Reviewed for Code Compliance
Inspections Division
Approved with Conditions
Date: 08/28/14

R E P O R T

November 12, 2013
13-0912 S

Geotechnical Engineering Services

Proposed Portland Yacht Services Facility
West Commercial Street
Portland, Maine

PREPARED FOR:
New Yard, LLC
Attention: Phineas Sprague
58 Fore Street
Portland, Maine 04101

PREPARED BY:
S.W.COLE ENGINEERING, INC.
286 Portland Road
Gray, Maine 04039
207-657-2866

S.W.COLE ENGINEERING, INC.

- *Geotechnical Engineering*
- *Construction Materials Testing*
- *GeoEnvironmental Services*
- *Ecological Services*

www.swcole.com

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TABLE OF CONTENTS

1.0 INTRODUCTION 1
1.1 Scope and Purpose 1
1.2 Site and Proposed Construction 2
2.0 EXPLORATION AND TESTING 3
2.1 Explorations 3
2.2 Testing 3
3.0 SITE AND SUBSURFACE CONDITIONS 4
3.1 Soil and Bedrock 4
3.2 Groundwater Conditions 4
3.3 Seismic and Frost Considerations 4
4.0 EVALUATION AND RECOMMENDATIONS 5
4.1 General Findings 5
4.2 Site and Subgrade Preparation 5
4.3 Excavation and Dewatering 6
4.4 Foundations 7
4.5 Slab-On-Grade 7
4.6 Entrance Slabs and Sidewalks 8
4.7 Backfill and Compaction 8
4.8 Weather Considerations 9
4.9 Design Review and Construction Testing 9
5.0 CLOSURE 10

Attachment A	Limitations
Sheet 1	Exploration Location Plan
Sheets 2 - 15	Exploration Logs
Sheet 16	Key to the Notes and Symbols
Sheet 17	Laboratory Consolidation Test Results
Sheet 18	Foundation Underdrain Detail

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13-0912 S

November 12, 2013

New Yard, LLC
Attn: Phineas Sprague
58 Fore Street
Portland, Maine 04101

Subject: Explorations and Geotechnical Engineering Services
Proposed Portland Yacht Services Facility
Former Clay Docks Site – West Commercial Street
Portland, Maine

Dear Phin:

In accordance with our Proposal, dated August 23, 2013, we have performed subsurface explorations for the subject project in Portland, Maine. This report summarizes our findings and geotechnical recommendations and its contents are subject to the limitations set forth in Attachment A. This report incorporates your comments and supersedes prior draft releases of this report, dated September 12, 2013, September 24, 2013 and October 2, 2103.

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 the making of ten test boring and six test pit explorations, soils laboratory testing, a geotechnical analysis of the subsurface findings and preparation of this report.

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Reviewed for Code Compliance
Inspections Division
Approved with Conditions
Date: 08/28/14

1.2 Site and Proposed Construction

We understand the site is the former Clay Docks between West Commercial Street and the Fore River west of the Casco Bay Bridge. The site is generally vacant with remnants of the former Clay Docks along the waterfront and the foundations of the former Clay Storage Warehouse landside. An abandoned railroad right-of-way exists along the northern edge of the site paralleling West Commercial Street. The general site area is relatively flat varying from about elevation 9 to 11 feet (project datum) with the former Clay Storage Warehouse pad at about elevation 14 feet.

Based on our meetings with you and recent site walk, we understand that site development will include:

- Operations Building: a pre-engineered steel, portal-frame building with tension fabric skin and concrete floor slab. We understand the building is proposed as a 120 foot by 180 foot main building with 60 foot by 160 foot shed wing off the southern side of the building. The main building would be situated over the former Clay Storage Warehouse pad with a finished floor elevation (FFE) 15 feet. The shed wing would be situated over the former Clay Warehouse Loading Dock with a FFE of 12 feet for the southern third and FFE of 15 feet for the northern two-thirds. We understand you desire to build over the foundation and slab remnants of the former Clay Storage Warehouse abandoning them in-place. As discussed the southern wall of the loading docks will be removed in favor of new foundations to support the proposed shed wing.

- Storage and Repair Building: a pre-engineered steel, portal-frame building with tension fabric skin and gravel surfaced floor and occupying a plan area of about 120 feet by 160 feet adjoining the east side of the Operations Building. We understand finished floor will slope along the long axis of the building from elevation 13 to 15 feet.

Proposed and existing site features are shown on the “Exploration Location Plan” attached as Sheet 1.

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Reviewed for Code Compliance
Inspections Division
Approved with Conditions
Date: 08/28/14

2.0 EXPLORATION AND TESTING

2.1 Explorations

Ten test borings (B-101 through B-110) were made at the site on August 28 and September 11, 2013 by Northern Test Boring, Inc. of Gorham, Maine working under subcontract to S. W. Cole Engineering, Inc. (S.W.COLE). Six test pits (TP-101 through TP-106) were made at the site on August 28, 2013 by Gorham Sand & Gravel working under subcontract to New Yard, LLC. The exploration locations were selected and established in the field by S.W.COLE based on measurements from existing site features. The approximate exploration locations are shown on the "Exploration Location Plan" attached as Sheet 1. Logs of the explorations are attached as Sheets 2 through 15. A key to the notes and symbols used on the logs is attached as Sheet 16.

As requested by CREDERE (project environmental consultant), two groundwater observation wells were installed in borings B-103 and B-110. Installation notes are shown on these test boring logs.

2.2 Testing

The borings were performed using a combination of solid stem auger, cased wash-boring and rod probing techniques. The soils were sampled at 2 to 5 foot intervals using Standard Penetration Test (SPT) methods. Shelby tube sampling and in-situ Vane Shear Testing (VST) was performed where softer cohesive soils were encountered. SPT blow counts and VST results are shown on the logs.

Soil samples obtained from the explorations were returned to our laboratory for further classification and testing. Atterberg Limits and moisture content test results are noted on the logs. The results of a one-dimensional laboratory consolidation test are attached as Sheet 17.

CITY OF PORTLAND, MAINE RESURGAM
Reviewed for Code Compliance
Inspections Division
Approved with Conditions
Date: 08/28/14

3.0 SITE AND SUBSURFACE CONDITIONS

3.1 Soil and Bedrock

Test borings B-101 through B-108 were made in the area of the proposed Operations Building situated over the former Clay Docks Warehouse. Below a surface of concrete or asphalt, these test borings encountered a subsurface profile generally consisting of granular fills and coal ash to depths of 7 to 10 feet (approximate elevation 4 to 5 feet) overlying native deposits of sand and silty sand to depths of 20 to 25 feet overlying gray silt with shells and organics to depths of 25 to 27 feet overlying a thick deposit of glaciomarine clay. The gray silt with shells and organics is generally soft and normally consolidated with an organic content of about 1.7 to 2.9% . The glaciomarine clays were generally medium stiff with in-situ shear strengths of 750 to 870 psf.

