associated
earth sciences
incorporated

August 25, 2015
Project No. KE150494A

MainStreet Property Group, LLC
12332 NE 115th Place
Kirkland, Washington 98033

Attention: Ms. Kim Faust

Subject: Geotechnical Engineering Report Review
East Lake Sammamish Property Report Review
6006 East Lake Sammamish Parkway
Redmond, Washington

Dear Ms. Faust:

Associated Earth Sciences, Inc. (AESI) has completed a review of the geotechnical report for the project located at approximately 6006 East Lake Sammamish Parkway, in Redmond, Washington. It is our understanding that the proposed development may consist of a multi-level, mixed-use residential/ commercial structure with potentially a level of underground parking. A geotechnical report for the site was prepared by GeoEngineers and is dated June 16, 2015. In their report, GeoEngineers specifically address the following key geotechnical considerations: 1) the nature and extent of fill soils and the depth to glacially consolidated soils, 2) preliminary allowable bearing pressures for shallow foundations, 3) appropriate temporary shoring options, and 4) an assessment of the ground water conditions at the site. From our site visit and report review, we generally agree with the conclusions in the report and provide the additional comments:

Preliminary allowable bearing pressures for shallow foundations:

GeoEngineers recommends an allowable soil bearing pressure between 4,000 and 6,000 pounds per square foot (psf) for isolated spread footings and continuous footings. We recommend use of these values only on native, glacially consolidated soils. We suggest an allowable soil bearing pressure of 3,000 psf for footings founded on structural fill or a mix of structural fill and native soils. For footings founded on recent alluvium, we suggest an allowable bearing pressure of 2,000 psf. We do not recommend leaving uncontrolled fill beneath foundations.

An assessment of the ground water conditions at the site:

Ground water was encountered in GeoEngineers' explorations between 15 and 25 feet below current site grades. GeoEngineers interprets the ground water to be perched ground water on top of the very dense/hard glacially consolidated soils. This appears to be the case in one of the borings, but the presence of water in boring GEI-2, GEI-3 and GEI-4 could represent a regional aquifer within the Vashon advance outwash soil unit. Ground water was encountered at elevations between 59 and 66 feet above sea level (asl) in these three borings. Based on our understanding of current development plans, we anticipate the static ground water table is below the base of planned excavations.

We hope this information serves your present needs. If you have any questions, please call.

Sincerely,
ASSOCIATED EARTH SCIENCES, INC.
Kirkland, Washington

Kurt D. Merriman, P.E.
Senior Principal Engineer

KDM/ld
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GeoEngineers
8410 154th Avenue NE
Redmond, Washington 98052
425.861.6000

June 16, 2015

Wolff Enterprises II, LLC
911 East Pike Street, Suite 310
Seattle, Washington 98122

Attention: Chris Rossman

Subject: Geotechnical Due Diligence Services
Proposed Redmond Senior Living Development
6006 East Lake Sammamish Parkway.
Redmond, Washington
File No. 12406-012-00

INTRODUCTION

This letter summarizes the key geotechnical considerations for the proposed Redmond Senior Living Community project at 6006 East Lake Sammamish Parkway in Redmond, Washington. In preparing this letter, GeoEngineers reviewed existing information and exploration logs in the site vicinity available in our library and through other resources. In addition, GeoEngineers completed four borings at the site to better characterize the subsurface and groundwater conditions. GeoEngineers' services have been completed in accordance with our services agreement with Wolff Enterprises II, LLC executed on May 18, 2015.

PROJECT DESCRIPTION

GeoEngineers understands that Wolff Enterprises II, LLC is interested in redeveloping seven King County parcels (1318300120, 1318300125, 1318300142, 1318300144, 1318300156, 1318300164 and 1825069025). The site is shown relative to surrounding physical features on the Vicinity Map (Figure 1) and the Site Plan (Figure 2).

The site is irregularly shaped and bounded by multi-family housing to the northwest, multi-family housing to the southeast, the Redmond – Fall City Road (SR 202) to the northeast and East Lake Sammamish Parkway NE to the southwest. The approximately 3.5-acre site is currently occupied by several single family residential buildings. The proposed development plan includes construction of four buildings with up to four stories and either partial below-grade parking or surface parking around each of the buildings. The main access to the site will be located off of East Lake Sammamish Parkway NE with service access located along SR 202.

The key geotechnical considerations that GeoEngineers has investigated as part of this evaluation include: (1) the nature and extent of fill soils and the depth to glacially consolidated soils below the building footprint, (2) preliminary allowable bearing pressures for shallow foundations and (3) appropriate temporary shoring options, and (4) an assessment of the groundwater conditions at the site. Preliminary geotechnical recommendations related to these key issues along with a summary of known subsurface conditions are presented in the following sections.

FIELD EXPLORATIONS AND LABORATORY TESTING

Field Explorations

The subsurface and groundwater conditions at the site were evaluated by GeoEngineers by completing four borings. The explorations (GEI-1 through GEI-4) were completed depths ranging from 21.5 to 41.5 feet below existing site grades. The borings were conducted on May 28, 2015 using a track-mounted Dietrich D-50 drill rig owned and operated by Geologic Drill XL, of Spokane, Washington.

The location of the explorations completed for this project are presented on Figure 2, together with previous explorations in the site vicinity. Details of the field exploration program and the logs of the explorations are presented in Appendix A.

Laboratory Testing

Soil samples were obtained during drilling and were taken to GeoEngineers' laboratory for further evaluation. Selected samples were tested for the determination of the grain size distribution, fines content, and moisture content. A description of the laboratory testing and the test results are presented in Appendix B.

PREVIOUS STUDIES

The logs of explorations completed as part of previous studies in the project vicinity were reviewed as part of this study. The previous studies reviewed are listed in the "References" section at the end of this report.

SITE CONDITIONS

Geology

The project site is located in the Puget Lowland. Our review of available geologic information indicates subsurface conditions in the project area are the result of several episodes of interglacial erosion, scour by glaciers, depositions of glacial and non-glacial sediments, and post-glacial deposition and erosion. The Fraser glaciation is the most recent in western Washington and includes the Vashon stade. Erosion and deposition during and following the Fraser glaciation have resulted in the modern topography of the Puget Lowland.

Alluvium, glacial outwash, glacial till, and glacio-lacustrine deposits are mapped in the project vicinity. Alluvium refers to the recent deposits left behind by the Sammamish River, which typically consist of loose to medium dense sand with variable silt content and occasional gravel with related peat and organic layers. The glacial outwash is deposited by meltwater in front of the glacier as it advances or recedes. Cobbles,

gravel, sand and silt settle out of the meltwater in stratified layers. Glacial outwash may or may not have been consolidated by the glacier. Glacial till is deposited directly by the glacier and typically consists of non-stratified deposits of silty sand with gravel and occasional cobbles and boulders. The till encountered has varying degrees of weathering. The till has been glacially consolidated and typically grades to dense to very dense at depth. The underlying glacio-lacustrine deposits typically consist of stiff to hard blocky jointed silt, clay and silty clay. These glacio-lacustrine deposits are likely associated with the transitional beds and were deposited in glacial lakes during the interglacial period before the Fraser glaciation.

Subsurface Conditions

Based on our review of the existing subsurface information and our borings, the explorations encountered three distinct soil units: fill, recent deposits and glacially consolidated soils. Descriptions of these soil units are provided below.

