GEOTECHNICAL ENGINEERING REPORT
PROPOSED BUILDING
ACADEMY FOR ACTIVE LEARNERS
134 WARREN AVENUE
PORTLAND, MAINE

Prepared for:

Delta Realty
380 Warren Avenue
Portland, Maine

Prepared by:

Ransom Consulting, Inc.
Pease International Tradeport
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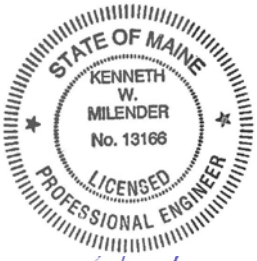
603.436.1490

Project 151.06127
January 8, 2016



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Project Engineer

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EXECUTIVE SUMMARY

Ransom Consulting, Inc. (Ransom) has prepared this project Geotechnical Engineering Report for the proposed development of the property located at 134 Warren Avenue in Portland, Maine (referred to as the "Site" in this report). This report presents our findings and geotechnical recommendations for design and construction of the proposed project.

The Site is located in a mixed commercial/residential area of Portland, Maine. The Site is situated on the south side of Warren Avenue adjacent to Keeley's Catering. The Site is a rectangular shaped 1.30 acre lot with a street address of 134 Warren Avenue. The parcel is primarily vegetated on the southern 1/2 of the Site and gravel parking with some grass on the northerly half of the Site adjacent to Warren Avenue. The northern portion is currently being used as overflow parking for the abutting Keeley's Catering.

Topographic survey of the Site indicates that the topography of the Site ranges from approximately 104 feet above mean sea level (MSL) on the northern portion of the Site adjacent to Warrant Avenue, to approximately 93 feet above MSL at the southern Site boundary. Regional topography generally slopes downward to the southeast, towards the Back Cove area.

The Site property is proposed to be developed into a daycare facility. The proposed development includes a single story daycare building with a playground. In addition to the proposed building, the redevelopment will include asphalt-paved areas for parking north, south, and west of the proposed daycare building and an entrance drive from Warren Avenue. Proposed finished floor elevation is planned to be elevation (El.) 103.25 feet. Based on existing Site topography, cuts and fills of generally 1 to 2 feet or less will be required within the proposed building footprint to achieve design grades.

Subsurface explorations generally encountered surficial layers (gravel, topsoil) underlain by Fill Materials, glaciomarine clay, and bedrock. Drilling refusals were encountered at depths ranging from approximately 5 to 18 feet below the existing grades. It could not be determined whether the drilling refusals were the result of encountering competent bedrock, large boulders, or very dense soils at all locations. However, it is our opinion that the deeper drilling refusals (depths ranging from 11 to 18 feet below existing grade, were on the top of the competent bedrock surface, and the shallow refusals may have been on boulders or very dense soils. Groundwater was encountered within the explorations at depths ranging from 10 to 14.5 feet below grade.

The proposed buildings could be supported on continuous and spread footings bearing on a minimum 12-inch thick layer of compacted structural fill placed above undisturbed, inorganic, native glaciomarine clay soil. Ground floors could be constructed as slabs-on-grade. We anticipate that the existing Fill Materials encountered beneath the proposed floor slab could be suitable to remain in-place with the approval of the project geotechnical engineer.

The clay soils that will be excavated are not suitable for reuse as common fill at the Site. The existing Fill Materials that will be excavated might be suitable for reuse as common fill below non-structural areas and landscaped areas. Structural fill will need to be imported to the Site from off-site borrow sources.

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1.0 INTRODUCTION

Ransom Consulting, Inc. (Ransom) has prepared this project Geotechnical Engineering Report for the proposed development of the property located at 134 Warren Avenue in Portland, Maine (referred to as the "Site" in this report). This geotechnical report has been prepared in general accordance with our September 3, 2015 Proposal for Engineering Services.

This geotechnical engineering evaluation was performed to obtain site-specific subsurface soil information and to make geotechnical evaluations and recommendations for the proposed Academy for Active Learners building construction. As completed, Ransom's scope of services included the following items:

1. Subcontracting and coordinating with a drilling contractor, marking the Site for utility clearance, and contacting the underground utility clearance system as required by law.

2. Providing technical monitoring for the subsurface explorations, obtaining soil samples, and preparing test boring logs.

3. Evaluating the field data with respect to the proposed development and preparing this report of our findings, evaluations, and recommendations for the proposed design and construction.

2.0 SITE AND PROJECT DESCRIPTIONS

The Site is located in a mixed commercial/residential area of Portland, Maine. The City of Portland Assessor's office identifies the Site as 295-G-1 with a corresponding street address of 134 Warren Avenue. A Site Location Map and a Subsurface Exploration Plan showing the existing conditions and the proposed Site layout are provided as Figure 1 and Figure 2, respectively.

2.1 Existing Conditions

The site is a rectangular shaped 1.30 acre lot located on the south side of Warren Avenue. The parcel is primarily vegetated (wooded/scrub brush) on the southern half of the Site and gravel parking with some grass on the northern half of the site adjacent to Warren Avenue. The northern portion is currently being used as overflow parking for an abutting business (Keeley's Catering).

Our current understanding of the existing Site layout and grades is based on review of "Existing Conditions Survey" (dated October 9, 2015), prepared by Titcomb Associates of Falmouth, Maine.

The Site is located on the Portland West, Maine U.S. Geological Survey 7.5-minute topographic quadrangle. Topographic survey of the Site indicates that the topography of the Site ranges from approximately 104 feet above mean sea level (MSL) on the northern portion of the Site adjacent to Warren Avenue, to approximately 92 feet above MSL at the southwest Site corner, as referenced to the National Geodetic Vertical Datum (NGVD). Regional topography generally slopes downward to the southwest, with surface drainage to the Fore River.

2.2 Proposed Redevelopment

The Site property is proposed to be developed into a daycare facility. The proposed development includes a single story daycare building with a playground. In addition to the proposed building, the redevelopment will include asphalt-paved areas for parking north, south, and west of the proposed daycare building and an entrance drive from Warren Avenue (Figure 2). Proposed preliminary grading and drainage plans prepared by Ransom as part of our civil design services on behalf of Delta Realty indicate that the proposed building will have a finished floor elevation of 103.25 feet above MSL. Cuts and fills of generally 1 to 2 feet will be required within the proposed building footprint and parking areas to achieve design grades.

