Sebago Technics
Engineering Expertise You Can Build On

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August 4, 2006
06020

Steve Atripaldi
Facilities Manager
Maine Historical Society
489 Congress Street
Portland, ME 04101-3498

Report on Subsurface and Foundation Investigation, Proposed Addition Maine Historical Society Library, Portland, Maine

Dear Steve:

This report presents the results of our subsurface and foundation investigation for the proposed Addition to the Maine Historical Society Library in Portland.

In summary, it is our opinion that the addition may be supported on spread and continuous footings bearing on undisturbed, naturally deposited soils or on compacted structural fill placed after removal of unsuitable material. In addition, a slab-on-grade may be used for the lowest (basement) floor level. An underslab and perimeter foundation drain is required to prevent hydrostatic pressures on the basement slab and foundation walls and minimize seepage in the basement. Specific recommendations regarding foundation design and construction considerations are presented below.

Introduction

The addition will be constructed to the northwest of the existing library at 489 Congress Street. The existing 2-story portion of the library will be demolished and a new three-story addition with basement will be constructed in the area occupied by the demolished portion and extending into the garden area. The addition will be approximately 32 feet by 64 feet in plan dimension and will be steel framed with brick exterior. The basement floor level will be at El. 62.23. Maximum column loads will be on the order of 270 kips.

Elevations in this report are in feet and based on the City of Portland Datum, which is essentially equivalent to NGVD 1929 Datum.

Subsurface Explorations

During the period July 5 July 7, 2006, Maine Test Borings, Inc. (MTB) of Brewer, Maine drilled 7 borings, B1 to B6 and B6A, at the site at locations shown on Sheet 1 of 1, Boring Plan. MTB drilled the borings to depths below ground surface varying from 6.5 feet to 22.0 feet. Sebago Technics, Inc. monitored the borings and prepared the logs included in Appendix A. Table I summarizes the results of borings. MTB backfilled the borings using the drilled material.

Borings were drilled using 3.0-inch diameter casing and a tripod. Borings were advanced using wash techniques. Samples were generally recovered at 5-feet intervals. Standard Penetration Resistance (N) was measured at each sample interval in accordance with ASTM Test D1586. A groundwater observation well was installed in completed boring B1.

On July 25, 2006, a test pit was hand excavated by O'Brien Brothers (OB) of Buxton, Maine adjacent to the garage connecter at the rear of the garden. OB excavated the test pit to 4.7 feet below ground surface to expose the foundation of the connector. Sebago Technics, Inc. monitored the test pit and prepared the log included in Appendix B. OB backfilled the test pit with the excavated material.

Sebago Technics, Inc. determined the locations of borings and test pit by taping from existing site features.

The boring and test pit logs and related information depict the subsurface conditions and water levels encountered at the locations and during the times indicated on the logs. Subsurface conditions at other locations may differ from those encountered in the test borings and test pit. The passage of time may result in a change in groundwater conditions at the exploration locations.

Subsurface Conditions

The borings encountered five principal soil units at the site: fill, marine sand, marine silt, marine clay and glacial till. Encountered thickness and generalized descriptions of the strata encountered are presented below in order of increasing depth below ground surface. Due to the complexity of the deposition process, strata thickness will vary and may be absent at specific locations.

Fill - Fill consists of very loose to dense, brown to dark brown silty SAND (SM); to well-graded SAND with gravel (SW); to well-graded SAND with silt (SW-SM) with trace roots and bricks. Encountered thickness varied from 2.8 feet to 6.5 feet.

Marine Sand - Marine sand consists of very loose to medium dense, brown to gray brown silty SAND (SM). Encountered thickness varied from 2.9 feet to 14.0 feet.

Marine Silt - Marine silt consists of stiff to hard, gray brown mottled sandy SILT (ML). Encountered thickness varied from 2.8 feet to 3.0 feet.

Marine Clay - Marine clay consists of medium stiff to stiff, gray lean CLAY (CL). Encountered thickness varied from 7.3 feet to 9.5 feet.

Glacial Till - Glacial till consists of medium dense to very dense, gray silty SAND with gravel (SM); to well-graded SAND with silt and gravel (SW-SM). Borings penetrated up to 8.5 feet into glacial till.

Water was observed in the borings at depths below ground surface varying from 5.0 feet to 11.8 feet. Water was measured in the observation well in B1 at depths below ground surface of 6.1 feet and 5.6 feet on July 7 and July 25, 2006, respectively.

Water levels at the site will vary with season, precipitation, temperature and construction activity in the area. Therefore, water levels during and following construction will vary from those measured in the borings and observation well.

Strength and Compressibility Characteristics of Clay Stratum

We estimated the stress history of the clay deposit by correlations with shear strength of similar clays in the area. The undrained shear strength of the clay stratum was estimated from correlations with the Standard Penetration Resistance, N, measured at sample intervals. Correlations of shear strength vary from 700 pounds per square foot (psf) to 1,200 psf. The stress history of the deposit was estimated by comparing the undrained shear strength with correlations for strength and stress history of clay from other projects with similar conditions.

The stress-strain or compressibility characteristics (settlement) of clays are highly dependent upon their stress history. If clay is stressed within the limits of the maximum previous stress, σ_{vm}, the strain (settlement) will be a function of the recompression ratio (RR) of the clay. If the applied stress exceeds the maximum previous stress, the strain will be proportional to the virgin compression ratio (CR). The compression ratio is typically 10 to 15 times the recompression ratio.

The stress history and appropriate compression ratios were estimated for the clay deposit as discussed above. The correlations indicate that the deposit is significantly over consolidated, that is, the existing overburden stress is considerably less than the maximum previous stress. The deposit likely became over consolidated due to desiccation (drying) resulting from a lowering of the groundwater level at some time in the geologic past which created a stiff upper crust and also increased the effective overburden stress throughout the stratum.

