7.3 Material Reuse

In the context of this report, structural fill is defined as compacted fill placed under footings, concrete stairs and landings, and slabs, or other load-bearing areas. In our opinion, the on-site soils are poorly graded, and are not suitable to be reused as structural fill. The structural backfill should consist of imported, well-graded granular material, such as WSDOT Gravel Borrow or approved equivalent. Well-graded recycled concrete may also be considered as a source of structural fill in areas not exposed to surface or below surface water. Use of recycled concrete as structural fill should be approved by the geotechnical engineer. The on-site soil can be used as general fill in the non-structural and landscaping areas. If use of the on-site soil is planned, the excavated soil should be stockpiled and protected with plastic sheeting to prevent softening from rainfall in the wet season.

7.4 Structural Fill and Compaction

Structural fill should be moisture conditioned to within about 3 percent of optimum moisture content, placed in loose, horizontal lifts less than 8 inches in thickness, and systematically compacted to a dense and relatively unyielding condition and to at least 95 percent of the maximum dry density, as determined using test method ASTM D 1557.

Depending on the type of compaction equipment used and depending on the type of fill material, it may be necessary to decrease the thickness of each lift in order to achieve adequate compaction. PanGEO can provide additional recommendations regarding structural fill and compaction during construction.

7.5 Wet Weather Construction

It is our opinion that construction of the project can be accomplished during wet season. However, performing earthwork activities during wet season is anticipated to be more costly than during dry weather conditions. General recommendations relative to earthwork performed in wet weather or in wet conditions are presented below:

- All footing surfaces should be protected against inclement weather, unless the footings can be poured immediately after the subgrade is exposed. It is the contractor's responsibility to protect the footing subgrade from disturbance. One option is to place a 2 to 3 inches of lean-mix concrete or 4 to 6 inches of crushed rock on the exposed foundation subgrade as soon as the subgrade is exposed. Alternatively, the footing pour

may be made immediately after the footing excavation is completed. This will require the reinforcing steel to be pre-fabricated and lowered into the footing excavation once the excavation is completed.

- Earthwork should be performed in small areas to minimize subgrade exposure to wet weather. Excavation or the removal of unsuitable soil should be followed promptly by the placement and compaction of clean structural fill. The size and type of construction equipment used may have to be limited to prevent soil disturbance.

- During wet weather, the allowable fines content of the structural fill should be reduced to no more than 5 percent by weight based on the portion passing ¾-inch sieve. The fines should be non-plastic.

- The ground surface within the construction area should be graded to promote run-off of surface water and to prevent the ponding of water.

- Geotextile silt fences should be strategically located to control erosion and the movement of soil. Erosion control measures should be installed along all the property boundaries.

- Excavation slopes and soils stockpiled on site should also be covered with plastic sheets.

7.6 EROSION CONSIDERATIONS

We recommend that the exposed slopes be covered with plastic sheeting. Surface runoff can be controlled during construction by careful grading practices. This could include the construction of shallow, upgrade perimeter ditches or low earthen berms in conjunction with silt fences to collect runoff and prevent water from entering excavations. Temporary erosion control may require the use of hay bales on the downhill side of the project to prevent water from leaving the site and potential storm water detention to trap sand and silt before the water is discharged to a suitable outlet.

Permanent control of surface water should be incorporated in the final grading design. Adequate surface gradients and drainage systems should be incorporated into the design such that surface runoff is collected and directed away from the structure to a suitable outlet. Potential issues

associated with erosion may also be reduced by establishing vegetation within disturbed areas immediately following grading operations.

8.0 LIMITATIONS

We have prepared this report for Finneight, LLC and the project design team. Recommendations contained in this report are based on a site reconnaissance, a subsurface exploration program, review of pertinent subsurface information, and our understanding of the project. The study was performed using a mutually agreed-upon scope of work.

Variations in soil conditions may exist between the explorations and the actual conditions underlying the site. The nature and extent of soil variations may not be evident until construction occurs. If any soil conditions are encountered at the site that are different from those described in this report, we should be notified immediately to review the applicability of our recommendations. Additionally, we should also be notified to review the applicability of our recommendations if there are any changes in the project scope.

The scope of our work does not include services related to construction safety precautions. Our recommendations are not intended to direct the contractors' methods, techniques, sequences or procedures, except as specifically described in our report for consideration in design. Additionally, the scope of our work specifically excludes the assessment of environmental characteristics, particularly those involving hazardous substances. We are not mold consultants nor are our recommendations to be interpreted as being preventative of mold development. A mold specialist should be consulted for all mold-related issues.

This report may be used only by the client and for the purposes stated, within a reasonable time from its issuance. Land use, site conditions (both off and on-site), or other factors including advances in our understanding of applied science, may change over time and could materially affect our findings. Therefore, this report should not be relied upon after 24 months from its issuance. PanGEO should be notified if the project is delayed by more than 24 months from the date of this report so that we may review the applicability of our conclusions considering the time lapse.

