SUBSURFACE EXPLORATION, GEOLOGIC HAZARD, AND PRELIMINARY GEOTECHNICAL ENGINEERING REPORT

SLOCUM PROPERTY

Woodinville, Washington

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I. PROJECT AND SITE CONDITIONS

1.0 INTRODUCTION

This report presents the results of Associated Earth Sciences, Inc.'s (AESI's) subsurface exploration, geologic hazard, and preliminary geotechnical engineering study for the Slocum Property in Woodinville, Washington. The location of the site is shown on Figure 1. A site plan of the property showing topographic contours and the approximate locations of the explorations conducted for this study is included as Figure 2. If any changes in the nature, design, or locations of the site development improvements are planned, the conclusions and recommendations in this report should be reviewed and modified, or verified.

The recommendations in this report are preliminary because construction details were not finalized at the time of this report. Once development plans are substantially complete, the conclusions and recommendations in this report should be reviewed and modified, or verified, as appropriate.

1.1 Purpose and Scope

The purpose of this study was to provide subsurface data and geotechnical design recommendations for the design and development of the subject project. This study included a review of available geologic literature, excavation of exploration pits, and performing geologic studies to assess the type, thickness, distribution, and physical properties of the subsurface sediments and shallow ground water conditions. Geologic studies were completed to identify geologic hazards associated with the site. Where warranted, geologic hazard mitigations are recommended. Geotechnical engineering studies were also conducted to recommend the type of suitable foundation, allowable foundation soil bearing pressure, anticipated foundation settlements, basement/retaining wall lateral pressures, floor support recommendations, drainage considerations, and erosion mitigation recommendations. This report summarizes our current fieldwork and offers development recommendations based on our present understanding of the project.

1.2 Authorization

Authorization to proceed with this study was granted by Quadrant Corporation through our contract agreement dated April 19, 2011, and Change Orders 1 and 2, dated May 12, 2011 and August 25, 2011, respectively. This report has been prepared for the exclusive use of Quadrant Corporation, and their agents, for specific application to this project. Within the limitations of scope, schedule, and budget, our services have been performed in accordance

with generally accepted geotechnical engineering and engineering geology practices in effect in this area at the time our report was prepared. No other warranty, express or implied, is made.

2.0 PROJECT AND SITE DESCRIPTION

2.1 Site Description

The subject site consists of a rectangular-shaped parcel of approximately 4.5 acres located at the southwest corner of the intersection of NE 195th Street and 136th Avenue NE in Woodinville, Washington. The property is currently vacant and vegetated by mixed coniferous/ deciduous forest with moderately thick to thick underbrush. The site is bounded to the south and west by developed residential properties.

The topography of the site generally slopes gently down toward the east-southeast at gradients of less than 10 percent. A shallow depression, possibly a glacial kettle, is located in the central portion of the site. This depression is approximately 8 to 10 feet deep. The topography steepens to an inclination of approximately 50 to 75 percent along its north, east, and south property margins, sloping down toward NE 195th Street, 136th Avenue NE, and developed residential properties, respectively. The steepened inclinations along the north and east site margins are interpreted to be cut slopes associated with construction of the adjacent roads. The steepened inclination along the south property margin is interpreted to be a cut slope resulting from mining activities associated with a borrow pit reported to have formerly been located on the developed residential parcels to the south. A small lake occupies the lower-lying portion of the former borrow pit approximately 125 feet south of the site. The cut slopes along the north, east, and west site margins range from approximately 8 to 25 feet in height.

2.2 Project Description

It is our understanding that project plans include subdividing the site into 23 residential lots. Access into the development would be provided by a new road entering the property off of 136th Avenue NE on the east side of the site. Retaining walls will be constructed along the steep slopes located along the north and south margins of the site. Retaining walls will also be used to grade out the pond area located at the northeast corner of the site.

Current development plans also propose on-site infiltration of storm water on individual lots. Each home will have a trench system that allows storm water to infiltrate from the impervious surfaces on the lots such as roof and driveway.

3.0 SUBSURFACE EXPLORATION

Our field study included excavating a series of exploration pits, infiltration test pits, and one infiltration test pit drain, and installation of one shallow well point to gain subsurface information about the site. The exploration pits were excavated using a track-mounted excavator operated under subcontract to our firm. The various types of sediments, as well as the depths where characteristics of the sediments changed, are indicated on the exploration logs presented in Appendix A. The depths indicated on the logs where conditions changed may represent gradational variations between sediment types. Our explorations were approximately located in the field by measuring from known site features visible on an aerial photograph of the site.

The conclusions and recommendations presented in this report are based, in part, on the conditions encountered in the explorations completed for this study. The number, locations, and depths of the explorations were completed within site and budgetary constraints. Because of the nature of exploratory work below ground, interpolation of subsurface conditions between the field explorations is necessary. Differing subsurface conditions may be present outside of the area of the field explorations due to the random nature of deposition and the alteration of topography by past grading and/or filling. The nature and extent of any variations between the field explorations may not become fully evident until construction. If variations are observed at that time, it may be necessary to re-evaluate specific recommendations in this report and make appropriate changes.

3.1 Exploration Pits and Infiltration Test Pits

A total of fourteen exploration pits, two infiltration test pits and one infiltration test pit drain were excavated for our study using a track-mounted excavator. EP-1 through EP-8 were completed on April 19, 2011; EP-9 and IT-1 were completed on August 26, 2011; and EP-10 through EP-14, IT-2, and PD-1 were completed on November 13 and 14, 2012. The November 2012 explorations were completed for infiltration feasibility studies. All infiltration test results will be included in the hydrogeologic report. The pits permitted direct, visual observation of subsurface conditions. Materials encountered in the exploration pits were studied and classified in the field by an engineering geologist or hydrogeologist from our firm. Selected samples were then transported to our laboratory for further visual classification and testing, as necessary.

3.2 Well Point

One hand-driven well point, identified as P-1, was installed to provide information on depth to ground water. The hand-driven well point was located on the eastern portion of the project, and advanced to a depth of 8.6 feet below ground surface.

The well point was constructed using 1.25-inch-diameter, steel casing and well screen, and completed aboveground with a threaded cap. The lower 2.5 feet of P-1 consisted of machine-perforated screen with a threaded end cap to allow the entry of water into the well point. Well point P-1 was developed using tubing and a check valve to move water through the screen and improve the hydraulic connection with the surrounding aquifer material. The well was purged for 10 minutes. The turbidity level was reduced but the discharge was still light brown in color.

4.0 SUBSURFACE CONDITIONS

Subsurface conditions at the project site were inferred from the explorations accomplished for this study, our visual reconnaissance of the site, and review of applicable geologic literature. As shown on the exploration logs included in Appendix A, natural sediments encountered at the site generally consisted of granular, glacial sediments of variable density with scattered lenses of fine-grained sediments. A pre-Vashon unit was interpreted to be present at depth in some of the explorations. The following section presents more detailed subsurface information organized from the youngest to the oldest sediment types.

4.1 Stratigraphy

Forest Duff

A surficial, organic forest duff layer was encountered at all exploration pit locations. The forest duff layer was approximately 0.5 to 1 foot thick and is not considered suitable for foundation support or for use as structural fill.

Glacial Outwash

The site soils on the regional geology map are mapped as Vashon recessional and advance outwash. Sediments encountered directly below the forest duff layer in all explorations consisted of sand with interbedded silt layers and variable gravel content. The apparent density of the sediments was variable, ranging from loose to dense. Where caving of the exploration pit sidewalls occurred or the material was easier to excavate, the sediments were interpreted to

be Vashon recessional outwash. Where little to no caving of the pit sidewalls occurred or where the material was somewhat more difficult to excavate, the sediments were interpreted to be Vashon advance outwash.

Because of their similar gradation and often subtle density differences, it is often difficult to distinguish between the recessional and advance outwash deposits. As described above, criteria used to distinguish between these sediment types for this study include digging action during excavation of the exploration pits and whether or not any caving of the pit sidewalls was observed. Our interpretation of the origin of the sediments encountered in our explorations should be considered tentative and could be more accurately assessed from boring logs with blow count data.

Vashon recessional and advance outwash are described in more detail below.

Vashon Recessional Outwash

Sediments encountered directly below the forest duff layer at the locations of exploration pits EP-3 through EP-5, EP-7, EP-8, EP-10 through EP-14, IT-1, IT-2, and PD-1 generally consisted of loose to medium dense, reddish tan, reddish brown, and brown sand with variable silt and gravel content.

We interpret these sediments to be representative of Vashon recessional outwash. The Vashon recessional outwash consists of sediments that were deposited by meltwater streams that emanated from the retreating glacial ice during the latter portion of the Vashon Stade of the Fraser Glaciation, approximately 12,500 to 15,000 years ago. The reduced density and reddish tan to reddish brown coloration observed within approximately 2 to 4 feet of the ground surface is interpreted to be due to weathering. The weathered soil horizon also typically contained abundant roots. At the locations encountered, the recessional outwash extended to depths ranging from approximately 2.5 to 10 feet, and was underlain by Vashon advance outwash.

Vashon Advance Outwash

Sediments encountered directly below the ground surface at the locations of exploration pits EP-1 and EP-2, EP-6, and EP-9, and beneath the recessional outwash in other explorations, generally consisted of medium dense to dense sand and stiff to very stiff silt with variable gravel content. The advance outwash was highly stratified and the sand/silt layers were interbedded. At the locations of EP-6, EP-11, and IT-2, the advance outwash extended to depths ranging from 16 to 18 feet, and was underlain by pre-Vashon sediments. At the

remainder of explorations where the advance outwash was encountered, it extended beyond the maximum depths explored of approximately 9 to 18.5 feet.

We interpret these sediments to be representative of the Vashon advance outwash. The Vashon advance outwash consists of sediments that were deposited by meltwater streams that emanated from the advancing glacial ice during the Vashon Stade of the Fraser Glaciation, approximately 12,500 to 15,000 years ago. The high relative density characteristic of the Vashon advance outwash is due to its consolidation by the glacial ice that overrode these sediments subsequent to their deposition.

Pre-Vashon Sediments

Sediments interpreted to be representative of pre-Vashon deposits were encountered at depth beneath the advance outwash deposits in exploration pits EP-6, EP-11, and IT-2, and continued beyond the maximum depth explored. These sediments were comprised of gray laminated silt or oxidized or somewhat cemented sand with few silt, trace gravel and trace boulders. The occurrence of the pre-Vashon deposits beneath the site is consistent with site conditions on the nearby Woodinville High School, located to the north of the subject site.

The pre-Vashon sediments were deposited prior to the advance of the Vashon glacier, and have been compacted by the weight of an ice sheet.

4.2 Geologic Mapping

Review of the regional geologic map titled *Composite Geologic Map of the Sno-King Area, Central Puget Lowland, Washington* prepared by Booth, Cox, Troost, and Shimel for the Seattle-Area Geologic Mapping Program, University of Washington (2004) indicates that the majority of the subject site is underlain by Vashon recessional outwash sediments with Vashon advance outwash exposed at the ground surface in the northwestern portion of the site. Our interpretation of the sediments encountered at the subject site is in general agreement with the regional geologic map.

4.3 Hydrology

Ground water seepage was not encountered in any of the exploration pits excavated for our study and no discoloration/mottling suggestive of seasonal saturation was observed. It should be recognized that the occurrence and level of ground water seepage may vary in response to such factors as changes in season, precipitation, and site use. Our exploration was conducted in mid-April when ground water levels in the unconfined aquifers in the Puget Lowland are typically at or near their seasonal high.

Water level in P-1 was measured by hand with an electronic tape on August 29 and September 28, 2011. The water depth below ground surface was 7.30 and 7.42 feet, respectively.

Further information regarding the hydrology and the potential for infiltration will be addressed in a separate hydrogeology report.

II. GEOLOGIC HAZARDS AND MITIGATIONS

The following discussion of potential geologic hazards is based on the geologic, topographic, and shallow ground water conditions as observed and discussed herein.

5.0 SEISMIC HAZARDS AND MITIGATION

Earthquakes occur in the Puget Lowland with great regularity. The vast majority of these events are small and are usually not felt by people. However, large earthquakes do occur, as evidenced by the 1949, 7.2-magnitude event; the 2001, 6.8-magnitude event; and the 1965, 6.5-magnitude event. The 1949 earthquake appears to have been the largest in this region during recorded history and was centered in the Olympia area. Evaluation of earthquake return rates indicates that an earthquake of the magnitude between 5.5 and 6.0 is likely within a given 20-year period.

Generally, there are four types of potential geologic hazards associated with large seismic events: 1) surficial ground rupture, 2) seismically induced landslides, 3) liquefaction, and 4) ground motion. The potential for each of these hazards to adversely impact the proposed project is discussed below.

5.1 Surficial Ground Rupture

The nearest known fault trace to the project site is the South Whidbey Island Fault Zone (SWIFZ), located approximately 1 to 2 miles to the southwest. Studies by the U.S. Geological Survey (USGS) (Sherrod et al., 2005, *Holocene Fault Scarps and Shallow Magnetic Anomalies Along the Southern Whidbey Island Fault Zone near Woodinville, Washington*, Open-File Report 2005-1136, March 2005) indicate that "strong" evidence of prehistoric earthquake activity has been observed along two fault strands thought to be part of the southeastward extension of the SWIFZ. The study suggests as many as nine earthquake events along the SWIFZ may have occurred within the last 16,400 years. The recognition of this fault splay is relatively new, and data pertaining to it are limited with the studies still ongoing. The recurrence interval of movement along this fault system is still unknown, although it is hypothesized to be in excess of one thousand years. Due to the suspected long recurrence interval, it is our opinion that the potential for damage to the proposed structures by surficial ground rupture along the SWIFZ is considered to be low during the life of the proposed structures.

5.2 Seismically Induced Landslides

Steep slopes on the subject site are limited to those located at the north, east, and south margins of the property. No evidence of historic landslide activity in these areas was observed during our site visit. In addition, grading plans for the project include construction of rockeries along the lower portions of these slopes, and regrading the upper portions of the slopes (above the rockeries) to inclinations of 50 percent or less. Provided that grading is conducted in accordance with the recommendations presented in this report, and given the lack of steep slopes in other areas of the site, it is our opinion that the risk of damage to the proposed structures by landsliding under either static or seismic conditions is low.

5.3 Liquefaction

The encountered stratigraphy has a low potential for liquefaction due to the density of the underlying strata and lack of adverse ground water conditions. No mitigation of liquefaction hazards is necessary.

5.4 Ground Motion

Structural design of the buildings should follow 2009 *International Building Code* (IBC) standards using Site Class "D" as defined in Table 1613.5.2. The 2009 IBC seismic design parameters for short period (S_S) and 1-second period (S_1) spectral acceleration values were determined from the latitude and longitude of the project site using the USGS National Seismic Hazard Mapping Project website (http://earthquake.usgs.gov/hazmaps/). These values are based on Site Class "B". Based on the more current 2002 data, the USGS website interpolated ground motions at the project site to be 1.163g and 0.398g for building periods of 0.2 and 1.0 seconds, respectively, with a 2 percent chance of exceedance in 50 years. These values correspond to site coefficients F_a = 1.035 and F_v = 1.603, and a peak horizontal acceleration of 0.32g.

6.0 LANDSLIDE HAZARDS AND MITIGATION

6.1 Landslide Hazard Areas 21.24.290(b)

Landslide hazard areas are areas potentially subject to landslides based on a combination of geologic, topographic, hydrogeologic, or man-made factors. Landslide hazard indicators are as follows:

i) Areas of historic failures, such as areas designated as quaternary slumps, earthflows, mudflows, lahars or landslides on maps published by the USGS, or DNR.

Review of the site in the field did not reveal any indications of distressed vegetation, hummocky ground, or pistol-butted trees that would indicate historic slope failure.

ii) Areas with all three of the following characteristics:

1. *Slopes steeper than 15 percent; and*

2. *Hillsides intersecting geologic contacts with a relatively permeable sediment overlying a relatively impermeable sediment or bedrock; and*

3. *Springs or ground water seepage.*

The slopes along the north property line are greater than 15 percent with a vertical relief of greater than 10 feet. However, it appears that the slopes were likely created for the development of NE 195th Street at the toe of the slope. The slopes appear stable at this time.

No geologic contacts or seeps were noted on the north property line.

iii) *Areas that have shown movement in the Holocene epoch or that are underlain or covered by mass wastage debris of that epoch.*

There are no indications of areas on the site that have moved in the recent past.

iv) Areas potentially unstable because of rapid stream incision, or erosion.

There are no indications of rapid stream incision due to the lack of streams, or moving water.

v) Areas located in a canyon or on an active alluvial fan.

These conditions do not exist on this site.

vi) Any area with a slope of 40 percent or steeper and with a vertical relief of ten or more feet except areas composed of consolidated rock.

The slopes along the north property line are greater than 40 percent with a vertical relief of greater than 10 feet. However, it appears that the slopes were likely created for the development of NE 195th Street at the toe of the slope. The slopes appear stable at this time.

The only criteria that the steep slopes along the north property meet for being a landslide hazard area is that the slopes are steeper than 40 percent and greater than 10 feet in height. It is our opinion that the slopes were created for the construction of the street to the north during legal grading activity.

Section 21.24.300 of the *Woodinville Municipal Code* indicates alterations of geologically hazardous areas or associated buffers may only occur for activities that:

a) *Will not increase the threat of the geological hazard to the adjacent properties beyond the pre-development conditions;*

b) *Will not adversely impact other critical areas; and are designed so that the hazard to the project is eliminated or mitigated to a level where there is no reasonable chance of harm to the project or its associated land use.*

The development proposal includes the construction of a retaining wall along the north property line of the site. The placement of the wall and the subsequent backfill will eliminate the steep slope. By placing the wall in this location, the project will not increase the threat of a geologic hazard to adjacent properties, nor will it impact other critical areas. It is our opinion that the placement of a retaining wall in the location of the steep slope will be beneficial to the project and reduce the potential future risk of debris in the right-of-way.

It is also our opinion that once the retaining wall is in place and the steep slope is eliminated, no buffers or setbacks are needed beyond what is needed for stability of the retaining wall.

7.0 EROSION HAZARDS AND MITIGATION

The erosion hazard of the site soils ranges from moderate to high, depending on the gradation of the soils and the slope. In our experience, maintaining cover measures atop disturbed ground provides the greatest reduction to the potential generation of turbid runoff and sediment transport. During the local wet season (October 1st through March 31st), exposed soil should not remain uncovered for more than 2 days unless it is actively being worked. Ground-cover measures can include erosion control matting, plastic sheeting, straw mulch, crushed rock or recycled concrete, or mature hydroseed.

7.1 Erosion Hazard Mitigation

To mitigate the erosion hazards and potential for off-site sediment transport, we would recommend the following:

1. The winter performance of a site is dependent on a well-conceived plan for control of site erosion and storm water runoff. It is easier to keep the soil on the ground than to remove it from storm water. The owner and the design team should include adequate ground-cover measures, access roads, and staging areas in the project bid for a workable site. The contractor must implement and maintain the required measures throughout the project duration. A site maintenance plan should be in place in the event storm water turbidity measurements are greater than the Washington State Department of Ecology (Ecology) standards.

2. All temporary erosion and sediment control (TESC) measures for a given area to be graded or otherwise worked should be installed prior to any activity within an area. The recommended sequence of construction within a given area would be to install sediment traps and/or ponds and establish perimeter flow control prior to starting mass grading.

