

# Gilles Consulting

— Brian K. Gilles —

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## EVALUATION OF SIX INCH AND LARGER TREES

AT

## THE RESERVE AT WOODINVILLE

15902 Woodinville-Redmond Road  
Woodinville, WA 98072

February 26, 2013

Revised June 17, 2013

**Revised June 6, 2016**

### PREPARED FOR:

**Matt Buchanan**  
**Panattoni Development Co.**  
**900 SW 16<sup>th</sup> Street**  
**Suite 300**  
**Renton, WA 98057**

### PREPARED BY:

#### GILLES CONSULTING

Brian K. Gilles, Consulting Arborist

*ISA Certified Arborist # PN-0260A*

*ASCA Registered Consulting Arborist # RCA-418*

*ISA TRAQ Qualified*

*ISA TRAQ Certified Instructor*



fax: 425-822-6314

email: [bkgilles@comcast.net](mailto:bkgilles@comcast.net)

P.O. Box 2366 Kirkland, WA 98083

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## **ASSIGNMENT**

Michelle Wahl of Brumbaugh & Associates, working for Matt Buchanan of Panattoni Development Company of Renton, Washington, contracted with Gilles Consulting to respond to the letter from the City of Woodinville regarding the trees at the development site, The Reserve at Woodinville at 15902 Woodinville-Redmond Road in Woodinville, Washington. The property is being re-developed and the City of Woodinville requires an update of the extensive analysis of the trees done earlier. This report provides the re-analysis. The information in this report can be utilized to create a Tree Plan as required by Woodinville Code. This report focuses on those trees on the property that are six inches in diameter and greater; measured at the standard 4.5 feet above the average ground level.

## **METHODOLOGY**

To evaluate the trees and to prepare the report, I drew upon my 30+ years of experience in the field of arboriculture and my formal education in natural resources management, dendrology, forest ecology, plant identification, and plant physiology. I also followed the protocol of the International Society of Arboriculture (ISA) for Visual Assessment (VA) that includes looking at the overall health of the trees as well as the site conditions. This is a scientifically based process to look at the entire site, surrounding land and soil, as well as a complete look at the trees themselves.

In examining each tree, I looked at such factors as: size, vigor, canopy and foliage condition, density of needles, injury, insect activity, root damage and root collar health, crown health, evidence of disease-causing bacteria, fungi or virus, dead wood and hanging limbs.

### Tree Tags

The trees were tagged and numbered 401 through 473, and 408A. . The tags are made of shiny aluminum approximately one inch by three inches in size and are attached to the tree with staples and a one foot strip of brightly colored survey tape. The tags were placed as high as possible to minimize their removal and were generally placed on the backsides of the trees as inconspicuously as possible. Please refer to *Attachment 1, Site Plan* for an orientation to the site and the approximate location of the trees.

## **OBSERVATIONS**

The property lies between Woodinville-Redmond Road and the Sammamish River in southwest Woodinville. The old railroad tracks cross the entrances to the property on the west side between the property line and the road right-of-way. As the former Woodinville Lumber site the property currently is almost completely hard surfaced with

an assortment of buildings. The property is currently fenced with a 6-foot chain-link fence with north and south gated entries.

There are only 7 trees on adjacent properties that come near the subject property. All 7 of the trees are *Significant* and are classified as *Type 1 Trees* based upon WMC 21.15.060(6). However, the seven trees are all far enough south of the south property line that they will not be significantly impacted. Three of the trees canopies do not overhang the subject property. Three of the remaining four trees overhang the subject property by between 1 and 2.5 feet. The final tree is a volunteer Red Alder tree that overhangs the subject property by 12 feet.

Photo # 1: looking NW from the northern end of the south property line at trees # 401 and 402 on the adjacent property to the south



Photo # 2: looking at trees # 403 – 407 on the adjacent property to the south.

Trees 401 – 407 can all be adequately protected during re-development with the standard 5-foot minimum setback



Although there are many trees around the main building and parking lots, the majority of the *Significant Trees* are located along the Sammamish River on the east side of the perimeter fence. The majority of the trees along the river appear to have been planted in two north/south rows as part of a landscape plan. However, there are a few Bitter Cherry and Black Cottonwood trees that have self-seeded onto the property and are growing quite well.



Photo # 3: looking north from near the southeast property corner at the western row of installed trees and grass.



Photo # 4: looking north from near the southeast property corner between the two rows of installed trees and grass.

In an effort to present the information and conclusions for each tree in a manner that is clear and easy to understand, as well as to save paper, I have included a detailed spreadsheet, *Attachment 2, Tree Inventory/Condition Spreadsheet*. All the same information from the ISA Tree Hazard Form is included in this spreadsheet and the attached glossary. The descriptions on the spreadsheet were left brief in order to include as much pertinent information as possible and to make the report manageable. The attached glossary provides a detailed description of the terms used in the spreadsheet and in this report. It can be found in *Attachment 3, Glossary*. A brief review of these terms

and descriptions will enable the reader to rapidly move through the spreadsheet and better understand the information.

## **DISCUSSION**

### Right-of-Way Trees

There are no right-of-way trees impacted by this project.

### Trees on Adjacent Properties

There are 7 trees on the adjacent property to the south. They are all very near the southwest property corner in a rough line. They are growing in planter beds. As noted above, all can be adequately protected with a minimum of a 5-foot setback from the south property line.

### Trees on the Subject Property

A total of 73 trees evaluated on the subject property; 72 are *Significant Trees*. In addition, there are additional small/non-significant trees on the property that are in Fair, Good, Very Good or Excellent condition—they were not counted, evaluated, or included in this report. These additional trees have been accounted for in the landscape plan that is part of the permit submission packet.

Four of the trees are located around the existing building that was the main building and office for Woodinville Lumber. There are 8 trees in a row on the south side of a drainage ditch on the east side of the property that connects to the Sammamish River. They are located in the southeast corner of Sheet 4 of 5 of *Attachment 1, Site Survey* below and are tagged as trees 445 through 451, plus a non-significant small Douglas Fir tree.

## **CONCLUSIONS AND RECOMMENDATIONS**

The trees on the adjacent property to the south can be adequately protected the “Limits of Construction” fence required.

### Tree Protection Measures

All the trees proposed for retention on the subject property and the 7 trees on the adjacent property to the south will be adequately protected with the regular “Limits of Construction” fencing that is required by the City. They are shown on Sheet 11-1 of the plan submittal.

### Tree Density Calculations

The Woodinville Municipal Code section 21.15.070 *Tree Density* sets out the minimum tree density requirements for new developments and major redevelopments. It allows for supplemental planting if a site falls below the minimum with existing trees.

Of the trees that were measured in 2013 to be six inches in diameter and greater provide 106.75 tree credits. The landscape plan includes additional trees existing on the site that are less than six inches. Those trees are included and the re-planting plan then incorporates those numbers into the plan.

### **WAIVER OF LIABILITY**

There are many conditions affecting a tree's health and stability, which may be present and cannot be ascertained, such as, root rot, previous or unexposed construction damage, internal cracks, stem rot and more which may be hidden. Changes in circumstances and conditions can also cause a rapid deterioration of a tree's health and stability. Adverse weather conditions can dramatically affect the health and safety of a tree in a very short amount of time. While I have used every reasonable means to examine these trees, this evaluation represents my opinion of the tree health at this point in time. These findings do not guarantee future safety nor are they predictions of future events.