It is the client's responsibility to see that all parties to this project, including the designer, contractor, subcontractors, etc., are made aware of this report in its entirety. The use of information

contained in this report for bidding purposes should be done at the contractor's option and risk. Any party other than the client who wishes to use this report shall notify PanGEO of such intended use and for permission to copy this report. Based on the intended use of the report, PanGEO may require that additional work be performed and that an updated report be reissued. Noncompliance with any of these requirements will release PanGEO from any liability resulting from the use this report.

Within the limitation of scope, schedule and budget, PanGEO engages in the practice of geotechnical engineering and endeavors to perform its services in accordance with generally accepted professional principles and practices at the time the Report or its contents were prepared. No warranty, express or implied, is made.

We appreciate the opportunity to be of service to you on this project. Please feel free to contact our office with any questions you have regarding our study, this report, or any geotechnical engineering related project issues.

Sincerely,

PanGEO, Inc.

Bart Weitering, G.I.T.
Staff Geologist

H. Michael Xue, P.E.
Principal Geotechnical Engineer

9.0 REFERENCES

ASTM D1557-12e1, *Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3 (2,700 kN-m/m3))*, ASTM International, West Conshohocken, PA, 2012, www.astm.org

ASTM D2488-17, *Standard Practice for Description and Identification of Soils (Visual-Manual Procedures)*, ASTM International, West Conshohocken, PA, 2017, www.astm.org.

City of Kirkland (2020). "Kirkland Landslide Susceptibility" dated February 5, 2020. Retrieved from https://www.kirklandwa.gov/Assets/IT/GIS/Landslide+Hazard+Map.pdf

City of Kirkland (2021). "Kirkland Liquefaction Potential" dated February 11, 2021. Retrieved from https://www.kirklandwa.gov/Assets/IT/GIS/Liquefaction+Potential+Map.pdf

City of Kirkland Maps. (2021). Retrieved September 15, 2021, from https://maps.kirklandwa.gov/Html5Viewer/

International Building Code (IBC), 2018, International Code Council.

Minard, J.P., 1983, *Geologic Map of the Kirkland Quadrangle, Washington* – U. S. Geological Survey Miscellaneous Field Studies Map MF-1543, scale 1:24,000.

Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. Web Soil Survey. Available online at the following link: http://websoilsurvey.sc.egov.usda.gov/. Accessed 09/28/2021.

Washington Administrative Code (WAC), 2021, Chapter 296-155 - *Safety Standards for Construction Work, Part N - Excavation, Trenching, and Shoring*, Olympia, Washington.

WSDOT, 2021, *Standard Specifications for Road, Bridge and Municipal Construction, M 41-10, Washington State Department of Transportation.*

Base Map: ESRI Topographic

NORTH

Approx. Scale: Not to Scale

PanGEO INCORPORATED

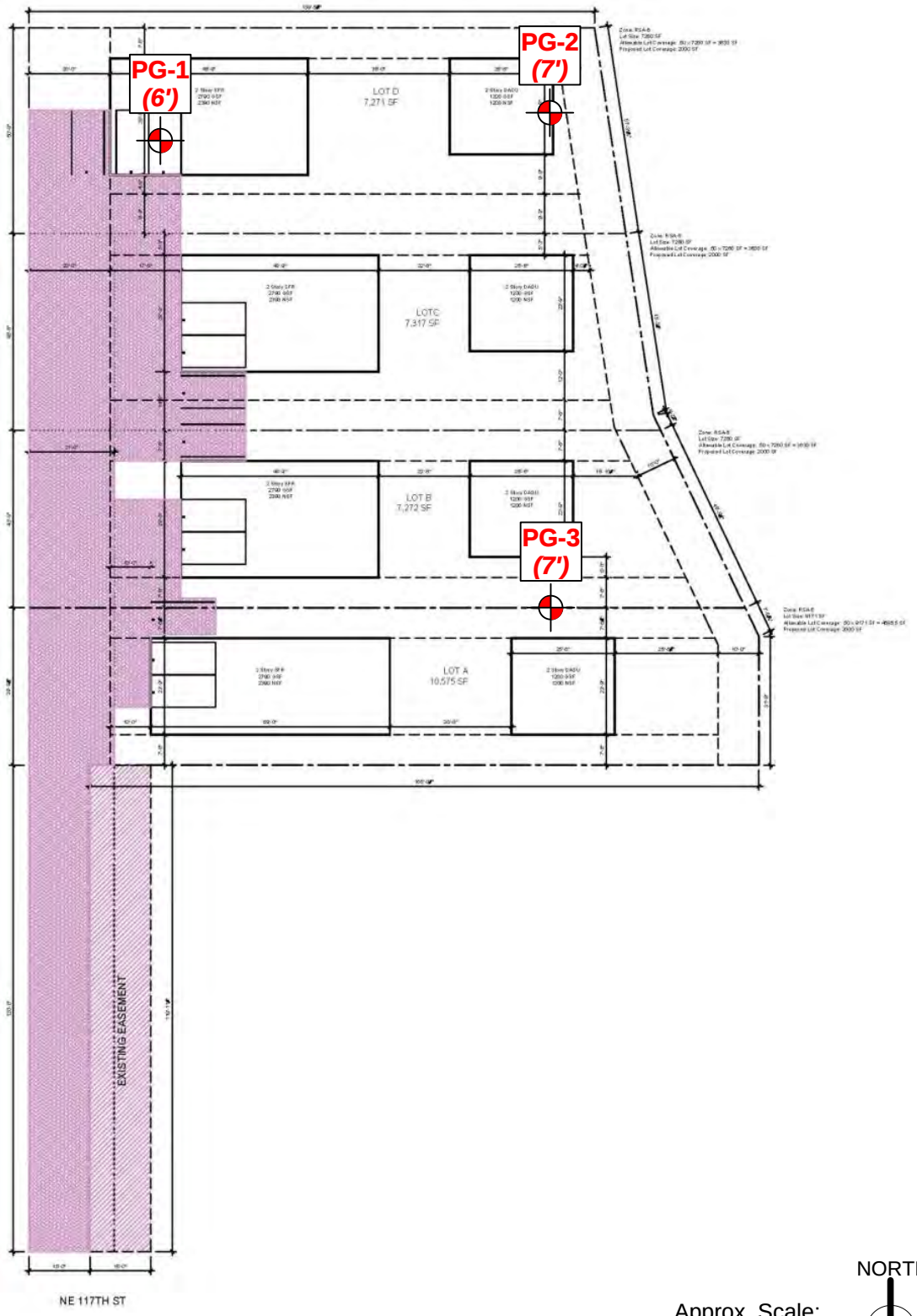
Proposed SFRs and DADUs
8230 NE 117th Street
Kirkland, Washington