3.0 SUBSURFACE INVESTIGATION

Ransom's geotechnical subsurface exploration program for the Site was conducted on December 10, 2015, and consisted of the advancement of seven test borings (designated B101 through B107), as shown on Figure 2. The explorations were not surveyed; their locations and elevations should be considered approximate.

Test drilling was performed by Technical Drilling Services of Sterling, Massachusetts utilizing 4 1/4-inch inside-diameter hollow-stem augers. Split-barrel sampling with standard penetration testing (ASTM D 1586), using a 140-pound drive hammer, was conducted at 2-foot intervals from ground surface to depths of 4 to 7 feet below ground surface (bgs), and at 5-foot intervals thereafter to the bottoms of the borings.

A Ransom representative monitored the subsurface explorations and prepared boring logs. Soil samples were placed in sealed containers and returned to Ransom's office for further evaluation. Soil samples were visually classified in general accordance with visual manual procedures (ASTM D 2488) and described using modified Burmister Soil Classification System descriptors. Exploration logs are included in Appendix A.

4.0 SUBSURFACE CONDITIONS

Subsurface conditions at the Site were characterized by drilling into the unconsolidated, overburden soil formations at accessible locations at the Site property. Figure 2 illustrates the existing Site features, proposed building and Site layout, and approximate test boring locations. The general characteristics of the subsurface strata are described below. Refer to the logs in Appendix A for more detailed soil descriptions at specific locations and depths.

4.1 Subsurface Soils

Test borings were advanced to depths ranging from approximately 5 to 18 feet below existing grades. The subsurface explorations generally encountered surficial layers of gravel or topsoil underlain by Fill Materials, glaciomarine clay, and bedrock. The general characteristics of the subsurface strata are described below in order of increasing depth encountered below the ground surface. Figure 2 illustrates the existing Site layout and approximate test boring locations.

Surficial Layers

Gravel or topsoil was penetrated at ground surface in each boring. Gravel thicknesses were measured to be approximately 4 inches thick. Topsoil, where encountered, was approximately 2 to 4 inches thick.

Fill Materials

Fill Materials were penetrated in each of the Site test borings (Appendix A). The Fill Materials generally consisted of 1 to 3 feet of brown/gray sand and gravel; or brown/gray clay with some sand and gravel. Asphalt fragments were observed in the Fill Materials at boring B102. Based on visual classification, the Fill Materials are designated as SW and CL under the Unified Soil Classification System (USCS). Standard penetration testing indicated that the Fill Materials were generally in a loose to medium dense relative density condition.

Glaciomarine Clay

A native, soft to stiff brown/gray silty clay deposit was encountered immediately below the Fill Materials. The thickness of this stratum ranged from approximately 10 feet (in B103) to 15 feet (in B104). Based on the visual classification, the native clay is a low-plasticity clay (CL) and non-plastic silt (ML). This clay formation is typically referred to as the Presumpscot Formation, and is encountered in the coastal areas of eastern New England that were formally submerged sea floor. Standard penetration testing indicates that the native glaciomarine clay is soft to stiff, which indicates that the clay is generally overconsolidated.

Glacial Till

Glacial till was encountered only in boring B104, at a depth of approximately 15 to 18 feet. The till consisted of brown, medium dense, clayey sand with trace amounts of gravel.

Drilling Refusal/Bedrock Surface

Drilling refusal, the depth at which the drilling equipment was not able to penetrate the deeper geologic units, was encountered in each of the soil borings. The depths of refusal were approximately 5 to 18 feet below existing grades. It could not be determined whether the drilling refusals were the result of

encountering competent bedrock, large boulders, or very dense soils at all locations. However, it is our opinion that the deeper drilling refusals (depths ranging from 11 to 18 feet below existing grade, elevations of 85 to 92 feet above MSL) were on the top of the competent bedrock surface, and the shallow refusals observed at borings B102 and B106 (depths of 7.5 to 5 feet below existing grades, respectively) were likely on boulders.

4.2 Groundwater

Groundwater was encountered in the Site test borings at depths ranging from approximately 10 to 14.5 feet bgs, corresponding to elevations ranging from approximately 87 to 93 feet above MSL. Note that groundwater levels at the Site will fluctuate due to season, temperature, precipitation, nearby underground utilities, and construction activity. Therefore, water levels at other times may differ from the observations and measurements made during drilling.

5.0 ENGINEERING EVALUATIONS

Geotechnical engineering evaluations for this project are based on the subsurface conditions interpreted from and between widely spaced subsurface explorations and the design information currently available. Should differing information become known prior to or during construction, the following evaluations and recommendations should be reviewed by Ransom.

The proposed daycare facility building footprint is generally underlain by a layer of Fill Materials, overlying glaciomarine clay, and bedrock. The controlling geotechnical features on the development of the Site are:

1. Fill Materials. Fill Materials were observed in Site borings within the proposed building area to depths of 1 to 3 feet below existing Site grades. Deeper pockets of Fill Materials to depths of approximately 7 feet are possible. Fill Materials were generally observed to range in density from loose to medium dense. It is unlikely that the Fill Materials were placed and compacted under controlled conditions. These soils are considered to be unsuitable for providing support to the foundation elements.

2. Foundation Bearing Soils. The naturally occurring overconsolidated glaciomarine clay soils are considered the uppermost suitable bearing stratum at this Site. The proposed building could be supported on a conventional, shallow foundation system of spread and continuous footings bearing on a minimum 12-inch thick layer of compacted structural fill or crushed stone placed above undisturbed, inorganic, native glaciomarine clay soils.

6.0 DESIGN RECOMMENDATIONS

Based on the subsurface explorations and our geotechnical evaluations, Ransom presents the following recommendations for the design of the proposed Academy for Active Learners daycare facility on Warren Avenue in Portland, Maine.

6.1 Building Foundations

The Site subsurface conditions generally include up to approximately 1 to 3 feet of Fill Materials overlying glaciomarine clay, and bedrock. Deeper pockets of Fill Materials to depths of approximately 7 feet are possible. The Fill Materials are considered to be unsuitable for supporting the proposed building, and Fill Materials that are encountered at foundation levels should be removed from below foundation elements and replaced with compacted structural fill.

With proper preparation, the proposed building could be supported on continuous and spread footings, bearing on a minimum 12-inch thick layer of compacted structural fill or crushed stone placed above undisturbed, inorganic, native glaciomarine clay soils.