The tree evaluation consists of an external visual inspection of an individual tree's root flare, trunk, and canopy from the ground only unless otherwise specified. The inspection may also consist of taking trunk or root soundings for sound comparisons to aid the evaluator in determining the possible extent of decay within a tree. Soundings are only an aid to the evaluation process and do not replace the use of other more sophisticated diagnostic tools for determining the extent of decay within a tree.

As conditions change, it is the responsibility of the property owners to schedule additional site visits by the necessary professionals to ensure that the long-term success of the project is ensured. It is the responsibility of the property owner to obtain all required permits from city, county, state, or federal agencies. It is the responsibility of the property owner to comply with all applicable laws, regulations, and permit conditions. If there is a homeowners association, it is the responsibility of the property owner to comply with all Codes, Covenants, and Restrictions (CC&R's) that apply to tree pruning and tree removal.

This tree evaluation is to be used to inform and guide the client in the management of their trees. This in no way implies that the evaluator is responsible for performing recommended actions or using other methods or tools to further determine the extent of internal tree problems without written authorization from the client. Furthermore, the evaluator in no way holds that the opinions and recommendations are the only actions required to insure that the tree will not fail. A second opinion is recommended. The client shall hold the evaluator harmless for any and all injuries or damages incurred if the evaluator's recommendations are not followed or for acts of nature beyond the evaluator's reasonable expectations, such as severe winds, excessive rains, heavy snow loads, etc.

This report and all attachments, enclosures, and references, are confidential and are for the use of the client concerned. They may not be reproduced, used in any way, or disseminated in any form without the prior consent of the client concerned and Gilles Consulting.

Thank you for calling Gilles Consulting for your arboricultural needs.

Sincerely,



Brian K. Gilles, Consulting Arborist  
ISA Certified Arborist # PN-0260A  
ASCA Registered Consulting Arborist # RCA-418  
ISA TRAQ Qualified  
ISA TRAQ Certified Instructor