VICINITY MAP

Project No. **21-509**

Figure No. **1**

file.grf w/ file.dat 12/15/21 (9:45:42) BW



NORTH

Approx. Scale:
1" = 40'

LEGEND:

Approx. Test Boring Location
(Approx. Depth to Bearing Soil, ft)

Note: Base map modified from Site Plan provided by Legacy Group Homes on September 16, 2021

PanGEO INCORPORATED	**Proposed SFRs and DADUs 8230 NE 117th Street Kirkland, Washington**	**SITE AND EXPLORATION PLAN**	
		Project No. **21-509**	Figure No. **2**

Site and Exploration Plan.grf 12/15/21 (9:39:01) BW

APPENDIX A

SUMMARY TEST BORING LOGS

RELATIVE DENSITY / CONSISTENCY

SAND / GRAVEL			SILT / CLAY		
Density	SPT N-values	Approx. Relative Density (%)	Consistency	SPT N-values	Approx. Undrained Shear Strength (psf)
Very Loose	<4	<15	Very Soft	<2	<250
Loose	4 to 10	15 - 35	Soft	2 to 4	250 - 500
Med. Dense	10 to 30	35 - 65	Med. Stiff	4 to 8	500 - 1000
Dense	30 to 50	65 - 85	Stiff	8 to 15	1000 - 2000
Very Dense	>50	85 - 100	Very Stiff	15 to 30	2000 - 4000
			Hard	>30	>4000

UNIFIED SOIL CLASSIFICATION SYSTEM

MAJOR DIVISIONS		GROUP DESCRIPTIONS	
Gravel 50% or more of the coarse fraction retained on the #4 sieve. Use dual symbols (eg. GP-GM) for 5% to 12% fines.	GRAVEL (<5% fines)	GW	Well-graded GRAVEL
		GP	Poorly-graded GRAVEL
	GRAVEL (>12% fines)	GM	Silty GRAVEL
		GC	Clayey GRAVEL
Sand 50% or more of the coarse fraction passing the #4 sieve. Use dual symbols (eg. SP-SM) for 5% to 12% fines.	SAND (<5% fines)	SW	Well-graded SAND
		SP	Poorly-graded SAND
	SAND (>12% fines)	SM	Silty SAND
		SC	Clayey SAND
Silt and Clay 50%or more passing #200 sieve	Liquid Limit < 50	ML	SILT
		CL	Lean CLAY
		OL	Organic SILT or CLAY
	Liquid Limit > 50	MH	Elastic SILT
		CH	Fat CLAY
		OH	Organic SILT or CLAY
Highly Organic Soils		PT	PEAT

Notes:
1. Soil exploration logs contain material descriptions based on visual observation and field tests using a system modified from the Uniform Soil Classification System (USCS). Where necessary laboratory tests have been conducted (as noted in the "Other Tests" column), unit descriptions may include a classification. Please refer to the discussions in the report text for a more complete description of the subsurface conditions.
2. The graphic symbols given above are not inclusive of all symbols that may appear on the borehole logs. Other symbols may be used where field observations indicated mixed soil constituents or dual constituent materials.

