



## General Tree Protection Guidelines

- 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. At least 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:** when provided, 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 estimated 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 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.

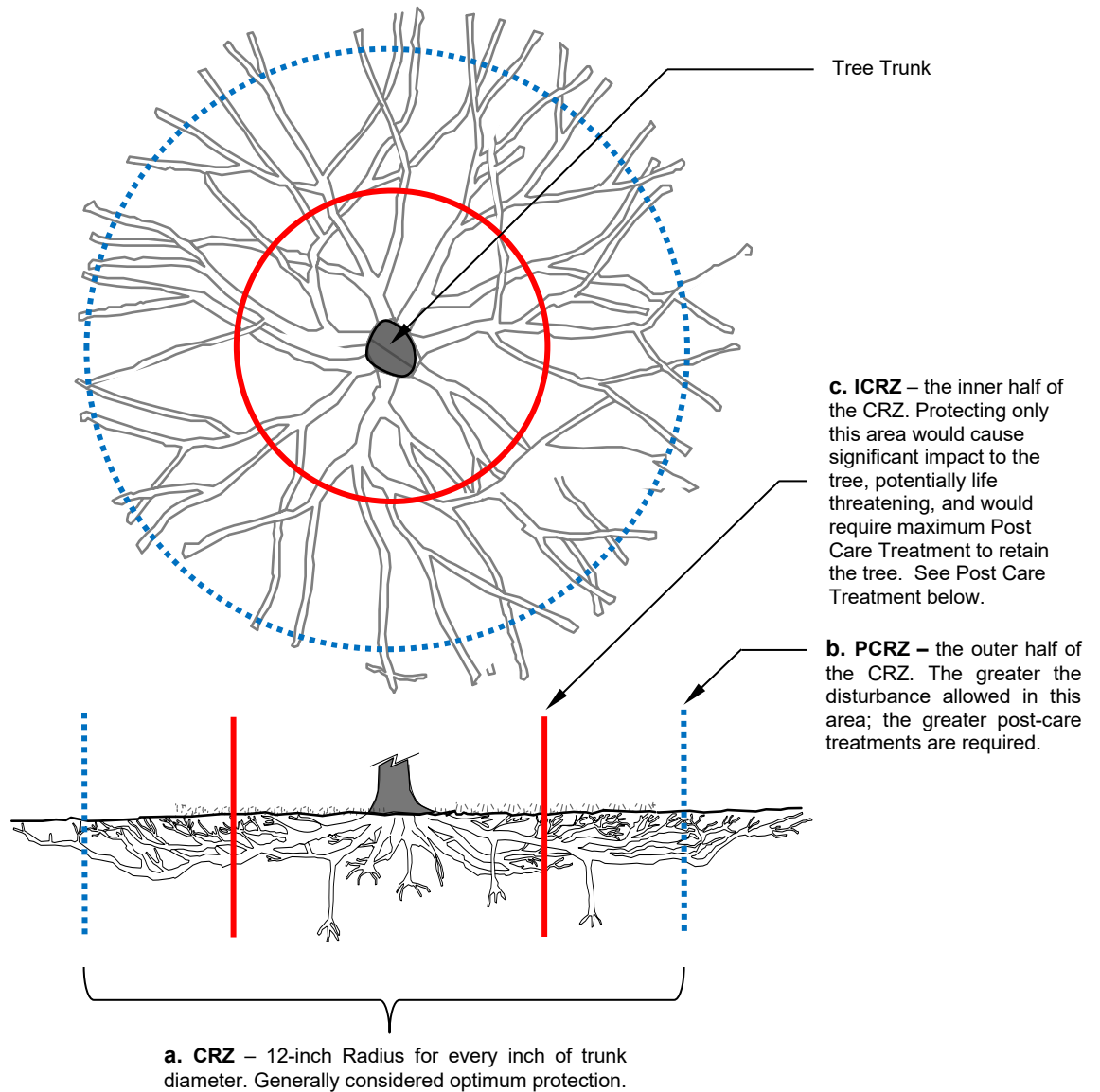
The TPF shall not be moved without authorization by the owner's arborist or City Arborist. The TPF shall remain in place for the duration of the project.

Work within this area shall be reviewed with and approved by the owner's arborist. Call Urban Forestry Services | Bartlett Consulting 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 | Bartlett Consulting.
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 inches of woodchips and/or plywood or metal sheets, or a combination of both, 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 shall 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 *Critical Root Zone Explanation* document 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 on ground 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| Bartlett Consulting report(s).


- 17. Tree Protection Monitoring:** The owner's arborist may be required to monitor work when disturbance occurs near retained trees and shall make periodic site visits to report to the owner and City if tree protection guidelines are being followed.
- 18. 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, if necessary for the retained trees.



**a. CRITICAL ROOT ZONE (CRZ)** – The CRZ of a tree is established based on trunk diameter measured at 4.5-feet from grade (DBH). The CRZ is a generalized circular area which has a radius of 12-inches to every inch trunk diameter. 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 is area optimum and should, in theory, result in no adverse impact to a tree.

The CRZ can be further differentiated into the 'Perimeter' and 'Interior' CRZs to help evaluate potential impacts and required post-care.

