R E P O R T

17-0097 S

March 9, 2017

Explorations and Geotechnical Engineering Services

Proposed Office Building
473 and 483 Riverside Street
Portland, Maine

Prepared For:
Acadia Lending Group
Attention: John Rose
190 Riverside Street, Unit 4B
Portland, ME 04103

Prepared By:
S. W. Cole Engineering, Inc.
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Gray, Maine 04039
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S.W.COLE ENGINEERING, INC.

- *Geotechnical Engineering*
- *Construction Materials Testing and Special Inspections*
- *GeoEnvironmental Services*
- *Test Boring Explorations*

www.swcole.com

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Acadia Lending Group
Attention: John Rose
190 Riverside Street, Unit 4B
Portland, ME 04103

Subject: Explorations and Geotechnical Engineering Services
Proposed Office Building
473 and 483 Riverside Street
Portland, Maine

Dear John:

In accordance with our Agreement, dated February 9, 2017, 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 Attachment 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 building construction. Our scope of services included observation of seven test pit explorations, a geotechnical analysis of the subsurface findings and preparation of this report.

1.2 Site and Proposed Construction

The site is located at 473 and 483 Riverside Street in Portland, Maine. We understand development plans call for construction of a new single-story, 6,000SF, on-grade office building with associated landscape, stormwater management and paved areas. We understand the building will have a finish floor elevation of 76 feet (project datum),

requiring tapered cuts and fills of about 2 feet. Proposed and existing site features are shown on the "Exploration Location Plan" attached as Sheet 1.

2.0 EXPLORATION AND TESTING

2.1 Explorations

Seven test pits (TP-1 through TP-7) were made at the site on February 23, 2017. The test pits were made by Shaw Earthworks, Inc. of Gorham, Maine working under subcontract to S. W. Cole Engineering, Inc. (S.W.COLE). The exploration locations were selected and established in the field by S.W.COLE using measurements from existing site features. The approximate exploration locations are shown on the "Exploration Location Plan" attached as Sheet 1. Logs of the explorations and a Key to the Notes and Symbols used on the Logs are attached as Appendix A.

2.2 Testing

Soils observed in the test pits were visually classified in the field by S.W.COLE. Pocket Penetrometer Testing (PPT) was performed on samples of stiff silty clay encountered at the explorations.

3.0 SITE AND SUBSURFACE CONDITIONS

3.1 Surficial

The site is relatively flat and level with some sparse tree cover and vegetation. Based on available aerial photography, it appears that portions of the site were previously occupied by two residential structures that have since been demolished. Existing ground surface varies from about elevation 72 to 76 feet. A relic mounded leachfield is present in the southeast portion of the site.

3.2 Soil and Bedrock

The test pits generally encountered a soil profile consisting of topsoil and uncontrolled fill overlying native stiff brown silty clay. The principal soils are described below. Not all the strata were encountered at each exploration; refer to the attached logs for more detailed subsurface information.

Uncontrolled Fill: Underlying a surficial layer of topsoil, the test pits encountered uncontrolled fill consisting of disturbed and reworked brown silty clay intermixed with sand, gravel, wood and branches extending to depths of 2 to 6 feet below the ground surface. The uncontrolled fill at test pit TP-3 consisted of sand with plastic septic leachfield chambers, crushed stone, and geotextile associated with the relic septic mound. The uncontrolled fill at test pits TP-6 and TP-7 encountered building demolition rubble (large concrete foundation pieces, metal, wood, brick, and glass), likely associated with the former site residential structures.

Glaciomarine Clay: Underlying the uncontrolled fill, the test pits encountered native glaciomarine soils consisting of very stiff brown silty clay. The test pits were terminated in the glaciomarine clay at depths varying from about 3.2 to 6.5 feet.

3.3 Groundwater

Groundwater was generally perched within the uncontrolled fills overlying the glaciomarine clays. Free water was observed perched in the fills at test pits TP-6 and TP-7 at depths of about 3.6 and 3.8 feet

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.