Recommendations for Foundation Design

Recommended Foundation Type and Design Criteria

The existing fill is not considered suitable for support of the addition or floor slab. All fill should be removed from within the addition limits. In our opinion, the addition may be supported on spread and continuous footings bearing on undisturbed, naturally-deposited sand, silt and clay or on compacted structural fill placed after removal of unsuitable soil or for raises-in-grade. Interior walls may be supported on footings or thickened portions of the floor slab.

For uniformity, footings may be proportioned for an allowable bearing stress in pounds per square foot (psf) equal to 1,000 multiplied by the least lateral dimension of the footing in feet, up to 3,000 psf. All footings should be a minimum of 2.0 feet wide.

Exterior footings should be founded at least 4.5 ft. below the lowest adjacent ground surface exposed to freezing. Interior footings should be founded a minimum of 1.5 ft. below the ground floor slab.

Compacted structural fill supporting footings should extend laterally from the footings to at least the limits defined by 1 horizontal to 1 vertical lines sloped outward and downward from points located at least 2 ft. horizontally beyond the bottom edges of the footings.

We estimate that the total settlement of the addition will be less than 1.0 inch with differential settlement less than 0.5 inch in 30 feet. We estimate that approximately 50 percent of this settlement will occur during the construction period as dead load is applied and the remainder will be long-term settlement occurring over 5 years. We anticipate that settlement of this magnitude is acceptable. However, Becker Structural Engineers should determine final acceptability of settlement.

We anticipate that the lowest level foundations for the addition will bear at approximately El 60.5. Bearing level of the adjacent connector at the rear of the garden is on the order of El. 70.4. We estimate that foundations for the adjacent building to the east side of the addition bear at elevations stepping from El 66.6 to El. 64.6 to El. 62.6. Foundations of the library to remain bear at approximately El. 73. Thus, the lowest foundation level will vary from 2 feet to 13 feet below the foundation level of adjacent structures.

Foundations at the lowest level of the addition should be designed to bear above an envelope defined by a 1 horizontal to 1 vertical line drawn outward and downward from the bottom edges of the adjacent footings. This will require adjusting the basement limits to meet this criteria. Alternatively, the adjacent foundations could be underpinned to carry the support level to approximately El. 60.5 to permit the basement to extend to the full footprint of the addition. Typical underpinning methods include panel and pit underpinning where panels or pits are excavated, formed and concrete is poured to extend the foundation to the new bearing level; slant piles consisting of drilled soldier piles; and drilled mini-piles installed through the existing foundations consisting of grouted concrete piles with high strength bar for reinforcing.

Ground Floor Slab

We recommend that the lowest level floor slab be designed as an earth-supported slab-on-grade bearing on a minimum 6-inch thickness of ¾-inch or crushed stone. All fill placed below the floor slab for raises-in-grade should consist of compacted structural fill or crushed stone. A perimeter foundation drain and underslab drain system will be required in the sub-basement area of the new addition.

Groundwater was observed above the proposed sub-basement floor level. We recommend that a perimeter foundation drain and an underslab drain be constructed on the outside of the foundation walls and below the basement slab. Drains should consist of 4-inch diameter perforated or porous wall pipe surrounded by 3/4-inch crushed stone and non-woven geotextile filter fabric. The basement slab should be underlain by a 6-inch layer of 3/4–inch crushed stone and non-woven geotextile filter fabric. The invert of the foundation drains should be below the basement floor levels and the underslab drain should include a loop around the perimeter of the slab to provide multiple paths for water flow. Gravity discharge and normal dampproofing and vapor barriers should be provided.

If gravity discharge is used, provisions should be made to prevent reversal of flow and backup of discharge in case of a severe storm or other event. If gravity discharge is not available, discharge from the system may be accomplished by pumping. In order to provide for backup discharge, the system should be designed with a standby pump at the sump. The pumps should have emergency electric power available in the event of a power failure. We recommend that the discharge from the sump be designed for a flow of 30 gallons per minute. Normal damp-proofing measures and vapor barriers should be provided for basement walls and slab.

We recommend a modulus of subgrade reaction of 200 pounds per cubic inch for slab design.

Seismic Design Considerations

We recommend that the building be designed in accordance with the seismic requirements of the latest edition of the International Building Code, the site classification is Class D; the site response coefficient F_a is 1.5 for a short period spectral response acceleration S_s of 0.37g; the site response coefficient F_v is 2.4 for the 1-second period spectral response acceleration S_1 of 0.10g. The subgrade soils are not considered liquefaction susceptible.

Lateral Foundation Loads

We recommend that lateral loads be resisted by bottom friction on footings and that a coefficient of friction equal to 0.35 be used for footings. If this does not provide sufficient lateral resistance, we will consider the problem in more detail to take into account other factors.

Lateral Soil Pressure

We recommend that the basement walls, which are restrained at the top and backfilled, be designed to resist a lateral earth pressure calculated on the basis of an equivalent fluid unit weight of 55 pounds per cubic feet. This fluid unit weight assumes an at rest earth pressure coefficient of 0.45, a free-draining granular backfill and an effective drainage system. The portion of basement wall adjacent to the library to remain will be subject to surcharge due to the loads from people, materials and equipment. The walls should be designed for a uniform lateral pressure acting over the full height of wall, calculated on the basis of 0.5 times the surcharge stress (floor load), in addition to the lateral soil pressure recommended above.

Backfill Materials

Structural fill used below foundations and floor slabs and for backfill adjacent to walls should consist of sandy gravel to gravelly sand. It should be free of organic material, loam, trash, snow, ice, frozen soil and other objectionable material, and should conform to the following gradation:

Sieve Size	Percent Finer by Weight
3 inches	100
No. 4	30 to 90
No. 40	10 to 50
No. 200	0 to 8

Compacted structural fill should be placed in layers not exceeding eight inches in loose measure and compacted by self propelled vibratory equipment at the approximate optimum moisture content to a dry density of at least 95 percent of the maximum dry density, as determined in accordance with ASTM Test Designation D1557. In confined areas, the loose layer thickness should be reduced to 6 inches and compaction performed by hand-guided vibratory equipment.

