Tree Solutions Inc
Consulting Arborists

TO:	Artoush Fanaiyan, Artoush Construction
JOB SITE:	11622 80th Ave NE. Kirkland, WA 98033
SUBJECT:	Tree Inventory & Assessment
DATE:	January 29, 2014
PREPARED BY:	Sean Dugan, Registered Consulting Arborist #457 ISA Certified Board Certified Master Arborist PN-5459B ISA Qualified Tree Risk Assessor

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Summary

I have identified twenty-nine (29) trees of significant size that stand on site. For this 43,560 sq. ft. property the city of Kirkland Zoning Code (95.33) requires a minimum tree density of 30 tree credits. The site currently has enough viable trees for potentially having 81.5 tree credits that can be retained and exceed the City requirements. However, it appears that only 30.5 tree credits will be retained due to proposed site design.

Trees 6, 7, 13, 14, and 18 might be considered High retention value trees that need to be retained. Tree 6 appears to be the only tree where this might be feasible, depending on how access is developed throughout the site. Tree 18 is a poor candidate for retention due to health and structural issues.

Two (2) trees on the adjacent property to the north have canopies that overhang the job site. These trees are unlikely to be negatively impacted due to the distance from the property line. The limits of disturbance for this tree should be at the property line.

Assignment & Scope of Report
This report outlines the site inspection by Sean Dugan, of Tree Solutions Inc., on January 17, 2013. I was asked to conduct a site visit to inventory all significant trees with descriptions of species, diameter size, health and structural condition, limits of disturbance, drip line radius, proposed action, and notes for each tree. I was asked to develop a formal arborist report addressing city of Kirkland requirements for tree preservation.

Included in the report are observations from the site located at 11622 80th Ave. NE., discussion, and recommendations. Artoush Fanaiyan, of Artoush Construction, requested these services to acquire information for project planning in accordance with requirements set by the city of Kirkland.

Limits of Assignment
Unless stated otherwise: 1) information contained in this report covers only those trees that were examined and reflects the condition of those trees at the time of inspection; and 2) the inspection is limited to visual examination of the subject trees without dissection, excavation, probing, climbing, or coring unless explicitly specified. There is no warranty or guarantee, expressed or implied, that problems or deficiencies of the subject trees may not arise in the future.

I was provided a survey of the site with limited information regarding future development plans. Additional Assumptions and Limiting Conditions can be found in Appendix A.

Methods
I measured the diameter of each tree at standard height (DSH). I calculated the equivalent single-stem diameter for multi-stemmed trees using the Guide to Trunk Area outlined in the Guide for Plant Appraisal (9th Edition). Tree species, size, health and structural condition, limit of disturbance, drip line radius, proposed action, tree credit value, and notes for each tree can be found in the attached Table of Trees. Numbers in the series 1 thru 29 on the Table correspond with the numbers on the attached Marked-up Site Plan. Two trees on adjacent site to the north with overhanging canopy are labeled using letters A and B.

I evaluated tree health and structure utilizing visual tree assessment (VTA) methods. The basis behind VTA is the identification of symptoms, which the tree produces in reaction to a weak spot or area of mechanical stress. A tree reacts to mechanical and physiological stresses by growing more vigorously to re-enforce weak areas, while depriving less stressed parts. (Mattheck & Breloer 1994) An understanding of the uniform stress allows me to make informed judgments about the condition of a tree.

Observations
The Site
The 43,560 square foot lot is located in a residential neighborhood in the city of Kirkland. The site is currently developed with a single family structure. The site abuts developed residential properties on the north, east, and south border. To the west of the site is 80th Ave NE. Beyond this area to the west appears to be open space.

The topography of the site is gradually sloped with mostly a southwest aspect. There are no environmental critical areas listed for the property.

The site is proposed for subdivision into five lots with an open space tract and a 21 foot wide access easement. The existing structures will be removed and the site will be extensively graded.

