

March 26, 2024

Matt Mawer
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Re: Arborist Report – Mercer Island/Hackett Residence

DCG/Watershed Reference Number: 2312.0315.00

Dear Matt:

We are pleased to present you with the findings of our tree inventory and arborist report for the property at 2965 74th Avenue SE, Mercer Island (parcel #531510-0756). Deb Powers, ISA Certified Arborist® and Qualified Tree Risk Assessor with DCG/Watershed, visited the subject property on January 12th, 2024, to inventory and assess trees within the project area.

The intent of this tree inventory was to screen for, identify, and assess any trees previously surveyed or trees meeting the City of Mercer Island’s large or exceptional tree code definitions that may be impacted by the proposed project. Tree attributes including species, size, and condition, were assessed during the on-site inventory, and are summarized in the enclosed Tree Inventory Table. Tree locations by number are shown on the enclosed site plan.

This arborist report has been prepared for the following purposes:

- Describe the tree inventory and assessment methods;
- Summarize tree inventory and assessment results;
- Document relevant municipal code and outline any necessary tree replacement or replanting requirements;
- Discuss the effects of potential development on existing tree conditions; and
- Provide construction strategies for the protection of trees to be retained.

Introduction

Background

The proposed project involves demolition and improvements to the existing single-family home on the property. Details of proposed improvements outside the existing building footprints were not provided.

Study Area

The study area includes the subject property and adjacent vegetation that the future project may affect. The parcel totals approximately 13,731 square feet (according to King County Assessor) and is zoned as Single Family Residential. Surveyed tree locations were provided to DCG/Watershed by NW Lifestyle Homes.



Figure 1. Vicinity map showing study area (parcel boundary highlighted in blue).
Imagery: King County Parcel Search

Current Site Conditions

The property is developed with a single-family home, detached garage, driveway and associated hardscape and landscaping. The trees on site consist of Douglas fir (*Pseudotsuga menziesii*), Western red cedar (*Thuja plicata*), and Korean dogwood (*Cornus kousa*). Two multi-stemmed rhododendrons that are in the rear yard are not included in the inventory as Mercer Island City Code (MICC) Chapter 19.10.060 does not prioritize small trees under 10" trunk diameter for retention with development. The majority of both the front and backyard is grass.

Methods

All previously surveyed trees in the study area, including those on adjacent parcels with overhanging driplines, were identified and assessed in the field using a Basic Assessment according to International Society of Arboriculture (ISA) standards to collect species name (scientific and common), number of stems, diameter, height, average crown radius, overall condition rating, and general assessment notes.

Diameter

According to Mercer Island City Code MICC 19.16.010, the lowest size threshold for a regulated tree is a "large" tree with at least ten inches DBH, the diameter at breast height measured at 4.5 feet above the average surface of the ground. The DBH for all large trees on the subject property was measured and recorded in the inventory, while those offsite with overhanging driplines were visually estimated. The methodology for measuring and calculating the diameter of trees with multiple trunks, major leans, or on steep slopes follows those outlined in the *Guide for Plant Appraisal, 10th Edition*, written by the Council of Tree and Landscape Appraisers (CTLA) and published by ISA (CTLA 2020). To measure trees with multiple trunks, the total diameter of multi-stemmed trees was calculated by taking the square root of the sum of each diameter squared; this allows for comparison to other single-stemmed trees and for more accurate permitting and tree retention calculations.

Estimated Height

The height of trees on the subject property and adjacent trees was visually estimated.

Canopy Radius

Canopy radius, also known as dripline, was measured horizontally from the center of the trunk to the outermost branch tips. For trees with uneven crowns, the average of the radii in each cardinal direction was measured.

Condition

A basic visual assessment was used to evaluate the health and condition of trees within the study area. The condition determination was based on current conditions and considered the

health, structural integrity, and form of the tree, in addition to characteristics of each species. Condition rating categories are described in Table 1 below. Each tree was given an overall condition rating from *Excellent* to *Very Poor* as summarized below.