Compacted structural fill on the exterior of the foundation and basement walls should extend laterally a minimum of 2 feet from the wall. Backfill beyond this limit on the exterior of the building may consist of common fill. The top 12 inches of fill on the exterior of the addition should consist of low permeability material or bituminous concrete pavement to minimize water infiltration next to the addition. Grading should provide for runoff away from the addition.

Common fill may consist of inorganic mineral soil that can be placed in layers and compacted. Common fill should be placed and spread in layers not exceeding 12 inches in thickness and compacted with a minimum of two systematic passes of the equipment placing the fill.

Construction Considerations

General

The primary purpose of this section of the report is to comment on items related to excavation, earthwork and related geotechnical aspects of proposed construction. It is written primarily for the engineer having responsibility for preparation of plans and specifications. Since it identifies potential construction problems related to foundations and earthwork, it will also aid personnel who monitor the construction activity. Prospective contractors for this project must evaluate the construction problems on the basis of their own knowledge and experience in the Portland, Maine area, and on the basis of similar projects in other localities, taking into account their proposed construction methods, procedures, equipment and personnel.

Excavation, Lateral Support and Control of Water

We anticipate that foundation excavation can be accomplished with sloped open excavation through the overburden soils provided safe side slopes can be maintained. Some sloughing and raveling should be anticipated in temporary slopes. Temporary excavations should be made in accordance with all OSHA and other applicable regulatory agency requirements. However, due to space limitations open excavation may not be feasible and it may be necessary to provide a braced, temporary earth support system. In addition, braced temporary earth support will be required for construction of the elevator pit adjacent to the library to remain.

Several lateral support schemes may be considered by the contractor, including interlocking steel sheeting, soldier beams and lagging and shotcrete walls. We anticipate that internal bracing is not practical and that external lateral bracing such as grouted tiebacks or screw anchors for sheeting and soldier beams or soil nails for shotcrete wall will be required.

Based on the observed groundwater levels in the borings and observation well, dewatering will be required during excavation and foundation construction and until the permanent perimeter foundation and underslab drain system is operational. Subsurface data indicate that excavation will be made in sand, silt and clay. In our opinion, excavation below the groundwater will require pre-drainage of the subsoils to lower the groundwater level below the lowest excavation level to achieve and maintain a stable excavation. We recommend that pre-drainage be monitored by observation wells installed within the limits of excavation and that no excavation below the groundwater table should be made to subgrade bearing level until the groundwater level has been lowered to a minimum of two feet below the lowest excavation level, as verified by the observation wells.

We anticipate that methods to predrain the soils will include vacuum assisted well points or ejectors and/or deep wells. Predrainage must be done in a manner which will preserve the undisturbed bearing capacity of the bearing soils and permit construction "in-the-dry." Well points, ejectors and deep wells should be installed with adequate filters to minimize loss of fine-grained soil.

We recommend that the contractor's methods for making and pre-draining the excavation be designed by a registered professional engineer and the scheme submitted to the owner's engineer for review and comment prior to installation.

Subgrade Preparation

The subgrade soil is susceptible to disturbance from construction traffic. Equipment and personnel should not be permitted to travel across exposed footing bearing surfaces or exposed slab subgrades. Any subgrade areas that are disturbed should be recompacted or excavated and replaced with compacted structural fill prior to placing concrete. Subgrades should be protected against freezing temperatures if exposed during construction. Final excavation to subgrade should be performed using equipment with smooth-edge buckets.

Construction Monitoring

The foundation recommendations contained herein are based on the known and predictable behavior of a properly engineered and constructed foundation. Monitoring of the foundation construction is required to enable the geotechnical engineer to keep in contact with procedures and techniques used in construction. Therefore, we recommend that a person qualified by training and experience be present to provide monitoring at the site during dewatering, excavation, preparation of foundation bearing surfaces, and placement of compacted structural fill.

Limitations of Recommendations

This report has been prepared for specific application to the subject project in accordance with generally accepted geotechnical engineering practices. In the event that any changes in the nature, design or location of the addition is planned, the conclusions and recommendations contained in this report should not be considered valid, unless the changes are reviewed and the conclusions of this report modified or verified in writing.

The recommendations presented herein are based in part on the data obtained from the referenced test borings and test pit. The nature and extent of variations between the explorations may not become evident until construction. If variations then appear evident, it will be necessary to reevaluate the recommendations of this report.

We request that we be provided the opportunity for a general review of final design and specifications in order to determine that our earthwork and foundation recommendations have been interpreted and implemented in the design and specifications as they were intended.

It has been a pleasure to work with you on this project. Please do not hesitate to contact us if you have any questions or need additional information.

Sincerely,

SEBAGO TECHNICS, INC.

