

# CASCARA TREE CONSULTING

## ARBORIST REPORT

TO: Mr. Jintao (Addison) Cui

REFERENCE: Arborist Report RE: SUB22-009 (Cui Preliminary Short Subdivision)

SITE ADDRESS: 4833 90<sup>th</sup> Ave SE, Mercer Island, WA

DATE: 8/9/2023

PREPARED BY: Katie Hogan, ISA Certified Arborist PN-8078A  
ISA Tree Risk Assessment Qualified

I conducted an inventory and assessment of 56 trees measuring 10-inches Diameter at Breast Height (DBH) or greater at the above-addressed site; 23 of which meet the Exceptional size threshold. Of the 56 trees assessed, 22 were in good to fair health and structural condition and considered viable; 12 of which are viable Exceptional trees.

The project proposes retention of 10 out of the 22 viable trees on the site for a total retention of 45-percent meeting the requirements of MICC 19.10.060(a)(2)(a). Of the 10 trees proposed for retention, 5 are Exceptional. See Tables 1 and 2 below for a summary of tree retention.

Table 1. Summary Tree Table

Summary Tree Table	
Total Trees	56
Total Viable Trees	22
Total Not Viable Trees	34
Total Viable Retain	10
Total Viable Remove	12
# Trees Required to Retain per MICC 19.10.060 (30%)	7
Total Retention Percentage	45%

Table 2. Summary Exceptional Tree Table

Summary Exceptional Tree Table	
Total Exceptional Trees by Size	23
Total Viable Exceptional Trees	12
Total Viable Exceptional Retain	5
Total Viable Exceptional Remove	7

## Tree Viability & Retention

I performed a Level 2 Visual Tree Assessment (VTA) of the 56 trees on the subject property. Each tree was visually inspected from the ground to identify health and structural condition. Each tree was then assigned a condition rating based on the criteria<sup>1</sup> listed in Table 3 below. Based on the condition ratings assigned, each tree was then assigned a viability rating as shown in Table 4 below.

Of the 56 total trees, 34 were found to be **not viable** due to having poor health and/or structure. Throughout the site, many trees exhibited advanced canopy decline due to insufficient access to sunlight and heavy invasive ivy (*Hedera* spp.) coverage. There were several trees that were nearly 100-percent covered in ivy vines with only small amounts of living foliage. Additionally, there was a high presence of the decay-causing fungus *Kretzschmaria deusta* on the trunks of mature bigleaf maple (*Acer macrophyllum*). This fungus, commonly referred to as Brittle Cinder Fungus, decays the flexible cellulose in trees leaving the more brittle lignin behind which can result in tree breakage or failure.

Fourteen pacific madrone (*Arbutus menziesii*) trees are present on the site; six of which were in poor health and/or structural condition. Canopy decline was evident on many of the madrone trees which is a common symptom throughout the Seattle Region. I also observed cankers on the trunks of most of the madrone trees, which is likely due to the fungus *Neofusicoccum arbuti*.

Table 3. Health & Structural Condition Ratings

CONDITION RATING	TREE HEALTH <i>Consider crown indicators — including vigor, density, leaf size, quality, and stem shoot extensions.</i>	TREE STRUCTURE <i>Consider root condition/formation, trunk condition, and branch assembly and arrangement.</i>
<b>Excellent</b>	Perfect specimen with excellent form and vigor, along with a well-balanced crown. Trunk is sound and solid. No apparent pest problems. Normal to exceeding shoot length on new growth. Normal leaf size and color. Exceptional life expectancy for the species.	Root plate undisturbed and clear of any obstructions. Trunk flare has normal development. No visible trunk defects or cavities. Branch spacing/structure and attachments are free of any defects.
<b>Good</b>	Imperfect canopy density in 10% or less of the tree. Lacks natural symmetry. Less than half the normal growth rate and minor deficiency in leaf development. Few pest issues or damage, and controllable if present. Normal branch and stem development with healthy growth. Typical life expectancy for the species.	Root plate appears normal, with only minor damage. Possible signs of root dysfunction around trunk flare. Minor trunk defects from previous injury, with good closure and less than 25% of bark section missing. Good branch habit; minor dieback with some signs of previous pruning. Codominant stem formation may be present, requiring minor corrections.
<b>Fair</b>	Crown decline and dieback up to 30% of the canopy. Poor overall symmetry. Leaf size smaller and color somewhat chlorotic. Shoot extensions indicate some stunting and stressed growing conditions. Obvious signs of pest problems contribute to a lesser condition. Some decay areas found in the main stem and branches. Below-average life expectancy for the species.	Root plate reveals previous damage or disturbance. Dysfunctional roots may be visible around the main stem. Evidence of trunk damage or cavities, with decay or defects present and less than 30% of bark sections missing on trunk. Co-dominant stems are present. Branching habit and attachments indicate poor pruning or damage, which requires moderate corrections.
<b>Poor</b>	Lacking a full crown, with more than 50% decline and dieback that especially affects larger branches. Stunting obvious, with little evidence of growth on smaller stems. Leaf size and color reveals overall stress in the plant. Insect or disease infestation may be severe. Extensive decay or hollow characteristics. Low life expectancy for the species.	Root plate disturbance and defects indicate major damage, with girdling roots around the trunk flare. Trunk reveals more than 50% of bark section missing. Branch structure has poor attachments, with several structurally important branches dead or broken. Canopy reveals signs of damage or previous topping or lion-tailing, with major corrective action required.

<sup>1</sup> Purcell, L. and Ling, J. (2019) *Tree appraisal and the value of trees - extension - purdue extension, Purdue Extension Forestry and Natural Resources*. Available at: <https://www.extension.purdue.edu/extmedia/FNR/FNR-473-W.pdf> (Accessed: 03 August 2023).

Table 4. Tree Viability Ratings

TREE STRUCTURE	TREE HEALTH			
	Excellent	Good	Fair	Poor
Excellent	Viable	Viable	Viable	Not Viable
Good	Viable	Viable	Viable	Not Viable
Fair	Viable	Viable	Not Viable	Not Viable
Poor	Not Viable	Not Viable	Not Viable	Not Viable

**Exceptional Tree Viability**

Twenty-three trees that meet or exceed the Exceptional tree criteria per City of Mercer Island exist on the site. Species include Douglas-fir (*Pseudotsuga menziesii*), bigleaf maple, pacific madrone, western redcedar (*Thuja plicata*), and native willow (*Salix* sp.).

Twelve of the Exceptional trees were determined to be **viable** and in good to fair health and/or structural condition. The additional 11 trees were in varying stages of decline and are unlikely to be good long-term trees adjacent to new development and were rated as **not viable**. See Table 5 below with detailed information on each exceptional tree and justification for removal per MICC 19.10.060(a)(3).

Table 5. Exceptional Tree Info & Justification for Removal per MICC

Tree ID	Common Name	DSH (in)	Health/Structure	Viable	Proposed Action	Field Notes	MICC 19.10.060(a)(3) Justification
4	Douglas-fir	41.5	Good/Fair	Yes	Retain	Dominant tree, trunk sweep to north	N/A – retained
5	Madrone	14.6	Good/Good	Yes	Retain	Minor dieback, stable condition	N/A – retained
11	Madrone	11.9	Poor/Poor	No	Remove	Top broken, small canopy, decay present	<b>MICC 19.10.060.a.3.a:</b> Unavoidable hazardous situation
12	Madrone	18.9	Poor/Fair	No	Remove	Dying	<b>MICC 19.10.060.a.3.a:</b> Unavoidable hazardous situation
18	Madrone	20.1	Poor/Fair	No	Remove	Tree completely suppressed, large 5” ivy vines on trunk with minimal live canopy remaining	<b>MICC 19.10.060.a.3.a:</b> Unavoidable hazardous situation
26	Douglas-fir	38.6	Good/Good	Yes	Remove	Dominant tree with extensive ivy on trunk, nearly 90% live crown ratio	<b>MICC 19.10.060.a.3.b and c:</b> Limits gross floor area to less than 85% of the maximum gross floor area allowed under chapter 19.02 MICC  Prevents creation of a residential lot through a subdivision or short subdivision that is otherwise allowed by this title
27	Bigleaf Maple	32.9	Fair/Poor	No	Remove	Very narrow codominant union at base with large seam of included bark, <i>K. deusta</i> at union, more than 50% canopy dieback and evident decay present in central columns	<b>MICC 19.10.060.a.3.a:</b> Unavoidable hazardous situation

Table 5 continued

Tree ID	Common Name	DSH (in)	Health/Structure	Viable	Proposed Action	Field Notes	MICC 19.10.060(a)(3) Justification
28	Western Redcedar	39.1	Fair/Good	Yes	Remove	Canopy slightly thin and chlorotic	<b>MICC 19.10.060.a.3.b and c:</b> Limits gross floor area to less than 85% of the maximum gross floor area allowed under chapter 19.02 MICC  Prevents creation of a residential lot through a subdivision or short subdivision that is otherwise allowed by this title
29	Madrone	10.4	Poor/Fair	No	Remove	In state of decline, cankers	<b>MICC 19.10.060.a.3.a:</b> Unavoidable hazardous situation
33	Madrone	28.1	Good/Good	Yes	Remove	Leans west, dominant tree	<b>MICC 19.10.060.a.3.b and c:</b> Limits gross floor area to less than 85% of the maximum gross floor area allowed under chapter 19.02 MICC  Prevents creation of a residential lot through a subdivision or short subdivision that is otherwise allowed by this title
35	Bigleaf Maple	31.6	Fair/Poor	No	Remove	Growing on nurse stump, <i>K. deusta</i>	<b>MICC 19.10.060.a.3.a:</b> Unavoidable hazardous situation
40	Madrone	7.5	Fair/Fair	Yes	Retain	Strong lean over Island Crest Way, lightly topped, cankers on trunk	N/A - retained
41	Madrone	10.9	Fair/Fair	Yes	Retain	Previously topped for utilities, overall in stable condition, minimal cankers on trunk	N/A - retained
43	Madrone	9.6	Fair/Fair	Yes	Retain	Central trunk dying, cankers on trunk beginning to form, previously topped, not good long-term tree but retention possible	N/A - retained
47	Madrone	10.3	Poor/Poor	No	Remove	Trunk cankers, very poor form from previous topping	<b>MICC 19.10.060.a.3.a:</b> Unavoidable hazardous situation
54	Madrone	13.9	Good/Good	Yes	Remove	Overall healthy canopy	<b>MICC 19.10.060.a.3.c:</b> Prevents creation of a residential lot through a subdivision or short subdivision that is otherwise allowed by this title
55	Bigleaf Maple	32.0	Good/Fair	Yes	Remove	Ivy on trunk, dominant tree with three narrowly attached trunks at about 20 feet	<b>MICC 19.10.060.a.3.b and c:</b> Limits gross floor area to less than 85% of the maximum gross floor area allowed under chapter 19.02 MICC  Prevents creation of a residential lot through a subdivision or short subdivision that is otherwise allowed by this title
56	Bigleaf Maple	36.9	Poor/Fair	No	Remove	Substantial canopy dieback, top is dead, over 50% dead overall	<b>MICC 19.10.060.a.3.a:</b> Unavoidable hazardous situation
58	Willow (native)	9.5	Poor/Poor	No	Remove	Ivy vines, broken top	<b>MICC 19.10.060.a.3.a:</b> Unavoidable hazardous situation
59	Willow (native)	9.2	Poor/Poor	No	Remove	Ivy vines, swept base, leans over utilities	<b>MICC 19.10.060.a.3.a:</b> Unavoidable hazardous situation



