REPORT

23-2478 S

March 20, 2024

Geotechnical Engineering Services

Proposed Maintenance Building
Town of Raymond Public Works Facility
170 Plains Road
Raymond, Maine

Prepared For:
Sebago Technics, Inc.
Attention: Owens McCullough, P.E.
75 John Roberts Rd.
South Portland, McE 04106

Prepared By:
S. W. Cole Engineering, Inc.
286 Portland Rd.
Gray, Maine
T: 207-657-2866

TABLE OF CONTENTS

23-2478 S

March 20, 2024

Sebago Technics, Inc.
Attention: Owens McCullough, P.E., LEED AP
75 John Roberts Road
South Portland, ME 04106

Subject: Geotechnical Engineering Services
Proposed Maintenance Building
Town of Raymond Public Works Facility
170 Plains Road
Raymond, Maine

Dear Owens:

In accordance with our Proposal, dated December 20, 2023, we have observed subsurface explorations for the subject project. This report summarizes our findings and geotechnical recommendations, and its contents are subject to the limitations set forth in Appendix A.

1.0 INTRODUCTION

1.1 Scope and Purpose

The purpose of our services was to obtain subsurface information at the site in order to develop geotechnical recommendations relative to foundations and earthwork associated with the proposed construction. Our scope of services included observation of excavator-dug test pits explorations, a geotechnical analysis of the subsurface findings and preparation of this report.

1.2 Site and Proposed Construction

We understand development plans call for construction of a new one story, high bay, steel-framed, heated maintenance building at the existing public works facility at 170 Plains Road in Raymond, Maine. We understand the new building site is currently a

relatively level gravel yard area occupied by an office trailer, septic tank and septic leach field.

We understand the proposed building will be about 90 by 148 in plan dimensions and will have a slab-on-grade at elevation 304 feet matching the existing salt shed building. We understand spread footings and frost walls are planned. Based on the plan provided, the existing ground surface within a majority of the proposed building footprint is at about elevation 303 feet with a cut slope rising to about elevation 308 at the southeasterly end. Anticipated structural loading is not available at this time.

Proposed and existing site features are shown on the "Exploration Location Plan" attached in Appendix B.

2.0 EXPLORATION AND TESTING

2.1 Explorations

Five test pits (TP-101 through TP-105) were made at the site on February 22, 2024, by P&K Sand & Gravel, Inc. working under subcontract to the Town of Raymond. The exploration locations were selected and established in the field by S. W. Cole Engineering, Inc. (S.W.COLE) using measurements from then proposed building corners as staked by Sebago Technics, Inc. (STI). As discussed, we understand the proposed building footprint was shifted about 30 feet towards Plains Road from the staked building corners referenced during observation of the test pits. The approximate exploration locations are shown on the "Exploration Location Plan" attached in Appendix B. Logs of the explorations and a key to the notes and symbols used on the logs are attached in Appendix C. The elevations shown on the logs were estimated based on topographic information shown on the "Exploration Location Plan".

2.2 Field Testing

The test pit explorations were dug using a mid-sized excavator. The soils were visually classified in the field during the explorations.

3.0 SUBSURFACE CONDITIONS

3.1 Soil and Bedrock

Test pits TP-101, TP-102 and TP-105 were made in the existing gravel yard area and generally encountered uncontrolled fill extending to depths of about 7 to 8 feet below the existing yard surface overlying native sands. The uncontrolled fill consists of a surficial layer of gravelly sand (where encountered) overlying loamy sand and silt with pieces of wood, logs, asphalt, and boulders of various sizes (mixed fill). These test pits were terminated in the native fine to medium sand, trace silt at depths varying from about 8 to 9 feet. Test pits TP-103 and TP-104 were made on the southeasterly end of the proposed building at the edge of the developed gravel yard area and generally encountered 2 to 2.5 feet of loamy topsoil with roots overlying the native fine to medium sand, trace silt. These test pits were terminated in the native sands at depths of about 4 to 5 feet. It should be noted that the soils were frozen at the time of the explorations to a depth of about 2 feet.

Not all the strata were encountered at each exploration; refer to the attached logs for more detailed subsurface information.