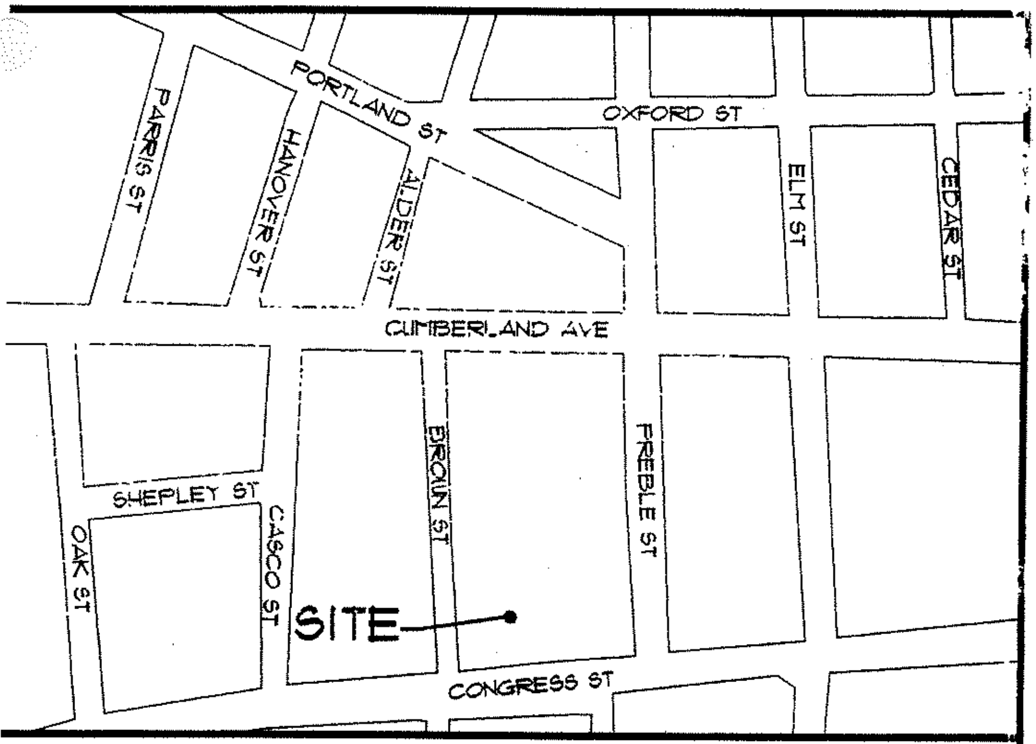
Kenneth L Recker

STATE OF MAINE
KENNETH
L
RECKER
#5435
REGISTERED
PROFESSIONAL ENGINEER

Kenneth L. Recker, P.E.
Geotechnical Engineering Manager

KLR:klr/kn
Enclosures:

Table I	- Summary of Borings
Sheet 1	- Subsurface Exploration Plan
Appendix A	- Logs of Borings
Appendix B	- Log of Test Pit and Photograph



OCATION MAP

N.T.S.

EGEND

YMBOL	DESCRIPTION
B-1	NUMBER AND APPROXIMATE LOCATION OF BORINGS DRILLED BY MAINE TEST BORINGS, INC. DURING JULY 5 TO JULY 7, 2006.
TP-1	NUMBER AND APPROXIMATE LOCATION OF TEST PIT EXCAVATED BY O'BRIEN BROTHERS ON JULY 25, 2006.

OTES

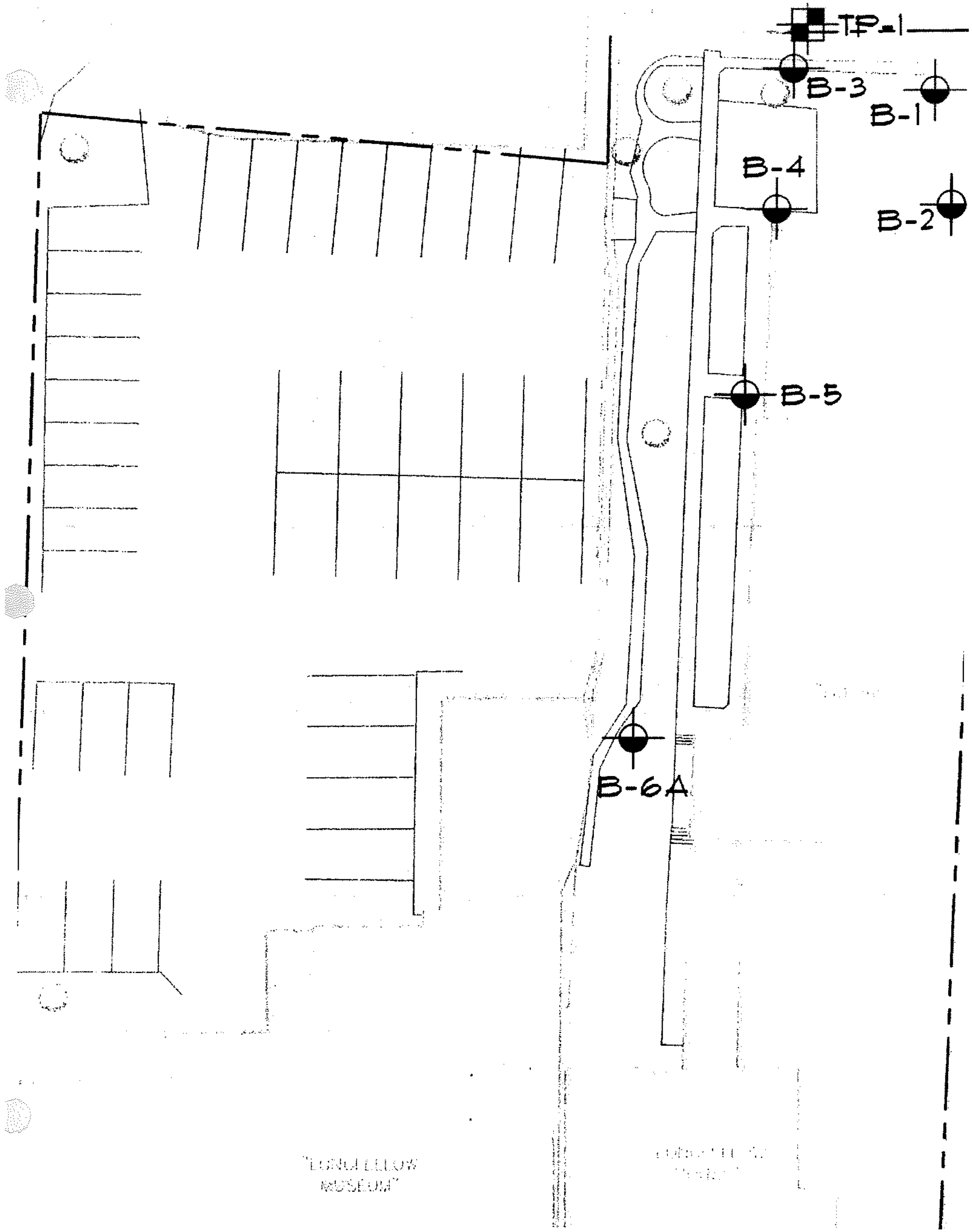
XPLORATIONS MONITORED BY SEBAGO CHNICS, INC.