Table 5 continued

Tree ID	Common Name	DSH (in)	Health/Structure	Viable	Proposed Action	Field Notes	MICC 19.10.060(a)(3) Justification
63	Madrone	25.2	Good/Good	Yes	Remove	Dominant tree with typically issues of mature madrone trees	<b>MICC 19.10.060.a.3.b and c:</b> Limits gross floor area to less than 85% of the maximum gross floor area allowed under chapter 19.02 MICC  Prevents creation of a residential lot through a subdivision or short subdivision that is otherwise allowed by this title
64	Madrone	8.5	Poor/Poor	No	Remove	Dying, 30% branch dieback	<b>MICC 19.10.060.a.3.a:</b> Unavoidable hazardous situation
68	Madrone	18.1	Fair/Good	Yes	Remove	Growing with trunk of a tree #67, touching and wrapping around trunk of #68, some dieback observed	<b>MICC 19.10.060.a.3.b and c:</b> Limits gross floor area to less than 85% of the maximum gross floor area allowed under chapter 19.02 MICC  Prevents creation of a residential lot through a subdivision or short subdivision that is otherwise allowed by this title

**Viable Exceptional Tree Impact & Removal Assessment**

Tree #s 26, 28, 33, 54, 55, 63, 68 are viable Exceptional trees that are proposed for removal. As part of this project, an analysis was conducted to determine whether adjustments to site plans could be made to preserve these trees. Detailed explanations are provided below.

Tree #26 – is located between proposed Lots 3 and 4. This tree is located in the centerline of the site where an access road and stormwater detention tank is proposed. Alternative options were explored, such as clustering the lots and reducing setbacks. However, due to the large size of this tree, even with these adjustments tree protection would not be adequate. While this species of tree (Douglas-fir) has a moderate to high tolerance to development impacts<sup>2</sup>, a minimum Tree Protection Zone (TPZ) of 20 to 25 feet, or 6 to 8 times the trunk diameter, is required to safely preserve a tree of this size.<sup>3</sup> Due to this, there was no feasible alternate location for the site access and stormwater detention tank and pipe that would support retention.

Tree #28 – is a dominant western redcedar tree located between proposed Lots 1 and 2. Impacts to this tree include the hammerhead turnaround and storm drainpipe. This species of tree has a relatively low tolerance to construction impacts and is particularly affected by changes to soil hydrology. I observed early symptoms of canopy stress, as is more common throughout the region for this species of tree, and even if the stormwater pipe could be realigned it is unlikely to survive impacts. While it may be feasible to shift the footprint of Lot 1 further north and reduce the setback, impacts from Lot 2 construction would be substantial and there is no alternative location for this building footprint that would not require removal of additional trees.

<sup>2</sup> Matheny, N. and Clark, J.R. (2000) *Trees and development: A technical guide to preservation of trees during land development*. Champaign, IL: International Society of Arboriculture.

<sup>3</sup> Fite, K. and Smiley, E.T. (2016) *Managing trees during construction*. 2nd edn. Atlanta, GA: International Society of Arboriculture.

Tree #33 – is a pacific madrone tree located in the northeast corner of the proposed building footprint for Lot 4. Impacts to this tree include the building pad for Lot 4, as well as impacts from construction of the access road, stormwater detention tank and water and sewer lines. Water and sewer were relocated to this area to avoid impacts along the northern property line which allows retention of Tree #s 3, 4, and 5. Shifting the footprint on Lot 4 to the west and reducing the setback would not provide this tree with adequate space for protection.

Tree #54 – this tree is a smaller madrone tree (14”) that is located just south of the Lot 2 building approximately 5 feet from the proposed building footprint. No alternate locations for the home on Lot 2 are feasible due to the stormwater infrastructure and access turnaround requirements to the north.

Tree #55 – tree #55 is located within proposed Lot 4 and is currently about 3 feet from the proposed building footprint. This is a dominant bigleaf maple tree with multiple codominant trunk attachments about 20 feet up the trunk. For this size of tree, a minimum TPZ of about 20-feet is recommended (8 times the trunk diameter). If the proposed house was shifted to the west, the greatest TPZ attainable is approximately 10 feet, not including over-excavation for the home.

Tree #63 – this tree is located at the southeast corner of proposed Lot 1. Impacts include construction of the footprint for Lot 1, construction of the access road and hammerhead, impacts from stormwater infrastructure and site grading. Pacific madrones have a poor tolerance to construction damages<sup>4</sup> and would require a minimum TPZ of 20 to 26 feet (10 to 12 times the trunk diameter) to be successfully retained.<sup>5</sup> Due to the required improvements for access and utilities, there are no alternate layouts that would achieve this protection area.

Tree #68 – this tree is located along the eastern edge of the proposed building footprint for Lot 1. The tree is wrapping around the trunk of Tree #67, which is a declining maple tree, and would be challenging to safely retain with the removal of the maple tree. Additionally, the house footprint for Lot 1 cannot feasibly shift west to accommodate this tree without impacting the slope along Island Crest Way.

### **Tree Grove Analysis**

The City of Mercer Island defines a Tree Grove as a group of eight or more trees each ten inches or more in diameter that form a continuous canopy. Trees that are part of a grove shall also be considered exceptional trees, unless they also meet the definition of a hazardous tree.

Due to the high number of declining and hazardous trees on the site, there are no intact tree groves that meet this definition.

A grove analysis was conducted of four areas on the site that consist of multiple viable trees with overlapping canopies.

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<sup>4</sup> Matheny, N. and Clark, J.R. (2000) *Trees and development: A technical guide to preservation of trees during land development*. Champaign, IL: International Society of Arboriculture.

<sup>5</sup> Fite, K. and Smiley, E.T. (2016) *Managing trees during construction*. 2nd edn. Atlanta, GA: International Society of Arboriculture.

**Analysis #1:** Southwest corner of site. Viable tree #s 40, 41, 43, 49, 50, 52.

**Conclusion:** While this area has a dense concentration of trees, there are only six viable trees with overlapping canopies (see Figure 1).

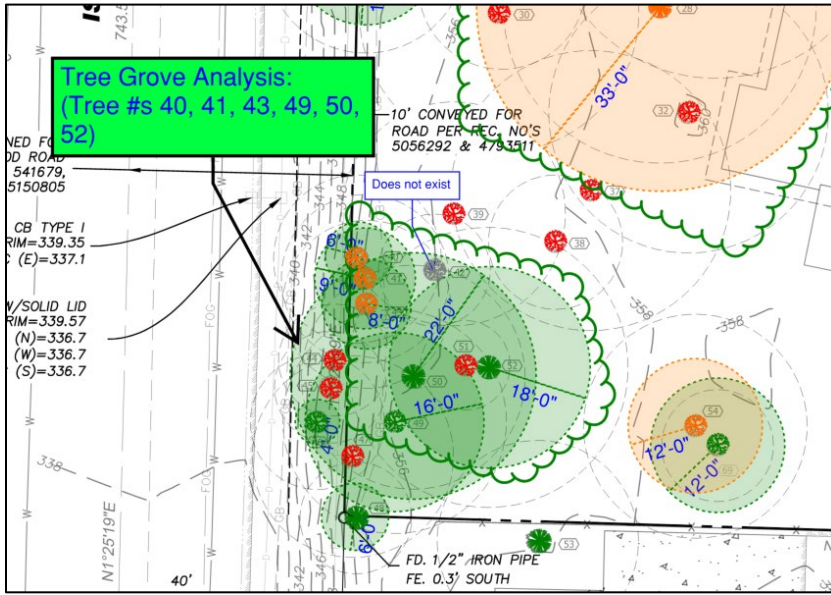


Figure 1. Tree Grove Analysis #1

**Analysis #2:** Central area of site near Lots 1 and 2. Viable tree #s 28, 63, 68,

**Conclusion:** While this area has a dense concentration of trees, there are only three viable trees with overlapping canopies (see Figure 2).