Foundation elements should be proportioned using a maximum allowable contact pressure of 3,000 pounds per square foot (psf). Spread footings should be at least 2 feet wide, and continuous footings should be at least 2 feet wide. Post-construction total and differential settlements are anticipated to be no more than 1 inch and 0.5 inch, respectively.

Lateral loads may be resisted by friction between the bottoms of footings and supporting subgrades, and by passive earth pressure against the sides of the foundation. A friction coefficient of 0.35 and an equivalent fluid unit weight of 150 pounds per cubic foot (pcf) against the sides of footings should be used.

Exterior footings should be placed a minimum of 4.5 feet below the lowest adjacent ground surface exposed to freezing conditions. At heated interior locations, footings may be designed to bear 2 feet below the top of ground floor slab. If exposure to freezing is anticipated during or after construction, interior footings should be lowered to bear 5 feet below the top of ground floor slab.

6.2 Floor Slabs

Subsurface conditions are suitable for a slab-on-grade ground floor. The uppermost 12 inches of material beneath all slabs-on-grade should consist of compacted structural fill that conforms to the gradation specification in this report. A modulus of subgrade reaction of 200 pounds per cubic inch (pci) should be used to proportion the slab-on-grade constructed on properly compacted structural fill.

We anticipate that the existing Fill Materials encountered beneath the proposed floor slab could be suitable to remain in-place with the on-site observation and approval of the project geotechnical engineer.

Exterior slabs at entrances should be underlain by at least 5 feet of free-draining material, such as structural fill or crushed stone, to reduce the potential for frost heaving. Surrounding Site grades should slope away from the building in order to reduce available moisture for frost and ice formation.

6.3 Seismic Considerations

For the purposes of seismic design, the soil profile constitutes a stiff soil profile and we classify the Site as Site Class D. It is our opinion that the Site soils are not susceptible to liquefaction.

6.4 Groundwater and Drainage Issues

Groundwater was encountered in the Site test borings at depths ranging from approximately 10 to 14.5 feet bgs, which correspond to elevations ranging from 87 to 93 feet above MSL. For reference, the proposed finished floor elevation of the Site building is approximately 103 feet above MSL.

Based on the measurements to the groundwater, the poor drainage characteristics of the Site soils, and the likely foundation elevations, it is our opinion that subslab drainage and/or vapor barrier systems are not necessary at this Site. We do recommend that a perimeter foundation drainage system be installed around the building.

Perimeter Foundation Drain

The perimeter drainage system should consist of 4-inch diameter, rigid polyvinyl chloride (PVC) SDR35 pipe with perforations of ¼ to ½ inch (openings should be oriented downward). The drain lines should be surrounded by a minimum of 6 inches of ¾-inch crushed stone wrapped in a nonwoven geotextile filter fabric (Mirafi 140N or approved equivalent). The foundation drains should be placed adjacent to the exterior sides of the spread footings at a minimum depth of 5 feet below adjacent exterior grades to protect against frost.

Where possible, the foundation drains should be pitched down at a minimum slope of 0.5 percent in the direction of flow. Cleanouts should be provided at every other 90 degree bend in order to provide for maintenance flushing of the system as needed.

The foundation drains should be gravity drained to daylight or to a suitable system outlet. The final outlet of the drainage systems should be designed by the project civil engineer in consideration of all applicable municipal, state, and federal regulations.

Roof downspout drains should not be connected to the foundation drain system. Roof downspouts should be separately tightlined to their discharge outlets.

6.5 Bedrock

Drilling refusal was encountered within all the Site borings at depths between approximately 5 feet to 18 feet. It is our opinion that the deeper drilling refusals (depths ranging from 11 to 18 feet below existing grade, elevations of 85 to 92 feet above MSL) were on the top of the competent bedrock surface, and the shallow refusals observed at borings B102 and B106 (depths of 7.5 to 5 feet below existing grades, respectively) were likely on boulders. Due to the depth at which suspected bedrock was encountered, we do not consider bedrock removal to be a construction consideration for this project.

7.0 EARTHWORK AND CONSTRUCTION RECOMMENDATIONS

Based on the subsurface explorations and our geotechnical evaluations, Ransom presents the following recommendations for the construction of the proposed Academy for Active Learners daycare facility on Warren Avenue in Portland, Maine.

7.1 Subgrade Preparation

All topsoil, pavements, debris, frozen soils, and loose or disturbed soils should be removed from the building footprint Existing foundations, slabs, and/or utilities (including old septic systems) associated with former Site buildings and any past uses should be removed from below the building footprint and from foundation bearing zones (to the lateral limits defined by a one horizontal to one vertical (1H:1V) line sloped down and away from the bottom edge of foundations to the top of undisturbed native soils) and replaced with compacted structural fill.

Based on the test borings, we anticipate removal of Fill Materials from foundation bearing zones should be approximately 3 feet or less within the proposed building footprint. Deeper pockets of Fill Materials to depths of approximately 7 feet are possible. The existing Fill Materials could be suitable to remain in place below floor slabs, provided it is observed by the project geotechnical engineer to be free of deleterious and/or organic materials and relatively dry and stable at the time of construction. Further undercutting of Fill Materials encountered below proposed floor slabs might be required based on field evaluations.

After Site stripping has been completed, the exposed soil subgrades beneath the proposed building footprint and 10 feet beyond, parking lots, loading areas, and driveways should be compacted with at least four complete passes of a 15-ton vibratory drum roller in perpendicular directions. Subgrades that are saturated or pump and weave during rolling should be rolled statically.

Unstable subgrade areas should be characterized by weaving or rutting of more than one inch during proofrolling. Any unstable areas identified should be undercut at least 12 inches, or to competent soil, and replaced with compacted structural fill or crushed stone. The depth of undercutting and type of backfill material should be selected with consideration of proposed use (i.e., building or pavement) and soil and weather conditions encountered during construction. Where subgrades become saturated, unstable, and/or difficult to compact, crushed stone should be placed and compacted in lieu of structural fill. Crushed stone, when used, should be wrapped in a geotextile filter fabric, such as Mirafi 140N or equal. At no time should structural fill or common fill be placed over crushed stone that has not been wrapped in a geotextile filter fabric.

