Sebago Technics determined the locations of test pits by taping from existing site features.

The test pit logs and related information depict subsurface conditions and water levels only at their specific locations at the time of excavation. Soil conditions at other locations may differ from conditions at these locations. Also, the passage of time may result in a change in groundwater conditions at exploration locations.

The test pits encountered three principal soil units at the site: topsoil, fill and glacial outwash. Encountered thickness and generalized descriptions of these units 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.

Topsoil – Topsoil consists of brown to dark brown, silty SAND **(SM),** with grass roots. Encountered thickness varied from 0.6 foot to 0.7 foot.

Fill – Fill consists of brown to dark brown to gray brown, silty SAND with gravel **(SM);** to well-graded SAND with gravel (SW); to well-graded GRAVEL (GW) with up to 40 percent oversized (cobbles and boulders). Encountered thickness varied from 0.6 foot to 3.3 feet.

Glacial Outwash – Glacial outwash consists of light brown to brown, well-graded SAND with gravel **(SW)** with up to 15 percent oversized (cobbles and boulders). Test pits penetrated up to 6.8 feet into the stratum.

Groundwater was not observed in the test pits. However, observations of water were made over a relatively short period of time and may not represent the stabilized water level. In addition, 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 encountered in the test pits.

Recommendations for Foundation Design

Recommended Foundation Type and Design Criteria

The topsoil and existing fill are not suitable for support of the building or ground floor slab. All topsoil, fill and existing construction should be removed from within the building limits. We recommend that the building be supported on spread and continuous footings bearing on the undisturbed, naturally deposited sand (glacial outwash) or on compacted structural fill placed after removal of unsuitable soil.

Footings should be proportioned for an allowable bearing stress of 1,000 pounds per square foot (psf) multiplied by the least lateral dimension of the footing in feet up to 3,000 psf. All footings should be at least 1.5 feet wide.

Exterior footings should be founded at least **4.5** feet below the lowest adjacent ground surface exposed to freezing. Interior footings should be founded a minimum of 1.5 feet 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** feet horizontally beyond the bottom edges of the footings.

Ground Floor Slab

We recommend that the lowest floor slab (basement) be designed as an earth-supported slab-on-grade bearing on a minimum of 4 inches of ½ or ¾ inch crushed stone. We recommend a perimeter and underslab drain system be constructed on the outside of the foundation walls and below the slab to minimize hydrostatic pressure and seepage into the basement of the building. The crushed stone layer below the floor slab, in combination with perforated pipes, may be used to collect any groundwater or surface water that infiltrates into the system.

We anticipate that gravity discharge is available for the system. If gravity discharge is not available, discharge will require collection into sumps and pumping. Normal dampproofing and vapor barrier should be provided for the lower level slab and walls.

Seismic Design Considerations

We recommend that the buildings 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. We recommend that a coefficient of friction equal to **0.35** be used for footings bearing on soil or crushed stone. If this does not provide sufficient resistance, we will study the problem in more detail to take into account other factors.

Lateral Soil Pressure

We recommend that foundation 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** and a free-draining backfill.

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 in.	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 outside of the foundation walls should extend laterally a minimum of 2 feet from the wall. Backfill beyond this limit on the outside of the building may consist of common fill. The top 12 inches of fill on the exterior of the building should consist of low permeability material to minimize water infiltration next to the building. Grading should provide for runoff away from the building.

Common fill may consist of inorganic mineral soil that can be placed 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.

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. It may be necessary to provide lateral support of the excavation along Sheridan Street if the existing sidewalk must be maintained during construction. 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. Existing foundations within the limits of proposed foundations and floor slabs should be completely removed and the excavation to bearing level backfilled with compacted structural fill or crushed stone, **as** appropriate. Existing foundations below drives and the parking area should be removed to at least 2 feet below the pavement.

We anticipate that groundwater may be encountered during excavation for footings. If encountered, open pumping from sumps can likely control groundwater. In general, the contractor should control groundwater and water from other sources by methods that prevent disturbance of adjacent soils and allow construction in-the-dry.

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 of 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 excavation of 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 buildings are 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.

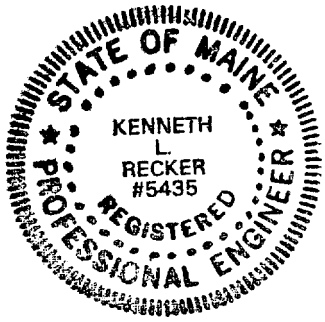
The recommendations presented herein are based in part on the data obtained from the referenced test pits. The nature and extent of variations between the explorations may not become evident until construction. **If** variations then appear evident, it will be necessary to re-evaluate the recommendations 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, P.E.
Geotechnical Engineering Manager

KLR:klr/jc
Enclosures:

Sheet 1 - Site and Subsurface Exploration Plan
Appendix A - Logs **of** Test Pits

Appendix A

Logs of Test Pits

(Test Pit No.