3. During the wetter months of the year, or when large storm events are predicted during the summer months, each work area should be stabilized so that if showers occur, the work area can receive the rainfall without excessive erosion or sediment transport. The required measures for an area to be "buttoned-up" will depend on the time of year and the duration the area will be left un-worked. During the winter months, areas that are to be left un-worked for more than 2 days should be mulched or covered with plastic. During the summer months, stabilization will usually consist of seal-rolling the subgrade. Such measures will aid in the contractor's ability to get back into a work area after a storm event. The stabilization process also includes establishing temporary storm water conveyance channels through work areas to route runoff to the approved treatment facilities.

4. All disturbed areas should be revegetated as soon as possible. If it is outside of the growing season, the disturbed areas should be covered with mulch, as recommended in the erosion control plan. Straw mulch provides a cost-effective cover measure and can be made wind-resistant with the application of a tackifier after it is placed.

5. Surface runoff and discharge should be controlled during and following development. Uncontrolled discharge may promote erosion and sediment transport. Under no circumstances should concentrated discharges be allowed to flow over the top of steep slopes.

6. Soils that are to be reused around the site should be stored in such a manner as to reduce erosion from the stockpile. Protective measures may include, but are not limited to, covering with plastic sheeting, the use of low stockpiles in flat areas, or the use of straw bales/silt fences around pile perimeters. During the period between October 1st and March 31st, these measures are required.

7. On-site erosion control inspections and turbidity monitoring should be performed in accordance with Ecology requirements. Weekly site visits and monthly reporting to Ecology should be performed on a regularly scheduled basis. TESC monitoring should be part of the weekly construction team meetings. Temporary and permanent erosion control and drainage measures should be adjusted and maintained, as necessary, at the time of construction.

It is our opinion that with the proper implementation of the TESC plans and by field-adjusting appropriate mitigation elements (best management practices [BMPs]) during construction, as recommended by the erosion control inspector, the potential adverse impacts from erosion hazards on the project may be mitigated.

III. PRELIMINARY DESIGN RECOMMENDATIONS

8.0 INTRODUCTION

Our exploration indicates that, from a geotechnical standpoint, the parcel is suitable for the proposed development provided the recommendations contained herein are properly followed. Sediments suitable for foundation support were encountered at a relatively shallow depth and conventional spread footing foundations may be utilized. Specific recommendations regarding site development are presented in the following sections of this report.

9.0 SITE PREPARATION

9.1 Clearing and Stripping

Site preparation of the planned building and pavement areas should include removal of all trees, brush, debris, and any other deleterious materials. These unsuitable materials should be properly disposed. Additionally, any areas of organic forest duff/topsoil should be removed and the remaining roots grubbed. The thickness of the topsoil encountered in our exploration pits was generally about 12 inches. Areas where loose surficial soils exist due to grubbing operations should be considered as fill to the depth of disturbance and treated as subsequently recommended for structural fill placement.

After stripping and grubbing operations have been completed, we recommend that the soil exposed in the proposed roadway be recompacted to a firm and unyielding condition using a 20-ton (minimum) vibratory roller. The recompacted area should then be proof-rolled with a fully loaded tandem-axle dump truck. Any soft or yielding areas identified during proof-rolling should be overexcavated and backfilled with structural fill.

9.2 Temporary and Permanent Cut Slopes

In our opinion, stable construction slopes should be the responsibility of the contractor and should be determined during construction based on the local conditions encountered at that time. For planning purposes, we anticipate that temporary, unsupported cut slopes in the loose to medium dense outwash can be made at a maximum slope of 1.5H:1V (Horizontal:Vertical). Temporary cut slopes within the dense outwash can be planned up to a 1H:1V inclination. As is typical with earthwork operations, some sloughing and raveling may occur, and cut slopes may have to be adjusted in the field. Flatter, temporary cut slopes should be anticipated in

areas of ground water seepage. In addition, WISHA/OSHA regulations should be followed at all times.

Permanent cut slopes should not exceed an inclination of 2H:1V.

9.3 Site Disturbance

We recommend site work be performed in the dry season; otherwise, expect increased costs for dealing with wet, moisture-sensitive material and TESC measures. The fines content of the outwash varies considerably both laterally and with depth. Portions of the outwash containing a moderate to high fines content are highly moisture-sensitive and subject to disturbance when wet. The contractor must use care during site preparation and excavation operations so that the underlying soils are not softened. If disturbance occurs, the softened soils should be removed and the area brought to grade with structural fill.

If crushed rock is considered for the access and staging areas, it should be underlain by stabilization fabric (such as Mirafi 500X or approved equivalent) to reduce the potential of fine-grained materials pumping up through the rock and turning the area to mud. The fabric will also aid in supporting construction equipment, thus reducing the amount of crushed rock required. We recommend that at least 10 inches of rock be placed over the fabric; however, due to the variable nature of the near-surface soils and differences in wheel loads, this thickness may have to be adjusted by the contractor in the field.

10.0 STRUCTURAL FILL

Structural fill may be necessary to establish desired grades in some areas. All references to structural fill in this report refer to subgrade preparation, fill type, and placement and compaction of materials, as discussed in this section. If a percentage of compaction is specified under another section of this report, the value given in that section should be used.

10.1 Subgrade Compaction

After overexcavation/stripping has been performed to the satisfaction of the geotechnical engineer's representative, the upper 12 inches of exposed ground should be compacted to a firm and unyielding condition. If the subgrade contains too much moisture, suitable compaction may be difficult or impossible to obtain, and should probably not be attempted. In lieu of compaction of the subgrade surface, the area to receive fill should be blanketed with washed rock or quarry spalls to act as a capillary break between the new fill and the wet subgrade. Where the exposed ground remains soft and further overexcavation is impractical,

placement of an engineering stabilization fabric may be necessary to prevent contamination of the free-draining layer by silt migration from below.

After compaction of the exposed ground is tested and approved, or a free-draining rock course is laid, structural fill may be placed to attain desired grades.

10.2 Structural Fill Compaction

Structural fill is defined as non-organic soil, acceptable to the geotechnical engineer, placed in maximum 8-inch loose lifts, with each lift being compacted to at least 95 percent of the modified Proctor maximum dry density using *American Society for Testing and Materials* (ASTM):D 1557 as the standard. Roadway and utility trench backfill should be placed and compacted in accordance with applicable municipal codes and standards. The top of the compacted fill should extend horizontally a minimum distance of 3 feet beyond the perimeter footings or pavement edges before sloping down at an angle no steeper than 2H:1V. Fill slopes should either be overbuilt and trimmed back to final grade or surface-compacted to the specified density.

10.3 Moisture-Sensitive Fill

Soils in which the amount of fine-grained material (smaller than the No. 200 sieve) is greater than approximately 5 percent (measured on the minus No. 4 sieve size) should be considered moisture-sensitive. Use of moisture-sensitive soil in structural fills should be limited to favorable dry weather conditions and near-optimum subgrade and fill moisture. We recommend that grading activities be conducted in the drier summer months to reduce the potential for additional costs associated with over-optimum soils. It is likely that grading during wet periods of the year will be more expensive due to wet soils.

The on-site outwash sediments are suitable for use as structural fill. Portions of the outwash contain relatively minor quantities of fine-grained materials and are not considered to be overly moisture-sensitive; however, much of the outwash contains significant quantities of fines and is considered to be highly moisture-sensitive. Use of these sediments for structural fill should be limited to favorable, dry weather conditions. In addition, construction equipment traversing the site when these soils are wet can cause considerable disturbance. If fill is placed during wet weather or if proper compaction cannot be obtained, a select material consisting of a clean, free-draining gravel and/or sand should be used. Free-draining fill consists of non-organic soil with the amount of fine-grained material limited to 5 percent by weight when measured on the minus No. 4 sieve fraction. Some of the natural outwash soils at the site are considered free-draining. Mechanical sieve analyses were conducted on selected samples of the outwash

collected from our explorations. The results of the sieve analyses are included in Appendix B. Copies of the laboratory testing reports are also included in Appendix B.

10.4 Structural Fill Testing

The contractor should note that any proposed fill soils must be evaluated by AESI prior to their use in fills. This would require that we have a sample of the material at least 3 business days in advance to perform a Proctor test and determine its field compaction standard.

A representative from our firm should inspect the stripped subgrade and be present during placement of structural fill to observe the work and perform a representative number of in-place density tests. In this way, the adequacy of the earthwork may be evaluated as filling progresses and any problem areas may be corrected at that time. It is important to understand that taking random compaction tests on a part-time basis will not assure uniformity or acceptable performance of a fill. As such, we are available to aid the owner in developing a suitable monitoring and testing frequency.

11.0 FOUNDATIONS

11.1 Spread Footing Foundations

Conventional spread footing foundations may be utilized for support of the new structures when bearing on the unweathered, medium dense to dense natural outwash sediments, or on structural fill placed over these sediments. Sediments suitable for foundation support were generally encountered in our explorations at depths of approximately 2 to 2½ feet.

Allowable Soil Bearing Pressure

For footings founded either directly upon the medium dense to dense outwash sediments, as described above, or on structural fill placed over these materials, we recommend that an allowable bearing pressure of 2,000 pounds per square foot (psf) be used for design purposes, including both dead and live loads. An increase of one-third may be used for short-term wind or seismic loading. The surface of the outwash should be recompacted to a firm and unyielding condition prior to placement of either footings, or structural fill.

Footing Widths and Depths

Perimeter footings for the proposed buildings should be buried a minimum of 18 inches into the surrounding soil for frost protection. No minimum burial depth is required for interior

footings; however, all footings must penetrate to the prescribed strata, and no footings should be founded in or above loose, organic, or existing fill soils. Footings should be at least 14 inches wide for single-story structures, with 2 inches of width added for each additional story.

Footings Adjacent to Cuts

The area bounded by lines extending downward at 1H:1V from any footing must not intersect another footing or intersect a filled area that has not been compacted to at least 95 percent of ASTM:D 1557. In addition, a 1.5H:1V line extending down from any footing must not daylight because sloughing or raveling may eventually undermine the footing. Thus footings should not be placed near the edges of steps or cuts in the bearing soils.

Footing Settlement

Anticipated settlement of footings founded as described above should be on the order of 1 inch or less. However, disturbed soil not removed from footing excavations prior to footing placement could result in increased settlements.

Footing Subgrade Bearing Verification

All footing areas should be observed by AESI prior to placing concrete to verify that the exposed soils can support the design foundation bearing capacity and that construction conforms with the recommendations in this report. Foundation bearing verification may also be required by the governing municipality.

Foundation Drainage

Perimeter footing drains should be provided, as discussed under the "Drainage Considerations" section of this report.

12.0 LATERAL WALL PRESSURES

All backfill behind walls or around foundations should be placed following our recommendations for structural fill and as described in this section of the report. Horizontally backfilled walls, which are free to yield laterally at least 0.1 percent of their height, may be designed using an equivalent fluid equal to 35 pounds per cubic foot (pcf). Fully restrained, horizontally backfilled, rigid walls that cannot yield should be designed for an equivalent fluid of 50 pcf. Walls that retain sloping backfill at a maximum angle of 2H:1V should be designed

for 55 pcf for yielding conditions and 75 pcf for restrained conditions. If parking areas are located adjacent to walls, a surcharge equivalent to 2 feet of soil should be added to the wall height in determining lateral design forces.

12.1 Wall Backfill

The lateral pressures presented above are based on the conditions of a uniform backfill consisting of either the on-site glacial sediments, or imported sand and gravel compacted to 90 to 95 percent of ASTM:D 1557. A higher degree of compaction is not recommended, as this will increase the pressure acting on the walls. A lower compaction may result in unacceptable settlement behind the walls. Thus, the compaction level is critical and must be tested by our firm during placement. The recommended compaction of 90 to 95 percent of ASTM:D 1557 applies to any structural fill placed behind the wall within a distance equal to the wall height and up to the elevation of the top of the wall. Structural fill used to construct slopes behind retaining walls should be compacted to at least 95 percent of ASTM:D 1557 if the fill is placed above the elevation of the top of the wall. Surcharges from adjacent footings, heavy construction equipment, or sloping ground must be added to the above-recommended lateral pressures. Footing drains should be provided for all retaining walls, as discussed under the "Drainage Considerations" section of this report.

12.2 Wall Drainage

It is imperative that proper drainage be provided so that hydrostatic pressures do not develop against the walls. This would involve installation of a minimum 1-foot-wide blanket drain for the full wall height (excluding the uppermost 1 foot of backfill) using imported washed gravel against the walls. The wall drain material must be hydraulically connected to the footing drain pipe.

12.3 Passive Resistance and Friction Factor

Lateral loads can be resisted by friction between the foundation and the natural, medium dense to dense glacial sediments or supporting structural fill soils, or by passive earth pressure acting on the buried portions of the foundations. The foundations must be backfilled with compacted structural fill to achieve the passive resistance provided below. We recommend the following allowable design parameters:

- Passive equivalent fluid = 200 pcf
- Coefficient of friction = 0.30

Both of these values include a factor of safety of at least 1.5.

12.4 Walls With Footing Surcharges

We are not aware of any retaining walls that will be subject to loads from nearby footings. If any footings will be located within a 1H:1V line from the base of a retaining wall, AESI should be contacted to review the design and provide additional recommendations.

13.0 FLOOR SUPPORT

Slab-on-grade floors may be constructed either directly on the medium dense to dense natural outwash sediments, or on structural fill placed over these materials. Areas of the slab subgrade that are disturbed (loosened) during construction should be recompacted to an unyielding condition prior to placing the pea gravel, as described below.

If moisture intrusion through slab-on-grade floors is to be limited, the floors should be constructed atop a capillary break consisting of a minimum thickness of 4 inches of washed pea gravel or washed $^{5}/_{8}$-inch or larger crushed rock (no fines). The pea gravel/washed rock should be overlain by a 10-mil (minimum thickness) plastic vapor retarder. If a crushed or sharp aggregate is used, the aggregate should be rolled with a smooth steel drum or plate compactor to reduce punctures in the vapor retarder and additional protection from the crushed aggregate should be provided by placing a geotextile (such as Mirafi 140N, or approved equivalent) between the crushed rock and the plastic vapor retarder. Alternatively, use of a puncture-resistant membrane compliant with ASTM:E 1745 Class A requirements for puncture resistance (such as Stego®Wrap 15 millimeter vapor barrier) may be used.

14.0 DRAINAGE CONSIDERATIONS

Prior to site work and construction, the contractor should be prepared to provide drainage and subgrade protection, as necessary.

14.1 Wall/Foundation Drains

All retaining and perimeter footing walls should be provided with a drain at the footing elevation. The drains should consist of rigid, perforated, polyvinyl chloride (PVC) pipe surrounded by washed pea gravel. The level of the perforations in the pipe should be set approximately 2 inches below the bottom of the footing, and the drains should be constructed with sufficient gradient to allow gravity discharge away from the buildings. All retaining walls should be lined with a minimum 12-inch-thick washed gravel blanket provided to within 1 foot of finish grade, and which ties into the footing drain. Roof and surface runoff should not

discharge into the footing drain system, but should be handled by a separate, rigid, tightline drain.

Exterior grades adjacent to walls should be sloped downward away from the structures to achieve surface drainage. Final exterior grades should promote free and positive drainage away from the buildings at all times. Water must not be allowed to pond or to collect adjacent to foundations or within the immediate building areas. It is recommended that a gradient of at least 3 percent for a minimum distance of 10 feet from the building perimeters be provided, except in paved locations. In paved locations, a minimum gradient of 1 percent should be provided unless provisions are included for collection and disposal of surface water adjacent to the structures. Additionally, pavement subgrades should be crowned to provide drainage toward catch basins and pavement edges. Crawl-space areas should be provided with drains at low points to prevent water from accumulating.

15.0 POND LINING AND DRAINAGE

As noted previously, outwash sands were encountered in the exploration in the vicinity of the pond. The pond is intended to provide short-term storm water detention and long-term water quality treatment. As such, the pond will maintain dead storage water. To reduce storm water infiltration through the base of the pond, the pond will need to be lined.

The pond liner should consist of a minimum 18-inch layer of compacted soil containing at least 20 percent fines (minus No. 200 sieve component, based on the minus No. 4 sieve fraction). Sieve analyses should be conducted on the proposed fill material prior to placement to verify sufficient fines content as pond liner.

16.0 PROJECT DESIGN AND CONSTRUCTION MONITORING

The recommendations in this report are preliminary because grading plans and construction details were not finalized at the time of this report. We are available to provide additional geotechnical consultation as the project design develops and possibly changes from that upon which this report is based. If significant changes in grading are made, we recommend that AESI perform a geotechnical review of the plans prior to final design completion. In this way, our earthwork and foundation recommendations may be properly interpreted and implemented in the design.

We are also available to provide geotechnical engineering and monitoring services during construction. The integrity of the foundations depends on proper site preparation and

construction procedures. In addition, engineering decisions may have to be made in the field in the event that variations in subsurface conditions become apparent. Construction monitoring services are not part of this current scope of work. If these services are desired, please let us know, and we will prepare a proposal.

We have enjoyed working with you on this study and are confident that these recommendations will aid in the successful completion of your project. If you should have any questions or require further assistance, please do not hesitate to call.