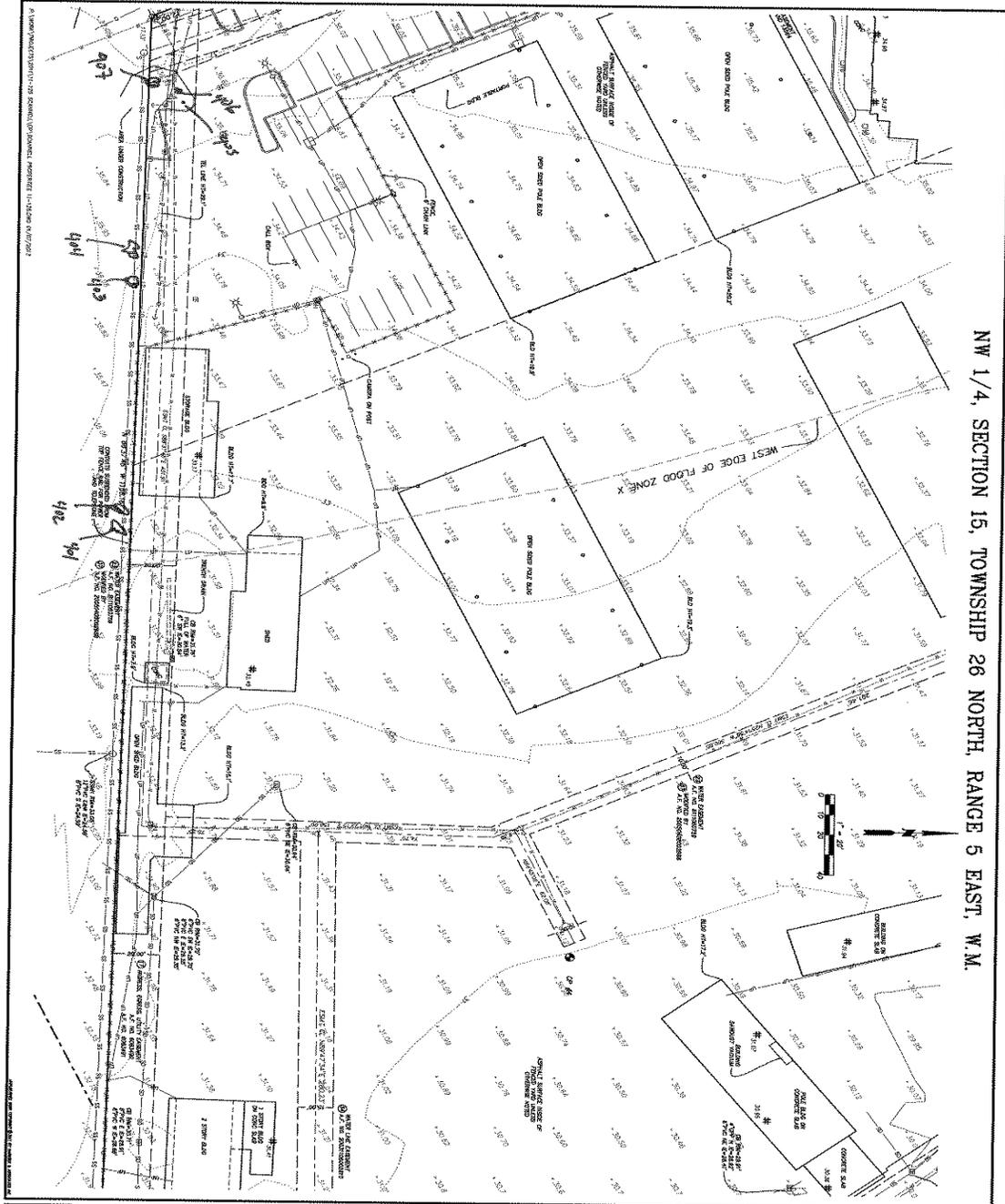


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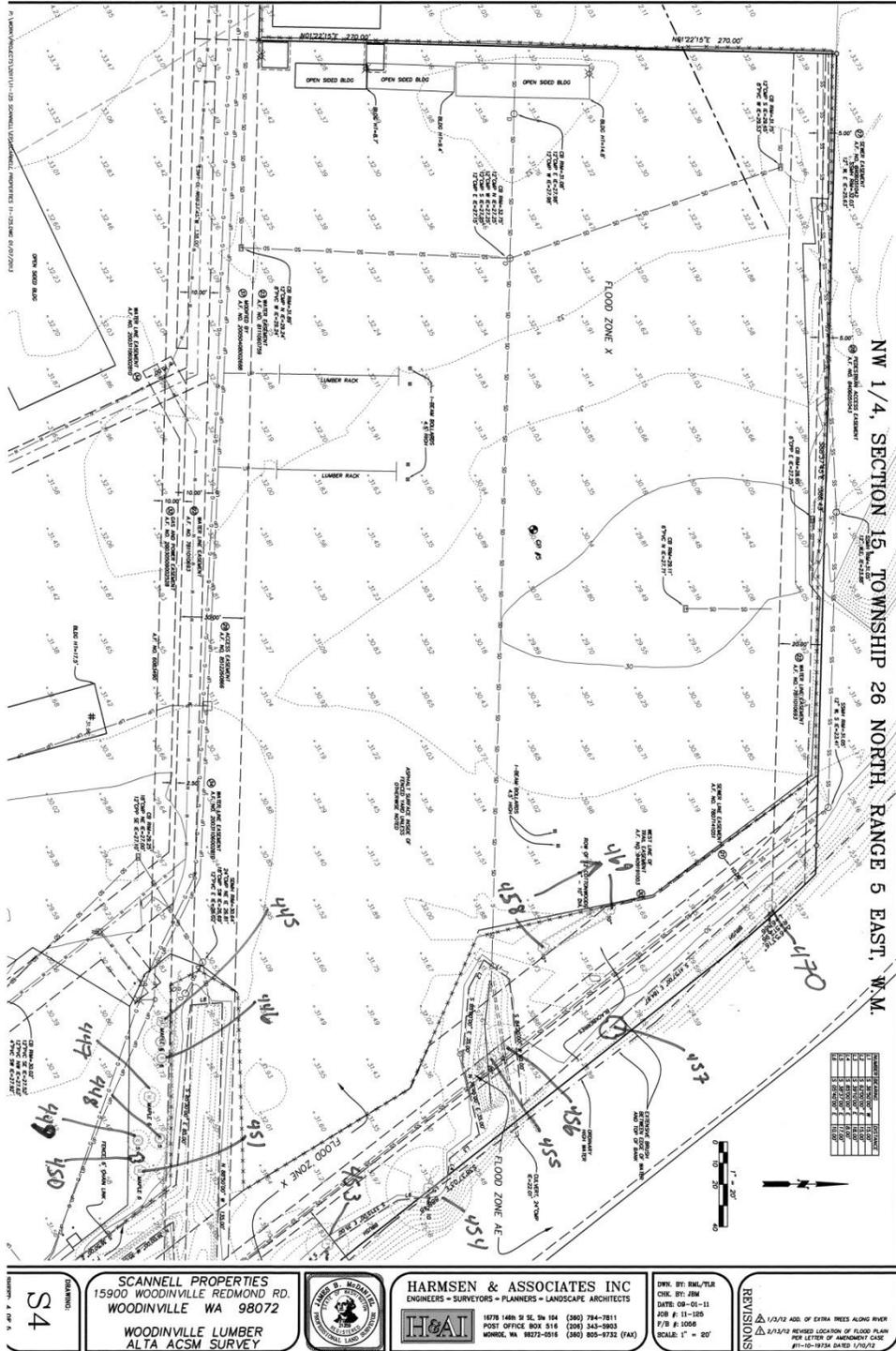


Evaluation of Trees at  
15902 Bear Creek Rd NE, Woodinville, WA 98077  
Gilles Consulting  
2/26/13, Revised, 6/17/13, Re-Revised 6/6/16  
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NW 1/4, SECTION 15, TOWNSHIP 26 NORTH, RANGE 5 EAST, W.M.

<p>SCANNELL PROPERTIES 15902 WOODINVILLE REDMOND RD. WOODINVILLE WA 98072 WOODINVILLE LUMBER ALTA/ACSM SURVEY</p>	 <p><b>HARMSEN &amp; ASSOCIATES INC</b> ENGINEERS - SURVEYORS - PLANNERS - LANDSCAPE ARCHITECTS</p> <p>16716 146th St SE, Ste 200 (520) 284-7811 POST OFFICE, BOX 516 (206) 348-9963 WOODS, WA 98073-0516 (360) 868-9732 (FAX)</p>	<p>DRN: 897-880/STL CHK: 897-880 DATE: 09-10-11 SHEET: 11 OF 12 P/B: P. 1056 SCALE: 1" = 20'</p>	<p>REVISIONS</p> <p>1/17/13 ADD. OF EXTRA TREES ALONG RIVER 2/26/13 REVISION LOCATION OF FLOOD PLAIN FOR LETTER OF AUTHORITY CASE #11-10-1410A DATED 2/16/12</p>
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**ATTACHMENT 2 - TREE INVENTORY/CONDITIONS SPREADSHEET**

ABBREVIATED LEGEND--SEE GLOSSARY IN REPORT ATTACHMENTS FOR GREATER DETAIL			
<b>#1</b>	<b>Property:</b> Whether the tree is on or off the Subject Property, or a Right-of-Way tree.		<b>#5</b> <b>DBH:</b> Trunk diameter @ 4.5' above average ground level.
<b>#2</b>	<b>Tree Location:</b> Relative placement of the tree on the Subject Property.		<b>#6A</b> <b>Species Multiplier:</b> Based upon Woodinville Code 21.15.072.2 (d) species are rated according to canopy size.
<b>#3</b>	<b>Tree #:</b> The unique tag number of each tree.		<b>#6B</b> <b>Table 21.15.07 Credit:</b> Trees are assigned a tree credit based upon DBH from this table in the code.
<b>#4</b>	<b>Species:</b>		<b>#6C</b> <b>Tree Credit:</b> Tree Credits are calculated by multiplying Columns 6A & 6B.
	BCh/Pe	Bitter Cherry, <i>Prunus emarginata</i>	<b>#7</b> <b>Drip Line:</b> The radius, the distance from the trunk to the furthest branch tips.
	BCw/Pt	Black Cottonwood, <i>Populus trichocarpa</i>	<b>#8</b> <b>LCR:</b> Live Crown Ratio - the amount of live canopy expressed as a % of the entire tree height
	BLM/Am	Big Leaf Maple, <i>Acer macrophyllum</i>	<b>#9</b> <b>Symmetry:</b> General shape of canopy and weight distribution of the tree around the trunk.
	CBS/Pp	Colorado Blue Spruce, <i>Picea pungens</i>	<b>#10</b> <b>Foliage:</b> General description of foliage density that indicates tree health and vigor.
	DC/Cd	Deodar Cedar, <i>Cedrus deodara</i>	<b>#11</b> <b>Crown Condition:</b> The most important external indication of tree health and vigor.
	DF/Pm	Douglas Fir, <i>Pseudotsuga menziesii</i>	<b>#12</b> <b>Trunk:</b> Description of trunk condition or abnormalities if any.
	ExC/ThPE	Excelsa Cedar, <i>Thuja plicata Excelsa</i>	<b>#13</b> <b>Root Collar:</b> The base of the tree where the trunk flares into the roots--deformities or problems are noted here.
	NM/Ap	Norway Maple, <i>Acer platanoides</i>	<b>#14</b> <b>Roots:</b> Root problems are noted here.
	NS/Pa	Norway Spruce, <i>Picea abies</i>	<b>#15</b> <b>Comments:</b> Additional observations about the tree's condition.
	POC/CI	Port Orford Cedar, <i>Chamaecyparis lawsoniana</i>	<b>#16</b> <b>Current Health Rating:</b> A description of general health ranging from dead, dying, poor, fair, good, very good, to excellent.
	RA/Ar	Red Alder, <i>Alnus rubra</i>	<b>#17</b> <b>Recommendation:</b> This is an estimate of whether or not the tree is of sufficient health, vigor, and structure to consider retaining.