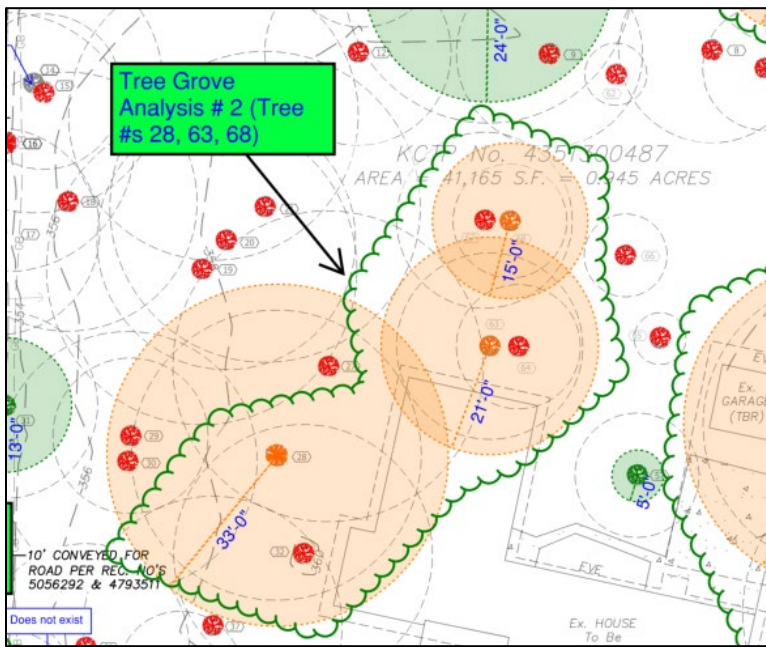


Figure 2. Tree Grove Analysis #2

**Analysis #3:** Northeast corner of site near Lot 3. Viable tree #s 3, 4, 5.

**Conclusion:** There are only three viable trees with overlapping canopies (see Figure 3).

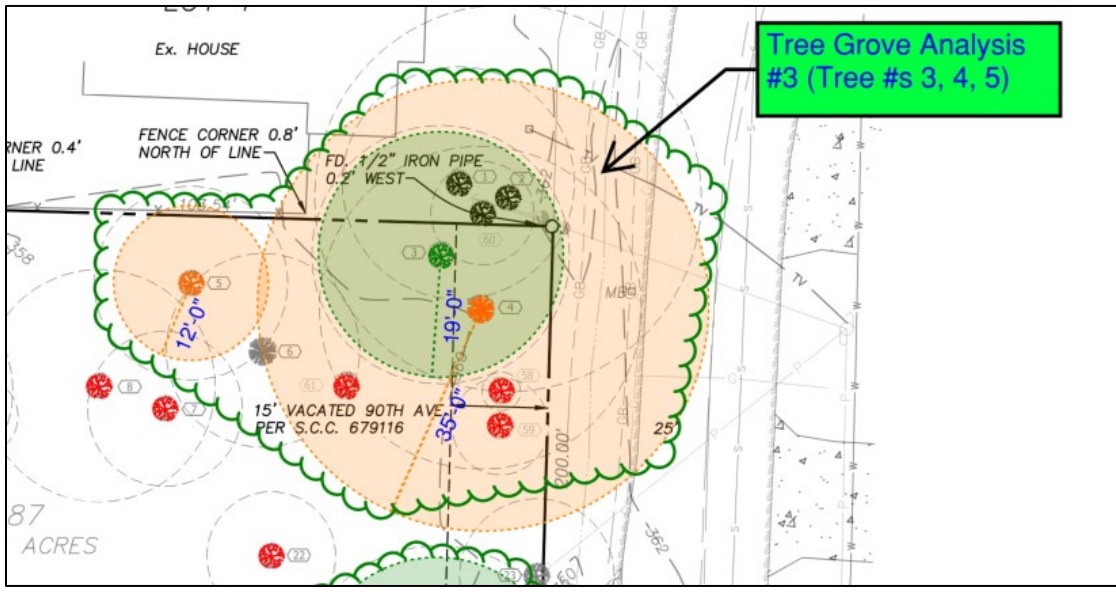


Figure 3. Tree Grove Analysis #3

**Analysis #4:** Southeast corner of site near Lot 4. Viable tree #s 24, 26, 33, 36, 55.

**Conclusion:** There are only five viable trees with overlapping canopies (see Figure 4).

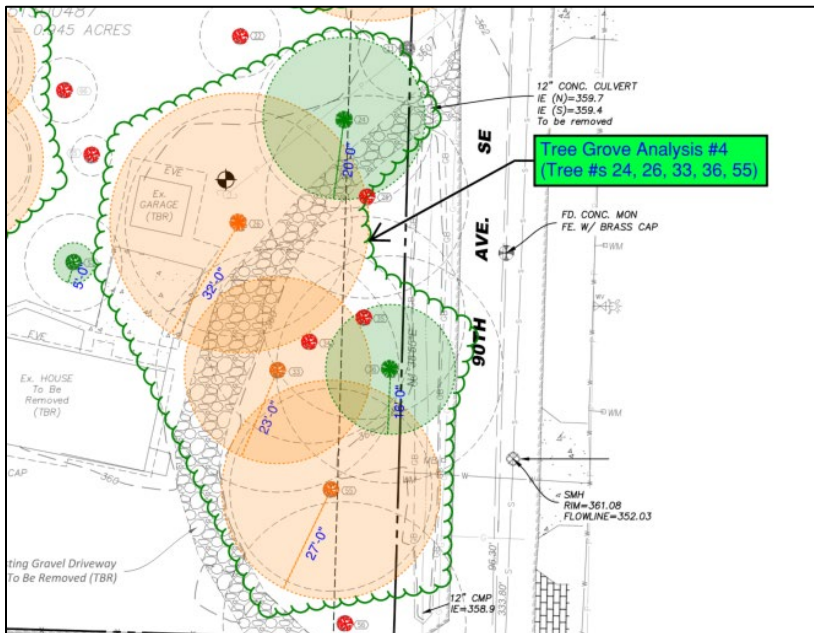


Figure 4. Tree Grove Analysis #4

## Proposed Tree Impacts & Protection Specifications

This project proposes to retain 10 viable trees; 5 of which are Exceptional. To ensure viability, detailed tree protection measures shall be implemented throughout the duration of this project. Please refer to the Tree Retention Plan, sheet TR-01, for more information on tree protection measures.

Table 6. Tree Protection Specifications for Retained Trees

Proposed Impact / Tree Numbers	Specifications
<b>General – all retained trees</b>	<ol style="list-style-type: none"> <li>1. Tree Protection Fence: shall be installed as shown on the Tree Protection Plan and consist of 6-foot tall chain-link fencing. Fencing shall be installed on concrete footings and securely attached by clamping the panels together.</li> <li>2. Tree Protection Signage: plastic laminate signs shall be affixed to the fencing in 15 foot intervals using zip ties or wire stating “Tree Protection Area – Keep Out”.</li> <li>3. No work, excavation, trenching, material storage, cleaning or dumping shall occur behind the tree fencing.</li> <li>4. All invasive and other vegetation removed within the driplines of the trees shall be done mainly by hand or using small machinery only.</li> <li>5. Under no circumstances shall the grade be lowered within the Tree Protection Fencing area.</li> </ol>
Tree #s 3, 4, 5 Construction of Lot 3 building foundation  Removal of existing vegetation	<ol style="list-style-type: none"> <li>6. Excavation within the driplines of these 3 trees shall be done using pneumatic excavation or hydro-excavation under supervision by the Project Arborist.</li> <li>7. The Project Arborist shall document and instruct construction crews to cleanly cut all encountered roots.</li> <li>8. Roots that are exposed shall be covered in wet burlap until the foundation is poured and the trench is backfilled.</li> </ol>
Tree #s 40, 41, 43, 49, 50, 69 Construction of Lot 2 building foundation  Removal of existing vegetation	<ol style="list-style-type: none"> <li>9. Soil protection shall be installed along the south side of the building footprint to protect from heavy machinery (see Tree Protection Plan). Soil protection shall consist of three-quarter inch plywood on top of 5-inches of woodchip mulch.</li> <li>10. Excavation for the building foundation within the dripline of trees shall be done using a flat-fronted bucket to avoid unnecessary ripping/tearing of roots.</li> <li>11. Roots encountered that are greater than 2-inches diameter shall be documented and cleanly cut.</li> <li>12. The stumps of tree #s 47, 51, 52, 54 shall be left in place and not ripped from the ground with heavy machinery.</li> </ol>

## Tree Replacement & Replanting Plan

The City of Mercer Island requires the replacement of all trees removed. Replacement trees must be a minimum of 6-feet tall for conifer trees and 1.5-inches caliper for deciduous trees. Tree replacement requirements per MICC 19.10.070 are as follows:

Table 7. Tree replacement requirements per MICC 19.10.070

Diameter of removed tree	Number of replacement trees required
Less than 10 inches	1
10 inches up to 24 inches	2
24 inches up to 36 inches	3
More than 36 inches and any exceptional trees	6

For this project, a total of 46 trees are proposed for removal; 12 of which are viable. Replacement requirements for all 46 trees removed is equal to 156 replacement trees (Table 8). The total replacement trees required for only the viable trees removed from the site is equal to 52 trees (Table 9). This project proposes to install 90 replacement trees, including 52 native trees (see Tree Planting Plan, sheet TR-02).

**The City’s tree ordinance does not explicitly state that non-viable trees do not require replacement; however, due to the substantial replanting proposed and declining condition of many trees throughout the site, I recommend requesting that the City waive the fee-in-lieu requirements for the additional 66 trees required for non-viable trees (156 total trees minus 90 proposed replacement trees).**

Table 8. Total replacement tree requirements

Diameter of removed tree	# of trees removed	# of replacement trees	Total replacement trees required
Less than 10 inches	7	1	7
10 inches up to 24 inches	19	2	38
24 inches up to 36 inches	3	3	9
More than 36 inches and any exceptional trees	17	6	102
<b>Total Replacement Trees</b>			<b>156</b>

Table 9. Replacement tree requirements for viable trees only

Diameter of removed tree	# of viable trees removed	# of replacement trees	Total replacement trees required
Less than 10 inches	1	1	1
10 inches up to 24 inches	3	2	6
24 inches up to 36 inches	1	3	3
More than 36 inches and any exceptional trees	7	6	42
<b>Total Replacement Trees (viable only)</b>			<b>52</b>



PHOTOGRAPHS

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*Photo 1. Tree # 6, dying.*





*Photo 2. Tree #s 11, 12, dying/dead.*





*Photo 3. Tree #15 covered in ivy vines and dying.*





*Photo 4. Tree #19 with one dead trunk.*





*Photo 5. Tree #21 with dead top.*





*Photo 6. Tree # 22, dying.*





*Photo 7. Typical madrone cankers observed throughout the site.*





*Photo 8. Tree #27 with decaying and dead trunk.*





Photo 9. *K. deusta* on trunk of Tree #27.





*Photo 10. Tree # 28, cedar with thinning canopy.*





*Photo 11. Broken stem of Tree #30.*





*Photo 12. Narrow union of Tree #32.*





*Photo 13. K. deusta on Tree #32.*





*Photo 14. Tree # 34 with decayed trunks.*





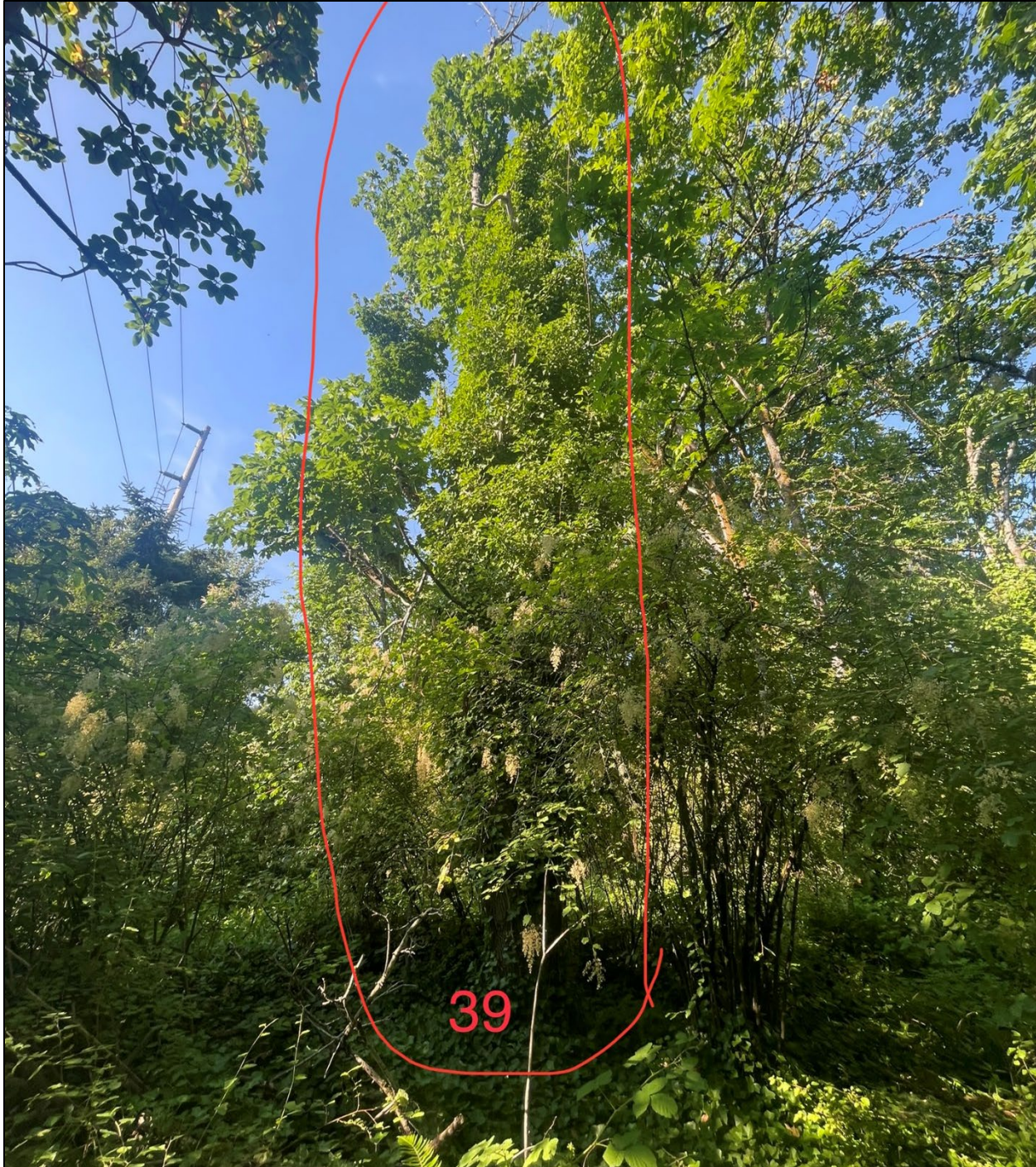
*Photo 15. Tree #37 with canopy decline.*





*Photo 16. Tree # 38 with dead top.*





*Photo 17. Tree #39 dying with heavy ivy.*





Photo 18. Tree #49 with hollow trunk.