Sincerely,
ASSOCIATED EARTH SCIENCES, INC.
Kirkland, Washington

Matthew A. Miller, P.E.
Principal Engineer

Attachments:
Figure 1: Vicinity Map
Figure 2: Site and Exploration Plan
Appendix A: Exploration Logs
Appendix B: Laboratory Testing Results

APPENDIX A

Exploration Logs

EXHIBIT 11
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Coarse-Grained Soils - More than 50% [1] Retained on No. 200 Sieve	Gravels - More than 50% [1] of Coarse Fraction Retained on No. 4 Sieve	≤5% Fines [5]	GW	Well-graded gravel and gravel with sand, little to no fines
			GP	Poorly-graded gravel and gravel with sand, little to no fines
		≥15% Fines [5]	GM	Silty gravel and silty gravel with sand
			GC	Clayey gravel and clayey gravel with sand
	Sands - 50% [1] or More of Coarse Fraction Passes No. 4 Sieve	≤5% Fines [5]	SW	Well-graded sand and sand with gravel, little to no fines
			SP	Poorly-graded sand and sand with gravel, little to no fines
		≥15% Fines [5]	SM	Silty sand and silty sand with gravel
			SC	Clayey sand and clayey sand with gravel
Fine-Grained Soils - 50% [1] or More Passes No. 200 Sieve	Silts and Clays Liquid Limit Less than 50		ML	Silt, sandy silt, gravelly silt, silt with sand or gravel
			CL	Clay of low to medium plasticity; silty, sandy, or gravelly clay, lean clay
			OL	Organic clay or silt of low plasticity
	Silts and Clays Liquid Limit 50 or More		MH	Elastic silt, clayey silt, silt with micaceous or diatomaceous fine sand or silt
			CH	Clay of high plasticity, sandy or gravelly clay, fat clay with sand or gravel
			OH	Organic clay or silt of medium to high plasticity
Highly Organic Soils			PT	Peat, muck and other highly organic soils

Terms Describing Relative Density and Consistency

	Density	SPT [2] blows/foot
Coarse-Grained Soils	Very Loose	0 to 4
	Loose	4 to 10
	Medium Dense	10 to 30
	Dense	30 to 50
	Very Dense	>50
	Consistency	**SPT [2] blows/foot**
Fine-Grained Soils	Very Soft	0 to 2
	Soft	2 to 4
	Medium Stiff	4 to 8
	Stiff	8 to 15
	Very Stiff	15 to 30
	Hard	>30

Test Symbols

G = Grain Size
M = Moisture Content
A = Atterberg Limits
C = Chemical
DD = Dry Density
K = Permeability

Component Definitions

Descriptive Term	Size Range and Sieve Number
Boulders	Larger than 12"
Cobbles	3" to 12"
Gravel	3" to No. 4 (4.75 mm)
Coarse Gravel	3" to 3/4"
Fine Gravel	3/4" to No. 4 (4.75 mm)
Sand	No. 4 (4.75 mm) to No. 200 (0.075 mm)
Coarse Sand	No. 4 (4.75 mm) to No. 10 (2.00 mm)
Medium Sand	No. 10 (2.00 mm) to No. 40 (0.425 mm)
Fine Sand	No. 40 (0.425 mm) to No. 200 (0.075 mm)
Silt and Clay	Smaller than No. 200 (0.075 mm)

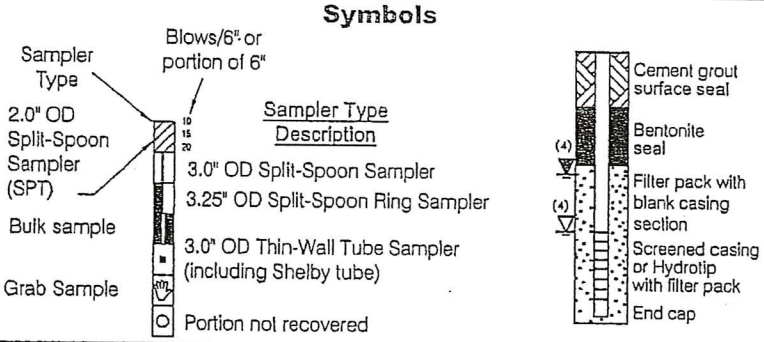
[3] Estimated Percentage

Component	Percentage by Weight
Trace	<5
Few	5 to 10
Little	15 to 25
With	- Non-primary coarse constituents: ≥ 15%
	- Fines content between 5% and 15%

Moisture Content

Dry - Absence of moisture, dusty, dry to the touch
Slightly Moist - Perceptible moisture
Moist - Damp but no visible water
Very Moist - Water visible but not free draining
Wet - Visible free water, usually from below water table

Symbols



(1) Percentage by dry weight
(2) (SPT) Standard Penetration Test (ASTM D-1586)
(3) In General Accordance with Standard Practice for Description and Identification of Soils (ASTM D-2488)
(4) Depth of ground water
ATD = At time of drilling
Static water level (date)
(5) Combined USCS symbols used for fines between 5% and 15%

Classifications of soils in this report are based on visual field and/or laboratory observations, which include density/consistency, moisture condition, grain size, and plasticity estimates and should not be construed to imply field or laboratory testing unless presented herein. Visual-manual and/or laboratory classification methods of ASTM D-2487 and D-2488 were used as an identification guide for the Unified Soil Classification System.

Associated Earth Sciences, Inc.

EXPLORATION LOG KEY

FIGURE A1

blocksilog_key.dwg LAYOUT: Layout2

LOG OF EXPLORATION PIT NO. EP-1

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This log is part of the report prepared by Associated Earth Sciences, Inc. (AESI) for the named project and should be read together with that report for complete interpretation. This summary applies only to the location of this trench at the time of excavation. Subsurface conditions may change at this location with the passage of time. The data presented are a simplification of actual conditions encountered.

Depth (ft)	DESCRIPTION — Approximate Elev. 162 feet
	Forest Duff
1	**Vashon Advance Outwash**
1	Loose to medium dense, moist, reddish brown, fine SAND, little silt (SP/SM); becomes reddish tan below ~2 feet; abundant roots 0 to 2 1/2 feet.
2	
3	Medium dense to dense, moist, tan, fine SAND, few silt (SP); trace gravel, large boulder present at 5 to 7 feet.
4	
5	
6	
7	
8	Medium dense to dense, moist, grayish tan, SAND, with gravel, trace silt (SW).
9	
10	
11	Medium dense to dense, very moist, grayish tan, silty fine SAND and fine sandy SILT (SM/ML) with lenses of clean, fine SAND; contains interbeds of clean fine to medium SAND below approximately 14 feet.
12	
13	
14	
15	
16	
17	
18	Bottom of exploration pit at depth 17 feet No ground water seepage. No caving.
19	
20	

Slocum Property
Woodinville, WA

Associated Earth Sciences, Inc.

Logged by: TJP
Approved by: JHS

Project No. KE110151A
4/19/11

LOG OF EXPLORATION PIT NO. EP-2

EXHIBIT 11
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This log is part of the report prepared by Associated Earth Sciences, Inc. (AESI) for the named project and should be read together with that report for complete interpretation. This summary applies only to the location of this trench at the time of excavation. Subsurface conditions may change at this location with the passage of time. The data presented are a simplification of actual conditions encountered.

Depth (ft)	DESCRIPTION — Approximate Elev. 153 feet
	Forest Duff
	Vashon Advance Outwash
1	Loose to medium dense, moist, reddish tan, fine SAND, little silt, few gravel (SP/SM); abundant roots.
2	
3	Medium dense to dense, moist, tan, fine SAND, few silt (SP); contains interbeds of stiff to very stiff, very moist silt from 4 to 6 1/2 feet; becomes grayish tan with silt (SM) below 6 1/2 feet.
4	
5	
6	
7	
8	
9	
10	
11	
12	Contains SILT lenses at ~12 to 13 feet.
13	Becomes gravelly grayish brown below 13 feet.
14	
15	Little gravel below 15 feet.
16	
17	Bottom of exploration pit at depth 16.5 feet No ground water seepage. No caving.
18	
19	
20	

Slocum Property
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Associated Earth Sciences, Inc.

Project No. KE110151A

4/19/11

LOG OF EXPLORATION PIT NO. EP-3

This log is part of the report prepared by Associated Earth Sciences, Inc. (AESI) for the named project and should be read together with that report for complete interpretation. This summary applies only to the location of this trench at the time of excavation. Subsurface conditions may change at this location with the passage of time. The data presented are a simplification of actual conditions encountered.

Depth (ft)	DESCRIPTION — Approximate Elev. 153 feet
	Forest Duff
1	**Vashon Recessional Outwash**
2	Loose to medium dense, moist, brown to reddish brown, silty fine SAND, little gravel (SM); abundant roots.
3	
4	Medium dense, moist, gray to grayish tan, SAND, with gravel, trace silt (SW); contains lenses of stiff, mottled tan, SILT below 7 feet.
5	
6	
7	
8	**Vashon Advance Outwash**
9	
10	Medium dense to dense, moist, grayish tan, fine SAND, little gravel, few silt (SP); contains pockets of dense, silty SAND, with gravel (SM) above 12 feet.
11	
12	
13	
14	
15	
16	Bottom of exploration pit at depth 15 feet No ground water seepage. Moderate caving 0 to 8 feet.
17	
18	
19	
20	

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Associated Earth Sciences, Inc.

Project No. KE110151A
4/19/11

KCTP3 110151A.GPJ November 16, 2012

LOG OF EXPLORATION PIT NO. EP-4

This log is part of the report prepared by Associated Earth Sciences, Inc. (AESI) for the named project and should be read together with that report for complete interpretation. This summary applies only to the location of this trench at the time of excavation. Subsurface conditions may change at this location with the passage of time. The data presented are a simplification of actual conditions encountered.

Depth (ft)	DESCRIPTION — Approximate Elev. 144 feet
	Forest Duff
1	**Vashon Recessional Outwash**
2	Loose to medium dense, moist, reddish tan, fine SAND, little silt, few gravel (SM/SP); abundant roots.
3	**Vashon Advance Outwash**
4	Medium dense to dense, moist, grayish tan, fine SAND, little silt, few gravel (SM); contains lenses of clean, fine SAND and very stiff, laminated SILT.
5	
6	
7	
8	Medium dense to dense, moist, gray, fine SAND, trace silt (SP); contains interbeds of fine sandy silt below 10 feet; few gravel.
9	
10	
11	
12	
13	
14	
15	
16	Bottom of exploration pit at depth 15 feet No ground water seepage. Moderate caving 7 to 10 feet.
17	
18	
19	
20	

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Logged by: TJP
Approved by: JHS

Associated Earth Sciences, Inc.

Project No. KE110151A

4/19/11

KCTP3 110151A.GPJ November 16, 2012

LOG OF EXPLORATION PIT NO. EP-5

EXHIBIT 11
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This log is part of the report prepared by Associated Earth Sciences, Inc. (AESI) for the named project and should be read together with that report for complete interpretation. This summary applies only to the location of this trench at the time of excavation. Subsurface conditions may change at this location with the passage of time. The data presented are a simplfication of actual conditions encountered.

Depth (ft)	DESCRIPTION — Approximate Elev. 145 feet
	Forest Duff
1	**Vashon Recessional Outwash**
2	Loose to medium dense, moist, reddish tan, fine SAND, little silt, few gravel (SP/SM); abundant roots.
3	
4	Medium dense, moist, tan, fine SAND, little silt, few gravel (SP/SM); trace silt below 4 feet; contains lenses and interbeds of silt below 7 1/2 feet; contains scattered roots.
5	
6	
7	
8	
9	
10	**Vashon Advance Outwash**
11	Medium dense to dense, moist, grayish tan, fine SAND, little gravel, trace silt (SP); contains lenses of very moist, silty SAND and fine sandy SILT.
12	
13	
14	
15	
16	Bottom of exploration pit at depth 15 feet No ground water seepage. Minor caving above 10 feet.
17	
18	
19	
20	

Slocum Property
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4/19/11

KCTP3 110151A.GPJ November 16, 2012

LOG OF EXPLORATION PIT NO. EP-6

This log is part of the report prepared by Associated Earth Sciences, Inc. (AESI) for the named project and should be read together with that report for complete interpretation. This summary applies only to the location of this trench at the time of excavation. Subsurface conditions may change at this location with the passage of time. The data presented are a simplfication of actual conditions encountered.

Depth (ft)	DESCRIPTION — Approximate Elev. 133 feet
	Forest Duff
1	**Vashon Advance Outwash** Loose to medium dense, moist, tan, fine SAND, little silt (SP/SM); abundant roots.
2	
3	Medium dense to dense, moist, tan, fine SAND, little silt (SP/SM); contains lenses and interbeds of stiff to very stiff, SILT and fine SAND, with few silt below 6 1/2 feet; becomes silty and very moist below 12 feet.
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	**Pre-Vashon ?**
15	Stiff to very stiff, very moist, grayish tan, SILT; laminated (ML).
16	
17	Bottom of exploration pit at depth 16 feet No ground water seepage. No caving.
18	
19	
20	

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Project No. KE110151A
4/19/11

KCTP3 110151A.GPJ November 16, 2012

LOG OF EXPLORATION PIT NO. EP-7

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PAGE 32 OF 63

This log is part of the report prepared by Associated Earth Sciences, Inc. (AESI) for the named project and should be read together with that report for complete interpretation. This summary applies only to the location of this trench at the time of excavation. Subsurface conditions may change at this location with the passage of time. The data presented are a simplification of actual conditions encountered.

Depth (ft)	DESCRIPTION — Approximate Elev. 152 feet
	Forest Duff
	Vashon Recessional Outwash
1	Loose to medium dense, moist, reddish tan, fine SAND, little silt (SP/SM); abundant roots.
2	
3	Medium dense, moist, grayish tan, fine SAND, few silt (SP); little silt below 4 feet (SP/SM).
4	
5	
6	Medium dense, very moist, brown, silty SAND, with gravel (SM); contains thin lenses of SAND, with little silt; scattered roots above 7 feet.
7	**Vashon Advance Outwash**
8	Medium dense to dense, moist, grayish tan, fine SAND, little gravel, trace silt (SP).
9	
10	
11	
12	
13	Stiff to very stiff, very moist, gray-tan, SILT (ML).
14	Medium dense to dense, moist, gray, SAND, with gravel, trace silt (SW).
15	
16	
17	Bottom of exploration pit at depth 16 feet No ground water seepage. Moderate caving 7 to 12 feet.
18	
19	
20	

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Project No. KE110151A

4/19/11

LOG OF EXPLORATION PIT NO. EP-8

EXHIBIT 11
PAGE 33 OF 63

This log is part of the report prepared by Associated Earth Sciences, Inc. (AESI) for the named project and should be read together with that report for complete interpretation. This summary applies only to the location of this trench at the time of excavation. Subsurface conditions may change at this location with the passage of time. The data presented are a simplfication of actual conditions encountered.

Depth (ft)	DESCRIPTION — Approximate Elev. 134 feet
	Forest Duff
1	**Vashon Recessional Outwash** Loose, moist, reddish brown, fine SAND, little gravel, little silt (SP/SM); abundant roots.
2	
3	
4	**Vashon Advance Outwash** Medium dense to dense, very moist, tan, silty fine SAND and fine sandy SILT, with little gravel (SM/ML); contains thin lenses of clean sand; becomes mottled at 6 to 7 feet.
5	
6	
7	
8	
9	
10	
11	Medium dense to dense, moist, gray, fine SAND, trace silt, trace gravel (SP); becomes well graded below 15 feet (SW).
12	
13	
14	
15	
16	
17	Bottom of exploration pit at depth 16 feet No ground water seepage. Moderate caving below 10 feet.
18	
19	
20	

KCTP3 110151A.GPJ November 16, 2012

Slocum Property
Woodinville, WA

Associated Earth Sciences, Inc.

Logged by: TJP
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Project No. KE110151A

4/19/11

LOG OF EXPLORATION PIT NO. EP-9

EXHIBIT 11
PAGE 34 OF 63

This log is part of the report prepared by Associated Earth Sciences, Inc. (AESI) for the named project and should be read together with that report for complete interpretation. This summary applies only to the location of this trench at the time of excavation. Subsurface conditions may change at this location with the passage of time. The data presented are a simplification of actual conditions encountered.

Depth (ft)	DESCRIPTION
	El. ~124.7'
	Forest Duff
1	**Vashon Advance Outwash**
2	Medium dense, damp, brown to oxidized brown, fine to medium SAND, trace silt, abundant roots.
3	
4	Medium dense, damp, brown to oxidized brown, fine to medium SAND, trace silt, occasional roots.
5	Medium stiff to stiff, moist, gray to gray brown, sandy SILT, faintly layered; probe 2-1/2 inches.
6	
7	Medium stiff to stiff, moist to wet, dark mottled brown, sandy SILT.
8	Medium dense to dense, wet, brown, fine to medium SAND, trace silt.
9	
10	Bottom of exploration pit at depth 9 feet Rapid ground water seepage at 7.5 feet. Moderate caving 0 to 4 feet, minor caving at 6 feet. Drivepoint installed, water level at 7.3 feet below ground surface.
11	
12	
13	
14	
15	
16	
17	
18	
19	
20	

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Woodinville, WA

Associated Earth Sciences, Inc.

Logged by: JHS
Approved by: JHS

Project No. KE110151A

8/26/11

KCTP3 110151A.GPJ November 16, 2012

LOG OF EXPLORATION PIT NO. EP-10

EXHIBIT 11
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This log is part of the report prepared by Associated Earth Sciences, Inc. (AESI) for the named project and should be read together with that report for complete interpretation. This summary applies only to the location of this trench at the time of excavation. Subsurface conditions may change at this location with the passage of time. The data presented are a simplfication of actual conditions encountered.

Depth (ft)	DESCRIPTION (El. ~149')
1	**Forest Duff** Loose, moist, dark brown, silty fine to medium SAND, few fine to coarse gravel; abundant roots, abundant organics (SM).
2	**Vashon Recessional Outwash** Loose to medium dense, slightly moist, brown, fine to medium SAND, few fine to coarse gravel, few silt; few roots (SP).
3	Becomes grayish brown.
4	Medium dense to dense, slightly moist, grayish brown, fine to medium SAND, trace gravel, trace silt (SP).
5	
6	
7	**Vashon Advance Outwash** Very stiff, slightly moist, brown with faint orange mottling, SILT; finely laminated (ML).
8	
9	
10	
11	Medium dense to dense, slightly moist, grayish brown, fine to medium SAND, few fine to coarse gravel, trace silt; stratified (SP).
12	
13	Increased gravel content to little.
14	Very stiff, slightly moist, brown, SILT; finely laminated (ML). Medium dense, slightly moist, grayish brown, fine to coarse SAND, few fine to coarse gravel, trace silt (SW).
15	Grades to fine to medium SAND (SP).
16	
17	Medium dense to dense and stiff, slightly moist, grayish brown, finely interbedded (1/4 to 1/2 inch), very fine to fine SAND, with silt, and SILT (SM/ML).
18	Medium dense to dense, slightly moist, grayish brown, fine to medium SAND, trace to little gravel, trace silt (SP).
19	Bottom of exploration pit at depth 18.5 feet No ground water seepage. No caving.
20	

KCTP3 110151A.GPJ November 16, 2012

Slocum Property
Woodinville, WA

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Associated Earth Sciences, Inc.

Project No. KE110151A
11/14/12

LOG OF EXPLORATION PIT NO. EP-11

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This log is part of the report prepared by Associated Earth Sciences, Inc. (AESI) for the named project and should be read together with that report for complete interpretation. This summary applies only to the location of this trench at the time of excavation. Subsurface conditions may change at this location with the passage of time. The data presented are a simplification of actual conditions encountered.

Depth (ft)	DESCRIPTION (El. ~145')
1	**Forest Duff** Loose, moist, dark brown, fine to medium SAND, few fine to coarse gravel, few silt; abundant organics, abundant roots (SM).
2	**Vashon Recessional Outwash** Loose to medium dense, slightly moist, brown, fine to medium SAND, few fine to coarse gravel, few silt (SP).
3	Becomes grayish brown.
4	
5	
6	
7	**Vashon Advance Outwash** Medium dense to dense, slightly moist, grayish brown to tan, fine SAND, few to little silt (SP/SM).
8	
9	
10	
11	
12	Medium dense to dense, slightly moist, grayish brown to tan, interbeds (1/2 to 2 inches), fine SAND, and SILT.
13	
14	
15	Medium dense to dense, slightly moist, grayish brown, fine SAND, trace silt (SP). **Pre-Vashon ?**
16	Medium dense to dense and stiff, slightly moist, grayish brown to brown, thinly bedded (1/8 to 1/4 inch), very fine to fine SAND and SILT (SP/ML).
17	Stiff, moist, brown to reddish brown, thinly bedded (1/16 to 1/8 inch) SILT (ML).
18	Dense, moist, brown to reddish brown, fine to medium SAND, few silt, trace gravel, trace coarse sand (SP); boulder at 18 feet.
19	Bottom of exploration pit at depth 18 feet No ground water seepage. No caving.
20	

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Slocum Property
Woodinville, WA

Associated Earth Sciences, Inc.

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Approved by: JHS

Project No. KE110151A

11/14/12

LOG OF EXPLORATION PIT NO. EP-12

EXHIBIT 11
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This log is part of the report prepared by Associated Earth Sciences, Inc. (AESI) for the named project and should be read together with that report for complete interpretation. This summary applies only to the location of this trench at the time of excavation. Subsurface conditions may change at this location with the passage of time. The data presented are a simplfication of actual conditions encountered.