Fill was observed in borings GEI-2 and GEI-4 and generally consisted of loose to medium dense silty sand and sand with silt. The fill ranged from 3 to 8 feet thick.

Recent deposits were encountered in boring GEI-4 and consists of loose sand with silt. The recent deposits were approximately 8 feet thick at the GEI-4 location.

Glacially consolidated soils were encountered in each of the borings completed for this evaluation either at the ground surface or below the fill and recent deposits, where present. The glacially consolidated soils consist of medium dense to very dense silty sand with variable gravel and cobble content, sandy silt, or gravel with variable sand and silt content. The glacially consolidated soils extended to depths explored.

Groundwater Conditions

Groundwater was inferred in the explorations completed at our site during drilling at depths between 15 and 25 feet below current site grades. The groundwater is interpreted to be a perched groundwater on top of a very dense or hard layer of glacially consolidated soils. Based on the current development plans, we anticipate the static groundwater table is below the base of the planned excavations; however, perched groundwater will likely be encountered within the soils located above the base of the planned excavation. Groundwater conditions will likely vary by location and season.

CONCLUSIONS AND PRELIMINARY RECOMMENDATIONS

Seismic Evaluation

Ground Surface Rupture

The site is located approximately 6 miles north of the Seattle Fault zone. Because of the anticipated infrequent recurrence of earthquake events and the project site's location with respect to the nearest known fault (Seattle Fault), it is our opinion that the risk of ground rupture at the site resulting from surface faulting is low.

Liquefaction and Lateral Spreading

Liquefaction is a phenomenon where soils experience a rapid loss of internal strength as a consequence of strong ground shaking. Ground settlement, lateral spreading and/or sand boils may result from soil

liquefaction. Conditions favorable to liquefaction occur in loose to medium dense, clean to moderately silty sand that is below the groundwater level. We conclude that the dense to very dense glacially consolidated soils below the site result in a low potential for liquefaction and liquefaction-induced displacements at the site.

Seismically Induced Landslides

Based on the presence of the competent glacially consolidated soils in the site vicinity, it is our opinion that the risk of seismically induced land sliding is low.

Seismic Design Criteria

Depending on the extent of fill at the project site, it may be classified as either Site Class C or Site Class D; this will need to be confirmed with additional explorations during the design phase. We recommend the use of the following 2012 International Building Code (IBC) parameters for soil profile type, short period spectral response acceleration (S_S), 1-second period spectral response acceleration (S_1) and seismic coefficients (F_A and F_V) for the project site.

2012 IBC Parameter	Recommended Value	Recommended Value
Site Class	C	D
Short Period Spectral Response Acceleration, S_S (percent g)	1.250	1.250
1-Second Period Spectral Response Acceleration, S_1 (percent g)	0.478	0.478
Seismic Coefficient, F_A	1.0	1.0
Seismic Coefficient, F_V	1.32	1.52

Excavation Support

Based on early development plans, temporary shoring may be required to allow for grade transitions at the site. If temporary slopes are not feasible, the subsurface conditions favor the use of soil nails with vertical elements, cantilever soldier piles, or soldier piles with tiebacks. GeoEngineers can provide recommendations for these types of systems once the due diligence period is complete and development plans are further along.

Shallow Foundations

Given the shallow competent soils, up to 7 feet, observed in the explorations completed at the site, shallow foundations bearing on native recent deposits, glacially consolidated soils, or on compacted structural fill extending down to native recent deposits or glacially consolidated soils are considered feasible.

Preliminary Allowable Bearing Pressure

For foundations bearing on subgrade soils prepared following the recommendations provided in this report, the foundations may be designed using a preliminary allowable soil bearing pressure between 4,000 and 6,000 pounds per square foot (psf) for isolated spread footings and continuous footings. The allowable soil bearing pressure applies to the total of dead and long-term live loads and may be increased by up to one-third for wind or seismic loads. The bearing pressure should be reevaluated during the design phase of the project.

The condition of the soils at the planned foundation subgrade elevation should be evaluated by GeoEngineers. If loose fill is present at foundation subgrade elevation, a portion of the fill should be removed and replaced with properly compacted structural fill. The extent of removal and replacement will be determined during construction. Where the foundations bear on dense to very dense glacially consolidated soils, no additional subgrade preparation is required. GeoEngineers' field representative can assist with determining the extent of removal and replacement required and evaluation of the degree of compaction of new structural fill materials.

Settlement

Provided all loose soil is removed and the subgrade is prepared as recommended, we estimate the total settlement of shallow foundations will be about 1 inch or less. The settlements will occur rapidly, essentially as loads are applied. Differential settlements between footings could be half of the total settlement. Note that smaller settlements will result from lower applied loads.

Lateral foundation loads may be resisted by passive resistance on the sides of footings and by friction on the base of the shallow foundations. For shallow foundations supported on native soils, the allowable frictional resistance may be computed using a coefficient of friction of 0.35 applied to vertical dead-load forces.

The allowable passive resistance may be computed using an equivalent fluid density between 250 and 400 pounds per cubic foot (pcf) (triangular distribution). These values are appropriate for foundation elements that are poured directly against undisturbed glacially consolidated soils or surrounded by structural fill.

The above coefficient of friction and passive equivalent fluid density values incorporate a factor of safety of about 1.5.

Construction Considerations

If soft or loose areas are present at the foundation subgrade elevation, the soft or loose areas should be removed and replaced with compacted structural fill. Structural fill placed to support foundations should meet the criteria for common borrow as described in Section 9-03.14(3) of the Washington State Department of Transportation (WSDOT) Standard Specifications. The structural fill should be compacted to at least 95 percent of the maximum dry density (MDD) per ASTM D 1557.

All loose soil and other debris should be removed from the foundation excavations prior to placing reinforcement steel and concrete. Loose or otherwise soft soils not removed from foundation subgrade areas can results in increased foundation settlement.

The condition of all subgrade areas should be observed by GeoEngineers to evaluate if the work is completed in accordance with our recommendations and to confirm that the subsurface conditions are as anticipated.

Slab-On-Grade Support

Design Parameters

For slabs designed as a beam on an elastic foundation, a modulus of subgrade reaction of 150 pounds per cubic inch (pci) may be used for slabs supported on site soils. We recommend that the slab-on-grade for the proposed structure be supported on a minimum 6-inch layer of capillary break material over the subgrade. Capillary break material should consist of material meeting the requirements of Mineral Aggregate Type 22 (¾-inch crushed gravel), City of Seattle Standard Specification 9-03.16.

Below-Slab Drainage

In areas where slabs-on-grade will be situated at an elevation lower than the ground surface elevation outside the footprint of the building, we recommend installing below grade drainage measures. The appropriate type and extent of below grade drainage measures will be determined once the building depth and extent has been determined.

Below Grade Walls

Conventional cast-in-place walls may be necessary for small retaining structures located on site. The lateral soil pressures acting on conventional cast-in-place subsurface walls will depend on the nature, density and configuration of the soil behind the wall and the amount of lateral wall movement that can occur as backfill is placed.