*Photo 19. Tree #51 with substantial decay.*





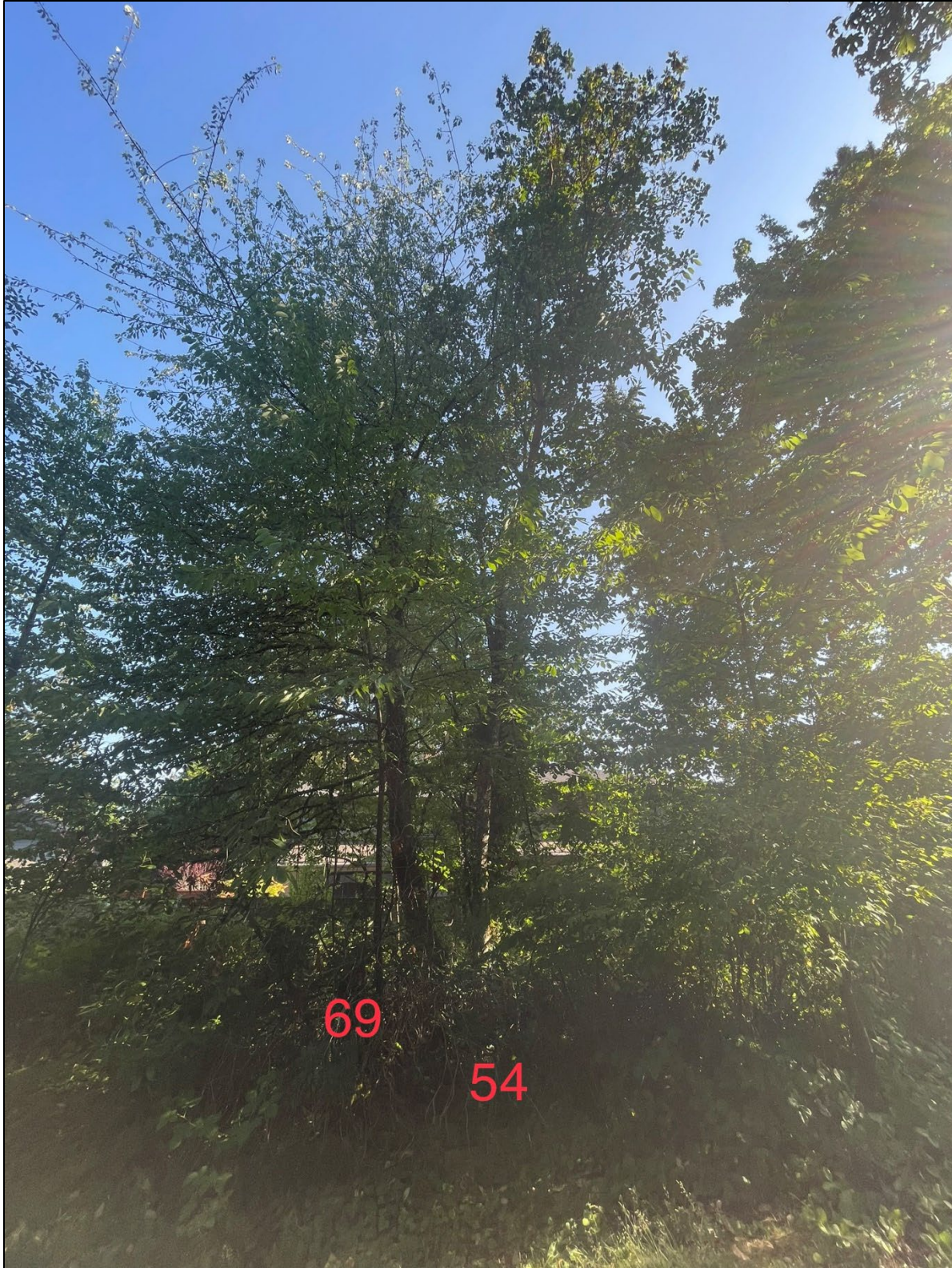
Photo 20. Tree #66 with dead top.





Photo 21. Tree #s 67 (dying/dead) and 68.





*Photo 22. Tree #69 is proposed for retention on Lot 2.*





*Photo 23. Looking southwest toward cluster of trees in southwest corner of proposed Lot 2.*

## Attachments

- 1) Glossary
- 2) References
- 3) Inspection Methods
- 4) Appendix A – Assumptions & Limiting Conditions
- 5) Appendix B – Certification of Performance
- 6) Tree Inventory Table
- 7) Tree Retention Plan (TR-01)
- 8) Tree Planting Plan (TR-02)



## GLOSSARY

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**ANSI A300:** American National Standards Institute (ANSI) standards for tree care

**Chlorotic:** discoloration caused by lack of chlorophyll in the foliage

**Codominant Stems:** two or more stems (or leaders) of relatively similar size that emerge from the same location on the main trunk (Gilman, 2002)

**Conifer:** a tree that bears cones and has evergreen needles or scales

**Crown:** the above ground portion of the tree comprised of branches and their foliage

**Crown raise pruning:** a pruning technique where the lower branches are removed, thus raising the overall height of the crown from the ground

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

**Deciduous:** tree or other plant that loses its leaves annually and remains leafless generally during the cold season

**Epicormic:** arising from latent or adventitious buds

**Evergreen:** tree or plant that keeps its needles or leaves year-round; this means for more than one growing season

**Increment:** the amount of new wood fiber added to a tree in a given period, normally one year.

**ISA:** International Society of Arboriculture

**Landscape function:** the environmental, aesthetic, or architectural functions that a plant can have

**Lateral:** secondary or subordinate branch

**Limits of disturbance:** The boundary of minimum protection around a tree, the area that cannot be encroached upon without possible permanent damage to the tree. It is a distance determined by a qualified professional and is based on the age of the tree, its health, the tree species tolerance to disruption and the type of disturbance. It also considers soil and environmental condition and previous impacts. It is unique to each tree in its location.

**Limited visual assessment:** a visual assessment from a specified perspective such as foot, vehicle, or aerial (airborne) patrol of an individual tree or a population of trees near specified targets to identify specified conditions or obvious defects (ISA 2013)

**Live crown ratio:** the percentage of living tissue in the canopy versus the tree's height. It is a good indicator of overall tree health and the trees growing conditions. Trees with less than a 30% crown ratio often lack the necessary quantity of photosynthetic material to sustain the roots; consequently, the tree may exhibit low vigor and poor health

**Monitoring:** keeping a close watch; performing regular checks or inspections

**Owner/manager:** the person or entity responsible for tree management or the controlling authority that regulates tree management

**Pathogen:** causal agent of disease

**Phototropic growth:** growth toward light source or stimulant

**ROW:** right-of-way; generally referring to a tree that is located offsite on a city easement

**Reaction wood:** specialized secondary xylem which develops in response to a lean or similar mechanical stress, it serves to help restore the stem to a vertical position

**Self-corrected lean:** a tree whose trunk is at an angle to the grade but whose trunk and canopy changes to become upright/vertical

**Significant tree:** a tree measuring a specific diameter determined by the municipality the tree grows in. Some municipalities deem that only healthy trees can be significant, other municipalities consider both healthy and unhealthy trees of a determined diameter to be significant

**Snag:** a tree left partially standing for the primary purpose of providing habitat for wildlife

**Soil structure:** the size of particles and their arrangement; considers the soil, water, and air space

**Sounding:** process of striking a tree with a mallet or other appropriate tool and listening for tones that indicate dead bark, a thin layer of wood outside a cavity, or cracks in wood

**Structural defects:** flaws, decay, or other faults in the trunk, branches, or root collar of a tree, which may lead to failure; may be genetic, or environmental

**Tree credit:** a number assigned to a tree by a municipality that may be equal to the diameter of the tree or a numerical count of the tree, or related to diameter by a factor conveyed in a table of the municipal code

**Trunk area:** the cross-sectional area of the trunk based upon measurement at 54 inches (4.5 ft.) above grade

**Visual Tree Assessment (VTA):** method of evaluating structural defects and stability in trees by noting the pattern of growth. Developed by Claus Mattheck (Harris, et al 1999) detailed visual inspection of a tree and surrounding site that may include the use of simple tools. It requires that a tree risk assessor walk completely around the tree trunk looking at the site, aboveground roots, trunk, and branches (ISA 2013)



## REFERENCES

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- Dirr, Michael A. Manual of Woody Landscape Plants, Their Identification, Ornamental Characteristics, Culture, Propagation, and Uses. Champaign: Stipes Publishing Company, 1990.
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## INSPECTION METHODS

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I performed a Level 2 Visual Tree Assessment (VTA) for each tree. I visually inspected the tree from the ground, walking around the tree to inspect for any basal defects. I then positioned myself further from the tree, looking up into the crown and branches for any notable defects and symptoms of canopy decline.

Using the VTA method, I rated the health and structural condition of each tree. This inspection method is an international industry standard for assessing trees from the ground level and identifies external signs of decay, physical damage, growth related defects, and abnormal or declining foliage. Tree health and structure are each assigned their own condition rating. The following ratings are used:

Poor: Lacking a full crown, with more than 50% decline and dieback that especially affects larger branches. Low life expectancy for the species.

Fair: Crown decline and dieback up to 30% of the canopy. Below-average life expectancy for the species.

Good: Imperfect canopy density in 10% or less of the tree. Typical life expectancy for the species.

Excellent: Perfect specimen with excellent form and vigor, along with a well-balanced crown. Exceptional life expectancy for the species.