Depth (ft)	DESCRIPTION (El. ~147')
1	**Forest Duff** Loose, moist, dark brown, silty fine to medium SAND, few fine to coarse gravel; abundant roots, abundant organics (SM).
2	**Vashon Recessional Outwash** Loose to medium dense, slightly moist, brown, fine to medium SAND, few fine to coarse gravel, few to trace silt (SP).
3	Becomes grayish brown at 1 foot.
4	
5	
6	
7	**Vashon Advance Outwash** Medium dense to dense, slightly moist, grayish brown, fine SAND, trace gravel, trace silt (SP).
8	
9	
10	
11	Medium dense to dense and stiff, slightly moist, grayish brown with orange mottling, thinly bedded (1/4 inch), very fine to fine SAND, with silt and SILT, with sand (SM/ML).
12	
13	
14	Very stiff, slightly moist, grayish brown, finely laminated SILT, with thin (<1/8 inch) interbeds very fine SAND, with silt; micaceous (ML/SM).
15	As above but 1 inch orangish brown and lavender gray, SILT and fine SAND, with silt (ML/SM); thinly bedded to laminated.
16	As above, orangish brown to brown.
17	
18	Bottom of exploration pit at depth 17 feet No ground water seepage. No caving.
19	
20	

KCTP3 110151A.GPJ November 16, 2012

Slocum Property
Woodinville, WA

Logged by: LBK
Approved by: JHS

Associated Earth Sciences, Inc.

Project No. KE110151A

11/14/12

LOG OF EXPLORATION PIT NO. EP-13

EXHIBIT 11
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This log is part of the report prepared by Associated Earth Sciences, Inc. (AESI) for the named project and should be read together with that report for complete interpretation. This summary applies only to the location of this trench at the time of excavation. Subsurface conditions may change at this location with the passage of time. The data presented are a simplfication of actual conditions encountered.

Depth (ft)	DESCRIPTION (El. ~146')
1	**Forest Duff** Loose, moist, dark brown, silty fine to medium SAND, few fine to coarse gravel; abundant roots, abundant organics (SM).
2	**Vashon Recessional Outwash** Loose to medium dense, slightly moist, brown, fine to medium SAND, few fine to coarse gravel, trace silt (SP).
3	
4	
5	
6	
7	
8	**Vashon Advance Outwash** Medium dense to dense and stiff, slightly moist, brown with orange mottling, fine to medium SAND, few to little silt interbedded with brown, SILT, with sand; thinly bedded (1/8 to 1/4 inch) layers (SP/SM).
9	
10	Medium dense to dense and stiff, slightly moist, grayish brown to light tan, thinly bedded (1/8 to 1/4 inch) very fine to fine SAND and SILT (SP/ML).
11	Medium dense to dense, fine to medium SAND, few to little silt, trace gravel, trace coarse sand; stratified (SP/SM).
12	
13	Very stiff, slightly moist, grayish brown, SILT; finely laminated; discontinuous across pit wall (ML).
14	
15	Medium dense to dense, slightly moist, grayish brown, fine to medium SAND, trace silt (SP).
16	
17	Bottom of exploration pit at depth 16 feet No ground water seepage. Minor caving 3 to 10 feet.
18	
19	
20	

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Slocum Property
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Project No. KE110151A

11/14/12

LOG OF EXPLORATION PIT NO. EP-14

EXHIBIT 11
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This log is part of the report prepared by Associated Earth Sciences, Inc. (AESI) for the named project and should be read together with that report for complete interpretation. This summary applies only to the location of this trench at the time of excavation. Subsurface conditions may change at this location with the passage of time. The data presented are a simplfication of actual conditions encountered.

Depth (ft)	DESCRIPTION (El. ~145')
1	**Forest Duff** Loose, moist, dark brown, silty fine SAND, trace gravel; abundant roots, abundant organics (SM).
2	**Vashon Recessional Outwash** Loose to medium dense, slightly moist, brown, fine SAND, few silt, trace gravel; few roots (SP).
3	Medium dense, slightly moist, grayish brown with orange mottling, fine to medium SAND, few fine to coarse gravel, few silt; stratified (SW/SM).
4	
5	**Vashon Advance Outwash** Medium dense to dense, slightly moist, grayish brown, fine SAND, trace to little silt; stratified, with discontinuous layer (2 inch) of silt; finely laminated (SP/SM).
6	
7	
8	
9	
10	Medium dense to dense, slightly moist, grayish brown, fine to coarse SAND, few fine to coarse gravel, trace silt (SW).
11	Bottom of exploration pit at depth 10.5 feet No ground water seepage. Minor caving 3 to 6 feet.
12	
13	
14	
15	
16	
17	
18	
19	
20	

Slocum Property
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LOG OF EXPLORATION PIT NO. IT-1

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This log is part of the report prepared by Associated Earth Sciences, Inc. (AESI) for the named project and should be read together with that report for complete interpretation. This summary applies only to the location of this trench at the time of excavation. Subsurface conditions may change at this location with the passage of time. The data presented are a simplification of actual conditions encountered.

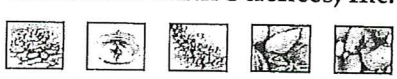
Depth (ft)	DESCRIPTION (El. ~136')
1	**Forest Duff** Loose, slightly moist, dark brown, fine to medium SAND, few silt, abundant roots.
2	**Vashon Recessional Outwash** Medium dense, moist, tan brown, fine to medium SAND, trace to few gravel, trace silt, abundant roots; massive (SP).
3	
4	Medium dense, moist, gray brown, fine to medium SAND, few gravel, trace cobbles and large gravel, trace silt; massive (SP).
5	
6	
7	**Vashon Advance Outwash** Medium dense to dense, moist, gray brown, fine to medium SAND, few gravel, trace silt; stratified (SP).
8	
9	
10	
11	
12	Medium dense to dense, moist, gray brown, fine to medium SAND, trace to few gravel, trace silt (SP).
13	Layer of medium dense to dense, moist, gray, SILT and very fine SAND; discontinuous (ML/SP).
14	Medium dense to dense, moist to very moist, gray, fine SAND, with silt, interbedded with very moist, gray, medium SAND (SM/SP).
15	Medium dense to dense, moist to very moist, gray, medium SAND, with silt interbeds (SP/ML).
16	
17	
18	Medium dense to dense, moist, gray, medium SAND, with thin silt interbeds (SP/ML).
19	Bottom of exploration pit at depth 18 feet Seepage from infiltration test water 14 to 14.5 feet. Heavy caving 0 to 8 feet, moderate caving 8 to 18 feet. Infiltration test at 13-13.5 feet.
20	

KCTP3 110151A.GPJ November 16, 2012

Slocum Property
Woodinville, WA

Logged by: JHS/SST
Approved by: JHS

Associated Earth Sciences, Inc.



Project No. KE110151A
8/26/11

LOG OF EXPLORATION PIT NO. IT-2

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This log is part of the report prepared by Associated Earth Sciences, Inc. (AESI) for the named project and should be read together with that report for complete interpretation. This summary applies only to the location of this trench at the time of excavation. Subsurface conditions may change at this location with the passage of time. The data presented are a simplification of actual conditions encountered.

Depth (ft)	DESCRIPTION (El. ~ 147')
1	**Forest Duff** Loose, moist, dark brown, silty fine to medium SAND, few fine to coarse gravel; abundant roots, abundant organics (SM).
2	**Vashon Recessional Outwash** Loose to medium dense, slightly moist, brown, fine to medium SAND, few fine to coarse gravel, few silt; few roots (SP).
3	Medium dense, slightly moist, grayish brown, fine to medium SAND, few fine to coarse gravel, few silt; weakly stratified (SP).
4	
5	**Vashon Advance Outwash** Medium dense to dense, slightly moist, grayish brown, interbedded fine to medium SAND, few to trace gravel, trace silt and fine SAND, trace silt (SP).
6	
7	
8	
9	
10	
11	As above, with interbeds of tan, SILT, with fine sand.
12	
13	
14	Medium dense to dense, slightly moist, grayish brown, fine SAND, few gravel, trace silt; weakly stratified (SP).
15	
16	As above, with discontinuous layers (4 to 6 inch) of SILT, scattered weathered gravel (SP/ML).
17	**Pre-Vashon** Dense, slightly moist, orangish brown, fine to coarse SAND, with gravel, few silt; somewhat cemented (SW).
18	Bottom of exploration pit at depth 18 feet No ground water seepage. Caving 12 to 16 feet. Infiltration test at 17 feet.
19	
20	

KCTP3 110151A.GPJ November 16, 2012

Slocum Property
Woodinville, WA

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Associated Earth Sciences, Inc.

Project No. KE110151A
11/13/12

LOG OF EXPLORATION PIT NO. PD-1

EXHIBIT 11
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This log is part of the report prepared by Associated Earth Sciences, Inc. (AESI) for the named project and should be read together with that report for complete interpretation. This summary applies only to the location of this trench at the time of excavation. Subsurface conditions may change at this location with the passage of time. The data presented are a simplification of actual conditions encountered.

Depth (ft)	DESCRIPTION (El. ~ 149')
1	**Forest Duff** Loose, moist, dark brown, silty fine to medium SAND, few fine to coarse gravel; abundant roots, abundant organics (SM).
2	**Vashon Recessional Outwash** Loose to medium dense, slightly moist, brown with orange mottling, fine to medium SAND, few fine to coarse gravel, few silt (SP).
3	Medium dense, slightly moist, grayish brown, fine to medium SAND, few fine to coarse gravel, few silt; weakly stratified (SP).
4	
5	
6	
7	
8	**Vashon Advance Outwash** Medium dense to dense, slightly moist, grayish brown, very fine to fine SAND, little to few silt; fine laminae (SP/SM).
9	
10	
11	Medium dense to dense and stiff, slightly moist, light gray to grayish brown, thinly interbedded (1/3 to 1/2 inch) very fine to fine SAND and SILT (SP/ML).
12	
13	Medium dense to dense, slightly moist, grayish brown, fine to medium SAND, few to trace fine gravel, trace silt (SP).
14	
15	
16	Dense, slightly moist, grayish brown to brown, fine to medium SAND, few fine to coarse gravel, trace silt; weakly cemented (SP).
17	Bottom of exploration pit at depth 16 feet Pit from 0 to 11 feet = 4x10 feet / Pit from 11 feet to bottom = 3x8 feet No ground water seepage. Minor caving 10 to 16 feet. **Completed as Pit Drain:**
18	+2 to 16 feet = Piezometer 0 to 7 feet = Native fill
19	7 feet = Plastic sheet 7 to 16 feet = Pea gravel
20	

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Project No. KE110151A

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APPENDIX B

Laboratory Testing Results

EXHIBIT 11
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GRAIN SIZE ANALYSIS - MECHANICAL

Date	Project	Project No.		Soil Description
4/25/2011	Slocum Property	KE110151A		Sand few silt trace gravel
Tested By	Location	EB/EP No	Depth	Intended Use / Specification
MS	Onsite	EP-1	2.5- 3.5'	

Wt. of moisture wet sample + Tare	347.95	Total Sample Tare	331.84
Wt. of moisture dry Sample + Tare	325.6	Total Sample wt + tare	773.83
Wt. of Tare	94.85	Total Sample Wt	442.0
Wt. of moisture Dry Sample	230.75	Total Sample Dry Wt	403.0
Moisture %	10%		

					Specification Requirements	
Sieve No.	Diam. (mm)	Wt. Retained (g)	% Retained	% Passing	Minimum	Maximum
3	76.1		0.0	100.0	-	-
2.5	64		0.0	100.0	-	-
2	50.8		0.0	100.0	-	-
1.5	38.1		0.0	100.0	-	-
1	25.4		0.0	100.0	-	-
3/4	19		0.0	100.0	-	-
3/8	9.51	2.28	0.6	99.4	-	-
#4	4.76	3.83	1.0	99.0	-	-
#8	2.38	6.82	1.7	98.3	-	-
#10	2	7.66	1.9	98.1	-	-
#20	0.85	14.78	3.7	96.3	-	-
#40	0.42	59.01	14.6	85.4	-	-
#60	0.25	221.45	55.0	45.0	-	-
#100	0.149	329.22	81.7	18.3	-	-
#200	0.074	368.6	91.5	8.5	-	-
#270	0.053	377.7	93.7	6.3	-	-

US STANDARD SIEVE NOS.

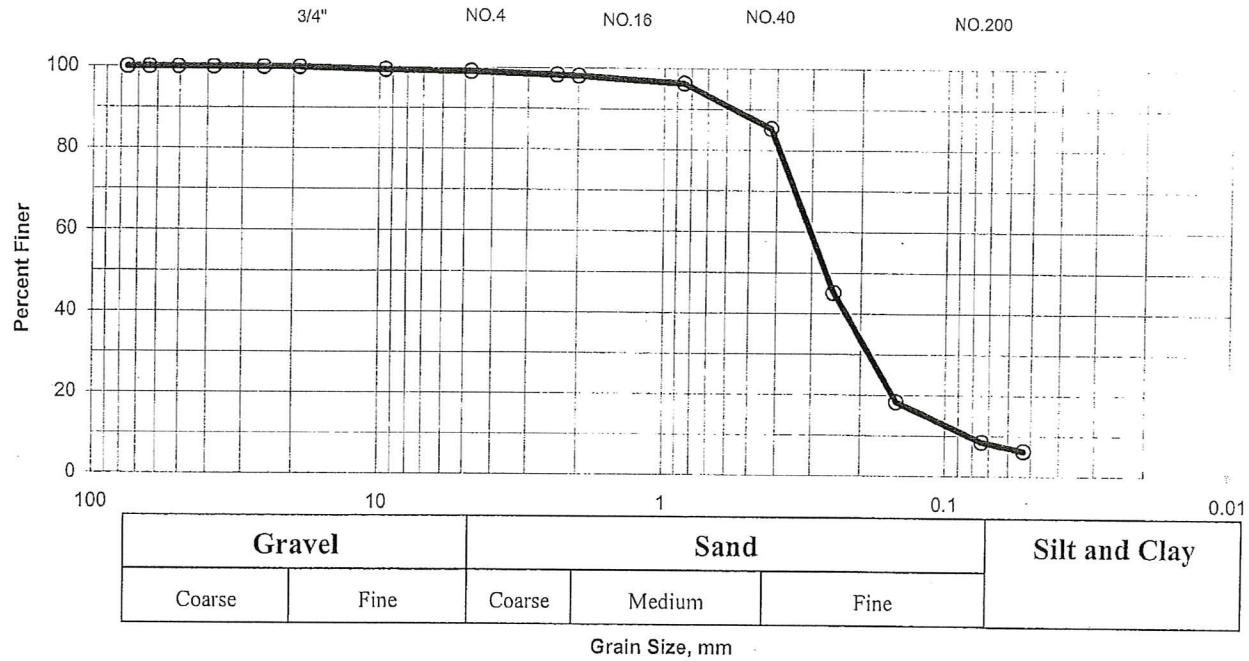

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EXHIBIT 11
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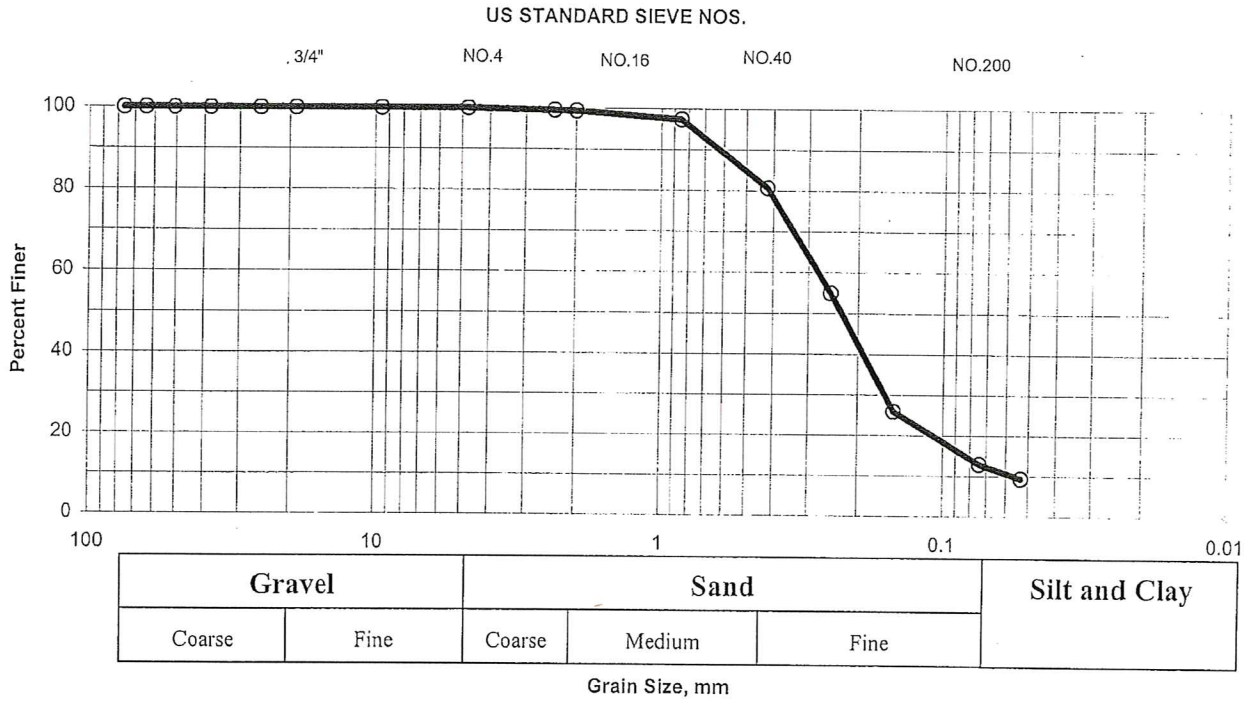
GRAIN SIZE ANALYSIS - MECHANICAL

Date	Project	Project No.		Soil Description
4/25/2011	Slocum Property	KE110151A		Sand few silt
Tested By	Location	EB/EP No	Depth	Intended Use / Specification
MS	Onsite	EP-2	3-4'	

Wt. of moisture wet sample + Tare	328.09	Total Sample Tare	521.14
Wt. of moisture dry Sample + Tare	314.25	Total Sample wt + tare	952.69
Wt. of Tare	101.87	Total Sample Wt	431.6
Wt. of moisture Dry Sample	212.38	Total Sample Dry Wt	405.1
Moisture %	7%		

					Specification Requirements	
Sieve No.	Diam. (mm)	Wt. Retained (g)	% Retained	% Passing	Minimum	Maximum
3	76.1		0.0	100.0	-	-
2.5	64		0.0	100.0	-	-
2	50.8		0.0	100.0	-	-
1.5	38.1		0.0	100.0	-	-
1	25.4		0.0	100.0	-	-
3/4	19		0.0	100.0	-	-
3/8	9.51		0.0	100.0	-	-
#4	4.76		0.0	100.0	-	-
#8	2.38	1.84	0.5	99.5	-	-
#10	2	2.51	0.6	99.4	-	-
#20	0.85	10.56	2.6	97.4	-	-
#40	0.42	78.22	19.3	80.7	-	-
#60	0.25	182.21	45.0	55.0	-	-
#100	0.149	300.1	74.1	25.9	-	-
#200	0.074	352.8	87.1	12.9	-	-
#270	0.053	367.09	90.6	9.4	-	-