3.4 Frost and Seismic

The 100-year Air Freezing Index for the Portland, Maine area is about 1,407-Fahrenheit degree-days, which corresponds to a frost penetration depth on the order of 4.5 feet. Based on the subsurface findings and our experience in the general site area, we interpret the site soils to correspond to Seismic Soil Site Class E according to 2009 IBC.

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:

- The uncontrolled fills, as well as any relic organics, utilities, foundations, structures, and septic systems are unsuitable for support of the proposed building and must be completely removed beneath the building footprint and replaced with compacted Granular Borrow as presented herein.

- Following overexcavation and replacement of uncontrolled fills, spread footing foundations and on-grade floor slabs bearing on properly prepared subgrades appear suitable for the proposed building.

- Paved areas should be proofrolled with a loaded 10 yard dump truck and soft areas repaired prior to filling and/or placement of pavement gravels. We anticipate that the buried demolition debris remnant from the former residential structures, as encountered at test pits TP-6 and TP-7, will need to be removed beneath new pavement, utilities, and stormwater management areas.

- Earthwork and grading activities should ideally occur during drier, non-freezing weather of Spring, Summer and Fall. Rubber tired construction equipment should not operate directly on the native clays. Excavation of bearing surfaces should be completed with a smooth-edged bucket to lessen subgrade disturbance.

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.

As discussed, it appears the site was previously occupied by at least two residential structures. The test pits encountered uncontrolled fill, buried building demolition debris and rubble, and a relic septic system mound. We recommend the uncontrolled fills, buried debris, and any relic organics, utilities, foundations, structures, and septic systems be completely removed from beneath the proposed building footprint and entrance slabs. The limits of overexcavation should extend at least 1-foot horizontally from outer edge of perimeter footings for every 1-foot of vertical depth below bottom of footing (1H:1V bearing splay). The overexcavation should be backfilled with compacted Granular Borrow.

We recommend that footings be excavated using a smooth-edged bucket and that footings be underlain by at least 6 inches of Crushed Stone wrapped in non-woven geotextile filter fabric, such as Mirafi 180N.

Paved areas should be proofrolled with a loaded 10 yard dump truck and soft areas repaired prior to filling and/or placement of pavement gravels. We anticipate that the buried demolition debris remnant from the former residential structures, as encountered at test pits TP-6 and TP-7, will need to be removed beneath new pavement, utilities, and stormwater management areas.

4.3 Excavation and Dewatering

Excavation work will generally encounter uncontrolled clayey fill with rubble and debris overlying native glaciomarine clay. The clayey fill and native clay are sensitive to moisture and strength loss when disturbed. Care must be exercised during construction to limit disturbance of the bearing soils. Earthwork and grading activities should ideally occur during drier, non-freezing weather of Spring, Summer and Fall. Rubber tired construction equipment should not operate directly on the native clays. Final cuts to subgrade should be performed with a smooth-edged bucket to help reduce soil disturbance.

Groundwater appeared to be perched in the uncontrolled fills on the native silty clay at the test pits. Sumping and pumping dewatering techniques should be adequate to control groundwater in excavations. 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 6-inches of crushed stone fully wrapped in non-woven geotextile fabric, such as Mirafi 180N, bearing on undisturbed, native, very stiff clay or compacted Granular Borrow overlying the undisturbed native clays.

For foundations bearing on properly prepared subgrades, we recommend the following geotechnical parameters for design consideration:

Geotechnical Parameters for Spread Footings	
Design Frost Depth	4.5 feet
Net Allowable Soil Bearing Pressure	2.0 ksf
Base Friction Factor	0.4
Total Unit Weight of Backfill Soil	125 pcf
At-Rest Lateral Earth Pressure Coefficient	0.5
Internal Friction Angle of Backfill	30°
Seismic Soil Site Class (IBC 2009)	E

We recommend design consider 1-inch total post-construction settlement and ¾-inch differential settlement across the building pad.

4.5 Foundation Drainage

We recommend an underdrain system be installed on the outside edge of the geotextile fabric wrapped Crushed Stone layer recommended below perimeter footings. The underdrain pipe should consist of 4-inch diameter, perforated SDR-35 foundation drain pipe 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 detail attached as Sheet 2.