Tests borings B-109 and B-110 and test pits TP-101 through TP-106 were made in the area of the proposed Storage and Repair Building. These explorations encountered similar subsurface conditions as B-101 through B-108 consisting of surficial granular fills and coal ash to depths of at least 7 feet (approximate elevation 4 feet) overlying native deposits of silty sand and sand to depths of 20 feet overlying gray silt with shells and organics. A petroleum-like odor and oily sheen was noted in B-109 as noted on that log.

Not all the strata were encountered in each of the explorations; refer to the attached logs for more detailed subsurface findings. Bedrock was not encountered within the depth explored.

3.2 Groundwater Conditions

Groundwater was measured at depths ranging from 2 to 8 feet below the ground surface in the observation wells installed at B-103 and B-110 after drilling. Groundwater is anticipated to be tidally influenced and level with the water surface of the adjacent Fore River Bay.

3.3 Seismic and Frost Considerations

The 25-year Air Freezing Index for the Portland, Maine area is about 1,290-Fahrenheit degree-days, which corresponds to a frost penetration depth on the order of 4.5 feet. Based on the findings at the explorations, we interpret the site soils to correspond to Seismic Soil Site Class E according to 2009 IBC.

CITY OF PORTLAND, MAINE RESURGAM
Reviewed for Code Compliance
Inspections Division
Approved with Conditions
Date: 08/28/14

4.0 EVALUATION AND RECOMMENDATIONS

4.1 General Findings

Based on the subsurface findings, the proposed construction appears feasible from a geotechnical standpoint. The uncontrolled granular fills and coal ash are loose and will require improvement for spread footing support. Specifically, we recommend overexcavation and replacement with compacted Gravel Borrow.

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 area to lessen the potential for erosion and site disturbance.

Operations Building (Tension Fabric Structure): We understand this building will comprise a main 120 x 180 foot building with 60 x 160 foot shed wing off the south side. As discussed, we understand the south wall of the main building will be founded on a new grade beam cast in an approximate 6-foot wide opening between the former warehouse and loading docks, and from this line the main building will extend 120 feet north with the shed wing extending approximately 60 feet south.

For the main building, we understand the existing slab with perimeter sheet piles will remain in-place with a new slab cast over the top for a finished floor elevation of approximately 15 feet. The main building will extend north of the existing slab about 30 feet where a new slab will be constructed over new compacted fill. For the shed wing, we understand the existing dock foundations and asphalt surface will remain in place over the northern two-thirds with a new slab cast over the top at an FFE of 15 feet. We understand the southern one-third will step down to a FFE of 12 feet with new foundations forming the southern wall and a new slab cast over densified existing granular fills.

Considering the subsurface findings and our understanding of the proposed construction, we recommend the surficial fills and coal ash be overexcavated at least 2 feet below footings, densified and then backfilled with compacted Gravel Borrow. The width of overexcavation should extend 1H:1V (bearing splay) beyond the edges of the footings, except under the common bearing line between the main building and shed wing that will

CITY OF PORTLAND, MAINE RESURGAM
Reviewed for Code Compliance
Inspections Division
Approved with Conditions
Date: 08/28/14

be cast in the approximate 6-foot opening between the former warehouse and loading dock foundations, where lateral oversizing is not required and the depth of overexcavation should not extend below existing footings.

Storage and Repair Building (Tension Fabric Structure): We understand this building will have gravel surfaced finished floor sloping downward from west (elevation 15 feet) to east (elevation 13 feet). We understand the top of foundation wall will be set at elevation 15 feet, level with the Operation Building finished floor elevation. Considering the subsurface findings, we recommend the surficial fills and coal ash be overexcavated at least 2 feet below footings, densified and then backfilled with compacted Gravel Borrow. The width of overexcavation should extend 1H:1V (bearing splay) beyond the edges of the footings.

For the gravel surfaced floor, we recommend leveling the subgrade at a depth of 1.5 feet below finished elevation with compacted on-site granular fills and coal ash. The subgrade surface should be proof-rolled and densified with a 20-ton vibratory roller compactor. Areas that become soft or continue to yield after densification should be removed and replaced with compacted Gravel Borrow. We recommend the gravel surfaced floor consist of at least 15 inches of compacted Gravel Borrow followed by 3 inches of compacted Crushed Stone for Surfacing.

4.3 Excavation and Dewatering

Excavation work will generally encounter sandy fill, coal ash and native silty sand. Care must be exercised during construction to minimize disturbance of the bearing soils. Controlling the water levels to at least one foot below planned excavation depths will help stabilize subgrades during construction. Sumping and pumping dewatering techniques should be adequate to control groundwater in shallow excavations at least 1 foot above tide. We recommend that excavations be coordinated with tides so tidally influenced groundwater levels are at least 1 foot below excavation depth.

Excavations must be properly shored and/or sloped in accordance with the OSHA trenching regulations to prevent sloughing and caving of the sidewalls during construction. Care must be taken to preclude undermining adjacent structures and utilities.

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4.4 Foundations

As presented herein, we recommend removal of granular fills and coal ash to a depth of at least 2 feet below footings, densifying the exposed soils and backfilling with compacted Gravel Borrow. For footings bearing on properly prepared subgrades, we recommend the following geotechnical parameters for design consideration:

- Design Frost Depth = 4.5 feet
- Net Allowable Soil Bearing Pressure = 1.5 ksf or less
- Base Friction Factor = 0.35 (Concrete to Gravel Borrow)
- Total Unit Weight of Backfill = 125 pcf (Structural Fill)
- Internal Friction Angle of Backfill = 30 degrees
- Seismic Soil Site Class = E (2009 IBC, N-value and Vane Shear methods)

The allowable soil bearing capacity may be increased one-third for transient wind and seismic loads.

Based on anticipated structural loads, laboratory consolidation testing and anticipated grades, we estimate differential post-construction settlement may approach 1 inch across building pads.

4.5 Slab-On-Grade

On-grade floor slabs in the heated Operations Building may be designed using a subgrade reaction modulus of 120 pci (pounds per cubic inch) provided the slab is underlain by at least 12-inches of compacted Structural Fill placed over densified subgrades or at least 4 inches of existing concrete slab over undisturbed in-place uncontrolled fills. The structural engineer should design steel reinforcing and joint spacing appropriate to slab thickness and function.