- b. PERIMETER CRITICAL ROOT ZONE (PCRZ)** – the full PCRZ is generally considered the optimum amount of root protection for a tree. The further one encroaches into the PCRZ (but not into the ICRZ) the greater post-care treatments the tree will require to remain alive and stable.
- c. INTERIOR CRITICAL ROOT ZONE (ICRZ)** – The absolute maximum disturbance allowed for a tree should leave the 'Interior' CRZ undisturbed if the tree is to have any chance of long-term survival. The ICRZ is half the radius of the full CRZ/PCRZ. Disturbance into the ICRZ could destabilize or cause the tree to decline. The ICRZ approximately equals the size of a root-ball needed to transplant this tree, which in turn would require extensive post-care treatments and possibly guying or propping to stabilize the tree. Post Care Treatment includes but may not be limited to; regular irrigation, misting, root treatment with special root hormones, mulching, guying and monitoring during construction and for several years following impacts.

 <p><b>Urban Forestry Services</b> BARTLETT CONSULTING Divisions of The F.A. Bartlett Tree Expert Company 15119 McLean Road Mount Vernon, WA 98273 1 (360) 399-1377</p>	<b>CRITICAL ROOT ZONE (CRZ) EXPLANATION</b>	
	<p>© Urban Forestry Services Bartlett Consulting – A Division of The F. A. Bartlett Tree Expert Company, January 2022. This document has been prepared specifically for UFS BC related projects and may not be suitable for use on other projects, or in other applications, and/or without the approval and participation of The F.A. Bartlett Tree Expert Company.</p>	<p><i>Not to scale</i></p> <p><b>CRZ - 01</b></p>

Tree ID	Species	Species Note	DBH (in)	Nos. Stems	DBH2 (in)	DBH3 (in)	DBH4 (in)	Dripline (radius) (ft)	Vigor	Structure	Preservation Value	Basic Exterior Critical Root Zone (ft)	Interior Critical Root Zone (ft)	Potential Habitat	Maintenance Recommendation	Tree Note	Property Note
46	Western red cedar (Thuja plicata)		42.3					15	Fair	Fair	High	42	21	Y		Codominant stems at 20-feet height, solid and stable union.	
44	Western red cedar (Thuja plicata)		22.1					13	Poor to Fair	Good	Medium	22	11			Small crown.	
45	Western red cedar (Thuja plicata)		56.0					20	Fair	Good	High	56	28			Excellent form, and good trunk taper.	
47	Western red cedar (Thuja plicata)		35.5					16	Fair to Good	Fair	High	36	18	Y		Bulge at trunk flare, slight lean south, two codominant stems from 50-feet height.	
48	Western red cedar (Thuja plicata)		38.6					16	Poor to Fair	Good	Medium	39	19			Excellent taper, few live branches.	
49	Western red cedar (Thuja plicata)		20.5					18	Poor to Fair	Good	Medium	21	10				
50	Western red cedar (Thuja plicata)		31.7					17	Fair	Good	High	32	16			Nurse tree, good form.	
52	Western red cedar (Thuja plicata)		33.2					19	Fair to Good	Good	High	33	17			Excellent form, asymmetrical crown.	
51	Western red cedar (Thuja plicata)		27.1					13	Fair	Fair to Good	Medium	27	14			Slight lean west, small crown.	
53	Western red cedar (Thuja plicata)		23.4					18	Fair to Good	Good	Medium	23	12			Asymmetrical crown.	
54	Western red cedar (Thuja plicata)		44.2					16.5	Fair to Good	Fair to Good	High	44	22	Y		Codominant stems from 60-feet, solid and currently stable union.	
66	Bigleaf maple (Acer macrophyllum)		58.3					47	Fair	Poor	Low	58	29	Y		Large cavity in trunk, two codominant stems from the ground, each stem is leaning.	
67	Western red cedar (Thuja plicata)		23.4					15	Poor to Fair	Good	Medium	23	12				
55	Western red cedar (Thuja plicata)		49.2					13	Fair to Good	Good	High	49	25			Excellent form.	
56	Bigleaf maple (Acer macrophyllum)		23.9					32	Fair to Good	Poor	Low	24	12	Y		Codominant stems from base, cavity in base, lean.	
57	Western red cedar (Thuja plicata)		38.3					23	Good	Poor	Medium	38	19	Y		Trunk bend at 25-feet height, two codominant stems, decay at bend in trunk.	
65	Western red cedar (Thuja plicata)		64.7					18	Fair to Good	Fair	High	65	32	Y		Two codominant stems from 18-feet height, currently stable union.	
68	Western red cedar (Thuja plicata)		21.6					12.5	Fair to Good	Good	Medium	22	11				
69	Western red cedar (Thuja plicata)		31.9					16	Fair	Fair	Medium	32	16			Nurse log tree, stilt rooted, currently stable.	
70	Western red cedar (Thuja plicata)		26.7					17	Good	Fair	Medium	27	13			Nurse log tree, stilt rooted, and currently stable.	
71	Douglas fir (Pseudotsuga menziesii)		56.5					26.5	Good	Fair to Good	High	57	28	Y		Sweep in base, good taper, kink mid trunk.	
72	Western red cedar (Thuja plicata)		28.4					18	Good	Good	High	28	14			Good form.	
73	Western red cedar (Thuja plicata)		20.5					19	Fair	Fair to Good	Medium	21	10			Stilt rooted, stable	

