Tree Solutions Inc
Consulting Arborists

TO:	Rui Gong
JOB SITE:	9105 128th Ave NE, Kirkland, WA, 98033
SUBJECT:	Tree Inventory and Assessments for Parcel #1238500350
DATE:	April 22, 2013
PREPARED BY:	Nicholas W. Dankers, ISA Certified Arborist #PN-5628A ISA Qualified Tree Risk Assessor

Contents

Summary

After inspecting the trees on site, I found the majority of the trees in fair condition and growing in saturated soils. The property has wetlands within its boundaries and many of the trees are shallow-rooted.

For this property, the Kirkland Zoning Code (95.33) requires a minimum tree density of 25.3 credits; the existing trees I recommend retaining are worth 66 credits.

Assignment & Scope of Report

This report outlines the site inspection by Nicholas W. Dankers of Tree Solutions Inc. April 22, 2013. Included is a table which identifies tree species for trees shown on the site photograph. Mr. Gong requested these services to in accordance to the guidelines provided by the City of Kirkland.

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.

Observations

The Site

This vacant lot has an area of 36,658 square feet and includes areas of wetlands that extend to the surrounding properties. The buildable area is in the northeast corner of the property and I crossed a flowing stream to access the remainder of the site.

Signs described "Protected Wetlands" on the western side of the property, and I could not access the trees in this area due to deep mud. I could not see any significant trees greater than 6-inches in diameter on the west side of the site.

In the middle of the parcel, I found saturated soils and areas of mud. The driest soils are in the northwest corner of the site.

The Trees

The trees on site are a mixture of native species. The specific observations pertaining to individual trees are summarized in the following Table of Trees. The table includes: **Tree number** which is also indicated on the site map; **Tree species**; **Tree diameter** (measured in inches at 4.5-feet above ground level), and **Comments**.

A majority of the trees had shallow root systems. I could see pronounced buttress and lateral roots growing at ground level. This is evident in the Western hemlock (*Tsuga heterophyla*) tree #983 in the middle of the site.

Nearby, the largest conifer on site is the 30.9-inch diameter Western Red cedar (*Thuja plicata*) Tree #982.

Numerous Red alder (*Alnus rubra*) trees have corrected leans, where the trunks curved towards the vertical orientation after a past, partial failure. Many trees have dead tops and show other signs of decline.

A group of the Western Red cedar trees, #986 through #991, are growing off a single tree that had fallen over previously. Multiple shoots had since grown upwards and rooted into the ground. I noted internal decay in Tree #990.

The Big Leaf maple (*Acer macrophyllum*) trees in the northwest corner of the property are multi-trunk sprouts off old stumps. After the original trees had been cut, the numerous shoots have grown around an area of decay. I found fungal pathogens at the bases of Tree #611, #618, and #620.

I only found one significant Pacific willow (*Salix lucida*) Tree #619 within the property boundaries and there is a column of basal decay in this double-trunk individual.

Though there is a well-established understory of native plants, I found thickets of Himalayan blackberry (*Rubus armeniana*) plants on site.

Due to some of the patches of this invasive species, I could not tag Trees #994, #995, #626, and #628. These tree locations are indicated on the Site Photograph.

Tree Density Credits

The Kirkland Zoning Code (95.33) requires tree density to satisfy 30 tree credits per acre. The property at 9105 128th Ave NE is 36,658-square feet, or 0.841-acres. Therefore, a tree density worth 25.25 tree credits (0.841 x 30 = 25.25) is required in order for the site to meet the City's minimum requirement.

Based on the various diameters of the retained tree on site, their values are worth 103 tree credits. Section 95.33 of the Kirkland Zoning Code describes "Tree Credits for Existing Significant Trees" in a Table 95.33.1. The existing trees on site fulfill the required tree density for this lot.

Discussion

With the wetland conditions and saturated soils on site, it will be necessary to locate these boundaries to insure the proper setbacks as required by the City of Kirkland.

The shallow root system around many of these trees require an expanded critical root zone (CRZ). On the tree inventory, I noted the limits of disturbance that consider the lean of individual trees.

A majority of the trees around the wetlands on site are good candidates for retention. I did not find any trees that present an excessive risk to the surrounding properties or infrastructure.

Despite the questionable roots of the Western Red cedar trees growing off a fallen parent, it is likely that this group will continue to root themselves into the ground. Trees #986 through #991 should be inspected every 5 years to determine their structural integrity.

In the northwest corner of the property, I determined that the multi-stem Big Leaf maple trees should not be retained. The basal decay will continue to weaken the tree as it grows. It is possible that this structural issue could lead to trunk failures in the future.

Even with the recommended removals, the remaining trees on site would represent 66 Tree Credits. This would satisfy the 25.25 required Tree Density Credits for this sized parcel.