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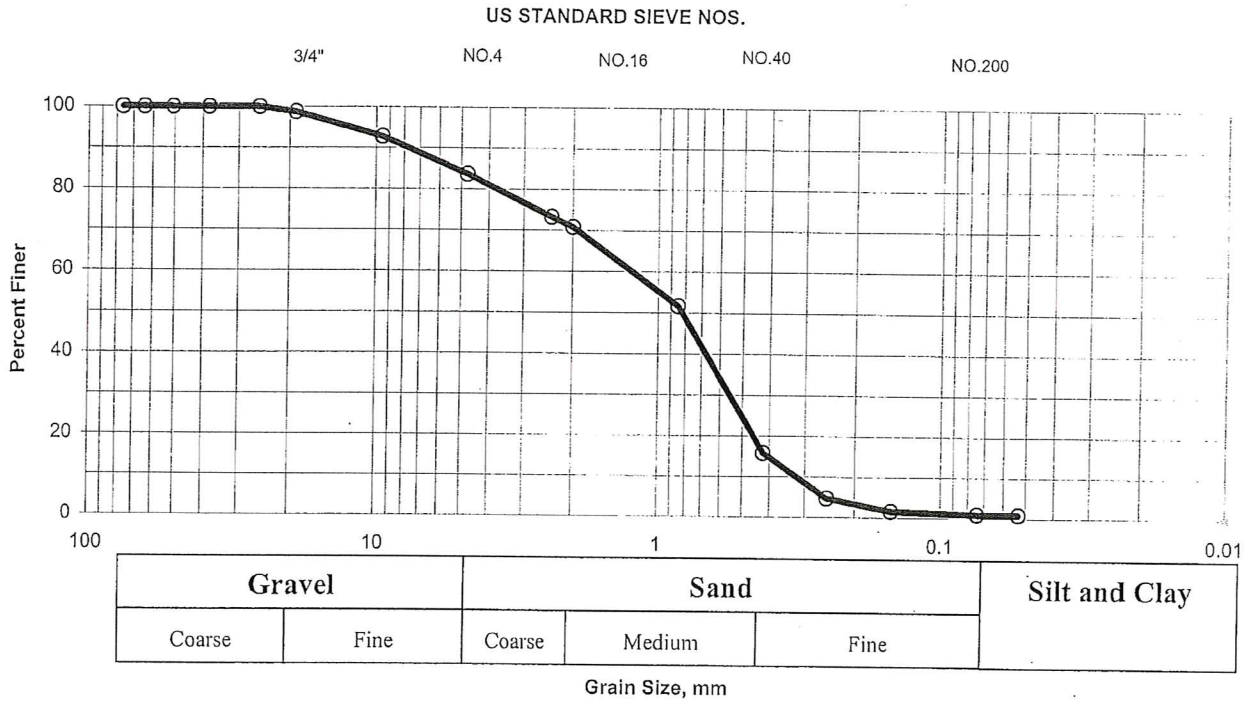
GRAIN SIZE ANALYSIS - MECHANICAL

Date	Project	Project No.		Soil Description
4/25/2011	Slocum Property	KE110151A		Sand little gravel trace silt
Tested By	Location	EB/EP No	Depth	Intended Use / Specification
MS	Onsite	EP-3	3-4'	

Wt. of moisture wet sample + Tare	429.38	Total Sample Tare	519.85
Wt. of moisture dry Sample + Tare	416.18	Total Sample wt + tare	1505.4
Wt. of Tare	99.25	Total Sample Wt	985.6
Wt. of moisture Dry Sample	316.93	Total Sample Dry Wt	946.1
Moisture %	4%		

					Specification Requirements	
Sieve No.	Diam. (mm)	Wt. Retained (g)	% Retained	% Passing	Minimum	Maximum
3	76.1		0.0	100.0	-	-
2.5	64		0.0	100.0	-	-
2	50.8		0.0	100.0	-	-
1.5	38.1		0.0	100.0	-	-
1	25.4		0.0	100.0	-	-
3/4	19	12.07	1.3	98.7	-	-
3/8	9.51	67.96	7.2	92.8	-	-
#4	4.76	155.05	16.4	83.6	-	-
#8	2.38	252.66	26.7	73.3	-	-
#10	2	276.07	29.2	70.8	-	-
#20	0.85	457.27	48.3	51.7	-	-
#40	0.42	796.04	84.1	15.9	-	-
#60	0.25	901	95.2	4.8	-	-
#100	0.149	931.02	98.4	1.6	-	-
#200	0.074	936.76	99.0	1.0	-	-
#270	0.053	937.47	99.1	0.9	-	-



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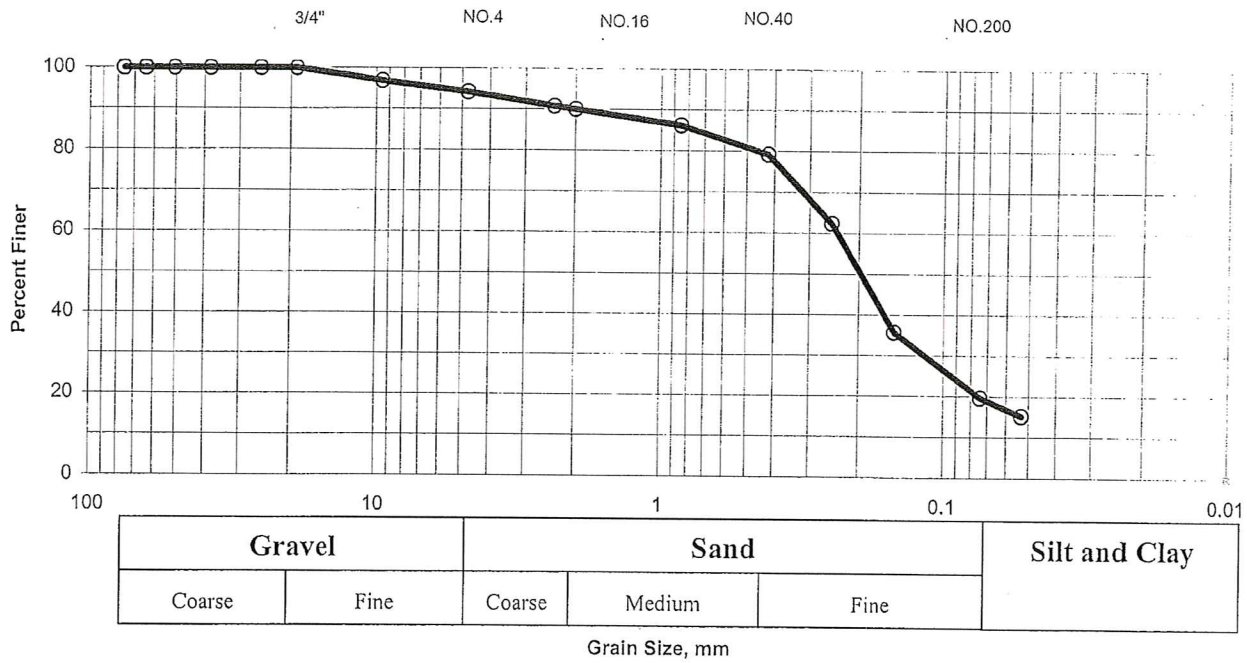
GRAIN SIZE ANALYSIS - MECHANICAL

Date	Project	Project No.		Soil Description
4/25/2011	Slocum Property	KE110151A		Sand few silt trace gravel
Tested By	Location	EB/EP No	Depth	Intended Use / Specification
MS	Onsite	EP-4	3-4'	

Wt. of moisture wet sample + Tare	237.86	Total Sample Tare	395.71
Wt. of moisture dry Sample + Tare	224.47	Total Sample wt + tare	745.01
Wt. of Tare	101.86	Total Sample Wt	349.3
Wt. of moisture Dry Sample	122.61	Total Sample Dry Wt	314.9
Moisture %	11%		

					Specification Requirements	
Sieve No.	Diam. (mm)	Wt. Retained (g)	% Retained	% Passing	Minimum	Maximum
3	76.1		0.0	100.0	-	-
2.5	64		0.0	100.0	-	-
2	50.8		0.0	100.0	-	-
1.5	38.1		0.0	100.0	-	-
1	25.4		0.0	100.0	-	-
3/4	19		0.0	100.0	-	-
3/8	9.51	9.77	3.1	96.9	-	-
#4	4.76	18.2	5.8	94.2	-	-
#8	2.38	28.86	9.2	90.8	-	-
#10	2	31.25	9.9	90.1	-	-
#20	0.85	43.45	13.8	86.2	-	-
#40	0.42	65.52	20.8	79.2	-	-
#60	0.25	118.42	37.6	62.4	-	-
#100	0.149	202.47	64.3	35.7	-	-
#200	0.074	253.07	80.4	19.6	-	-
#270	0.053	267.17	84.8	15.2	-	-

US STANDARD SIEVE NOS.



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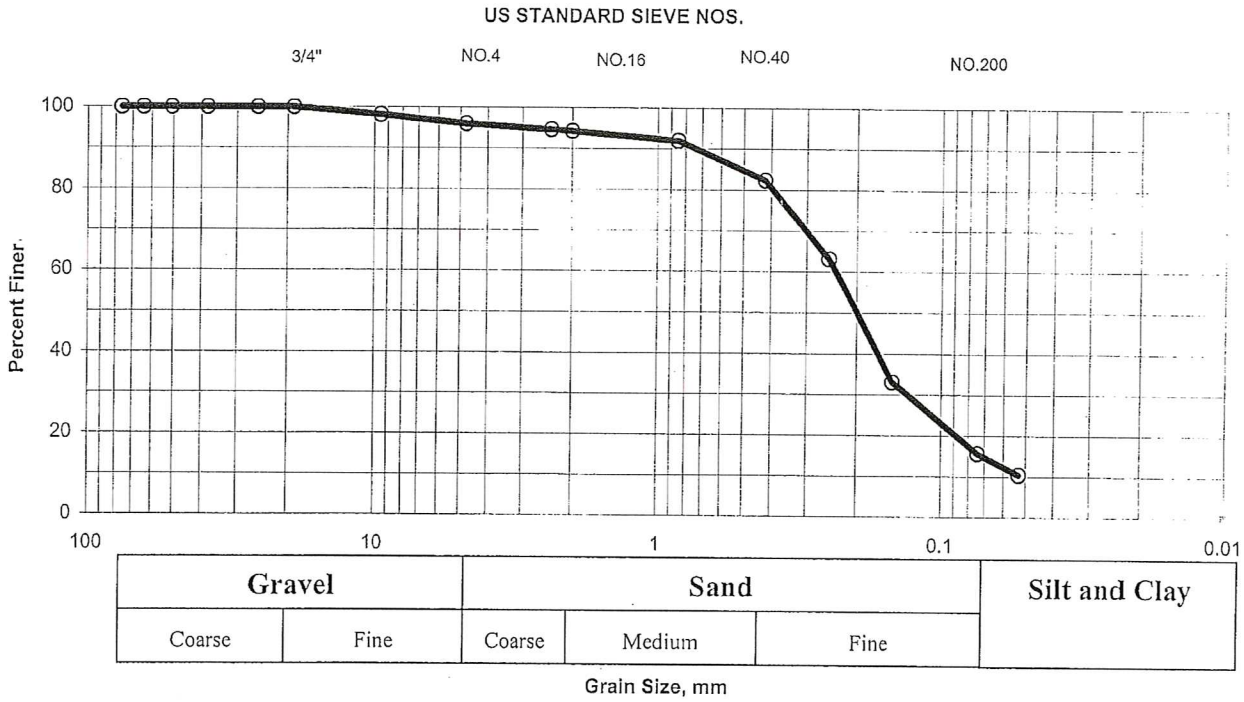
GRAIN SIZE ANALYSIS - MECHANICAL

Date	Project	Project No.		Soil Description
4/25/2011	Slocum Property	KE110151A		Sand few silt trace gravel
Tested By	Location	EB/EP No	Depth	Intended Use / Specification
MS	Onsite	EP-5	3-4'	

Wt. of moisture wet sample + Tare	262.88	Total Sample Tare	331.8
Wt. of moisture dry Sample + Tare	246.5	Total Sample wt + tare	724.28
Wt. of Tare	101.83	Total Sample Wt	392.5
Wt. of moisture Dry Sample	144.67	Total Sample Dry Wt	352.6
Moisture %	11%		

					Specification Requirements	
Sieve No.	Diam. (mm)	Wt. Retained (g)	% Retained	% Passing	Minimum	Maximum
3	76.1		0.0	100.0	-	-
2.5	64		0.0	100.0	-	-
2	50.8		0.0	100.0	-	-
1.5	38.1		0.0	100.0	-	-
1	25.4		0.0	100.0	-	-
3/4	19		0.0	100.0	-	-
3/8	9.51	6.6	1.9	98.1	-	-
#4	4.76	14.05	4.0	96.0	-	-
#8	2.38	18.85	5.3	94.7	-	-
#10	2	20.12	5.7	94.3	-	-
#20	0.85	28.16	8.0	92.0	-	-
#40	0.42	62.09	17.6	82.4	-	-
#60	0.25	129.86	36.8	63.2	-	-
#100	0.149	235.83	66.9	33.1	-	-
#200	0.074	297.43	84.4	15.6	-	-
#270	0.053	315.8	89.6	10.4	-	-



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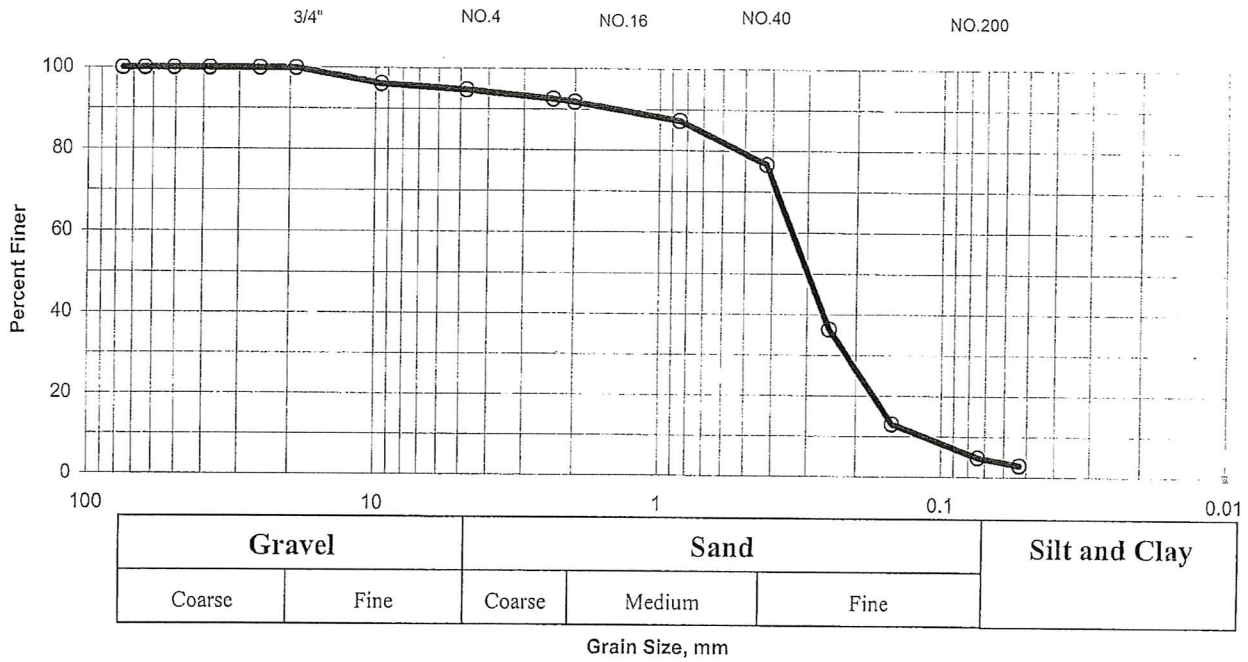
GRAIN SIZE ANALYSIS - MECHANICAL

Date	Project	Project No.		Soil Description
4/25/2011	Slocum Property	KE110151A		Sand trace gravel trace silt
Tested By	Location	EB/EP No	Depth	Intended Use / Specification
MS	Onsite	EP-7	3-4'	

Wt. of moisture wet sample + Tare	250.3	Total Sample Tare	519.67
Wt. of moisture dry Sample + Tare	240.52	Total Sample wt + tare	842.08
Wt. of Tare	94.88	Total Sample Wt	322.4
Wt. of moisture Dry Sample	145.64	Total Sample Dry Wt	302.1
Moisture %	7%		

					Specification Requirements	
Sieve No.	Diam. (mm)	Wt. Retained (g)	% Retained	% Passing	Minimum	Maximum
3	76.1		0.0	100.0	-	-
2.5	64		0.0	100.0	-	-
2	50.8		0.0	100.0	-	-
1.5	38.1		0.0	100.0	-	-
1	25.4		0.0	100.0	-	-
3/4	19		0.0	100.0	-	-
3/8	9.51	11.68	3.9	96.1	-	-
#4	4.76	15.92	5.3	94.7	-	-
#8	2.38	22.47	7.4	92.6	-	-
#10	2	24.5	8.1	91.9	-	-
#20	0.85	38.32	12.7	87.3	-	-
#40	0.42	70.55	23.4	76.6	-	-
#60	0.25	192.38	63.7	36.3	-	-
#100	0.149	262.69	86.9	13.1	-	-
#200	0.074	287.66	95.2	4.8	-	-
#270	0.053	293.42	97.1	2.9	-	-

US STANDARD SIEVE NOS.



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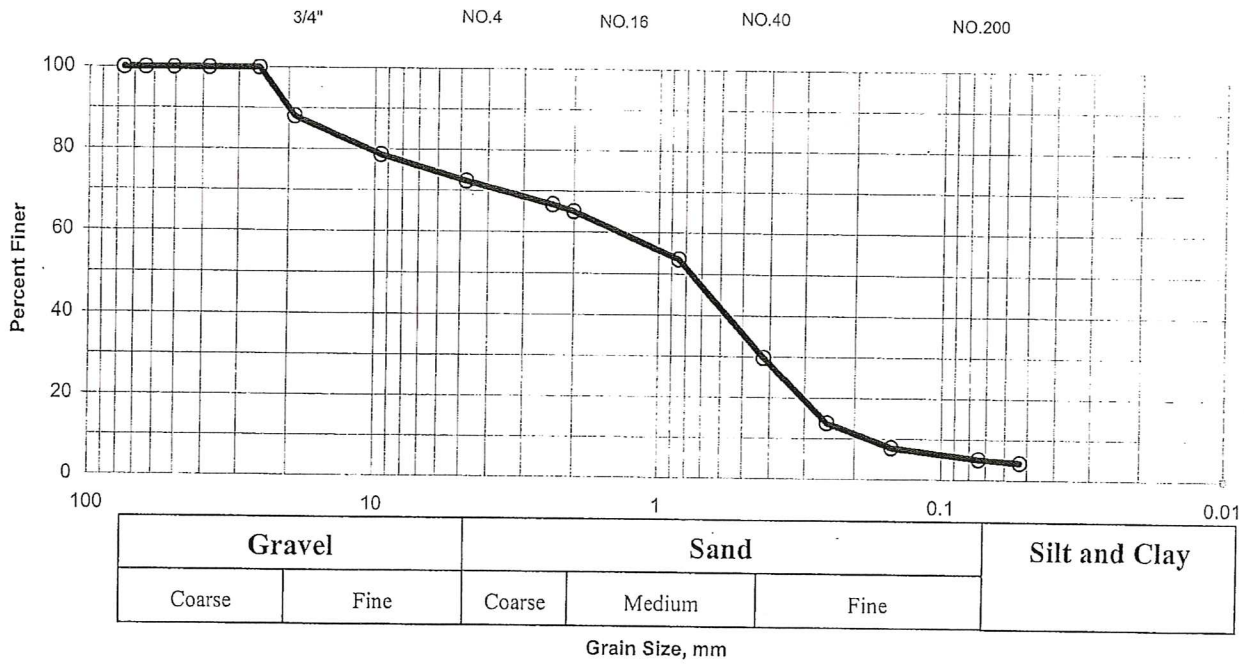
GRAIN SIZE ANALYSIS - MECHANICAL

Date	Project	Project No.		Soil Description
4/25/2011	Slocum Property	KE110151A		Sand with gravel trace silt
Tested By	Location	EB/EP No	Depth	Intended Use / Specification
MS	Onsite	EP-8	3-4'	

Wt. of moisture wet sample + Tare	326.71	Total Sample Tare	518.34
Wt. of moisture dry Sample + Tare	302.94	Total Sample wt + tare	921.04
Wt. of Tare	99.25	Total Sample Wt	402.7
Wt. of moisture Dry Sample	203.69	Total Sample Dry Wt	360.6
Moisture %	12%		

Sieve No.	Diam. (mm)	Wt. Retained (g)	% Retained	% Passing	Specification Requirements	
					Minimum	Maximum
3	76.1		0.0	100.0	-	-
2.5	64		0.0	100.0	-	-
2	50.8		0.0	100.0	-	-
1.5	38.1		0.0	100.0	-	-
1	25.4		0.0	100.0	-	-
3/4	19	43.09	11.9	88.1	-	-
3/8	9.51	76.68	21.3	78.7	-	-
#4	4.76	99.48	27.6	72.4	-	-
#8	2.38	119.81	33.2	66.8	-	-
#10	2	125.8	34.9	65.1	-	-
#20	0.85	167.46	46.4	53.6	-	-
#40	0.42	253.28	70.2	29.8	-	-
#60	0.25	310.74	86.2	13.8	-	-
#100	0.149	332.45	92.2	7.8	-	-
#200	0.074	342.3	94.9	5.1	-	-
#270	0.053	345.24	95.7	4.3	-	-

US STANDARD SIEVE NOS.