DESCRIPTIONS OF SOIL STRUCTURES

Layered: Units of material distinguished by color and/or composition from material units above and below
Laminated: Layers of soil typically 0.05 to 1mm thick, max. 1 cm
Lens: Layer of soil that pinches out laterally
Interlayered: Alternating layers of differing soil material
Pocket: Erratic, discontinuous deposit of limited extent
Homogeneous: Soil with uniform color and composition throughout
Fissured: Breaks along defined planes
Slickensided: Fracture planes that are polished or glossy
Blocky: Angular soil lumps that resist breakdown
Disrupted: Soil that is broken and mixed
Scattered: Less than one per foot
Numerous: More than one per foot
BCN: Angle between bedding plane and a plane normal to core axis

COMPONENT DEFINITIONS

COMPONENT	SIZE / SIEVE RANGE	COMPONENT	SIZE / SIEVE RANGE
Boulder:	> 12 inches	Sand	
Cobbles:	3 to 12 inches	Coarse Sand:	#4 to #10 sieve (4.5 to 2.0 mm)
Gravel		Medium Sand:	#10 to #40 sieve (2.0 to 0.42 mm)
Coarse Gravel:	3 to 3/4 inches	Fine Sand:	#40 to #200 sieve (0.42 to 0.074 mm)
Fine Gravel:	3/4 inches to #4 sieve	Silt	0.074 to 0.002 mm
		Clay	<0.002 mm

TEST SYMBOLS

for In Situ and Laboratory Tests listed in "Other Tests" column.

ATT	Atterberg Limit Test
Comp	Compaction Tests
Con	Consolidation
DD	Dry Density
DS	Direct Shear
%F	Fines Content
GS	Grain Size
Perm	Permeability
PP	Pocket Penetrometer
R	R-value
SG	Specific Gravity
TV	Torvane
TXC	Triaxial Compression
UCC	Unconfined Compression

SYMBOLS

Sample/In Situ test types and intervals

- 2-inch OD Split Spoon, SPT (140-lb. hammer, 30" drop)
- 3.25-inch OD Spilt Spoon (300-lb hammer, 30" drop)
- Non-standard penetration test (see boring log for details)
- Thin wall (Shelby) tube
- Grab
- Rock core
- Vane Shear

MONITORING WELL

- Groundwater Level at time of drilling (ATD)
- Static Groundwater Level
- Cement / Concrete Seal
- Bentonite grout / seal
- Silica sand backfill
- Slotted tip
- Slough
- Bottom of Boring

MOISTURE CONTENT

Dry	Dusty, dry to the touch
Moist	Damp but no visible water
Wet	Visible free water

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Phone: 206.262.0370

Terms and Symbols for Boring and Test Pit Logs

Figure A-1

LOG KEY 16-056_LOGS.GPJ PANGEO.GDT 02/22/16

Project:	Proposed SFRs and DADUs	Surface Elevation:	391 ft
Job Number:	21-509	Top of Casing Elev.:	n/a
Location:	8230 NE 117th Street, Kirkland, Washington	Drilling Method:	HSA
Coordinates:	Northing: 47.70605, Easting: -122.231	Sampling Method:	SPT

Depth, (ft)	Sample No.	Sample Type	Blows / 6 in.	Other Tests	Symbol	MATERIAL DESCRIPTION
0						**TOPSOIL** Grass and sod over loose, dark brown, slightly organic silty SAND; moist; poorly graded, rootlets.
						WEATHERED VASHON ADVANCE OUTWASH Medium dense, interlayered gray-brown and orange, fine SAND interlayered with silty fine SAND; moist; poorly graded, iron oxide banding.
5	S-1		3 3 7			
	S-2		6 8 9			**VASHON ADVANCE OUTWASH (Qva)** Medium dense, interlayered gray and dark gray, fine SAND trace silt; moist; poorly graded.
10	S-3		10 13 19			--becomes dense.
15	S-4		11 14 17			
20	S-5		16 27 34			--becomes very dense. --trace gravel. -- light perched groundwater seepage observed between S-5 & S-6.
						VASHON ADVANCE OUTWASH (Qva) Very dense, gray-brown and orange, SILT with few thin sandy interlayers; moist; non-plastic, iron oxide staining.
25	S-6		14 19 34			
30						Boring terminated about 26.5 feet below grade. Light perched groundwater seepage was observed at about 23 feet depth during drilling.

N-Value ▲
PL Moisture LL
RQD Recovery
0 50 100

Completion Depth:	26.5ft
Date Borehole Started:	11/29/21
Date Borehole Completed:	11/29/21
Logged By:	B. Weitering
Drilling Company:	Geologic Drill Partners

Remarks: CAT-mounted track drill rig used. Standard Penetration Test (SPT) sampler driven with a 140 lb. safety hammer. Hammer operated with a rope and cathead mechanism. This surface elevation is estimated from City of Kirkland GIS mapping 2-foot topographic contour set.