The contractor is responsible for construction means and methods and should anticipate the need for methods to prevent disturbance, softening, or rutting of subgrades, or damage to soils resulting from construction traffic. Care must be taken to avoid disturbing subgrades by keeping construction traffic off of subgrades during wet conditions and/or inclement weather until a firm fill layer has been placed. Subgrade soils that become unstable should be undercut and replaced with structural fill, crushed stone or common fill, as necessary.

Excavations for foundation, floor slab, pavement and utility trench subgrades should be made with equipment fitted with smooth-edged buckets to limit disturbance to the native subgrades.

Suitable foundation subgrades should consist of compacted structural fill placed above undisturbed native soils. Existing Fill Materials could be left in-place, undisturbed, below building slab areas with the approval of the project geotechnical engineer, but should be removed from below the building foundation elements.

Final foundation and floor slab subgrade preparation should include re-compaction of bearing surfaces. Care should be taken to limit disturbance to bearing surfaces prior to placement of concrete. Any loose, softened, or disturbed material should be removed and replaced with compacted structural fill or crushed stone prior to placement of concrete. Excavated subgrades should not be left exposed overnight unless the forecast calls for above-freezing, clear conditions.

7.2 Earthwork in Wet Environments

Foundation subgrade soils contain silt and clay. Care must be taken to avoid disturbing subgrades by keeping construction traffic off of the silty clay subgrades during wet conditions and/or inclement weather until a firm fill layer has been placed. To reduce disturbance of exposed subgrade soils, it will be important to divert runoff, provide positive grading to shed seepage and runoff, and to compact exposed subgrades to reduce rutting, ponding, and surface water infiltration.

The native silty clay soils may be sensitive to moisture and difficult to place and compact during wet weather and freezing conditions. Moisture-density relationships (Proctor tests) should be determined at the start of construction to determine the appropriate range of working moisture contents.

7.3 Temporary Excavations

Construction Site safety, means and methods, and sequencing of construction activities is the sole responsibility of the Contractor. Under no circumstances should the following information be interpreted to mean that Ransom is assuming responsibility for construction Site safety, trench protection, or the Contractor's responsibilities. Such responsibility is not being implied and should not be inferred.

All temporary excavations should be performed according to Occupational Safety and Health Administration (OSHA) Standards (29 CFR 1926 Subpart P). It is our opinion that the on-site soils are OSHA Type C soils. Temporary unbraced excavations completely within the Fill Materials and native soils should be cut no steeper than 1½H:1V under dry or dewatered conditions.

7.4 Dewatering and Surface Runoff Control

Groundwater was encountered in the test borings at depths ranging from approximately 10 to 14.5 feet below existing grades. We do not anticipate that groundwater will be encountered in foundation and utility excavations.

Surface water runoff should be directed away from excavations to reduce dewatering efforts and to protect subgrades from becoming soft and unstable. The contractor should anticipate the need for controlling runoff during wet periods; pumping from open sumps will likely provide adequate control of water within excavations during construction.

Earthwork should be completed "in the dry." Subgrade soils that become unstable should be undercut and replaced with structural fill or crushed stone, as necessary. Excavation side slopes should be monitored for potential seepage and maintained to promote stability, accordingly.

Temporary detention ponds, trenches, ditches, and dewatering sumps should not be made in areas to be filled.

7.5 Placement of Granular Engineered Fills

Engineered fills may be required to achieve the final design grades in areas of the proposed Site development. The table below is the gradation specifications for soils used in fills at the Site. Reference is made to materials, described by the Maine Department of Transportation (MDOT) Standard Specifications, as possible alternatives. The different fill types should be used as follows:

1. Structural Fill should be used for engineered fills below building footprint areas and in foundation bearing zones.

2. Common Fill should be used for engineered fills below roadway, parking, and other non-structural areas.

3. Aggregate Base for Pavements should be used as the base course layer below the asphalt pavements.

All granular fills should be placed in 12-inch maximum loose lifts and should be compacted to a minimum of 95 percent of the material's maximum dry density, as determined by ASTM D 1557 (modified proctor test) and confirmed with field density testing (ASTM D 2922 or equivalent method). Lift thickness should be a maximum of 6-inch loose lifts when compacted with hand-guided equipment.

Material	Sieve Size	% Passing
Structural Fill MDOT Standard Specification 703.06, Type C	3" (75 mm)	100
	1/4" (6.3 mm)	25 – 70
	No. 40 (425 µm)	0 - 30
	No. 200 (75 µm)	0 - 5
Common Fill	8"	100
	No. 200 (75 µm)	0 - 15 when placed within 3 feet of finished grade in paved areas
Aggregate Base for Pavements MDOT 703.06, Type A	2" (50 mm)	100
	1/2" (12.5 mm)	45 - 70
	1/4" (6.3 mm)	30 - 55
	No. 40 (425 µm)	0 - 20
	No. 200 (75 µm)	0 - 5

Where subgrades become saturated, unstable, and/or difficult to compact, crushed stone should be placed and compacted in lieu of structural fill. Crushed stone, when used, should be wrapped in a geotextile filter fabric, such as Mirafi 140N or equal. At no time should structural fill or common fill be placed over crushed stone that has not been wrapped in a geotextile filter fabric.

7.6 Reuse of Site Soils

A preliminary assessment of the suitability of using the unconsolidated soils at the Site in the proposed construction is based on the soil classifications and observations at the Site. The suitability of these materials is summarized below.

1. Topsoils are suitable only for reuse in landscaped areas.

2. The clay soils that will be excavated are not suitable for reuse as common fill at the Site.

3. The existing Fill Materials that will be excavated might be suitable for reuse only as common fill below non-structural areas and landscaped areas.

Materials to be used as structural fill and the pavement base courses will need to be imported to the Site. Representative samples of all proposed fills should be submitted for testing during construction to compare their gradation characteristics to the requirements of the project specifications, and to establish their optimum water contents and maximum dry densities (modified proctor testing, ASTM D 1557). The geotechnical engineer must approve use and reuse of on-site or borrow soils for structural and common fills. Use of fills assumes that the moisture content of the material will be strictly controlled in order to allow for proper placement and compaction.

7.7 Underground Utilities

Bedding placed below utilities should be in accordance with the utility and manufacturer requirements. In general, utilities may be supported directly on a minimum 6-inch-thick layer of compacted structural fill, crushed stone, or other suitable pipe bedding materials. Fill placed as backfill for utilities below building floor slabs should consist of compacted structural fill or crushed stone. Elsewhere, fill placed as backfill for utilities should consist of compacted common fill.