## APPENDIX A - ASSUMPTIONS & LIMITING CONDITIONS

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- 1) Any legal description provided to the consultant/appraiser is assumed to be correct. Any titles and ownerships to any property are assumed to be good and marketable. No responsibility is assumed for matters legal in character. Any and all property is appraised or evaluated as though free and clear, under responsible ownership and competent management.
- 2) It is assumed that any property is not in violation of any applicable codes, ordinances, statutes or other governmental regulations.
- 3) The assessment in this report is based on information and data from sources believed to be reliable, correct, and accurately reported. No responsibility is assumed for false or misleading information provided by others.
- 4) The consultant/appraiser shall not be required to give testimony or to attend court by reason of the report unless subsequent contractual arrangements are made including payment of an additional fee for such services as described in the fee schedule and contract of engagement.
- 5) Loss or alteration of any part of this report invalidates the entire report.
- 6) Possession of this report or a copy thereof does not imply right of publication or use for any purpose by any other than the person to whom it is addressed, without the prior expressed written or verbal consent of the consultant/appraiser.
- 7) Neither all nor any part of the contents of the report, nor copy thereof, shall be conveyed by anyone, including the client to the public through advertising, public relations, news, sales or other media, without the prior expressed written or verbal consent of the consultant/appraiser – particularly as to value conclusions, identity of the consultant/appraiser, or any reference to any professional society or institute or to any initialed designation conferred upon the consultant/appraiser as stated in her qualification.
- 8) The report and any values expressed herein represent the opinion of the consultant/appraiser, and the consultant's/appraiser's fee is in no way contingent upon the reporting of a specified value, a stipulated result, the occurrence of subsequent event, nor upon any finding to be reported.
- 9) Sketches, diagrams, graphs, and photographs in this report, being intended as visual aid, are not necessarily to scale and should not be construed as engineering or architectural reports or survey.
- 10) Unless expressed otherwise: 1) information contained in this report covers only those items that were examined and reflects the condition of those items at the time of inspection; and 2) the inspection is limited to visual examination of accessible items without dissection, excavation, probing or coring. There is not warranty or guarantee, expressed or implied, that problems or deficiencies of the plants or property in question may not arise in the future.

## APPENDIX B - CERTIFICATION OF PERFORMANCE

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I, Katie Hogan, certify that:

- I have personally inspected the trees on the property referenced in this report and the statements of fact contained in this report are true and correct.
- I have no present or prospective interest in the property that is the subject of this report, and I have no personal interest with respect to the parties involved.
- The reported analysis, opinions, and conclusions are my personal, unbiased professional analysis, opinions, and conclusions.
- My analysis, opinions, and conclusions were developed, and this report has been prepared according to commonly accepted arboricultural best practices.
- No individuals or organizations have provided significant assistance with the preparation of this report, except those named in the report.
- My compensation for completing this assignment is not contingent upon the development or reporting of a predetermined outcome or direction that favors the cause of the client, the results of the assessment, or the occurrence of any subsequent events.

Signed:

A handwritten signature in black ink that reads "Katie Hogan". The signature is written in a cursive, flowing style.

Cascara Tree Consulting, LLC



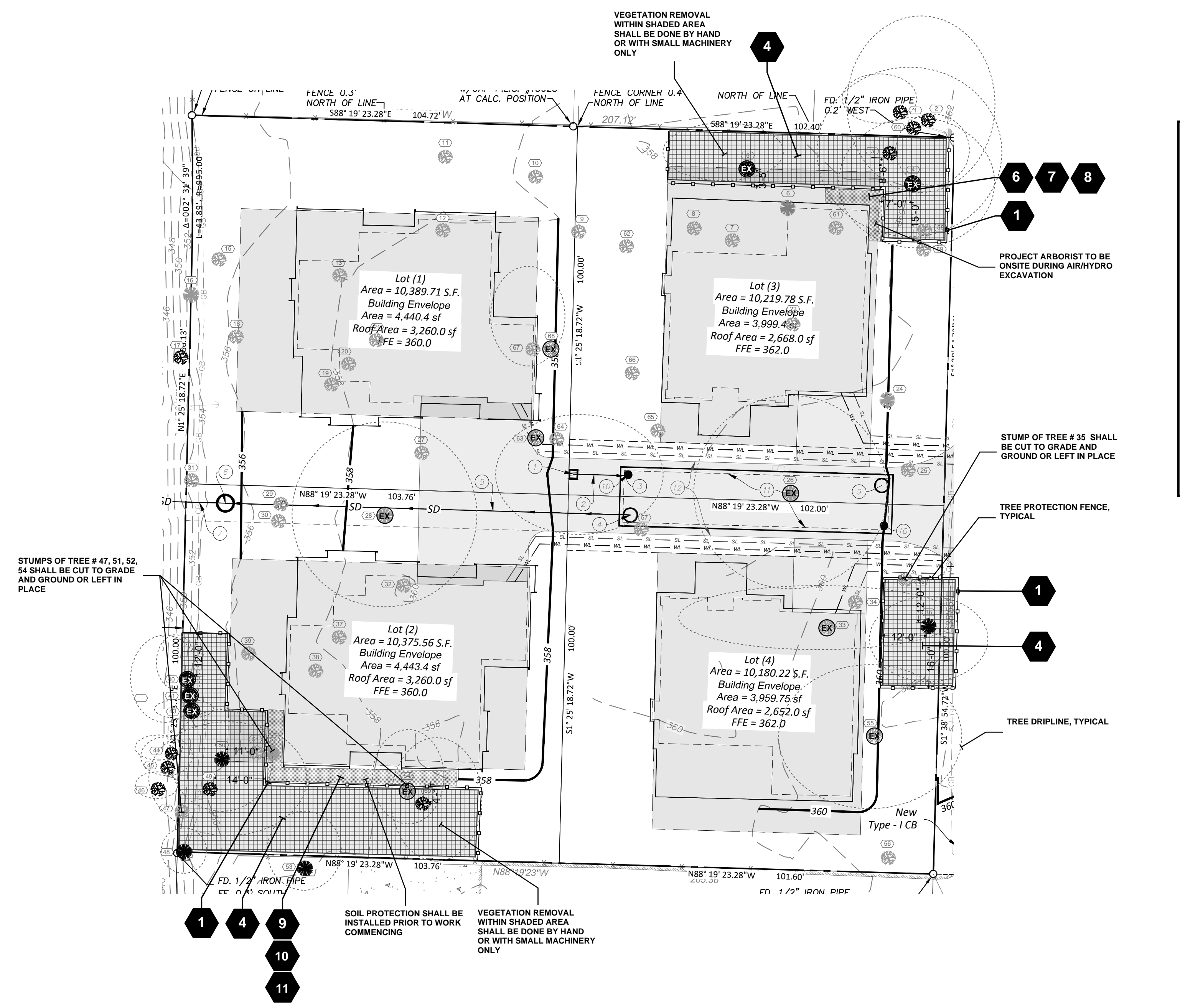
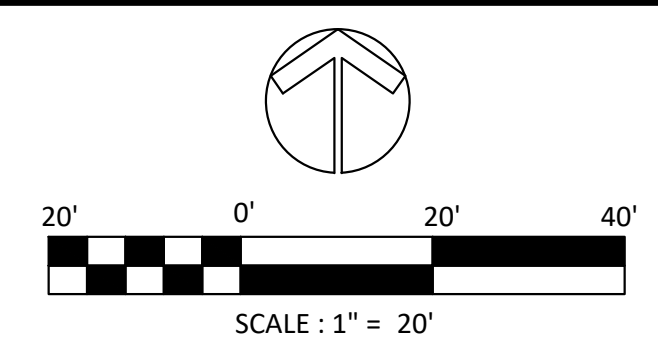
# Tree Inventory Table