The decay in the base of Pacific willow Tree #619 could lead to the failure of the top. At this point, this tree appears stable and is a potential source of wildlife habitat.

Himalayan blackberry is a wide-spread, invasive species that can dominate native understory plants. Though this species is limited by shade, it will continue to spread on this parcel unless the canes a rhizomes are removed.

Recommendations

1. Obtain all necessary permits and approval from City prior to the commencement of site work.
2. Determine the setbacks and buffers around the wetlands on site.
3. Near the potential building site, determine which trees to retain and delineate the Tree Protection Zone (TPZ) boundary around the drip lines of these trees.
4. Indicate trees to be removed and retained on site plans.
5. Include tree protection measures on site plans.
6. Install tree protection measures prior to heavy equipment arriving on site.
7. Mulch the area beyond the limits of disturbance with a 6-inch thick layer of wood chips.
8. Designate specific trees to remove.
9. Clear all black berry plants on site with approval from the City of Kirkland. To remove these thickets, it is critical to dig up the rhizome and roots of each plant.
10. Replant trees and native plants as required by the City of Kirkland.

I hope you find this information helpful. Please call me if I can be of further assistance.

Respectfully,

Nicholas W. Dankers, Associate Consultant, Tree Solutions, Inc.

Appendix A - Photographs

Photo 1: Trees #981 through #991 from the NW

Photo 2: Western Red Cedar Trees #981 and #982 from the W

Photo 3: Western Red Cedar Trees #986 through #991 from the W

Photo 4: Red Alder Trees #992 and #993 from the N

Appendix B - Glossary

codominant stems: stems or branches of nearly equal diameter, often weakly attached (Matheny *et al.* 1998)
cracks: defects in trees that, if severe, may pose a risk of tree or branch failure (Lilly 2001)
crown: the aboveground portions of a tree (Lilly 2001)
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)
deciduous: tree or other plant that loses its leaves sometime during the year and stays leafless generally during the cold season (Lilly 2001)
evergreen: tree or plant that keeps its needles or leaves year round; this means for more than one growing season (Lilly 2001)
ISA: International Society of Arboriculture
included bark: bark that becomes embedded in a crotch between branch and trunk or between codominant stems and causes a weak structure (Lilly 2001)
lateral: secondary or subordinate branch (Lilly 2001)
monitoring: keeping a close watch; performing regular checks or inspections (Lilly 2001)
pathogen: causal agent of disease (Lilly 2001)
phototropic growth: growth toward light source or stimulant (Harris *et al.*1999)
PNWISA: Pacific Northwest Chapter of ISA
significant size: a tree measuring 6" DSH or greater
snag: a tree left partially standing for the primary purpose of providing habitat for wildlife
soil structure: the arrangement of soil particles (Lilly 2001)
structural defects: flaws, decay, or other faults in the trunk, branches, or root collar of a tree, which may lead to failure (Lilly 2001)
target: person, object, or structure that could be injured or damaged in the event of tree or branch failure (Lilly 2001)

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.

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, 1994.

Appendix C - 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 D – Tree Protection Specification

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 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.

