



Title: Rudolf Property Development
ISA Level 2 Basic Tree Risk Assessment
8253 West Mercer Way
Mercer Island, Washington

Prepared for: James Rudolf
8225 West Mercer Way
Mercer Island, WA 98040

Prepared by: Urban Forestry Service, Inc.
Anna Heckman
ISA Board Certified Master Arborist® #PN-6153B
ISA Tree Risk Assessment Qualified

Date: September 18, 2018

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Summary

An ISA Level 2 Basic Tree Risk Assessment was conducted at 8253 West Mercer Way, Mercer Island Washington for 29 significant trees and three non-significant tree groups with canopies overhanging the property. Twenty-four of these trees are on the Rudolf property, four of which are hazard trees and should be immediately removed. Seven trees have a high value for retention with new construction. At least seven trees on the property must be retained for permit compliance. Based on the current plans for tree retention, design adaptations may be required to increase the number of viable trees to be retained.

Of the trees on the Rudolph property, nine are greater than 24-inch D.B.H, and three of these are over 36-inch D.B.H. Two trees meet the criteria for an Exceptional tree.

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Five significant trees on adjacent properties overhang the Rudolph property. Three are in very poor condition, and two neighboring trees, Exceptional by size, have a high potential risk of failure and should have a Level 3 Advanced Tree Risk Assessment conducted.

Introduction

Urban Forestry Services, Inc. consulting arborists were onsite on August 28th, 2018 to assess the trees at 8235 West Mercer Ave, Mercer Island, Washington. The purpose of this work was to assess trees for condition and retention value, to determine which trees are worthy and possible to retain based on the construction plans provided to us and to provide General Tree Protection Guidelines for retained trees in compliance with the new tree code.

The property is a westerly facing steep slope covered in mature mixed canopy forest. The understory consists primarily of invasive English ivy, and Himalayan blackberry interspersed with clumps of young trees and native shrubs.



Using the site plan provided, 29 significant and regulated individual trees, over 10” diameter, and three groups of non-significant neighboring trees were assessed. These 29 trees are numbered with aluminum tags in the field beginning with #101. The attached Tree Site Plan and Tree Assessment Matrix provide details on location, species, trunk diameter, Critical Root Zone (CRZ) radius, condition, maintenance recommendations, risk of failure, and preservation values.

Findings

Twenty-four trees are on the property, and five significant trees (# 125-129) are on neighboring properties with canopies overhanging the property edge. Tree numbers #113, #122, #125, #127 are considered Exceptional based on the MICC 19.16 Exceptional tree table. Two of these Exceptional trees (#122, #127) and an additional two non-exceptional trees (#114, #120) are over 36-inches in diameter. Trees #104, #110, #111, #115, 116, 119, #125, #128, and #129 are greater than 24-inch diameter. The attached Tree Inventory and Replacement Submittal Form has significant tree numbers for the property added to it. This form is required for submittal with the permit.

Recommendations

1. Request immediate removal of hazard trees # 114, #115, #116, and #119.

These large and over mature big leaf maples, *Acer macrophyllum*, and black cottonwood, *Populus trichocarpa*, have both signs and symptoms of advanced heartwood decay. Some trees are structurally failing, and all have existing targets. Trees #114 and #119 are over 36 inches diameter. The removal or mitigation of these trees should be independent of development decisions. Stumps and root systems should be kept in place for soil stabilization where possible.

2. Retain, protect, and closely monitor adjacent property trees #125 through #132.

Many of the adjacent property trees are in poor condition. Pre-construction tree condition is documented in the Tree Assessment Matrix. For non-regulated groups of trees less than 10-inch diameter (#130 through #132), removal and replacement after construction may be a better long-term option rather than investing in root system protection because of their poor condition and preservation value.

Current development plans indicate disturbance will occur within the Critical Root Zone (CRZ) of adjacent property trees #125 and #127 (about 30 feet from the trunk). Tree #127 is 39.5-inches in diameter and is an Exceptional tree. These large Douglas firs, *Pseudotsuga menziesii*, will be within falling distance of the proposed building and adequate protection of their root zone is essential.

The proximity of and grading for the recent construction of a neighboring driveway indicate a very high probability that structural roots for these Douglas firs have been severed or

damaged in the recent past during that work. Tree #125 displays decline in the crown and symptom patterns consistent with extensive root loss. An ISA Level 3 Advanced Tree Risk Assessment to assess tree stability is highly recommended prior to building near these trees.

If tree #125 is retained, the following measures will help decrease the risk of potential tree failure to the development on the Rudolph property:

- Adjust the placement of the building out of the fall zone of the trees;
- Decrease development impacts within the CRZ of the trees;
- Use low impact work practices within the CRZ to retain as many structural and fine roots as possible.
- An ISA certified arborist should be on site if any work is conducted within the CRZ.
- Monitor trees closely for changes in health or structure during and after construction.
- Work with neighboring property tree owners for tree maintenance and removal if any concerns in tree health or stability arise.

All retained trees on the adjacent property will require tree protection and that data needs to be added to the plans using the dripline measurement. In most cases this is equivalent to the Interior CRZ. For trees #125 and #127, the full CRZ based on one foot per inch of trunk diameter is recommended. This is shown on the attached maps.



Photo 3. This is the neighboring Driveway to the south and graded cut slope potentially impacting roots.

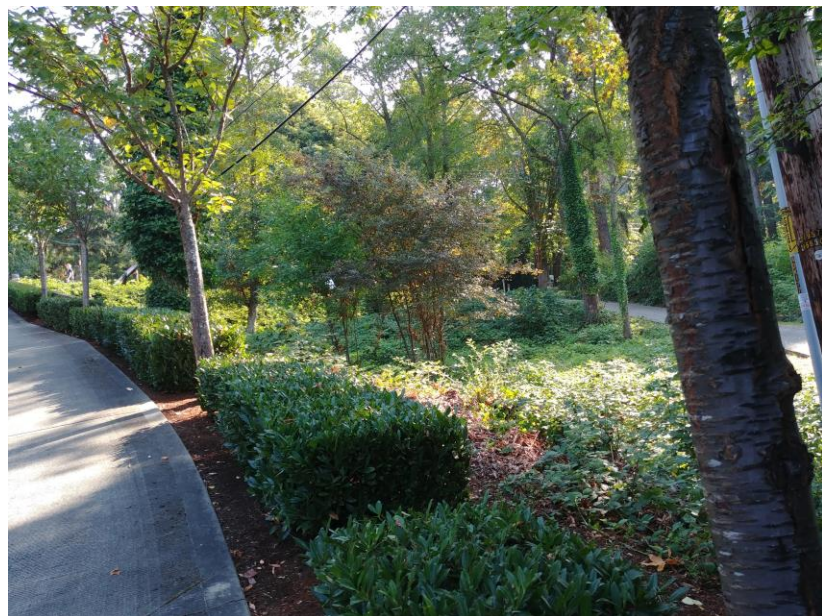


Photo 4. These are flowering cherry trees along the North property edge. Trees on top the wall only require branch protection, others will require root protection as well.

3. Select seven trees to retain on site, retain Exceptional and high retention value trees where possible.

Thirty percent (7.2 or 8) of the 24 trees on the property are required by City code to be retained. Trees #101, #104, #112, #113, #117, #118, #120, #121 are possibilities, based on the current plans. Only three of these trees (#113, #118, and #121) are healthy viable trees in locations within the current plan designs that have adequate space for tree protection. The other trees are not recommended for retention through development based on this Level 2 Basic Tree Risk assessment as they will pose a future hazard to proposed site improvements.