3.2 Groundwater

Below about 2 feet of frozen soil, the soils encountered at the test pits were generally moist from the ground surface. Long term groundwater information is not available. It should be anticipated that groundwater levels will fluctuate, particularly in response to periods of snowmelt and precipitation, as well as changes in site use.

4.0 EVALUATION AND RECOMMENDATIONS

4.1 General Findings

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

- Based on the findings at the test pits, it appears the existing yard area was constructed with a tapered, uncontrolled fill reaching at least 8 feet thick in the northwesterly portion of the proposed building. The uncontrolled fill is unsuitable for support of the foundations and slabs and will need to be removed beneath the entire building footprint, including entrance slabs, and replaced with compacted

Granular Borrow. The limits of unsuitable soils removal should extend laterally outward at least 1 foot from the building perimeter for each 1 foot of excavation depth below footing bearing elevation.

- Spread footing foundations and a slab-on-grade floor bearing on properly prepared subgrades appear suitable for the proposed building. Footings should bear on at least 3-inches of compacted Crushed Stone overlying undisturbed native sands or compacted Granular Borrow overlying undisturbed native sands. On-grade floor slabs should bear on at least 18-inches of compacted Structural Fill overlying undisturbed native sands or compacted Granular Borrow overlying undisturbed native sands.

- All fill, topsoil and soils with organics and roots, remnant structures and utilities must be completely removed from beneath the proposed building area to expose the native sands; the overexcavated area should be backfilled with compacted Granular Borrow. All boulders encountered in the native soils should be removed to within 24-inches below all concrete and utilities.

- Based on the exploration information, native soils across the site are anticipated to consist of sand with varying amounts of silt and gravel. Based on site observations and exploration information, boulders of various sizes should be expected during site preparation and excavation. Excavation of bearing surfaces should be completed with a smooth-edged bucket to lessen subgrade disturbance. In our opinion, the native, non-organic sands appear suitable for reuse as compacted Granular Borrow to backfill overexcavations beneath the building footprint.

4.2 Site and Subgrade Preparation

We recommend that site preparation begin with the construction of an erosion control system to protect adjacent drainage ways and areas outside the construction limits. As much vegetation as possible should remain outside the construction areas to lessen the potential for erosion and site disturbance.

All fill, topsoil and soils with organics and roots, remnant structures and utilities must be completely removed from beneath the entire building footprint, including entrance slabs.

The extent of removal should extend 1 foot laterally outward from outside edge of perimeter footings for every 1-foot of excavation depth (1H:1V bearing splay). The overexcavated area should be backfilled with compacted Granular Borrow. All boulders should be removed to within 24-inches below all concrete and utilities.

We recommend that footings be excavated using a smooth-edged bucket to help reduce subgrade disturbance. We recommend footings be underlain with at least 3 inches of compacted Crushed Stone overlying properly prepared subgrades. We recommend on-grade floor slabs be underlain with at least 18 inches of compacted Structural Fill overlying properly prepared subgrades.

4.3 Excavation and Dewatering

Excavation work will generally encounter topsoil, soils with organics and roots, uncontrolled fill with debris and wood, boulders of various sizes and native sands. Care must be exercised during construction to limit disturbance of the bearing soils. Earthwork and grading activities should occur during drier, non-freezing weather of Spring, Summer and Fall. Final cuts to subgrade should be performed with a smooth-edged bucket to help reduce strength loss from soil disturbance.

Vibrations from construction should be controlled below threshold limits of 0.5 in/sec for structures, water supply wells and infrastructure within 500 feet of the project site. More restrictive vibration limits may be warranted in specific cases with sensitive equipment, historic structures or artifacts on-site or within close proximity.

Sumping and pumping dewatering techniques should be adequate to control groundwater in excavations, if needed. Controlling the water levels to at least one foot below planned excavation depths will help stabilize subgrades during construction. Excavations must be properly shored or sloped in accordance with OSHA Regulations to prevent sloughing and caving of the sidewalls during construction. Care must be taken to preclude undermining adjacent structures, utilities and roadways. The design and planning of excavations, excavation support systems, and dewatering is the responsibility of the contractor.