Table 1. Tree Condition Ratings Table

Rating Category	Condition Components			Percent Rating
	Health	Structure	Form	
Excellent - 1	High vigor and nearly perfect health with little or no twig dieback, discoloration, or defoliation.	Nearly ideal and free of defects.	Nearly ideal for the species. Generally symmetric. Consistent with the intended use.	81% to 100%
Good - 2	Vigor is normal for species. No significant damage due to diseases or pests. Any twig dieback, defoliation, or discoloration is minor.	Well-developed structure. Defects are minor and can be corrected.	Minor asymmetries/deviations from species norm. Mostly consistent with the intended use. Function and aesthetics are not compromised.	61% to 80%
Fair - 3	Reduced vigor. Damage due to insects or diseases may be significant and associated with defoliation but is not likely to be fatal. Twig dieback, defoliation, discoloration, and/or dead branches may compromise up to 50% of the crown.	A single defect of a significant nature or multiple moderate defects. Defects are not practical to correct or would require multiple treatments over several years.	Major asymmetries/deviations from species norm and/or intended use. Function and/or aesthetics are compromised.	41% to 60%
Poor - 4	Unhealthy and declining in appearance. Poor vigor. Low foliage density and poor foliage color are present. Potentially fatal pest infestation. Extensive twig and/or branch dieback.	A single serious defect or multiple significant defects. Recent change in tree orientation. Observed structural problems cannot be corrected. Failure may occur at any time.	Largely asymmetric/abnormal. Detracts from intended use and/or aesthetics to a significant degree.	21% to 40%
Very Poor - 5	Poor vigor. Appears to be dying and in the last stages of life. Little live foliage.	Single or multiple severe defects. Failure is probable or imminent.	Visually unappealing. Provides little or no function in the landscape.	6% to 20%
Dead - 6				0% to 5%

Mercer Island City Code

Tree Removals Associated with Development MICC Chapter 19.10.060

Retention requirements stipulate that a minimum of 30 percent of the regulated trees (10 inches or greater in DBH or that otherwise meet the definition of a “large tree”) be retained over a rolling five-year period to maximize on-site tree retention while minimizing the removal of large trees. Exceptional trees are defined as minimum 24 inches DBH and by species/trunk diameter listed per MICC 19.16.010. A tree grove is “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 meet the definition of a hazardous tree. Under MICC 19.10.060, the following trees are prioritized for retention, in this order:

1. Exceptional trees
2. Trees with greater than 24-inches trunk diameter
3. Trees that have a greater likelihood of longevity; and
4. Trees that are a part of a healthy grove.

Exceptional trees are required to be retained. Removal of exceptional trees is limited to the following exceptions:

1. Retention of an exceptional tree will result in an unavoidable hazardous situation.
2. Retention will limit the constructable gross floor area to less than 85 percent of the maximum gross floor area allowed (Ch 19.02).

Tree Replacement MICC 19.10.070

Note that to our best knowledge, no trees have been proposed for removal by the applicant. If known improvements were to necessitate tree removal, depending on the size of any trees removed, they shall be replaced using the following ratios:

Table 2. Tree Replacement Ratio MICC 19.10.070.A

Diameter of the Tree Removed	Required Number of Replacements
Less than 10 inches	1
10 inches up to 24 inches	2
24 inches up to 36 inches	3
More than 36 inches and exceptional trees	6

The possibility for reducing the number of required replacement trees exists (MICC 19.10.070.B.4) if, for example, replacement of hazardous, undesired, or short-lived trees with healthy new trees that have a greater chance of long-term survival.

Results

Tree Inventory and Assessment Findings

A total of 7 trees were assessed within the study area. On-site trees include 1 Douglas fir (*Pseudotsuga menziesii*), 2 Western red cedars (*Thuja plicata*), and 1 Korean dogwood (*Cornus kousa*). Of those trees, 4 trees on the subject property meet the criteria for large trees as defined by MICC 19.10.010. No groves are located on the parcel. A total of 3 “exceptional” sized trees at least 24-inches DBH were identified on the subject property. Details can be found in Table 3, Tree Inventory Table below.

Table 3. Tree Inventory Table

TREE # (untagged)	TREE NAME	# STEMS	COMB DBH (IN)	HEIGHT (FT)	RADIUS (FT)	CONDITION	EXCEPTIONAL	REMOVAL	NOTES
1	Western Red Cedar, <i>Thuja plicata</i>	1	35.2*	95	20'	Fair	Yes	No	Tips pruned, slight lean N., thinning, crack, buckling bark
2	Western Red Cedar, <i>Thuja plicata</i>	1	35*	75	20'	Good	Yes	No	Previously topped at 60'
3	Korean dogwood, <i>Cornus kousa</i>	2	13.1	20	18'	Good	No	No	8.8" + 9.8" DBH
4	Douglas fir, <i>Pseudotsuga menziesii</i>	1	37.2*	120	30	Excellent	Yes	No	Open-grown, full canopy
A	Western Red Cedar, <i>Thuja plicata</i>	1	40.0	110	30	Good	Yes	No	Offsite
B	Douglas fir, <i>Pseudotsuga menziesii</i>	1	38.0	110	30	Good	Yes	No	Offsite
C	Douglas fir, <i>Pseudotsuga menziesii</i>	1	24.0	110	25	Good	Yes	No	Offsite
**"Exceptional" per MIMC 19.10.060.A.3									

Diameter

Trees range in DBH from 13.1 inches to 37.2 inches, with an average diameter of 25.15 inches.