4.6 Slab-On-Grade Floor

We recommend on-grade floor slabs be underlain with at least 12-inches of compacted Structural Fill. On-grade floor slabs in heated spaces may be designed using a subgrade reaction modulus of 100 pci (pounds per cubic inch). We recommend a vapor

retarder be installed beneath on-grade floor slabs. The structural engineer or concrete consultant must design steel reinforcing and joint spacing appropriate to slab thickness and function.

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 Sheet 2.

4.8 Backfill and Compaction

The on-site uncontrolled clayey fill may be reused in landscape areas. The on-site sandy fill may be suitable for reuse in paved areas provided debris is removed. The native clays are unsuitable for reuse in building and pavement areas but may be reused in landscape areas.

For building and paved areas, we recommend the following fill and backfill materials:

Granular Borrow: Fill to raise grades beneath the building and to backfill the overexcavation beneath the building should be sand or silty sand meeting the requirements of 2014 Maine DOT Standard Specification 703.19 Granular Borrow. Granular Borrow for Underwater Backfill will be required as initial lifts over wet subgrades.

Structural Fill: Fill to repair soft areas, backfill for foundations, slab-on-grade base material, fill within the frost transition zone below exterior entrances and sidewalks should be clean, non-frost susceptible sand and gravel meeting the following gradation requirements:

Structural Fill	
Sieve Size	**Percent Finer by Weight**
4 inch	100
3 inch	90 to 100
¼ inch	25 to 90
#40	0 to 30
#200	0 to 5

Crushed Stone: Crushed Stone, used beneath foundations for underdrain aggregate should meet the requirements of 2014 MaineDOT 703.13 Crushed Stone ¾-Inch.

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 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.

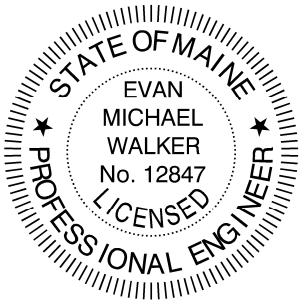
A soils and concrete testing program should be implemented during construction to observe compliance with the design concepts, plans, and specifications. S.W.COLE is available to observe the preparation of foundation bearing surfaces, as well as, testing services for soils, concrete, asphalt, steel and spray-applied fireproofing materials.

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.



Evan M. Walker, P.E.
Geotechnical Engineer

EMW:tjb

Attachment A
Limitations

This report has been prepared for the exclusive use of Acadia Lending Group for specific application to the Proposed Office Building at 473 and 483 Riverside Street in Portland, 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.

