CASCARA TREE CONSULTING
ARBORIST REPORT

TO:	Mr. Jintao (Addison) Cui
REFERENCE:	Tree Removal Assessment (Tree #s 6, 14, 23)
SITE ADDRESS:	4833 90th Ave SE, Mercer Island, WA
DATE:	7/17/2023
PREPARED BY:	Katie Hogan, ISA Certified Arborist PN-8078A ISA Tree Risk Assessment Qualified

I assessed three (3) trees at the above-addressed site that were previously removed to determine whether the trees met the City of Mercer Island's criteria for a hazard tree and to address comments received from the City dated June 5th, 2023. This memo addresses the following City comment:

> *Trees numbered 6, 14, and 23 were previously cut down without a permit. Please provide the reason for their removal. Please provide the diameter of the trees at 4.5 or a stump diameter. Appraisal for the value of trees 6, 14, and 23 is required even if the appraisal is retroactive with only the stump left.*

Observations & Discussion

I used historical photos available through Google Street View, photos available online from realtors, and observations of the remaining tree parts to evaluate the condition of the subject trees. I measured the diameter of each of the remaining stumps and measured the height of the cut stump.

Using Visual Tree Assessment (VTA) methods, I was able to determine that the three trees were all in declining condition at the time of their removal. See details in the table below for more information.

Table 1. Tree information and observations

Tree #	**Species**	**Stump Diameter** (in)	**Height of Stump Cut** (ft)	**Health Condition**	**Structural Condition**	**Notes**
6	Western redcedar (*Thuja plicata)*	27"	3'	Poor/Dead	Fair	Tree was over 70% dead; advanced trunk decay
14	Bigleaf maple (*Acer macrophyllum*)	12"	2'	Fair	Poor	Living snag; repeatedly topped; 100% ivy cover
23	Red alder (*Alnus rubra*)	19"	1.5'	Fair	Poor	Living snag; ivy cover

Appraisal Valuation

I conducted a tree appraisal using the Cost Approach and Trunk Formula Method outline in the Guide for Plant Appraisal, 10th Edition. This method is used to determine the value of mature and/or large trees that cannot be replaced in kind from nursery or field grown stock. The value of the tree using this methodology is based on the cost of the largest most commonly available tree stock, cost of installation, and the increase in value to account for the larger size of the subject tree being appraised. The value of the tree is then adjusted based on the observed condition of the tree as well as any limitations of the site where the tree was growing. The following formula is used to calculate the appraisal valuation:

Value = (Basic Tree Cost) X (Condition Rating %) X (Functional Limitations %) X (External Limitations %)

Table 2. Appraisal Calculations

Tree #	Species	Condition Rating	Functional Limitations	External Limitations	Basic Reproduction Cost	Depreciated Reproduction Cost	Total Appraisal Value (rounded)
6	*Thuja plicata*	14%	40%	50%	$32,636	$914	$910
14	*Acer macrophyllum*	30%	20%	20%	$8,143	$98	$100
23	*Alnus rubra*	30%	40%	40%	$20,414	$980	$980

Condition Ratings

Based on observations of the trunk, branches, roots, twigs, and foliage during the site inspection and review of imagery available online, average condition ratings were assigned to each tree. These ratings are based on the health, structure, and form of the tree which consider the following factors:

Health: *Considers crown indicators such as vigor, density, leaf size, quality, and stem shoot extensions.*

Structure: *Considers root condition and form, trunk condition, and branch assembly and arrangement.*

Form: *Considers the general shape and overall tree form.*

Table 3. Condition ratings for each tree

Tree #	Species	Average Condition Rating	Health Rating	Structure Rating	Form Rating	Factors Considered
6	*Thuja plicata*	14%	10%	20%	10%	Nearly dead; decayed
14	*Acer macrophyllum*	30%	30%	30%	30%	Declining/weak canopy; previously topped
23	*Alnus rubra*	30%	30%	30%	30%	Declining/weak canopy; previously topped

Functional & External Limitations

Based on observations of the site, location of the trees, and species characteristics functional and external limitation ratings were assigned. These ratings consider the following:

Functional Limitations: *Considers factors that may limit future growth, development, and overall health such as proximity to utility lines, susceptibility to pests or disease, or lack of soil and water availability.*

External Limitations: *Considers factors outside of the control of the tree owner that may affect long-term viability, structure, health, or tree form such as view easements, overhead utility pruning, prevalent disease/pests in the area, or climate change.*

Table 4. Functional and external limitation ratings for each tree

Tree #	Species	Functional Limitations	External Limitations	Factors Considered
6	*Thuja plicata*	40%	50%	Adjacent to new development; species intolerance to climate change & altered soil hydrology
14	*Acer macrophyllum*	30%	30%	Topped for utility clearance
23	*Alnus rubra*	30%	30%	Previously topped; species prone to decay/failure

PHOTOGRAPHS

Photo 1. Tree #6, cedar, nearly dead (Source: Zillow, accessed 7/13/2023).

Photo 2. Remaining stump from tree #6 showing substantial central decay and response growth around decay/wound.

Photo 3. Tree #23 shown from historical 2018 street view. Tree is a living snag that appears to have previously failed.

Photo 4. Remaining stump of Tree #23, alder.

Photo 5. Historical Google Street View imagery from October 2022 of Tree #14. Tree was in poor condition, nearly completely covered in ivy, and previously topped.

Photo 6. Historical Google Street View imagery from April 2022 of Tree #14. Tree was in poor condition, nearly completely covered in ivy, and previously topped.

Photo 7. Base of Tree #14. Eastern trunk failed and remaining western trunk over Island Crest Way was cut. Decay-causing fungi Kretzschmaria deusta was present.

Photo 8. Fallen tree parts from failed eastern trunk of Tree #14, note breaking point. Fallen trunk completely covered in ivy.

Attachments

1) Glossary
2) References
3) Inspection Methods
4) Appendix A – Assumptions & Limiting Conditions
5) Appendix B – Certification of Performance

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)

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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 instate 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:

Cascara Tree Consulting, LLC