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64	Bigleaf maple (Acer macrophyllum)		24.2		15.3	23.3		23	Fair to Good	Poor to Fair	Medium	24	12	Y		Stilt rooted on two stems, upright form	
74	Bigleaf maple (Acer macrophyllum)		28.7					22	Good	Fair	Medium	29	14			Upright form, narrow crown , large branch dieback	
75	Western red cedar (Thuja plicata)		42.6					19.5	Good	Fair	High	43	21			Mainly straight trunk	
19	Western red cedar (Thuja plicata)		50.3					21	Fair to Good	Fair to Good	High	50	25			Good form, stilt rooted, stable	
18	Western red cedar (Thuja plicata)		52.3					16.5	Fair to Good	Good	High	52	26			Good form	
20	Western red cedar (Thuja plicata)		59.2					22	Good	Good	High	59	30			Small amount of decay in base, stable, recent branch failure	
17	Western red cedar (Thuja plicata)		33.5					17	Good	Good	High	34	17			Excellent form, slight lean	
16	Western red cedar (Thuja plicata)		43.4					18.5	Good	Good	High	43	22			Excellent form	
21	Western red cedar (Thuja plicata)		27.3					23.5	Fair to Good	Fair to Good	High	27	14			Sweep in base, excellent taper	
22	Black cottonwood (Populus trichocarpa)		21.6					19	Fair to Good	Fair	Low	22	11			Poor taper, kink mid-trunk, branch failure	
23	Bigleaf maple (Acer macrophyllum)		41.0		22.8			29	Poor to Fair	Poor to Fair	Low	41	21	Y		Codominant stems from base, large branch dieback, decay in base	
24	Western red cedar (Thuja plicata)		48.4					18	Good	Good	High	48	24			Excellent form	
62	Western hemlock (Tsuga heterophylla)		32.4					21	Good	Good	High	32	16			Straight form, branch failure	
62	Western hemlock (Tsuga heterophylla)		32.4					21	Good	Good	High	32	16			Straight form, branch failure	
63	Western hemlock (Tsuga heterophylla)		20.8					18	Fair	Good	Medium	21	10			Slightly stilt rooted, branch dieback	
61	Western hemlock (Tsuga heterophylla)		35.1					23	Fair to Good	Good	High	35	18			Good form, branch failure	
60	Western red cedar (Thuja plicata)		39.1					13.5	Fair to Good	Good	High	39	20			Excellent form	
59	Western red cedar (Thuja plicata)		29.5					22	Fair	Good	High	30	15				
58	Western red cedar (Thuja plicata)		29.3					19.5	Good	Fair to Good	Medium	29	15			Small cavity in base, contained, solid	
25	Western hemlock (Tsuga heterophylla)		34.3					15	Fair to Good	Good	High	34	17			Slight lean	
27	Western red cedar (Thuja plicata)		20.9					14	Fair	Good	Medium	21	10			Asymmetrical crown	
26	Bigleaf maple (Acer macrophyllum)		21.2					22	Fair	Good	High	21	11			Upright form	
31	Western red cedar (Thuja plicata)		22.1					15	Fair to Good	Fair to Good	Medium	22	11			Asymmetrical crown	

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30	Douglas fir (Pseudotsuga menziesii)		28.9					16.5	Good	Fair to Good	High	29	14			Sweep in base, 30% lcr	
29	Western red cedar (Thuja plicata)		34.9					11	Fair to Good	Good	High	35	17				
28	Western hemlock (Tsuga heterophylla)		27.3					16.5	Fair	Fair to Good	High	27	14			Branch failure	
32	Western red cedar (Thuja plicata)		23.9					15	Fair to Good	Poor to Fair	Medium	24	12			Codominant stems from 30', solid union	
35	Western red cedar (Thuja plicata)		21.2					10	Fair to Good	Good	Medium	21	11			Healthy tree	
34	Douglas fir (Pseudotsuga menziesii)		44.3					17	Fair to Good	Good	High	44	22	Y		Excellent form, branch failure	
33	Douglas fir (Pseudotsuga menziesii)		29.9					19	Fair to Good	Fair	High	30	15	Y		Bow towards top	
36	Douglas fir (Pseudotsuga menziesii)		34.9					17.5	Good	Fair to Good	High	35	17			Good taper	
39	Douglas fir (Pseudotsuga menziesii)		24.3					12.5	Fair	Fair	Medium	24	12			Slight bow, small LCR	
37	Western red cedar (Thuja plicata)		22.1					16.5	Fair to Good	Fair to Good	Medium	22	11			Stilt rooted	
38	Western red cedar (Thuja plicata)		23.9					19	Fair to Good	Good	Medium	24	12			Excellent form	
40	Western red cedar (Thuja plicata)		49.9					19	Fair	Poor to Fair	High	50	25	Y		Decay column in lower 30' of trunk, codominant stems in top	
41	Western red cedar (Thuja plicata)		46.7					19.5	Fair	Fair	High	47	23			Full crown , hollow base, good taper	
42	Western red cedar (Thuja plicata)		26.8					15	Fair to Good	Fair	Medium	27	13			Codominant from 45', otherwise good form	
43	Western red cedar (Thuja plicata)		48.8					17	Fair	Fair	High	49	24	Y		Codominant stems from 18', good taper	
15	Red alder (Alnus rubra)		25.3					20	Fair to Good	Good	Medium	25	13			Some dieback, upright form	
14	Western red cedar (Thuja plicata)		28.3					22	Good	Fair to Good	High	28	14			Small codominant stem from 25', weak union	
13	Western red cedar (Thuja plicata)		33.3					19.5	Fair to Good	Good	High	33	17			Good form	
12	Douglas fir (Pseudotsuga menziesii)		36.8					20	Good	Fair to Good	High	37	18	Y		Bow in trunk, branch failure	
11	Western red cedar (Thuja plicata)		23.9					21	Fair	Good	Medium	24	12			Full crown, buttress roots growing around o"d stump	
10	Western red cedar (Thuja plicata)		22.5					18.5	Fair to Good	Good	Medium	23	11			Excellent form	