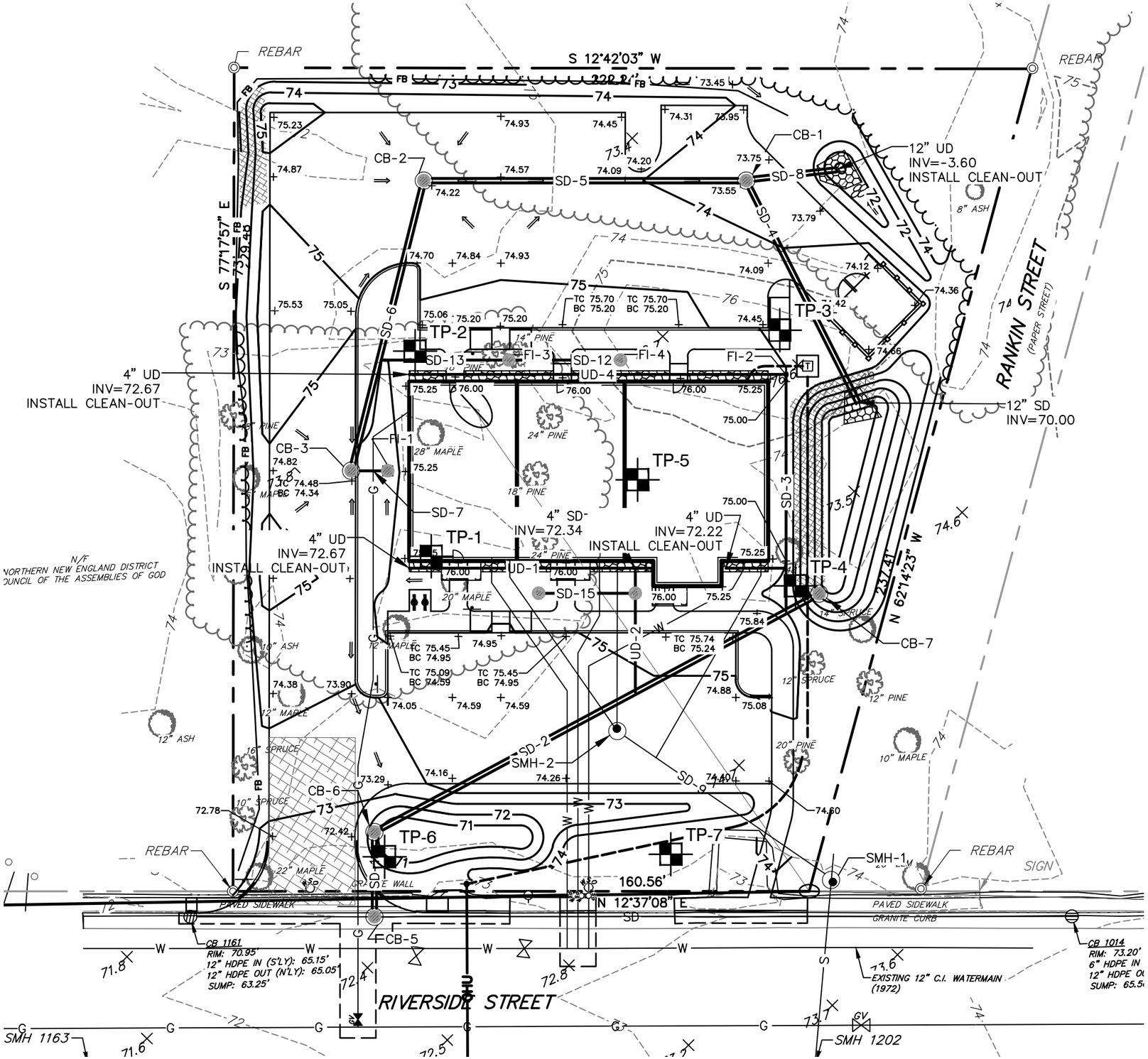
The soil profiles described in the report are intended to convey general trends in subsurface conditions. The boundaries between strata are approximate and are based upon interpretation of exploration data and samples.

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.



LEGEND:

APPROXIMATE TEST PIT LOCATION

NOTES:

1. EXPLORATION LOCATION PLAN WAS PREPARED FROM A 1"=20' SCALE PLAN OF THE SITE ENTITLED "GRADING AND UTILITY PLAN," PREPARED BY SEBAGO TECHNICS, RECEIVED VIA E-MAIL MARCH 2, 2017.
2. THE TEST PITS WERE LOCATED IN THE FIELD BY GPS SURVEY USING A MAPPING GRADE TRIMBLE GPS RECEIVER AND MEASUREMENTS FROM 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