LOCATIONS OF EXPLORATIONS DETERMINED BY SEBAGO TECHNICS, INC. BY TAPING FROM EXISTING SITE FEATURES.

STATUS:

ATE:

E MODIFIED WITHOUT WRITTEN PERMISSION FROM SEBAGO TECHNICS, INC. ANY ALTERATIONS, ISE, SHALL BE AT THE USER'S SOLE RISK AND WITHOUT LIABILITY TO SEBAGO TECHNICS, INC.


TP-1
B-3
B-1
B-4
B-2
B-5
B-6A
"LONGFELLOW
MUSEUM"

Appendix A

Logs of Borings

SEBAGO TECHNICS, INC.

TEST BORING REPORT

BORING NO. **B1**

Page 1 of 1

PROJECT	PROPOSED LIBRARY ADDITION, MAINE HISTORICAL SOCIETY	**STI JOB NO.**	06020
LOCATION	489 CONGRESS STREET, PORTLAND, MAINE	**PROJECT MGR.**	K. RECKER
CLIENT	MAINE HISTORICAL SOCIETY	**FIELD REP.**	K. STEPHENSON
CONTRACTOR	MAINE TEST BORINGS, INC.	**DATE STARTED**	7/6/2006
DRILLER	P. HATCH	**DATE FINISHED**	7/6/2006

Elevation ft. Datum Boring Location See Plan

Item	Casing	Sampler	Core Barrel
Type	BW	SS	--
Inside Diameter (in.)	2.0	1.375	--
Hammer Weight (lb.)	140		
Hammer Fall (in.)	30		

Rig Make & Model: Acker

☐ Track ☑ 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: BW/Driven/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		Sand				Field Test			
									% Coarse	% Fine	% Coarse	% Medium	% Fine	% Fines	Dilatancy	Toughness	Plasticity	Strength
74	0	WOH 2 2 2	S1 10	0.0 2.0		0.5	SM	Very loose, dark brown silty SAND (SM), trace roots, mps = 0.1 in., damp -FILL-				40	40	20				
						3.8	SM	Very loose, brown silty SAND (SM), trace brick and cinder, roots, mps = 0.2 in., damp -FILL-			30	30	25	15				
	5	7 5 10 10	S2 8	5.0 7.0		6.7	SM	Medium dense, gray-brown silty SAND (SM), frequent silt to clay seams, mps = 0.02 in., wet -MARINE DEPOSITS-					60	40				
						8.5	CL	Stiff, gray-brown mottled lean CLAY (CL), frequent sand partings, mps = 0.02 in., wet -MARINE DEPOSITS-					10	90	N	M	M	
64	10	5 4 5 5	S3 16	10.0 12.0		14.0	CL	Stiff, gray lean CLAY (CL), frequent sand seams, mps = 0.02 in., wet -MARINE DEPOSITS-					20	80	N	M	M	
59	15	12 42 50/.2	S4 8	15.0 16.2		16.2	SM	Very dense gray silty SAND with gravel (SM), occasional silt seams, mps = 1.0 in., wet -GLACIAL TILL DEPOSITS-	5	10	30	20	15	20				
								Split spoon refusal at 16.2 ft. Bottom of exploration at 16.2 ft. below ground surface Installed 1 in. PVC observation well at 16.0 ft.										
	20																	
	25																	
	30																	

Water Level Data

Date	Time	Elapsed Time (hr.)	Depth in feet to: Bottom of Casing	Bottom of Hole	Water
7/7/2006	0700		Well	16.0	6.1
7/15/06	[illegible]		Well	[illegible]	5.6

Sample ID

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

Well Diagram

Riser Pipe
Screen
Filter Sand
Cuttings
Grout
Concrete
Bentonite Seal

Summary

Overburden (Linear ft.)	16.2
Rock Cored (Linear ft.)	--
Number of Samples	4S
BORING NO.	B1

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.

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TEST BORING REPORT

BORING NO.
B2
Page 1 of 1

PROJECT PROPOSED LIBRARY ADDITION, MAINE HISTORICAL SOCIETY
LOCATION 489 CONGRESS STREET, PORTLAND, MAINE
CLIENT MAINE HISTORICAL SOCIETY
CONTRACTOR MAINE TEST BORINGS, INC.
DRILLER P. HATCH

STI JOB NO. 06020
PROJECT MGR. K. RECKER
FIELD REP. K. STEPHENSON
DATE STARTED 7/6/2006
DATE FINISHED 7/6/2006

Elevation ft. Datum
Boring Location See Plan

Item	Casing	Sampler	Core Barrel
Type	NW	SS	–
Inside Diameter (in.)	3.0	1.375	–
Hammer Weight (lb.)	140	140	
Hammer Fall (in.)	30	30	

Rig Make & Model: Acker
☐ 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: BW/Driven/20.0 ft.
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
75.5 0																	
					0.2		-BRICK PAVERS-										
	2 2 2 2	S1 7	0.2 2.2		0.7	SW	Very loose, brown to light brown well-graded SAND (SW), mps = 0.2 in., damp -FILL-			30	40	30					
							Very loose, dark gray silty SAND (SM), trace ash and brick, mps = 0.75 in., damp -FILL-		5	30	30	20	15				
							Note: casing refusal at 4.5 ft. Refusal at 4.0 to 4.5 ft. in four locations under brick walkway (on probable wood). Moved boring into garden bed.										
5	8 6 7 18	S2 13	5.0 7.0		5.2	SW-SM	Medium dense, brown well-graded SAND with silt and gravel (SW), mps = 1.0 in., wet -FILL-	10	10	30	30	10	10				
						ML	Stiff, gray-brown mottled sandy SILT (ML), frequent clay seams, mps = 0.02 in., wet -MARINE DEPOSITS-					40	60		L	L	
					8.0												
65.5 10	4 4 4 3	S3 20	10.0 12.0			CL	Medium stiff, gray lean CLAY (CL), frequent sand seams, mps = 0.02 in., wet -MARINE DEPOSITS-					30	70	N	M	M	
60.5 15	2 1 4 3	S4 19	15.0 17.0			CL	Medium stiff, gray lean CLAY (CL), frequent sand seams, one 0.5 in. gravel piece at 16.7 ft., wet -MARINE DEPOSITS-				20	20	60	N	M	M	
					17.5												
20	14 10 14 16	S5 4	20.0 22.0			SM	Medium dense, gray silty SAND with gravel (SM), mps = 1.2 in., wet -GLACIAL TILL DEPOSITS-	10	10	30	20	15	15				
							Bottom of exploration at 22.0 feet below ground surface. No refusal										
25																	
30																	

