

CASCARA TREE CONSULTING

ARBORIST REPORT

TO: Tammy Liu

REFERENCE: Tree Inventory & Assessment

SITE ADDRESS: 8636 N Mercer Way, Mercer Island, WA

DATE: 3/10/2024

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

I conducted an inventory and assessment of 17 trees measuring 10-inches Diameter at Breast Height (DBH) or greater at the above-addressed site; one of which meets the Exceptional size threshold. All 17 trees assessed were in good to fair health and structural condition and considered viable.

The project proposes retention of all 17 viable trees on the site for a total retention of 100-percent meeting the requirements of MICC 19.10.060(a)(2)(a). This report also addresses comments received from the City of Mercer Island dated January 10, 2024, regarding impacts to trees from recent site work.

See Tables 1 and 2 below for a summary of tree retention.

Table 1. Summary Tree Table

Summary Tree Table	
Total Trees	17
Total Viable Trees	17
Total Not Viable Trees	0
Total Viable Retain	17
Total Viable Remove	0
# Trees Required to Retain per MICC 19.10.060 (30%)	5
Total Retention Percentage	100%

Table 2. Summary Exceptional Tree Table

Summary Exceptional Tree Table	
Total Exceptional Trees by Size	1
Total Viable Exceptional Trees	1
Total Viable Exceptional Retain	1
Total Viable Exceptional Remove	0

Tree Viability

I performed a Level 2 Visual Tree Assessment (VTA) of the 17 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 criteria¹ 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.

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>
Excellent	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.
Good	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.
Fair	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.
Poor	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.

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

¹ 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).

Tree Impacts & Protection Specifications

The western portion of the site along N. Mercer Way was recently improved, including construction of several concrete block walls, a greenhouse, and gazebo. There are several significant trees located throughout this area; however, impacts to these trees were minimal and are not likely to have long-term impacts.

The grade was maintained or raised throughout the area of work. Because the site slopes gradually east toward the lake, the installation of the retaining walls did not result in substantial excavation. The walls were installed, and fill soil was added behind the walls to level/terrace the area to make it more usable.

Tree #s 1924 and 1925 are located near the existing detached dwelling unit. These trees are a 16-inch DBH western redcedar (*Thuja plicata*) and 20.5-inch DBH Douglas-fir (*Pseudotsuga menziesii*), respectively. A rock retaining wall was installed east of the trees and fill soil was added to level the area. As a result of the fill, the trunks were slightly buried at the time of my assessment, which can lead to trunk rot and other moisture-related issues. **To mitigate potential issues, I recommend removing the soil around the base of the trees to expose the root flares.** This work should be done by hand using a shovel and mattock to carefully remove soil from around the base of the trees. Gradually expose the root flare without causing damage to the roots or trunk and avoid excessive disturbance to the root zone. Any adventitious roots growing above the root flare should be carefully trimmed with hand pruners. The area around the tree should be re-graded to encourage proper drainage away from the trunk (see Figure 1).

Tree #1929 is a 21.3-inch DBH western redcedar located along the western property line. A concrete block retaining wall was constructed about 8-9 feet from the base of the tree. Excavation required for the wall was minimal, and the grade was raised above the wall resulting in minimal tree impacts. **There were a few inches of fill soil around the tree base which should be removed per the specifications described above.** Overall impacts to this tree are likely to be negligible and should not impact long-term viability.

The remainder of trees throughout this area are either small or located further from recent site work and were not impacted.

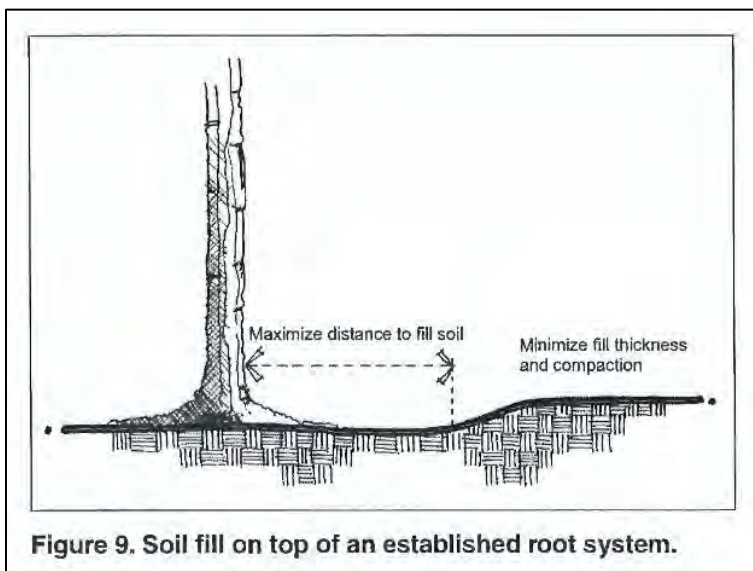


Figure 1. Expose root flare by removing soil around base of trees (Best Management Practices: Managing Trees During Construction, 2016).