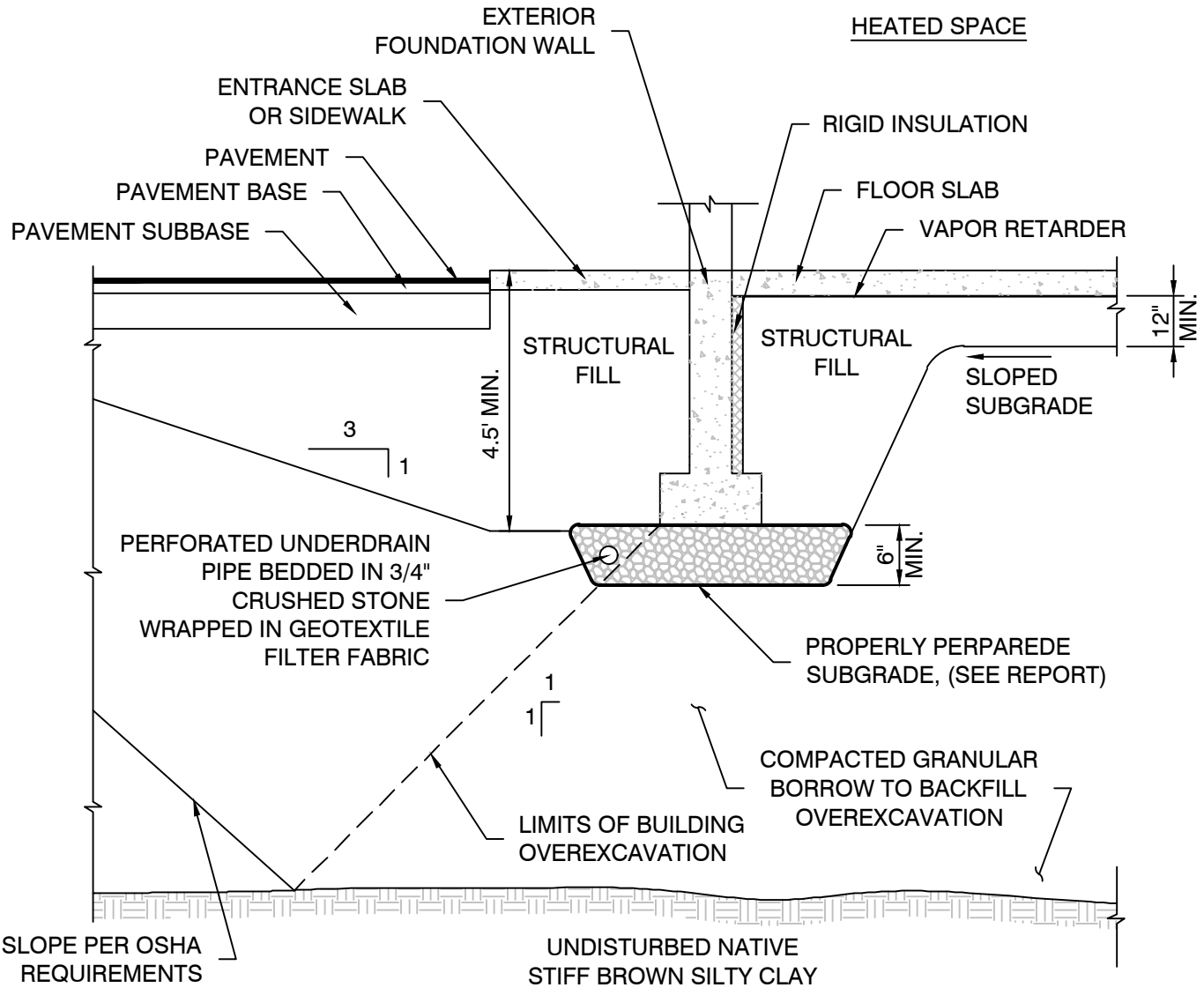
S.W.COLE ENGINEERING, INC.

ACADIA LENDING GROUP LLC

EXPLORATION LOCATION PLAN

PROPOSED OFFICE BUILDING
473 & 483 RIVERSIDE STREET
PORTLAND, MAINE

Job No.:	17-0097	Scale:	1" = 30'
Date :	03/09/2017	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.

ACADIA LENDING GROUP LLC

FOUNDATION SKETCH

PROPOSED OFFICE BUILDING
473 & 483 RIVERSIDE STREET
PORTLAND, MAINE

Job No.:	17-0097	Scale:	Not to Scale
Date :	03/09/2017	Sheet:	2

Appendix A
Exploration Logs and Key to Notes and Symbols Used on Logs

TEST PIT LOGS

CLIENT: Acadia Lending Group
PROJECT: Proposed Office Building
LOCATION: 473 And 483 Riverside Street, Portland, Maine

PROJECT NO.: 17-0097
LOGGED BY: Evan Walker
CONTRACTOR: Shaw Earthworks
EQUIPMENT: Komatsu 228

TEST PIT TP-1

DATE: 2/23/2017 **LOCATION:** See Exploration Location Plan **SURFACE ELEVATION (FT):** 74.0 +/- **COMPLETION DEPTH (FT):** 5.5
WATER LEVEL DEPTHS (FT): All Soils Moist