4.4 Foundations

We recommend the proposed buildings be supported on spread footings founded on at least 3-inches of compacted Crushed Stone bearing on the native sands or Granular

Borrow overlying native sands. For foundations bearing on properly prepared subgrades, we recommend the following geotechnical parameters for design consideration:

Geotechnical Parameters for Spread Footings and Foundation Walls	
Design Frost Depth (100 year AFI)	4.5 feet
Net Allowable Soil Bearing Pressure	3.0 ksf
Base Friction Factor	0.35
Total Unit Weight of Backfill	125 pcf
At-Rest Lateral Earth Pressure Coefficient	0.5
Internal Friction Angle of Backfill	30°
Seismic Soil Site Class	D (IBC 2015)
Estimated Total Settlement	1-inch
Differential Settlement	½-inch

4.5 Foundation Drainage

We recommend an underdrain system be installed on the outside edge of the building perimeter footings. The underdrain pipe should consist of 4-inch diameter, perforated SDR-35 foundation drainpipe bedded in Crushed Stone and wrapped in non-woven geotextile fabric. The underdrain pipe must have a positive gravity outlet protected from freezing, clogging and backflow. Surface grades should be sloped away from the building for positive surface water drainage. General underdrain details are illustrated on the "Foundation Detail Sketch" attached in Appendix B.

4.6 Slab-On-Grade

On-grade floor slabs in heated areas may be designed using a subgrade reaction modulus of 100 pci (pounds per cubic inch) provided the slab is underlain by at least 18-inches of compacted Structural Fill placed over properly prepared subgrades. The structural engineer or concrete consultant must design steel reinforcing and joint spacing appropriate to slab thickness and function, as well as prevention of slab cracking and curling.

We recommend a sub-slab vapor retarder particularly in areas of the building where the concrete slab will be covered with an impermeable surface treatment or floor covering that may be sensitive to moisture vapors. The vapor retarder must have a permeance that is less than the floor cover or surface treatment that is applied to the slab. The vapor retarder must have sufficient durability to withstand direct contact with the sub-

slab base material and construction activity. The vapor retarder material should be placed according to the manufacturer's recommended method, including the taping and lapping of all joints and wall connections. The architect and/or flooring consultant should select the vapor retarder products compatible with flooring and adhesive materials.

The floor slab should be appropriately cured using moisture retention methods after casting. Typical floor slab curing methods should be used for at least 7 days. The architect or flooring consultant should assign curing methods consistent with current applicable American Concrete Institute (ACI) procedures with consideration of curing method compatibility to proposed surface treatments, flooring and adhesive materials.

4.7 Entrance Slabs and Sidewalks

Entrance slabs and sidewalks adjacent to the building must be designed to reduce the effects of differential frost action between adjacent pavement, doorways, and entrances. We recommend that non-frost susceptible Structural Fill be provided to a depth of at least 4.5 feet below the top of entrance slabs. This thickness of Structural Fill should extend the full width of the entrance slab and outward at least 4.5 feet, thereafter transitioning up to the bottom of the adjacent sidewalk or pavement gravels at a 3H:1V or flatter slope. General details of this frost transition zone are shown on the "Foundation Detail Sketch" attached in Appendix B.

4.8 Fill, Backfill and Compaction

We recommend the following fill and backfill materials: recycled products must also be tested in accordance with applicable environmental regulations and approved by a qualified environmental consultant.

Common Borrow: Fill to raise grades in landscape areas should be non-organic compactable earth meeting the requirements of 2020 MaineDOT Standard Specification 703.18 Common Borrow.

Granular Borrow: Fill to raise grades in building, paved and gravel yard areas, as well as to repair soft areas, should be sand or silty sand meeting the requirements of 2020 MaineDOT Standard Specification 703.19 Granular Borrow.

Structural Fill: Backfill for foundations, slab base material and material below exterior entrances slabs should be clean, non-frost susceptible sand and gravel meeting the gradation requirements for Structural Fill as given below:

Structural Fill	
Sieve Size	**Percent Finer by Weight**
4 inch	100
3 inch	90 to 100
¼ inch	25 to 90
No. 40	0 to 30
No. 200	0 to 6

Crushed Stone: Crushed Stone, used beneath foundations and for underdrain aggregate should be washed ¾-inch crushed stone meeting the requirements of 2020 MaineDOT Standard Specification 703.13 Crushed Stone ¾-Inch.

Reuse of Site Soils: Based on the subsurface findings, the native non-organic sands appear suitable for reuse as Granular Borrow in building, paved and gravel yard areas, provided they are free of organics, wood and debris, and and are at a compactable moisture content at the time of reuse.