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9	Western red cedar (Thuja plicata)		30.5					21	Good	Good	High	31	15			Excellent form, very healthy	
8	Western red cedar (Thuja plicata)		40.2					14.5	Fair to Good	Good	High	40	20			Small spike from base	
7	Western red cedar (Thuja plicata)		25.3					18.5	Good	Good	Medium	25	13			Very healthy	
6	Douglas fir (Pseudotsuga menziesii)		34.5					22.5	Good	Fair	High	35	17			25% LCR, branch failure, curve in trunk	
3	Western red cedar (Thuja plicata)		46.2					24	Fair to Good	Good	High	46	23			Thinning top	
5	Western red cedar (Thuja plicata)		41.3					16.5	Poor to Fair	Good	High	41	21			Thinning crown	
4	Western red cedar (Thuja plicata)		25.2					23	Fair to Good	Good	Medium	25	13			Asymmetrical crown, good taper	
2	Western hemlock (Tsuga heterophylla)		21.4					24	Fair to Good	Fair to Good	Medium	21	11			Large branch failure, asymmetrical crown	
1	Western red cedar (Thuja plicata)		58.6					25	Good	Good	High	59	29			Excellent form	
430	Bigleaf maple (Acer macrophyllum)		23.6		11.5	17.2		39	Fair to Good	Fair	Low	24	12			Third stem somewhat separate, two stems over parking	
429	Bigleaf maple (Acer macrophyllum)		15.5		22.5	22.0		31			Low	16	8			Significant dieback	
150	River birch (Betula nigra)		15.5		12.0	11.0	10.0	33.5	Fair to Good	Fair	Low	16	8			Spreading form	
151	Bigleaf maple (Acer macrophyllum)		18.0		17.5	11.5	8.0	23	Poor to Fair	Fair	Low	18	9			Ivy covering base, large stem dieback	
152	Douglas fir (Pseudotsuga menziesii)		33.8					22	Good	Fair to Good	High	34	17			Ivy on trunk, 30% LCR	
153	Douglas fir (Pseudotsuga menziesii)		40.2					24	Poor to Fair	Good	High	40	20			Thinning top	
154	Douglas fir (Pseudotsuga menziesii)		29.1					21	Fair	Good	High	29	15			Good form	
155	Western red cedar (Thuja plicata)		26.1					17.5	Fair to Good	Fair	Medium	26	13			Slightly suppressed	
156	Douglas fir (Pseudotsuga menziesii)		29.6					24	Good	Fair to Good	Medium	30	15			Windshake, 20% LCR	
157	Douglas fir (Pseudotsuga menziesii)		26.8					16.5	Fair to Good	Fair to Good	Medium	27	13				
158	Douglas fir (Pseudotsuga menziesii)		32.3					23	Good	Fair to Good	High	32	16			25% LCR, branch failure	

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160	Western red cedar (Thuja plicata)		29.7					21.5	Fair to Good	Fair	Medium	30	15			Codominant stems from 40', weak union	
159	Douglas fir (Pseudotsuga menziesii)		33.9					23	Fair to Good	Fair to Good	High	34	17			Slight sweep in base, branch failure	
161	Douglas fir (Pseudotsuga menziesii)		28.1					16.5	Fair	Fair	High	28	14			Narrow crown	
162	Douglas fir (Pseudotsuga menziesii)		27.2					20	Fair to Good	Fair	High	27	14				
163	Douglas fir (Pseudotsuga menziesii)		23.0					20	Good	Fair to Good	Medium	23	12			Branch failure, long branches	
164	Douglas fir (Pseudotsuga menziesii)		32.5					14.5	Fair to Good	Good	High	33	16			Branch failure	
165	Douglas fir (Pseudotsuga menziesii)		21.9					13.5	Fair	Fair to Good	Medium	22	11			Bow in trunk	
166	Western red cedar (Thuja plicata)		38.4					14.5	Fair	Good	High	38	19			Top thinning	
167	Western red cedar (Thuja plicata)		37.8					19.5	Fair to Good	Fair to Good	High	38	19			Weak side codominant stem at 18', main stem stable	
168	Douglas fir (Pseudotsuga menziesii)		33.6					15.5	Dying/Dead		Dead	34	17			Dead within past 6 months. Suspected root disease Laminated root rot.	
169	Western red cedar (Thuja plicata)		36.9					18	Fair to Good	Fair	Medium	37	18			Two levels of codominant stems, larger pair from 20	
170	Western red cedar (Thuja plicata)		42.9					15.5	Fair	Good	High	43	21			Top thinning	
171	Bigleaf maple (Acer macrophyllum)		42.4					30	Fair to Good	Fair	Low	42	21			Codominant from the base, large branch dieback	
172	Western red cedar (Thuja plicata)		43.2					23	Fair	Good	High	43	22			Thinning crown	
176	Douglas fir (Pseudotsuga menziesii)		32.9					20	Fair	Good	Medium	33	16			Slightly thinning top	
173	Western red cedar (Thuja plicata)		34.5					17.5	Poor	Good	Medium	35	17			Basal decay, very sparse crown	
174	Western hemlock (Tsuga heterophylla)		23.1					28	Good	Fair to Good	Medium	23	12			Trunk in contact with cedar tree	
175	Western red cedar (Thuja plicata)		27.9					24	Fair to Good	Fair	Medium	28	14			Bowed above wound from failed stem at 18' high	
177	Douglas fir (Pseudotsuga menziesii)		37.4					16	Fair to Good	Good	High	37	19			Branch failure, good taper	