Water Level Data

Date	Time	Elapsed Time (hr.)	Depth in feet to: Bottom of Casing	Depth in feet to: Bottom of Hole	Depth in feet to: Water

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

Well Diagram
Riser Pipe
Screen
Filter Sand
Cuttings
Grout
Concrete
Bentonite Seal

Summary
Overburden (Linear ft.) 22.0
Rock Cored (Linear ft.) --
Number of Samples 5S

BORING NO. B2

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. **B3**

Page 1 of 1

PROJECT PROPOSED LIBRARY ADDITION, MAINE HISTORICAL SOCIETY
LOCATION 489 CONGRESS STREET, PORTLAND, MAINE
CLIENT MAINE HISTORICAL SOCIETY
CONTRACTOR MAINE TEST BORINGS, INC.
DRILLER P. HATCH

STI JOB NO. 06020
PROJECT MGR. K. RECKER
FIELD REP. K. STEPHENSON
DATE STARTED 7/6/2006
DATE FINISHED 7/6/2006

Elevation ft. Datum
Boring Location See Plan

Item	Casing	Sampler	Core Barrel
Type	NW	SS	–
Inside Diameter (in.)	3.0	1.375	–
Hammer Weight (lb.)	140	140	
Hammer Fall (in.)	30	30	

Rig Make & Model Acker
☐ 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
BW/Driven/15.0 ft.

Drilling Notes:

74.5
69.5
64.5

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/consistancy, 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		0.5	SM	Loose, dark brown silty SAND (SM), trace roots, mps = 0.1 in., damp				40	40	20				
	1					SW	Loose, brown silty SAND with gravel (SM), brick, mps = 1.3 in., damp	10	10	30	20	15	15				
	5																
	7	15	2.0				-FILL-										
					3.0												
5	8	S2	5.0			SM	Loose, gray-brown mottled silty SAND (SM), frequent silt seams, layer of					60	40				
	4						gray-brown mottled sandy silt from 6.7-7.0 ft., mps = 0.02 in., wet										
	6																
	9	16	7.0														
							-MARINE DEPOSITS-										
					8.0												
10	4	S3	10.0			SM	Medium dense, gray and brown silty SAND (SM), frequent clay seams					60	40				
	9						from 11.5-12.0 ft., one 1.0 in. gravel piece, wet										
	5																
	10	18	12.0														
					12.7		-MARINE DEPOSITS-										
15	7	NR	15.0				No recovery from 15.0 to 17.0 ft. Coarse sand and gravel in wash.										
	8																
	7																
	10		17.0														
	7	S4	17.0			SW-SM	Medium dense, gray well-graded SAND with silt and gravel (SW-SM),	10	10	30	20	20	10				
	9						mps = 1.0 In., wet										
	14						-GLACIAL TILL DEPOSITS-										
	14	12	19.0														
20							Bottom of exploration at 19.0 feet below ground surface.										
							No refusal										
25																	
30																	

Water Level Data

Date	Time	Elapsed Time (hr.)	Depth in feet to: Bottom of Casing	Depth in feet to: Bottom of Hole	Depth in feet to: Water
7/6/2006	1605		--	16.4	11.8

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

Wall Diagram
▭ Riser Pipe
▭ Screen
▭ Filter Sand
▭ Cuttings
▭ Grout
▭ Concrete
▨ Bentonite Seal

Summary
Overburden (Linear ft.) 19.0
Rock Cored (Linear ft.) –
Number of Samples 4S

BORING NO. B3

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. **B4**

Page 1 of 1

PROJECT	PROPOSED LIBRARY ADDITION, MAINE HISTORICAL SOCIETY	**STI JOB NO.**	06020
LOCATION	489 CONGRESS STREET, PORTLAND, MAINE	**PROJECT MGR.**	K. RECKER
CLIENT	MAINE HISTORICAL SOCIETY	**FIELD REP.**	K. STEPHENSON
CONTRACTOR	MAINE TEST BORINGS, INC.	**DATE STARTED**	7/5/2006
DRILLER	P. HATCH	**DATE FINISHED**	7/5/2006

Elevation ft. Datum

Boring Location See Plan

Item	Casing	Sampler	Core Barrel
Type	NW	SS	–
Inside Diameter (in.)	3.0	1.375	–
Hammer Weight (lb.)	140	140	
Hammer Fall (in.)	30	30	

Rig Make & Model: Acker

☐ 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: BW/Driven/10.5 ft.