Placement and Compaction: Fill should be placed in horizontal lifts and compacted such that the desired density is achieved throughout the lift thickness with 3 to 5 passes of the compaction equipment. Loose lift thicknesses for grading, fill and backfill activities should not exceed 12 inches. We recommend that fill and backfill in building and paved areas be compacted to at least 95 percent of its maximum dry density as determined by ASTM D-1557. Crushed Stone should be compacted with 3 to 5 passes of a vibratory plate compactor having a static weight of at least 500 pounds.

4.9 Weather Considerations

Construction activity should be limited during wet and freezing weather and the site soils may require drying or thawing before construction activities may continue. The contractor should anticipate the need for water to temper fills in order to facilitate compaction during dry weather. If construction takes place during cold weather, subgrades, foundations and floor slabs must be protected during freezing conditions. Concrete and fill must not be placed on frozen soil; and once placed, the concrete and soil beneath the structure must be protected from freezing.

4.10 Design Review and Construction Testing

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

A construction materials testing and quality assurance program should be implemented during construction to observe compliance with the design concepts, plans, and specifications. S.W.COLE is available to observe earthwork activities, the preparation of foundation bearing surfaces as well as to provide testing and IBC Special Inspection services for soils, concrete, steel, spray-applied fireproofing, fire-stopping, structural masonry and asphalt construction materials.

4.11 Recommendations for Additional Services

As discussed recently, we understand the proposed building footprint has been shifted about 30 feet to the southeast (toward Plains Road) partially into an area that is currently wooded and anticipated to contain the native soils. The attached Exploration Location Plan shows the shifted location. After grubbing the proposed building area, we recommend additional test pit explorations be performed in the unexplored areas of the building area to observe the native soils and to assess if the recommendations provided here-in are appropriate for the new, unexplored areas.

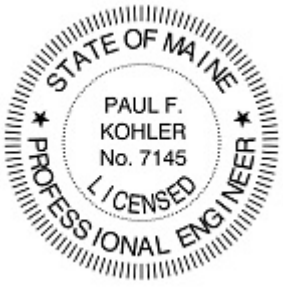
5.0 CLOSURE

It has been a pleasure to be of assistance to you with this phase of your project. We look forward to working with you during the construction phase of the project.

Sincerely,

S. W. Cole Engineering, Inc.

Digitally signed by 4a73a9d2-578e-4aa8-b9df-d38bc1f5d84b
Date: 2024.03.21 10:46:04 -04'00'



Paul F. Kohler, P.E.
Principal Geotechnical Engineer

PFK:tjb

APPENDIX A

Limitations

This report has been prepared for the exclusive use of Sebago Technics, Inc. for specific application to the proposed Maintenance Building at the existing Public Works Facility on Plains Road in Raymond, Maine. S. W. Cole Engineering, Inc. (S.W.COLE) has endeavored to conduct our services in accordance with generally accepted soil and foundation engineering practices. No warranty, expressed or implied, is made.

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

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

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

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

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

APPENDIX B

Figures

LEGEND:

APPROXIMATE TEST PIT LOCATION

NOTES:

1. EXPLORATION LOCATION PLAN WAS PREPARED FROM A 1"= 30' SCALE PLAN OF THE SITE PREPARED BY SEBAGO TECHNICS, INC., RECEIVED 03/12/2024.
2. THE TEST PITS WERE LOCATED IN THE FIELD BY MEASUREMENTS FROM STAKED PROPOSED BUILDING CORNERS AND EXISTING SITE FEATURES.
3. THIS PLAN SHOULD BE USED IN CONJUNCTION WITH THE ASSOCIATED S. W. COLE ENGINEERING, INC. GEOTECHNICAL REPORT.
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 30 60 Feet