7.8 Construction Quality Control

Ransom should be provided the opportunity to review the final design and specifications to ensure our recommendations have been properly interpreted and applied. It is recommended that all fill, backfill and compaction be inspected and tested by a qualified firm to make sure the proper materials are placed and adequately compacted. Ransom should review all soil inspection and testing reports. Ransom should be retained to provide construction observation for the following aspects of Site development:

1. Observe subsurface conditions as they are exposed and to confirm that the exposed conditions are similar to those anticipated within this report;

2. Evaluate the existing Fill Materials and determine their suitability to remain in-place below the proposed building slab; and

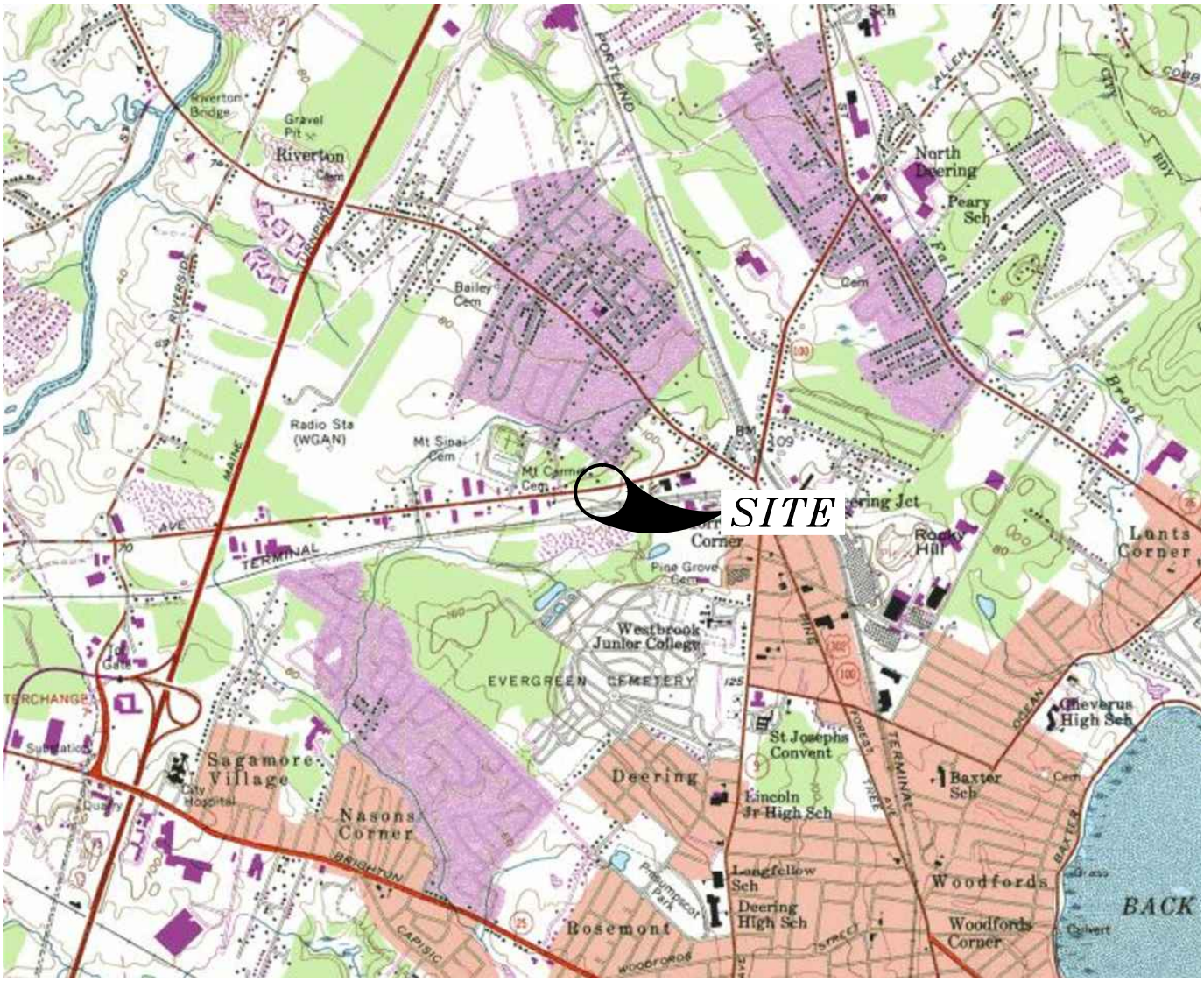
3. Determine the need for additional cut and backfill, or stabilization of subgrades.

8.0 CONCLUDING COMMENTS

This report has been prepared for specific application to the proposed development at 134 Warren Avenue in Portland, Maine as understood by Ransom at the time. In the event that changes in the design or location of the proposed structures are planned, the conclusions and recommendations contained in this report should not be considered valid unless they have been reviewed and modified or verified in writing by Ransom. Our recommendations are based in part upon data obtained from widely spaced test borings. The nature and extent of variations between explorations will not become evident until construction. If significant variations then appear, it may be necessary to reevaluate the recommendations of this report.

We recommend that Ransom be provided the opportunity to review the final design plans and project specifications in order to confirm that the recommendations made in this report were interpreted and implemented as intended.

The findings, recommendations, specifications, and professional opinions contained within this project geotechnical report have been prepared in accordance with generally accepted professional geotechnical engineering practice. No other warranties are implied or expressed.



TAKEN FROM U.S.G.S. 7.5x15 MINUTE SERIES TOPOGRAPHIC MAP OF PORTLAND WEST, MAINE–1956 (REVISED 1978).

CONTOUR INTERVAL IS 20 FEET

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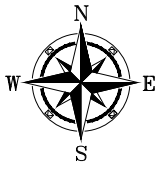
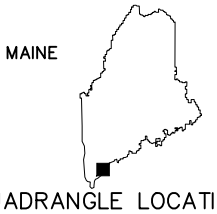
LONGITUDE 70°18'07"

UTM COORDINATES: 48: 38: 075mN
3: 95: 069mE





QUADRANGLE LOCATION

SCALE in FEET
1: 25,000

RANSOM Consulting, Inc.