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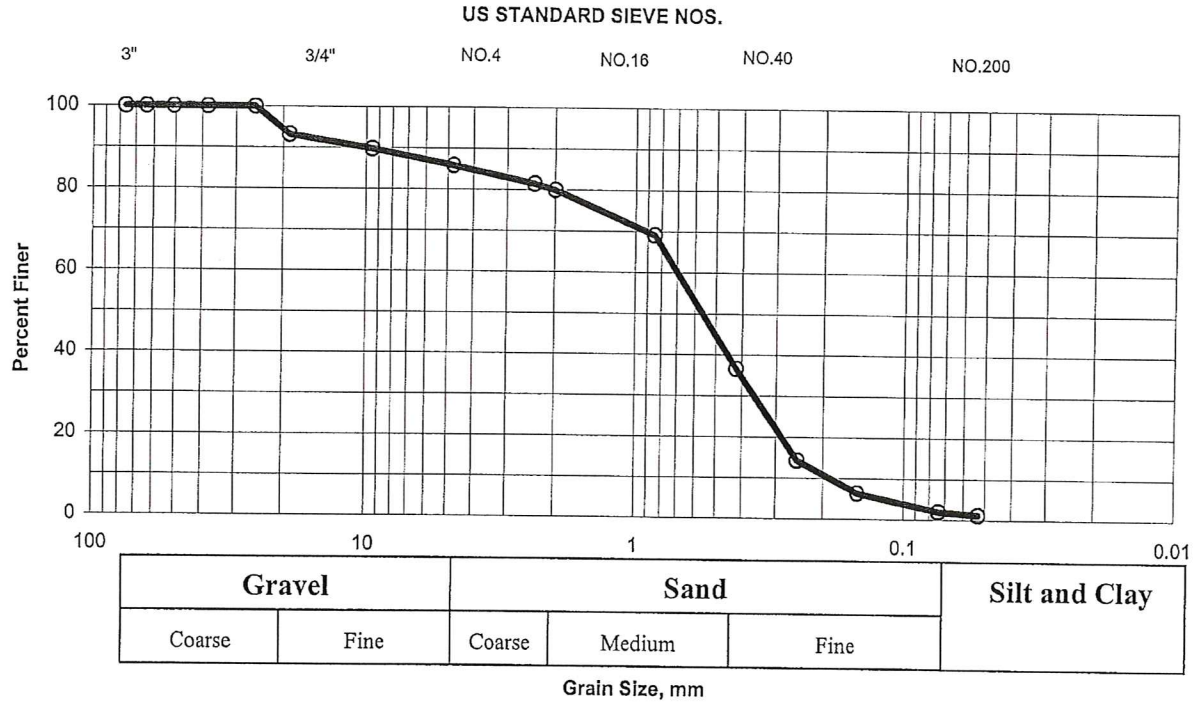
GRAIN SIZE ANALYSIS - MECHANICAL

Date Sampled	Project	Project No.		Soil Description
11/14/2012	**Slocum Property**	**KE110151A**		**Sand few gravel trace silt**
Tested By	Location	EB/EP No	Depth	Intended Use / Specification
MS	**Onsite**	**EP-10**	**15'**	

Wt. of moisture wet sample + Tare	476.26	Total Sample Tare	331.77
Wt. of moisture dry Sample + Tare	453.88	Total Sample wt + tare	1093.56
Wt. of Tare	101.19	Total Sample Wt	761.8
Wt. of moisture Dry Sample	352.69	Total Sample Dry Wt	716.3
Moisture %	6%		

					Specification Requirements	
Sieve No.	Diam. (mm)	Wt. Retained (g)	% Retained	% Passing	Minimum	Maximum
3	76.1		0.0	100.0	-	-
2.5	64		0.0	100.0	-	-
2	50.8		0.0	100.0	-	-
1.5	38.1		0.0	100.0	-	-
1	25.4		0.0	100.0	-	-
3/4	19	48.73	6.8	93.2	-	-
3/8	9.51	72.97	10.2	89.8	-	-
#4	4.76	101.89	14.2	85.8	-	-
#8	2.38	133.27	18.6	81.4	-	-
#10	2	143.79	20.1	79.9	-	-
#20	0.85	220.96	30.8	69.2	-	-
#40	0.42	454.54	63.5	36.5	-	-
#60	0.25	614.03	85.7	14.3	-	-
#100	0.149	670.75	93.6	6.4	-	-
#200	0.074	702.2	98.0	2.0	-	-
#270	0.053	708.09	98.8	1.2	-	-



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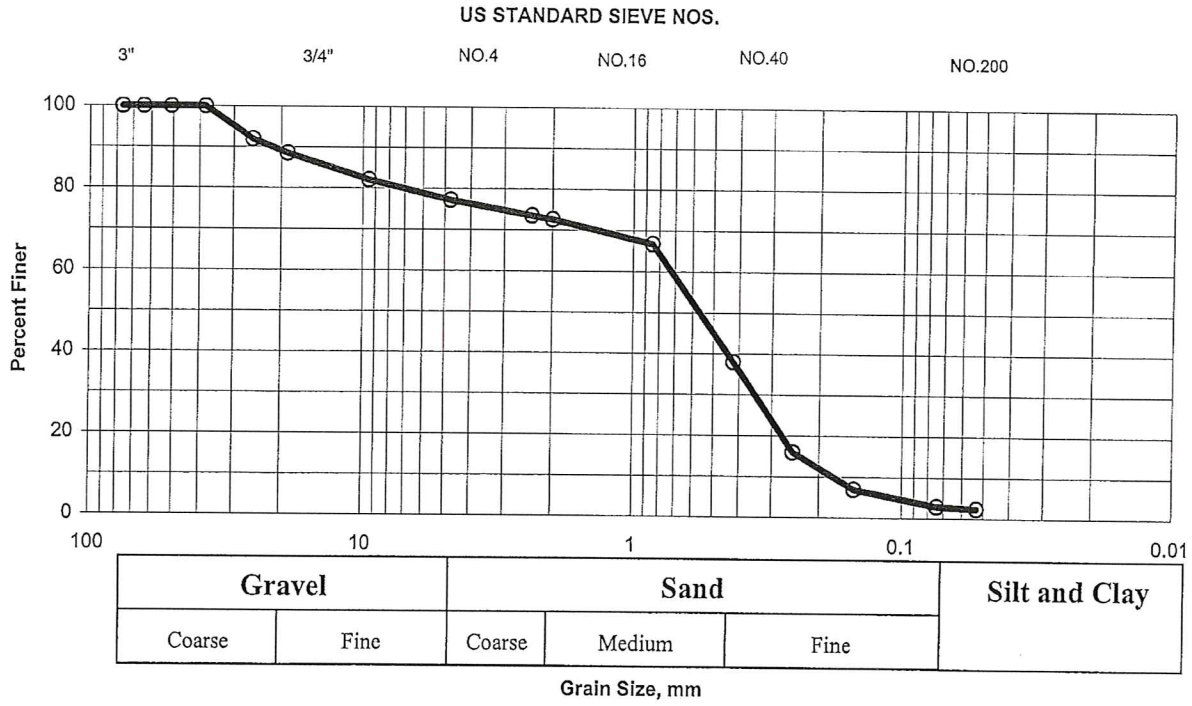
GRAIN SIZE ANALYSIS - MECHANICAL

Date Sampled	Project	Project No.		Soil Description
11/14/2012	**Slocum Property**	**KE110151A**		**Sand little gravel trace silt**
Tested By	Location	EB/EP No	Depth	Intended Use / Specification
MS	**Onsite**	**EP-10**	**18'**	

Wt. of moisture wet sample + Tare	486.1	Total Sample Tare	296.61
Wt. of moisture dry Sample + Tare	474.28	Total Sample wt + tare	1169.82
Wt. of Tare	98.39	Total Sample Wt	873.2
Wt. of moisture Dry Sample	375.89	Total Sample Dry Wt	846.6
Moisture %	3%		

					Specification Requirements	
Sieve No.	Diam. (mm)	Wt. Retained (g)	% Retained	% Passing	Minimum	Maximum
3	76.1		0.0	100.0	-	-
2.5	64		0.0	100.0	-	-
2	50.8		0.0	100.0	-	-
1.5	38.1		0.0	100.0	-	-
1	25.4	68.16	8.1	91.9	-	-
3/4	19	96.82	11.4	88.6	-	-
3/8	9.51	151.78	17.9	82.1	-	-
#4	4.76	192.88	22.8	77.2	-	-
#8	2.38	224.19	26.5	73.5	-	-
#10	2	231.63	27.4	72.6	-	-
#20	0.85	281.63	33.3	66.7	-	-
#40	0.42	525.32	62.1	37.9	-	-
#60	0.25	711.44	84.0	16.0	-	-
#100	0.149	787.82	93.1	6.9	-	-
#200	0.074	821.89	97.1	2.9	-	-
#270	0.053	826.32	97.6	2.4	-	-



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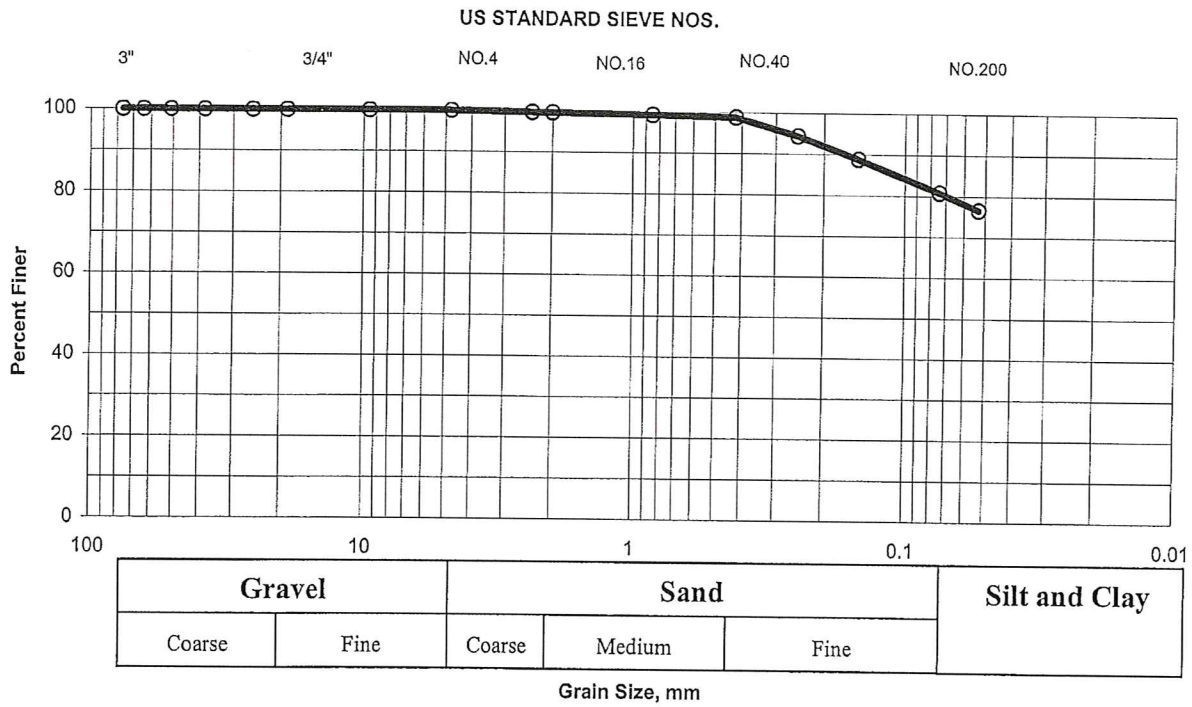
GRAIN SIZE ANALYSIS - MECHANICAL

Date Sampled	Project	Project No.		Soil Description
11/14/2012	Slocum Property	KE110151A		Silt little sand
Tested By	Location	EB/EP No	Depth	Intended Use / Specification
MS	Onsite	EP-11	13'	

Wt. of moisture wet sample + Tare	364.34	Total Sample Tare	395.43
Wt. of moisture dry Sample + Tare	324.9	Total Sample wt + tare	1061.62
Wt. of Tare	100.99	Total Sample Wt	666.2
Wt. of moisture Dry Sample	223.91	Total Sample Dry Wt	566.4
Moisture %	18%		

					Specification Requirements	
Sieve No.	Diam. (mm)	Wt. Retained (g)	% Retained	% Passing	Minimum	Maximum
3	76.1		0.0	100.0	-	-
2.5	64		0.0	100.0	-	-
2	50.8		0.0	100.0	-	-
1.5	38.1		0.0	100.0	-	-
1	25.4		0.0	100.0	-	-
3/4	19		0.0	100.0	-	-
3/8	9.51		0.0	100.0	-	-
#4	4.76		0.0	100.0	-	-
#8	2.38	1.6	0.3	99.7	-	-
#10	2	2.16	0.4	99.6	-	-
#20	0.85	4.2	0.7	99.3	-	-
#40	0.42	6.68	1.2	98.8	-	-
#60	0.25	31.79	5.6	94.4	-	-
#100	0.149	63.29	11.2	88.8	-	-
#200	0.074	108.66	19.2	80.8	-	-
#270	0.053	132.68	23.4	76.6	-	-



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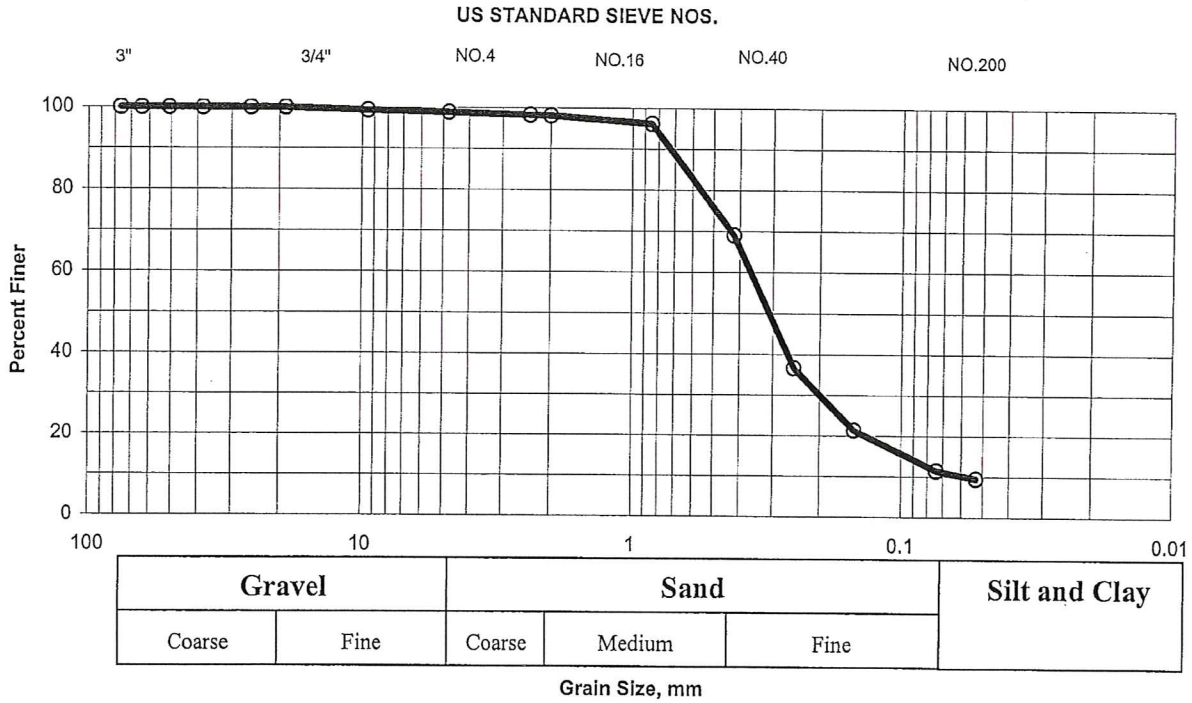
GRAIN SIZE ANALYSIS - MECHANICAL

Date Sampled	Project	Project No.		Soil Description
11/14/2012	Slocum Property	KE110151A		Sand few silt trace gravel
Tested By	Location	EB/EP No	Depth	Intended Use / Specification
MS	Onsite	EP-11	17.5'	

Wt. of moisture wet sample + Tare	333.06	Total Sample Tare	296.19
Wt. of moisture dry Sample + Tare	318.62	Total Sample wt + tare	804.44
Wt. of Tare	101.12	Total Sample Wt	508.3
Wt. of moisture Dry Sample	217.5	Total Sample Dry Wt	476.6
Moisture %	7%		

					Specification Requirements	
Sieve No.	Diam. (mm)	Wt. Retained (g)	% Retained	% Passing	Minimum	Maximum
3	76.1		0.0	100.0	-	-
2.5	64		0.0	100.0	-	-
2	50.8		0.0	100.0	-	-
1.5	38.1		0.0	100.0	-	-
1	25.4		0.0	100.0	-	-
3/4	19		0.0	100.0	-	-
3/8	9.51	3.02	0.6	99.4	-	-
#4	4.76	5.46	1.1	98.9	-	-
#8	2.38	7.96	1.7	98.3	-	-
#10	2	8.86	1.9	98.1	-	-
#20	0.85	17.94	3.8	96.2	-	-
#40	0.42	147.47	30.9	69.1	-	-
#60	0.25	302.11	63.4	36.6	-	-
#100	0.149	375.09	78.7	21.3	-	-
#200	0.074	422.34	88.6	11.4	-	-
#270	0.053	431.36	90.5	9.5	-	-