1	2	3	4	5	6A	6B	6C	7	8	9	10	11	12	13	14	15	16	17
PROPERTY	TREE LOCATION	TREE #	SPECIES	DBH	SPECIES MULTIPLIER	Table 21.15.07 Credit	TREE CREDIT	DRIP LINE	LCR	SYMMETRY	FOLIAGE	CROWN CONDITION	TRUNK	ROOT COLLAR	ROOTS	COMMENTS	CURRENT HEALTH RATING	RECOMMENDATION
off property south	Near Southwest Property Corner	401	CBS/Pp	10.0"	1.00		0.00	15'								Tag on fence. Canopy overhangs subject property by 0 feet. Roots uplifting asphalt. Base is approximately 16 feet south of south property line fence. Spider might infestation.	Good	Potential to retain with Tree Protection Measures
off property south	Near Southwest Property Corner	402	POC/CI	8.0"	0.75		0.00	6'								Tag on fence. Roots uplifting asphalt. Canopy overhangs subject property by 1 foot.	Good	Potential to retain with Tree Protection Measures

1	2	3	4	5	6A	6B	6C	7	8	9	10	11	12	13	14	15	16	17
PROPERTY	TREE LOCATION	TREE #	SPECIES	DBH	SPECIES MULTIPLIER	Table 21.115.07 Credit	TREE CREDIT	DRIP LINE	LCR	SYMMETRY	FOLIAGE	CROWN CONDITION	TRUNK	ROOT COLLAR	ROOTS	COMMENTS	CURRENT HEALTH RATING	RECOMMEN DATION
off property south	Near Southwe st Property Corner	403	RA/Ar	12.0"	0.75		0.00	15'							-	Tag on fence. Canopy overhangs subject property by 12 feet. Base is approximately 3 feet south of south property line.	Fair	Potential to retain with Tree Protection Measures
off property south	Near Southwe st Property Corner	404	POC/Cl	12.0"	0.75		0.00	5'							-	Tag on fence. Canopy overhangs subject property by 1 foot.	Very good	Potential to retain with Tree Protection Measures
off property south	Near Southwe st Property Corner	405	POC/Cl	12.0"	0.75		0.00	7'							-	Tag on fence. Canopy overhangs subject property by 1 foot. Base is approximately 6 feet south of south property line.	Very good	Potential to retain with Tree Protection Measures
off property south	Near Southwe st Property Corner	406	POC/Cl	12.0"	0.75		0.00	9'							-	Tag on fence. Canopy overhangs subject property by 2.5 feet. Base is approximately 6 feet south of south property line.	Very good	Potential to retain with Tree Protection Measures

1	2	3	4	5	6A	6B	6C	7	8	9	10	11	12	13	14	15	16	17
PROPERTY	TREE LOCATION	TREE #	SPECIES	DBH	SPECIES MULTIPLIER	Table 21.115.07 Credit	TREE CREDIT	DRIP LINE	LCR	SYMMETRY	FOLIAGE	CROWN CONDITION	TRUNK	ROOT COLLAR	ROOTS	COMMENTS	CURRENT HEALTH RATING	RECOMMEN DATION
off property south	Near Southwe st Property Corner	407	NS/Pa	12.0"	1.00		0.00	14'								Tag on fence. Base is 15 feet south of south property line fence. Canopy overhangs subject property by 0 feet.	Very good	Potential to retain with Tree Protection Measures
Subject property	In front of main building	408	DC/Cd	7.5"	1.00	1.25	1.25	12'	98%	Gen. Sym.	Dense	Healthy	Straight	NAD	Restricted	3 foot block retaining wall is 5 feet west of property line.	Very good	Potential to retain with Tree Protection Measures
Subject property	In front of main building	408 A	DC/Cd	5.0"	1.00	0.75	0.75	9'	85%	Gen. Sym.	Dense	Healthy	Straight	NAD	Restricted	Growing in planter bed just south of the building.	Very good	Potential to retain with Tree Protection Measures
Subject property	Buffer	409	BCw/Pt	18.2"	1.20	2.50	3.00	24'							NAD	Compost pile at base.	Good	Potential to retain with Tree Protection Measures
Subject property	Buffer	410	DF/Pm	8.1"	1.00	1.25	1.25	12'	90%								Good	Potential to retain with Tree Protection Measures

1	2	3	4	5	6A	6B	6C	7	8	9	10	11	12	13	14	15	16	17
PROPERTY	TREE LOCATION	TREE #	SPECIES	DBH	SPECIES MULTIPLIER	Table 21.115.07 Credit	TREE CREDIT	DRIP LINE	LCR	SYMMETRY	FOLIAGE	CROWN CONDITION	TRUNK	ROOT COLLAR	ROOTS	COMMENTS	CURRENT HEALTH RATING	RECOMMENDATION
Subject property	Buffer	411	DF/Pm	7.4"	1.00	1.25	1.25	12'	98%						-		Fair	Potential to retain with Tree Protection Measures
Subject property	Buffer	412	Exc/ThPE	7.9"	1.00	1.25	1.25	8'	99%	Gen. Sym.					-		Excellent	Potential to retain with Tree Protection Measures
Subject property	Southeast Property line	413	NM/Ap	6.2"	1.00	0.75	0.75	12'	90%	Gen. Sym.	GBS/GSE	Healthy	Typical	NAD	NAD		Excellent	Potential to retain with Tree Protection Measures
Subject property	Buffer	414	NM/Ap	7.4"	1.00	1.25	1.25	16'	90%	Gen. Sym.	ABS/ASE	Average	Typical	NAD	NAD		Very good	Potential to retain with Tree Protection Measures
Subject property	Buffer	415	Exc/ThPE	6.1"	1.00	0.75	0.75	6'	98%	Gen. Sym.	Dense	Healthy	Straight		-		Very good	Potential to retain with Tree Protection Measures

1	2	3	4	5	6A	6B	6C	7	8	9	10	11	12	13	14	15	16	17
PROPERTY	TREE LOCATION	TREE #	SPECIES	DBH	SPECIES MULTIPLIER	Table 21.115.07 Credit	TREE CREDIT	DRIP LINE	LCR	SYMMETRY	FOLIAGE	CROWN CONDITION	TRUNK	ROOT COLLAR	ROOTS	COMMENTS	CURRENT HEALTH RATING	RECOMMENDATION
Subject property	Buffer	416	DF/Pm	7.4"	1.00	1.25	1.25	12'	97%						-		Very good	Potential to retain with Tree Protection Measures
Subject property	Buffer	417	BCh/Pe	13.8"	0.75	1.75	1.31	23'	90%				Forked at 2 feet			Rot pockets in branch collar wounds.	Fair	Potential to retain with Tree Protection Measures
Subject property	Buffer	418	BCh/Pe	12.2"	0.75	1.75	1.31	16'	90%				Forked at base				Good	Potential to retain with Tree Protection Measures
Subject property	Buffer	419	NM/Ap	6.2"	1.00	0.75	0.75	13'	85%						-		Very good	Potential to retain with Tree Protection Measures
Subject property	Buffer	420	NM/Ap	7.2"	1.00	1.25	1.25	18'	85%						-		Very good	Potential to retain with Tree Protection Measures
Subject property	Buffer	421	Exc/ThPE	7.9"	1.00	1.25	1.25	5'	98%						-		Excellent	Potential to retain with Tree Protection Measures