Tree ID	Species	Species Note	DBH (in)	Nos. Stems	DBH2 (in)	DBH3 (in)	DBH4 (in)	Dripline (radius) (ft)	Vigor	Structure	Preservation Value	Basic Exterior Critical Root Zone (ft)	Interior Critical Root Zone (ft)	Potential Habitat	Maintenance Recommendation	Tree Note	Property Note
178	Western red cedar (Thuja plicata)		38.4					18	Fair to Good	Fair	Medium	38	19			Column of decay in lower trunk	
179	Douglas fir (Pseudotsuga menziesii)		24.9		17.4			18.5	Fair to Good	Fair	Medium	25	12			Codominant from the base, stable	
180	Douglas fir (Pseudotsuga menziesii)		33.3					26.5	Fair to Good	Good	High	33	17			Branch failure	
181	Western red cedar (Thuja plicata)		44.5					24.5	Poor to Fair	Fair to Good	High	45	22			Thinning crown	
182	Western red cedar (Thuja plicata)		48.2					24	Fair to Good	Fair	Medium	48	24			Wide trunk flare, codominant stems from base	
183	Western red cedar (Thuja plicata)		23.6					19	Fair	Fair	Low	24	12			Suppressed	
184	Western red cedar (Thuja plicata)		24.5					19.5	Poor to Fair	Fair	Medium	25	12				
185	Western red cedar (Thuja plicata)		25.1					19.5	Fair to Good	Fair to Good	Medium	25	13				
186	Western hemlock (Tsuga heterophylla)		22.0					17.5	Good	Fair	Medium	22	11			Codominant stems from 6', one stem subordinate	
187	Western red cedar (Thuja plicata)		29.2					12.5	Fair	Fair	Medium	29	15			Codominant stems from 14', one stem subordinate	
190	Western red cedar (Thuja plicata)		27.9					13.5	Fair	Good	Medium	28	14				
188	Western red cedar (Thuja plicata)		24.7					25	Fair to Good	Good	Medium	25	12				
189	Western red cedar (Thuja plicata)		33.4					17	Fair to Good	Good	Medium	33	17				
191	Western red cedar (Thuja plicata)		27.1					20	Fair	Poor to Fair	Low	27	14			Codominant stems from 6', solid union	
193	Western red cedar (Thuja plicata)		33.5					19	Fair to Good	Good	Medium	34	17				
192	Western red cedar (Thuja plicata)		24.5					11	Fair	Good	Medium	25	12				
194	Douglas fir (Pseudotsuga menziesii)		48.3					19	Good	Good	High	48	24	Y		Branch failure	
195	Western red cedar (Thuja plicata)		36.1					19.5	Fair to Good	Fair to Good	Medium	36	18				
197	Western red cedar (Thuja plicata)		27.7					15	Fair	Good	Medium	28	14				
196	Western red cedar (Thuja plicata)		28.6					16	Fair to Good	Good	High	29	14				
198	Bigleaf maple (Acer macrophyllum)		27.9		15.3			28.5	Fair to Good	Good	Medium	28	14			Some dieback	
199	Western red cedar (Thuja plicata)		35.4					20.5	Fair	Fair to Good	High	35	18			Slight sweep in base	

Tree ID	Species	Species Note	DBH (in)	Nos. Stems	DBH2 (in)	DBH3 (in)	DBH4 (in)	Dripline (radius) (ft)	Vigor	Structure	Preservation Value	Basic Exterior Critical Root Zone (ft)	Interior Critical Root Zone (ft)	Potential Habitat	Maintenance Recommendation	Tree Note	Property Note
200	Western red cedar (Thuja plicata)		41.9					23	Good	Good	High	42	21			Narrow cavity with decay in base, slightly lean	
409	Douglas fir (Pseudotsuga menziesii)		41.0					28	Good	Fair to Good	High	41	21			Slight sweep in base, on mound	
410	Douglas fir (Pseudotsuga menziesii)		26.2					25	Fair to Good	Fair to Good	Medium	26	13			Asymmetrical crown	
411	Douglas fir (Pseudotsuga menziesii)		32.7					23	Good	Fair to Good	High	33	16			Branch failure, asymmetrical crown Basal and lower trunk decay. Cavity in lower trunk, caused by the past failure of a codominant trunk. Crown contains typical 2 to 3-inch deadwood, but in a limited quantity. Adjacent vine maple next to stop sign removed.	
101	Bigleaf maple (Acer macrophyllum)		20.5	2	18.5			27	Fair to Good	Fair	Low	21	10			Invasive species yellow archangel noted in this corner. Cover of this invasive species is light, and establishment could be controlled if action to remove invasive species is taken now.	
102	Western red cedar (Thuja plicata)		29.9					15	Fair to Good	Good	High	30	15			Codominant crown (stand classification.) Originally two (2) trees, fused at the base to now form single tree. Asymmetrical roots along nurse log. Tree adapted to root structure and exposure.	
103	Western red cedar (Thuja plicata)		24.3					11.5	Fair	Fair to Good	Medium	24	12			Slight thinning of foliage density, potentially caused by this trees codominant canopy situation.	
104	Western red cedar (Thuja plicata)		31.2	2	31.3			20.2	Fair	Fair	Medium	31	16	Y		Decayed remains of lower trunk, and remnants of failed native birch at base and with drip line of this tree. This tree has a codominant crown and canopy with two closely located Douglas fir trees.	
105	Western red cedar (Thuja plicata)		31.6					15	Fair	Fair to Good	Medium	32	16			Tree leans, currently stable. Lean is associated with the codominant canopy situation (phototrophic growth habit.)	
106	Western red cedar (Thuja plicata)		23.6					12	Fair to Good	Fair to Good	High	24	12			Evidence of trunk flex and ring shake with the exudation of sap on the north-northwest face of the trunk.	
107	Douglas fir (Pseudotsuga menziesii)	Species is prone branch failure. This can be mitigated through pruning.	28.7					15	Fair	Fair	Medium	29	14			Tree with close codominant crown growing situation. The result is less foliage density, narrow crown, and lower than typical live crown ratio.	
108	Douglas fir (Pseudotsuga menziesii)		26.2					17	Fair to Good	Fair	Medium	26	13				
109	Western red cedar (Thuja plicata)		24.3					12	Fair	Fair	Medium	24	12	Y			