The City of Mercer Island tree retention code requests applicants to prioritize tree retention to Exceptional and healthy trees. Trees #110, #111, and #122 should be considered for retention. Plan adaptations or use of low impact paving techniques will be required to protect the CRZ of these trees. If retention of Exceptional trees, high priority trees, or at least seven trees on the site is not possible, a discussion of how the development fits with the following exception will be required:

“Removal of Exceptional trees with a diameter of 24 inches or more, shall be limited to the following circumstances: A. Retention will result in an unavoidable hazardous situation. B. Retention will limit the constructible gross floor area to less than 85% of the maximum gross floor area allowed under MICC 19.02. C. Retention will prevent creation of a residential lot through a subdivision or short subdivision that is otherwise allowed by MICC 19.10”

4. Update design plans and documents for resubmittal.

Submittal of this report alone will not fulfill the requirements for the development permit. The following items documented in the City comments should be addressed using this report, the attached Tree Site Maps, General Tree Protection Guidelines, Critical Root Zone Explanation, and the detail sheet for tree protection fencing.

- Do not show the eight trees less than 10-inch diameter on the design plans.
- Add tree protection boundaries using the CRZ for the onsite trees selected for retention and all Exceptional trees and dripline measurements for significant trees on the adjacent property.
- X or ghost out trees to be removed on the plans
- Complete and attach the Tree Inventory Replacement Submittal sheet with the trees selected to retain and replacement trees calculated.
- A landscape plan with proposed replacement trees
- Document the development reasoning for the removal of Exceptional trees and the inability to adjust plans to retain seven trees onsite per code 19.10.060 3a,b,and c

Method of assessment

The Level 2 Basic Tree Risk Assessments were conducted according to the ISA Tree Risk Assessment Qualification (TRAQ) training and methodology (see the attached Tree Risk Assessment Level Descriptions). Tree retention values are determined based on tree age, size, health, structure, risk, wind firmness species characteristics and ability to adapt to site changes and construction impacts.

While no one can predict with absolute certainty which trees will fail and which trees will remain healthy, by methodical process we can predict those most likely to fail by the conditions observed and take appropriate action to reduce or eliminate the potential hazard. The time frame for these assessments consider expected conditions and issues over the next year. Because tree conditions change over time, further assessment may be necessary in the future.