1	2	3	4	5	6A	6B	6C	7	8	9	10	11	12	13	14	15	16	17
PROPERTY	TREE LOCATION	TREE #	SPECIES	DBH	SPECIES MULTIPLIER	Table 21.115.07 Credit	TREE CREDIT	DRIP LINE	LCR	SYMMETRY	FOLIAGE	CROWN CONDITION	TRUNK	ROOT COLLAR	ROOTS	COMMENTS	CURRENT HEALTH RATING	RECOMMEN DATION
Subject property	Buffer	422	BCw/Pt	15.9"	1.20	2.50	3.00	20'	94%						surface		Very good	Potential to retain with Tree Protection Measures
Subject property	Buffer	423	DF/Pm	6.0"	1.00	0.75	0.75	13'	96%						-		Very good	Potential to retain with Tree Protection Measures
Subject property	Buffer	424	DF/Pm	6.8"	1.00	1.25	1.25	12'	90%						-		Very good	Potential to retain with Tree Protection Measures
Subject property	Buffer	425	NM/Ap	6.4"	1.00	0.75	0.75	14'	85%				Typical	NAD	NAD		Excellent	Potential to retain with Tree Protection Measures
Subject property	Buffer	426	DF/Pm	8.6"	1.00	1.25	1.25	13'	98%	Gen. Sym.	Sparse	Healthy	Straight	NAD	NAD		Very good	Potential to retain with Tree Protection Measures
Subject property	Buffer	427	NM/Ap	8.3"	1.00	1.25	1.25	16'	90%	Gen. Sym.	ABS/ASE	Healthy	Typical	NAD	NAD		Excellent	Potential to retain with Tree Protection Measures
Subject property	Buffer	428	NM/Ap	7.8"	1.00	1.25	1.25	16'	90%	Gen. Sym.	ABS/ASE	Healthy	Typical	NAD	NAD		Very good	Potential to retain with Tree Protection Measures

1	2	3	4	5	6A	6B	6C	7	8	9	10	11	12	13	14	15	16	17
PROPERTY	TREE LOCATION	TREE #	SPECIES	DBH	SPECIES MULTIPLIER	Table 21.115.07 Credit	TREE CREDIT	DRIP LINE	LCR	SYMMETRY	FOLIAGE	CROWN CONDITION	TRUNK	ROOT COLLAR	ROOTS	COMMENTS	CURRENT HEALTH RATING	RECOMMENDATION
Subject property	Buffer	429	DF/Pm	7.7"	1.00	1.25	1.25	14'	98%	Gen. Sym.	Dense	Healthy	Straight	NAD	NAD		Very good	Potential to retain with Tree Protection Measures
Subject property	Buffer	430	DF/Pm	7.4"	1.00	1.25	1.25	16'	98%						-		Very good	Potential to retain with Tree Protection Measures
Subject property	Buffer	431	NM/Ap	8.2"	1.00	1.25	1.25	18'	85%	Gen. Sym.	ABS/ASE	Healthy	Typical	Bowed	NAD		Excellent	Potential to retain with Tree Protection Measures
Subject property	Buffer	432	DF/Pm	8.2"	1.00	1.25	1.25	16'	98%	Gen. Sym.	Dense	Healthy	Typical	NAD	NAD		Excellent	Potential to retain with Tree Protection Measures
Subject property	Buffer	433	Exc/ThPE	6.8"	1.00	1.25	1.25	7'	99%	Gen. Sym.	Dense	Healthy	Straight	NAD	NAD		Excellent	Potential to retain with Tree Protection Measures
Subject property	Buffer	435	DF/Pm	7.5"	1.00	1.25	1.25	16'	95%	Gen. Sym.	Average	Regenerating-Average	Forked at 6.5 feet	NAD	Restricted		Fair	Potential to retain with Tree Protection Measures
		Tag # 434 lost in the field					0.00											--
Subject property	Buffer	436	BCh/Pe	22.2"	0.75	3.25	2.44	28'	90%	Gen. Sym.	ABS/ASE	Healthy	Typical		NAD	Growing on a small mound.	Very good	Potential to retain with Tree Protection Measures

1	2	3	4	5	6A	6B	6C	7	8	9	10	11	12	13	14	15	16	17
PROPERTY	TREE LOCATION	TREE #	SPECIES	DBH	SPECIES MULTIPLIER	Table 21.115.07 Credit	TREE CREDIT	DRIP LINE	LCR	SYMMETRY	FOLIAGE	CROWN CONDITION	TRUNK	ROOT COLLAR	ROOTS	COMMENTS	CURRENT HEALTH RATING	RECOMMEN DATION
Subject property	Buffer	437	BCh/Pe	16.5"	0.75	2.50	1.88	22'	90%	Gen. Sym.	ABS/ASE	Average	Typical	NAD	NAD		Good	Potential to retain with Tree Protection Measures
Subject property	Buffer	438	BCw/Pt	12.6"	1.20	1.75	2.10	22'	85%	Gen. Sym.	ABS/ASE	Average	Typical	NAD	NAD		Very good	Potential to retain with Tree Protection Measures
Subject property	Buffer	439	BCh/Pe	23.1"	0.75	3.25	2.44	28'	85%	Gen. Sym.	Average	Average	Forked at 7 feet with included bark down to base	NAD	NAD		Very good	Potential to retain with Tree Protection Measures
Subject property	Buffer	440	DF/Pm	6.6"	1.00	0.75	0.75	11'	90%	Gen. Sym.	Dense	Healthy	Straight	NAD	NAD		Excellent	Potential to retain with Tree Protection Measures
Subject property	Buffer	441	Exc/ThPE	6.4"	1.00	0.75	0.75	9'	98%	Gen. Sym.	Dense	Healthy	Straight	NAD	NAD		Excellent	Potential to retain with Tree Protection Measures
Subject property	Buffer	442	DF/Pm	7.7"	1.00	1.25	1.25	14'	90%	Gen. Sym.	Dense	Healthy	Straight	NAD	NAD		Very good	Potential to retain with Tree Protection Measures
Subject property	Buffer	443	BCw/Pt	17.3"	1.20	2.50	3.00	20'	96%	Gen. Sym.	ABS/ASE	Average	Forked at 4.5 feet. Typical.	NAD	NAD		Good	Potential to retain with Tree Protection Measures