Tree No.	Scientific Name	Common Name	DBH (inches)	Health	Structure	Viable	Dripline (ft)				Exceptional Size	Exceptional?	Proposed Action	Notes
							N	E	S	W				
3	<i>Acer macrophyllum</i>	Bigleaf Maple	22.5	Good	Good	Yes	22	30	22	20	30		Retain	
4	<i>Pseudotsuga menziesii</i>	Douglas-fir	41.5	Good	Fair	Yes	18	22	18	20	30	Exceptional - Size	Retain	Sweep to north
5	<i>Arbutus menziesii</i>	Madrone	14.6	Good	Good	Yes	12	10	0	24	6	Exceptional - Size	Retain	Stable condition
6	<i>Thuja plicata</i>	Western Redcedar	27.0	Poor/Dead	Fair	Removed	0	0	0	0	30	-	-	Previously removed, hollow trunk with rams horns, log on ground is hollow, tree was 70% dead prior to removal
7	<i>Acer macrophyllum</i>	Bigleaf Maple	7.5	Fair	Poor	No	0	15	11	6	30		Remove	Leans, broken top
8	<i>Acer macrophyllum</i>	Bigleaf Maple	12.1	Poor	Poor	No	0	18	0	16	30		Remove	Asymmetric, leans south
9	<i>Acer macrophyllum</i>	Bigleaf Maple	20.9	Poor	Poor	No	0	14	0	28	30		Remove	Hollow, top broken
10	<i>Populus trichocarpa</i>	Black cottonwood	28.7	Good	Good	Yes	36	30	26	36	-		Remove	Ivy vines, not good long-term tree for site due to species and size
11	<i>Arbutus menziesii</i>	Madrone	11.9	Poor	Poor	No	2	4	4	0	6	Not Viable	Remove	Top broken, small canopy, minor decay
12	<i>Arbutus menziesii</i>	Madrone	18.9	Poor	Fair	No	30	0	6	6	6	Not Viable	Remove	Dying, dead limbs
13	<i>Acer macrophyllum</i>	Bigleaf Maple	19.5	Fair	Fair	No	20	14	24	22	30		Remove	Nearly 100% covered in ivy, southern quadrant of canopy and top of tree is dying back, very narrow union at base, trunks are touching, column of decay on west side of trunk
14	<i>Acer macrophyllum</i>	Bigleaf Maple	12.0	Fair	Poor	Removed	0	0	0	0	30	-	-	Previously removed, east trunk completely failed at base due to <i>Kretzschmaria deusta</i> and advanced decay. Westernmost trunk was then removed (diameter ~12 inches). Maple was growing on a decayed nurse stump.
15	<i>Acer macrophyllum</i>	Bigleaf Maple	14.5	Poor	Fair	No	6	4	4	4	30		Remove	Completely dead and covered in ivy vines
16	<i>Pseudotsuga menziesii</i>	Douglas-fir	17.5	Fair	Poor	No	14	17	8	18	30		Remove	Previously topped with visible decay at old topping wound, very poor long-term form, not ideal long-term tree
18	<i>Arbutus menziesii</i>	Madrone	20.1	Poor	Fair	No	6	8	12	12	6	Not Viable	Remove	Tree completely suppressed, large 5 inch ivy vines on trunk with minimal live canopy remaining
19	<i>Acer macrophyllum</i>	Bigleaf Maple	19.6	Fair	Poor	No	8	20	4	22	30		Remove	Very narrow trunk attachment at base, staining on north trunk - possibly fungal, north trunk is completely dead, remaining trunk has dead top and additional dieback throughout
20	<i>Ilex aquifolium</i>	English holly	12.7	Good	Good	No	16	16	16	16	-		Remove	Invasive species not recommended for retention
21	<i>Acer macrophyllum</i>	Bigleaf Maple	21.2	Poor	Fair	No	30	8	4	4	30		Remove	North trunk is nearly dead with top dieback, south trunk is also completely dead except for one small sprout
22	<i>Alnus rubra</i>	Red alder	12.2	Poor	Fair	No	8	24	0	24	-		Remove	Top dieback, nearly 100% covered and ivy vines
23	<i>Alnus rubra</i>	Red alder	19.0	Fair	Poor	Removed	0	0	0	0	-	-	-	Stump found - diameter ~19 inches cut at 1.5 feet above ground, tree was previously topped and was a living snag
24	<i>Thuja plicata</i>	Western Redcedar	23.5	Good	Good	Yes	16	16	16	16	30		Remove	
25	<i>Acer macrophyllum</i>	Bigleaf Maple	19.6	Fair	Fair	No	20	20	20	18	30		Remove	Three stems at based with narrow unions, visible dieback throughout canopy, not good long-term tree
26	<i>Pseudotsuga menziesii</i>	Douglas-fir	38.6	Good	Good	Yes	26	26	26	26	30	Exceptional - Size	Remove	Dominant Douglas fir tree with extensive ivy on trunk, nearly 90% live crown ratio
27	<i>Acer macrophyllum</i>	Bigleaf Maple	32.9	Fair	Poor	No	28	28	34	30	30	Not Viable	Remove	Very narrow codominant union at base with large seam of included bark, <i>Kretzschmaria deusta</i> observed at union, more than 50% canopy dieback and evident decay present in central columns
28	<i>Thuja plicata</i>	Western Redcedar	39.1	Fair	Good	Yes	24	24	24	24	30	Exceptional - Size	Remove	Canopy slightly thin and chlorotic, species is intolerant of changes to soil conditions and level of protection needed to successfully retain tree would make site on buildable
29	<i>Arbutus menziesii</i>	Madrone	10.4	Poor	Fair	No	24	6	18	0	6	Not Viable	Remove	In a state of decline, cankers on trunk
30	<i>Acer macrophyllum</i>	Bigleaf Maple	20.0	Fair	Poor	No	24	18	16	16	30		Remove	10 inch diameter trunk failed at codominant union, significant decay evident throughout tree
31	<i>Pseudotsuga menziesii</i>	Douglas-fir	15.5	Good	Fair	Yes	14	14	14	14	30		Remove	Topped for utilities
32	<i>Acer macrophyllum</i>	Bigleaf Maple	28.3	Fair	Fair	No	18	30	28	28	30		Remove	Visible branch dieback ~ 10 to 20% on southside of canopy, <i>Kretzschmaria deusta</i> observed at lower codominant union, multiple weak attachments
33	<i>Arbutus menziesii</i>	Madrone	28.1	Good	Good	Yes	12	35	0	40	6	Exceptional - Size	Remove	Leans to the west, dominant madrone tree
34	<i>Acer macrophyllum</i>	Bigleaf Maple	25.1	Fair	Fair	No	14	18	0	25	30		Remove	Smaller codominant is dead, large column of decay in trunk with visible areas of significant decay
35	<i>Acer macrophyllum</i>	Bigleaf Maple	31.6	Fair	Poor	No	28	32	20	26	30	Not Viable	Remove	Growing on nurse stump, <i>Kretzschmaria deusta</i>
36	<i>Cedrus deodara</i>	Deodar Cedar	19.4	Good	Good	Yes	7	16	16	16	30		Retain	One sided canopy Island Crest Way
37	<i>Acer macrophyllum</i>	Bigleaf Maple	17.6	Fair	Fair	No	30	20	6	28	30		Remove	Visible dieback in approximately 1/4 of the canopy, cavities and decay columns observed
38	<i>Acer macrophyllum</i>	Bigleaf Maple	7.1	Poor	Poor	No	0	16	16	0	30		Remove	Nearly 100% dead
39	<i>Acer macrophyllum</i>	Bigleaf Maple	21.2	Fair	Fair	No	14	6	6	6	30		Remove	In a state of decline with top dieback, heavily pruned on one side for utilities, stunted growth
40	<i>Arbutus menziesii</i>	Madrone	7.5	Fair	Fair	Yes	12	2	0	10	6	Exceptional - Size	Retain	Strong lean over Island Crest Way, lightly topped, cankers on trunk
41	<i>Arbutus menziesii</i>	Madrone	10.9	Fair	Fair	Yes	16	0	6	16	6	Exceptional - Size	Retain	Previously topped for utilities, but overall in decent condition, minimal cankers on trunk

### Tree Inventory Table

42	<i>Arbutus menziesii</i>	<i>Madrone</i>	-	-	-	-	6	0	0	16	6		-	Does not exist, likely inaccurate inventory, remove from survey	
43	<i>Arbutus menziesii</i>	<i>Madrone</i>	9.6	Fair	Fair	Yes	2	6	2	10	6		Exceptional - Size	Retain	Central trunk dying, cankers on trunk beginning to form, previously topped, not good long term tree
47	<i>Arbutus menziesii</i>	<i>Madrone</i>	10.3	Poor	Poor	No	6	5	0	12	6		Not Viable	Remove	Trunk cankers, very poor form from previous topping
49	<i>Acer macrophyllum</i>	<i>Bigleaf Maple</i>	18.7	Fair	Fair	Yes	18	26	12	18	30			Retain	Columns of dieback in central canopy and dead branches throughout, codominant at base, previously topped for line clearance, not ideal long-term tree
50	<i>Pseudotsuga menziesii</i>	<i>Douglas-fir</i>	26.1	Good	Good	Yes	14	14	14	14	30			Retain	Current condition is stable with some minor abnormalities and sunken areas, canopy well-distributed, some dead branches that target in Island Crest Way
51	<i>Acer macrophyllum</i>	<i>Bigleaf Maple</i>	11.1	Poor	Fair	No	1	0	0	0	30			Remove	Large wound with decay at base
52	<i>Acer macrophyllum</i>	<i>Bigleaf Maple</i>	21.9	Fair	Fair	Yes	23	28	28	6	30			Remove	Visible central decay with moderate levels of dieback throughout canopy, codominant union at base with slow growth, columns of decay in trunk, not ideal long-term tree
54	<i>Arbutus menziesii</i>	<i>Madrone</i>	13.9	Good	Good	Yes	16	8	8	8	6		Exceptional - Size	Remove	Overall healthy canopy
55	<i>Acer macrophyllum</i>	<i>Bigleaf Maple</i>	32.0	Good	Fair	Yes	20	24	20	29	30		Exceptional - Size	Remove	Ivy on trunk, dominant maple tree with three narrowly attached trunks at about 20 feet
56	<i>Acer macrophyllum</i>	<i>Bigleaf Maple</i>	36.9	Poor	Fair	No	25	30	25	25	30		Not viable	Remove	Substantial canopy dieback, top is dead, over 50% dead overall
57	<i>Cornus florida</i>	<i>Eastern Dogwood</i>	6.4	Good	Good	Yes	9	9	9	9	12			Remove	
58	<i>Salix sp.</i>	<i>Willow (native)</i>	9.5	Poor	Poor	No	0	6	3	3	8		Not Viable	Remove	Ivy vines, broken top
59	<i>Salix sp.</i>	<i>Willow (native)</i>	9.2	Poor	Poor	No	5	8	15	0	8		Not Viable	Remove	Ivy vines, swept base, leans over utilities
61	<i>Acer macrophyllum</i>	<i>Bigleaf Maple</i>	8.5	Poor	Poor	No	0	3	0	0	30			Remove	Stem broken
62	<i>Prunus emarginata var. mollis</i>	<i>Bitter cherry</i>	8.5	Fair	Fair	No	12	12	12	12	-			Remove	Canopy thinning and declining
63	<i>Arbutus menziesii</i>	<i>Madrone</i>	25.2	Good	Good	Yes	0	36	28	10	6		Exceptional - Size	Remove	Dominant canopy stretching over 30 feet radius, tree unlikely to survive construction
64	<i>Arbutus menziesii</i>	<i>Madrone</i>	8.5	Poor	Poor	No	4	3	24	0	6		Not Viable	Remove	Dying, 30% dead branches
65	<i>Crataegus monogyna</i>	<i>Common hawthorn</i>	6.1	Good	Good	No	10	12	10	8	-			Remove	Invasive species not recommended for retention
66	<i>Prunus emarginata var. mollis</i>	<i>Bitter cherry</i>	10.1	Fair	Fair	No	16	8	6	12	-			Remove	Nearly 100% dead
67	<i>Acer macrophyllum</i>	<i>Bigleaf Maple</i>	15.6	Good	Fair	No	0	12	0	34	30			Remove	Nearly 100% dead
68	<i>Arbutus menziesii</i>	<i>Madrone</i>	18.1	Fair	Good	Yes	22	0	0	14	6		Exceptional - Size	Remove	Growing with trunk of a tree #67 touching and wrapping around trunk of #68, canopy appears to be in decent condition, care would need to be taken when reducing maple tree #67 and retention may not be possible
69	<i>Prunus emarginata var. mollis</i>	<i>Bitter cherry</i>	14.8	Good	Good	Yes	18	16	20	8	-			Retain	Condition stable
<b>Off Site Trees</b>															
1	<i>Acer macrophyllum</i>	<i>Bigleaf Maple</i>	15.4	Good	Good	Yes	10	3	0	16	30			Retain	Asymmetric
2	<i>Acer macrophyllum</i>	<i>Bigleaf Maple</i>	25.5	Good	Fair	Yes	36	18	20	22	30			Retain	Leans northeast
17	<i>Acer macrophyllum</i>	<i>Bigleaf Maple</i>	8.4	Good	Poor	No	3	14	10	12	30			Retain	Topped for utilities, overhangs Island Crest Way
44	<i>Arbutus menziesii</i>	<i>Madrone</i>	5.0	Fair	Fair	No	4	2	0	8	6			Retain	Strong lean over Island Crest Way, substantial cankers on trunk, not ideal long-term tree
45	<i>Arbutus menziesii</i>	<i>Madrone</i>	7.2	Good	Fair	No	8	4	0	8	6		Not viable	Retain	Young tree in decent condition, previously topped, cankers on trunk are currently minor
46	<i>Thuja plicata</i>	<i>Western Redcedar</i>	5.0	Good	Good	Yes	4	5	2	6	30			Retain	Young tree, previously topped, overall in decent condition
48	<i>Pseudotsuga menziesii</i>	<i>Douglas-fir</i>	6.8	Poor	Poor	No	6	6	6	4	30			Retain	Previously topped, small tree
53	<i>Pseudotsuga menziesii</i>	<i>Douglas-fir</i>	15.0	Good	Fair	Yes	16	10	6	10	30			Retain	Swept
60	<i>Acer macrophyllum</i>	<i>Bigleaf Maple</i>	10.5	Good	Fair	Yes	0	16	16	0	30			Retain	