The Trees

Twenty-nine significant size trees exist on the site. Tree species include Douglas-fir (*Psuedotsuga menziesii*), Ponderosa pine *(Pinus ponderosa),* English holly *(Ilex aquifolium),* Norway maple (*Acer platanoides),* Western Red cedar (*Thuja plicata),* Willow species *(Salix sp.),* Big leaf maple *(Acer macrophyllum),* and Bitter cherry (*Prunus emarginatta)* trees. Information specific to each tree can be found in the attached Table of Trees.

Nineteen trees are in good health condition, nine are in fair condition and one is in poor condition. The tree in poor health condition has a poor structural condition as well. All of the trees present a low risk rating to the surrounding targets except for tree 18, which presents a moderate risk rating.

The trees on the adjacent site with the overhanging canopy are a Pacific madrone *(Arbutus menziesi),* and a Douglas-fir tree. Both of the trees are in good condition.

Discussion

Trees 2, 5, 8, 15, 18, 22, 23, should be removed due to issues relating to health and structure. Trees 8, 9, 10, and 35 appear to be in the access easement and will need to be removed for entry into the site and right-of-way improvements. Tree 3 should be removed due to being an invasive species.

Trees 4, 6, 7, 13, 14, and 18 might be considered as high Retention value by the City as they are located in the required property setbacks. Based on our discussion it appears that it may only be feasible to retain tree 6. This tree should be tested for decay at the base if retained. The City desires to retain these trees to the maximum extent possible and may require design changes to achieve this goal.

There appears to be three tree groves present on the site. Groves contain trees (7 - 9), (19-25), and (26-28). Based on our discussion none of these groves can be retained. The City considered groves to be of high retention value.

Prior to site development, tree protection measures, as outlined in the Kirkland Zoning Code Section 95.34 Tree Protection during Development Activity, will need to be implemented around trees to be preserved. These measures can be found in Appendix B of this report.

Tree Density Credits

The Kirkland Zoning Code (95.33) requires tree density to satisfy 30 tree credits per acre. The property is 43,560 sq. ft., or 1 acre. Therefore, a tree density worth 30 tree credits (1.0 x 30 = 30) is required in order to meet the minimum requirement. The property currently has 187 tree credits, 81.5 credits are from viable trees. As proposed, 30.5 tree credits will remain.

With additional testing it might be feasible to retain tree 1. If tree 1 is retained an additional 11.5 tree credits can be added to the site for a total of 42 tree credits.

Adjacent Site Trees

Trees A and B on the north property border are unlikely to be negatively impacted by the proposed development due to the distance away from the job site. The limits of the disturbance can be to the property's edge.

Recommendations

- Determine which trees can be preserved based on the location of proposed structures and infrastructure to be installed.
- Meet with City Planners to determine if the proposed site plans are acceptable or if they will require adjustments.
- Obtain all necessary permits and approval from the City prior to commencement of site work.
- Provide basic tree protection measures around trees to be preserved.

Glossary

DBH or DSH: diameter at breast or standard height; the diameter of the trunk measured 54 inches (4.5 feet) above grade (Matheny *et al.* 1998)

Grove: A group of three (3) or more significant trees with overlapping or touching crowns. **ISA:** International Society of Arboriculture (KZC)

Limit of Disturbance: The boundary between the protected area around a tree and the allowable site disturbance as determined by a qualified professional measured in feet from the trunk (KZC)

Retention Value: The Planning Official's designation of a tree based on information provided by a qualified professional that is one (1) of the following:

a. High, a viable tree, located within required yards and/or required landscape areas. Tree retention efforts shall be directed to the following trees if they are determined to be healthy and windfirm by a qualified professional, and provided the trees can be safely retained when pursuing alternatives to development standards pursuant to KZC 95.32:

1) Specimen trees;
2) Tree groves and associated vegetation that are to be set aside as preserved groves pursuant to KZC 95.51(3);
3) Trees on slopes of at least 10 percent; or
4) Trees that are a part of a grove that extends into adjacent property, such as in a public park, open space, sensitive area buffer or otherwise preserved group of trees on adjacent private property. If significant trees must be removed in these situations, an adequate buffer of trees may be required to be retained or planted on the edge of the remaining grove to help stabilize; (KZC)

References

ANSI A300 (Part 1) – 2008 American National Standards Institute. American National Standard for Tree Care Operations: Tree, Shrub, and Other Woody Plant Maintenance: Standard Practices (Pruning). New York: Tree Care Industry Association, 2008.