Height

The estimated height of the trees ranges from 20 feet to 120 feet, with an average height of 77.5 feet.

Canopy radius

The canopy radius of all trees ranges from 18 to 30 feet, with an average radius of 22 feet.

Condition

Of the 4 onsite trees, 2 (Trees #2, 3) were found to be in *Good* condition with normal vigor, well-developed structure and no significant damage, defects or disease. One tree, Tree #4, the Douglas fir in the rear yard is in *Excellent* condition, showing high vigor with nearly ideal structure and free of any obvious defects.

One Western red cedar (Tree #1) was noted in *Fair* condition due to a longitudinal trunk crack and buckling bark that may be a result of a lightning strike that occurred many years, possibly a decade ago. Internal decay may be present at this location, although a Level I visual inspection could not determine the extent of the potential decay. It has reduced vigor evident by thinning foliage, which is also typical for red cedars that may be undergoing stress related to recent years' dry, hot summers.

Three trees, Trees A, B, and C, whose canopies extended into the subject parcel, were located off-parcel and assessed from the subject parcel. Of the off-site trees, all were given a *Good* rating, exhibiting generally even canopies, good structure and vigorous growth.

Recommendations for Site Design & Tree Protection

Tree Retention and Removal

Exceptional trees are prioritized to be retained by the City of Mercer Island. However, based on the 30 percent retention requirement, one on-site tree may be removed. Tree #1 appears to have slight defects that may be limiting its capacity for long-term longevity, especially if it were to sustain impacts due to development.

Exceptional trees must be retained unless they can qualify for removal based on the exceptions per MICC 19.10.070.B.4, described earlier. Tree #1 may qualify for removal as a hazardous tree if it were to undergo a Level II assessment. That is not to say Tree #1 should be removed based on its current condition, especially if adequate tree protection is provided.

Tree Protection

ANSI A300 Part 9 Tree Care Standards (2023) define limits of allowable disturbance as TPZ, or Tree Protection Zone, calculated at 6-18 times trunk diameter. At its minimal range (rounding up fractions), TPZ equates to the following distances from the trunk face:

Tree #1 - 18-foot radius

Tree #2 - 18-foot radius

Tree #3 - 7-foot radius

Tree #4 - 19-foot radius

Tree #1 - It appears that underground utility trenching may be proposed within Tree #1 TPZ. Utilities that cannot be routed outside the TPZ should be installed by tunneling or other methods to avoid root damage. If minimum TPZ cannot be achieved, removal and mitigation should be followed per MICC.

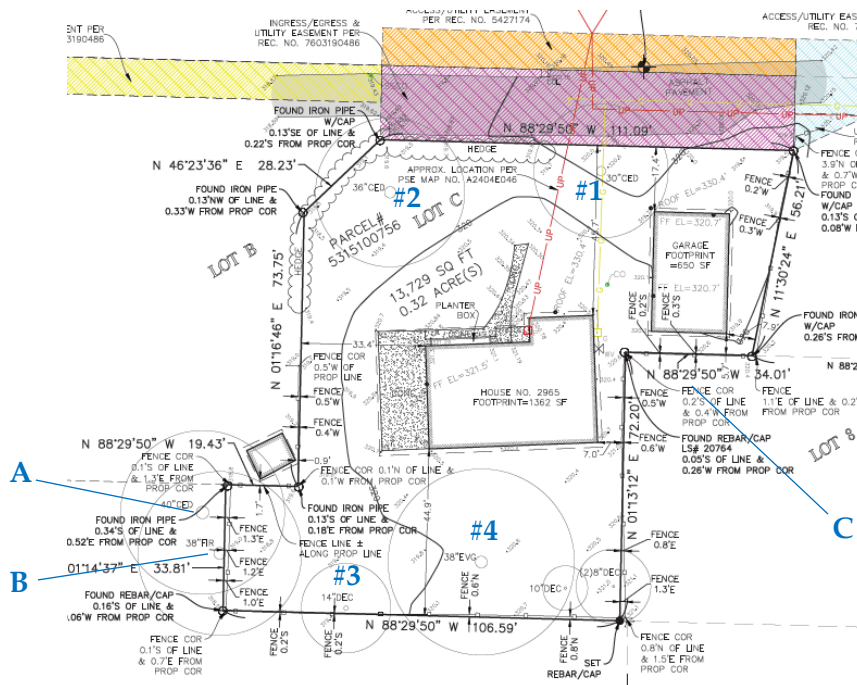
Tree #2 – Fencing shall be installed at the minimal TPZ to provide adequate tree protection, however if site conditions allow, increase the TPZ/fence location to the maximum feasible that can remain through the duration of construction. Only specified and approved activities may occur within the TPZ.