Depth (feet)	Graphic Log	Stratum Description	H_20 Depth	Sample No.	Type	Sample Depth (ft)	Field / Lab Test Data
		Vegetation / Dark Brown Clayey Sand with Organics (Topsoil/Fill)					
		1.0 Disturbed Brown Silty CLAY with Layers of Brown Sand, Some Gravel, with Wood and 1-1/2" Crushed Stone (Fill)					
5		5.0 Brown Silty CLAY ~ Very Stiff ~					q_P=8 ksf
		5.5 Bottom of Exploration at 5.5 feet					

TEST PIT TP-2

DATE: 2/23/2017 **LOCATION:** See Exploration Location Plan **SURFACE ELEVATION (FT):** 74.0 +/- **COMPLETION DEPTH (FT):** 6.3
WATER LEVEL DEPTHS (FT): All Soils Moist

Depth (feet)	Graphic Log	Stratum Description	H_20 Depth	Sample No.	Type	Sample Depth (ft)	Field / Lab Test Data
		Vegetation / Dark Brown Clayey Silty Sand with Organics (Topsoil/Fill)					
		0.5 Disturbed Brown Silty CLAY, Some Sand (Fill)					
		2.0 Brown Silty CLAY ~ Very Stiff ~					
5							q_P=9 ksf
		6.3 Bottom of Exploration at 6.3 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 AND SYMBOLS:
Water Level
▽ At time of Digging
▼ At Completion of Digging
▼ After Digging

q_p = Pocket Penetrometer Strength, kips/sq.ft.

TEST PIT 17-0097.GPJ SWCE TEMPLATE.GDT 3/9/17

TEST PIT LOGS

CLIENT: Acadia Lending Group
PROJECT: Proposed Office Building
LOCATION: 473 And 483 Riverside Street, Portland, Maine

PROJECT NO.: 17-0097
LOGGED BY: Evan Walker
CONTRACTOR: Shaw Earthworks
EQUIPMENT: Komatsu 228

TEST PIT TP-3

DATE: 2/23/2017 **LOCATION:** See Exploration Location Plan **SURFACE ELEVATION (FT):** 76.0 +/- **COMPLETION DEPTH (FT):** 6.0
WATER LEVEL DEPTHS (FT): ▽ 3.80 Seepage

Depth (feet)	Graphic Log	Stratum Description	H_20 Depth	Sample No.	Type	Sample Depth (ft)	Field / Lab Test Data
		Vegetation / Dark Brown Silty Sand with Organics (Topsoil/Fill)					
		0.5 Light Brown SAND, Trace Silt with Plastic Sewer Chambers Bedded in 3/4" Crushed Stone and Geotextile (Fill)	▽ 3.8				
		3.8 Brown Silty CLAY ~ Very Stiff ~					
5							q_P=9 ksf
		6.0 Bottom of Exploration at 6.0 feet					

TEST PIT TP-4

DATE: 2/23/2017 **LOCATION:** See Exploration Location Plan **SURFACE ELEVATION (FT):** 74.0 +/- **COMPLETION DEPTH (FT):** 6.5
WATER LEVEL DEPTHS (FT): ▽ 2.00 Light Seepage

Depth (feet)	Graphic Log	Stratum Description	H_20 Depth	Sample No.	Type	Sample Depth (ft)	Field / Lab Test Data
		Vegetation / Dark Brown Clayey Silty Sand with Organics (Topsoil/Fill)					
		0.7 Disturbed Brown Silty CLAY, Some Sand, with Wood Branch Pieces (Fill)	▽ 2				
		4.0 Brown Silty CLAY ~ Very Stiff ~					
5							q_P=9 ksf
		6.5 Bottom of Exploration at 6.5 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 AND SYMBOLS:
Water Level
▽ At time of Digging
▼ At Completion of Digging
▼ After Digging

q_p = Pocket Penetrometer Strength, kips/sq.ft.