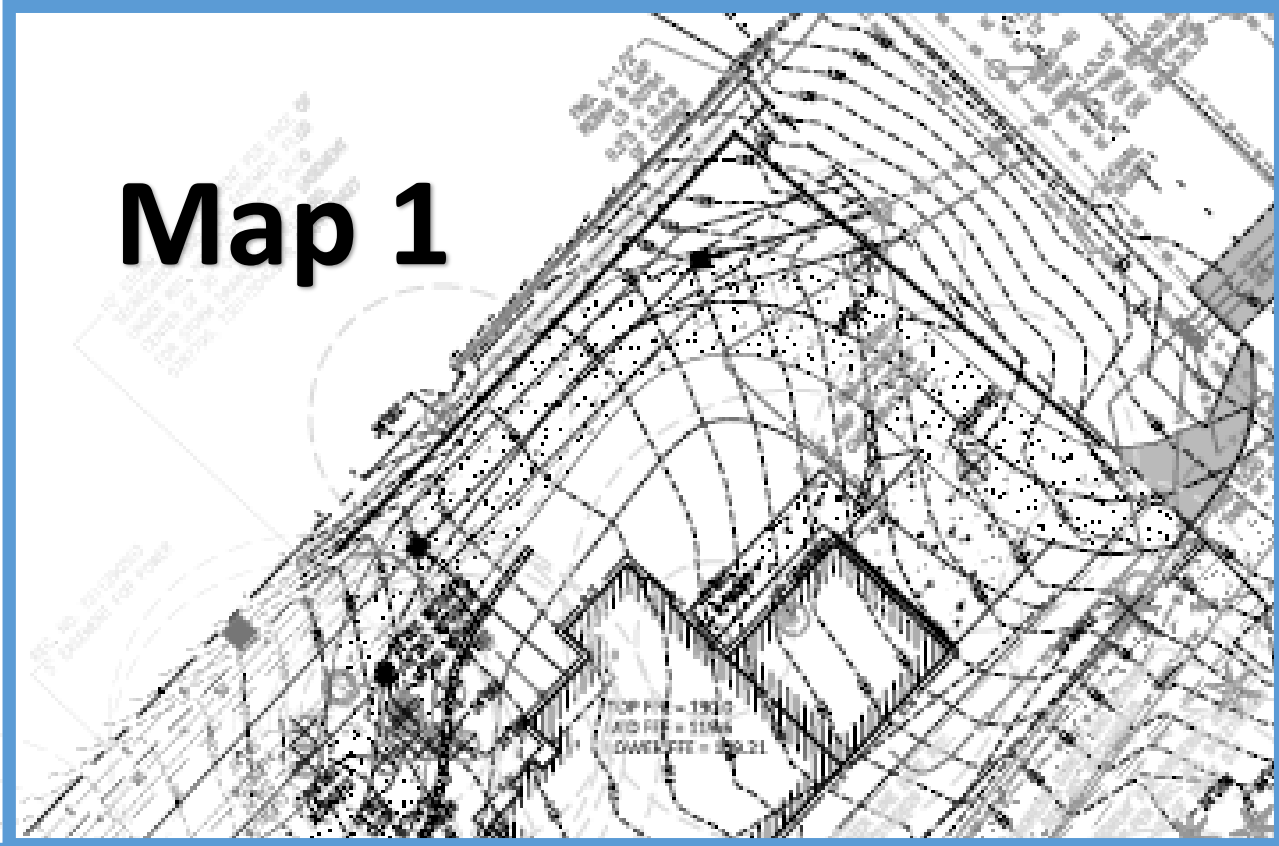
Rudolf Property Tree Assessment

8253 West Mercer Way

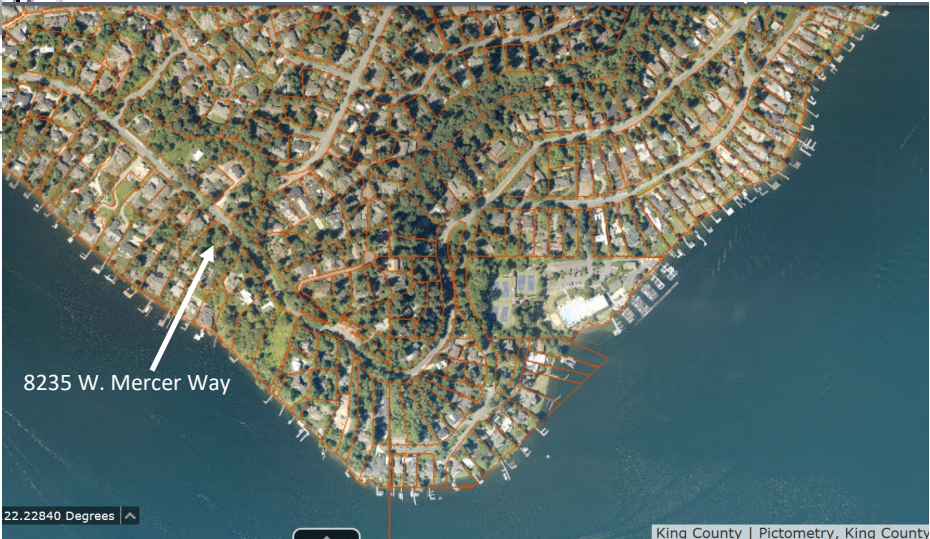
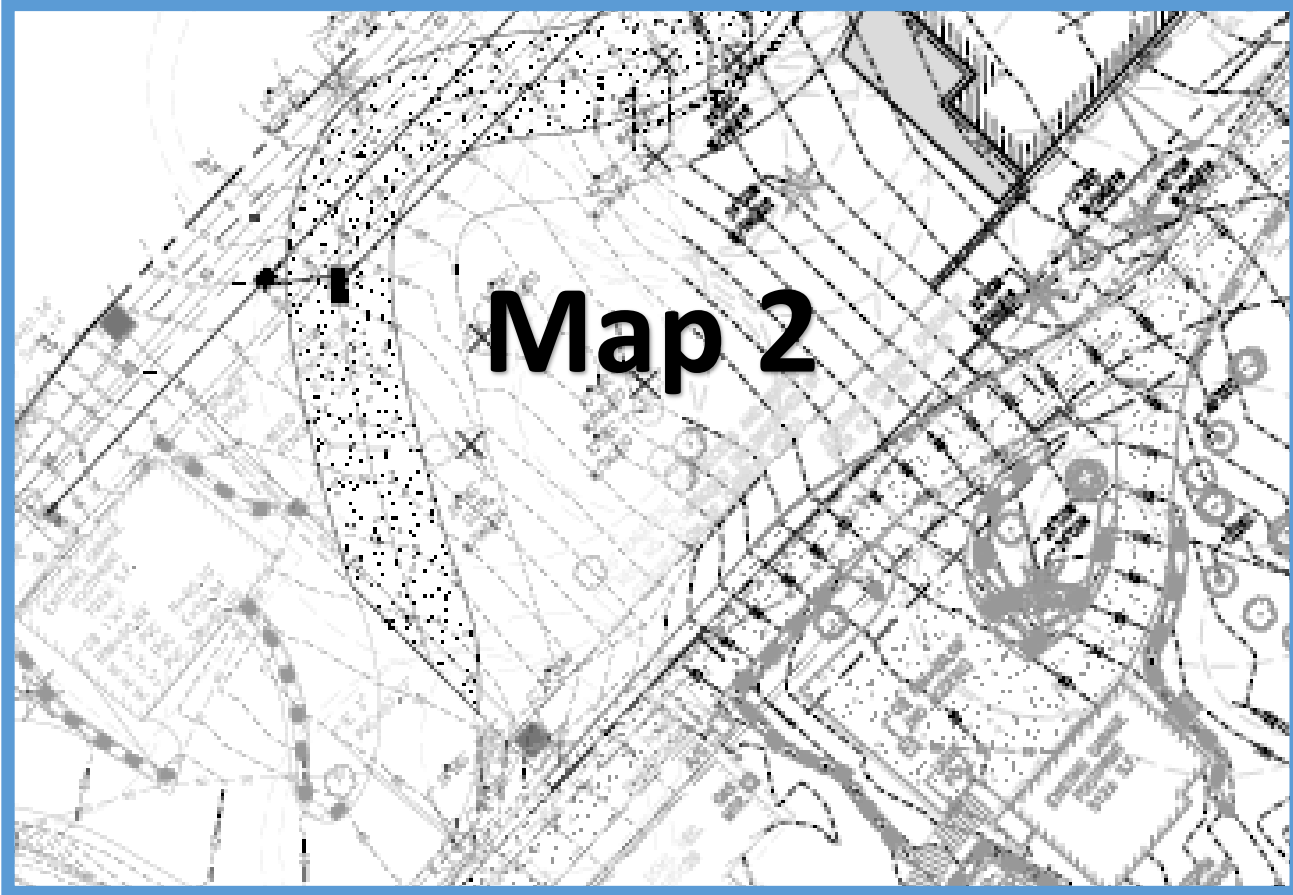
Mercer Island, Washington

September 6, 2018

Map 1



Map 2



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Rudolf Property Tree Assessment








Map 1 of 2

8253 West Mercer Way

Mercer Island, Washington

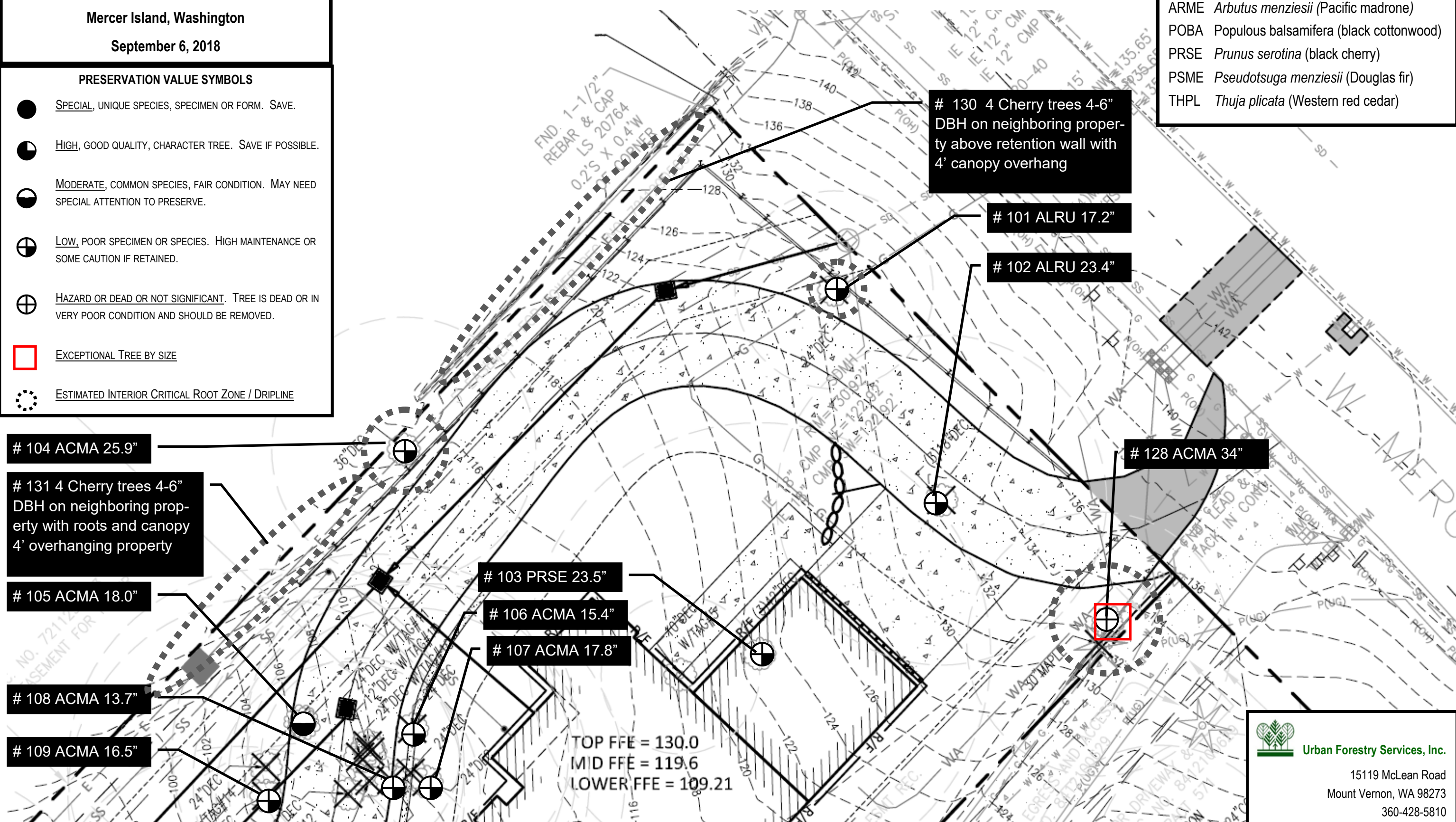
September 6, 2018

PRESERVATION VALUE SYMBOLS

-  SPECIAL, UNIQUE SPECIES, SPECIMEN OR FORM. SAVE.
-  HIGH, GOOD QUALITY, CHARACTER TREE. SAVE IF POSSIBLE.
-  MODERATE, COMMON SPECIES, FAIR CONDITION. MAY NEED SPECIAL ATTENTION TO PRESERVE.
-  LOW, POOR SPECIMEN OR SPECIES. HIGH MAINTENANCE OR SOME CAUTION IF RETAINED.
-  HAZARD OR DEAD OR NOT SIGNIFICANT. TREE IS DEAD OR IN VERY POOR CONDITION AND SHOULD BE REMOVED.
-  EXCEPTIONAL TREE BY SIZE
-  ESTIMATED INTERIOR CRITICAL ROOT ZONE / DRIPLINE

Species Key

- ACMA *Acer macrophyllum* (bigleaf maple)
- ALRU *Alnus rubra* (red alder)
- ARME *Arbutus menziesii* (Pacific madrone)
- POBA *Populus balsamifera* (black cottonwood)
- PRSE *Prunus serotina* (black cherry)
- PSME *Pseudotsuga menziesii* (Douglas fir)
- THPL *Thuja plicata* (Western red cedar)