NO.	DATE	DESCRIPTION	BY
1	03/15/2024	REPORT SUBMISSION	CEM
0	03/05/2024	DRAFT SUBMISSION	CEM

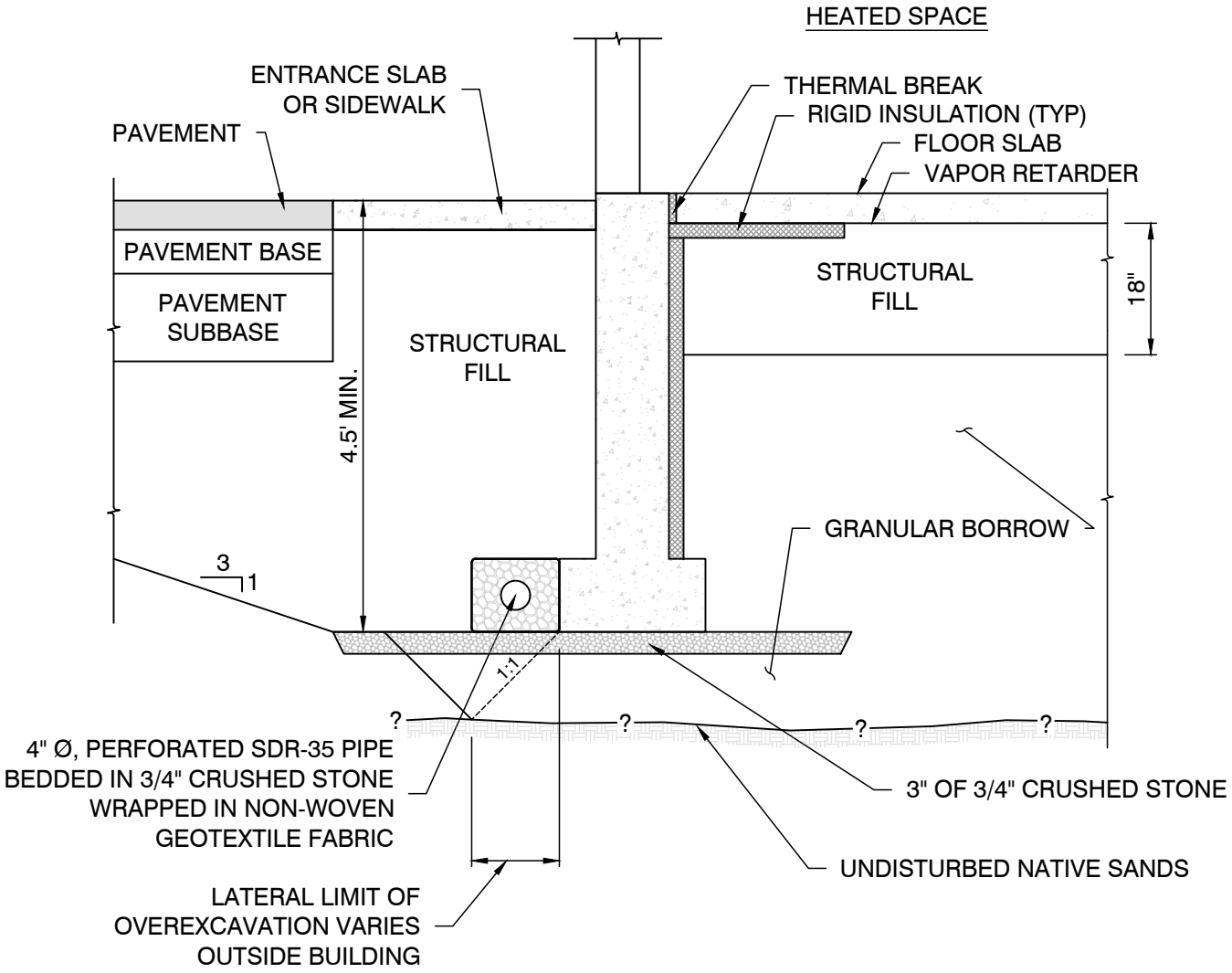
S.W.COLE ENGINEERING, INC.

SEBAGO TECHNICS, INC.

EXPLORATION LOCATION PLAN

PROPOSED MAINTENANCE BUILDING
TOWN OF RAYMOND PUBLIC WORKS FACILITY
PLAINS ROAD, RAYMOND, MAINE

Job No.: 23-2478 Scale: 1" = 30'
Date : 03/05/2024 Sheet: 1



NOTE:

1. UNDERDRAIN INSTALLATION AND MATERIAL GRADATION RECOMMENDATIONS ARE CONTAINED WITHIN THIS REPORT.
2. DETAIL IS PROVIDED FOR ILLUSTRATIVE PURPOSES ONLY, NOT FOR CONSTRUCTION.