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LOG OF TEST BORING PG-1

Figure A-2

The stratification lines represent approximate boundaries. The transition may be gradual.

Sheet 1 of 1

Project:	Proposed SFRs and DADUs	Surface Elevation:	396 ft
Job Number:	21-509	Top of Casing Elev.:	n/a
Location:	8230 NE 117th Street, Kirkland, Washington	Drilling Method:	HSA
Coordinates:	Northing: 47.7061, Easting: -122.2306	Sampling Method:	SPT

Depth, (ft)	Sample No.	Sample Type	Blows / 6 in.	Other Tests	Symbol	MATERIAL DESCRIPTION
0						**TOPSOIL** Grass and sod over loose, dark brown, slightly organic silty SAND; moist; poorly graded, rootlets.
	S-1		4 5 4			**WEATHERED VASHON ADVANCE OUTWASH** Loose, gray-brown, slightly gravelly fine SAND; moist; poorly graded.
5	S-2		2 3 3			**WEATHERED VASHON ADVANCE OUTWASH** Loose, gray-brown interlayered with some orange and dark brown, slightly silty fine SAND interlayered with silty SAND; moist; poorly graded.
	S-3		7 8 11			**VASHON ADVANCE OUTWASH (Qva)** Medium dense, gray-brown, fine SAND; moist; poorly to uniformly graded, trace iron oxide banding. --1" medium sand interlayer.
10	S-4		7 10 15			-- becomes massive (no interlayering).
15	S-5		16 18 27			--becomes dense.
						Boring terminated about 16.5 feet below grade. No groundwater was observed during drilling.
20						
25						
30						

N-Value ▲
PL Moisture LL
RQD Recovery
0 50 100

Completion Depth:	16.5ft
Date Borehole Started:	11/29/21
Date Borehole Completed:	11/29/21
Logged By:	B. Weitering
Drilling Company:	Geologic Drill Partners

Remarks: CAT-mounted track drill rig used. Standard Penetration Test (SPT) sampler driven with a 140 lb. safety hammer. Hammer operated with a rope and cathead mechanism. This surface elevation is estimated from City of Kirkland GIS mapping 2-foot topographic contour set.

PanGEO INCORPORATED

LOG OF TEST BORING PG-2

Figure A-3

The stratification lines represent approximate boundaries. The transition may be gradual.

Sheet 1 of 1

Project:	Proposed SFRs and DADUs	Surface Elevation:	385 ft
Job Number:	21-509	Top of Casing Elev.:	n/a
Location:	8230 NE 117th Street, Kirkland, Washington	Drilling Method:	HSA
Coordinates:	Northing: 47.70575, Easting: -122.2306	Sampling Method:	SPT

Depth, (ft)	Sample No.	Sample Type	Blows / 6 in.	Other Tests	Symbol	MATERIAL DESCRIPTION
0						**TOPSOIL/FILL** Grass and sod over loose, dark brown, slightly organic silty SAND; moist; poorly graded, rootlets.
	S-1		4 7 5			**FILL** Loose to medium dense, gray and dark brown, slightly gravelly to silty fine SAND; moist; poorly graded, organics, washed rock [Fill].
5	S-2		4 5 4			**WEATHERED VASHON ADVANCE OUTWASH (Qva)** Loose, gray-brown interlayered with some orange and gray, fine SAND interlayered with silty fine SAND; moist; poorly graded, iron oxide banding.
	S-3		6 9 15			**VASHON ADVANCE OUTWASH (Qva)** Medium dense, gray-brown to gray, fine SAND trace gravel; moist; poorly to uniformly graded, trace iron oxide banding.
10	S-4		10 13 17			--becomes dense, massive.
						-- light perched groundwater seepage observed between S-4 & S-5.
						VASHON ADVANCE OUTWASH (Qva) Dense, gray-brown and orange, interlayered SILT, silty fine SAND, and fine SAND; wet to moist; non-plastic fines, poorly graded sand, iron oxide staining.
15	S-5		16 16 21			
						Boring terminated about 16.5 feet below grade. Light perched groundwater seepage was observed at about 13 feet depth during drilling.
20						
25						
30						

N-Value ▲
PL Moisture LL
RQD Recovery
0 50 100

Completion Depth:	16.5ft
Date Borehole Started:	11/29/21
Date Borehole Completed:	11/29/21
Logged By:	B. Weitering
Drilling Company:	Geologic Drill Partners

Remarks: CAT-mounted track drill rig used. Standard Penetration Test (SPT) sampler driven with a 140 lb. safety hammer. Hammer operated with a rope and cathead mechanism. This surface elevation is estimated from City of Kirkland GIS mapping 2-foot topographic contour set.

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LOG OF TEST BORING PG-3

Figure A-4

The stratification lines represent approximate boundaries. The transition may be gradual.