TOP FFE = 130.0
MID FFE = 119.6
LOWER FFE = 109.21



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Rudolf Property Tree Assessment

Map 2 of 2








8255 West Mercer Way

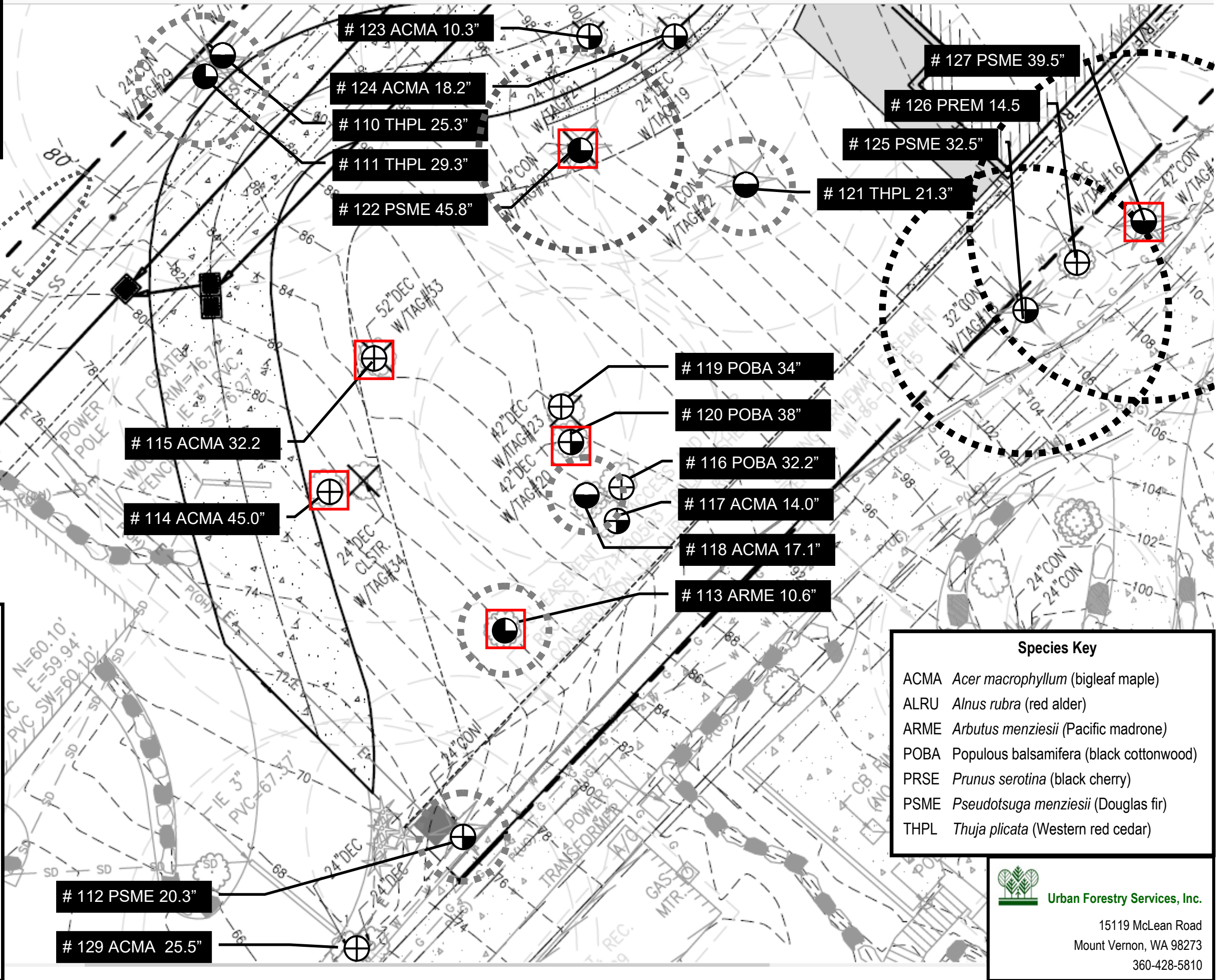
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132 20 arborvitae
less than 10" DBH may
be on adjacent property.
3' overhang on property


PRESERVATION VALUE SYMBOLS

-  SPECIAL, UNIQUE SPECIES, SPECIMEN OR FORM. SAVE.
-  HIGH, GOOD QUALITY, CHARACTER TREE. SAVE IF POSSIBLE.
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Species Key

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Tree Assessment Matrix

Rudolph Property Tree Assessment

Inspector: Heckman
 ISA Certified Arborist
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Tree	Species	DBH (in)	Dripline (ft)	CRZ (ft)	Vigor	Structure	Risk	Prot.Cat./Pres.Val.	Recommendations
101	Red alder <i>Alnus rubra</i>	17.2, (17.2)	14.0	17.2	Fair	Poor to Fair	Medium	Low	Remove Tree, Construction Risk of Failure
Notes / Defects	Pistil butt formation indicates slope movement. Tree has a five degree uncorrected lean down slope.								



Tree	Species	DBH (in)	Dripline (ft)	CRZ (ft)	Vigor	Structure	Risk	Prot.Cat./Pres.Val.	Recommendations
102	Red alder <i>Alnus rubra</i>	14.8, 12.8, 12.8	20.0	23.4	Poor to Fair	Poor	Low	Low	Remove Tree, Construction Impact
Notes / Defects	Multi stem tree covered in ivy. Trunks have 10 -15 degree leans away from each other. excessive compression growth supporting trunks. Decay symptoms in larger stem.								





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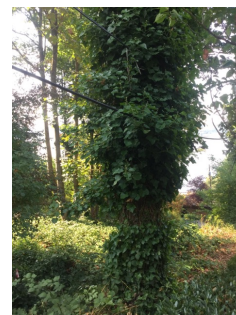
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Tree	Species	DBH (in)	Dripline (ft)	CRZ (ft)	Vigor	Structure	Risk	Prot.Cat./Pres.Val.	Recommendations
103	Cherry <i>Prunus species</i>	23.5, (23.5)	22.0	23.5	Poor	Fair	Medium	Low	Remove Tree, Construction Impact
Notes / Defects	Species may be <i>serotina</i> . Tree is old and large for a cherry. Remove ivy from trunk. Tree has multiple symptoms of decay. Tag #4. Adjacent cherry Tagged #5 is 9" and should not be mapped. many clumps of Maple and ash sprouts in this area.								



Tree	Species	DBH (in)	Dripline (ft)	CRZ (ft)	Vigor	Structure	Risk	Prot.Cat./Pres.Val.	Recommendations
104	Bigleaf maple <i>Acer macrophyllum</i>	25.9, (25.9)	24.0	25.9	Poor to Fair	Poor	Medium	Low	Remove Tree, Construction Risk of Failure
Notes / Defects	Evidence of previous scaffold pruning and symptoms of decay. Excessive seed production. Ivy impacting tree, Lawn clippings and leaves piled from neighboring property impacting soil. Root impacts expected due to proximity of tree to neighboring driveway.								





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105	Bigleaf maple <i>Acer macrophyllum</i>	18, (18)	12.0	18.0	Fair	Fair	Medium	Medium	Remove Tree, Construction Impact Retain Tree With Plan Adjustments
Notes / Defects	Tag #15 tag stapled to on ivy and may fall off. Bark damage from previous ivy removal. Tree can be retained independently of adjacent clump.								



Tree	Species	DBH (in)	Dripline (ft)	CRZ (ft)	Vigor	Structure	Risk	Prot.Cat./Pres.Val.	Recommendations
106	Bigleaf maple <i>Acer macrophyllum</i>	15.4, (15.4)	9.5	15.4	Fair	Poor		Low	Remove Tree, Construction Impact
Notes / Defects	Part of clump. No tag. Tree located on North East side of clump. Tree has low probability of survival through construction impacts.								