S.W.COLE ENGINEERING, INC.

SEBAGO TECHNICS, INC.

FOUNDATION DETAIL SKETCH

PROPOSED MAINTENANCE BUILDING
TOWN OF RAYMOND PUBLIC WORKS FACILITY
PLAINS ROAD, RAYMOND, MAINE

Job No.:	23-2478	Scale:	Not to Scale
Date :	03/08/2024	Sheet:	2

APPENDIX C

Exploration Logs and Key

BORING LOG

BORING NO.: TP-101
SHEET: 1 of 1
PROJECT NO. 23-2478
DATE START: 2/22/2024
DATE FINISH: 2/22/2024

CLIENT: Sebago Technics, Inc.
PROJECT: Proposed Public Works Maintenance Building
LOCATION: 170 Plains Road, Raymond, Maine

Drilling Information

LOCATION: See Exploration Location Plan **ELEVATION (FT):** 303' +/- **TOTAL DEPTH (FT):** 9.0 **LOGGED BY:** Tim Boyce
DRILLING CO.: P&K Sand & Gravel **DRILLER:** **DRILLING METHOD:**
RIG TYPE: **AUGER ID/OD:** N/A / N/A **SAMPLER:**
HAMMER TYPE: N/A **HAMMER WEIGHT (lbs):** N/A **CASING ID/OD:** N/A /N/A **CORE BARREL:**
HAMMER CORRECTION FACTOR: **HAMMER DROP (inch):** N/A
WATER LEVEL DEPTHS (ft): 2/22/2024 No free water observed. Soils moist
GENERAL NOTES:

KEY TO NOTES AND SYMBOLS:
Water Level
▽ At time of Drilling
▼ At Completion of Drilling
▼ After Drilling
D = Split Spoon Sample
U = Thin Walled Tube Sample
R = Rock Core Sample
V = Field Vane Shear
Pen. = Penetration Length
Rec. = Recovery Length
bpf = Blows per Foot
mpf = Minute per Foot
WOR = Weight of Rods
WOH = Weight of Hammer
RQD = Rock Quality Designation
PID = Photoionization Detector
S_v = Field Vane Shear Strength, kips/sq.ft.
q_u = Unconfined Compressive Strength, kips/sq.ft.
Ø = Friction Angle (Estimated)
N/A = Not Applicable

Elev. (ft)	Depth (ft)	Casing Pen. (bpf)	SAMPLE INFORMATION: Sample No.	Type	Depth (ft)	Pen./ Rec. (in)	Blow Count or RQD	Field / Lab Test Data	Graphic Log	Sample Description & Classification	H_20 Depth	Remarks
300	5									Gray, gravelly SAND some silt (FILL), Frozen		
										2.0 Brown-black, SAND with wood, boulders, logs (FILL)		
295										8.0 Tan, fine to medium SAND, trace silt		

Bottom of Exploration at 9.0 feet

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

BORING LOG

BORING NO.:	**TP-102**
SHEET:	1 of 1
PROJECT NO.	23-2478
DATE START:	2/22/2024
DATE FINISH:	2/22/2024

CLIENT: Sebago Technics, Inc.
PROJECT: Proposed Public Works Maintenance Building
LOCATION: 170 Plains Road, Raymond, Maine

Drilling Information

LOCATION: See Exploration Location Plan **ELEVATION (FT):** 303' +/- **TOTAL DEPTH (FT):** 8.0 **LOGGED BY:** Tim Boyce
DRILLING CO.: P&K Sand & Gravel **DRILLER:** **DRILLING METHOD:**
RIG TYPE: **AUGER ID/OD:** N/A / N/A **SAMPLER:**
HAMMER TYPE: N/A **HAMMER WEIGHT (lbs):** N/A **CASING ID/OD:** N/A /N/A **CORE BARREL:**
HAMMER CORRECTION FACTOR: **HAMMER DROP (inch):** N/A
WATER LEVEL DEPTHS (ft): 2/22/2024 No free water observed. Soils moist
GENERAL NOTES:

KEY TO NOTES AND SYMBOLS:
Water Level
▽ At time of Drilling
▼ At Completion of Drilling
▼ After Drilling
D = Split Spoon Sample
U = Thin Walled Tube Sample
R = Rock Core Sample
V = Field Vane Shear
Pen. = Penetration Length
Rec. = Recovery Length
bpf = Blows per Foot
mpf = Minute per Foot
WOR = Weight of Rods
WOH = Weight of Hammer
RQD = Rock Quality Designation
PID = Photoionization Detector
S_v = Field Vane Shear Strength, kips/sq.ft.
q_u = Unconfined Compressive Strength, kips/sq.ft.
Ø = Friction Angle (Estimated)
N/A = Not Applicable

Elev. (ft)	Depth (ft)	Casing Pen. (bpf)	SAMPLE INFORMATION: Sample No.	Type	Depth (ft)	Pen./ Rec. (in)	Blow Count or RQD	Field / Lab Test Data	Graphic Log	Sample Description & Classification	H_20 Depth	Remarks
300	5									Brown, LOAM with wood poles and sand (FILL), Upper 2 feet Frozen		
295										7.0 Tan, fine to medium SAND trace silt		
										Bottom of Exploration at 8.0 feet		

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

BORING LOG

BORING NO.:	**TP-103**
SHEET:	1 of 1
PROJECT NO.	23-2478
DATE START:	2/22/2024
DATE FINISH:	2/22/2024

CLIENT: Sebago Technics, Inc.
PROJECT: Proposed Public Works Maintenance Building
LOCATION: 170 Plains Road, Raymond, Maine

Drilling Information

LOCATION: See Exploration Location Plan **ELEVATION (FT):** 305' +/- **TOTAL DEPTH (FT):** 5.0 **LOGGED BY:** Tim Boyce
DRILLING CO.: P&K Sand & Gravel **DRILLER:** **DRILLING METHOD:**
RIG TYPE: **AUGER ID/OD:** N/A / N/A **SAMPLER:**
HAMMER TYPE: N/A **HAMMER WEIGHT (lbs):** N/A **CASING ID/OD:** N/A /N/A **CORE BARREL:**
HAMMER CORRECTION FACTOR: **HAMMER DROP (inch):** N/A
WATER LEVEL DEPTHS (ft): 2/22/2024 No free water observed. Soils moist
GENERAL NOTES:

KEY TO NOTES AND SYMBOLS:
Water Level
▽ At time of Drilling
▼ At Completion of Drilling
▼ After Drilling
D = Split Spoon Sample
U = Thin Walled Tube Sample
R = Rock Core Sample
V = Field Vane Shear
Pen. = Penetration Length
Rec. = Recovery Length
bpf = Blows per Foot
mpf = Minute per Foot
WOR = Weight of Rods
WOH = Weight of Hammer
RQD = Rock Quality Designation
PID = Photoionization Detector
S_v = Field Vane Shear Strength, kips/sq.ft.
q_u = Unconfined Compressive Strength, kips/sq.ft.
Ø = Friction Angle (Estimated)
N/A = Not Applicable

Elev. (ft)	Depth (ft)	Casing Pen. (bpf)	SAMPLE INFORMATION: Sample No.	Type	Depth (ft)	Pen./ Rec. (in)	Blow Count or RQD	Field / Lab Test Data	Graphic Log	Sample Description & Classification	H_20 Depth	Remarks
										Brown sandy LOAM with roots (TOPSOIL), Frozen		
										2.5 Tan, fine to medium SAND trace silt		
300	5									Bottom of Exploration at 5.0 feet		

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

BORING LOG

BORING NO.: TP-104
SHEET: 1 of 1
PROJECT NO. 23-2478
DATE START: 2/22/2024
DATE FINISH: 2/22/2024

CLIENT: Sebago Technics, Inc.
PROJECT: Proposed Public Works Maintenance Building
LOCATION: 170 Plains Road, Raymond, Maine

Drilling Information

LOCATION: See Exploration Location Plan **ELEVATION (FT):** 304' +/- **TOTAL DEPTH (FT):** 4.0 **LOGGED BY:** Tim Boyce
DRILLING CO.: P&K Sand & Gravel **DRILLER:** **DRILLING METHOD:**
RIG TYPE: **AUGER ID/OD:** N/A / N/A **SAMPLER:**
HAMMER TYPE: N/A **HAMMER WEIGHT (lbs):** N/A **CASING ID/OD:** N/A /N/A **CORE BARREL:**
HAMMER CORRECTION FACTOR: **HAMMER DROP (inch):** N/A
WATER LEVEL DEPTHS (ft): 2/22/2024 No free water observed. Soils moist
GENERAL NOTES:

KEY TO NOTES AND SYMBOLS:
Water Level
▽ At time of Drilling
▼ At Completion of Drilling
▼ After Drilling
D = Split Spoon Sample
U = Thin Walled Tube Sample
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PID = Photoionization Detector
S_v = Field Vane Shear Strength, kips/sq.ft.
q_u = Unconfined Compressive Strength, kips/sq.ft.
Ø = Friction Angle (Estimated)
N/A = Not Applicable

Elev. (ft)	Depth (ft)	Casing Pen. (bpf)	SAMPLE INFORMATION: Sample No.	Type	Depth (ft)	Pen./ Rec. (in)	Blow Count or RQD	Field / Lab Test Data	Graphic Log	Sample Description & Classification	H_20 Depth	Remarks
300										Brown sandy LOAM with roots (TOPSOIL), Frozen		
										2.0 Tan, fine to medium SAND trace silt		
										Bottom of Exploration at 4.0 feet		

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

BORING LOG

BORING NO.: TP-105
SHEET: 1 of 1
PROJECT NO. 23-2478
DATE START: 2/22/2024
DATE FINISH: 2/22/2024

CLIENT: Sebago Technics, Inc.
PROJECT: Proposed Public Works Maintenance Building
LOCATION: 170 Plains Road, Raymond, Maine

Drilling Information

LOCATION: See Exploration Location Plan **ELEVATION (FT):** 304' +/- **TOTAL DEPTH (FT):** 8.5 **LOGGED BY:** Tim Boyce
DRILLING CO.: P&K Sand & Gravel **DRILLER:** **DRILLING METHOD:**
RIG TYPE: **AUGER ID/OD:** N/A / N/A **SAMPLER:**
HAMMER TYPE: N/A **HAMMER WEIGHT (lbs):** N/A **CASING ID/OD:** N/A /N/A **CORE BARREL:**
HAMMER CORRECTION FACTOR: **HAMMER DROP (inch):** N/A
WATER LEVEL DEPTHS (ft): 2/22/2024 No free water observed. Soils moist
GENERAL NOTES:

KEY TO NOTES AND SYMBOLS:
Water Level
▽ At time of Drilling
▼ At Completion of Drilling
▼ After Drilling
D = Split Spoon Sample
U = Thin Walled Tube Sample
R = Rock Core Sample
V = Field Vane Shear
Pen. = Penetration Length
Rec. = Recovery Length
bpf = Blows per Foot
mpf = Minute per Foot
WOR = Weight of Rods
WOH = Weight of Hammer
RQD = Rock Quality Designation
PID = Photoionization Detector
S_v = Field Vane Shear Strength, kips/sq.ft.
q_u = Unconfined Compressive Strength, kips/sq.ft.
Ø = Friction Angle (Estimated)
N/A = Not Applicable

Elev. (ft)	Depth (ft)	Casing Pen. (bpf)	SAMPLE INFORMATION: Sample No.	Type	Depth (ft)	Pen./ Rec. (in)	Blow Count or RQD	Field / Lab Test Data	Graphic Log	Sample Description & Classification	H_20 Depth	Remarks
300	5									Brown SAND travel gravel with asphalt slabs (FILL), Upper 2 feet Frozen		
										7.0 Tan, fine to medium SAND trace silt		

Bottom of Exploration at 8.5 feet

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

KEY TO NOTES & SYMBOLS

Test Boring and Test Pit Explorations

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. - laboratory 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. – 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.
γ_T	-	total soil weight
γ_B	-	buoyant soil weight

Description of Proportions:

Trace:	0 to 5%
Some:	5 to 12%
"Y"	12 to 35%
And	35+%
With	Undifferentiated

Description of Stratified Soils

Parting:	0 to 1/16" thickness
Seam:	1/16" to 1/2" thickness
Layer:	½" to 12" thickness
Varved:	Alternating seams or layers
Occasional:	one or less per foot of thickness
Frequent:	more than one per foot of thickness

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.