**LEGEND:**

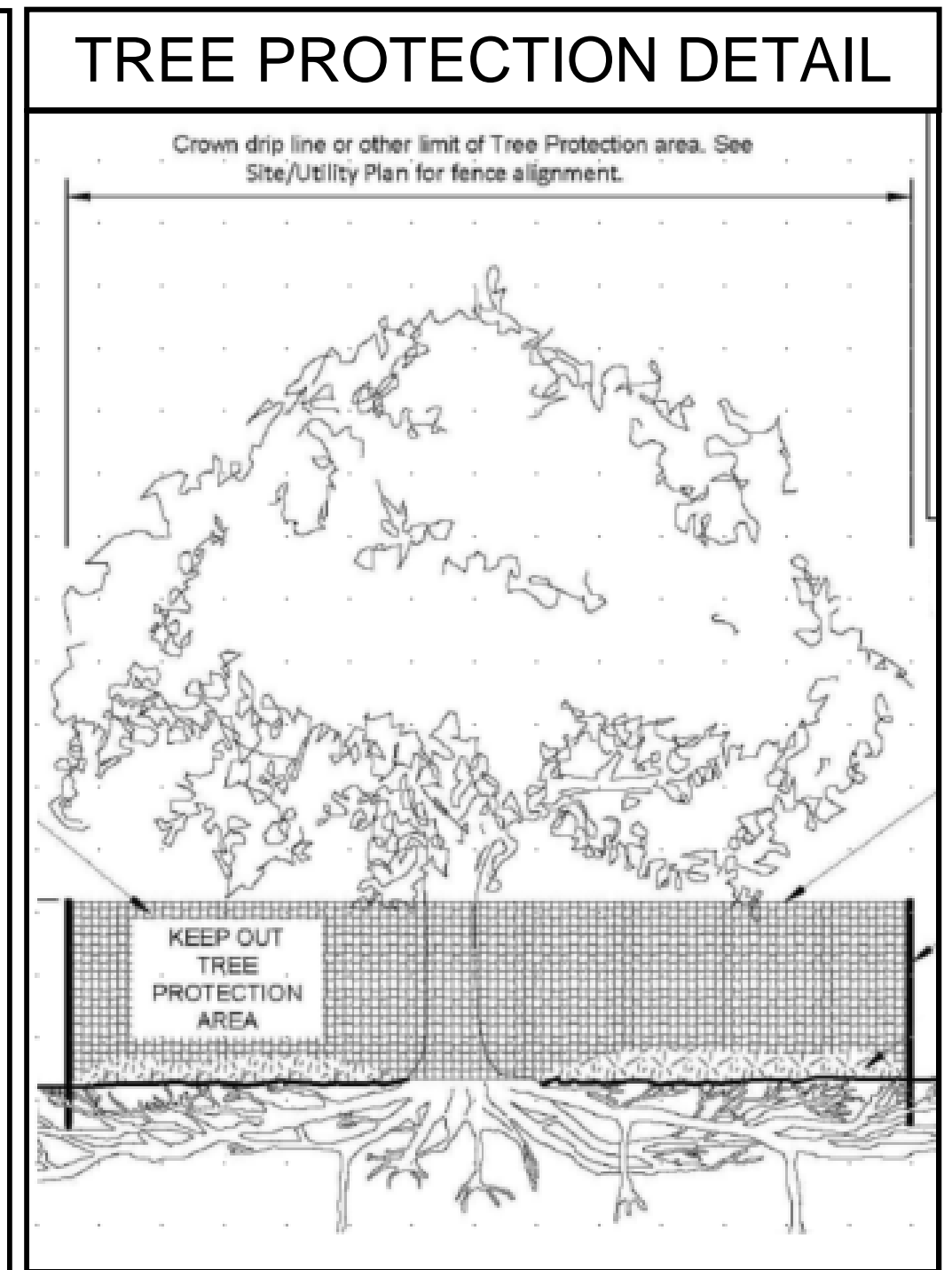
- = TREE PROTECTION FENCE
- ① = TREE IDENTIFIER
- ☼ = TREE REMOVE
- ☼☼ = EXCEPTIONAL TREE REMOVE
- ☼☼☼ = TREE RETAIN
- ☼☼☼☼ = EXCEPTIONAL TREE RETAIN
- ① = TREE PROTECTION RECOMMENDATIONS [SEE TABLE 1]
- = TREE DRIPLINE

TREE TO BE RETAINED					
Tree No.	Common Name	DBH (in)	Viable	Dripline Avg (ft)	Proposed Action
3	Bigleaf Maple	22.5	Yes	24	Retain
4	Douglas-fir	41.5	Yes	20	Retain
5	Madrone	14.6	Yes	12	Retain
36	Deodar Cedar	19.4	Yes	14	Retain
40	Madrone	7.5	Yes	6	Retain
41	Madrone	10.9	Yes	10	Retain
43	Madrone	9.6	Yes	5	Retain
49	Bigleaf Maple	18.7	Yes	19	Retain
50	Douglas-fir	26.1	Yes	14	Retain
69	Bitter cherry	14.8	Yes	16	Retain
1	Bigleaf Maple	15.4	Yes	7	Retain
2	Bigleaf Maple	25.5	Yes	24	Retain
17	Bigleaf Maple	8.4	No	10	Retain
44	Madrone	5.0	No	4	Retain
45	Madrone	7.2	No	5	Retain
46	Western	5.0	Yes	4	Retain
48	Douglas-fir	6.8	No	6	Retain
53	Douglas-fir	15.0	Yes	11	Retain
60	Bigleaf Maple	10.5	Yes	8	Retain

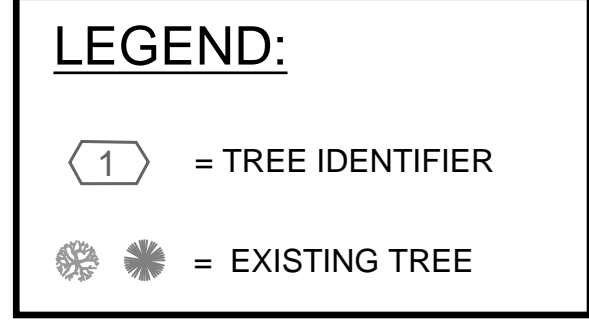
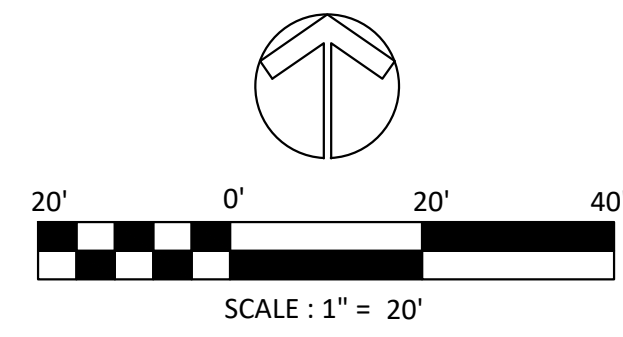
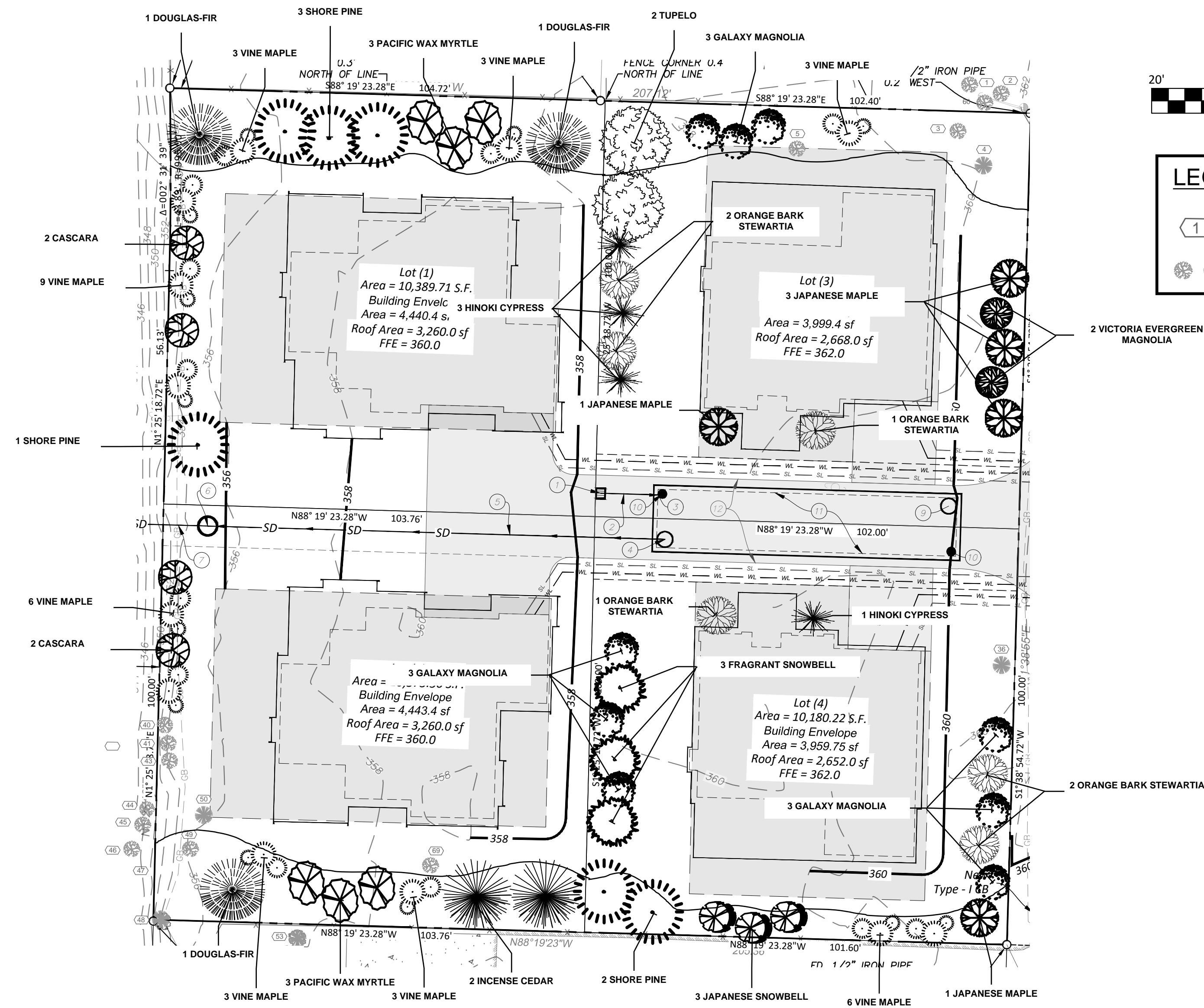
TREE RETENTION CALCULATIONS	
TOTAL VIABLE TREES	22 TREES
TOTAL RETAINED TREES	10 TREES
TOTAL TREE RETENTION	45%