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107	Bigleaf maple <i>Acer macrophyllum</i>	17.8, (17.8)	18.5	17.8	Fair	Poor	Low	Low	Remove Tree, Construction Impact
Notes / Defects	Tree tagged #7. Off center crown and is part of a clump with #106. tree has low probability of survival through construction.								



Tree	Species	DBH (in)	Dripline (ft)	CRZ (ft)	Vigor	Structure	Risk	Prot.Cat./Pres.Val.	Recommendations
108	Bigleaf maple <i>Acer macrophyllum</i>	13.7, (13.7)	7.5	13.7	Poor to Fair	Poor	Low	Low	Remove Tree, Construction Impact
Notes / Defects	Tree is tagged #8. Small crown with symptoms of decay. Two rotten cherry stumps near the road. Tree is part of clump with #107 and #106. Nearby trees tagged #9- #11 are <10 inches								





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109	Bigleaf maple <i>Acer macrophyllum</i>	16.5, (16.5)	12.8	16.5	Poor to Fair	Poor to Fair	Medium	Low	Remove Tree, Construction Impact
Notes / Defects	Located next to snag. Tree has excessive seed crop and uneven canopy. Tag #13. Tree has low probability of survival through construction impacts.								



Tree	Species	DBH (in)	Dripline (ft)	CRZ (ft)	Vigor	Structure	Risk	Prot.Cat./Pres.Val.	Recommendations
110	Western red cedar <i>Thuja plicata</i>	25.3, (25.3)	11.8	25.3	Fair to Good	Fair	Medium	Medium	Remove Tree, Construction Risk of Failure Retain Tree With Plan Adjustments
Notes / Defects	Double leader. Diameter measurement taken below split. Some sap at base connection. Tree should be retained with #111								





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111	Western red cedar <i>Thuja plicata</i>	29.3, (29.3)	13.5	29.3	Fair	Fair	Medium	High	Remove Tree, Construction Risk of Failure Retain Tree With Plan Adjustments
Notes / Defects	Tree Tag #29. Diameter was double checked and is just under the Exceptional tree threshold. Trees 111 and 110 should be retained as group.								



Tree	Species	DBH (in)	Dripline (ft)	CRZ (ft)	Vigor	Structure	Risk	Prot.Cat./Pres.Val.	Recommendations
112	Douglas fir <i>Pseudotsuga menziesii</i>	20.3, (20.3)	16.5	20.3	Fair to Good	Poor to Fair	High	Low	Monitor Tree, Risk of Failure Retain Tree
Notes / Defects	Tagged #35. Tree on property line and should be double checked prior to removal decisions. Roots have been cut for neighboring drive 2 ft from trunk. Tree has considerable bark growth to stabilize. Previously lost top. Corrected trunk lean to neighboring house. Some sap and old ivy on trunk. Level 3 Advanced Tree Risk assessment recommended.								





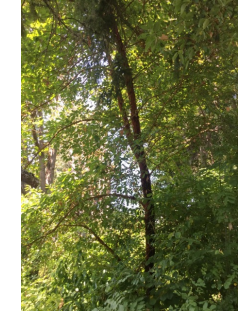
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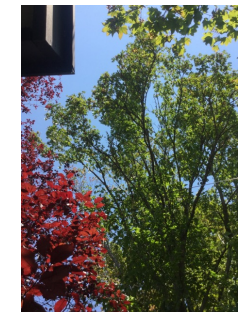
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113	Pacific madrone <i>Arbutus menziesii</i>	10.1, 3.2 (10.59)	11.0	10.6	Good	Fair to Good	Low	Exceptional High	Retain Tree Tree Protection Required,
Notes / Defects	Corrected lean. No tag, This species is Exceptional in size.								



Tree	Species	DBH (in)	Dripline (ft)	CRZ (ft)	Vigor	Structure	Risk	Prot.Cat./Pres.Val.	Recommendations
114	Bigleaf maple <i>Acer macrophyllum</i>	45, (45)	13.5	45.0	Poor	Poor	High	None	Remove Tree, Hazard Cut to Create a Wildlife Tree
Notes / Defects	3 stem tree with trunk weight and lean over garage. Tag #34. Remove second tree canopy marked on map Tree is exceptional by size but not by condition. Fungal conk at base indicates advanced decay. Tree removal recommended due to High Risk. Level 3 Advanced Tree Risk assessment recommended if retention is required for one or both trunks.								





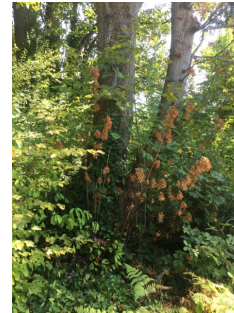
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115	Bigleaf maple <i>Acer macrophyllum</i>	15.8, 28 (32.15)	9.5	32.2	Dying/Dead	Dying/Dead	High	None	Remove Tree, Hazard Create Wildlife Tree
Notes / Defects	Tag #33. Diameters were estimated under ivy. Tree is near dead with multiple symptoms of basal decay. Canopy and 2 scaffold branches lean toward garage/house.								



Tree	Species	DBH (in)	Dripline (ft)	CRZ (ft)	Vigor	Structure	Risk	Prot.Cat./Pres.Val.	Recommendations
116	Black cottonwood <i>Populus trichocarpa</i>	37.5, (37.5)	5.5	37.5	Poor to Fair	Poor	High	None	Remove Tree, Hazard Cut to Create a Wildlife Tree
Notes / Defects	Multi stem top bent to neighboring garage and parking area. Tree is Exceptional by size but not by condition. Tree has high probability of failure. Evidence of a previously lost top evident. Symptoms of trunk decay. Tree tag #25.								





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117	Bigleaf maple <i>Acer macrophyllum</i>	14, (14)	6.5	14.0	Poor to Fair	Poor	Medium	Low	Remove Tree, Hazard Create Wildlife Tree
Notes / Defects	Tree is south west of #116 Tagged #27. 20 degree lean to neighbor house. Uneven canopy.								



Tree	Species	DBH (in)	Dripline (ft)	CRZ (ft)	Vigor	Structure	Risk	Prot.Cat./Pres.Val.	Recommendations
118	Bigleaf maple <i>Acer macrophyllum</i>	17.1, (17.1)	7.0	17.1	Fair	Fair	Low	Medium	Retain Tree Monitor Tree, During Construction
Notes / Defects	Located west of tree #116 on steep slope. Tag #26. Remove English ivy.								





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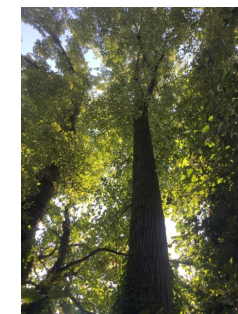
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119	Black cottonwood <i>Populus trichocarpa</i>	35, (35)	7.3	35.0	Poor	Poor to Fair	High	None	Remove Tree, Hazard
Notes / Defects	Trunk is attached to #120. Tag #24. Trunk has a seeping vertical crack and 15 degree uncorrected lean to north. Recent large scaffold branch loss in upper canopy.								



Tree	Species	DBH (in)	Dripline (ft)	CRZ (ft)	Vigor	Structure	Risk	Prot.Cat./Pres.Val.	Recommendations
120	Black cottonwood <i>Populus trichocarpa</i>	38, (38)	16.0	38.0	Fair	Poor to Fair	Medium	Low	Remove Tree, Construction Risk of Failure Create Wildlife Tree
Notes / Defects	Tree is the second of a double stem (tree #119) on a very steep slope. Some symptoms of decay in base. A Level 3 Advanced Tree Risk Assessment is recommended to assess the extent of decay in the base if retention is desired. This tree would require close monitoring if retained. Tree is exceptional by size, but not by condition. Retention of this tree is not advised on this site.								