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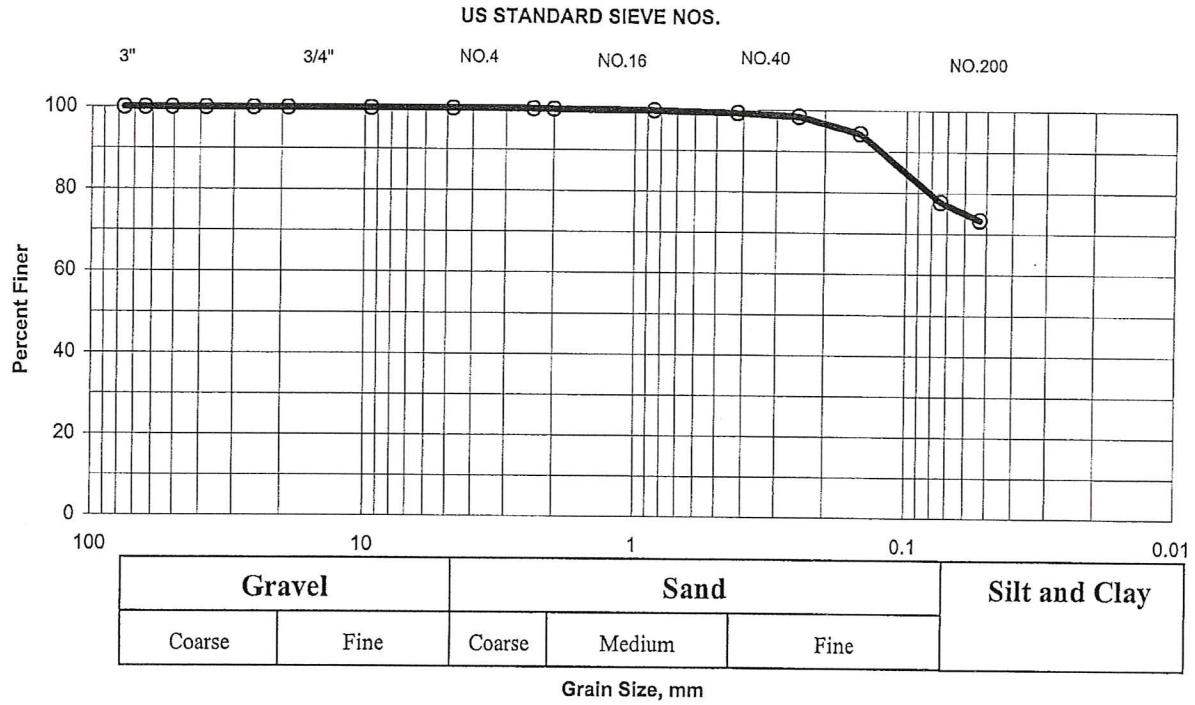
GRAIN SIZE ANALYSIS - MECHANICAL

Date Sampled	Project	Project No.		Soil Description
11/14/2012	Slocum Property	KE110151A		Silt with sand
Tested By	Location	EB/EP No	Depth	Intended Use / Specification
MS	Onsite	EP-12	16'	

Wt. of moisture wet sample + Tare	440.99	Total Sample Tare	408.61
Wt. of moisture dry Sample + Tare	374.45	Total Sample wt + tare	1188.26
Wt. of Tare	101.03	Total Sample Wt	779.7
Wt. of moisture Dry Sample	273.42	Total Sample Dry Wt	627.0
Moisture %	24%		

Sieve No.	Diam. (mm)	Wt. Retained (g)	% Retained	% Passing	Specification Requirements Minimum	Maximum
3	76.1		0.0	100.0	-	-
2.5	64		0.0	100.0	-	-
2	50.8		0.0	100.0	-	-
1.5	38.1		0.0	100.0	-	-
1	25.4		0.0	100.0	-	-
3/4	19		0.0	100.0	-	-
3/8	9.51		0.0	100.0	-	-
#4	4.76		0.0	100.0	-	-
#8	2.38		0.0	100.0	-	-
#10	2	0.3	0.0	100.0	-	-
#20	0.85	1.8	0.3	99.7	-	-
#40	0.42	4.99	0.8	99.2	-	-
#60	0.25	9.87	1.6	98.4	-	-
#100	0.149	35.63	5.7	94.3	-	-
#200	0.074	139.89	22.3	77.7	-	-
#270	0.053	167.22	26.7	73.3	-	-



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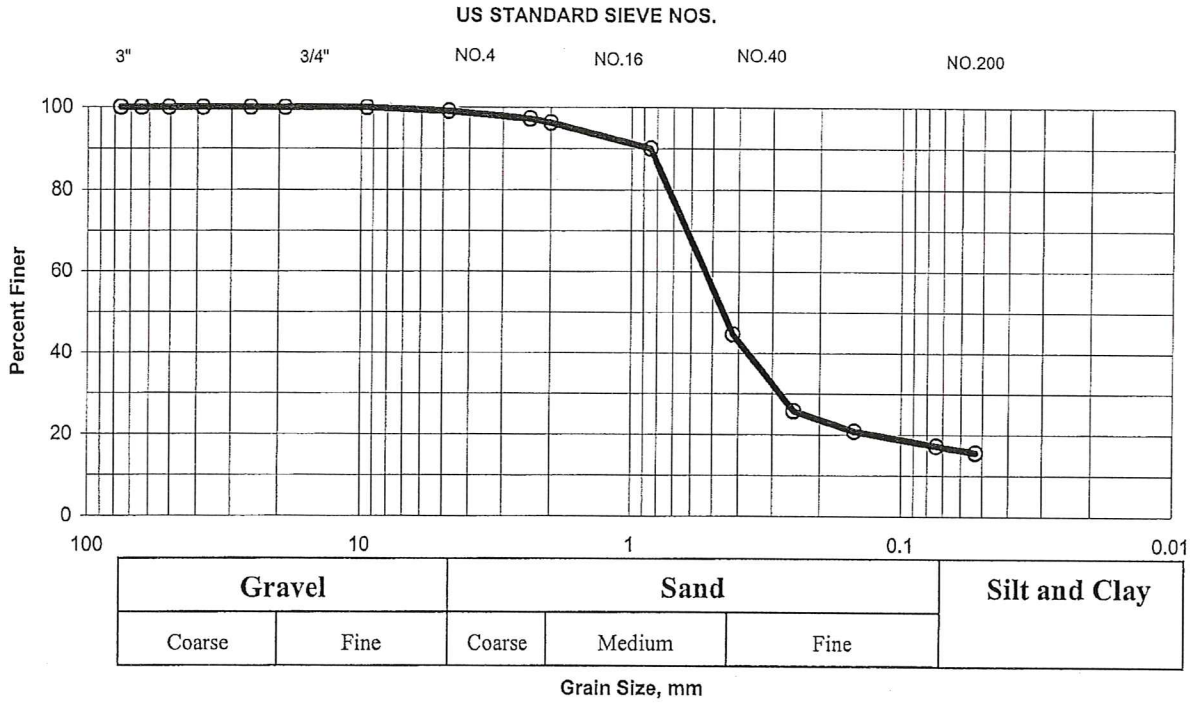
GRAIN SIZE ANALYSIS - MECHANICAL

Date Sampled	Project	Project No.		Soil Description
11/14/2012	Slocum Property	KE110151A		Sand trace gravel little silt
Tested By	Location	EB/EP No	Depth	Intended Use / Specification
MS	Onsite	EP-13	13'	

Wt. of moisture wet sample + Tare	408.4	Total Sample Tare	391.15
Wt. of moisture dry Sample + Tare	387.85	Total Sample wt + tare	1111.71
Wt. of Tare	97.62	Total Sample Wt	720.6
Wt. of moisture Dry Sample	290.23	Total Sample Dry Wt	672.9
Moisture %	7%		

					Specification Requirements	
Sieve No.	Diam. (mm)	Wt. Retained (g)	% Retained	% Passing	Minimum	Maximum
3	76.1		0.0	100.0	-	-
2.5	64		0.0	100.0	-	-
2	50.8		0.0	100.0	-	-
1.5	38.1		0.0	100.0	-	-
1	25.4		0.0	100.0	-	-
3/4	19		0.0	100.0	-	-
3/8	9.51		0.0	100.0	-	-
#4	4.76	5.94	0.9	99.1	-	-
#8	2.38	18.66	2.8	97.2	-	-
#10	2	25.02	3.7	96.3	-	-
#20	0.85	66.78	9.9	90.1	-	-
#40	0.42	372.55	55.4	44.6	-	-
#60	0.25	499.8	74.3	25.7	-	-
#100	0.149	533.03	79.2	20.8	-	-
#200	0.074	556.66	82.7	17.3	-	-
#270	0.053	567.82	84.4	15.6	-	-



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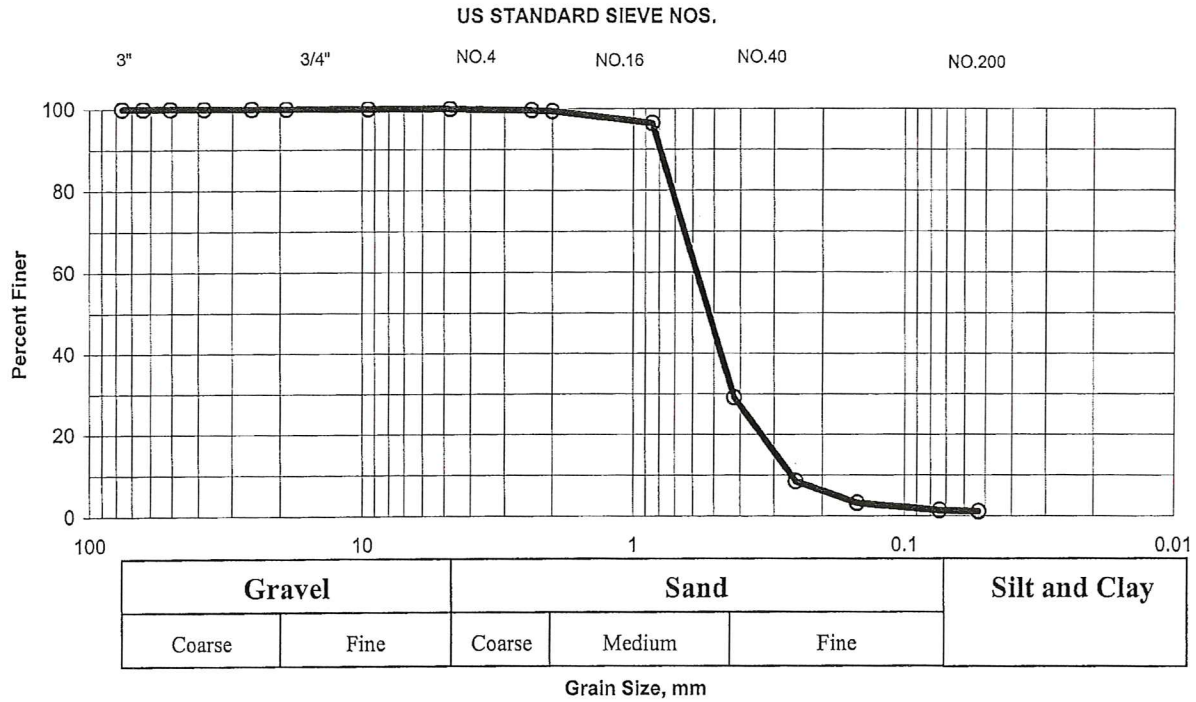
GRAIN SIZE ANALYSIS - MECHANICAL

Date Sampled	Project	Project No.		Soil Description
11/14/2012	Slocum Property	KE110151A		Sand trace silt
Tested By	Location	EB/EP No	Depth	Intended Use / Specification
MS	Onsite	EP-13	15'	

Wt. of moisture wet sample + Tare	478.1	Total Sample Tare	509.67
Wt. of moisture dry Sample + Tare	464.51	Total Sample wt + tare	1282.99
Wt. of Tare	100.66	Total Sample Wt	773.3
Wt. of moisture Dry Sample	363.85	Total Sample Dry Wt	745.5
Moisture %	4%		

					Specification Requirements	
Sieve No.	Diam. (mm)	Wt. Retained (g)	% Retained	% Passing	Minimum	Maximum
3	76.1		0.0	100.0	-	-
2.5	64		0.0	100.0	-	-
2	50.8		0.0	100.0	-	-
1.5	38.1		0.0	100.0	-	-
1	25.4		0.0	100.0	-	-
3/4	19		0.0	100.0	-	-
3/8	9.51		0.0	100.0	-	-
#4	4.76		0.0	100.0	-	-
#8	2.38	2.51	0.3	99.7	-	-
#10	2	4.47	0.6	99.4	-	-
#20	0.85	26.43	3.5	96.5	-	-
#40	0.42	528.85	70.9	29.1	-	-
#60	0.25	682.03	91.5	8.5	-	-
#100	0.149	721.58	96.8	3.2	-	-
#200	0.074	734.88	98.6	1.4	-	-
#270	0.053	736.97	98.9	1.1	-	-



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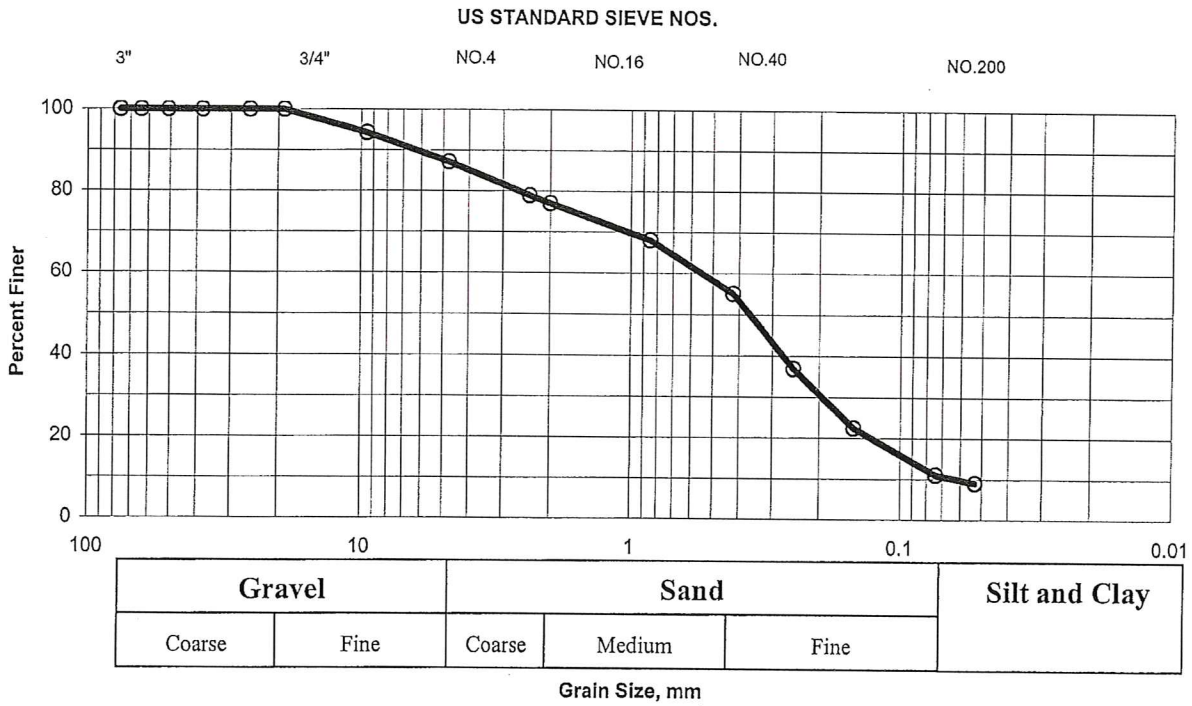
GRAIN SIZE ANALYSIS - MECHANICAL

Date Sampled	Project	Project No.		Soil Description
11/14/2012	Slocum Property	KE110151A		Sand few gravel few silt
Tested By	Location	EB/EP No	Depth	Intended Use / Specification
MS	Onsite	EP-14	3'	

Wt. of moisture wet sample + Tare	413.47	Total Sample Tare	343.35
Wt. of moisture dry Sample + Tare	395.2	Total Sample wt + tare	1040.36
Wt. of Tare	100.77	Total Sample Wt	697.0
Wt. of moisture Dry Sample	294.43	Total Sample Dry Wt	656.3
Moisture %	6%		

					Specification Requirements	
Sieve No.	Diam. (mm)	Wt. Retained (g)	% Retained	% Passing	Minimum	Maximum
3	76.1		0.0	100.0	-	-
2.5	64		0.0	100.0	-	-
2	50.8		0.0	100.0	-	-
1.5	38.1		0.0	100.0	-	-
1	25.4		0.0	100.0	-	-
3/4	19		0.0	100.0	-	-
3/8	9.51	37.23	5.7	94.3	-	-
#4	4.76	84.27	12.8	87.2	-	-
#8	2.38	137.72	21.0	79.0	-	-
#10	2	150.73	23.0	77.0	-	-
#20	0.85	209.42	31.9	68.1	-	-
#40	0.42	295.11	45.0	55.0	-	-
#60	0.25	414.46	63.2	36.8	-	-
#100	0.149	508.92	77.5	22.5	-	-
#200	0.074	583.76	88.9	11.1	-	-
#270	0.053	596.92	91.0	9.0	-	-



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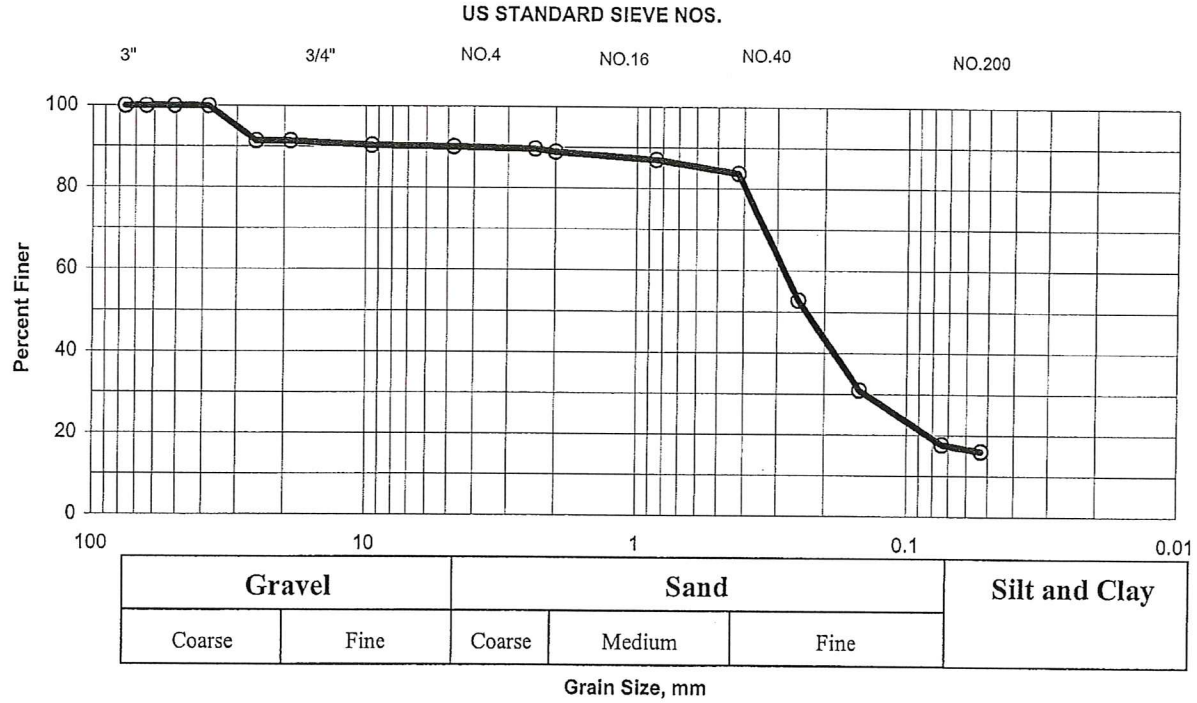
GRAIN SIZE ANALYSIS - MECHANICAL