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 shall be placed according to the manufacturer's recommended method, including the taping and lapping

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Inspections Division
Approved with Conditions
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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.

4.6 Entrance Slabs and Sidewalks

Entrance slabs and sidewalks adjacent to buildings must be designed to reduce the effects of differential frost action between adjacent pavement, doorways, and entrances. We recommend that clean, 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 slabs and outward at least 4.5 feet, thereafter transitioning up to the bottom of the adjacent sidewalk or pavement subbase gravel at a 3H:1V or flatter slope. General details of this frost transition zone are attached as Sheet 18.

4.7 Backfill and Compaction

The on-site soils are unsuitable for reuse in building areas, except as noted herein to level the gravel surface floor area of the tension fabric structure. For building areas, we recommend the following fill and backfill materials:

Gravel Borrow: Sand and gravel or recycled crushed concrete used to backfill overexcavations below footings, fill to raise grades below on-grade floor slabs and base gravel for the tension fabric structure floor area should meet the gradation requirements of MaineDOT 703.20 “Gravel Borrow”.

Structural Fill: Backfill for foundations should be clean, non-frost susceptible sand and gravel meeting the gradation requirements for Structural Fill as given below.

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Reviewed for Code Compliance
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Approved with Conditions
Date: 08/28/14

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 as surfacing for the tension fabric structure floor should meet the requirements of MDOT Standard Specifications 703.12 "Aggregate for Crushed Stone Surfacing".

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 generally exceed 12 inches. We recommend that fill and backfill in building 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 compactor having a static weight of at least 600 pounds.

4.8 Weather Considerations

Construction activity should be limited during wet 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.

4.9 Design Review and Construction Testing

S.W.COLE should be engaged to review the final design and specifications to determine that our earthwork and foundation recommendations have been properly interpreted and implemented.

A soils and concrete testing program should also be implemented during construction to observe compliance with the design concepts, plans, and specifications. S.W.COLE is available to provide subgrade observations for foundations as well as testing services for

CITY OF PORTLAND, MAINE · RESURGAM
Reviewed for Code Compliance
Inspections Division
Approved with Conditions
Date: 08/28/14

soils, concrete, asphalt, steel, masonry and spray-applied fireproofing construction 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.

STATE OF MAINE
TIMOTHY J. BOYCE
No. 9263
LICENSED
PROFESSIONAL ENGINEER

Timothy J. Boyce, P.E.
Senior Geotechnical Engineer

TJB:ajh

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Inspections Division
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Attachment A
Limitations

This report has been prepared for the exclusive use of New Yard, LLC. for specific application to the proposed Portland Yacht Services Facility on West Commercial Street in Portland, Maine. S. W. Cole Engineering, Inc. (S.W.COLE) has endeavored to conduct the work 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 scope of work has not included the investigation, detection, or prevention of any Biological Pollutants at the project site or in any existing or proposed structure at the site. The term “Biological Pollutants” includes, but is not limited to, molds, fungi, spores, bacteria, and viruses, and the byproducts of any such biological organisms.

Recommendations contained in this report are based substantially upon information provided by others regarding the proposed project. In the event that any changes are made in the design, nature, or location of the proposed project, S.W.COLE 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.

Approved by the City of Portland Planning Board
Date: 08/28/14

LEGEND:

APPROXIMATE BORING LOCATION

APPROXIMATE TEST PIT LOCATION

NOTES:

1. EXPLORATION LOCATION PLAN WAS PREPARED FROM A 1"=50' SCALE PLAN OF THE SITE ENTITLED "AMENDED GRADING AND DRAINAGE PLAN PHASE 1B," PREPARED BY FAY, SPOFFORD & THORNDIKE, INC., DATED AUGUST 2013, REVISED 9/25/2013.
2. THE EXPLORATIONS WERE LOCATED IN THE FIELD BY GPS SURVEY BY S.W. COLE ENGINEERING, INC. USING A MAPPING GRADE TRIMBLE GPS RECEIVER.
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.

NO.	DATE	DESCRIPTION	BY
2	10/02/2013	FINAL REPORT SUBMITTAL	CEM
1	09/12/2013	DRAFT REPORT SUBMITTAL	CEM
-	09/06/2013	DRAFT SUBMITTAL	CEM

S.W. COLE ENGINEERING, INC.

NEW YARD, LLC

EXPLORATION LOCATION PLAN

PROPOSED PORTLAND YACHT SERVICES - WEST COMMERCIAL STREET
PORTLAND, MAINE

Job No.: 13-0912 Scale: 1" =50'
Date : 09/06/2013 Sheet: 1

K:\2013\13-0912\CAD\Drawings\13-0912-Sheet 1-EP_Rev2.dwg, 9/27/2013 9:31:18 AM, L1, CEM, S.W. Cole Engineering, Inc.

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.:
SHEET:
PROJECT NO.:

Reviewed for Code Compliance
Inspections Division
Approved with Conditions
Date: 08/28/14

PROJECT: PROPOSED PORTLAND YACHT SERVICES FACILITY
CLIENT : NEW YARD, LLC
LOCATION: FORMER CLAY DOCKS SITE - WEST COMMERCIAL STREET, PORTLAND, MAINE
DRILLING FIRM: NORTHERN TEST BORING, INC. DRILLER: MIKE NADEAU

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

DATE START: 8/28/2013
DATE FINISH: 8/28/2013
ELEVATION: 14' +/-
SWC REP.: E. WALKER

WATER LEVEL INFORMATION
SOILS SATURATED BELOW 5' +/-

CASING BLOWS PER FOOT	SAMPLE NO.	PEN.	REC.	DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
									4"	CONCRETE SLAB
	1D	24"	16"	2.5'	5	8	11	10	4.0'	BROWN GRAVELLY SAND SOME SILT WITH SILTY SAND LAYERS (FILL) ~ MEDIUM DENSE ~
	2D	24"	12"	7.0'	4	3	1	2	9.0'	BLACK ASH AND CLINKER (FILL) ~ LOOSE ~
	3D	24"	16"	12.0'	7	3	5	4		ORANGE-BROWN SILTY SAND WITH COARSE SAND SEAMS ~ LOOSE TO MEDIUM DENSE ~
	4D	24"	14"	17.0'	8	8	6	4	16.5'	
									20.0'	GRAY SILTY SAND WITH SHELLS AND ORGANICS ~ MEDIUM DENSE ~
	5D	24"	16"	22.0'	2	2	1	2	25.0'	GRAY SILTY CLAY WITH BROWN SILT AND FINE SAND SEAMS ~ MEDIUM ~
	6D	24"	18"	27.0'	2	1	1	1	27.0'	LAYERED GRAY SILTY CLAY, CLAYEY SILT, AND SILTY FINE SAND ~ MEDIUM / LOOSE ~
										BOTTOM OF EXPLORATION @ 27.0'

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

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

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

2

BORING NO.: **B-101**

S.W.COLE ENGINEERING, INC.