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121	Western red cedar <i>Thuja plicata</i>	21.3, (21.3)	7.0	21.3	Good	Good	Low	Medium	Retain Tree Tree Protection Required,
Notes / Defects	Previous tree failure took out branches Tag #22								



Tree	Species	DBH (in)	Dripline (ft)	CRZ (ft)	Vigor	Structure	Risk	Prot.Cat./Pres.Val.	Recommendations
122	Douglas fir <i>Pseudotsuga menziesii</i>	45.8, (45.8)	20.0	45.8	Fair to Good	Fair to Good	Medium	Exceptional High	Remove Tree, Construction Risk of Failure Retain Tree With Plan Adjustments
Notes / Defects	Tag #20. This is an exceptional tree on a steep slope. Visual assessment indicates the tree is in good health								





Urban Forestry Services, Inc.
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 Mount Vernon, WA 98273
 (360) 428-5810

Tree Assessment Matrix

Rudolph Property Tree Assessment

Inspector: Heckman
 ISA Certified Arborist
 ISA Tree Risk Assessment Qualified

Tree	Species	DBH (in)	Dripline (ft)	CRZ (ft)	Vigor	Structure	Risk	Prot.Cat./Pres.Val.	Recommendations
123	Bigleaf maple <i>Acer macrophyllum</i>	10.3, (10.3)	4.5	10.3	Poor to Fair	Poor to Fair	Low	Low	Remove Tree, Construction Impact
Notes / Defects	Tag #21. Previously lost top. Small tree.								



Tree	Species	DBH (in)	Dripline (ft)	CRZ (ft)	Vigor	Structure	Risk	Prot.Cat./Pres.Val.	Recommendations
124	Bigleaf maple <i>Acer macrophyllum</i>	18.2, (18.2)	8.5	18.2	Poor to Fair	Poor to Fair	Low	Low	Remove Tree, Construction Impact
Notes / Defects	Tag #19. Crook in trunk. Poor canopy health and distribution.								





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125	Douglas fir <i>Pseudotsuga menziesii</i>	32.5, (32.5)	19.0	32.5	Poor to Fair	Fair	Medium	Exceptional Low	Monitor Tree, Risk of Failure Tree Protection Required, Monitor During Construction Monitor Tree, Construction Impacts
Notes / Defects	Off property tree tag #18. Canopy health is in decline. Tree roots significantly impacted by neighboring driveway. Level 3 Advanced Tree Risk Assessment recommended.								



Tree	Species	DBH (in)	Dripline (ft)	CRZ (ft)	Vigor	Structure	Risk	Prot.Cat./Pres.Val.	Recommendations
126	Bitter cherry <i>Prunus emarginata</i>	14.5, (14.5)	0.0	14.5	Dying/Dead	Dying/Dead	Low	None	Create Wildlife Tree Remove Tree, Dead
Notes / Defects	Off property tree, previously tagged #17. Tree is dead, no protection required								





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127	Douglas fir <i>Pseudotsuga menziesii</i>	39.5, (39.5)	18.0	39.5	Fair to Good	Fair	Medium	Exceptional Medium	Monitor Tree, Risk of Failure Tree Protection Required, Monitor During Construction Retain Tree With Plan Adjustments
Notes / Defects	Off property tree, no tag found. 10 degree lean to east. Tree roots significantly impacted by recent neighboring driveway. Trees should be monitored close and reassessed after construction. Level 3 Advanced Tree Risk Assessment recommended.								



Tree	Species	DBH (in)	Dripline (ft)	CRZ (ft)	Vigor	Structure	Risk	Prot.Cat./Pres.Val.	Recommendations
128	Bigleaf maple <i>Acer macrophyllum</i>	34, (34)	14.3	34.0	Poor	Poor		None	Crown Clean Prune Install Tree Protection Fencing Monitor Tree, Risk of Failure Cut to Create a Wildlife Tree
Notes / Defects	Off property tree in the field. The survey map shows the tree on property with an adjacent non existent conifer. Tree has a split trunk in process of failing. Signs and symptoms of multiple trunk decay issues. Both trunks are living snags. The Douglas fir across drive does not overhang property.								





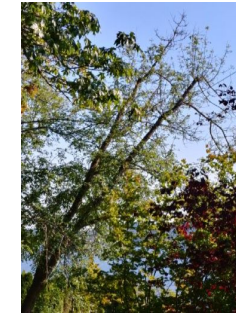
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Tree Assessment Matrix

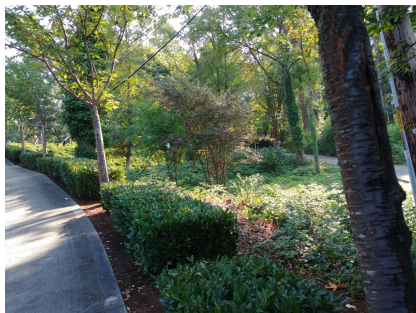
Rudolph Property Tree Assessment

Inspector: Heckman
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Tree	Species	DBH (in)	Dripline (ft)	CRZ (ft)	Vigor	Structure	Risk	Prot.Cat./Pres.Val.	Recommendations
129	Bigleaf maple <i>Acer macrophyllum</i>	18, 18 (25.46)	15.0	25.5	Poor	Poor	High	None	Remove Tree, Hazard Cut to Create a Wildlife Tree
Notes / Defects	Off property tree, no longer overhangs development. One stem has a 25 degree uncorrected lean toward house. Trunk has failed at base. Top was removed recently with new growth. Symptoms of decay present at base of tree. Diameters and dripline measurements are estimates. Remove one trunk, reduce other dying trunk to manageable height.								



Tree	Species	DBH (in)	Dripline (ft)	CRZ (ft)	Vigor	Structure	Risk	Prot.Cat./Pres.Val.	Recommendations
130	Kwanzan cherry <i>Prunus serrulata</i> 'Kwanzan'	6, (6)	4.0	6.0	Fair	Fair to Good	Low	Medium	Crown Reduction Prune Install Tree Protection Fencing Monitor Tree, Construction Impacts
Notes / Defects	4 cherries on adjacent property west of wall and tree # 104. 3 have canopy and root systems overhanging property to be developed. 4.5, 5.5, 6.0" DBH Trees may be removed and replaced due to size. Laurel hedge will also have root impacts.								





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Tree Assessment Matrix

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Tree	Species	DBH (in)	Dripline (ft)	CRZ (ft)	Vigor	Structure	Risk	Prot.Cat./Pres.Val.	Recommendations
131	Kwanzan cherry <i>Prunus serrulata</i> 'Kwanzan'	6, (6)		6.0	Fair	Fair	Low	Medium	Crown Reduction Prune Install Tree Protection Fencing Monitor Tree, Construction Impacts
Notes / Defects	3 trees on top of wall, canopy overhang. can be replaced if needed due to small size								



Tree	Species	DBH (in)	Dripline (ft)	CRZ (ft)	Vigor	Structure	Risk	Prot.Cat./Pres.Val.	Recommendations
132	Arborvitae <i>Thuja occidentalis</i>	4, (4)	4.0	4.0	Fair	Fair	Low	Low	Install Tree Protection Fencing Monitor Tree, Construction Impacts
Notes / Defects	20 tightly spaced arborvitae along property edge. Many on adjacent property. The north east end of row begins at tree 110. Hedge is overgrown. Trees can be thinned and protected or Hedge can be removed and replace.								





General Tree Protection Guidelines With Critical Root Zone Explanation Attachment

- 1. Responsibilities:** These Guidelines pertain to any disturbance, use or activity within the Critical Root Zone of any retained tree on this project. See attached **Critical Root Zone Explanation** for reference. The owner's arborist and general contractor shall meet onsite before any site work begins, to review and designate the most appropriate methods to be used to protect the retained trees during construction.

These guidelines apply to work provided by all contractors and sub-contractors on the project.

The project consulting arborist shall be contacted prior to any work that may need to enter the tree protection fencing. Two days notice shall be provided to the project consulting arborist. A proposed method for work shall be provided to the arborist. This method shall be reviewed by the project consulting arborist and either approval and / or comments provided by the project consulting arborist prior to commencing works within the tree protection area. He or she should be notified within 8 hours should any injury occur to any protected tree or its larger roots (greater than 2-inch diameter) so that appropriate assessment and/or treatment may be made.