Tree ID	Species	Species Note	DBH (in)	Nos. Stems	DBH2 (in)	DBH3 (in)	DBH4 (in)	Dripline (radius) (ft)	Vigor	Structure	Preservation Value	Basic Exterior Critical Root Zone (ft)	Interior Critical Root Zone (ft)	Potential Habitat	Maintenance Recommendation	Tree Note	Property Note
111	Western red cedar (Thuja plicata)		31.8					14.5	Fair to Good	Fair to Good	High	32	16				
110	Western red cedar (Thuja plicata)		28.2					16				28	14	Y		Tight codominant canopy arrangement with tree 109.	
428	Douglas fir (Pseudotsuga menziesii)		24.8					18.5	Fair to Good	Fair to Good	High	25	12			Close to property line. Ensure location is accurately surveyed, especially if this tree and adjacent trees are identified for removal.	
427	Douglas fir (Pseudotsuga menziesii)		20.2					19	Fair to Good	Fair	Medium	20	10			Asymmetrical crown form, predominant over property to the south.	
426	Douglas fir (Pseudotsuga menziesii)		22.6					22	Fair to Good	Fair	High	23	11			Large crown and dominance in the canopy of two codominant trees situated adjacent to this tree.	
425	Western red cedar (Thuja plicata)		29.9					21.5	Fair	Fair	Low	30	15			Assigned a low preservation value due to the lower trunk condition (includes recent injuries, and presence of past injuries and basal decay), and the slightly thin density of foliage.	
424	Douglas fir (Pseudotsuga menziesii)		42.5					19	Fair to Good	Fair to Good	High	43	21	Y			
423	Western red cedar (Thuja plicata)		27.4					16.5	Fair to Good	Fair to Good	Medium	27	14			Invasive ground covers emerging, and English ivy on south face of the lower trunk.	
422	Douglas fir (Pseudotsuga menziesii)		29.8					17	Fair to Good	Fair to Good	High	30	15	Y		Localized sap exudation on the lower trunk. No crown symptoms of decline or disease.	
421	Douglas fir (Pseudotsuga menziesii)		40.8					23	Fair to Good	Fair to Good	High	41	20			This tree has a dominant crown structure. This tree is the dominant of all trees in this area of canopy. This tree will have value as a prominent perch tree.	
420	Douglas fir (Pseudotsuga menziesii)		24.5					16.5	Fair to Good	Fair to Good	High	25	12	Y			
419	Douglas fir (Pseudotsuga menziesii)		27.5					15	Fair to Good	Fair to Good	High	28	14				
418	Douglas fir (Pseudotsuga menziesii)		42.7					25	Fair to Good	Fair to Good	High	43	21	Y		See notes for Tree 420.	
417	Douglas fir (Pseudotsuga menziesii)		33.4					23	Fair	Fair to Good	High	33	17	Y			
416	Douglas fir (Pseudotsuga menziesii)		42.7					32	Fair to Good	Fair to Good	High	43	21	Y			