Kirkland Zoning Code. Chapter 95 – TREE MANAGEMENT AND REQUIRED LANDSCAPING. http://www.codepublishing.com/wa/kirkland/ (accessed January 28, 2014)

Lilly, Sharon. Arborists' Certification Study Guide. Champaign, IL: The International Society of Arboriculture, 2001.

Matheny, Nelda and James R. Clark. Trees and Development: A Technical Guide to Preservation of Trees During Land Development. Champaign, IL: International Society of Arboriculture, 1998.

Mattheck, Claus and Helge Breloer, The Body Language of Trees.: A Handbook for Failure Analysis. London: HMSO, 199

Appendix A – Assumptions & Limiting Conditions

1. Consultant assumes that any legal description provided to Consultant is correct and that title to property is good and marketable. Consultant assumes no responsibility for legal matters. Consultant assumes all property appraised or evaluated is free and clear, and is under responsible ownership and competent management.

2. Consultant assumes that the property and its use do not violate applicable codes, ordinances, statutes or regulations.

3. Although Consultant has taken care to obtain all information from reliable sources and to verify the data insofar as possible, Consultant does not guarantee and is not responsible for the accuracy of information provided by others.

4. Client may not require Consultant to testify or attend court by reason of any report unless mutually satisfactory contractual arrangements are made, including payment of an additional fee for such Services as described in the Consulting Arborist Agreement.

5. Unless otherwise required by law, possession of this report does not imply right of publication or use for any purpose by any person other than the person to whom it is addressed, without the prior express written consent of the Consultant.

6. Unless otherwise required by law, no part of this report shall be conveyed by any person, including the Client, the public through advertising, public relations, news, sales or other media without the Consultant's prior express written consent.

7. This report and any values expressed herein represent the opinion of the Consultant, and the Consultant's fee is in no way contingent upon the reporting of a specific value, a stipulated result, the occurrence of a subsequent event or upon any finding to be reported.

8. Sketches, drawings and photographs in this report, being intended as visual aids, are not necessarily to scale and should not be construed as engineering or architectural reports or surveys. The reproduction of any information generated by architects, engineers or other consultants and any sketches, drawings or photographs is for the express purpose of coordination and ease of reference only. Inclusion of such information on any drawings or other documents does not constitute a representation by Consultant as to the sufficiency or accuracy of the information.

9. Unless otherwise agreed, (1) information contained in this report covers only the items examined and reflects the condition of the those items at the time of inspection; and (2) the inspection is limited to visual examination of accessible items without dissection, excavation, probing, climbing, or coring. Consultant makes no warranty or guarantee, express or implied, that the problems or deficiencies of the plans or property in question may not arise in the future.

10. Loss or alteration of any part of this Agreement invalidates the entire report.

Appendix B - Kirkland Tree Protection Specifications – as stated in Chapter 95.34 of KZC

6. Tree Protection during Development Activity. Prior to development activity or initiating tree removal on the site, vegetated areas and individual trees to be preserved shall be protected from potentially damaging activities pursuant to the following standards:

a. Placing Materials near Trees. No person may conduct any activity within the protected area of any tree designated to remain, including, but not limited to, operating or parking equipment, placing solvents, storing building material or soil deposits, or dumping concrete washout or other chemicals. During construction, no person shall attach any object to any tree designated for protection.

b. Protective Barrier. Before development, land clearing, filling or any land alteration, the applicant shall:

1) Erect and maintain a readily visible temporary protective tree fencing along the limits of disturbance which completely surrounds the protected area of all retained trees or groups of trees. Fences shall be constructed of chain link and be at least four feet high, unless other type of fencing is authorized by the Planning Official.

2) Install highly visible signs spaced no further than 15 feet along the entirety of the protective tree fence. Said sign must be approved by the Planning Official and shall state at a minimum "Tree Protection Area, Entrance Prohibited" and provide the City phone number for code enforcement to report violations.