Sheet 1 of 1

LAYTON TREE CONSULTING, LLC

ARBORIST REPORT

8230 NE 117th Street
Kirkland, WA

Report Prepared by:
Bob Layton
Registered Consulting Arborist #670
Certified Arborist #PN-2714A

October 4, 2021

It's all about trees……

PO BOX 572, SNOHOMISH, WA 98291-0572 * 425-220-5711 * bob@laytontreeconsulting.com

Table of Contents

Attachments

Photos, pages 10 - 18

Tree Summary Table

Tree Locator/Conditions Map

Tree Plan Map

Kirkland Fencing Detail

Assignment

Layton Tree Consulting, LLC was asked to compile an Arborist Report for a property in Kirkland. The purpose of the report is to satisfy City requirements regarding tree retention and protection associated with the proposed re-development of the property located at 8230 NE 117th Street.

My assignment is to prepare a written report on present tree conditions, which is to be submitted to the City with the development application materials.

This report covers all of the criteria set forth under the City of Kirkland's tree regulations (Chapter 95 of the Kirkland Zoning Code). The required minimum tree density for the parcels (+/- 30,590 sq. ft.) is 21 tree credits.

Date of Field Examination: September 13, 2021

Description

32 significant trees were identified and assessed on the subject property. These are comprised of a mix of native, volunteer and planted ornamental species.

Subject property trees have been identified with a numbered aluminum tag attached to the lower trunk. These tag numbers correspond with the numbers on the attached Tree Summary Table and map.

Only one off-site or neighboring tree was identified within a proximity of subject property lines. This is a small umbrella pine located off of the south property line. There are no neighboring trees issues adjacent to the north or east property lines.

Methodology

Each tree in this report was visited. Tree diameters were measured by tape. The tree heights were measured using a Spiegel Relaskop. Each tree was visually examined for defects and vigor. The tree assessment procedure involves the examination of many factors:

- The crown or canopy of the tree is examined for current vigor/health by examining the foliage for appropriate color and density, the vegetative buds for color and size, and the branches for structural form and annual shoot growth; and the overall presence of limb dieback and/or any disease issues.

- The trunk or main stem of the tree is inspected for decay, which includes cavities, wounds, fruiting bodies of decay (conks or mushrooms), seams, insect pests, bleeding or exudation of sap, callus development, broken or dead tops, structural defects and unnatural leans. Structural defects can include but are not limited to excessive or unnatural leans, crooks, forks with V-shaped crotches, multiple attachments.

- The root collar and exposed surface roots are inspected for the presence of decay, insect damage, as well as if they have been injured or wounded, undermined or exposed, or the original grade has been altered.

Based on these factors a determination of condition is made. A 'viable' tree, as defined by the City of Kirkland is "A significant tree (a trunk diameter greater than six inches when measured four and a half feet above ground) that a qualified professional has determined to be in good health, with a low risk of failure due to structural defects, is wind firm if isolated or remains as part of a grove, and is a species that is suitable for its location." Trees considered 'non-viable' are trees that are in poor condition due to disease and/or pest infestation, age related decline, have significant decay issues and/or cumulative structural defects, which will compromise longevity.

Judging Condition

The three condition categories are described as follows:

Good – free of significant structural defects, no disease concerns, minor pest issues, no significant root issues, good structure/form with uniform crown or canopy, foliage of normal color and density, average or normal vigor, will be wind firm if isolated or left as part of a grouping or grove of trees, suitable for its location

Fair – minor to moderate structural defects not expected to contribute to a failure in near future, no disease concerns, moderate pest issues, no significant root issues, asymmetric or unbalanced crown or canopy, average or normal vigor, foliage of normal color, moderate foliage density, will be wind firm if left as part of a grouping or grove of trees, cannot be isolated, suitable for its location

Poor – major structural defects expected to cause fail in near future, disease or significant pest concerns, decline due to old age, significant root issues, asymmetric or unbalanced crown or canopy, sparse or abnormally small foliage, poor vigor, not suitable for its location

The attached tree plan map indicates the 'condition rating' of the subject trees found at the site. The attached Tree Summary Table provides specific information on tree sizes, condition and dripline measurements.

Judging Retention Suitability

Not all trees necessarily warrant retention. The three retention suitability categories as described in ANSI A300 Part 5 (Standard Practices for the Management of Trees During Site Planning, Site Development and Construction) are as follows:

Good – trees are in good health condition and structural stability and have the potential for longevity at the site

Fair – trees are in fair health condition and/or have structural defects that can be mitigated with treatment. These trees may require more intense management and monitoring, and may have shorter life-spans than those in the "good" category.

Poor – trees are in poor health condition and have significant defects in structure that cannot be mitigated with treatment. These trees can be expected to decline regardless of management. The species or individual tree may possess characteristics that are incompatible or undesirable in landscape settings or be unsuited for the intended use of the site.