1	2	3	4	5	6A	6B	6C	7	8	9	10	11	12	13	14	15	16	17
PROPERTY	TREE LOCATION	TREE #	SPECIES	DBH	SPECIES MULTIPLIER	Table 21.115.07 Credit	TREE CREDIT	DRIP LINE	LCR	SYMMETRY	FOLIAGE	CROWN CONDITION	TRUNK	ROOT COLLAR	ROOTS	COMMENTS	CURRENT HEALTH RATING	RECOMMENDATION
Subject property	Buffer	444	BLM/Am	6.7"	1.20	1.25	1.50	14'	96%	Gen. Sym.	Average	Average	Typical	NAD	NAD		Very good	Potential to retain with Tree Protection Measures
Subject property	South of ditch on Sheet 4	445	NM/Ap	7.7"	1.00	1.25	1.25	16'	85%	Gen. Sym.	ABS/ASE	Average	Typical	NAD	Restricted		Very good	Potential to retain with Tree Protection Measures
Subject property	South of ditch on Sheet 5	446	DF/Pm	7.1"	1.00	1.25	1.25	12'	98%	Gen. Sym.	Dense	Healthy	Straight	NAD	Restricted		Very good	Potential to retain with Tree Protection Measures
Subject property	South of ditch on Sheet 6	447	NM/Ap	7.2"	1.00	1.25	1.25	16'	85%	Gen. Sym.	ABS/ASE	Average	Typical	NAD	Restricted		Very good	Potential to retain with Tree Protection Measures
Subject property	South of ditch on Sheet 7	448	Exc/ThPE	7.8"	1.00	1.25	1.25	7'	98%	Gen. Sym.	Dense	Healthy	Typical	NAD	Restricted		Very good	Potential to retain with Tree Protection Measures
Subject property	South of ditch on Sheet 8	449	Exc/ThPE	6.0"	1.00	0.75	0.75	7'	92%	Gen. Sym.	Dense	Healthy	Straight	NAD	Restricted		Very good	Potential to retain with Tree Protection Measures
Subject property	South of ditch on Sheet 9	450	BCw/Pt	7.8"	1.20	1.25	1.50	12'	95%	Min. Asym.	ABS/ASE	Healthy	Forked at base	Partially exposed	Restricted		Good	Potential to retain with Tree Protection Measures

1	2	3	4	5	6A	6B	6C	7	8	9	10	11	12	13	14	15	16	17
PROPERTY	TREE LOCATION	TREE #	SPECIES	DBH	SPECIES MULTIPLIER	Table 21.115.07 Credit	TREE CREDIT	DRIP LINE	LCR	SYMMETRY	FOLIAGE	CROWN CONDITION	TRUNK	ROOT COLLAR	ROOTS	COMMENTS	CURRENT HEALTH RATING	RECOMMENDATION
Subject property	South of ditch on Sheet 10	451	NM/Ap	6.8"	1.00	1.25	1.25	13'	85%	Gen. Sym.	ABS/ASE	Healthy	Typical	NAD	Restricted		Very good	Potential to retain with Tree Protection Measures
Subject property	Buffer	452	BCh/Pe	13.7"	0.75	1.75	1.31	18'	70%	Gen. Sym.	GBS/GSE	Healthy	Typical	NAD	Restricted	Open wound on the west side from 1-3 feet with decay. Near the water.	Fair	Potential to retain with Tree Protection Measures
Subject property	Buffer	453	BCh/Pe	13.0"	0.75	1.75	1.31	25'	85%	Gen. Sym.	GBS/GSE	Healthy	Typical	NAD	Restricted	Near the water.	Very good	Potential to retain with Tree Protection Measures
Subject property	Buffer	454	BCh/Pe	16.5"	0.75	2.50	1.88	28'	90%	Gen. Sym.	GBS/GSE	Healthy	Forked at base	partial failure	partial failure		Very good	Potential to retain with Tree Protection Measures
Subject property	Buffer	455	BCw/Pt	16.3"	1.20	2.50	3.00	18'	85%	Maj. Asym.	ABS/ASE	Average	Typical		-		Fair	Potential to retain with Tree Protection Measures
Subject property	Buffer	456	BCw/Pt	36.5"	1.20	9.00	10.80	34'	90%	Gen. Sym.	GBS/GSE	Healthy	Typical		-	Dead branches in canopy. Open wound on the northeast side from base up to 7 feet.	Fair	Potential to retain with Tree Protection Measures
Subject property	Buffer	457	BCh/Pe	9.3"	0.75	1.25	0.94	21'	75%	Min. Asym.	ABS/ASE	Average	Typical	Partially exposed	Restricted	Base is approximately 10 feet west of river.	Fair	Potential to retain with Tree Protection Measures

1	2	3	4	5	6A	6B	6C	7	8	9	10	11	12	13	14	15	16	17
PROPERTY	TREE LOCATION	TREE #	SPECIES	DBH	SPECIES MULTIPLIER	Table 21.115.07 Credit	TREE CREDIT	DRIP LINE	LCR	SYMMETRY	FOLIAGE	CROWN CONDITION	TRUNK	ROOT COLLAR	ROOTS	COMMENTS	CURRENT HEALTH RATING	RECOMMEN DATION
Subject property	Buffer	458	BCw/Pt	14.4"	1.20	1.75	2.10	18'	85%	Maj. Asym.	ABS/ASE	Average	Typical	NAD	NAD		Fair	Potential to retain with Tree Protection Measures
Subject property	Buffer	459	BCw/Pt	13.1"	1.20	1.75	2.10	25'	55%	Maj. Asym.	ABS/ASE	Average	Typical	NAD	Restricted		Fair	Potential to retain with Tree Protection Measures
Subject property	Buffer	460	BCw/Pt	22.2"	1.20	3.25	3.90	26'	90%	Min. Asym.	GBS/GSE	Healthy	Typical	NAD	NAD	Trunk diameters are: 11.8", 12.2" 5.1" & 13.1" = single trunk of 22.2 inches.	Very good	Potential to retain with Tree Protection Measures
Subject property	Buffer	461	BCw/Pt	5.3"	1.20	0.75	0.90	9'	65%	Gen. Sym.	Average	Average	Typical	NAD	NAD		Fair	Potential to retain with Tree Protection Measures
Subject property	Buffer	462	BCw/Pt	7.9"	1.20	1.25	1.50	9'	65%	Maj. Asym.	ABS/ASE	Average	Typical	NAD	NAD		Excellent	Potential to retain with Tree Protection Measures
Subject property	Buffer	463	BCw/Pt	14.6"	1.20	1.75	2.10	23'	65%	Maj. Asym.	Average	Average	Typical	NAD	NAD	Trunk diameters are: 11.3" & 9.3" = single trunk of 14.6 inches.	Fair	Potential to retain with Tree Protection Measures
Subject property	Buffer	464	BCw/Pt	8.2"	1.20	1.25	1.50	12'	70%	Maj. Asym.	ABS/ASE	Average	Typical	NAD	NAD		Fair	Potential to retain with Tree Protection Measures

1	2	3	4	5	6A	6B	6C	7	8	9	10	11	12	13	14	15	16	17
PROPERTY	TREE LOCATION	TREE #	SPECIES	DBH	SPECIES MULTIPLIER	Table 21.115.07 Credit	TREE CREDIT	DRIP LINE	LCR	SYMMETRY	FOLIAGE	CROWN CONDITION	TRUNK	ROOT COLLAR	ROOTS	COMMENTS	CURRENT HEALTH RATING	RECOMMEN DATION
Subject property	Buffer	465	BCw/Pt	10.6"	1.20	1.75	2.10	16'	65%	Maj. Asym.	ABS/ASE	Average	Typical	NAD	NAD		Fair	Potential to retain with Tree Protection Measures
Subject property	Buffer	466	BCw/Pt	9.2"	1.20	1.25	1.50	14'	70%	Maj. Asym.	ABS/ASE	Average	Typical	NAD	NAD		Fair	Potential to retain with Tree Protection Measures
Subject property	Buffer	467	BCw/Pt	7.3"	1.20	1.25	1.50	14'	65%	Maj. Asym.	ABS/ASE	Average	Typical	NAD	NAD		Fair	Potential to retain with Tree Protection Measures
Subject property	Buffer	468	BCw/Pt	6.4"	1.20	0.75	0.90	12'	70%	Maj. Asym.	ABS/ASE	Average	Typical	NAD	NAD		Fair	Potential to retain with Tree Protection Measures
Subject property	Buffer	469	BCw/Pt	17.5"	1.20	2.50	3.00	29'	95%	Gen. Sym.	GBS/GSE	Healthy	Typical	NAD	NAD		Very good	Potential to retain with Tree Protection Measures
Subject property	Buffer	470	BCh/Pe	8.6"	0.75	1.25	0.94	13'	70%	Gen. Sym.	ABS/ASE	Average	Typical	NAD	NAD	Above river bank.	Fair	Potential to retain with Tree Protection Measures
Subject property	Buffer	471	DF/Pm	8.0"	1.00	1.25	1.25	12'	95%	Min. Asym.	Average	Average	Straight	NAD	NAD		Good	Potential to retain with Tree Protection Measures