PHOTOGRAPHS



Photo 1. Base of Tree #s 1924 and 1925. Slight fill soil added at base. See specifications for mitigating.



Photo 2. Base of Tree #1929. Slightly pull soil away from base of tree to ensure moisture is not accumulating at base.



Photo 3. Looking southwest toward recent site work.

Attachments

- 1) Glossary
- 2) References
- 3) Inspection Methods
- 4) Appendix A – Assumptions & Limiting Conditions
- 5) Appendix B – Certification of Performance
- 6) Tree Inventory Map**
- 7) Tree Inventory Table**

GLOSSARY

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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- Mattheck, Claus and Breloer, Helge. The Body Language of Trees: A Handbook for Failure Analysis. London: HMSO, 1994
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INSPECTION METHODS

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

- 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

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 (in)	Health Condition	Structural Condition	Viable (Yes/No)	Dripline Radius (ft)	Exceptional Size Threshold	Exceptional	Remove/Retain	Notes/Observations
Site Trees											
523	<i>Thuja plicata</i>	Western Redcedar	17.5	Good	Good	Yes	15.0	30		Retain	
1925	<i>Pseudotsuga menziesii</i>	Douglas-fir	20.5	Good	Good	Yes	12.0	30		Retain	Fill soil added around base; trunk slightly buried
1924	<i>Thuja plicata</i>	Western Redcedar	16.0	Good	Good	Yes	13.0	30		Retain	Fill soil added around base; trunk slightly buried
1929	<i>Thuja plicata</i>	Western Redcedar	21.3	Fair	Good	Yes	10.0	30		Retain	Canopy slightly thin; some fill soils around base; new rock retaining wall about 8 feet from base of tree
524	<i>Pinus nigra</i>	Austrian Black Pine	16.0	Good	Good	Yes	10.0	24		Retain	Located on property line
525	<i>Pinus nigra</i>	Austrian Black Pine	16.0	Good	Good	Yes	9.0	24		Retain	Located on property line
526	<i>Prunus spp.</i>	Flowering cherry	11.0	Fair	Fair	Yes	15.0	23		Retain	Small tree; minimal impacts
527	<i>Thuja plicata</i>	Western Redcedar	21.4	Fair	Good	Yes	16.0	30		Retain	Canopy slightly thin
528	<i>Pseudotsuga menziesii</i>	Douglas-fir	41.9	Good	Good	Yes	28.0	30	Exceptional - Size	Retain	Dominant and old fir tree in good condition
529	<i>Thuja plicata</i>	Western Redcedar	11.0	Good	Good	Yes	15.0	30		Retain	
530	<i>Thuja plicata</i>	Western Redcedar	18.0	Fair	Fair	Yes	17.0	30		Retain	Growing on nurse stump; stilted root structure; canopy slightly thin
531	<i>Chamaecyparis pisifera</i>	Sawara cypress	10.5	Fair	Fair	Yes	15.0	-		Retain	Heavy sapsucker activity
532	<i>Chamaecyparis pisifera</i>	Sawara cypress	14.0	Fair	Fair	Yes	15.0	-		Retain	Heavy sapsucker activity; trunk is hollow sounding
533	<i>Quercus palustris</i>	Pin Oak	19.3	Good	Good	Yes	35.0	30		Retain	
534	<i>Pinus nigra</i>	Austrian Black Pine	19.0	Good	Good	Yes	20.0	24		Retain	
535	<i>Thuja plicata</i>	Western Redcedar	15.0	Good	Good	Yes	17.0	30		Retain	
536	<i>Fagus sylvatica</i>	European Beech	19.0	Good	Good	Yes	17.0	30		Retain	
Off-Site Trees											
A	<i>Thuja plicata</i>	Western Redcedar	30.0	Good	Good	-	20.0	30	Exceptional - Size	Retain	
B	<i>Pseudotsuga menziesii</i>	Douglas-fir	16.0	Good	Good	-	12.0	30		Retain	
C	<i>Abies grandis</i>	Grand Fir	20.0	Poor	Poor	-	6.0	24		Retain	Dying
D	<i>Thuja plicata</i>	Western Redcedar	18.0	Good	Good	-	16.0	30		Retain	Compacted soils at base
E	<i>Cedrus deodara</i>	Deodar Cedar	17.0	Good	Good	-	19.0	30		Retain	