- 2. Soil Disturbance:** No soil disturbance shall take place before tree protection fences are installed. All evaluated trees to be retained within these areas are clearly illustrated on the Site Plan.
- 3. Designated Tree Removals:** The owner's arborist and contractor shall confirm on site which trees are to be removed and those to be retained. Directional felling and removal of trees will be completed with great care to avoid any damage to the trunks, limbs, and critical root zones of the retained trees.
- 4. The Tree Protection Site Plan** shows the recommended location of the Tree Protection Fence (TPF). Immediately after the clearing limits and grading stakes are set in the field, the owner's arborist, during review and discussion with the contractor, will make a final determination on the tree protection requirements depending on construction limits and impact on major roots and soil condition. The arborist may adjust clearing limits in the field so that, in his/her opinion, tree roots and soils are protected while necessary work can proceed.
- 5. The Tree Protection Fence (TPF)** shall be installed along the clearing limits, with special consideration of the Critical Root Zone (CRZ) of trees to be preserved. The CRZ of a tree is generally described as an area equal to 1-foot radius for every 1-inch diameter of tree. For example, a 10-inch diameter tree has a CRZ of 10-foot radius. Work within the CRZ may be limited to hand work or alternate method of construction.

The Tree Protection Fence (TPF) shall be constructed with steel posts driven into the ground with 6-ft. chain link fence attached. Upon consultation with the contractor, the arborist shall determine the placement of the fence and the extent and method of clearing that may be done

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near preserved trees. Additional follow-up determinations may be required as work progresses on the project. See attached **Critical Root Zone Explanation**.

No parking, storage, dumping, or burning of materials is allowed beyond the clearing limits or within the Tree Protection Fence.

The TPF shall not be moved without authorization by the owner's arborist or City arborist. The TPF shall remain in place for the duration of the project.

Work within this area shall be reviewed with and approved by the owner's arborist. Call Urban Forestry Services, Inc. at 360-428-5810 with questions.

6. **Silt Fence:** If a silt fence is required to be installed within the Critical Root Zone of a retained tree, the bottom of the silt fence shall not be buried in a trench, but instead, folded over and placed flat on the ground. The flat portion of the silt fence shall be covered with gravel or soil for anchorage.
7. **CRZ over Hardscape:** Where the Critical Root Zone (CRZ) includes an area covered by hardscape, the TPF can be placed along the edge of the hardscape if and until it is removed. After hardscape removal, the available CRZ should be backfilled with topsoil up to 6 inches deep and protected with the TPF. Incorporation of topsoil into the existing sub-grade shall be determined by the consulting arborist. Where applicable a specification for topsoil will be provided or approved by Urban Forestry Services, Inc.
8. **Tree Protection Signs** shall be attached to the fence only and shall be shown as required on the Site Plan. They should read "Protect Critical Root Zone (CRZ) of trees to be retained. No soil disturbance, parking, storage, dumping, or burning of materials is allowed within the Tree Protection Barrier. " Monetary Fines based on the appraised dollar value of the retained trees may also be included on these signs. Telephone contact details for the project consulting arborist should also be included in the sign.
9. **Soil Protection within the Critical Root Zone (CRZ):** Where vehicular access, temporary work pad or storage pad is required within the CRZ of any preserved tree that is not protected with hardscape, the soil shall be protected with 18" of woodchips and/or plywood or metal sheets to protect from soil compaction and damage to roots of retained trees. A biodegradable coir mat netting is recommended to be placed on the existing grade before woodchip placement to protect the condition and confirm the location of the existing grade. The netting is a valuable benchmark upon removal of the material within the CRZ.
10. **Landscape Plans, Irrigation Design and Installation Details:** Great care shall be exercised when landscaping within the Critical Root Zone (CRZ) of any tree. Roots of preserved trees and other vegetation shall not be damaged by planting or installation of irrigation lines. The owner's arborist shall review the Landscape Plan for any potential design and tree preservation conflicts and approve related irrigation and landscape installation activities within the CRZ of retained trees. A proposed method for work shall be provided to and approved by the arborist.
11. **Backfill and Grade Changes:** The owner's arborist will determine to what extent backfilling may be allowed within the Critical Root Zone of a preserved tree, and if needed, the specific

material which may be used. Grade cuts are usually more detrimental than grade filling within the CRZ and should be reviewed by the arborist well in advance of construction.

- 12. Tree Maintenance and Pruning:** Trees recommended for maintenance and approved by the owner, shall be pruned for deadwood, low hanging limbs, and proper balance, as recommended for safety, clearance or aesthetics. All pruning shall be done by an International Society of Arboriculture Certified Arborist. *ANSI A300 American Standards for Pruning* shall be used. Limbs of retained trees within 10 feet or less, of any power line, depending on power line voltage, may only be pruned by a Utility Certified Arborist. This pruning must be coordinated with the local power company, as they may prefer to provide this pruning.
- 13. Underground Utilities:** Utility installation within the Critical Root Zone (CRZ) of any retained tree shall be reviewed by the Project Consulting Arborist. A less root disturbing route or minimal impact installation method of utility installation may be discussed and recommended i.e. tunneling or trenchless excavation. Trenching through the Interior CRZ of a retained tree is not usually allowed. **See CRZ Explanation to differentiate between the Perimeter and Interior CRZ.** An Air spade and Vac., Truck may be required when utility installation is mandatory near a retained tree or other methodology such as trenchless excavation.
- 14. Root Pruning:** Required work may result in the cutting of roots of retained trees. Cutting roots 2" or greater should be avoided. Potential root pruning needs should be reviewed in advance with the Project Consulting Arborist to minimize potential root fracturing and other damage. Severed roots of retained trees shall be cut off cleanly with a sharp saw or pruning shears. Applying pruning paint on trunk or root wounds is not recommended. Severed roots shall be covered immediately after final pruning with moist soil or covered with mulch until covered with soil. Excavation equipment operators shall take extreme care not to hook roots and pull them back towards retained trees. In all cases, the excavator shall sit outside of the CRZ. Soil excavation within the CRZ shall be under the direct supervision of the owner's arborist.
- 15. Supplemental Tree Irrigation:** If clearing is performed during the summer, supplemental watering and/or mulching over the root systems within the Tree Protection Fencing of preserved trees may be required by the owner's arborist. The arborist should be notified of the proposed schedule for clearing and grading work. Supplemental watering and mulching over the root systems of roots impacted or stressed trees are strongly recommended to compensate for root loss and initiate new root growth. Long periods of slow drip irrigation will be most effective. A large coil of soaker hose starting at least 18" from the trunk and covering the Interior Critical Root Zone area is recommended. Water once per week and check soils for at least 12 inches infiltration. This work shall be under the direct supervision of the owner's arborist.
- 16. Additional Measures:** Additional tree protection recommendations may be required and may be specified in Urban Forestry Services, Inc. report(s).
- 17. Final Inspection:** The owner's arborist shall make a final site visit to report on retained tree condition following completed work and shall report to the city to release the bond for the retained trees.

Critical Root Zone

(CRZ) =

12" Radius for every Tree inch diameter is generally considered optimum protection.