For walls that are free to yield at the top at least 0.1 percent of the height of the wall, soil pressures will be less than if movement is limited by such factors as wall stiffness or bracing. Assuming that the walls are backfilled, and drainage is provided as outlined in the following paragraphs, we recommend that yielding walls supporting horizontal backfill be designed using an equivalent fluid density of 35 pcf (triangular distribution), and that non-yielding walls supporting horizontal backfill be designed using an equivalent fluid density of 55 pcf (triangular distribution). For seismic loading conditions, a rectangular earth pressure equal to 8H psf, where H is the height of the wall, should be added to the active/at-rest pressures. Other surcharge loading should be applied as appropriate. Lateral resistance for conventional cast-in-place walls can be provided by frictional resistance along the base of the wall and passive resistance in front of the wall in accordance with the “Lateral Resistance” discussion earlier in this report.

The above soil pressures assume that wall drains will be installed to prevent the buildup of hydrostatic pressure behind the walls, as discussed in the following paragraphs.

Drainage

Positive drainage should also be provided behind cast-in-place retaining walls by placing a minimum 2-foot-wide zone of City of Seattle Standard Specification Mineral Aggregate Type 17 (bank run gravel), with the exception that the percent passing the U.S. No. 200 sieve should be less than 3 percent. A perforated or slotted drainpipe should be placed near the base of the retaining wall to provide drainage. The drainpipe should be surrounded by a minimum of 6 inches of Mineral Aggregate Type 22 or Type 5 (1-inch washed gravel), or an alternative approved by GeoEngineers. The Type 22 or Type 5 material should be wrapped with a geotextile filter fabric meeting the requirements of construction geotextile for underground drainage, WSDOT Standard Specification 9-33. The wall drainpipe should be connected to a header pipe and routed to a sump or gravity drain. Appropriate cleanouts for drainpipe maintenance should be installed. A larger diameter pipe will allow for easier maintenance of drainage systems.

Excavation Considerations

The site soils may be excavated with conventional excavation equipment, such as trackhoes or dozers. It may be necessary to rip the glacially consolidated soils locally to facilitate excavation. The contractor should be prepared to deal with occasional cobbles and boulders in the site soils. Likewise, the surficial fill may contain foundation elements and/or utilities from previous site development, debris, rubble and/or cobbles and boulders. We recommend that procedures be identified in the project specifications for measurement and payment of work associated with obstructions.

Temporary Cut Slopes

The stability of open-cut slopes is a function of soil type, groundwater seepage, slope inclination, slope height and nearby surface loads. The use of inadequately designed open cuts could impact the stability of adjacent work areas, could affect existing utilities and could endanger personnel.

For planning purposes, temporary unsupported cut slopes more than 4 feet high may be inclined at 1½H:1V (horizontal to vertical) maximum steepness within the fill soils and no steeper than 1H:1V in the glacially consolidated deposits. If significant seepage is present on the cut face, then the cut slopes may need to be flattened.

The above guidelines assume that surface loads such as traffic, construction equipment, stockpiles or building supplies will be kept away from the top of the cut slopes a sufficient distance so that the stability of the excavation is not affected. We recommend that this distance be at least 5 feet from the top of the cut for temporary cuts made at 1H:1V or flatter.

Temporary cut slopes should be planned such that they do not encroach on a 1H:1V influence line projected down from the edges of nearby or planned foundation elements.

Water that enters the excavation must be collected and routed away from prepared subgrade areas. We expect that this may be accomplished by installing a system of drainage ditches and sumps along the toe of the cut slopes. Some sloughing and raveling of the cut slopes should be expected. Temporary covering, such as heavy plastic sheeting with appropriate ballast, should be used to protect these slopes during periods of wet weather. Surface water runoff from above cut slopes should be prevented from flowing over the slope face by using berms, drainage ditches, swales or other appropriate methods.

Permanent Cut and Fill Slopes

We recommend that permanent cut and fill slopes be constructed at inclinations of 2H:1V or flatter, and be blended into existing slopes with smooth transitions. Permanent fill slopes constructed in materials compacted to 85 percent of the MDD estimated in general accordance with ASTM D 1557 should be no steeper than 3H:1V. To achieve uniform compaction, we recommend that fill slopes be overbuilt slightly and subsequently cut back to expose well-compacted fill.

To reduce erosion, newly constructed slopes should be planted or hydroseeded shortly after completion of grading. Until the vegetation is established, some sloughing and raveling of the slopes should be expected. This may necessitate localized repairs and reseeding. Temporary covering, such as clear heavy plastic sheeting, jute fabric or erosion control blankets (such as American Excelsior Curlex 1 or North American Green S150) could be used to protect the slopes during periods of rainfall.

Recommended Additional Geotechnical Services

GeoEngineers shall complete a design-level geotechnical engineering evaluation for the project, which is anticipated to confirm or modify as appropriate the preliminary design recommendations presented in this report. Additionally, GeoEngineers recommends completing additional explorations at the site to better understand the subsurface soil and groundwater conditions.

REFERENCES

City of Seattle, "Standard Specifications for Road, Bridge and Municipal Construction," 2014.

CH2M Hill. (1992). "Final Soils Report, SR 202, East Lake Sammamish Parkway to Sahalee Way NE." November 1992.

GeoEngineers Inc. (1999). "Geotechnical Report, Jefferson at Marymoor Park, Redmond, Washington." March 10, 1999. GEI Project No. 5952-008-00.

Terra Associates, Inc (1993). "Geotechnical Report, English Cove Condominiums, NE Redmond – Fall City Road, Redmond, Washington." November 1993.

Terra Associates, Inc. (2000). "Geotechnical Report, Jefferson at Marymoor Park, Redmond, Washington." December 8, 2000.

United States Geological Service Seismic Design Maps. Available online at http://earthquake.usgs.gov/designmaps/us/application.php

Washington State Department of Transportation. "2012 Standard Specifications for Road, Bridge and Municipal Construction," Publication No, M 41-10.

Washington State Department of Transportation. "Geotechnical Design Manual," Publication M 46-03, April 2012.

LIMITATIONS

We have prepared this preliminary geotechnical evaluation letter for the exclusive use of Wolff Enterprises II, LLC and their authorized agents for the project site. The data and report should be provided to prospective contractors for their bidding or estimating purposes, but our report, conclusions and interpretations should not be construed as a warranty of the subsurface conditions.

Within the limitations of scope, schedule and budget, our services have been executed in accordance with generally accepted practices in the fields of geotechnical engineering in this area at the time this report was prepared. No warranty or other conditions, express or implied, should be understood.

Any electronic form, facsimile or hard copy of the original document (email, text, table, and/or figure), if provided, and any attachments are only a copy of the original document. The original document is stored by GeoEngineers, Inc. and will serve as the official document of record.

We trust that this letter provides the information required at this time. If you have any questions regarding this report, please contact us.

Sincerely,
GeoEngineers, Inc.

