'	1	2	1	1	60'	
S-14	24"	20"	65'-67'	1	1	1	1	65'	
S-15	24"	22"	70'-72'	1	1	1	2	70'	Grey Silty Clay
S-16	24"	23"	75'-77'	1	2	1	1	75'	
S-17	24"	22"	80'-82'	1	1	2	2	80'	
S-18	24"	12"	85'-87'	7	7	9	8	85'	Brown Medium-Coarse Sand Some Silt (Glacial Till)
S-19	24"	11"	90'-92'	6	8	8	12	90'	
S-20	24"	10"	95'-97'	7	8	10	12	95'	
S-21	24"	4"	100'-102'	11	11	12	11	100'	
									Bottom of Exploration @ 102' (No Refusal)

Boring #: B-1
Sheet: 2 of 2

Northern Test Boring, Inc. Boring Log

Client: Waterfront Maine	Project Name: Cumberland Storage Building
Location: Portland, Maine	Driller: Mike Nadeau

	Casing	Sample	Core	Ground Water Observation
Type	HW	SS		9.2'
Size	4"	1 3/8"		Start Date: 3/15/10 Finish Date: 3/16/10
Hammer Wt.	300	140		
Hammer Fall	30"	30"		

No.	Pen	Rec	Sample Depth	Sample Blow Counts				Depth	Stratum Description
S-1	24"	10"	0'-2'	3	4	3	3		3" Pavement
S-2	24"	14"	5'-7'	3	4	4	4	5'	Brown Fine-Medium Sand and Gravel
S-3	24"	18"	10'-12'	3	4	4	5	10'	Dark Brown Silt and Organics (Original Ground Surface)
S-4	24"	22"	15'-17'	1	2	1	1	15'	Grey Fine Sand with Organics
S-5	24"	19"	20'-22'	1	2	2	2	20'	Grey Fine Sand and Silt
S-6	24"	22"	25'-27'	1	1	1	1	25'	
S-7	24"	22"	30'-32'	1	1	1	1	30'	
S-8	24"	24"	35'-37'	1	1	1	1	35'	
S-9	24"	22"	40'-42'	1	1	1	1	40'	Grey Silty Clay
S-10	24"	21"	45'-47'	1	1	1	1	45'	
S-11	24"	22"	50'-52'	1	1	1	1	50'	

Boring #: B-2
Sheet: 1 of 2

Northern Test Boring, Inc. Boring Log

Client: Waterfront Maine	Project Name: Cumberland Storage Building
Location: Portland, Maine	Driller: Mike Nadeau

	Casing	Sample	Core	Ground Water Observation
Type	HW	SS		9.2'
Size	4"	1 3/8"		Start Date: 3/15/10 Finish Date: 3/16/10
Hammer Wt.	300	140		
Hammer Fall	30"	30"		

No.	Pen	Rec	Sample Depth	Sample Blow Counts				Depth	Stratum Description
S-12	24"	22"	55'-57'	1	1	1	1	55'	Grey Clayey Silt
S-13	24"	23"	60'-62'	1	1	1	1	60'	
S-14	24"	17"	65'-67'	9	11	12	14	65'	Brown Medium-Coarse Sand Some Silt (Glacial Till)
S-15	24"	19"	70'-72'	12	15	13	17	70'	
S-16	24"	16"	75'-77'	10	12	12	19	75'	
S-17	24"	17"	80'-82'	12	15	17	18	80'	
S-18	4"	3"	85'-87'	50/4					Bottom of Exploration @ 88.2' (Bedrock Possible Boulder)

Boring #: B-2
Sheet: 2 of 2

Northern Test Boring, Inc. Boring Log

Client: Waterfront Maine	Project Name: Cumberland Storage Building
Location: Portland, Maine	Driller: Mike Nadeau

	Casing	Sample	Core	Ground Water Observation
Type	HW	SS		8.7'
Size	4"	1 3/8"		Start Date: 3/16/10 Finish Date: 3/16/10
Hammer Wt.	300	140		
Hammer Fall	30"	30"		

No.	Pen	Rec	Sample Depth	Sample Blow Counts				Depth	Stratum Description
S-1	24"	9"	0'-2'	4	5	5	7		Brown Fine-Medium Sand and Gravel with Brick Pieces
S-2	24"	15"	5'-7'	4	5	5	4	5'	
S-3	24"	17"	10'-12'	1	1	1	1	10'	Dark Brown Silt and Organics (Original Ground Surface)
S-4	24"	2"	15'-17'	2	1	1	1	15'	Brown Sand and Gravel Trace Silt
S-5	24"	15"	20'-22'	7	8	8	12	20'	
S-6	24"	14"	25'-27'	5	5	5	6	25'	
S-7	24"	18"	30'-32'	5	9	9	8	30'	
S-8	24"	15"	35'-37'	7	7	6	9	35'	
S-9	24"	14"	40'-42'	3	7	7	10	40'	Light Rust Brown Sand and Gravel Some Silt (Glacial Till)
S-10	24"	15"	45'-47'	8	10	10	11	45'	
S-11	24"	17"	50'-52'	10	12	12	16	50'	
									Bottom of Exploration 52.7' (bedrock possible boulder)

Boring #: B-3
Sheet: 1 of 1

Northern Test Boring, Inc. Boring Log

Client: Waterfront Maine	Project Name: Cumberland Storage Building
Location: Portland, Maine	Driller: Mike Nadeau

	Casing	Sample	Core	Ground Water Observation
Type	HW	SS		9.2'
Size	4"	1 3/8"		Start Date: 3/17/10 Finish Date: 3/17/10
Hammer Wt.	300	140		
Hammer Fall	30"	30"		

No.	Pen	Rec	Sample Depth	Sample Blow Counts				Depth	Stratum Description
S-1	24"	12"	0'-2'	11	3	3	2		Brown Fine-Medium Sand and Gravel
S-2	24"	17"	5'-7'	3	4	4	3	5'	Sand and Clay Mixed with wood Pieces
S-3	24"	14"	10'-12'	1	1	2	2	10'	Brown Fine-Medium Sand some Silt
S-4	24"	15"	15'-17'	1	1	2	1	15'	Grey Clayey Silt (Native)
S-5	24"	22"	20'-22'	1	1	1	1	20'	
S-6	24"	23"	25'-27'	1	1	1	1	25'	Grey Silty Clay
S-7	24"	21"	30'-32'	1	1	1	1	30'	
S-8	24"	15"	35'-37'	10	12	14	14	35'	Brown Medium-Coarse Sand Trace Silt (Glacial Till)
S-9	24"	16"	40'-42'	10	14	16	14	40'	
									Bottom of Exploration @ 43.2' (Bedrock possible Boulder)

Boring #: B-4
Sheet: 1 of 1