SITE LOCATION MAP

PREPARED FOR:
DELTA REALTY
380 WARREN AVENUE
PORTLAND, MAINE

SITE:
ACADEMY FOR ACTIVE LEARNERS
134 WARREN AVENUE
PORTLAND, MAINE

DATE: DECEMBER 2015
PROJECT: 151.06127
FIGURE: 1

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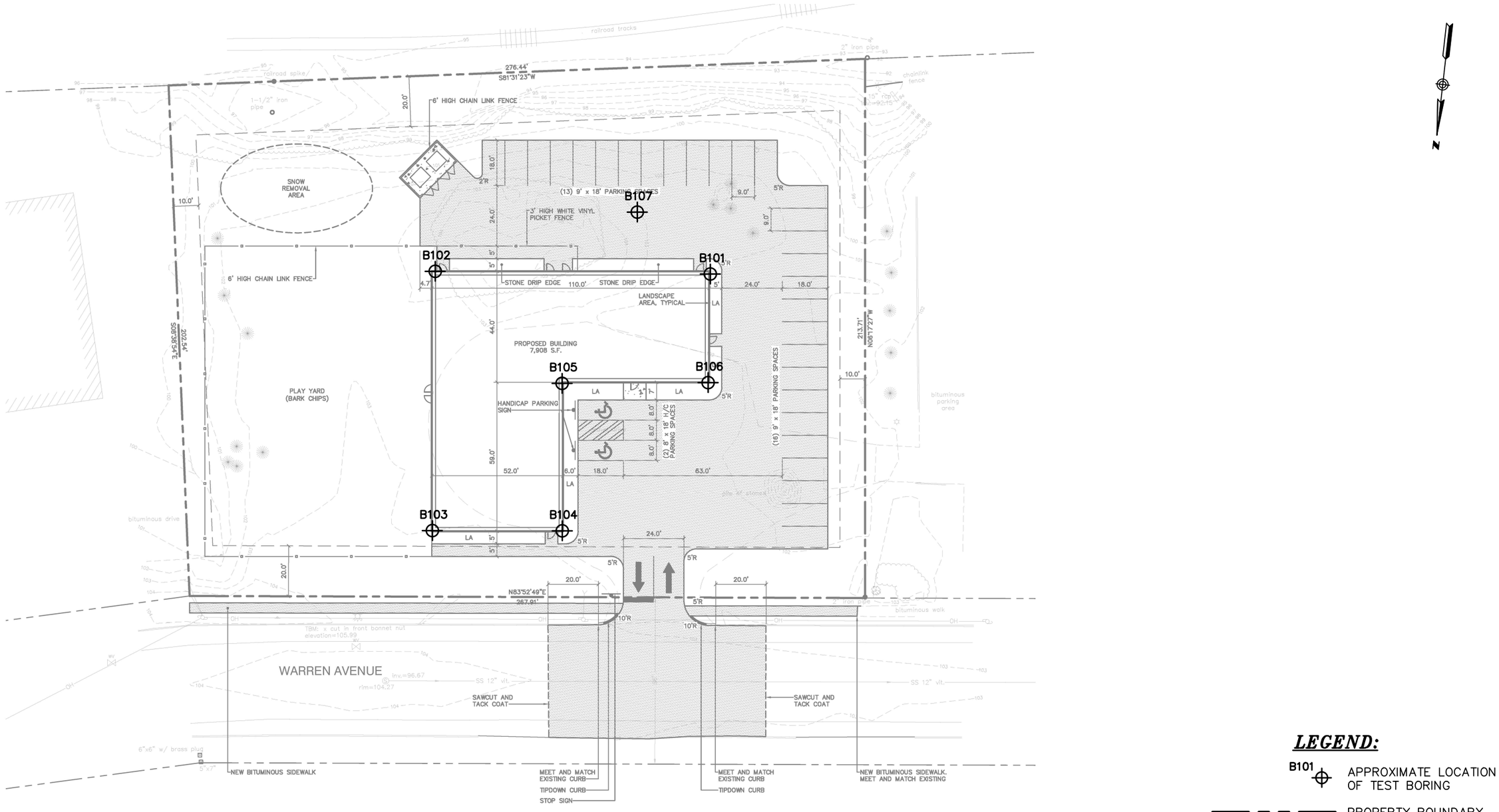

NOTES:

1. SITE PLAN BASED ON "C-100 SITE PLAN" PREPARED BY RANSOM CONSULTING, INC. AND OBSERVATIONS MADE BY RANSOM CONSULTING, INC. ON DECEMBER 12, 2015.
2. SOME FEATURES ARE APPROXIMATE IN LOCATION AND SCALE.
3. THIS PLAN HAS BEEN PREPARED FOR DELTA REALTY. ALL OTHER USES ARE NOT AUTHORIZED, UNLESS WRITTEN PERMISSION IS OBTAINED FROM RANSOM CONSULTING, INC.

LEGEND:

B101 ⊕ APPROXIMATE LOCATION OF TEST BORING

PROPERTY BOUNDARY

0 20 40 80

SCALE in FEET
1"=40'

RANSOM Consulting, Inc.

PREPARED FOR:
DELTA REALTY
380 WARREN AVENUE
PORTLAND, MAINE

SITE:
ACADEMY FOR ACTIVE LEARNERS
134 WARREN AVENUE
PORTLAND, MAINE

SUBSURFACE EXPLORATION PLAN

DATE: DECEMBER 2015
PROJECT: 151.06127
FIGURE: 2

O:\ME-DWGS\2015\151.06127\151.06127-GEO.dwg Dec 23, 2015 - 2:28pm

APPENDIX A

Test Boring Logs

Geotechnical Engineering Report
Proposed Building
Academy for Active Learners
134 Warren Avenue
Portland, Maine

RANSOM
Consulting
Engineers
and Scientists

B101

Reviewed by: JPS	Total Depth: 15.7 Feet	Logged By: EPP	
Date Reviewed: 1/5/16	Boring Diameter: 8 Inches	Date Drilled: 12/10/15 to 12/10/15	
Surface Elevation: 102 Feet	Well Stickup: NA	Driller: TDS	