Daniel P. Ciani, PE
Senior Geotechnical Engineer

Matthew W. Smith, PE
Principal

MATTHEW W. SMITH
STATE OF WASHINGTON
35217
REGISTERED
PROFESSIONAL ENGINEER
6/16/15

DTM:DPC:MWS:nld

Attachments:
Figure 1. Vicinity Map
Figure 2. Site Plan
Appendix A. Field Explorations
Figure A-1 – Key to Exploration Logs
Figures A-2 through A-5 – Log of Borings
Appendix B. Laboratory Testing
Figure B-1 – Sieve Analysis Results
Appendix C. Previous Explorations
Appendix D. Report Limitations and Guidelines for Use

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Feet

Notes:

1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Mapbox Open Street Map, 2015

Projection: NAD 1983 UTM Zone 10N

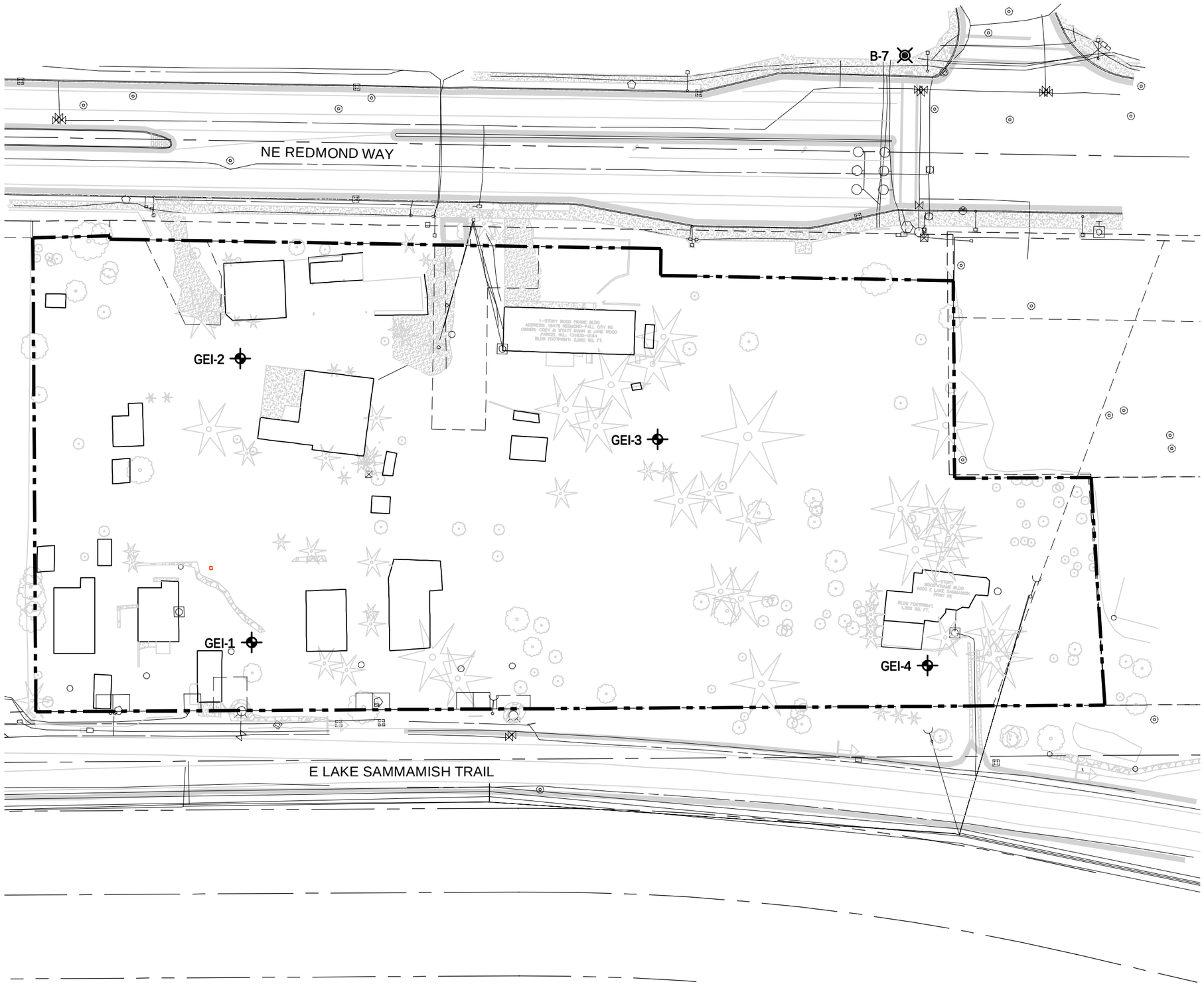
Vicinity Map

Proposed East Lake Sammamish Development
Redmond, Washington

GEOENGINEERS

Figure 1

\\sea\projects\12\12406012\GIS\MXD\124060100_VicinityMap.mxd Date Exported: 06/11/15 by maugust



Legend

- Project Site
- GEI-1 Boring by GeoEngineers, 2015
- B-7 Boring by CH2M Hill, 1992

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Notes:

1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers Inc. and will serve as the official record of this communication.

Data Source:
Base survey by Bush Roed & Hitchings, Inc. dated 6/15.

Site Plan

Redmond Senior Living Community
Redmond, Washington

GEOENGINEERS

Figure 2

P:\12\1240601200\CAD\12406012-00 Fig 2 Site Plan.dwg TAB:Layout2 Date Exported: 06/12/15 - 13:12 by tmichaud

APPENDIX A
Field Explorations

APPENDIX A
FIELD EXPLORATIONS

Subsurface conditions at the site were explored on May 28, 2015 by advancing four borings (GEI-1 through GEI-4) at the approximate locations shown on the Site Plan, Figure 2. The borings were advanced to depths ranging from about 21½ to 41½ feet below the existing ground surface. The borings were completed using a track-mounted Dietrich D-50 drill rig owned and operated by Geologic Drill Exploration, Inc. of Spokane, Washington.

The borings were continuously monitored by a geotechnical engineer from our firm who examined and classified the soils encountered, obtained representative soil samples, and observed groundwater conditions. Our representative maintained a detailed log of each boring. Disturbed samples of the representative soil types were obtained from the borings using standard penetration test (SPT) sampling procedures. SPT sampling was performed using a 2-inch outside diameter split-spoon sampler driven with a standard 140-pound hammer attached to an autohammer in accordance with ASTM D 1586.

The soils encountered in the borings were typically sampled at 2½- to 5-foot vertical intervals with the SPT split spoon sampler. Samples were obtained by driving the sampler 18 inches into the soil with a hammer free-falling 30 inches. The number of blows required for each 6 inches of penetration is recorded. The Standard Penetration Resistance ("N-value") of the soil is calculated as the number of blows required for the final 12 inches of penetration (blows/foot). This value is shown on the boring logs. This resistance, or N-value, provides a measure of the relative density of granular soils and the relative consistency of cohesive soils. If the high penetration resistance encountered in the very dense soils precluded driving the total 18-inch sample interval, the penetration resistance for the partial penetration is entered on logs as follows: if the penetration is greater than 6 inches and less than 18 inches, then the number of blows is recorded over the number of inches driven; 30 blows for 6 inches and 50 for 3 inches, for instance, would be recorded as 80/9". The blow counts are shown on the boring logs at the respective sample depths. The Standard Penetration Test is a useful quantitative tool from which soil density/consistency was evaluated.

Soils encountered in the borings were classified in the field in general accordance with ASTM D 2488, the Standard Practice for Classification of Soils, Visual-Manual Procedure, which is summarized in Figure A-1. Logs of the borings are provided as Figures A-2 through A-5.

Boring locations were determined in the field using the ARC-GIS app on a GPS-enabled iPad. The locations on the site plan are therefore accurate to about 20 feet. It is our understanding that the surveyors will include the flagged boring locations in their site survey.

SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			SYMBOLS GRAPH	SYMBOLS LETTER	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS MORE THAN 50% RETAINED ON NO. 200 SIEVE	GRAVEL AND GRAVELLY SOILS MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	CLEAN GRAVELS (LITTLE OR NO FINES)		GW	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES
				GP	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES
		GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
				GC	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES
	SAND AND SANDY SOILS MORE THAN 50% OF COARSE FRACTION PASSING NO. 4 SIEVE	CLEAN SANDS (LITTLE OR NO FINES)		SW	WELL-GRADED SANDS, GRAVELLY SANDS
				SP	POORLY-GRADED SANDS, GRAVELLY SAND
		SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SM	SILTY SANDS, SAND - SILT MIXTURES
				SC	CLAYEY SANDS, SAND - CLAY MIXTURES
FINE GRAINED SOILS MORE THAN 50% PASSING NO. 200 SIEVE	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS, ROCK FLOUR, CLAYEY SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS SILTY SOILS
				CH	INORGANIC CLAYS OF HIGH PLASTICITY
				OH	ORGANIC CLAYS AND SILTS OF MEDIUM TO HIGH PLASTICITY
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

NOTE: Multiple symbols are used to indicate borderline or dual soil classifications

ADDITIONAL MATERIAL SYMBOLS

SYMBOLS GRAPH	SYMBOLS LETTER	TYPICAL DESCRIPTIONS
	AC	Asphalt Concrete
	CC	Cement Concrete
	CR	Crushed Rock/ Quarry Spalls
	TS	Topsoil/ Forest Duff/Sod

Groundwater Contact

Measured groundwater level in exploration, well, or piezometer

Measured free product in well or piezometer

Graphic Log Contact

Distinct contact between soil strata or geologic units

Approximate location of soil strata change within a geologic soil unit

Material Description Contact

Distinct contact between soil strata or geologic units

Approximate location of soil strata change within a geologic soil unit

Sampler Symbol Descriptions

- **2.4-inch I.D. split barrel**
- **Standard Penetration Test (SPT)**
- **Shelby tube**
- **Piston**
- **Direct-Push**
- **Bulk or grab**
- **Continuous Coring**

Blowcount is recorded for driven samplers as the number of blows required to advance sampler 12 inches (or distance noted). See exploration log for hammer weight and drop.

A "P" indicates sampler pushed using the weight of the drill rig.

Laboratory / Field Tests

%F	Percent fines
AL	Atterberg limits
CA	Chemical analysis
CP	Laboratory compaction test
CS	Consolidation test
DS	Direct shear
HA	Hydrometer analysis
MC	Moisture content
MD	Moisture content and dry density
OC	Organic content
PM	Permeability or hydraulic conductivity
PI	Plasticity index
PP	Pocket penetrometer
PPM	Parts per million
SA	Sieve analysis
TX	Triaxial compression
UC	Unconfined compression
VS	Vane shear

Sheen Classification

NS	No Visible Sheen
SS	Slight Sheen
MS	Moderate Sheen
HS	Heavy Sheen
NT	Not Tested

NOTE: The reader must refer to the discussion in the report text and the logs of explorations for a proper understanding of subsurface conditions. Descriptions on the logs apply only at the specific exploration locations and at the time the explorations were made; they are not warranted to be representative of subsurface conditions at other locations or times.

KEY TO EXPLORATION LOGS

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FIGURE A-1

Drilled	Start 5/28/2015	End 5/28/2015	Total Depth (ft) 21.5	Logged By DTM/SJB Checked By DPC	Driller Geologic Drill, Inc.	Drilling Method Hollow-Stem Auger
Surface Elevation (ft) Vertical Datum	61 NAVD88		Hammer Data	Autohammer 140 (lbs) / 30 (in) Drop	Drilling Equipment	Diedrich D-50
Latitude Longitude			System Datum	N/A	Groundwater Date Measured	Depth to Water (ft) / Elevation (ft): See remarks
Notes:						

Elevation (feet)	Depth (feet)	Interval	Recovered (in)	Blows/foot	Collected Sample	Sample Name / Testing	Water Level	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
	0								GP	Sod and crushed gravel driveway			
60									SP-SM	Brown fine sand with silt (loose, moist) (recent deposits)			
			13	6		1 %F					5	5	Slight sheen; no petroleum odor
	5		12	8		2							No sheen
55													
			18	16		3				Grades fine to medium and moist to wet			No sheen
									SM	Grayish brown silty fine to medium sand with gravel (medium dense, moist) (glacially consolidated soils)			Gravel encountered; weathered glacial till
	10		16	31		4				Becomes dense with increased gravel content			
50													
	15		5	29		5							
45													
													Groundwater encountered at approximately 19 feet during drilling
	20		14	44		6			ML	Brownish gray to gray silt with sand and occasional gravel (hard, moist)			Glaciolacustrine
40													

Note: See Figure A-1 for explanation of symbols.

Log of Boring GEI-1

GEOENGINEERS

Project: Redmond Senior Living Community
Project Location: Redmond, Washington
Project Number: 12406-012-00

Figure A-2
Sheet 1 of 1

Redmond: Date:6/16/15 Path:C:\USERS\KJANCI\DESKTOP\1240601200.GPJ DBTemplate/LibTemplate:GEOENGINEERS8.GDT/GEI8_GEOTECH_STANDARD

Drilled	Start 5/28/2015	End 5/28/2015	Total Depth (ft) 28	Logged By DTM/SJB Checked By DPC	Driller Geologic Drill, Inc.	Drilling Method Hollow-Stem Auger
Surface Elevation (ft) Vertical Datum	87 NAVD88		Hammer Data	Autohammer 140 (lbs) / 30 (in) Drop	Drilling Equipment	Diedrich D-50
Latitude Longitude			System Datum	N/A	Groundwater Date Measured	Depth to Water (ft) / Elevation (ft): See remarks
Notes:						

Elevation (feet)	Depth (feet)	Interval	Recovered (in)	Blows/foot	Collected Sample	Sample Name / Testing	Water Level	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
	0								GP	Crushed gravel surfacing			
									SM	Dark brown silty fine to medium sand with gravel and plastic debris (loose, moist) (fill)			
85			12	7		1			SM	Orange-brown silty fine to medium sand with occasional gravel (loose, moist) (glacially consolidated soils)			No sheen; weathered glacial till
	5		14	15		2				Becomes medium dense with gravel			
									SP-SM	Orange-brown coarse sand with silt (medium dense, moist)			No sheen
80									ML	Gray-brown sandy silt with gravel (stiff, moist)			
			8	33		3				Becomes very stiff			
	10		15	26		4 SA					15	53	
75									SM	Orange-brown to gray silty fine to medium sand with gravel and occasional cobbles (dense to very dense, moist)			
	15		10	40		5							Light oxidation staining
70													Large cobbles encountered
	20		7	53		6				Becomes very dense, moist to wet			
65									GM	Brown silty fine to coarse gravel with sand (dense, wet) (advance outwash)			
	25		8	87		7							Groundwater encountered at approximately 25 feet during drilling
60			5	50/6"		8							

Note: See Figure A-1 for explanation of symbols.