BORING LOG

Reviewed for Code Compliance Inspections Division Approved with Conditions
Date: 08/28/14

BORING NO.:
SHEET:
PROJECT NO.:

PROJECT: PROPOSED PORTLAND YACHT SERVICES FACILITY
CLIENT : NEW YARD, LLC
LOCATION: FORMER CLAY DOCKS SITE - WEST COMMERCIAL STREET, PORTLAND, MAINE
DRILLING FIRM: NORTHERN TEST BORING, INC. DRILLER: MIKE NADEAU

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

DATE START: 8/28/2013
DATE FINISH: 8/28/2013
ELEVATION: 14' +/-
SWC REP.: E. WALKER

WATER LEVEL INFORMATION
ALL SAMPLED SOILS SATURATED

CASING BLOWS PER FOOT	SAMPLE NO.	PEN.	REC.	DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
									4.5"	REINFORCED CONCRETE SLAB
									15.0'	AUGER TO 15' - NO SAMPLING
	1D	24"	18"	17.0'	3	3	3	4	20.0'	GRAY-BROWN SILTY FINE TO MEDIUM SAND WITH SHELLS AND ORGANICS ~ LOOSE ~
	2D	24"	16"	22.0'	3	1	1	1	25.0'	O = 2.9% GRAY SILT AND SAND WITH SHELLS AND ORGANICS ~ LOOSE ~
	3D	24"	18"	27.0'	2	2	2	2		q_p = 1-2 KSF LAYERED SILTY CLAY, CLAYEY SILT, AND SILTY FINE SAND ~ STIFF ~
	4D	24"	24"	32.0'	3	2	2	2	32.0'	~ MEDIUM ~ q_p = 0.5 KSF
										BOTTOM OF EXPLORATION @ 32.0'

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

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

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

BORING NO.: **B-102**

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.:
SHEET:
PROJECT NO.:

CITY OF PORTLAND, MAINE — RESURGAM
Reviewed for Code Compliance
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PROJECT: PROPOSED PORTLAND YACHT SERVICES FACILITY
CLIENT : NEW YARD, LLC
LOCATION: FORMER CLAY DOCKS SITE - WEST COMMERCIAL STREET, PORTLAND, MAINE
DRILLING FIRM: NORTHERN TEST BORING, INC. DRILLER: MIKE NADEAU

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

DATE START: 8/28/2013
DATE FINISH: 8/28/2013
ELEVATION: 14' +/-
SWC REP.: E. WALKER

WATER LEVEL INFORMATION
SOILS SATURATED BELOW 3' DURING SAMPLING
WATER IN PIEZOMETER @ 1.9' ON 8/28/13

CASING BLOWS PER FOOT	SAMPLE NO.	PEN.	REC.	DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
									6"	CONCRETE SLAB
	1D	24"	14"	2.5'	6	7	8	5	2.5'	BROWN SAND SOME SILT AND GRAVEL (FILL) ~ MEDIUM DENSE ~
	2D	24"	10"	4.5'	7	7	5	5	5.0'	BROWN GRAVELLY SAND SOME SILT (FILL) ~ MEDIUM DENSE ~
	3D	24"	4"	7.0'	2	2	2	2		BLACK ASH WITH BRICK FRAGMENTS WITH SOME SILTY SAND (FILL)
	4D	24"	12"	9.0'	2	3	4	3	9.0'	~ LOOSE ~
									11.0'	GRAY-BROWN SILTY FINE SAND ~ LOOSE ~
	5D	24"	14"	12.0'	4	2	6	6	15.0'	ORANGE-BROWN SILTY FINE SAND ~ LOOSE ~
	6D	24"	16"	17.0'	1	1-12"		1	20.0'	GRAY WITH BLACK LAYERS SILTY FINE SAND WITH TRACE ROOTLETS ~ VERY LOOSE ~
	7D	24"	24"	22.0'	WOH - 18"			1	26.6'	O = 1.8% GRAY SILT SOME SAND SOME CLAY WITH SHELLS AND ORGANICS (ROOTLETS, SEED PODS) ~ VERY LOOSE ~
	8D	24"	24"	27.0'	WOH - 24"				27.0'	GRAY SILTY CLAY WITH OCCASIONAL SAND SEAMS ~ STIFF ~ q_p = 4 KSF

BOTTOM OF EXPLORATION @ 27.0'

PIEZOMETER INSTALLED

MATERIAL	DEPTH
FILTER SAND	1.5' - 27'
BENTONITE	0' - 1.5'
2" PVC SCREEN	2' - 17'
2" PVC RISER	0' - 2' WITH 3' +/- STICKUP

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

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

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

BORING NO.: **B-103**

S.W.COLE ENGINEERING, INC.

BORING LOG

CITY OF PORTLAND, MAINE — RESURGAM
Reviewed for Code Compliance Inspections Division Approved with Conditions
Date: 08/28/14

BORING NO.:
SHEET:
PROJECT NO.:

PROJECT: PROPOSED PORTLAND YACHT SERVICES FACILITY
CLIENT : NEW YARD, LLC
LOCATION: FORMER CLAY DOCKS SITE - WEST COMMERCIAL STREET, PORTLAND, MAINE
DRILLING FIRM: NORTHERN TEST BORING, INC. DRILLER: MIKE NADEAU