Trees # 3-4 - Because Douglas fir can tolerate a moderate amount of root loss and Tree #4 is in excellent condition/well-suited for retention efforts, the minimal TPZ is appropriate for Tree #4. If tree protection fencing placed 19 feet north of Tree #4 (parallel to the south property line), extending to the east and west property lines, Offsite Trees A-B to the west of the subject property and Tree #3 would receive adequate tree protection.

Adequate tree protection would be afforded to offsite Tree C if fencing were to be installed at the east property line inset corner and run east and south 20 feet to minimize potential impacts.

All minimum required tree protection measures shall be shown on the development plan set, to scale, at these distances. All site improvements shall be designed and located to minimize tree removal during and following construction.

Figure 2. Site Plan



Additional Tree Protection Recommendations

Root pruning

Where excavation or construction is proposed within the TPZs of retained trees, roots must be protected or properly pruned to ensure tree health and stability. Prior to excavation within a tree's root zone exposing roots using high-pressure air (pneumatic) or water (hydraulic) excavation is recommended at the outer limit of the proposed excavation and should be overseen by the project arborist. Any roots over one inch that are exposed after excavation should be clean cut by hand. All root pruning of roots over one inch should be overseen by the project arborist.

Trenching, Excavation, and Tunneling

Trenching and excavation within the critical root and tree protection zones should be avoided to reduce root loss and to help preserve the structural integrity of the tree. Alternative routes outside the TPZ should be considered for underground infrastructure. If no alternative path is possible, consider using air excavation to create a trench or tunneling at least 18 inches below the soil to reduce the loss of roots.

The following best practices for trenching are as follows (ANSI A300 Part 9, 2023):

- Excavation and construction equipment shall be kept out of the TPZ.
- Excavation and construction equipment shall be selected, positioned, and operated to avoid damage to tree roots, branches, and trunks.
- Prior to soil excavation near trees, roots should be pruned or cleanly cut at the excavation limit, outside the TPZ.
- The least destructive methods should be used to minimize damage to roots greater than 2 inches in diameter during soil excavations.
- Exposed roots should be covered and kept moist until backfilled.

Limitations of This Study

The findings of this report are based on the best available science and are limited to the scope, budget, and site conditions at the time of the assessment. Although the information in this report is based on sound methodology, internal physical flaws (such as cracking or root rot) or other conditions that are not visible cannot be detected with this limited basic visual screening. Trees are inherently unpredictable. Even vigorous and healthy trees can fail due to high winds, heavy snow, ice storms, rain, age, or other causes.

This report is based on the current observable conditions and may not represent the future conditions of the trees. Changes in site conditions, including clearing and grading, will alter the condition of the remaining trees in a way that is not predictable. The conclusions contained within this report have been made for permitting purposes only and are not intended for tree risk assessment purposes.

Please call if you have any questions or if we can provide you with any additional information.

Sincerely,



Deb Powers

ISA Certified Arborist® PN-1465A

Tree Risk Assessment Qualified (TRAQ)

References

American National Standard (ANSI) A300 (Part 5). 2019. Tree, Shrub, and Other Woody Plant Management Standard Practices (Management of Trees and Shrubs During Site Planning, Site Development, and Construction). Londonderry, NH: Tree Care Industry Association.

Council of Tree & Landscape Appraisers (CTLA). 2020. Guide for Plant Appraisal: 10th Edition, Revised. Atlanta, GA: International Society of Arboriculture.

[Mercer Island City Code. MCC Chapter 19.10 – Trees](#) (Municode) accessed March 26, 2024.