Log of Boring GEI-2

GEOENGINEERS

Project: Redmond Senior Living Community
Project Location: Redmond, Washington
Project Number: 12406-012-00

Figure A-3
Sheet 1 of 1

Redmond: Date:6/16/15 Path:C:\USERS\KJANCI\DESKTOP\1240601200.GPJ DBTemplate/LibTemplate:GEOENGINEERS8.GDT/GEI8_GEOTECH_STANDARD

Drilled Start 5/28/2015	End 5/28/2015	Total Depth (ft) 41.5	Logged By DTM/SJB Checked By DPC	Driller Geologic Drill, Inc.	Drilling Method Hollow-Stem Auger
Surface Elevation (ft) 95 Vertical Datum NAVD88			Hammer Data Autohammer 140 (lbs) / 30 (in) Drop	Drilling Equipment Diedrich D-50	
Latitude Longitude			System Datum N/A	Groundwater Date Measured / Depth to Water (ft) / Elevation (ft): Not encountered	
Notes:					

Elevation (feet)	Depth (feet)	Interval	Recovered (in)	Blows/foot	Collected Sample	Sample Name / Testing	Water Level	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
	0								SOD	Sod			
									SM	Dark brown grading to light brown silty fine to medium sand with occasional gravel and grass roots (medium dense, moist) (glacially consolidated soils)			
			14	12		1							No sheen; weathered glacial till
90	5		18	27		2 %F				Becomes grayish-brown and moist	12	41	No sheen
			18	25		3							
85	10		14	48		4				Becomes dense			
									GM	Grayish brown silty gravel with sand (very dense, moist) (advance outwash)			
80	15		3	50/5"*		5							*Blow count overstated
75	20		1	86/11"		6							Poor recovery due to rock in sampler shoe
70	25		9	50/6"		7 SA					6	13	
									SM	Gray silty fine to coarse sand with gravel (very dense, wet)			Groundwater encountered during drilling
65	30												

Note: See Figure A-1 for explanation of symbols.

Log of Boring GEI-3

GEOENGINEERS

Project: Redmond Senior Living Community
Project Location: Redmond, Washington
Project Number: 12406-012-00

Figure A-4
Sheet 1 of 2

Redmond: Date:6/16/15 Path:C:\USERS\KJANC\DESKTOP\1240601200.GPJ DBTemplate/LibTemplate:GEOENGINEERS8.GDT/GEI8_GEOTECH_STANDARD

Elevation (feet)	Depth (feet)	FIELD DATA: Interval	Recovered (in)	Blows/foot	Collected Sample	Sample Name / Testing	Water Level	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
	30		16	84		8							
60	35		18	90		9							
									ML	Gray silt (hard, moist)			Fissured glaciolacustrine
55	40			76		10							

Note: See Figure A-1 for explanation of symbols.

Log of Boring GEI-3 (continued)

GEOENGINEERS

Project: Redmond Senior Living Community
Project Location: Redmond, Washington
Project Number: 12406-012-00

Figure A-4
Sheet 2 of 2

Redmond: Date:6/16/15 Path:C:\USERS\KJANCI\DESKTOP\1240601200.GPJ DBTemplate/LibTemplate:GEOENGINEERS8.GDT/GEI8_GEOTECH_STANDARD

Drilled Start 5/28/2015	End 5/28/2015	Total Depth (ft) 21.5	Logged By DTM/SJB Checked By DPC	Driller Geologic Drill, Inc.	Drilling Method Hollow-Stem Auger
Surface Elevation (ft) 74 Vertical Datum NAVD88		Hammer Data Autohammer 140 (lbs) / 30 (in) Drop		Drilling Equipment Diedrich D-50	
Latitude Longitude		System Datum N/A		Groundwater Date Measured / Depth to Water (ft) / Elevation (ft) See remarks	
Notes:					

Elevation (feet)	Depth (feet)	Interval	Recovered (in)	Blows/foot	Collected Sample	Sample Name / Testing	Water Level	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
	0								SOD	Sod			
									SM	Brown silty fine to medium sand with occasional gravel and roots (medium dense, moist) (fill)			
			6	25		1							No sheen
70													
	5		8	38		2				Becomes dense			No sheen
			16	33		3A 3B %F							Weathered glacial till
65									SM	Grayish brown with oxidation staining silty fine sand with gravel (dense, moist) (glacially consolidated soils)	8	22	
	10		12	40		4							
60										Becomes wet			
	15		9	38		5A 5B				Grades to gray			Groundwater encountered at approximately 15 feet during drilling
55													
	20		0	50/4"									No recovery, resampled with California sampler
			14	100/6"		6				Grades to with cobbles; clasts of sandy silt and clay with occasional oxidation staining; very dense			

Note: See Figure A-1 for explanation of symbols.

Log of Boring GEI-4

GEOENGINEERS

Project: Redmond Senior Living Community
Project Location: Redmond, Washington
Project Number: 12406-012-00

Figure A-5
Sheet 1 of 1

Redmond: Date:6/16/15 Path:C:\USERS\KJANCI\DESKTOP\1240601200.GPJ DBTemplate/LibTemplate:GEOENGINEERS8.GDT/GEI8_GEOTECH_STANDARD

APPENDIX B
Laboratory Testing

APPENDIX B
LABORATORY TESTING

General

Soil samples obtained from the borings were transported to our laboratory and examined to confirm or modify field classifications, as well as to evaluate engineering properties of the soil. Representative samples were selected for laboratory testing that consisted of moisture content, percent fines, and sieve analysis. The tests were performed in general accordance with test methods of the American Society for Testing and Materials (ASTM) or other applicable procedures.

Soil Classifications

All soil samples obtained from the borings were visually classified in the field and/or in our laboratory using a system based on the Unified Soil Classification System (USCS) and ASTM classification methods. ASTM test method D 2488 was used to visually classify the soil samples, while ASTM D 2487 was used to classify the soils based on laboratory tests results. These classification procedures are incorporated in the boring logs shown in Figures A-2 through A-5 in Appendix A.