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

DATE START: 9/11/2013
DATE FINISH: 9/11/2013
ELEVATION: 14' +/-
SWC REP.: E. WALKER

WATER LEVEL INFORMATION
SOILS SATURATED BELOW 5' +/-

CASING BLOWS PER FOOT	SAMPLE NO.	PEN.	REC.	DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
									6"	CONCRETE SLAB
	1D	24"	14"	3.0'	4	4	6	5	3.0'	BROWN GRAVELLY SAND SOME SILT WITH ASH LAYERS (FILL) ~ LOOSE ~
	2D	24"	16"	7.0'	4	3	5	6	8.0'	BLACK AND DARK BROWN ASH AND SLAG (FILL) ~ LOOSE ~
	3D	24"	4"	12.0'	4	5	5	5	15.0'	DARK BROWN SILTY SAND SOME GRAVEL ~ LOOSE TO MEDIUM DENSE ~
	4D	24"	14"	17.0'	3	2	5	4	19.0'	GRAY-BROWN FINE TO MEDIUM SAND SOME SILT WITH SHELLS ~ LOOSE ~
	5D	24"	20"	22.0'	WOH - 24"				21.8'	GRAY CLAYEY SILT SOME SAND WITH SHELLS AND ORGANICS ~ VERY LOOSE ~
	1V			25.8'	3 5/8" X 7" VANE					GRAY SILTY CLAY WITH FREQUENT FINE SAND SEAMS
	1V'			25.8'	3 5/8" X 7" VANE					S_v = 1.11 KSF / 0.16 KSF VANE ATTEMPTED - NO PENETRATION PROBABLE SAND SEAM
										BEGIN ROD PROBE @ 25.8'
										HYDRAULIC PUSH ROD PROBE 25.8' - 41' SWITCH TO 140 LB HAMMER : 41' - 42.5' : 28 BLOWS - PENETRATE SAND LAYER HYDRAULIC PUSH ROD PROBE 41' - 56' SWITCH TO 140 LB HAMMER : 56' - 57.5' : 43 BLOWS - PENETRATE SAND LAYER HYDRAULIC PUSH ROD PROBE 57.5' - 58' SWITCH TO 140 LB. HAMMER: 58' - 58.5' 43 BLOWS - DENSE GRANULAR SOILS
									58.5'	BOTTOM OF EXPLORATION @ 58.5'

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

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

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

BORING NO.: **B-104**

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.:
SHEET:
PROJECT NO.:

Reviewed for Code Compliance
Inspections Division
Approved with Conditions
Date: 08/28/14

PROJECT: PROPOSED PORTLAND YACHT SERVICES FACILITY
CLIENT : NEW YARD, LLC
LOCATION: FORMER CLAY DOCKS SITE - WEST COMMERCIAL STREET, PORTLAND, MAINE
DRILLING FIRM: NORTHERN TEST BORING, INC. DRILLER: MIKE NADEAU

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

DATE START: 8/28/2013
DATE FINISH: 8/28/2013
ELEVATION: 14' +/-
SWC REP.: E. WALKER

WATER LEVEL INFORMATION
ALL SAMPLED SOILS SATURATED

CASING BLOWS PER FOOT	SAMPLE NO.	PEN.	REC.	DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
									4"	CONCRETE SLAB
									15.0'	AUGER TO 15' - NO SAMPLING
	1D	24"	18"	17.0'	5	4	5	4	20.0'	BROWN SILTY SAND WITH CLAYEY SILT LAYERS ~ LOOSE ~
	2D	24"	16"	22.0'	3	2	2	1	25.0'	GRAY SANDY CLAYEY SILT WITH SHELLS AND ORGANICS ~ LOOSE ~
	3D	24"	18"	27.0'	5	6	7	7	30.0'	BROWN-GRAY SILTY CLAY ~VERY STIFF ~ q_p = 6-7 KSF
	4D	24"	24"	32.0'	3	4	3	2	32.0'	GRAY SILTY CLAY WITH FREQUENT SAND AND SILT SEAMS ~ MEDIUM ~
										BOTTOM OF EXPLORATION @ 32.0'

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

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

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

BORING NO.: **B-105**

S.W.COLE ENGINEERING, INC.

BORING LOG

CITY OF PORTLAND, MAINE — RESURGAM
Reviewed for Code Compliance Inspections Division Approved with Conditions
Date: 08/28/14

BORING NO.:
SHEET:
PROJECT NO.:
DATE START: 8/28/2013
DATE FINISH: 8/28/2013
ELEVATION: 14' +/-
SWC REP.: E. WALKER

PROJECT: PROPOSED PORTLAND YACHT SERVICES FACILITY
CLIENT : NEW YARD, LLC
LOCATION: FORMER CLAY DOCKS SITE - WEST COMMERCIAL STREET, PORTLAND, MAINE
DRILLING FIRM: NORTHERN TEST BORING, INC. DRILLER: MIKE NADEAU

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

WATER LEVEL INFORMATION
SOILS MOIST BELOW 5' +/-
SOILS SATURATED BELOW 10' +/-

CASING BLOWS PER FOOT	SAMPLE NO.	PEN.	REC.	DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
									2"	ASPHALT PAVEMENT
	1D	24"	18"	2.5'	8	12	11	12	2.3'	BLACK ASH WITH BRICK FRAGMENTS (FILL) ~ MEDIUM DENSE ~
									3.0'	GRAY-BROWN SILTY GRAVELLY SAND (FILL) ~ MEDIUM DENSE ~
	2D	24"	18"	4.5'	10	12	11	12	6.0'	LIGHT BROWN GRAVELLY SAND SOME SILT (FILL) ~ MEDIUM DENSE ~
	3D	24"	16"	7.0'	7	7	4	4	8.0'	BLACK ASH AND SLAG (FILL) ~ MEDIUM DENSE ~
	4D	24"	18"	9.0'	6	10	11	8	10.0'	BROWN SILTY SAND WITH GRAY SILT SEAMS ~ MEDIUM DENSE ~
	5D	24"	16"	12.0'	4	1	1	1	15.0'	BROWN SILTY SAND SOME GRAVEL WITH GRAY SANDY SILT SEAMS ~ LOOSE ~
	6D	24"	10"	17.0'	4	2	4	4	20.0'	BROWN SAND SOME SILT ~ LOOSE ~
	7D	24"	16"	22.0'	14	6	2	2	21.5'	BROWN SAND TRACE GRAVEL AND SILT ~ LOOSE ~
									25.0'	GRAY SANDY SILT TRACE ORGANICS ~ LOOSE ~
	8D	24"	18"	27.0'	5	4	6	4	27.0'	MOTTLED GRAY CLAYEY SILT SOME FINE SAND WITH FINE SAND SEAMS ~ LOOSE ~
										BOTTOM OF EXPLORATION @ 27.0'

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

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

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

BORING NO.: **B-106**

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.:
SHEET:
PROJECT NO.:

Reviewed for Code Compliance
Inspections Division
Approved with Conditions
Date: 08/28/14