Tree ID	Species	Species Note	DBH (in)	Nos. Stems	DBH2 (in)	DBH3 (in)	DBH4 (in)	Dripline (radius) (ft)	Vigor	Structure	Preservation Value	Basic Exterior Critical Root Zone (ft)	Interior Critical Root Zone (ft)	Potential Habitat	Maintenance Recommendation	Tree Note	Property Note
415	Douglas fir (Pseudotsuga menziesii)		30.6					22	Fair to Good	Fair to Good	High	31	15	Y			Location places tree under protection of riparian boundary and buffer.
414	Douglas fir (Pseudotsuga menziesii)		34.1					22	Fair to Good	Fair to Good	High	34	17	Y			Location places tree under protection of riparian boundary and buffer.
413	Douglas fir (Pseudotsuga menziesii)		26.6					22	Fair to Good	Fair to Good	High	27	13	Y			Location places tree under protection of riparian boundary and buffer.
412	Douglas fir (Pseudotsuga menziesii)		32.4					19	Fair to Good	Fair to Good	High	32	16	Y			Location places tree under protection of riparian boundary and buffer.
404	Bigleaf maple (Acer macrophyllum)		32.6					32	Fair	Fair	Medium	33	16	Y		This tree has dead secondary and tertiary trunks, each with a significant diameter. Hardware is embedded in to the trunk. Dead sections could be manipulated through specialized pruning to stabilize and enhance wildlife habitat potential of this tree.	Location places tree under protection of riparian boundary and buffer.
403	Western red cedar (Thuja plicata)		45.9					25	Fair to Good	Fair to Good	High	46	23	Y			Location places tree under protection of riparian boundary and buffer.
405	Douglas fir (Pseudotsuga menziesii)		21.9					16	Fair to Good	Fair to Good	High	22	11				Location places tree under protection of riparian boundary and buffer.
406	Grand fir (Abies grandis)		41.0					19	Fair to Good	Fair	Medium	41	21	Y	Advanced Assessment	Aerial inspection recommended. Codominant leader in upper crown failed. Remaining part of the failed leader is decaying. The extent and severity of this decay cannot be evaluated from the ground.	Location places tree under protection of riparian boundary and buffer.
402	Western red cedar (Thuja plicata)		43.2					21	Fair	Fair to Good	Medium	43	22				Location places tree under protection of riparian boundary and buffer.
407	Western red cedar (Thuja plicata)		32.2					18	Fair to Good	Fair to Good	Medium	32	16				The location of this tree places it within the buffer for the riparian area.
401	Western red cedar (Thuja plicata)		32.7					15	Fair	Fair to Good	Medium	33	16				The location of this tree places it within the buffer for the riparian area.
149	Western red cedar (Thuja plicata)		48.3					21.5	Fair	Fair to Good	Medium	48	24	Y		Noted very slight yellowing of the foliage. Tree has a stable reiterated codominant leader (originating from branch.)	
408	Douglas fir (Pseudotsuga menziesii)		28.4					15	Fair to Good	Fair to Good	High	28	14				The location of this tree places it within the buffer for the riparian area.
148	Douglas fir (Pseudotsuga menziesii)		32.0					16.5	Fair to Good	Fair to Good	High	32	16				The location of this tree places it within the buffer for the riparian area.
147	Douglas fir (Pseudotsuga menziesii)		25.4					17.5	Fair to Good	Fair to Good	High	25	13				The location of this tree places it within the buffer for the riparian area.

Tree ID	Species	Species Note	DBH (in)	Nos. Stems	DBH2 (in)	DBH3 (in)	DBH4 (in)	Dripline (radius) (ft)	Vigor	Structure	Preservation Value	Basic Exterior Critical Root Zone (ft)	Interior Critical Root Zone (ft)	Potential Habitat	Maintenance Recommendation	Tree Note	Property Note
146	Douglas fir (Pseudotsuga menziesii)		22.4					17.5	Fair to Good	Fair to Good	Medium	22	11			Root damage from vehicle entry into this area.	The location of this tree places it within the buffer for the riparian area.
145	Western red cedar (Thuja plicata)		32.1					13.5	Fair to Good	Fair to Good	High	32	16				Debris (including waste material) placed in the area around this tree.
144	Western red cedar (Thuja plicata)		49.8					15.5	Fair to Good	Fair to Good	High	50	25	Y		Lower trunk swelling indicates potential decay up to a height of 7-feet.	
143	Western hemlock (Tsuga heterophylla)		31.2					16.5	Fair to Good	Fair to Good	High	31	16	Y		Unusual example of a tall western hemlock.	
142	Western red cedar (Thuja plicata)		32.6					15	Fair to Good	Fair	High	33	16			Basal swelling indicating decay at the soil line and up to height of approximately 5.5-feet.	The location of this tree places it within the buffer for the riparian area.
141	Western hemlock (Tsuga heterophylla)		22.5					18	Fair	Fair		23	11			Slightly thin crown. Adjacent tree, western hemlock, not surveyed or inventoried. The adjacent tree was a w.hemlock. This adjacent tree is now dead. Subject w.hemlock has thinning foliage. This condition is related to canopy codominance with the now dead w.hemlock.	
140	Western red cedar (Thuja plicata)		36.0	2	36.5			25	Fair to Good	Fair	High	36	18	Y		West codominant trunk has sharp bend. No indication of significant structural weakness associated with this form.	
139	Western red cedar (Thuja plicata)		55.2					24	Fair to Good	Fair to Good	High	55	28	Y		Failed and lodged branch in the lower crown. No action necessary.	
138	Western red cedar (Thuja plicata)		22.1					15	Fair	Fair to Good	Medium	22	11			Soil cavity under tree base.	
137	Douglas fir (Pseudotsuga menziesii)		34.3					18.5	Fair to Good	Fair to Good	High	34	17	Y			
136	Western hemlock (Tsuga heterophylla)		25.3					15	Fair to Good	Fair to Good	High	25	13	Y			
135	Douglas fir (Pseudotsuga menziesii)		30.6					16.5	Fair to Good	Fair to Good	High	31	15			Lower trunk has swelling, typical of this species this is likely to indicate nasal decay.	This location is on the north side of the main access drive. This area contains many exceptional trees.
134	Western red cedar (Thuja plicata)		43.8					17.5	Fair to Good	Fair	High	44	22			This tree remains stable and structurally sound at this time.	This location is on the north side of the main access drive. This area contains many exceptional trees.
133	Western hemlock (Tsuga heterophylla)		22.9					16	Fair to Good	Fair to Good	Medium	23	11				This location is on the north side of the main access drive. This area contains many exceptional trees.
132	Western hemlock (Tsuga heterophylla)		23.0					12.5	Fair to Good	Fair to Good	High	23	12			Soil cavity beneath the base of this tree.	This location is on the north side of the main access drive. This area contains many exceptional trees.
131	Western hemlock (Tsuga heterophylla)		23.5					16.5	Fair to Good	Fair	Medium	24	12			This tree is a large example of a western hemlock growing on a nurse stump.	This location is on the north side of the main access drive. This area contains many exceptional trees.