TREES TO BE REMOVED					
Tree No.	Common Name	DBH (in)	Viable	Dripline Avg (ft)	Proposed Action
7	Bigleaf Maple	7.5	No	8	Remove
8	Bigleaf Maple	12.1	No	9	Remove
9	Bigleaf Maple	20.9	No	11	Remove
10	Black	28.7	Yes	32	Remove
11	Madrone	11.9	No	3	Remove
12	Madrone	18.9	No	11	Remove
13	Bigleaf Maple	19.5	No	20	Remove
15	Bigleaf Maple	14.5	No	5	Remove
16	Douglas-fir	17.5	No	14	Remove
18	Madrone	20.1	No	10	Remove
19	Bigleaf Maple	19.6	No	14	Remove
20	English holly	12.7	No	16	Remove
21	Bigleaf Maple	21.2	No	12	Remove
22	Red alder	12.2	No	14	Remove
24	Western	23.5	Yes	16	Remove
25	Bigleaf Maple	19.6	No	20	Remove
26	Douglas-fir	38.6	Yes	26	Remove
27	Bigleaf Maple	32.9	No	30	Remove
28	Western	39.1	Yes	24	Remove
29	Madrone	10.4	No	12	Remove
30	Bigleaf Maple	20.0	No	19	Remove
31	Douglas-fir	15.5	Yes	14	Remove
32	Bigleaf Maple	28.3	No	26	Remove
33	Madrone	28.1	Yes	22	Remove
34	Bigleaf Maple	25.1	No	14	Remove
35	Bigleaf Maple	31.6	No	27	Remove
37	Bigleaf Maple	17.6	No	21	Remove
38	Bigleaf Maple	7.1	No	8	Remove
39	Bigleaf Maple	21.2	No	8	Remove
47	Madrone	10.3	No	6	Remove
51	Bigleaf Maple	11.1	No	0	Remove
52	Bigleaf Maple	21.9	Yes	21	Remove
54	Madrone	13.9	Yes	10	Remove
55	Bigleaf Maple	32.0	Yes	23	Remove
56	Bigleaf Maple	36.9	No	26	Remove
57	Eastern	6.4	Yes	9	Remove
58	Willow (native)	9.5	No	3	Remove
59	Willow (native)	9.2	No	7	Remove
61	Bigleaf Maple	8.5	No	1	Remove
62	Bitter cherry	8.5	No	12	Remove
63	Madrone	25.2	Yes	19	Remove
64	Madrone	8.5	No	8	Remove
65	Common	6.1	No	10	Remove
66	Bitter cherry	10.1	No	11	Remove
67	Bigleaf Maple	15.6	No	12	Remove
68	Madrone	18.1	Yes	9	Remove

TABLE 1 - ARBORIST RECOMMENDATIONS FOR TREE PROTECTION	
PROPOSED IMPACT / TREE NUMBERS	RECOMMENDATIONS
General - All Retained Trees	<ol style="list-style-type: none"> <li>Tree Protection Fence: shall be installed as shown on the Tree Protection Plan and consist of 6-foot tall chain-link fencing. Fencing shall be installed on concrete footings and securely attached by clamping the panels together.</li> <li>Tree Protection Signage: plastic laminate signs shall be affixed to the fencing in 15 foot intervals using zip ties or wire stating "Tree Protection Area - Keep Out".</li> <li>No work, excavation, trenching, material storage, cleaning or dumping shall occur behind the tree fencing.</li> <li>All invasive and other vegetation removed within the driplines of the trees shall be done mainly by hand or using small machinery only.</li> <li>Under no circumstances shall the grade be lowered within the Tree Protection Fencing area.</li> </ol>
Tree #s 3, 4, 5 Construction of Lot 3 building foundation	<ol style="list-style-type: none"> <li>Excavation within the driplines of these 3 trees shall be done using pneumatic excavation or hydro-excavation under supervision by the Project Arborist.</li> <li>The Project Arborist shall document and instruct construction crews to cleanly cut all encountered roots.</li> <li>Roots that are exposed shall be covered in wet burlap until the foundation is poured and the trench is backfilled.</li> </ol>
Removal of existing vegetation	
Tree #s 40, 41, 43, 49, 50, 69 Construction of Lot 2 building foundation	<ol style="list-style-type: none"> <li>Soil protection shall be installed along the south side of the building footprint to protect from heavy machinery (see Tree Protection Plan). Soil protection shall consist of three-quarter inch plywood on top of 5-inches of woodchip mulch.</li> <li>Excavation for the building foundation within the dripline of trees shall be done using a flat-fronted bucket to avoid unnecessary ripping/tearing of roots.</li> <li>Roots encountered that are greater than 2-inches diameter shall be documented and cleanly cut.</li> <li>The stumps of tree #s 47, 51, 52, 54 shall be left in place and not ripped from the ground with heavy machinery.</li> </ol>
Removal of existing vegetation	







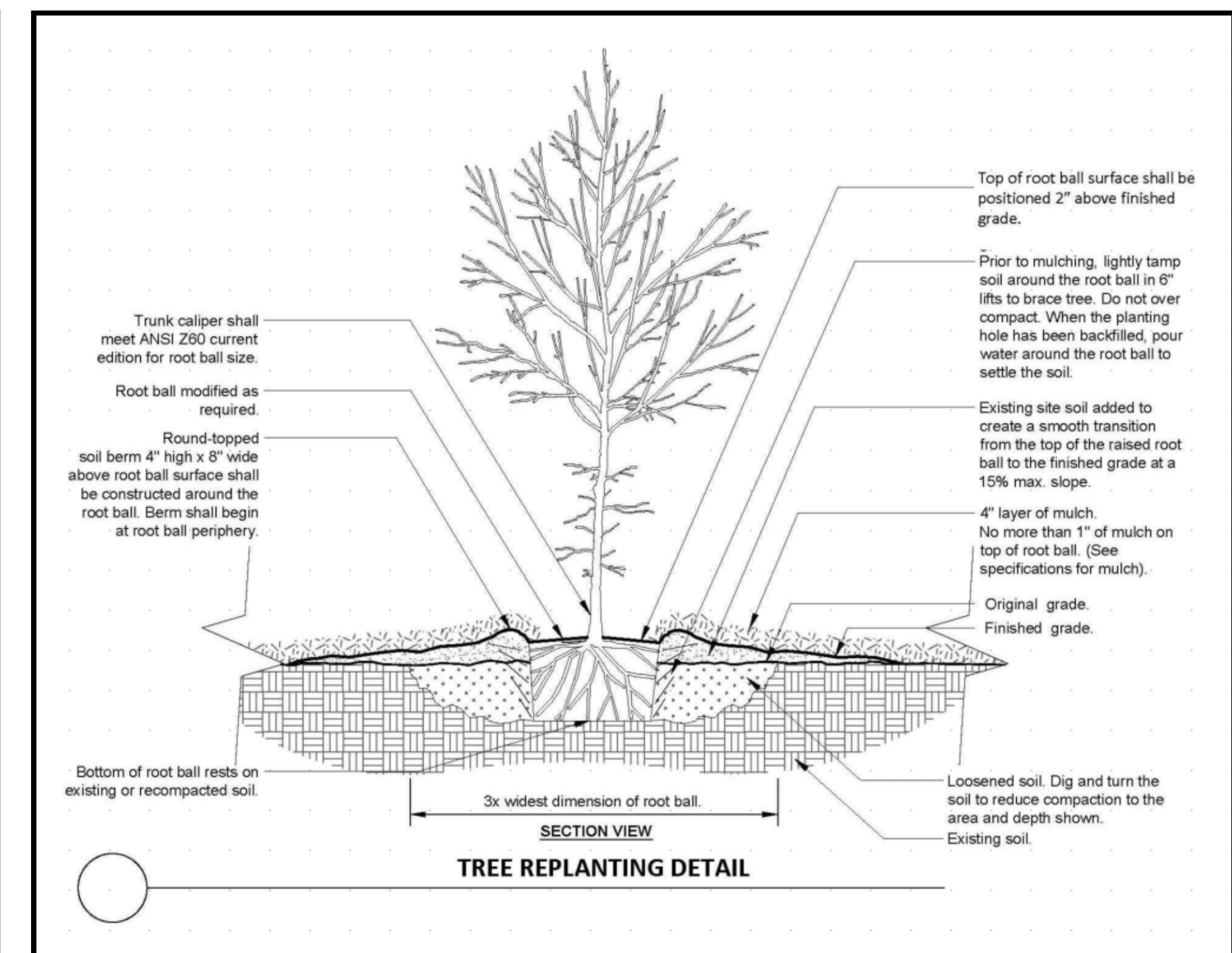
### Tree Planting Schedule

Species	Scientific Name	Native	Qty	Size
Douglas-fir	<i>Pseudotsuga menziesii</i>	Yes	3	6' tall
Shore Pine	<i>Pinus contorta</i>	Yes	6	6' tall
Incense Cedar	<i>Calocedrus decurrens</i>	No	2	6' tall
Tupelo	<i>Nyssa sylvatica</i>	No	2	1.5" caliper
Cascara	<i>Frangula purshiana</i>	Yes	4	1.5" caliper
Victoria Evergreen Magnolia	<i>Magnolia grandiflora 'Victoria'</i>	No	4	1.5" caliper
Pacific Wax Myrtle	<i>Myrica californica</i>	Yes	6	1.5" caliper
Vine Maple	<i>Acer circinatum</i>	Yes	33	1.5" caliper
Japanese Maple	<i>Acer palmatum</i>	No	5	1.5" caliper
Orange Bark Stewartia	<i>Stewartia monadelpha</i>	No	6	1.5" caliper
Hinoki Cypress	<i>Chamaecyparis obtusa</i>	No	4	6' tall
Galaxy Magnolia	<i>Magnolia 'Galaxy'</i>	No	9	1.5" caliper
Fragrant Snowbell	<i>Styrax obassia</i>	No	3	1.5" caliper
Japanese Snowbell	<i>Styrax japonicus</i>	No	3	1.5" caliper

Total Replacement Trees	
Native	52
Non-Native	38
<b>Total Replacement Trees</b>	<b>90</b>

### TREE PLANTING SPECIFICATIONS

- Stage all trees before installation.
- Spacing on the plan is approximate. Trees shall be planted no closer than 10 feet apart. Large conifer trees shall be spaced 15 to 20 feet apart.
- Dig a hole at least 2 x the width of the root ball. The hole should be as deep as the root ball.
- Remove the tree from the container. If wrapped in burlap and wire, all materials should be removed prior to planting.
- Gently break up the root ball and cut away any wrapping/girdling roots.
- Place the root ball in the hole and fill the hole with loose soil.
- Ensure the root collar is not buried when filling the hole.
- Pack the soil down gently and water deeply.



PROJECT 4833 MI\_4 - LOT SHORT PLAT

TREE PLANTING PLAN

CASCARA TREE CONSULTING

PN-8078A  
QUALIFIED TREE RISK  
ASSESSOR



PREPARED:

08/09/2023

SHEET NO.

TR-02