PROJECT: PROPOSED PORTLAND YACHT SERVICES FACILITY
CLIENT : NEW YARD, LLC
LOCATION: FORMER CLAY DOCKS SITE - WEST COMMERCIAL STREET, PORTLAND, MAINE
DRILLING FIRM: NORTHERN TEST BORING, INC. DRILLER: MIKE NADEAU

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

DATE START: 8/28/2013
DATE FINISH: 8/28/2013
ELEVATION: 14' +/-
SWC REP.: E. WALKER

WATER LEVEL INFORMATION
SOILS SATURATED BELOW 11' +/-

CASING BLOWS PER FOOT	SAMPLE NO.	PEN.	REC.	DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
									2"	ASPHALT PAVEMENT
	1D	24"	16"	2.5'	4	7	9	10	5.0'	BROWN GRAVELLY SAND SOME SILT (FILL) ~ MEDIUM DENSE ~
	2D	24"	16"	7.0'	6	5	4	4	9.0'	BLACK ASH AND SLAG (FILL) ~ LOOSE ~
	3D	24"	16"	12.0'	12	8	5	9	15.0'	BROWN AND GRAY-BROWN SILTY GRAVELLY SAND WITH SILTY CLAY LAYERS
	4D	24"	10"	17.0'	3	1	3	5	18.0'	BROWN SILTY SAND SOME GRAVEL WITH GRAY CLAYEY SILT SEAMS ~ LOOSE ~
	5D	24"	24"	22.0'	WOH - 24"					O = 1.7 % GRAY SILT SOME CLAY SOME SAND WITH SHELLS AND ORGANICS
	1C	24"		24.0'	PISTON SAMPLER					O = 2.3 % ~ VERY LOOSE ~
									27.0'	
	6D	24"	24"	32.0'	1	2	2	2		GRAY WITH BLACK STREAKING SILTY CLAY ~ MEDIUM ~

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

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

REMARKS: CONTINUED…

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

BORING NO.: **B-107**

S.W.COLE ENGINEERING, INC.

BORING LOG

Reviewed for Code Compliance Inspections Division Approved with Conditions
Date: 08/28/14

BORING NO.:
SHEET:
PROJECT NO.:
DATE START: 8/28/2013
DATE FINISH: 8/28/2013
ELEVATION: 14' +/-
SWC REP.: E. WALKER

PROJECT: PROPOSED PORTLAND YACHT SERVICES FACILITY
CLIENT : NEW YARD, LLC
LOCATION: FORMER CLAY DOCKS SITE - WEST COMMERCIAL STREET, PORTLAND, MAINE
DRILLING FIRM: NORTHERN TEST BORING, INC. DRILLER: MIKE NADEAU

	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:				
SAMPLER:	SS	1 3/8"	140 LBS.	30"
CORE BARREL:				

WATER LEVEL INFORMATION

CASING BLOWS PER FOOT	SAMPLE NO.	PEN.	REC.	DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
	1V			40.8'	3 5/8" X 7" VANE					S_v = 0.87 KSF / 0.13 KSF
	1V'			41.6'	3 5/8" X 7" VANE					S_v = 0.75 KSF / 0.11 KSF
										GRAY SILTY CLAY
										~ MEDIUM ~
	2V			50.8'	3 5/8" X 7" VANE					S_v = 0.78 KSF / 0.12 KSF
	2V'			51.6'	3 5/8" X 7" VANE				51.6'	S_v = 0.75 KSF / 0.11 KSF
										BOTTOM OF EXPLORATION @ 51.6'

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

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

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

BORING NO.: **B-107**

S.W.COLE ENGINEERING, INC.

BORING LOG

Reviewed for Code Compliance Inspections Division Approved with Conditions
Date: 08/28/14

BORING NO.:
SHEET:
PROJECT NO.:

PROJECT: PROPOSED PORTLAND YACHT SERVICES FACILITY
CLIENT : NEW YARD, LLC
LOCATION: FORMER CLAY DOCKS SITE - WEST COMMERCIAL STREET, PORTLAND, MAINE
DRILLING FIRM: NORTHERN TEST BORING, INC. DRILLER: MIKE NADEAU

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

DATE START: 8/28/2013
DATE FINISH: 8/28/2013
ELEVATION: 14' +/-
SWC REP.: E. WALKER

WATER LEVEL INFORMATION
SOILS SATURATED BELOW 11' +/-

CASING BLOWS PER FOOT	SAMPLE NO.	PEN.	REC.	DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
									1.5"	ASPHALT PAVEMENT
	1D	24"	8"	2.5'	4	5	9	16	4.0'	BROWN SILTY GRAVELLY SAND (FILL) ~ LOOSE TO MEDIUM DENSE ~
	2D	24"	16"	4.5'	5	4	4	3		BLACK ASH / SLAG WITH SOME GRAVELLY SAND (FILL)
	3D	24"	4"	7.0'	2	2	2	2		~ LOOSE ~
	4D	24"	14"	9.0'	2	2	2	2	10.0'	
	5D	24"	14"	12.0'	15	10	9	9	12.0'	BROWN SILTY SAND SOME GRAVEL ~ MEDIUM DENSE ~
	6D	24"	18"	14.0'	8	4	1	1	15.0'	BROWN AND GRAY-BROWN SILTY SAND TRACE GRAVEL WITH SILTY SAND SEAMS ~ LOOSE ~
	7D	24"	2"	17.0'	3	3	3	3	17.0'	BROWN SILTY GRAVELLY SAND ~ LOOSE ~

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

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

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

10

BORING NO.: **B-108**

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.:
SHEET:
PROJECT NO.:

Reviewed for Code Compliance
Inspections Division
Approved with Conditions
Date: 08/28/14

PROJECT:	PROPOSED PORTLAND YACHT SERVICES FACILITY
CLIENT :	NEW YARD, LLC
LOCATION:	FORMER CLAY DOCKS SITE - WEST COMMERCIAL STREET, PORTLAND, MAINE
DRILLING FIRM:	NORTHERN TEST BORING, INC. DRILLER: MIKE NADEAU