Ground El. / Datum	41.5 ft	Location	See Plan
Groundwater depths/entry rates (in/min): N/E			

Depth	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	Toughness	Plasticity	Strength
			SM	Dark brown silty SAND with gravel (SM), roots. mps = 3 0 in.. dry	10	10	30	10	25	15				
		0 9		-FILL-										
	1.6	1.6	SW-SM	Brown well-graded SAND with silt and gravel (SW-SM), bricks, 25% oversized, mps = 12 0 in , trace wood, dry	20	10	30	20	10	10				
2	S1		GW	Brown well-graded GRAVEL with sand (GW), mps = 3.0 in., roots, trace silt, dry	30	40	20	5	5					
	2.3	2 3		-FILL-										
			SW	Light brown well-graded SAND with gravel (SW), 10% oversized, mps = 6 0 in , dry	10	10	40	30	10					
4				-GLACIAL OUTWASH DEPOSITS-										
6														
8														
				Bottom of exploration at 8 0 ft below ground surface										
				No refusal										
10														

Obstructions:

Remarks: Fill is deeper on up-slope wall of test pit

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

Boulders:

Diameter (in.)	Number		Approx. vol. (cu. ft.)
12 to 24	3	=	
over 24	--	=	

Test Pit Dimensions:
Pit Depth 8.0 Ft.
Pit Length X Width 11.0 Ft. X 4.0 Ft.

SEBAGO TECHNICS, NC.

TEST PIT LOG

Test Pit No. **TP2**

Page 1 of 1

PROJECT	SHERIDAN STREET CONDOMINIUMS	PROJECT NO.	04446
LOCATION	SHERIDAN STREET, PORTLAND, MAINE	PROJECT MCR.	K. RECKER
CLIENT	TFH ARCHITECTS	FIELD REP	K. B. STEPHENSON
CONTRACTOR	W. H. LAVIGNE	DATE	11/4/04
EQUIPMENT	LINK BELT 2700	WEATHER	Sunny, 40s

Ground El. 38.1 ft | Location See Plan | Groundwater depths/entry rates (in/min): N/E

Datum

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
		0.3		-BITUMINOUS CONCRETE-										
		0.5	SW	Brown well-graded SAND with gravel (SW), mps = 2.0 in., dry -FILL-	15	10	30	20	25					
		0.6		-BITUMINOUS CONCRETE-										
		0.8	SW	Brown well-graded SAND with gravel (SW), mps = 2.0 in., dry -FILL-										
		1.8	GW-GM	Brown well-graded GRAVEL with silt and sand (GW-GM), mps = 4.0 in., wood, brick, dry	30	30	20	5	5	10				
2			SW	Light brown well-graded SAND with gravel (SW), 10% oversized, mps = 6.0 in., dry	10	10	40	30	10					
4				-GLACIAL OUTWASH DEPOSITS-										
	5.0 S1 6.0													
6														
8				Bottom of exploration at 8.0 ft. below ground surface No refusal										
10														

Instructions:

Remarks:

Standine 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:
Pit Depth 8.0 Ft
Pit Length X Width 10.0 Ft. X 4.0 Ft.

SEBAGO TECHNICS, INC.

TEST PIT LOG

Test Pit No. **TP3**

Page 1 of 1

PROJECT	SHERIDAN STREET CONDOMINIUMS	PROJECT NO.	04446
LOCATION	SHERIDAN STREET, PORTLAND, **MAINE**	PROJECT MGR.	K. RECKER
CLIENT	TFH ARCHITECTS	FIELD **REP**	K. B. STEPHENSON
CONTRACTOR	W. H. LAVIGNE	DATE	11/4/04
EQUIPMENT	**LINK** BELT 2700	WEATHER	Sunny, **40s**

Ground El. **37.1** ft | Location See Plan | Groundwater depths/entry rates (in/min): N/E

El. Datum

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
		0.3		-BITUMINOUS CONCRETE-										
		0.9	SM	Brown silty SAND with gravel (SM), mps = 3.0 in., dry -FILL-	25	15	30	10	5	15				
			SM	Gray-brown silty SAND with gravel (SM), bituminous concrete, ash, brick, rebar, mps =	20	10	25	15	10	20				
		1.5		4.0 in., dry -FILL-										
2			SW	Brown well-graded SAND with gravel (SW), 40% oversized, mps = 12.0 in.,	25	20	40	10	5					
	S1	2.2		dry -FILL-										
			SW	Light brown well-graded SAND with gravel (SW), 10% oversized, mps = 8.0 in., dry	10	10	40	30	10					
4														
				-GLACIAL OUTWASH DEPOSITS-										
6														
	6.0													
	S2													
	7.0													
				Bottom of exploration at 7.0 ft. below ground surface										
8				No refusal										
10														

Instructions:

Remarks: Test pit walls collapse rapidly

Standine water in comnleted pit:
at depth ft.
measured after hrs. elapsed

Boulders:

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

Test Pit Dimensions:
Pit Depth 7.0 Ft.
Pit Length X Width 10.0 Ft. X 4.0 Ft.