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
76	0																	
						0.1		-SLATE-										
		1	S1	0.1		0.6	SM	Medium dense, dark brown silty SAND with gravel (SM), mps = 1.0 in., trace ash, damp -FILL-	5	10	20	30	20	15				
		4																
		9					SM	Medium dense, brown silty SAND (SM), brick fragments, mps = 0.2 in., dry			20	35	30	15				
		10	10	2.1														
								-FILL-										
						3.5												
								Note: coarse sand and gravel in wash from 3.5-4.5 ft.										
						4.5		-FILL-										
	5	15	S2	5.0			SM	Medium dense, brown to gray-brown silty SAND (SM), frequent silt seams, trace clay, mps = 0.02 in., wet -FILL-					60	40				
		6																
		8																
		13	15	7.0														
								-MARINE DEPOSITS-										
						8.5												
66	10																	
		2	S3	10.5			SM	Very loose, gray silty SAND (SM), frequent silt seams, mps = 0.02 in., trace clay, wet					65	35				
		2																
		1																
		5	20	12.5				-MARINE DEPOSITS-										
61	15	2	S4	15.0			SM	Very loose, gray silty SAND (SM), frequent silt seams, trace coarse sand, one 1 in. gravel piece, wet			5	5	60	30				
		WOH																
		3																
		3	20	17.0				-MARINE DEPOSITS-										
					576	18.5												
56	20	6	S5	19.5			SM	Medium dense, gray silty SAND with gravel (SM), mps = 1.0 in., wet	5	10	30	20	20	15				
		7																
		9																
		8	15	21.5				-GLACIAL TILL DEPOSITS-										
								Bottom of exploration at 21.5 feet below ground surface. No refusal										
	25																	
	30																	

Water Level Data

Date	Time	Elapsed Time (hr.)	Depth in feet to: Bottom of Casing	Depth in feet to: Bottom of Hole	Depth in feet to: Water
7/5/2006	1615		10.5	19.8	11.9
7/6/2006	0740		10.5	19.8	11.2

Sample ID

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

Well Diagram

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

Summary

Overburden (Linear ft.) 21.5
Rock Cored (Linear ft.) –
Number of Samples 5S

BORING NO. **B4**

Field Tests Dilatancy: R - Rapid S - Slow N - None Plasticity: N - Nonplastic L - Low M - Medium H - High
Toughness: 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. **B5**

Page 1 of 1

PROJECT	PROPOSED LIBRARY ADDITION, MAINE HISTORICAL SOCIETY	STI JOB NO.	06020
LOCATION	489 CONGRESS STREET, PORTLAND, MAINE	PROJECT MGR.	K. RECKER
CLIENT	MAINE HISTORICAL SOCIETY	FIELD REP.	K. STEPHENSON
CONTRACTOR	MAINE TEST BORINGS, INC.	DATE STARTED	7/7/2006
DRILLER	P. HATCH	DATE FINISHED	7/7/2006

Elevation ft. Datum
Boring Location See Plan

Item	Casing	Sampler	Core Barrel
Type	NW	SS	–
Inside Diameter (in.)	3.0	1.375	–
Hammer Weight (lb.)	140	140	
Hammer Fall (in.)	30	30	

Rig Make & Model Acker
☐ 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
BW/Driven/15.0
Drilling Notes:

76

665

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	0.2			SP-SM	Loose, light to dark brown to black poorly-graded SAND with silt (SP-SM),			5	45	40	10				
	2						mps = 0.1 in., damp, trace brick										
	3																
	5	13	2.2														
							-FILL-										
5																	
	9	NR	5.0		5.5												
	10					SM	Medium dense, brown silty SAND (SM)										
	14																
	15		7.0				Note: Sample description prepared from material in wash water.										
							-MARINE DEPOSITS-										
					8.5												
10																	
	5	S2	10.0			SM	Medium dense, gray silty SAND with gravel (SM), mps = 1.2 in., wet	5	10	10	25	30	20				
	6																
	8																
	9	15	12.0														
							-GLACIAL TILL DEPOSITS-										
15																	
	5	S3	15.0			SM	Medium dense, gray silty SAND (SM), mps = 1.0 in., wet		5	15	30	30	20				
	8																
	8						-GLACIAL TILL DEPOSITS-										
	10	12	17.0														
							Bottom of exploration at 17.0 feet below ground surface.										
							No refusal										
20																	
25																	
30																	

Water Level Data

Date	Time	Elapsed Time (hr.)	Depth in feet to: Bottom of Casing	Depth in feet to: Bottom of Hole	Depth in feet to: Water
6/7/2006	900		–	14.8	5.0

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

Well Diagram
▭ Riser Pipe
▭ Screen
▭ Filter Sand
▨ Cuttings
▭ Grout
▨ Concrete
▨ Bentonite Seal

Summary
Overburden (Linear ft.) 17.0
Rock Cored (Linear ft.) –
Number of Samples 3S

BORING NO. B5

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. **B6**

Page 1 of 1

PROJECT	PROPOSED LIBRARY ADDITION, MAINE HISTORICAL SOCIETY	STI JOB NO.	06020
LOCATION	489 CONGRESS STREET, PORTLAND, MAINE	PROJECT MGR.	K. RECKER
CLIENT	MAINE HISTORICAL SOCIETY	FIELD REP.	K. STEPHENSON
CONTRACTOR	MAINE TEST BORINGS, INC.	DATE STARTED	7/7/2006
DRILLER	P. HATCH	DATE FINISHED	7/7/2006

Elevation ft. Datum

Boring Location See Plan

Item	Casing	Sampler	Core Barrel
Type	NW	SS	--
Inside Diameter (in.)	3.0	1.375	--
Hammer Weight (lb.)	140	140	
Hammer Fall (in.)	30	30	

Rig Make & Model Acker

☐ 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
BW/Driven/6.5 ft.

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		0.5	ML	Dark brown sandy SILT (ML) with roots -TOPSOIL-					40	60	S	N	N	
	1					SM	Loose, dark brown silty SAND (SM), mps = 0.05 in., damp				20	60	20				
	1																
	2	8	2.0														
							-FILL-										
					3.0												
5	19	S2	5.0			SW	Dense, orange brown well graded SAND with gravel (SW), mps = 1.0 in., we	10	10	15	30	30	5				
	24						-FILL-										
	100	8	6.5														
							Split spoon refusal at 6.5 ft.										
							Bottom of exploration at 6.5 feet below ground surface										
							Moved boring 4 ft. south. Casing refusal at 2.3 ft.										
10							Moved boring 4 ft. north of original location. Advanced boring to 22.0 ft. below ground surface. See boring log B6A.										
15																	
20																	
25																	
30																	

Water Level Data

Date	Time	Elapsed Time (hr.)	Depth in feet to: Bottom of Casing	Depth in feet to: Bottom of Hole	Depth in feet to: Water