3) Prohibit excavation or compaction of earth or other potentially damaging activities within the barriers; provided, that the Planning Official may allow such activities approved by a qualified professional and under the supervision of a qualified professional retained and paid for by the applicant.

4) Maintain the protective barriers in place until the Planning Official authorizes their removal.

5) Ensure that any approved landscaping done in the protected zone subsequent to the removal of the barriers shall be accomplished with light machinery or hand labor.

6) In addition to the above, the Planning Official may require the following:

a) If equipment is authorized to operate within the critical root zone, cover the areas adjoining the critical root zone of a tree with mulch to a depth of at least six inches or with plywood or similar material in order to protect roots from damage caused by heavy equipment.

b) Minimize root damage by excavating a two-foot-deep trench, at edge of critical root zone, to cleanly sever the roots of trees to be retained.

c) Corrective pruning performed on protected trees in order to avoid damage from machinery or building activity.

d) Maintenance of trees throughout construction period by watering and fertilizing.

c. Grade.

1) The grade shall not be elevated or reduced within the critical root zone of trees to be preserved without the Planning Official's authorization based on recommendations from a qualified professional. The Planning Official may allow coverage of up to one half of the area of the tree's critical root zone with light soils (no clay) to the minimum depth necessary to carry out grading or landscaping plans, if it will not imperil the survival of the tree. Aeration devices may be required to ensure the tree's survival.

2) If the grade adjacent to a preserved tree is raised such that it could slough or erode into the tree's critical root zone, it shall be permanently stabilized to prevent suffocation of the roots.

3) The applicant shall not install an impervious surface within the critical root zone of any tree to be retained without the authorization of the Planning Official. The Planning Official may require specific construction methods and/or use of aeration devices to ensure the tree's survival and to minimize the potential for root-induced damage to the impervious surface.

4) To the greatest extent practical, utility trenches shall be located outside of the critical root zone of trees to be retained. The Planning Official may require that utilities be tunneled under the roots of trees to be retained if the Planning Official determines that trenching would significantly reduce the chances of the tree's survival.

5) Trees and other vegetation to be retained shall be protected from erosion and sedimentation. Clearing operations shall be conducted so as to expose the smallest practical area of soil to erosion for the least possible time. To control erosion, it is encouraged that shrubs, ground cover and stumps be maintained on the individual lots, where feasible.

d. Directional Felling. Directional felling of trees shall be used to avoid damage to trees designated for retention.

e. Additional Requirements. The Planning Official may require additional tree protection measures that are consistent with accepted urban forestry industry practices.

Attachments:

Table of Trees
Marked-up Site Plan

Tree Solutions Inc
Consulting Arborists

Artoush Construction - Table of Trees
11622 80th Ave. NE, Kirkland

Date of Inventory: January 17, 2014
Table Prepared: January 24, 2014

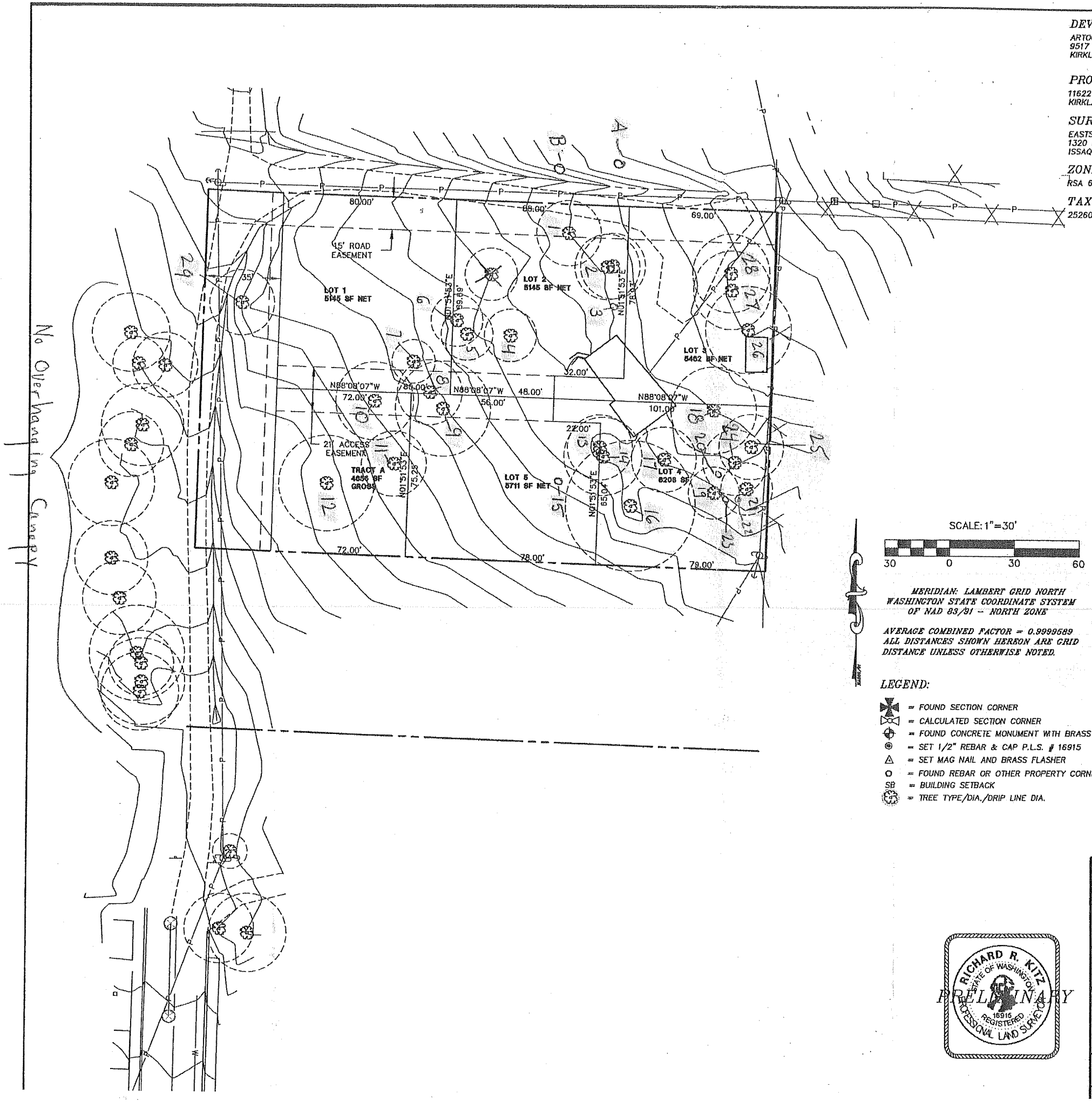
Tree #	Common/Scientific Name	DSH (inches)	Health Condition	Structural Condition	Limits of Disturbance	Drip Line Radius (ft)	Viability	Risk Rating	Proposed Action	Credits	Notes
1	*Douglas-fir/ Psuedotsuga menziesii*	31.2	Good	Good	Trunk	20	*Possible	Low	Remove/ Grading	0	Tip dieback in lowe canopy, Phaeolus schweinitzii fruiting body at base; ***Advanced test for decay if proposed for retention**
2	*Ponderosa pine/ Pinus ponderosa*	36.3	Fair	Fair	Trunk	15	NO	Low	Remove/ Health	0	Tree appears to be in decline; Two trunks with the smaller being girdled by a wire that will likely lead to death; sparse canopy due to foliar disease; 31+19 DSH trunks
3	*English holly/ Ilex aquifolium*	10.9	Good	Fair	Trunk	7	NO	Low	Remove/ Species	0	Invasive species; 4+5+5+7.3 DSH trunks
4	*Norway maple/ Acer platanoides*	8.2	Fair	Fair	Trunk	10	Yes	Low	Remove/ Grading	0	canker at base may be early symptom of Verticillium wilt, monitor foliage in spring
5	*Douglas-fir/ Psuedotsuga menziesii*	24.5	Good	Fair	Trunk	18	NO	Low	Remove/ Structure	0	Trunk leans to the north and has corrected, failed at roots in the past and has been leaning on tree 6, can only be retained if 6 is retained
6	*Douglas-fir/ Psuedotsuga menziesii*	20.5	Good	Good	Drip line	18	Yes*	Low	Retain	5	tip dieback on some branches, root wads of trees that previously failed near the base of this tree; ***suggest advanced decay testing if tree is retained to determine if there are any internal issues at the base of the tree.**
7	*Douglas-fir/ Psuedotsuga menziesii*	26.5	Good	Good	Trunk	15	NO	Low	Remove/ Access	0	Becoming suppressed by trees 7 and 9, large fruiting body from Phaeolus schweinitzii at the base, will be compromised by access road; poor candidate for retention
8	*Douglas-fir/ Psuedotsuga menziesii*	17.5	Fair	Fair	Trunk	12	NO	Low	Remove/ Access	0	Phaeolus schweinitzii at base
9	*Douglas-fir/ Psuedotsuga menziesii*	39.0	Fair	Good	Trunk	22	Yes	Low	Remove/ Access	0	
10	*Douglas-fir/ Psuedotsuga menziesii*	25.0	Good	Good	Trunk	16	Yes	Low	Remove/ Access	0	
11	*Douglas-fir/ Psuedotsuga menziesii*	26.0	Good	Good	Drip line east, 24 ft in other directions	12	Yes	Low	Retain	9	
12	*Douglas-fir/ Psuedotsuga menziesii*	33.0	Good	Good	Drip line	20	Yes	Low	Retain	12.5	
13	*Western Red cedar/ Thuja plicata*	26.0	Fair	Good	Trunk	20	Yes	Low	Remove/ Grading	0	Canopy sparse and off color; tree roots will be compromised by access to site
14	*Western Red cedar/ Thuja plicata*	29.0	Fair	Good	Trunk	20	Yes	Low	Remove/ Grading	0	Canopy sparse and off color; tree roots will be compromised by access to site
15	*Willow species/ Salix sp.*	11.0	Poor	Poor	Trunk	6	NO	Low	Remove/ Health	0	Split at base with extensive decay, multiple part failure; trunks measured 4+5+9 DSH
16	*Big leaf maple/ Acer macrophyllum*	31.0	Good	Good	Trunk	25	Yes	Low	Remove/ Grading	0	Large surface roots, low density moderate size dead wood, crown clean if retained
17	*Big leaf maple/ Acer macrophyllum*	14.9	Fair	Fair	Trunk	18	Yes	Low	Remove/ Grading	0	slow growth rate, smaller lead previously failed, disturbance in the root zone; trunks measured 10+11 DSH