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

DATE START:	9/11/2013
DATE FINISH:	9/11/2013
ELEVATION:	11' +/-
SWC REP.:	E. WALKER

WATER LEVEL INFORMATION

SOILS DAMP BELOW 4' +/-

SOILS SATURATED BELOW 7' +/-

CASING BLOWS PER FOOT	SAMPLE NO.	PEN.	REC.	DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
	1D	24"	12"	2.0'	3	4	3	2	3.8'	BLACK ASH AND SLAG TRACE ORGANICS (FILL) ~ LOOSE ~
	2D	24"	12"	4.0'	2	2	2	2	5.0'	BROWN FINE TO MEDIUM SAND SOME SILT (FILL) ~ LOOSE ~
	3D	24"	16"	7.0'	3	2	5	4	7.0'	GRAY-BROWN AND BROWN SILTY SAND SOME GRAVEL (FILL) WITH SANDY SILT LAYERS ~ LOOSE ~
	4D	24"	16"	9.0'	3	3	2	2		GRAY-BROWN SILT SAND TRACE GRAVEL ~ LOOSE ~ NOTE: PETROLEUM-LIKE ODOR OBSERVED @ SAMPLES 4D AND 5D BLACK OILY SUBSTANCE IN WASH WATER
	5D	24"	0"	12.0'	1	1-18"			13.0'	~ VERY LOOSE ~
	6D	24"	14"	15.0'	HYDRAULIC PUSH					GRAY SILT AND SAND SOME GRAVEL TRACE CLAY
	7D	24"	14"	17.0'	2	1	3	2	20.0'	~ LOOSE ~
	8D	24"	12"	22.0'	2	1	2	3	22.0'	GRAY CLAYEY SILT SOME FINE SAND WITH SHELLS ~ LOOSE ~
										BOTTOM OF EXPLORATION @ 22.0'

SAMPLES:

D = SPLIT SPOON
C = 3" SHELBY TUBE
U = 3.5" SHELBY TUBE

SOIL CLASSIFIED BY:

	DRILLER - VISUALLY
X	SOIL TECH. - VISUALLY
	LABORATORY TEST

REMARKS:

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

11

BORING NO.: **B-109**

S.W.COLE ENGINEERING, INC.

BORING LOG

Reviewed for Code Compliance Inspections Division Approved with Conditions
Date: 08/28/14

BORING NO.:
SHEET:
PROJECT NO.:
DATE START: 8/28/2013
DATE FINISH: 8/28/2013
ELEVATION: 11' +/-
SWC REP.: E. WALKER

PROJECT: PROPOSED PORTLAND YACHT SERVICES FACILITY
CLIENT : NEW YARD, LLC
LOCATION: FORMER CLAY DOCKS SITE - WEST COMMERCIAL STREET, PORTLAND, MAINE
DRILLING FIRM: NORTHERN TEST BORING, INC. DRILLER: MIKE NADEAU

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

WATER LEVEL INFORMATION
WATER MEASURED IN
WATER IN PIEZOMETER @ 7.4' ON 8/28/13

CASING BLOWS PER FOOT	SAMPLE NO.	PEN.	REC.	DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
									1.0'	BLACK ASH WITH BRICK FRAGMENTS AND ORGANICS (FILL)
	1D	24"	16"	2.0'	4	6	5	5	2.0'	BROWN SILTY SAND SOME GRAVEL (FILL) ~ MEDIUM DENSE ~
	2D	24"	14"	4.0'	4	5	5	7	5.0'	LIGHT BROWN AND GRAY-BROWN SILTY SAND TRACE GRAVEL (FILL) ~ MEDIUM DENSE ~
	3D	24"	10"	7.0'	4	4	4	4	7.0'	ORANGE-BROWN GRAVELLY SILTY SAND (FILL) ~ LOOSE ~
	4D	24"	14"	9.0'	3	3	2	1	10.0'	BROWN AND ORANGE-BROWN SILTY SAND TRACE GRAVEL ~ LOOSE ~
	5D	24"	6"	12.0'	3	2	1	2	13.0'	GRAY-BROWN AND ORANGE-BROWN SAND SOME GRAVEL AND SILT ~ LOOSE ~
	6D	24"	8"	17.0'	3	3	2	3	20.0'	GRAY-BROWN MEDIUM TO COARSE SAND TRACE GRAVEL AND SILT ~ LOOSE ~
	7D	24"	24"	22.0'	WOH - 24"					GRAY CLAYEY SILT TRACE SAND WITH SHELLS AND ORGANICS ~ VERY LOOSE ~
	8D	24"	24"	27.0'	WOH - 24"				27.0'	

BOTTOM OF EXPLORATION @ 27.0'

PIEZOMETER INSTALLED

MATERIAL	DEPTH
FILTER SAND	1.5' - 27'
BENTONITE	0' - 1.5'
2" PVC SCREEN	2' - 17'
2" PVC RISER	0' - 2' WITH 3' +/- STICKUP

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

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

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

BORING NO.: **B-110**

S.W.COLE ENGINEERING, INC.

TEST PIT LOGS

Reviewed for Code Compliance
Inspections Division
Approved with Conditions
Date: 08/28/14

PROJECT / CLIENT: PROPOSED PORTLAND YACHT SERVICES PHASE I BUILDINGS / NEW YARD, LLC

LOCATION: WEST COMMERCIAL STREET, PORTLAND, MAINE PROJECT NO. 13-0912

TEST PIT TP-101

DATE: 08-28-13 SURFACE ELEVATION: _____ LOCATION: SEE SHEET 1

SAMPLE NO.	SAMPLE DEPTH	DEPTH (FT)	STRATUM DESCRIPTION	TEST RESULTS
		0.3	VEGETATION / BLACK ASH WITH MISCELLANEOUS DEBRIS (FILL)	
		3.0	BLACK ASH AND SLAG (FILL)	
		6.0	LIGHT BROWN TO ORANGE-BROWN SILTY SAND TRACE GRAVEL (FILL)	

COMPLETION DEPTH: 6 DEPTH TO WATER: ALL SOILS MOIST

TEST PIT TP-102

DATE: 08-28-13 SURFACE ELEVATION: _____ LOCATION: SEE SHEET 1

SAMPLE NO.	SAMPLE DEPTH	DEPTH (FT)	STRATUM DESCRIPTION	TEST RESULTS
		3.5	BLACK ASH WITH ROOTLETS (FILL)	
		5.5	LIGHT GRAY-BROWN SILTY FINE TO MEDIUM SAND, TRACE GRAVEL WITH SANDY SILT SEAMS (FILL)	

COMPLETION DEPTH: 5.5' DEPTH TO WATER: ALL SOILS MOIST, NO FREE WATER

S.W.COLE ENGINEERING, INC.