Tree ID	Species	Species Note	DBH (in)	Nos. Stems	DBH2 (in)	DBH3 (in)	DBH4 (in)	Dripline (radius) (ft)	Vigor	Structure	Preservation Value	Basic Exterior Critical Root Zone (ft)	Interior Critical Root Zone (ft)	Potential Habitat	Maintenance Recommendation	Tree Note	Property Note
130	Western red cedar (Thuja plicata)		59.7					24	Fair to Good	Fair to Good	High	60	30	Y		Lower trunk has swelling, typical of this species this is likely to indicate nasal decay. This tree remains stable and structurally sound at this time.	This location is on the north side of the main access drive. This area contains many exceptional trees.
129	Western red cedar (Thuja plicata)		37.4					19	Fair to Good	Fair	High	37	19	Y			This location is on the north side of the main access drive. This area contains many exceptional trees.
128	Western red cedar (Thuja plicata)		43.8	2	35.4			26	Fair to Good	Fair to Good	High	44	22			Lower crown contains failed and lodged branch. Branch removal is advised.	This location is on the north side of the main access drive. This area contains many exceptional trees.
126	Western red cedar (Thuja plicata)		37.1					15	Fair to Good	Fair	High	37	19				This location is on the north side of the main access drive. This area contains many exceptional trees.
127	Western red cedar (Thuja plicata)		22.7					14.5	Fair to Good	Fair	High	23	11			Codominant leaders in the upper crown. Condition assessment is not possible due to poor visibility.	This location is on the north side of the main access drive. This area contains many exceptional trees.
124	Western red cedar (Thuja plicata)		26.1					13	Fair to Good	Fair	Medium	26	13			Codominant leaders in the upper crown. Condition assessment is not possible due to poor visibility.	This location is on the north side of the main access drive. This area contains many exceptional trees.
125	Western red cedar (Thuja plicata)		40.2					15.5	Fair to Good	Fair	Medium	40	20			Codominant leaders in the upper crown. Condition assessment is not possible due to poor visibility. Three (3) leaders noted.	This location is on the north side of the main access drive. This area contains many exceptional trees.
123	Western hemlock (Tsuga heterophylla)		32.5					16.5	Fair to Good	Fair to Good	High	33	16				This location is on the north side of the main access drive. This area contains many exceptional trees.
122	Western red cedar (Thuja plicata)		27.5					28	Fair to Good	Fair	Medium	28	14	Y		This tree is codominant with adjacent western hemlock. Trunks are in contact from soil line to a height of 2-feet. Crown is slightly suppressed, explaining significant crown radius.	This location is on the north side of the main access drive. This area contains many exceptional trees.
110	Douglas fir (Pseudotsuga menziesii)		26.2					19.5	Fair to Good	Fair to Good	High	26	13				This location is on the north side of the main access drive. This area contains many exceptional trees.
121	Western red cedar (Thuja plicata)		47.1					18.5	Fair to Good	Fair to Good	High	47	24				This location is on the north side of the main access drive. This area contains many exceptional trees.
119	Western hemlock (Tsuga heterophylla)		24.4					18	Fair to Good	Fair	High	24	12			Trunk has a swept form. No indication of structural weakness.	This location is on the north side of the main access drive. This area contains many exceptional trees. Debris beneath and around this tree.
118	Western red cedar (Thuja plicata)		30.7					16	Fair to Good	Fair to Good	High	31	15	Y			This location is on the north side of the main access drive. This area contains many exceptional trees.
116	Western red cedar (Thuja plicata)		32.8					17	Fair to Good	Fair	Medium	33	16	Y		Low trunk, especially at soil line, contains a column of decay.	This location is on the north side of the main access drive. This area contains many exceptional trees.



North Shore Drive  
 Bellingham, Washington

Tree ID	Species	Species Note	DBH (in)	Nos. Stems	DBH2 (in)	DBH3 (in)	DBH4 (in)	Dripline (radius) (ft)	Vigor	Structure	Preservation Value	Basic Exterior Critical Root Zone (ft)	Interior Critical Root Zone (ft)	Potential Habitat	Maintenance Recommendation	Tree Note	Property Note
117	Bigleaf maple (Acer macrophyllum)	Tree has asymmetrical crown, with crown centered to south of tree base.	22.9					23	Fair	Poor to Fair	Low	23	11			This tree has a column of decay in the lower trunk, with an open cavity up to a height of 15-feet. Increased exposure may cause tree trunk to fail along this column of decay.	This location is on the north side of the main access drive. This area contains many exceptional trees.
115	Western red cedar (Thuja plicata)		38.9					20.5	Fair to Good	Fair to Good	High	39	19	Y		This tree has a column of decay in the lower trunk, noted through excessive swelling in the lower trunk.	This location is on the north side of the main access drive. This area contains many exceptional trees.
114	Western red cedar (Thuja plicata)	Survey shows symbol for deciduous species.	46.1					19	Fair to Good	Fair to Good	High	46	23	Y		Tree has codominant leaders, two (2) stems. Union appears structurally sound and currently stable.	This location is on the north side of the main access drive. This area contains many exceptional trees.
112	Western red cedar (Thuja plicata)		23.9					17	Fair to Good	Fair	High	24	12	Y		This tree has basal decay, most noticeable at the soil line on the north side of this tree.	This location is on the north side of the main access drive. This area contains many exceptional trees.
113	Western red cedar (Thuja plicata)		48.9					18.5	Fair to Good	Fair to Good	High	49	24			Form of this trees lower trunk indicates basal decay. Extending from soil line to 7-feet.	This location is on the north side of the main access drive. This area contains many exceptional trees.