Interior Critical Root Zone (ICRZ)

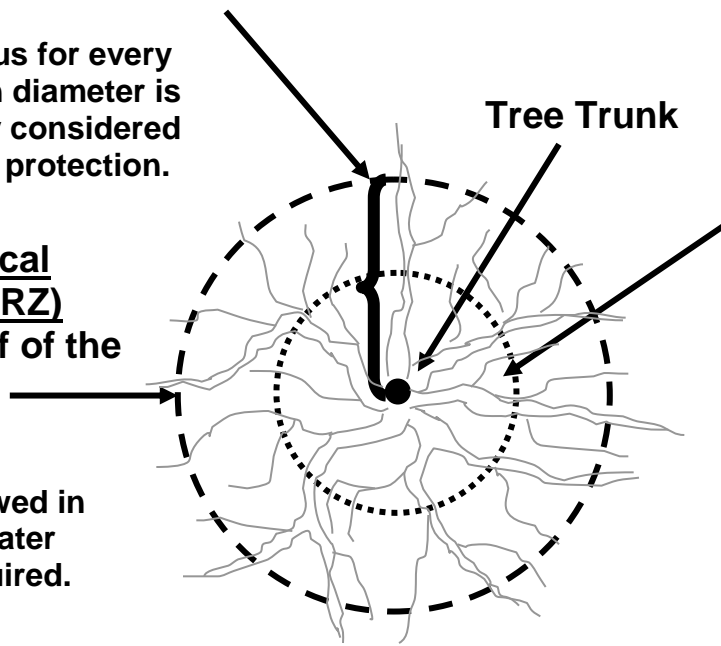
= the inner half of the CRZ

Protecting only this area would cause significant impact to the tree, potentially life threatening, and would require maximum Post Care Treatment to retain the tree. See Post Care Treatment below.

Perimeter Critical Root Zone (PCRZ)

= the outer half of the CRZ

The greater the disturbance allowed in this area, the greater Post Care is required.



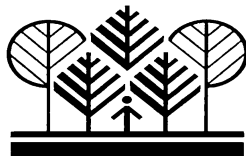
The Critical Root Zone (CRZ) of a tree is established on the basis of the trunk diameter. The CRZ is a circular area which has a radius of 12 inches for every inch diameter of trunk measured at 4.5 feet above grade. Root systems will vary both in depth and spread depending on size of tree, soils, water table, species and other factors. However, this CRZ description is generally accepted in the tree industry. Protecting this entire root zone area should result in no adverse impact to the tree, except for potentially increased exposure.

The above CRZ drawing has been further differentiated into the 'Perimeter' (PCRZ) and 'Interior' (ICRZ) to help define potential impact and required Post Care.

Generally, the full PCRZ is considered the optimum amount of root protection for a tree. As one encroaches into the "Perimeter CRZ, but not into the "Interior CRZ" the greater Post Care the tree would require to remain alive and stable. The 'Interior CRZ is half the radius of the full PCRZ. Disturbance into the ICRZ could destabilize or cause the tree to decline.

The 'Interior' CRZ should never be disturbed if the tree is to have any chance of survival. This 'Interior' CRZ would approximately equal the size of a rootball needed to transplant this tree which in turn would require extensive Post Care and possibly guying.

This Post Care Treatment would include but may not be limited to; regular irrigation, misting, root treatment with special root hormones or growth stimulants, mulching, guying and monitoring for several years. Lack of this treatment would be fatal.



Urban Forestry Services, Inc.

15119 McLean Rd.
Mount Vernon, WA 98273

Title: Critical Root Zone (CRZ) Explanation

Source: Urban Forestry Services, Inc

Jim Barborinas, ISA Certified Arborist PN-0135

ASCA Registered Consulting Arborist #356,

Tree Risk Assessor Qualified

Date: 2018

Not to Scale

ASSUMPTIONS AND LIMITING CONDITIONS

**Urban Forestry Services, Inc.
15119 McLean Rd.
Mount Vernon, Washington 98273**

1. Limitations of this Assessment

This Assessment is based on the circumstances and observations as they existed at the time of the site inspection of the Client's Property and the trees inspected by Urban Forestry Services, Inc. and upon information provided by the Client to Urban Forestry Services, Inc. The opinions in this Assessment are given based on observations made and using generally accepted professional judgment, however, because trees and plants are living organisms and subject to change, damage, and disease, the results, observations, recommendations, and analysis took place and no guarantee, warranty, representation, or opinion is offered or made by Urban Forestry Services, Inc. as to the length of the validity of the results, observations, recommendations, and analysis contained within this Assessment. As a result, the Client shall not rely upon this Assessment, save and except for representing the circumstances and observations, analysis, and recommendations that were made as at the date of such inspections. It is recommended that the trees discussed in this Assessment should be re-assessed periodically.

Urban Forestry Services, Inc. shall not be required to give testimony or to attend court by reason of this report unless subsequent contractual arrangements are made, including payment of an additional fee for such services as described in our fee schedule and contract of engagement.

Sketches, diagrams, graphs, 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.

2. Reaction of Assessment

The Assessment carried out was restricted to the Property. No assessment of any other trees or plants has been undertaken by Urban Forestry Services, Inc. Urban Forestry Services, Inc. is not legally liable for any other trees or plants on the Property except those expressly discussed herein. The conclusions of this Assessment do not apply to any areas, trees, plants, or any other property not covered or referenced in this Assessment.

3. Professional Responsibility

In carrying out this Assessment, Urban Forestry Services, Inc. and any Assessor appointed for and on behalf of Urban Forestry Services, Inc. to perform and carry out the Assessment has exercised a reasonable standard of care, skill, and diligence as would be customarily and normally provided in carrying out this Assessment. The Assessment has been made using accepted arboricultural techniques. These include a visual examination of each tree for structural defects, scars, external indications of decay such as fungal fruiting bodies, evidence of insect attack, discolored foliage, the condition of any visible root structures, the degree and direction of lean (if any), the general condition of the tree(s) and the surrounding site, and the current or planned proximity of property and people. Except where specifically noted in the Assessment, none of the trees examined on the property were dissected, cored, probed, or climbed and detailed root crown examinations involving excavation were not undertaken.

While reasonable efforts have been made to ensure that the trees recommended for retention are healthy, no guarantees are offered, or implied, that these trees, or all parts of them will remain standing. It is professionally impossible to predict with absolute certainty the behavior of any single tree or group of trees, or all their component parts, in all given circumstances. Inevitably, a standing tree will always pose some risk. Most trees have the potential to fall, lean, or otherwise pose a danger to property and persons in the event of adverse weather conditions, and this risk can only be eliminated if the tree is removed.

Without limiting the foregoing, no liability is assumed by Urban Forestry Services, Inc. or its directors, officers, employers, contractors, agents, or Assessors for:

- any legal description provided with respect to the Property;
- issues of title and or ownership respect to the Property;
- the accuracy of the Property line locations or boundaries with respect to the Property; and
- the accuracy of any other information provided to Urban Forestry Services, Inc. by the Client or third parties;
- any consequential loss, injury, or damages suffered by the Client or any third parties, including but not limited to replacement costs, loss of use, earnings, and business interruption; and
- the unauthorized distribution of the Assessment.

The total monetary amount of all claims or causes of action the Client may have as against Urban Forestry Services, Inc. including but not limited to claims for negligence, negligent misrepresentation, and breach of contract, shall be strictly limited to solely to the total amount of fees paid by the Client to Urban Forestry Services, Inc. pursuant to the Contract for Services as dated for which this Assessment was carried out. Further, under no circumstance may any claims be initiated or commenced by the Client against Urban Forestry Services, Inc. or any of its directors, officers, employees, contractors, agents, or Assessors, in contract or in tort, more than 12 months after the date of this Assessment.

4. **Third Party Liability**

This Assessment was prepared by Urban Forestry Services, Inc. exclusively for the Client. The contents reflect Urban Forestry Services, Inc. best assessment of the trees and plants on the Property in light of the information available to it at the time of preparation of this Assessment. Any use which a third party makes of this Assessment, or any reliance on or decisions made based upon this Assessment, are made at the sole risk of any such third parties. Urban Forestry Services, Inc. accepts no responsibility for any damages or loss suffered by any third party or by the Client as a result of decisions made or actions based upon the use of reliance of this Assessment by any such party.

5. **General**

Any plans and/or illustrations in this Assessment are included only to help the Client visualize the issues in this Assessment and shall not be relied upon for any other purpose.

This report and any values expressed herein represent the opinion of Urban Forestry Services, Inc. Our fee is in no way contingent upon any specified value, a result or occurrence of a subsequent event, nor upon any finding reported.

The Assessment report shall be considered as a whole, no sections are severable, and the Assessment shall be considered incomplete if any pages are missing. The right is reserved to adjust tree valuations, if additional relevant information is made available. This Assessment is for the exclusive use of the Client.