:EBAGO 'ECHNICS, NC.	**TEST PIT LOG**	Test Pit No. **TP4**
		Page 1 of 1

ROJECT	SHERIDAN **STREET** CONDOMINIUMS	PROJECT **NO.**	04446
OCATION	SHERIDAN **STREET,** PORTLAND, MAINE	PROJECTMGR.	K RECKER
LIENT	TFH ARCHITECTS	FIELD **REP**	K. B. STEPHENSON
'ONTRACTOR	W. H LAVIGNE	DATE	1 1/4/04
QUIPMENT	LINK BELT 2700	WEATHER	Sunny, 40s

Ground El.	37.1 ft	Location	See Plan	Groundwater depths/entry rates (in/min): N/E
Datum				

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
			SM	Dark brown silty SAND (SM), mps = 1.0 in., grass roots, dry	5	5	15	20	40	15				
		0.7		-TOPSOIL/FILL-										
			SM	Gray-brown silty SAND with gravel (SM), brick, glass, shells, mps = 3.0 in., dry	10	10	30	10	25	15				
		1.5		(Note: varies in depth from 1.2 to 1.5 ft.) -FILL-										
2			SW	Brown well-graded SAND with gravel (SW), 40% oversized, mps = 24.0 in., root mass at 2.5 ft., dry	20	10	30	30	10					
				-FILL-										
4		4.0												
			SW	Brown well-graded SAND with gravel (SW), 15% oversized, mps = 10.0 in., dry	20	15	30	25	10					
6				-GLACIAL OUTWASH DEPOSITS-										
8														
				Bottom of exploration at 8.4 ft. below ground surface										
				No refusal										
10														
-														
-														

Instructions:

Remarks:

Standine water in completed pit:
at depth _____ ft.
measured after _____ hrs. elapsed

Boulders:

Diameter (in.)	Number		Approx. vol. (cu. ft.)
12 to 24	20	=	
over 24	10	=	

Test Pit Dimensions:

Pit Depth	8 4 Ft
Pit Length X Width	10.0 Ft. X 4.0 Ft.

SEBAGO TECHNICS, INC.

TEST PIT LOG

Test Pit No. **TP5**

Page 1 of 1

PROJECT	SHERIDAN STREET **CONDOMINIUMS**	PROJECT NO.	04446
LOCATION	SHERIDAN STREET, PORTLAND, MAINE	PROJECT MGR.	K. RECKER
CLIENT	TFH ARCHITECTS	FIELD REP	K. B. STEPHENSON
CONTRACTOR	W. H. LAVIGNE	DATE	11/4/04
EQUIPMENT	LINK BELT 2700	WEATHER	Sunny, 40s

Ground El. 38.3 A | Location See Plan | Groundwater depths/entry rates (in/min): N/E

El. Datum

Depth (ft)	Sample ID	Stratum Change Depth (ft)	USCS Group Symbol	Visual-Manual Identification & Description (densityiconsistency. color, GROUP NAME & SYMBOL, % oversized, max particle size, structure. odor, moisture, optional descnptions, geologic interpretation)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Toughness	Plasticity	Strength
			SM	Bmwn silty SAND (SM), 15% oversized, mps = 6.0 in., grass roots, dry	5	5	20	20	35	15				
		1.2		-TOPSOIL/FILL-										
2			SW	Light brown well-graded SAND with gravel (SW), 10% oversized, mps = 8 0 in, dry	15	10	40	25	10					
4														
6				-GLACIAL OUTWASH DEPOSITS-										
8				Bottom of exploration at 8.0 ft. below ground surface No refusal										
10														

Instructions:

Remarks:

Standing water in completed Pit:
at depth _____ A.
measured after _____ hrs. elapsed

Boulders:

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

Test Pit Dimensions:
Pit Depth 8.0 Ft.
Pit Length X Width 10.0 Ft. X 4.0 Ft.

04446

TABLE I
SUMMARY OF TEST PITS
PROPOSED CONDOMINIUMS
SHERIDAN STREET
PORTLAND, MAINE

Test Pit Number	Depth (Ft)	Depth to Water (Ft)	Strata Thickness (Ft)		
			Topsoil	Fill	Glacial Outwash
TP1	8.0	NE	--	2.3	5.7*
TP2	8.0	NE	--	1.8	6.2*
TP3	7.0	NE	--	2.2	4.8*
TP4	8.4	NE	0.7	3.3	4.4*
TP5	8.0	NE	0.6	0.6	6.8*

NOTES:

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