Observations

Trees #1, #2 and #3 are small, young Douglas fir trees near the southwest corner of the property. Vigor is good. No concerns were observed. Condition is 'good'.

Tree #4 is a young to semi-mature apple tree on the south perimeter of the property. There are also three dead fruit trees on the south perimeter. It has developed typical form for the species. Overall condition is rated as 'fair'.

Tree #5 is another young Douglas fir tree on the east perimeter of the property. It has been recently topped at roughly 12-feet above ground. The tree was likely topped because it was interfering with somebody's view of Lake Washington. It is of good vigor. Overall condition is rated as 'fair'.

Tree #6 is a large cluster of figs, comprised of multiple small diameter stems. It has a large-spreading canopy and is of good vigor. Condition is 'good'.

Trees #7 is a young to semi-mature English hawthorn. This is likely a volunteer and was not planted. The lower trunk forks into multiple tops. It has an asymmetric crown or canopy to the north. It is in 'fair' condition.

Tree #8 is a young English holly. This is likely a volunteer and was not planted. It has developed typical form for the species. Condition is 'fair'.

Trees #9, #10, #11 and #12 are semi-mature Douglas fir located close to the existing house, on the south side. All of these were topped many, many years ago at roughly 16-feet above ground. See pictures below. They have developed two or more new tops or upright stems from the old topping cuts. Forked attachments appear sound. Vigor is fairly good. Foliage is of normal color and density. The lower trunks appear sound with no outward indicators of any significant internal decay issues. Overall condition is rated as 'fair'.

Tree #13 is a semi-mature white oak. It has developed good structural form. Vigor is good. Condition is 'good'.

Trees #14, #15 and #18 > #24 are young to semi-mature English holly, planted in a row across the front of the property. These have developed typical form for the species and are of fairly good vigor. Condition is 'fair'.

Tree #16 is a young Siberian elm. This is likely a volunteer and was not planted. It has developed typical form for the species. Condition is 'fair'.

Trees #25 and #26 are a young to semi-mature Douglas fir and Western hemlock located in the northwest corner of the property. Both have been topped at roughly 12-feet above ground. Both have very few live branches. Structural form has been compromised by the topping. These are in 'poor' condition.

Trees #27 and #29 are semi-mature to mature apple trees. #27 has an asymmetric canopy and lean and is in 'fair' condition. #29 has been well-maintained and is in 'good' condition.

Tree #28 is a mature big-cone pine. It has a major lean to the southwest. It is growing out of a rockery close to the north property line and very close to the existing outbuilding. It has been excessively pruned over the years. Vigor is good. The lower trunk appears sound. Condition is 'fair'.

Trees #30 and #31 are young to semi-mature holly. #30 has a recent dead top and very sparse foliage. it is in 'poor' condition. #31 is in 'fair' condition.

Tree #32 is a young Colorado blue spruce close to the north property line, located on the opposite side of the fence. No concerning conditions were observed from the subject property side. Condition is 'good'.

Neighboring/Off-Site Trees

Tree #101 is a young umbrella pine tree. No concerning conditions were observed from the subject property side. Vigor is good. Foliage is of normal color and density. Condition is 'good'.

Discussion/Recommendations

The attached 'Tree Plan Map' indicates the actual driplines of subject trees proposed for retention. The information on the attached map and in this report can be used by the project architect to create the final tree retention plan sheet for City submittal if necessary. The recommended Limit of Disturbance (LOD) measurements can be found on the tree summary table. This is basically the limit of acceptable impact, measured in feet from the trunk face. The LOD measurements are based on species, age, condition, drip-line, prior improvements, proposed impacts and the anticipated cumulative impacts to the entire root zone. These shall be referenced when determining the feasibility of retention. These have also been delineated on the Tree plan Map.

The proposal is to retain the grouping of trees in the middle of the property, Trees #7 > #12 on proposed Lots 1 and 2 and the mature apple tree between proposed Lots 3 and 4. These trees will not be affected by the removal of other trees from the property.

There is an existing deck and hot tub within the LOD of Trees #9, #10, #11 and #12. These shall be removed using hand-labor only. Once removed, thoroughly irrigate and cover the disturbed areas with a protective +/- 6-inch layer of coarse arborist wood chip mulch or hog fuel to protect soils and surface roots. The existing house shall be demolished and removed by equipment working from outside of the dripline areas. For the demo phase, position a temporary tree protection barrier 5-feet beyond the driplines on the west, south and east sides of the grove to fully protect trees. Position a barrier at the house extents north of the trees to keep equipment off root zones.

There are several improvements proposed within the driplines of Trees #9 > #12. Douglas fir is quite hardy and would be expected to tolerate the proposed impacts so long as work is carried out diligently. The project arborist shall be on-site to supervise all work within the driplines to properly protect and

prune roots during excavation of building foundations. Any damaged roots shall be pruned clean back to sound tissue prior to backfilling and finishing areas. Sound tissue is where the root is undamaged and the bark is completely intact with the root. This will allow the tree to seal off any potential decay and sprout new root growth.