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Table of Trees

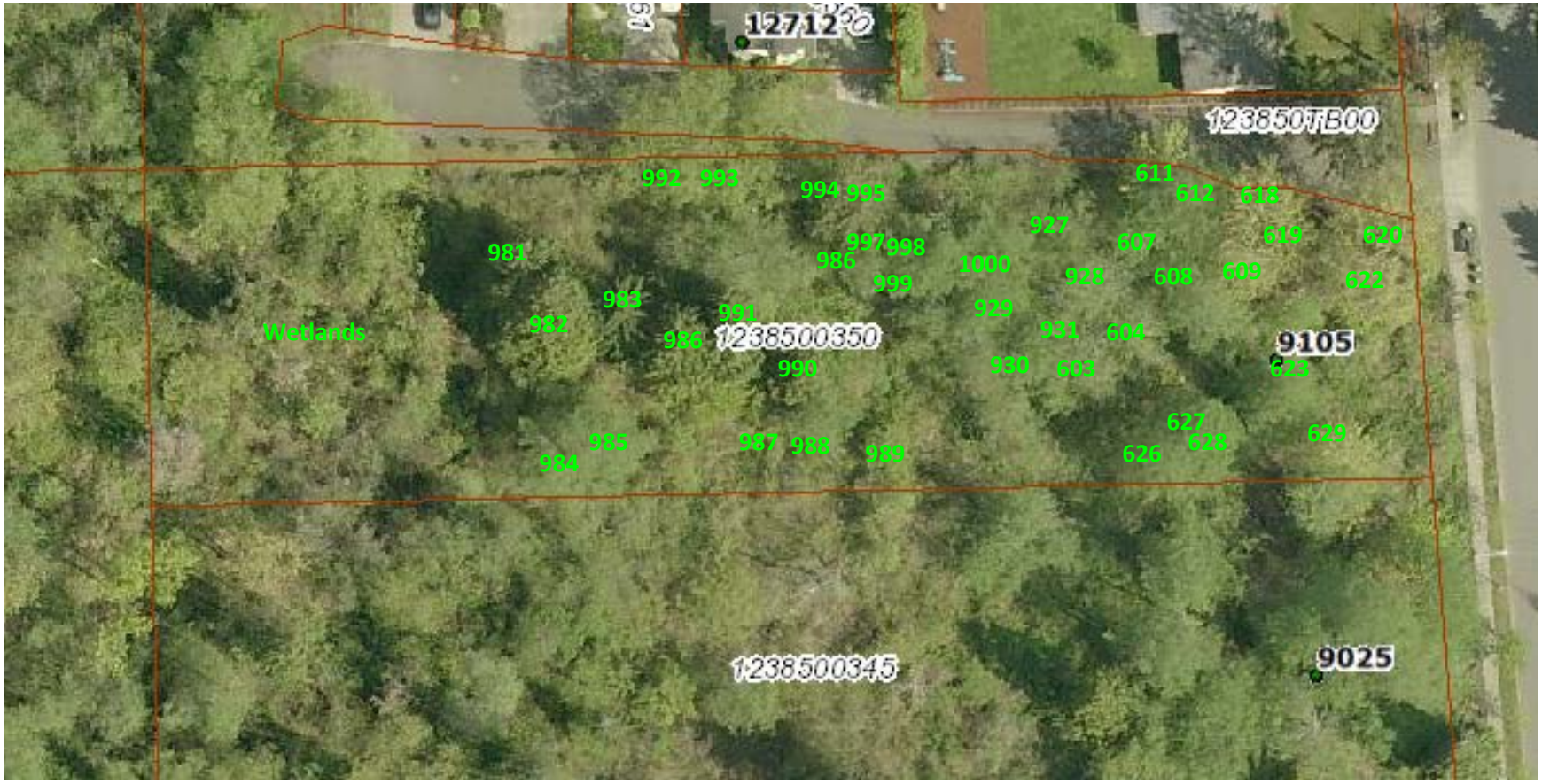
Date of Inventory 4-22-13
Table Prepared 4-22-13
Table Revised 5-1-13

						Limits of Disturbance						
Tree #	**Scientific Name**	**Common Name**	**DSH (inches)**	**Drip Line**	**Condition**	**North**	**South**	**East**	**West**	**Retain**	**Credits**	**Notes**
981	*Thuja plicata*	Western Red cedar	24.6	20	Good	20	20	20	20	Yes	8	
982	*Thuja plicata*	Western Red cedar	30.9	25	Good	25	25	25	25	Yes	11	
983	*Tsuga heterophyla*	Western hemlock	12	12	Good	12	12	12	12	Yes	2	
984	*Alnus rubra*	Red alder	18.4	20	Fair	15	15	20	15	Yes	5	Top Dieback
985	*Alnus rubra*	Red alder	15.5	17	Fair	12	12	17	12	Yes	3	Top Dieback
986	*Thuja plicata*	Western Red cedar	23.7	25	Good	25	25	25	25	Yes	7	Multiple Trunks
987	*Thuja plicata*	Western Red cedar	12.7	13	Good	13	13	13	13	Yes	2	Shoot on Fallen Tree
988	*Thuja plicata*	Western Red cedar	6.5	8	Fair	8	8	8	8	Yes	1	Shoot on Fallen Tree
989	*Alnus rubra*	Red alder	12	12	Poor	12	12	12	12	Yes	2	No tag, good habitat
990	*Thuja plicata*	Western Red cedar	13	20	Fair	20	15	15	20	Yes	2	Decay, Leaning to NW
991	*Thuja plicata*	Western Red cedar	6	10	Fair	10	6	10	6	Yes	1	Shoot on Fallen Tree
992	*Alnus rubra*	Red alder	13.6	20	Fair	14	20	14	14	Yes	2	Dead top
993	*Alnus rubra*	Red alder	7.8	8	Fair	8	8	8	15	Yes	1	Dead top
994	*Thuja plicata*	Western Red cedar	11	12	Fair	12	12	12	12	Yes	1	No tag
995	*Thuja plicata*	Western Red cedar	11.5	12	Fair	12	12	12	12	Yes	1	No tag

Additional Notes:

Wet soils
Nearby stream

Appendix A – Site Photograph



Tree Locations for Lot at 9105 128th Ave NE, Kirkland, WA, 98033