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

Well Diagram
▯ Riser Pipe
▤ Screen
☐ Filter Sand
▨ Cuttings
☐ Grout
▨ Concrete
▧ Bentonite Seal

Summary
Overburden (Linear ft.) 6.5
Rock Cored (Linear ft.) -
Number of Samples 2S

BORING NO. B6

Field Tests Dilatancy: R - Rapid S - Slow N - None Plasticity: N - Nonplastic L - Low M - Medium H - High
Toughness: 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. B6A

Page 1 of 1

PROJECT PROPOSED LIBRARY ADDITION, MAINE HISTORICAL SOCIETY
LOCATION 489 CONGRESS STREET, PORTLAND, MAINE
CLIENT MAINE HISTORICAL SOCIETY
CONTRACTOR MAINE TEST BORINGS, INC.
DRILLER P. HATCH

STI JOB NO. 06020
PROJECT MGR. K. RECKER
FIELD REP. K. STEPHENSON
DATE STARTED 7/7/2006
DATE FINISHED 7/7/2006

Elevation ft. Datum
Boring Location See Plan

Item	Casing	Sampler	Core Barrel
Type	NW	SS	--
Inside Diameter (in.)	3.0	1.375	--
Hammer Weight (lb.)	140	140	
Hammer Fall (in.)	30	30	

Rig Make & Model Acker
☐ 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
BW/Driven/20.0 ft.

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	Dilatancy	Toughness	Plasticity	Strength
0																	
							Note: Washed to 5.0 feet. See log of B6 for description of soil to 5.0 feet.										
5	27	S1	5.0			SW/SM	Dense, orange-brown well-graded SAND (SW), mps = 1.3 in., wet; to silty	10	15	15	30	25	5				
	23						SAND (SM), mps = 0.5 in., wet		5	15	30	30	20				
	26				6.5		-FILL-										
	13	10	7.0			ML	Hard, gray-brown SILT with sand (ML), mps = 0.02 in., wet					20	80	S	N	N	
							-MARINE DEPOSITS-										
					9.5												
10	3	S2	10.0			CL	Medium stiff, gray lean CLAY (CL), wet					10	90	N	M	M	
	2																
	2																
	2	12	12.0														
							-MARINE DEPOSITS-										
15	2	S3	15.0			CL	Medium stiff, gray lean CLAY (CL), wet					10	90	N	M	M	
	2				16.0												
	4					SM	Loose, gray silty SAND with gravel (SM), mps = 0.75 in., wet		10	10	20	30	30				
	4	24	17.0														
							-GLACIAL TILL DEPOSITS-										
20	17	S4	20.0			SM	Dense, gray silty SAND with gravel (SM), mps = 1.0 in., wet	10	10	10	20	20	30				
	30																
	36						-GLACIAL TILL DEPOSITS-										
	50/4 in.	14	21.9														
							Bottom of exploration at 21.9 feet below ground surface. No refusal										
25																	
30																	

19
67
63

Water Level Data

Date	Time	Elapsed Time (hr.)	Depth in feet to: Bottom of Casing	Depth in feet to: Bottom of Hole	Depth in feet to: Water
7/7/2006	1150		--	19.9	8.0

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

Well Diagram
▯ Riser Pipe
▤ Screen
▯ Filter Sand
▯ Cuttings
▯ Grout
▯ Concrete
▨ Bentonite Seal

Summary
Overburden (Linear ft.) 21.9
Rock Cored (Linear ft.) --
Number of Samples 4S

BORING NO. B6A

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.

Appendix B

Logs of Test Pit and Photograph

SEBAGO TECHNICS, INC.

TEST PIT LOG

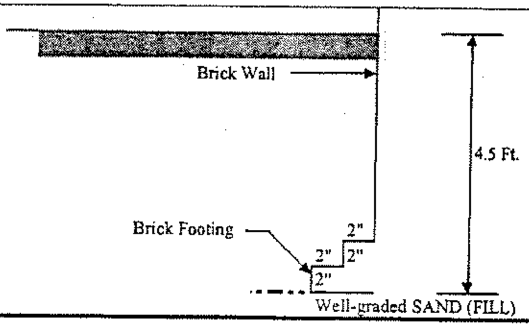
Test Pit No. TP1

Page 1 of 1

PROJECT LIBRARY ADDITION, MAINE HISTORICAL SOCIETY
LOCATION PORTLAND, MAINE
CLIENT MAINE HISTORICAL SOCIETY
CONTRACTOR O'BRIEN BROTHERS
EQUIPMENT HAND EXCAVATION

PROJECT NO. 06020
PROJECT MGR. W. CONWAY
FIELD REP K. RECKER
DATE 7/25/2006
WEATHER Sunny, 70s

Ground El. ______ ft
El. Datum ______
Location See Plan
Groundwater depths/entry rates (in/min): Not Encountered

Depth (ft)	Sample ID	Stratum Change Depth (ft)	USCS Group Symbol	Visual-Manual Identification & Description (density/consistency, color, GROUP NAME & SYMBOL, % oversized, max 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
			ML	Dark brown sandy SILT (ML), mps = 0.5 in., damp, roots		5	5	10	15	70	S	N	N	
				-TOPSOIL-										
1														
		1.5												
			SM	Dark brown silty SAND (SM), mps = 1.5 in., damp, trace roots		5	10	25	30	30				
2														
				-FILL-										
3														
4														
		4.5												
			SW	Brown well-graded SAND with gravel (SW), mps = 1.0 in., damp -FILL-	5	10	15	30	35	5				
				Bottom of test pit at 4.7 feet below ground surface.										
5														
				No Refusal										
6														
7														

Obstructions:

Remarks:

Standing water in completed pit:
at depth ______ ft.
measured after ______ hrs. elapsed

Boulders:

Diameter (in.)	Number		Approx. vol. (cu. ft.)
12 to 24		=	
over 24		=	

Test Pit Dimensions (ft):
Pit Depth 4.7
Pit Length X Width 4.0 x 2.0

06020