1	2	3	4	5	6A	6B	6C	7	8	9	10	11	12	13	14	15	16	17
PROPERTY	TREE LOCATION	TREE #	SPECIES	DBH	SPECIES MULTIPLIER	Table 21.115.07 Credit	TREE CREDIT	DRIP LINE	LCR	SYMMETRY	FOLIAGE	CROWN CONDITION	TRUNK	ROOT COLLAR	ROOTS	COMMENTS	CURRENT HEALTH RATING	RECOMMENDATION
Subject property	Buffer	472	Exc/ThPE	6.8"	1.00	1.25	1.25	6'	99%	Min. Asym.	Dense	Broken Out	Straight	NAD	NAD		Good	Potential to retain with Tree Protection Measures
Subject property	Buffer	473	NM/Ap	6.6	1.00	0.75	0.75	12	85	Gen. Sym.	ABS/ASE	Healthy	Typical	NAD	NAD		Good	Potential to retain with Tree Protection Measures

**106.75**      **Tree Credits for trees greater than 6 inches.**

## ATTACHMENT 3 - GLOSSARY

### Terms Used in This Report, on the Tree Condition / Inventory Spreadsheet, and Their Significance

In an effort to clearly present the information for each tree in a manner that facilitates the reader's ability to understand the conclusions I have drawn for each tree, I have collected the information in a spreadsheet format. This spreadsheet was developed by Gilles Consulting based upon the *Tree Risk Assessment in Urban Areas and the Urban/Rural Interface* course manual and the *Tree Risk Assessment Form*, both sponsored by the Pacific Northwest Chapter of the International Society of Arboriculture, and the *Hazard Tree Evaluation Form* from the book, *The Evaluation of Hazard Trees in Urban Areas*, by Matheny and Clarke. The descriptions were left brief on the spreadsheet in an effort to include as much pertinent information as possible, to make the report manageable, and to avoid boring the reader with infinite levels of detail. However, a review of these terms and descriptions will allow the reader to rapidly move through the report and understand the information.

- 1) **PROPERTY**—Whether the tree is on or off the Subject Property, or a Right-of-Way tree.
- 2) **TREE LOCATION**—Relative placement of the tree.
- 3) **TREE #**—the unique tag number of each tree.
- 4) **SPECIES**—this describes the species of each tree with both most readily accepted common name and the officially accepted scientific name.
- 5) **DBH**—Diameter Breast Height. This is the standard measurement of trees taken at 4.5 feet above the average ground level of the tree base.
  - i) Occasionally it is not practical to measure a tree at 4.5 feet above the ground. The most representative area of the trunk near 4.5 feet is then measured and noted on the spreadsheet. For instance, a tree that forks at 4.5 feet can have an unusually large swelling at that point. The measurement is taken below the swelling and noted, e.g. '28.4" at 36"'.
    - (1) Every effort is made to distinguish between a single tree with multiple stems and several trees growing close together at the bases.
  - ii) Trees with multiple stems are listed as a "clump of x," with x being the number of trunks in the clump. Measurements may be given as an average of all the trunks, or individual measurements for each trunk may be listed.
- 6) **DRIP LINE**— the radius, the distance from the trunk to the furthest branch tips.
- 7) **% LCR**—Percentage of Live Crown Ratio. The relative proportion of green crown to overall tree height. This is an important indication of a tree's health. If a tree has a high percentage of Live Crown Ratio, it is likely producing enough photosynthetic activity to support the tree. If a tree has less than 30% to 40% LCR, it can create a shortage of needed energy and can indicate poor health and vigor.

- 8) **SYMMETRY**—is the description of the form of the canopy, i.e., the balance or overall shape of the canopy and crown. This is the place I list any major defects in the canopy shape, e.g. does the tree have all its foliage on one side or in one unusual area? Symmetry can be important if there are additional defects in the tree such as rot pockets, cracks, loose roots, weak crown, etc. Symmetry is generally categorized as Generally Symmetrical, Minor Asymmetry or Major Asymmetry:
- i) Gen. Sym.—Generally Symmetrical. The canopy/foliage is generally even on all sides with spacing of scaffold branches typical for the species, both vertically and radially.
  - ii) Min. Asym.—Minor Asymmetry. The canopy/foliage has a slightly irregular shape with more weight on one side, but appears to be no problem for the tree.
  - iii) Maj. Asym.—Major Asymmetry. The canopy/foliage has a highly irregular shape for the species with the majority of the weight on one side of the tree. This can have a significant impact on the tree's stability, health and hazard potential—especially if other defects are noted such as cracks, rot, or root defects.
- 9) **FOLIAGE/BRANCH**—describes the foliage of the tree in relation to a perfect specimen of that particular species. First the branch growth and foliage density is described, and then any signs or symptoms of stress and/or disease are noted. The condition of the foliage, or the branches and buds for deciduous trees in the dormant season, are important indications of a tree's health and vigor.
- i) For Deciduous trees in the dormant season:
    - (1) The structure of the deciduous tree is visible.
    - (2) The quantity and quality of buds indicates health, and is described as good bud set, average bud set, or poor bud set. These are abbreviated in the spreadsheet as: gbs, abs, or pbs.
    - (3) The amount of annual shoot elongation is visible and is another major indication of tree health and vigor. This is described as:
      - a) Excellent, Good, Average, or Short Shoot Elongation. These are abbreviated in the spreadsheet as ESE, GSE, ASE, or SSE.
  - ii) For evergreen trees year round and deciduous trees in leaf, the color and density of the foliage indicates if the tree is healthy or stressed, or if an insect infestation, a bacterial, fungal, or viral infection is present. Foliage is categorized on a scale from:
    - (1) Dense—extremely thick foliage, an indication of healthy vigorous growth,
    - (2) Good—thick foliage, thicker than average for the species,
    - (3) Normal/Average—thick foliage, average for the species, an indication of healthy growth,
    - (4) Thin or Thinning—needles and leaves becoming less dense so that sunlight readily passes through; an indication that the tree is under serious stress that could impact the long-term survivability and safety of the tree,