TEST PIT LOGS

CLIENT: Acadia Lending Group
PROJECT: Proposed Office Building
LOCATION: 473 And 483 Riverside Street, Portland, Maine

PROJECT NO.: 17-0097
LOGGED BY: Evan Walker
CONTRACTOR: Shaw Earthworks
EQUIPMENT: Komatsu 228

TEST PIT TP-5

DATE: 2/23/2017 **LOCATION:** See Exploration Location Plan **SURFACE ELEVATION (FT):** 74.0 +/- **COMPLETION DEPTH (FT):** 3.2
WATER LEVEL DEPTHS (FT): All Soils Moist

Depth (feet)	Graphic Log	Stratum Description	H_20 Depth	Sample No.	Type	Sample Depth (ft)	Field / Lab Test Data
		Vegetation / Dark Brown Clayey Silty Sand with Organics (Topsoil / Fill)					
		0.5 Disturbed Brown Silty CLAY, Some Sand (Fill)					
		2.5 Brown Silty CLAY ~ Very Stiff ~					
		3.2 Bottom of Exploration at 3.2 feet					
5							

TEST PIT TP-6

DATE: 2/23/2017 **LOCATION:** See Exploration Location Plan **SURFACE ELEVATION (FT):** 74.0 +/- **COMPLETION DEPTH (FT):** 6.5
WATER LEVEL DEPTHS (FT): ▼ 3.60 Free Water - Likely Perched in Fill

Depth (feet)	Graphic Log	Stratum Description	H_20 Depth	Sample No.	Type	Sample Depth (ft)	Field / Lab Test Data
		Vegetation / Dark Brown Clayey Silty Sand with Organics (Topsoil/Fill)					
		0.5 Disturbed Brown Silty CLAY, Some Sand, Some Gravel, Intermixed with Large Concrete Foundation Rubble, Wood, Metal	▼ 3.6				
5							
		5.5 Brown Silty CLAY (Appears Native) ~ Very Stiff ~					
		6.5 Bottom of Exploration at 6.5 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 AND SYMBOLS:
Water Level
▽ At time of Digging
▼ At Completion of Digging
▼ After Digging

q_p = Pocket Penetrometer Strength, kips/sq.ft.

TEST PIT LOGS

CLIENT: Acadia Lending Group
PROJECT: Proposed Office Building
LOCATION: 473 And 483 Riverside Street, Portland, Maine

PROJECT NO.: 17-0097
LOGGED BY: Evan Walker
CONTRACTOR: Shaw Earthworks
EQUIPMENT: Komatsu 228

TEST PIT TP-7

DATE: 2/23/2017 **LOCATION:** See Exploration Location Plan **SURFACE ELEVATION (FT):** 74.0 +/- **COMPLETION DEPTH (FT):** 6.5
WATER LEVEL DEPTHS (FT): ▼ 3.80 Free Water - Likely Perched in Fill

Depth (feet)	Graphic Log	Stratum Description	H_20 Depth	Sample No.	Type	Sample Depth (ft)	Field / Lab Test Data
		Vegetation / Dark Brown Clayey Silty Sand with Organics (Topsoil/Fill)					
		0.7 Disturbed Brown Silty CLAY, Intermixed with Silty Sand and Gravel, with Wood, Cobbles, Large Concrete Foundation Rubble, Brick, Glass (Fill)	▼ 3.8				
5							
		6.0 Brown Silty CLAY (Appears Native)					
		6.5 Bottom of Exploration at 6.5 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 AND SYMBOLS:
Water Level
▽ At time of Digging
▼ At Completion of Digging
▼ After Digging

q_p = Pocket Penetrometer Strength, kips/sq.ft.

TEST PIT 17-0097.GPJ SWCE TEMPLATE.GDT 3/9/17

S.W.COLE ENGINEERING, INC. • Geotechnical Engineering • Field & Lab Testing • Scientific & Environmental Consulting

KEY TO THE NOTES & SYMBOLS
Test Boring and Test Pit Explorations

All stratification lines represent the approximate boundary between soil types and the transition may be gradual.

Key to Symbols Used:

w	-	water content, percent (dry weight basis)
q_u	-	unconfined compressive strength, kips/sq. ft. - 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+%

Description of Stratified Soils

Parting:	0 to 1/16" thickness
Seam:	1/16" to ½" 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.