Tree Solutions Inc
Consulting Arborists

Artoush Construction - Table of Trees
11622 80th Ave. NE, Kirkland

Date of Inventory: January 17, 2014
Table Prepared: January 24, 2014

18	*Big leaf maple/ Acer macrophyllum*	29.0	Fair	Poor	Trunk	23	NO	Moderate	Remove/ Structure	0	Large tearout in lower trunk with cavity and decay, wounds on multiple sides of the tree, verticillium wilt, moderate density of moderate size dead wood
19	*Douglas-fir/ Psuedotsuga menziesii*	32.0	Good	Good	Trunk	21	Yes	Low	Remove/ Grading	0	
20	*Big leaf maple/ Acer macrophyllum*	6.0	Good	Good	Trunk	12	Yes	Low	Remove/ Grading	0	Intermediate canopy
21	*Western Red cedar/ Thuja plicata*	16.0	Good	Fair	12 feet from trunk	8	Yes	Low	Retain	4	Forks at five feet above grade, narrow angle of attachment with included bark
22	*Big leaf maple/ Acer macrophyllum*	6.5	Good	Fair	Trunk	8	NO	Low	Remove/ Structure	0	
23	*Big leaf maple/ Acer macrophyllum*	7.6	Good	Fair	Trunk	8	NO	Low	Remove/ Structure	0	Trunks measured 3+7 DSH
24	*Douglas-fir/ Psuedotsuga menziesii*	26.0	Good	Good	Trunk	22	Yes	Low	Remove/ Grading	0	
25	*Bitter cherry/ Prunus emarginatta*	9.7	Fair	Fair	Trunk	12	Yes	Low	Remove/ Grading	0	Tall trunks with narrow taper, trunks measure 2+3.5+6+6.5 DSH
26	*Western Red cedar/ Thuja plicata*	~48	Good	Good	Trunk	25	Yes	Low	Remove/ Grading	0	debris around the base limited access to trunk
27	*Western Red cedar/ Thuja plicata*	28.0	Good	Good	Trunk	18	Yes	Low	Remove/ Grading	0	debris around the base limited access to trunk
28	*Western Red cedar/ Thuja plicata*	28.0	Good	Good	Trunk	18	Yes	Low	Remove/ Grading	0	debris around the base limited access to trunk
29	*Douglas-fir/ Psuedotsuga menziesii*	27.0	Good	Good	Trunk	18	Yes	Low	Remove/ Access	0	Power line below canopy, difficult access due to black berry
									Total Tree Credits	30.5	
						Adjacent Site					
A	*Pacific madrone/ Arbutus menziesii*	~15	Good	Good	Drip line	23	Yes	Low	Retain	0	tree trunk is approximately 20 feet from the property line
B	*Douglas-fir/ Psuedotsuga menziesii*	~20	Good	Good	Drip line	18	Yes	Low	Retain	0	Tree trunk is approximately 15 feet from the property line