Moisture Content Determinations

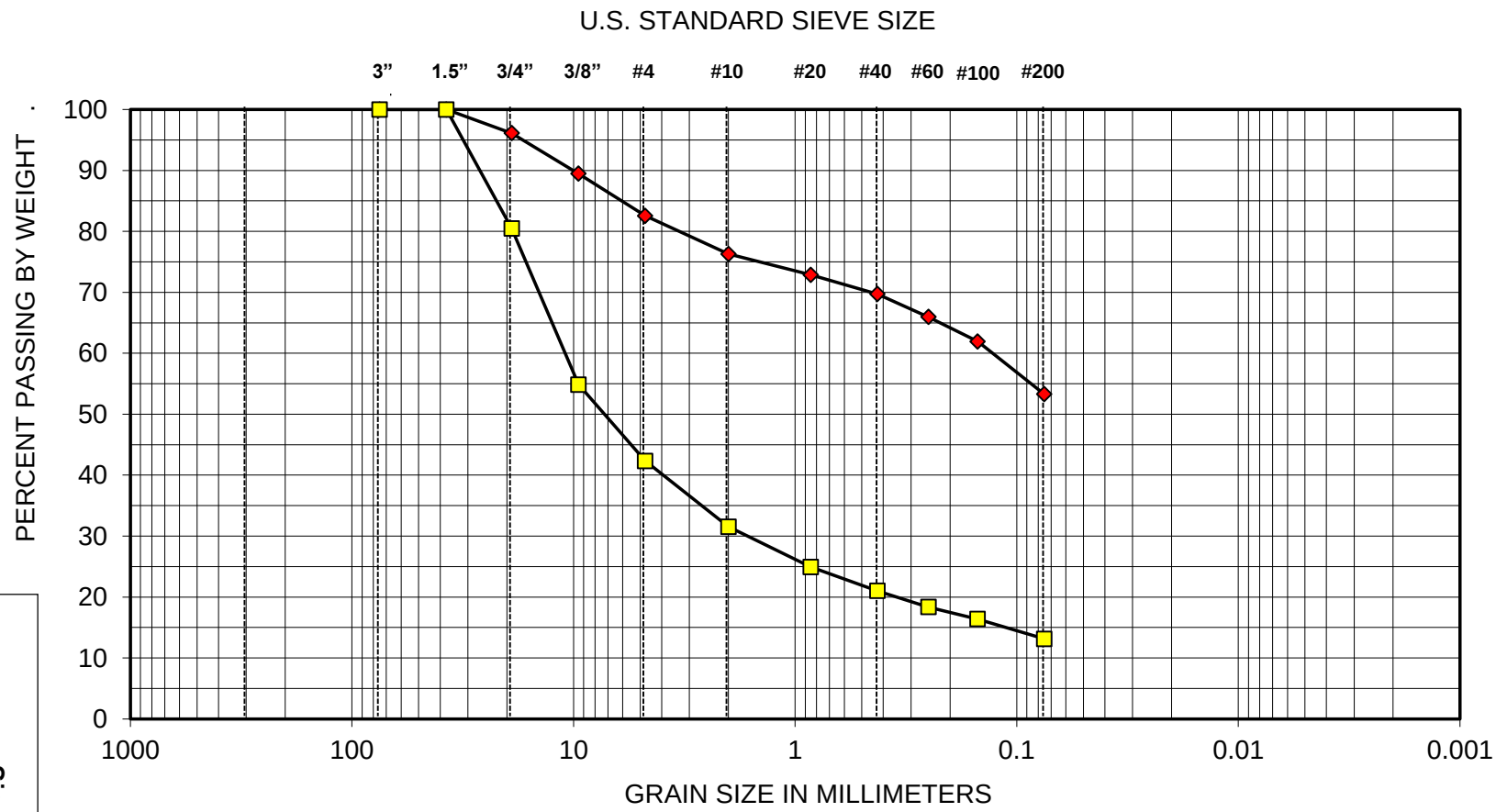
Moisture contents were determined in general accordance with ASTM D 2216 for nine samples obtained from the borings. The results of these tests are presented on the boring logs at the respective sample depth in Appendix A.

Percent Fines Determinations

Percent fines were determined in general accordance with ASTM D 1140 for two samples obtained from the borings. The results of these tests are presented on the boring logs at the respective sample depth in Appendix A.

Sieve Analysis

Sieve analyses were performed on two samples obtained from the borings. The analyses were conducted in general accordance with ASTM D 422. The wet sieve analysis method was used to determine the percentage of soil greater than the U.S. No. 200 mesh sieve. The results of the sieve analyses were plotted, classified in general accordance with the USCS, and presented on Figure B-1.



BOULDERS	COBBLES	GRAVEL		SAND			SILT OR CLAY
		COARSE	FINE	COARSE	MEDIUM	FINE	

SYMBOL	EXPLORATION NUMBER	DEPTH (ft)	SOIL CLASSIFICATION
◆	GEI-2	10	Sandy silt with gravel (ML)
■	GEI-4	25	Silty gravel with sand (GM)

Note: This report may not be reproduced, except in full, without written approval of GeoEngineers, Inc. Test results are applicable only to the specific sample on which they were performed, and should not be interpreted as representative of any other samples obtained at other times, depths or locations, or generated by separate operations or processes.

The grain size analysis results were obtained in general accordance with ASTM D 6913.

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Sieve Analysis Results

6006 E. Lake Sammamish
Redmond, WA

Figure B-1

APPENDIX C
Previous Explorations

APPENDIX C
PREVIOUS EXPLORATIONS

Previous explorations by GeoEngineers and others, completed in the project vicinity, were reviewed as part of this study. The following exploration log has been included on the site plan and are presented in the following figures

- B-7 from CH2M Hill. "Final Soils Report, SR 202, East Lake Sammamish Parkway to Sahalee Way NE." dated November 1992.

Qvd / Do NOT ENTER

Missing

CH2M HILL

PROJECT NUMBER	BORING NUMBER	
SEA30738.G1	B-7 673	SHEET 1 OF 2

SOIL BORING LOG

PROJECT SR 202 LOCATION STA 158+25, 65' LEFT

ELEVATION APPROXIMATELY 125 DRILLING CONTRACTOR D.A.KENNER, SHERWOOD, OR

DRILLING METHOD AND EQUIPMENT MUD ROTARY CME 75

WATER LEVELS NOT AVAILABLE START 1-20-92 FINISH 1-20-92 LOGGER J.C.

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL (FT)	SAMPLE TYPE AND NUMBER	SAMPLE RECOVERY (FT)	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS: DEPTH OF CASING, DRILLING RATE DRILLING FLUID LOSS TESTS AND INSTRUMENTATION
						Sand, silt and gravel to 5'.
						Large rock from 3-4'.
5.0	5.0 – 6.5	S-1	1.3	9-13-17 (30)	SILTY GRAVEL, (GM), brown, moist, medium dense, approximately 40% silt, 2" minus poorly graded gravel.	
10.0	10.0 – 11.0	S-2	1.0	48-56/6" (112)	Top 4": SILTY SAND, (SM) brown, moist, very dense. Bottom 8": Weathered Quartz, white and brown, moist, very dense, breaks into 0.75" minus pieces. 22% Fines	
15.0	15.0 – 16.5	S-3	0.5	13-18-23 (41)	SILTY GRAVEL WITH SAND, (GM), brown, moist, dense, approximately 30% silt, 2" minus, poorly graded gravel, with approximately 15% fine and coarse grained sand.	
						Driller notes that the stratum is layered - gravle layer, silty gravel and cobbles, and then silt and sand.
20.0	20.0 – 21.4	S-4	1.1	36-38-60/5 (110)	WELL GRADED GRAVEL WITH SILT, (GW-GM), brown, moist, very dense, 2" minus gravel (broken by sampler), with approximately 10% silt.	
25.0	25.0 – 25.9	S-5	?	43-60/5" (144)	WELL GRADED GRAVEL WITH SAND AND SILT, (GW-GM), brown, moist very dense, 1.5" minus gravel, approximately 15% sand, approximately 10% silt.	
	30.0				SM-(20) SPT=83	Driller notes that hit cobbles at 29'. Lost about 20 gallons of mud.

Bottom of Hole near 30' No gw encountered

APPENDIX D
Report Limitations and Guidelines for Use

APPENDIX D
REPORT LIMITATIONS AND GUIDELINES FOR USE[1]

This appendix provides information to help you manage your risks with respect to the use of this report.

Geotechnical Services Are Performed for Specific Purposes, Persons and Projects

This report has been prepared for the exclusive use of Wolff Enterprises II, LLC and other project team members for the 6006 East Lake Sammamish development project in Redmond, Washington. This report is not intended for use by others, and the information contained herein is not applicable to other sites.

GeoEngineers structures our services to meet the specific needs of our clients. For example, a geotechnical or geologic study conducted for a civil engineer or architect may not fulfill the needs of a construction contractor or even another civil engineer or architect that are involved in the same project. Because each geotechnical or geologic study is unique, each geotechnical engineering or geologic report is unique, prepared solely for the specific client and project site. Our report is prepared for the exclusive use of our Client. No other party may rely on the product of our services unless we agree in advance to such reliance in writing. This is to provide our firm with reasonable protection against open-ended liability claims by third parties with whom there would otherwise be no contractual limits to their actions. Within the limitations of scope, schedule and budget, our services have been executed in accordance with our Agreement with the Client and generally accepted geotechnical practices in this area at the time this report was prepared. This report should not be applied for any purpose or project except the one originally contemplated.