DEPTH	DESCRIPTION Based on USCS and modified Burmister Soil Classification System	SOIL PROFILE	SAMPLE	SAMPLE NUMBER	BLOWS (per 6")	SPT-N Value	PENETRATION/ RECOVERY	OVM (ppm) / DEXSIL (ppm)	WELL CONSTRUCTION
1	S1 (0-2') 2" Brown, sandy LOAM, over 13" brown/gray, very loose SAND, some Gravel, some Fines.	Fill		S1	2-2-2-6	4	24/15		
2	S2 (2-4') No recovery.								
3				S2	7-5-2-2	7	24/0		
4	S3 (4-6') 4" Brown, very loose SAND, some Fines and Brick fragments (maybe sluff), over 13" brown/gray, soft Clay.								
5		Glaciomarine Clay		S3	2-1-1-1	2	24/17		
6									
7	Auger to 10'.								
8									
9									
10	S4 (10-12') Mottled gray/brown, stiff CLAY, trace fine sand.								
11				S4	1-5-6-9	11	24/24		
12									
13									
14									
15	S5 (15-15.7') Brown SAND, weathered BEDROCK and pulverized ROCK, wet at 14.5'.	Weathered Bedrock		S5	81-100/2"	100+	24/10		
16	Spoon refusal, end of exploration 15.7'.								
17									
18									
19									

WATER LEVELS:

During Drilling 14.5' End of Boring Date:

WELL LEGEND:

Filter Sand | Native Fill | Bentonite | Bentonite Grout | Concrete | PVC Screen | PVC Riser

NOTES:

1. Boring advanced using hollow-stem auger drilling techniques.
2. Soil samples collected with 2" diameter split-spoon sampler driven by 140 lb. hammer falling 30".
3. NA=Not applicable; NM=not measured; NE=not encountered.

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B102

Reviewed by:	JPJ	Total Depth:	7.5 Feet	Logged By:	EPP
Date Reviewed:	1/5/16	Boring Diameter:	8 Inches	Date Drilled:	12/10/15 to 12/10/15
Surface Elevation:	104 Feet	Well Stickup:	NA	Driller:	TDS

DEPTH	DESCRIPTION Based on USCS and modified Burmister Soil Classification System	SOIL PROFILE	SAMPLE	SAMPLE NUMBER	BLOWS (per 6")	SPT-N Value	PENETRATION/ RECOVERY	OVM (ppm) / DEXSIL (ppm)	WELL CONSTRUCTION
1	S1 (0-2') 4" Brown, sandy LOAM, over 5" brown CLAY, some Sand, Gravel and Asphalt fragments.	Fill		S1	1-1-1-4	2	24/9		
2									
3	S2 (2-4') Brown, very stiff CLAY, some Sand, little gravel.	Glaciomarine Clay		S2	4-7-8-6	15	24/20		
4	S3 (4-6') No recovery.								
5		Glaciomarine Clay/Rock		S3	1-2-3-1	5	24/0		
6	S4 (6-7.5') 8" Gray CLAY, little fine sand, moist to wet, over 1" ROCK fragments.			S4	4-3-100/5"	100+	17/9		
7									
8	Auger refusal, end of exploration 7.5'.								
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									

WATER LEVELS:

During Drilling: NE | End of Boring: | Date:

WELL LEGEND:

Filter Sand | Native Fill | Bentonite | Bentonite Grout | Concrete | PVC Screen | PVC Riser

NOTES:

1. Boring advanced using hollow-stem auger drilling techniques.
2. Soil samples collected with 2" diameter split-spoon sampler driven by 140 lb. hammer falling 30".
3. NA=Not applicable; NM=not measured; NE=not encountered.

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B103

Reviewed by:	JPS	Total Depth:	11 Feet	Logged By:	EPP
Date Reviewed:	1/5/16	Boring Diameter:	8 Inches	Date Drilled:	12/10/15 to 12/10/15
Surface Elevation:	103 Feet	Well Stickup:	NA	Driller:	TDS

DEPTH	DESCRIPTION Based on USCS and modified Burmister Soil Classification System	SOIL PROFILE	SAMPLE	SAMPLE NUMBER	BLOWS (per 6")	SPT-N Value	PENETRATION/ RECOVERY	OVM (ppm) / DEXSIL (ppm)	WELL CONSTRUCTION
1	S1 (0-2') 4" Brown, well graded SAND and GRAVEL, over 6" brown, very stiff CLAY, some Sand, little gravel.	Fill		S1	2-8-10-9	18	24/10		
2	S2 (2-4') Gray, medium stiff CLAY, trace fine sand.								
3				S2	6-6-2-3	8	24/12		
4	S3 (4-6') Gray, medium stiff CLAY.								
5		Glaciomarine Clay		S3	3-4-4-6	8	24/24		
6									
7	Auger to 10'.								
8									
9									
10	S4 (10-10.9') 7" Light brown CLAY, wet, over 12" light brown, poorly graded, fine SAND, little fine silt, wet.	Glaciomarine Clay		S4	10-100/5"	100+	19/17		
11	Auger refusal, end of exploration 10.9'.								
12									
13									
14									
15									
16									
17									
18									
19									

WATER LEVELS:

During Drilling 10' | End of Boring | Date:

WELL LEGEND:

Filter Sand | Native Fill | Bentonite | Bentonite Grout | Concrete | PVC Screen | PVC Riser

NOTES:

1. Boring advanced using hollow-stem auger drilling techniques.
2. Soil samples collected with 2" diameter split-spoon sampler driven by 140 lb. hammer falling 30".
3. NA=Not applicable; NM=not measured; NE=not encountered.

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B104

Reviewed by:		Total Depth: 18 Feet	Logged By: EPP
Date Reviewed: 01/08/2016		Boring Diameter: 8 Inches	Date Drilled: 12/10/15 to 12/10/15
Surface Elevation: 103 Feet		Well Stickup: NA	Driller: TDS

DEPTH	DESCRIPTION Based on USCS and modified Burmister Soil Classification System	SOIL PROFILE	SAMPLE	SAMPLE NUMBER	BLOWS (per 6")	SPT-N Value	PENETRATION/ RECOVERY	OVM (ppm) / DEXSIL (ppm)	WELL CONSTRUCTION
1	S1 (0-2') 4" Brown, well graded SAND and GRAVEL, over 11" dark gray, very stiff CLAY, little sand and gravel.	Fill		S1	4-9-10-10	19	24/15		
2	S2 (2-4') Dark gray, stiff CLAY, trace sand and gravel.			S2	4-6-8-5	14	24/22		
3									
4	S3 (4-6') Gray, medium dense, fine SAND and CLAY.								
5		Glaciomarine Clay		S3	11-10-9-7	19	24/13		
6									
7	Auger to 10'.								
8									
9									
10	S4 (10-12') Brown/gray, stiff CLAY, trace fine SAND, moist to wet.								
11		Glaciomarine Clay		S4	4-5-10-7	15	24/24		
12									
13									
14									
15	S5 (15-17') Light brown, medium dense, fine SAND, some Clay, trace gravel, wet.								
16		Glacial Till		S5	13-11-16-20	27	24/16		
17									
18	Auger refusal, end of exploration 18'.								
19									

WATER LEVELS:

During Drilling 13' | End of Boring | Date:

WELL LEGEND:

Filter Sand | Native Fill | Bentonite | Bentonite Grout | Concrete | PVC Screen | PVC Riser

NOTES:

1. Boring advanced using hollow-stem auger drilling techniques.
2. Soil samples collected with 2" diameter split-spoon sampler driven by 140 lb. hammer falling 30".
3. NA=Not applicable; NM=not measured; NE=not encountered.