There is a driveway proposed within the critical root zone or LOD of Tree #11. The existing grade is favorable for placing the driveway at or above the existing grade, requiring excavation of only the top sod layer to place a gravel sub-base. Limit the degree of compaction within the dripline area. If work is performed conscientiously to protect soils and surface roots, there should not be any significant impacts to the root zone.

Trees #7 and #29 will require some clearance pruning to site new buildings. Both species respond well to pruning and it is not expected to be an issue. Use a professional, certified arborist to complete the work. No pruning of Trees #9 > #12 is anticipated. These have already been significantly crown-raised in the past. There may be a branch or two that will need to be removed but nothing significant.

Neighboring tree #101 will not be impacted by the proposal. The existing property line fence is adequate protection.

The outer dripline areas of retained trees shall be provided supplemental irrigation during the dry season of June through September. Thoroughly water the outer dripline areas every 7 to 10 days to maintain a favorable environment for new root growth and to reduce the degree of stress associated with the site changes.

Finish the landscape within the driplines of retained or protected trees by simply cutting and/or hand-pulling unwanted or undesirable vegetation and applying a +/- 4-inch layer of organic mulch. Keep irrigation trenches, large plantings or other improvements outside of the dripline areas.

Tree Protection Measures

The following guidelines are recommended to ensure that the designated space set aside for the preserved trees are protected and construction impacts are kept to a minimum. Standards have been set forth under Kirkland Zoning Code 95.34 of Chapter 95. Please review these standards prior to any development activity.

- Tree protection fencing shall be erected prior to moving any heavy equipment on site. Doing this will set clearing limits and avoid compaction of soils within root zones of retained trees.

- Excavation limits shall be laid out in paint on the ground to avoid over excavation and unnecessary damage.

- Excavations within the driplines shall be monitored by a qualified tree professional so necessary precautions can be taken to decrease impacts to tree parts. A qualified tree professional shall monitor excavations when work is required and allowed within the drip-line or critical root zone.

- To establish sub grade for foundations, curbs and pavement sections near the trees, soil shall be removed parallel to the roots and not at 90-degree angles to avoid breaking and tearing roots that lead back to the trunk within the drip-line. Any roots damaged during these excavations should be exposed to sound tissue and cut cleanly with a saw. Cutting tools should be sterilized with alcohol.

- Areas excavated within the drip-line of retained trees shall be thoroughly irrigated weekly during dry periods.

- Preparations for final landscaping shall be accomplished by hand within the drip-lines of retained trees. Large equipment shall be kept outside of the tree protection zones at all times.

Tree Density-Tree Replacement

Tree Density Calculation
Lot Size – +/- 30,590 sq.ft.
30,590/43,560 X 30 = 21.1
Required Minimum Tree Density = 21 tree credits
Tree Credits Existing on Property = 108
Tree Credits to be retained = 55
Supplemental Trees required = 0

Consult with your City planner on required supplemental tree requirements.

New tree plantings will likely be preferred to enhance the finished landscape. Refer to the City of Kirkland Plant List for recommended species.

For planting and maintenance specifications, refer to chapters 95.50 and 51 of the Kirkland Zoning Code.

Arborist Disclosure Statement

Arborists are tree specialists who use their education, knowledge, training and experience to examine and assess trees, recommend measures to enhance the beauty and health of trees, and attempt to reduce the risks associated with living near trees. Clients may choose to accept or disregard the recommendations of the arborist, or to seek additional advice.

Arborists cannot detect every condition that could possibly lead to the structural failure of a tree. Trees are living organisms that grow, respond to their environment, mature, decline and sometimes fail in ways we do not fully understand. Conditions are often hidden within trees and below ground.

Arborists cannot guarantee that a tree will be healthy and/or safe under all circumstances, or for a specified period of time. Likewise, remedial treatments, like any medicine, cannot be guaranteed. Treatment, pruning and removal of trees may involve considerations beyond the scope of the arborist's services such as property boundaries, property ownership, site lines, disputes between neighbors, and other issues. Arborists cannot take such considerations into account unless complete and accurate information is disclosed to the arborist. An arborist should then be expected to reasonably rely upon the completeness and accuracy of the information provided.

Trees can be managed, but they cannot be controlled. To live near trees is to accept some degree of risk. The only way to eliminate all risk associated with trees is to eliminate all trees.

Photo Documentation

Trees #1, #2 and #3

South perimeter of property, dead plum trees

Southeast corner of site, Tree #4 in foreground, dead fruit tree in background

Tree #5, recently topped

Tree #6, fig, large cluster of small stems

Trees #7 and #8

Trees #9 > #12

Trees #9 > #12, all topped many years ago

Front of property, Tree #17 – center, #13 in background on left

Tree #13 on left, #14 > #16 on right

Trees #18 > #24

Trees #25 and #26 in northwest corner of site