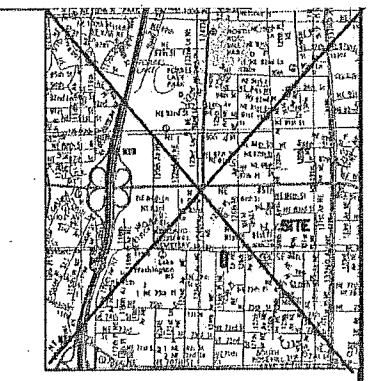
DEVELOPER/AGENT:
ARTOUSH FANAIYAN
9517 132ND AVW NE
KIRKLAND, WA 98033

PROPERTY ADDRESS
11622 80TH AVE NE.
KIRKLAND, WA 98033

SURVEYOR/ENGINEER
EASTSIDE CONSULTANTS, INC.
1320 NW MALL STREET, STE B
ISSAQUAH, WA 98027

ZONING
RSA 6

TAX ACCOUNT NO.
2526049024



VICINITY MAP
NTS

SCALE: 1"=30'
30 0 30 60

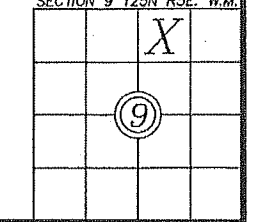
MERIDIAN: LAMBERT GRID NORTH
WASHINGTON STATE COORDINATE SYSTEM
OF NAD 83/91 – NORTH ZONE

AVERAGE COMBINED FACTOR = 0.9999589
ALL DISTANCES SHOWN HEREON ARE GRID
DISTANCE UNLESS OTHERWISE NOTED.

LEGEND:

- = FOUND SECTION CORNER
- = CALCULATED SECTION CORNER
- = FOUND CONCRETE MONUMENT WITH BRASS CAP IN CASE
- = SET 1/2" REBAR & CAP P.L.S. # 16915
- = SET MAG NAIL AND BRASS FLASHER
- = FOUND REBAR OR OTHER PROPERTY CORNER MARKER
- SB = BUILDING SETBACK
- = TREE TYPE/DIA./DRIP LINE DIA.

LOCATION INDEX:
SECTION 9 T25N R5E. W.M.



RICHARD R. KITZ
STATE OF WASHINGTON
16915
REGISTERED
PROFESSIONAL LAND SURVEYOR

PRELIMINARY

EASTSIDE CONSULTANTS, INC.
ENGINEERS-SURVEYORS
1320 N.W. MALL ST., SUITE B
ISSAQUAH, WASHINGTON 98027
PHONE: (425)392-5351
FAX: (425)392-4676

CITY OF KIRKLAND
SHORT PLAT No.
PORTION NW1/4, NE1/4 SEC. 9, T25N R5E.

DWN BY	DATE	JOB NO.
S.KITZ	6/13	13050
CHKD BY	SCALE	SHEET