TEST PIT LOGS

Reviewed for Code Compliance
Inspections Division
Approved with Conditions
Date: 08/28/14

PROJECT / CLIENT: PROPOSED PORTLAND YACHT SERVICES PHASE I BUILDINGS / NEW YARD, LLC

LOCATION: WEST COMMERCIAL STREET, PORTLAND, MAINE PROJECT NO. 13-0912

TEST PIT TP-103

DATE: 08-28-13 SURFACE ELEVATION: _____ LOCATION: SEE SHEET 1

SAMPLE NO.	SAMPLE DEPTH	DEPTH (FT)	STRATUM DESCRIPTION	TEST RESULTS
		0.2'	ORGANICS AND BLACK ASH WITH MISCELLANEOUS DEBRIS (FILL)	
			BLACK ASH AND SLAG WITH POCKETS OF LIGHT BROWN SILTY SAND WITH BRICK, ORGANICS AND COBBLES (FILL) FORMED CONCRETE STRUCTURE ON NORTHWEST SIDE OF PIT VERTICAL AND HORIZONTAL EXTENTS UNKNOWN	
		6.5		

COMPLETION DEPTH: 6.5' DEPTH TO WATER: ALL SOILS MOIST

TEST PIT TP-104

DATE: 08-28-13 SURFACE ELEVATION: _____ LOCATION: SEE SHEET 1

SAMPLE NO.	SAMPLE DEPTH	DEPTH (FT)	STRATUM DESCRIPTION	TEST RESULTS
		0.2	BLACK ASH WITH ORGANICS AND MISCELLANEOUS DEBRIS (FILL)	
		1.0	BLACK ASH WITH ROOTLETS	
			ORANGE-BROWN WITH DARK BROWN AND GRAY LAYERS SILTY SAND TRACE GRAVEL WITH BRICK AND ORGANICS AND SILTY CLAY POCKETS (FILL) MORTARED BRICK WALL FRAGMENTS IN EXCAVATION SIDEWALLS	
		5.2		

COMPLETION DEPTH: 5.2' DEPTH TO WATER: NO FREE WATER OBSERVED

S.W.COLE ENGINEERING, INC.

TEST PIT LOGS

Reviewed for Code Compliance
Inspections Division
Approved with Conditions
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PROJECT / CLIENT: PROPOSED PORTLAND YACHT SERVICES PHASE I BUILDINGS / NEW YARD, LLC

LOCATION: WEST COMMERCIAL STREET, PORTLAND, MAINE PROJECT NO. 13-0912

TEST PIT TP-105

DATE: 08-28-13 SURFACE ELEVATION: _____ LOCATION: SEE SHEET 1

SAMPLE NO.	SAMPLE DEPTH	DEPTH (FT)	STRATUM DESCRIPTION	TEST RESULTS
		0.3	VEGETATION / BLACK ASH WITH MISCELLANEOUS DEBRIS	
			BLACK ASH AND SLAG WITH POCKETS OF BROWN AND BLACK SILTY SAND WITH BRICK AND ORGANICS (FILL)	
		6.6		

COMPLETION DEPTH: 6.6' DEPTH TO WATER: ALL SOILS MOIST

TEST PIT TP-106

DATE: 08-28-13 SURFACE ELEVATION: _____ LOCATION: SEE SHEET 1

SAMPLE NO.	SAMPLE DEPTH	DEPTH (FT)	STRATUM DESCRIPTION	TEST RESULTS
		0.2'	VEGETATION / BLACK ASH WITH MISCELLANEOUS DEBRIS (FILL)	
		1.0	BLACK ASH WITH ROOTLETS (FILL)	
			LIGHT BROWN SILTY FINE TO MEDIUM SAND TRACE GRAVEL WITH SANDY SILT LAYERS AND WITH ORGANICS AND BRICK (FILL)	
		5.0		
			ORANGE-BROWN SILTY SAND TRACE GRAVEL (FILL)	
		6.1		

COMPLETION DEPTH: 6.1' DEPTH TO WATER: ALL SOILS MOIST

CITY OF PORTLAND, MAINE RESURGAM
Reviewed for Code Compliance
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KEY TO THE NOTES & SYMBOLS
Test Boring and Test Pit Explorations

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

Key to Symbols Used:

w	-	water content, percent (dry weight basis)
q_u	-	unconfined compressive strength, kips/sq. ft. - based on laboratory unconfined compressive test
S_v	-	field vane shear strength, kips/sq. ft.
L_v	-	lab vane shear strength, kips/sq. ft.
q_p	-	unconfined compressive strength, kips/sq. ft. based on pocket penetrometer test
O	-	organic content, percent (dry weight basis)
W_L	-	liquid limit - Atterberg test
W_P	-	plastic limit - Atterberg test
WOH	-	advance by weight of hammer
WOM	-	advance by weight of man
WOR	-	advance by weight of rods
HYD	-	advance by force of hydraulic piston on drill
RQD	-	Rock Quality Designator - an index of the quality of a rock mass. RQD is computed from recovered core samples.
γ_T	-	total soil weight
γ_B	-	buoyant soil weight

Description of Proportions:

0 to 5% TRACE
5 to 12% SOME
12 to 35% "Y"
35+% AND

REFUSAL: **Test Boring Explorations** - Refusal depth indicates that depth at which, in the drill foreman's opinion, sufficient resistance to the advance of the casing, auger, probe rod or sampler was encountered to render further advance impossible or impracticable by the procedures and equipment being used.

REFUSAL: **Test Pit Explorations** - Refusal depth indicates that depth at which sufficient resistance to the advance of the backhoe bucket was encountered to render further advance impossible or impracticable by the procedures and equipment being used.

Although refusal may indicate the encountering of the bedrock surface, it may indicate the striking of large cobbles, boulders, very dense or cemented soil, or other buried natural or man-made objects or it may indicate the encountering of a harder zone after penetrating a considerable depth through a weathered or disintegrated zone of the bedrock.

S.W.COLE ENGINEERING, INC.

Consolidation Tes

ASTM D-2435

Reviewed for Code Compliance
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Project Name	Portland Yacht Services Facility	Project Number	13-0912
Client	New Yard, LLC	Lab ID	16657B
		Date	9/19/2013
Boring	B107	Date Complete	10/31/2013
Sample	1C		
Depth	22'-24'		

P_C =	2.1 ksf
C_C =	0.15
C_R =	0.04
w =	38.8%
O =	2.30%
PL =	NP

Comments:

Reviewed By

Reviewed for Code Compliance
Inspections Division
Approved with Conditions
Date: 08/28/14

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.

NEW YARD, LLC

FOUNDATION DETAIL

PROPOSED PORTLAND YACHT SERVICES - WEST
COMMERCIAL STREET
PORTLAND, MAINE

Job No.:	13-0912	Scale:	Not to Scale
Date :	10/09/2013	Sheet:	18

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