- (5) Sparse—few leaves or needles on the twigs, an indication that the tree is under extreme stress and could indicate the future death of the tree,
  - (6) Necrosis—the presence of dead twigs and branchlets. This is another significant indication of tree health. A few dead twigs and branches are reasonably typical in most trees of size. However, if there are dead twigs and branchlets all over a certain portion of the tree, or all over the tree, these are indications of stress or attack that can have an impact on the tree's long-term health.
  - (7) Hangers—a term to describe a large branch or limb that has broken off but is still hanging up in the tree. These can be particularly dangerous in adverse weather conditions.
- 10) **CROWN CONDITION**—the crown is uppermost portion of the tree, generally considered the top 10 to 20% of the canopy or that part of the canopy above the main trunk in deciduous trees and above the secondary bark in evergreen trees.
- i) The condition of the tree's crown is a reflection of the overall health and vigor of the entire tree. The crown is one of the first places a tree will demonstrate stress and pathogenic attack such as root rot.
  - ii) If the **Crown Condition** is healthy and strong, this is a good sign. If the crown condition is weak, broken out, or shows other signs of decline, it is an indication that the tree is under stress. It is such an important indication of health and vigor that this is the first place a trained forester or arborist looks to begin the evaluation of a tree. Current research reveals that, by the time trees with root rot show significant signs of decline in the crown, fully 50% or more of the roots have already rotted away. **Crown Condition** can be described as:
    - (1) Healthy Crown—exceptional growth for the species.
    - (2) Average Crown—typical for the species.
    - (3) Weak Crown—thin spindly growth with thin or sparse needles.
    - (4) Flagging Crown—describes a tree crown that is weak and unable to grow straight up.
    - (5) Dying Crown—describes obvious decline that is nearing death.
    - (6) Dead Crown—the crown has died due to pathological or physical injury. The tree is considered to have significant stress and/or weakness if the crown is dead.
    - (7) Broken out—a formerly weak crown condition that has been broken off by adverse weather conditions or other mechanical means.
    - (8) Regenerated or Regenerating—formerly broken out crowns that are now growing back. Regenerating crowns may appear healthy, average, or weak and indicate current health of the tree.
    - (9) Suppressed—a term used to describe poor condition of an entire tree or just the crown. Suppressed crowns are those that are entirely below the general level of the canopy of surrounding trees which receive no direct sunlight. They are generally in poor health and vigor. Suppressed trees are generally trees that are smaller and growing in the

shade of larger trees around them. They generally have thin or sparse needles, weak or missing crowns, and are prone to insect attack as well as bacterial and fungal infections.

- 11) **TRUNK**—this is the area to note any defects that can have an impact on the tree’s stability or hazard potential. Typical things noted are:
- i) **FORKED**—bifurcation of branches or trunks that often occur at a narrow angle.
  - ii) **INCLUDED BARK**—a pattern of development at branch or trunk junctions where bark is turned inward rather than pushed out. This can be a serious structural defect in a tree that can and often does lead to failure of one or more of the branches or trunks, especially during severe, adverse weather conditions.
  - iii) **EPICORMIC GROWTH**—this is generally seen as dense thick growth near the trunk of a tree. Although this looks like a healthy condition, it is, in fact the opposite. Trees with Epicormic Growth have used their reserve stores of energy in a last ditch effort to produce enough additional photosynthetic surface area to produce more sugars, starches and carbohydrates to support the continued growth of the tree. Generally speaking, when conifers in the Pacific Northwest exhibit heavy amounts of Epicormic Growth, they are not producing enough food to support their current mass and are already in serious decline.
  - iv) **INTERNAL STRUCTURAL WEAKNESS**—a physical characteristic of the tree trunk, such as a **kink, crack, rot pocket, or rot column** that predisposes the tree trunk to failure at the point of greatest weakness.
  - v) **BOWED**—a gradual curve of the trunk. This can indicate an Internal Structural Weakness or an overall weak tree. It can also indicate slow movement of soils or historic damage of the tree that has been corrected by the curved growth.
  - vi) **KINKED**—a sharp angle in the tree trunk that indicates that the normal growth pattern is disrupted. Generally this means that the internal fibers and annual rings are weaker than straight trunks and prone to failure, especially in adverse weather conditions.
  - vii) **GROUND FLOWER**—an area of deformed bark near the base of a tree trunk that indicates long-term root rot.
- 12) **ROOT COLLAR**—this is the area where the trunk enters the soil and the buttress roots flare out away from the trunk into the soil. It is here that signs of rot, decay, insect infestation, or fungal or bacterial infection are noted. **NAD** stands for **No Apparent Defects**.
- 13) **ROOTS**—any abnormalities such as girdling roots, roots that wrap around the tree itself that strangle the cambium layer and kill the tree, are noted here.
- 14) **COMMENTS**—this is the area to note any additional information that would not fit in the previous boxes or attributes about the tree that have bearing on the health and structure of the tree.

- 15) **COMMENTS**—this is the area to note any additional information that would not fit in the previous boxes or attributes about the tree that have bearing on the health and structure of the tree.
- 16) **SIGNIFICANCE**—a “significant” tree is at least 6” in diameter measured at 4.5’ above the average ground level.
- 17) **CURRENT HEALTH RATING**— a description of general health ranging from dead, dying, poor, senescent, suppressed, fair, good, very good, to excellent.
- 18) **RECOMMENDATION**— this is an estimate of whether or not the tree is of sufficient health, vigor, and structure that it is worth retaining. Specific recommendations for each tree are included in this column. They may include anything from pruning dead wood, mulching, aerating, injecting tree-based fertilizer into the root system, shortening into a habitat tree or wildlife snag, or to completely removing the tree.
- i) **Monitor:** “Monitor” is a specific recommendation that the tree be re-evaluated on a routine basis to determine if there are any significant changes in health or structural stability. “Monitor annually” (or bi-annually, tri-annually, etc.)” means the tree should be looked at once every year (or every 2 or 3 years, etc.) This yearly monitoring can be a quick look at the trees to see if there are any significant changes. Significant changes such as storm damage, loss of crown, partial failure of one or more roots, etc. require that a full evaluation be done of the tree at that time.
  - ii) **Potential to retain with tree protection measures:** means that the tree appears to have the internal resources, the health and vigor, structural stability, and the wind firmness to be able to withstand the stresses of construction if development requirements and construction requirements allow.
  - iii) **Habitat or Remove:** means that the tree has a high potential to fail and cause either personal injury or property damage—in other words the tree has been declared a hazard tree and should be dealt with prior to the next large storm. If it is at all possible the recommendation is to leave some of the trunk standing for wildlife habitat and some of the trunk on the ground as a nurse log. The height of the standing habitat tree depends upon the size of the tree, the condition of the tree, and the distance to a probable target. It should be short enough so that when it does fail years in the future it will not cause personal injury or property damage. Nurse logs can be laid horizontally across the slope to aid with erosion control and to provide microenvironments for new plantings. The nurse logs meaning to be steak to prevent their movement and potential harm to people. If for some reason this is not possible that should be removed for safety.

**NOTE: TREES WITH THE SAME DESCRIPTION AND DIFFERENT RATINGS:**  
Two trees may have the same descriptions in the matrix boxes, one may be marked “Significant,” while another may be marked “Non-Significant.” The difference is in the degree of the description, i.e., “early necrosis” versus “advanced necrosis” for instance.

Another example is “center rot” or ‘base rot”. In a Western Red Cedar tree, the presence of low or even moderate rot is not significant and does not diminish the strength of the tree. However, low levels of rot in the base of a Douglas Fir tree, in an area known to have virulent pathogens present, is highly significant and predisposes that tree to windthrow.

#### ATTACHMENT 4 - REFERENCES

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