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B105

Reviewed by:	JPS	Total Depth:	12 Feet	Logged By:	EPP
Date Reviewed:	1/5/16	Boring Diameter:	8 Inches	Date Drilled:	12/10/15 to 12/10/15
Surface Elevation:	103 Feet	Well Stickup:	NA	Driller:	TDS

DEPTH	DESCRIPTION Based on USCS and modified Burmister Soil Classification System	SOIL PROFILE	SAMPLE	SAMPLE NUMBER	BLOWS (per 6")	SPT-N Value	PENETRATION/ RECOVERY	OVM (ppm) / DEXSIL (ppm)	WELL CONSTRUCTION
1	S1 (0-2') 4" SAND and GRAVEL, over 5" brown, stiff CLAY, some Sand and Gravel, over 6" dark gray CLAY, little sand.	Fill		S1	5-3-8-10	11	24/15		
2	S2 (2-4') Dark gray, CLAY, some Sand, little gravel.								
3				S2	3-9-16-7	25	24/16		
4	S3 (4-6') Dark gray CLAY, some Sand and Gravel.								
5		Glaciomarine Clay		S3	5-4-3-2	7	24/3		
6									
7	Auger to 10'.								
8									
9									
10	S4 (10-11.7') Light brown, hard CLAY, some fine Sand, moist to wet. Pulverized rock in shoe.								
11		Glaciomarine Clay		S4	4-16-15-50/3"	31	21/20		
12	Auger refusal, end of exploration 12'.								
13									
14									
15									
16									
17									
18									
19									

WATER LEVELS:

During Drilling 12' | End of Boring | Date:

WELL LEGEND:

Filter Sand | Native Fill | Bentonite | Bentonite Grout | Concrete | PVC Screen | PVC Riser

NOTES:

1. Boring advanced using hollow-stem auger drilling techniques.
2. Soil samples collected with 2" diameter split-spoon sampler driven by 140 lb. hammer falling 30".
3. NA=Not applicable; NM=not measured; NE=not encountered.

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B106

Reviewed by:	JPJ	Total Depth:	5 Feet	Logged By:	EPP
Date Reviewed:	1/5/16	Boring Diameter:	8 Inches	Date Drilled:	12/10/15 to 12/10/15
Surface Elevation:	102 Feet	Well Stickup:	NA	Driller:	TDS

DEPTH	DESCRIPTION Based on USCS and modified Burmister Soil Classification System	SOIL PROFILE	SAMPLE	SAMPLE NUMBER	BLOWS (per 6")	SPT-N Value	PENETRATION/ RECOVERY	OVM (ppm) / DEXSIL (ppm)	WELL CONSTRUCTION
1	S1 (0-2') 4" SAND and GRAVEL, over 11" brown/gray, stiff CLAY, some Sand, little gravel.	Fill		S1	18-7-6-5	13	24/15		
2									
3	S2 (2-3.5') Gray, very stiff CLAY, some Sand, little gravel.	Glaciomarine Clay		S2	6-17-10	27	18/7		
4	Spoon refusal at 4', auger to 5'.								
5	Auger refusal, end of exploration 5'.								
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									

WATER LEVELS:

During Drilling: NE | End of Boring: | Date:

WELL LEGEND:

Filter Sand | Native Fill | Bentonite | Bentonite Grout | Concrete | PVC Screen | PVC Riser

NOTES:

1. Boring advanced using hollow-stem auger drilling techniques.
2. Soil samples collected with 2" diameter split-spoon sampler driven by 140 lb. hammer falling 30".
3. NA=Not applicable; NM=not measured; NE=not encountered.

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B107

Reviewed by:	JPS	Total Depth:	13.1 Feet	Logged By:	EPP
Date Reviewed:	1/5/16	Boring Diameter:	8 Inches	Date Drilled:	12/10/15 to 12/10/15
Surface Elevation:	103 Feet	Well Stickup:	NA	Driller:	TDS

DEPTH	DESCRIPTION Based on USCS and modified Burmister Soil Classification System	SOIL PROFILE	SAMPLE	SAMPLE NUMBER	BLOWS (per 6")	SPT-N Value	PENETRATION/ RECOVERY	OVM (ppm) / DEXSIL (ppm)	WELL CONSTRUCTION
1	S1 (0-2') Dark brown, medium dense SAND, some Clay. Cobbles at the surface.	Fill		S1	6-15-5-5	20	24/7		
2	S2 (2-4') Dark brown, medium dense SAND, some Clay, trace gravel.			S2	5-8-7-10	15	24/5		
3									
4									
5	Auger to 7'.								
6									
7	S3 (7-9') Gray, soft CLAY, little sand and gravel.								
8		Glaciomarine Clay		S3	1-1-1-2	2	24/15		
9	Auger to 10'.								
10	S4 (10-12') Gray, stiff CLAY, little fine sand.								
11				S4	1-4-10-10	14	24/24		
12									
13	Auger to 15'.								
14									
15	S5 (15-17') No recovery.								
16				S5	6-8-8-10	16	24/0		
17									
18	Auger refusal, end of exploration 18'.								
19									

WATER LEVELS:

During Drilling 13' | End of Boring | Date:

WELL LEGEND:

Filter Sand | Native Fill | Bentonite | Bentonite Grout | Concrete | PVC Screen | PVC Riser

NOTES:

1. Boring advanced using hollow-stem auger drilling techniques.
2. Soil samples collected with 2" diameter split-spoon sampler driven by 140 lb. hammer falling 30".
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