Date Sampled	Project	Project No.		Soil Description
11/14/2012	**Slocum Property**	**KE110151A**		**Sand little silt few gravel**
Tested By	Location	EB/EP No	Depth	Intended Use / Specification
MS	**Onsite**	**EP-14**	**5'**	

Wt. of moisture wet sample + Tare	377.66	Total Sample Tare	325.85
Wt. of moisture dry Sample + Tare	361.03	Total Sample wt + tare	1020.36
Wt. of Tare	99.81	Total Sample Wt	694.5
Wt. of moisture Dry Sample	261.22	Total Sample Dry Wt	652.9
Moisture %	6%		

					Specification Requirements	
Sieve No.	Diam. (mm)	Wt. Retained (g)	% Retained	% Passing	Minimum	Maximum
3	76.1		0.0	100.0	-	-
2.5	64		0.0	100.0	-	-
2	50.8		0.0	100.0	-	-
1.5	38.1		0.0	100.0	-	-
1	25.4	56.27	8.6	91.4	-	-
3/4	19	56.27	8.6	91.4	-	-
3/8	9.51	62.73	9.6	90.4	-	-
#4	4.76	64.68	9.9	90.1	-	-
#8	2.38	67.89	10.4	89.6	-	-
#10	2	72.3	11.1	88.9	-	-
#20	0.85	84.54	12.9	87.1	-	-
#40	0.42	106.55	16.3	83.7	-	-
#60	0.25	308.54	47.3	52.7	-	-
#100	0.149	450.98	69.1	30.9	-	-
#200	0.074	537.89	82.4	17.6	-	-
#270	0.053	548.64	84.0	16.0	-	-



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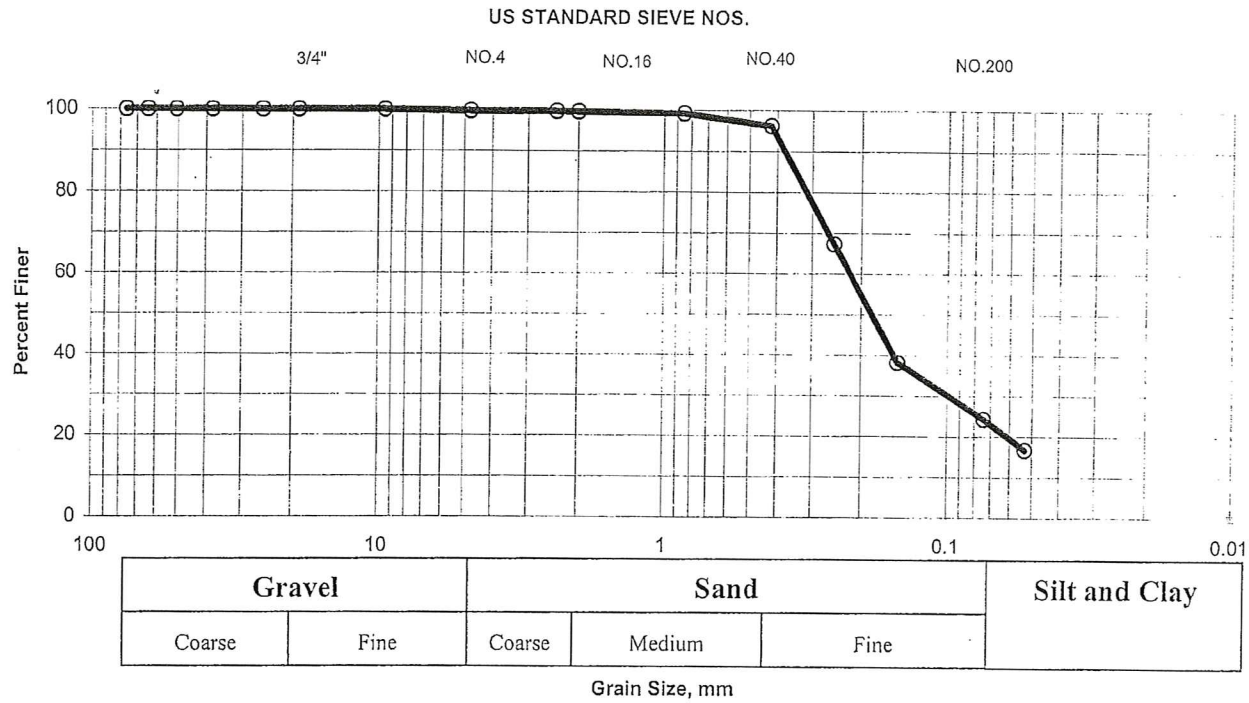
GRAIN SIZE ANALYSIS - MECHANICAL

Date	Project	Project No.		Soil Description
8/26/2011	Slocum Property	KE110151A		Sand little silt trace gravel
Tested By	Location	EB/EP No	Depth	Intended Use / Specification
JC	Onsite	IT-1	14.5'	

Wt. of moisture wet sample + Tare	526.46	Total Sample Tare	519.2
Wt. of moisture dry Sample + Tare	447.54	Total Sample wt + tare	1070.32
Wt. of Tare	99.87	Total Sample Wt	551.1
Wt. of moisture Dry Sample	347.67	Total Sample Dry Wt	449.2
Moisture %	23%		

					Specification Requirements	
Sieve No.	Diam. (mm)	Wt. Retained (g)	% Retained	% Passing	Minimum	Maximum
3	76.1		0.0	100.0	-	-
2.5	64		0.0	100.0	-	-
2	50.8		0.0	100.0	-	-
1.5	38.1		0.0	100.0	-	-
1	25.4		0.0	100.0	-	-
3/4	19		0.0	100.0	-	-
3/8	9.51		0.0	100.0	-	-
#4	4.76	1.19	0.3	99.7	-	-
#8	2.38	1.8	0.4	99.6	-	-
#10	2	2.13	0.5	99.5	-	-
#20	0.85	3.77	0.8	99.2	-	-
#40	0.42	16.88	3.8	96.2	-	-
#60	0.25	146.6	32.6	67.4	-	-
#100	0.149	277.58	61.8	38.2	-	-
#200	0.074	340.23	75.7	24.3	-	-
#270	0.053	373.95	83.3	16.7	-	-



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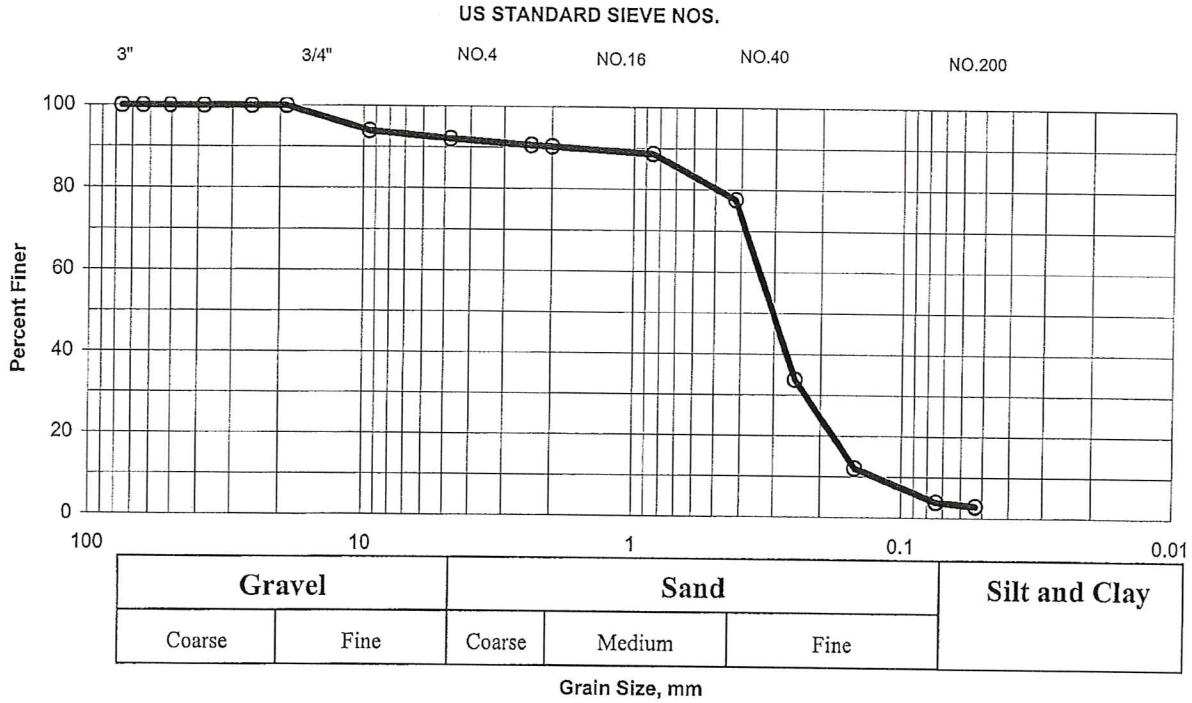
GRAIN SIZE ANALYSIS - MECHANICAL

Date Sampled	Project	Project No.		Soil Description
11/14/2012	Slocum Property	KE110151A		Sand few gravel trace silt
Tested By	Location	EB/EP No	Depth	Intended Use / Specification
MS	Onsite	IT-2	14'	

Wt. of moisture wet sample + Tare	402.31	Total Sample Tare	394.14
Wt. of moisture dry Sample + Tare	390.8	Total Sample wt + tare	1009.82
Wt. of Tare	101.78	Total Sample Wt	615.7
Wt. of moisture Dry Sample	289.02	Total Sample Dry Wt	592.1
Moisture %	4%		

					Specification Requirements	
Sieve No.	Diam. (mm)	Wt. Retained (g)	% Retained	% Passing	Minimum	Maximum
3	76.1		0.0	100.0	-	-
2.5	64		0.0	100.0	-	-
2	50.8		0.0	100.0	-	-
1.5	38.1		0.0	100.0	-	-
1	25.4		0.0	100.0	-	-
3/4	19		0.0	100.0	-	-
3/8	9.51	35.92	6.1	93.9	-	-
#4	4.76	47.07	7.9	92.1	-	-
#8	2.38	55.72	9.4	90.6	-	-
#10	2	57.46	9.7	90.3	-	-
#20	0.85	66.9	11.3	88.7	-	-
#40	0.42	132.93	22.5	77.5	-	-
#60	0.25	392.26	66.2	33.8	-	-
#100	0.149	520.77	88.0	12.0	-	-
#200	0.074	569.11	96.1	3.9	-	-
#270	0.053	574.92	97.1	2.9	-	-



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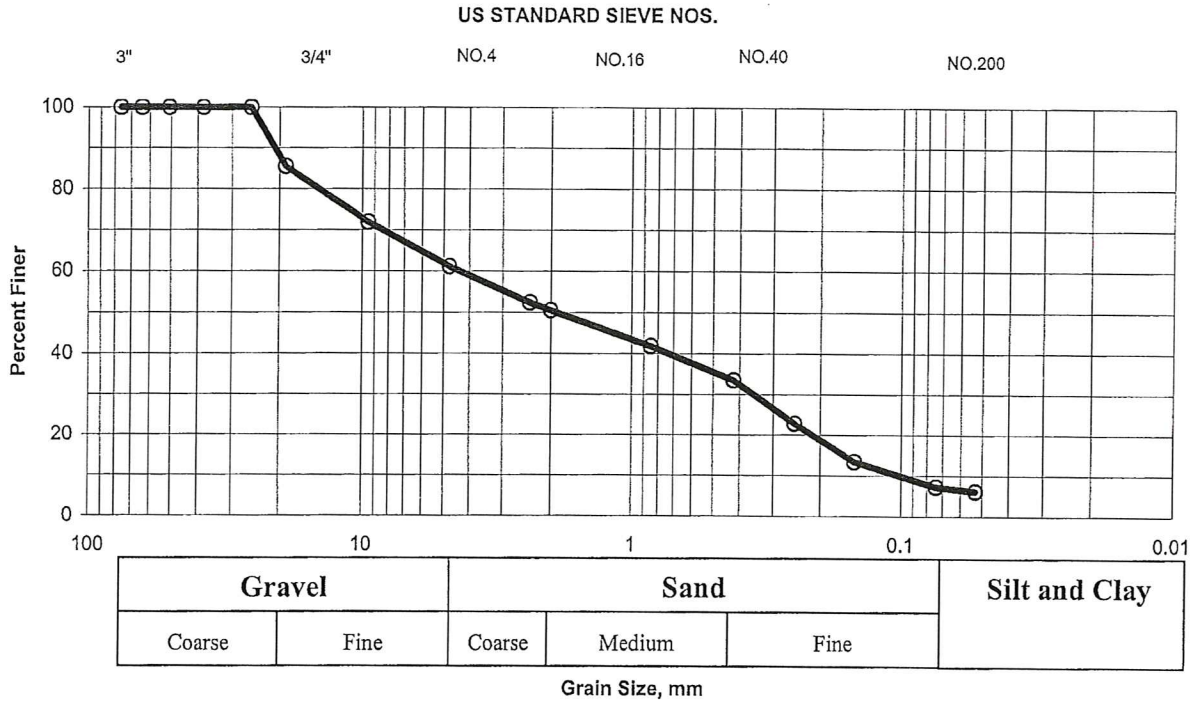
GRAIN SIZE ANALYSIS - MECHANICAL

Date Sampled	Project	Project No.		Soil Description
11/14/2012	Slocum Property	KE110151A		Sand with gravel few silt
Tested By	Location	EB/EP No	Depth	Intended Use / Specification
MS	Onsite	IT-2	17'	

Wt. of moisture wet sample + Tare	624.97	Total Sample Tare	296.24
Wt. of moisture dry Sample + Tare	602.79	Total Sample wt + tare	1131.17
Wt. of Tare	99.2	Total Sample Wt	834.9
Wt. of moisture Dry Sample	503.59	Total Sample Dry Wt	799.7
Moisture %	4%		

					Specification Requirements	
Sieve No.	Diam. (mm)	Wt. Retained (g)	% Retained	% Passing	Minimum	Maximum
3	76.1		0.0	100.0	-	-
2.5	64		0.0	100.0	-	-
2	50.8		0.0	100.0	-	-
1.5	38.1		0.0	100.0	-	-
1	25.4		0.0	100.0	-	-
3/4	19	116.1	14.5	85.5	-	-
3/8	9.51	224.16	28.0	72.0	-	-
#4	4.76	310.74	38.9	61.1	-	-
#8	2.38	381.46	47.7	52.3	-	-
#10	2	395.77	49.5	50.5	-	-
#20	0.85	465.32	58.2	41.8	-	-
#40	0.42	532.03	66.5	33.5	-	-
#60	0.25	617.27	77.2	22.8	-	-
#100	0.149	692.45	86.6	13.4	-	-
#200	0.074	741.7	92.7	7.3	-	-
#270	0.053	750.77	93.9	6.1	-	-



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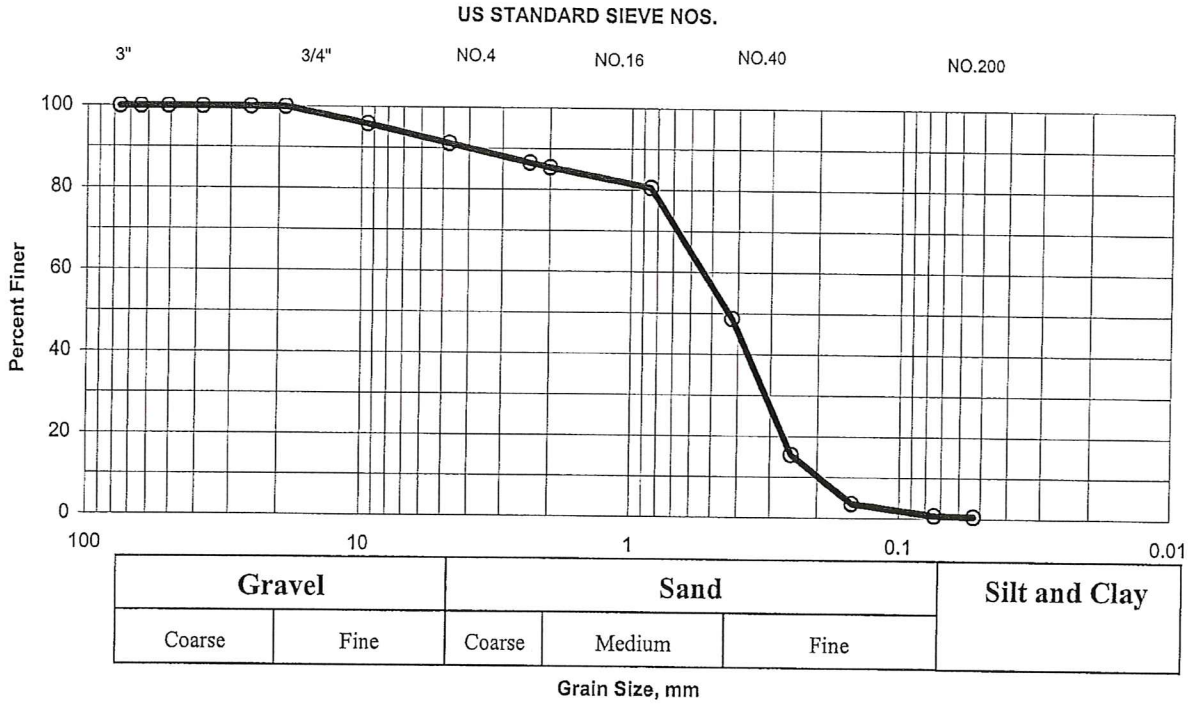
GRAIN SIZE ANALYSIS - MECHANICAL

Date Sampled	Project	Project No.		Soil Description
11/14/2012	Slocum Property	KE110151A		Sand few gravel trace silt
Tested By	Location	EB/EP No	Depth	Intended Use / Specification
MS	Onsite	PD-1	16'	

Wt. of moisture wet sample + Tare	507.99	Total Sample Tare	313.42
Wt. of moisture dry Sample + Tare	494.57	Total Sample wt + tare	1096.22
Wt. of Tare	100.01	Total Sample Wt	782.8
Wt. of moisture Dry Sample	394.56	Total Sample Dry Wt	757.1
Moisture %	3%		

Sieve No.	Diam. (mm)	Wt. Retained (g)	% Retained	% Passing	Specification Requirements	
					Minimum	Maximum
3	76.1		0.0	100.0	-	-
2.5	64		0.0	100.0	-	-
2	50.8		0.0	100.0	-	-
1.5	38.1		0.0	100.0	-	-
1	25.4		0.0	100.0	-	-
3/4	19		0.0	100.0	-	-
3/8	9.51	31.46	4.2	95.8	-	-
#4	4.76	66.64	8.8	91.2	-	-
#8	2.38	102.24	13.5	86.5	-	-
#10	2	110.14	14.5	85.5	-	-
#20	0.85	146.93	19.4	80.6	-	-
#40	0.42	388.58	51.3	48.7	-	-
#60	0.25	639.96	84.5	15.5	-	-
#100	0.149	730.02	96.4	3.6	-	-
#200	0.074	751.47	99.3	0.7	-	-
#270	0.053	753.26	99.5	0.5	-	-



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