A Geotechnical Engineering or Geologic Report Is Based on a Unique Set of Project-Specific Factors

This report has been prepared for the 6006 East Lake Sammamish Development project in Redmond, Washington. GeoEngineers considered a number of unique, project-specific factors when establishing the scope of services for this project and report. Unless GeoEngineers specifically indicates otherwise, do not rely on this report if it was:

- not prepared for you,
- not prepared for your project,
- not prepared for the specific site explored, or
- completed before important project changes were made.

For example, changes that can affect the applicability of this report include those that affect:

- the function of the proposed structure;
- elevation, configuration, location, orientation or weight of the proposed structure;
- composition of the design team; or
- project ownership.

[1] Developed based on material provided by ASFE, Professional Firms Practicing in the Geosciences; www.asfe.org .

If important changes are made after the date of this report, GeoEngineers should be given the opportunity to review our interpretations and recommendations and provide written modifications or confirmation, as appropriate.

Subsurface Conditions Can Change

This geotechnical or geologic report is based on conditions that existed at the time the study was performed. The findings and conclusions of this report may be affected by the passage of time, by manmade events such as construction on or adjacent to the site, or by natural events such as floods, earthquakes, slope instability or groundwater fluctuations. Always contact GeoEngineers before applying a report to determine if it remains applicable.

Most Geotechnical and Geologic Findings Are Professional Opinions

Our interpretations of subsurface conditions are based on field observations from widely spaced sampling locations at the site. Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. GeoEngineers reviewed field and laboratory data and then applied our professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ, sometimes significantly, from those indicated in this report. Our report, conclusions and interpretations should not be construed as a warranty of the subsurface conditions.

Geotechnical Engineering Report Recommendations Are Not Final

Do not over-rely on the preliminary construction recommendations included in this report. These recommendations are not final, because they were developed principally from GeoEngineers' professional judgment and opinion. GeoEngineers' recommendations can be finalized only by observing actual subsurface conditions revealed during construction. GeoEngineers cannot assume responsibility or liability for this report's recommendations if we do not perform construction observation.

Sufficient monitoring, testing and consultation by GeoEngineers should be provided during construction to confirm that the conditions encountered are consistent with those indicated by the explorations, to provide recommendations for design changes should the conditions revealed during the work differ from those anticipated, and to evaluate whether or not earthwork activities are completed in accordance with our recommendations. Retaining GeoEngineers for construction observation for this project is the most effective method of managing the risks associated with unanticipated conditions.

A Geotechnical Engineering or Geologic Report Could Be Subject to Misinterpretation

Misinterpretation of this report by other design team members can result in costly problems. You could lower that risk by having GeoEngineers confer with appropriate members of the design team after submitting the report. Also retain GeoEngineers to review pertinent elements of the design team's plans and specifications. Contractors can also misinterpret a geotechnical engineering or geologic report. Reduce that risk by having GeoEngineers participate in pre-bid and preconstruction conferences, and by providing construction observation.

Do Not Redraw the Exploration Logs

Geotechnical engineers and geologists prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in a geotechnical engineering or geologic report should never be redrawn for inclusion in architectural or other design drawings. Only photographic or electronic reproduction is acceptable, but recognize that separating logs from the report can elevate risk.

Give Contractors a Complete Report and Guidance

Some owners and design professionals believe they can make contractors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give contractors the complete geotechnical engineering or geologic report, but preface it with a clearly written letter of transmittal. In that letter, advise contractors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with GeoEngineers and/or to conduct additional study to obtain the specific types of information they need or prefer. A pre-bid conference can also be valuable. Be sure contractors have sufficient time to perform additional study. Only then might an owner be in a position to give contractors the best information available, while requiring them to at least share the financial responsibilities stemming from unanticipated conditions. Further, a contingency for unanticipated conditions should be included in your project budget and schedule.

Contractors are Responsible for Site Safety on Their Own Construction Projects

Our geotechnical recommendations are not intended to direct the contractor's procedures, methods, schedule or management of the work site. The contractor is solely responsible for job site safety and for managing construction operations to minimize risks to on-site personnel and to adjacent properties.

Read These Provisions Closely

Some clients, design professionals and contractors may not recognize that the geoscience practices (geotechnical engineering or geology) are far less exact than other engineering and natural science disciplines. This lack of understanding can create unrealistic expectations that could lead to disappointments, claims and disputes. GeoEngineers includes these explanatory "limitations" provisions in our reports to help reduce such risks. Please confer with GeoEngineers if you are unclear how these "Report Limitations and Guidelines for Use" apply to your project or site.

Geotechnical, Geologic and Environmental Reports Should Not be Interchanged

The equipment, techniques and personnel used to perform an environmental study differ significantly from those used to perform a geotechnical or geologic study and vice versa. For that reason, a geotechnical engineering or geologic report does not usually relate any environmental findings, conclusions or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. Similarly, environmental reports are not used to address geotechnical or geologic concerns regarding a specific project.

Biological Pollutants

GeoEngineers' Scope of Work specifically excludes the investigation, detection, prevention or assessment of the presence of Biological Pollutants. Accordingly, this report does not include any interpretations, recommendations, findings, or conclusions regarding the detecting, assessing, preventing or abating of Biological Pollutants and no conclusions or inferences should be drawn regarding Biological Pollutants, as they may relate to this project. The term "Biological Pollutants" includes, but is not limited to, molds, fungi, spores, bacteria, and viruses, and/or any of their byproducts.

If Client desires these specialized services, they should be obtained from a consultant who offers services in this specialized field.

Environmental Regulations Are Always Evolving

Some substances may be present in the vicinity of the subject property in quantities or under conditions that may have led, or may lead, to contamination of the subject property, but are not included in current local, state or federal regulatory definitions of hazardous substances or do not otherwise present current potential liability. GeoEngineers cannot be responsible if the standards for appropriate inquiry, or regulatory definitions of hazardous substances, change or if more stringent environmental standards are developed in the future.

Uncertainty May Remain Even After This Environmental Soil Sampling Is Completed

Performance of environmental soil sampling is intended to reduce uncertainty regarding the potential for contamination in connection with a property, but no environmental sampling can wholly eliminate that uncertainty. Our interpretation of subsurface conditions in this study is based on field observations and chemical analytical data from widely spaced sampling locations. It is always possible that contamination exists in areas that were not explored, sampled or analyzed.

Soil and Groundwater End Use

The cleanup levels referenced in this report are site- and situation-specific. The cleanup levels may not be applicable for other properties or for other on-site uses of the affected soil and/or groundwater. Note that hazardous substances may be present in some of the on-site soil and/or groundwater at detectable concentrations that are less than the referenced cleanup levels. GeoEngineers should be contacted prior to the export of soil or groundwater from the subject property or reuse of the affected soil or groundwater on-site to evaluate the potential for associated environmental liabilities. We are unable to assume responsibility for potential environmental liability arising out of the transfer of soil and/or groundwater from the subject property to another location or its reuse on-site in instances that we did not know or could not control.