



Formerly DCG/Watershed

September 30, 2024

Tim and Kathy Bauman
5928 77th AVE SE
Mercer Island, WA 98040
Email: kathrynbauman@aol.com

Tree Inventory Report

Facet Number: 2402.0436.01

Dear Tim and Kathy:

We are pleased to present you with the findings of our tree inventory and impact assessment for your property at 5928 77th Avenue SE in Mercer Island, Washington (parcel #2424049037). The enclosed report has been prepared to describe our inventory methods, summarize the tree inventory and assessment results, outline local requirements for tree retention and/or replacement, and provide an impact assessment based on the site plan prepared by McClellan | Tellone, dated August 20, 2024.

Please reach out if you have any questions.

Sincerely,

A handwritten signature in blue ink that reads 'Devin Melville'.

Devin Melville
ISA Certified Arborist® PN-9628A
dmelville@facetnw.com

Enclosure

Arborist Report



Arborist Report

Bauman Residence

Facet Number: 2402.0436.01

September 2024

Introduction

This report outlines the methods, findings, and regulatory implications of a tree inventory study completed at 5928 77th Avenue SE in Mercer Island, Washington (parcel #2424049037). Devin Melville, an ISA Certified Arborist® with Facet, visited the study area on September 17, 2024, to inventory and assess trees. The intent of the study was to screen for, identify, and assess any regulated trees that may be impacted by the proposed project.

BACKGROUND

The project proposes to demolish the existing residence and shed and construct a new single-family residence. The parcel is located near the base of a ravine with a stream flowing along the northeast property line. In February of 2024, Facet ecologist Sage Yuasa visited the subject property to flag the ordinary high water mark (OHWM) of the on-site portion of Stream A. During that visit, one wetland, Wetland A, was observed off-site to the north of the stream. No wetlands were identified on the subject property. Stream A was determined to be a Type F stream with a 120-foot buffer, per Mercer Island City Code (MICC) 19.07.180.C.1 requirements. For additional information, refer to the *5928 77th AVE SE Stream Delineation and Wetland Assessment Report*, dated March 5, 2024.

STUDY AREA

The study area includes the subject property and adjacent trees which may be affected by the proposed development. The subject property is approximately 0.36-acre in size according to the King County Assessor and is currently developed with a single-family residence, detached structures, associated hardscaping and ornamental landscaping (Figure 1). The site is zoned single-family residential (R-12). Single-family residential parcels border the subject property in all directions and Lake Washington is adjacent to the west.

EXISTING CONDITIONS

The subject property is landscaped with grass, garden plants, and both native and ornamental shrubs, trees, and ground covers. The parcel is located on the southern flank of a forested ravine with a stream flowing along the northeast parcel boundary and continuing under the property before discharging into Lake Washington. Trees on the subject property include both native and non-native species and are discussed in detail below.

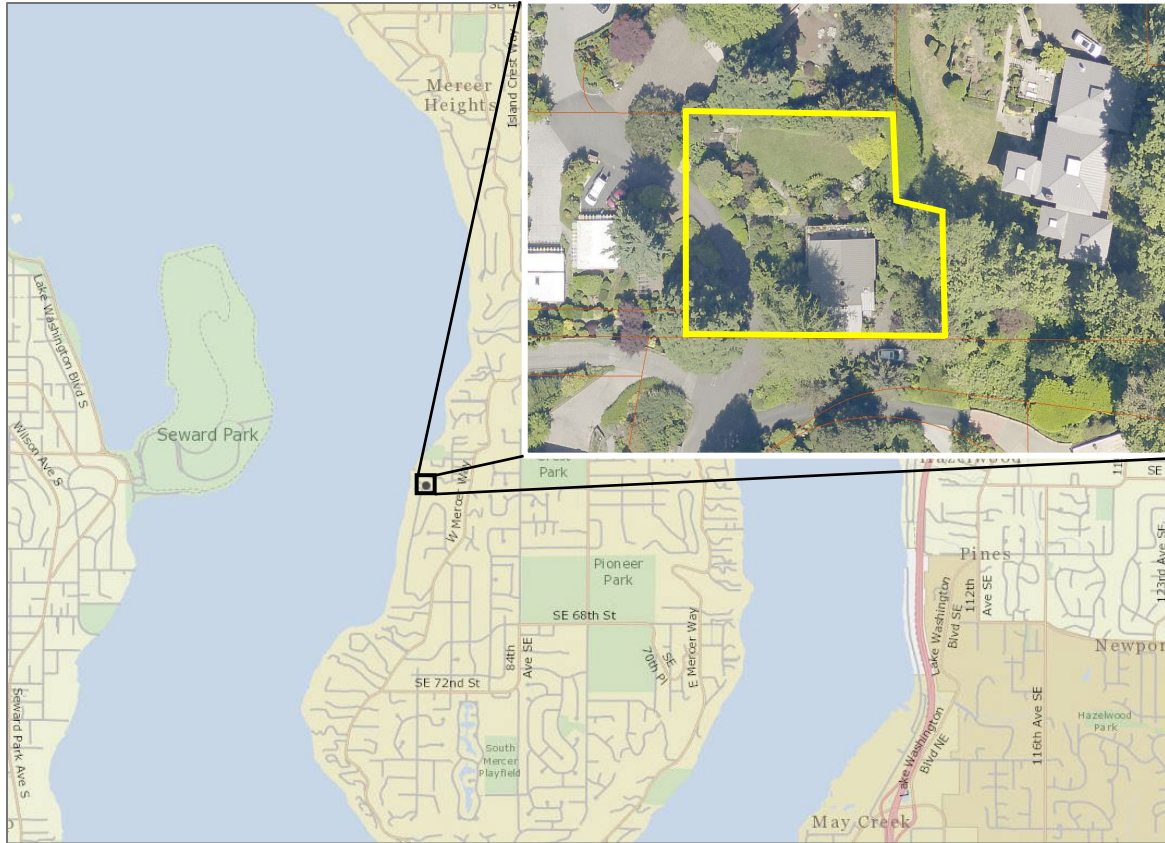


Figure 1. Vicinity map, subject property outlined in yellow. Source: King County iMap, 2021.

Methods and Definitions

All regulated trees in the study area were identified and assessed in the field using a Basic Assessment according to International Society of Arboriculture (ISA) standards. Regulated off-site trees with canopies overhanging the project area were also assessed from the subject property.

According to the Mercer Island City Code (MICC), regulated trees are defined as follows:

MICC 19.16.010 – Tree, large (regulated):

Any tree with a diameter of ten inches or more, and any tree that meets the definition of an exceptional tree.

MICC 19.16.010 – Tree, exceptional:

A tree or group of trees that because of their unique historical, ecological, or aesthetic value constitute an important community resource. An exceptional tree is a tree that is rare by virtue of size, species, condition, cultural importance, age, and/or contribution as part of a tree grove. Trees with a diameter of more than 36 inches, or with a diameter that is equal to or greater than the diameter provided in the Exceptional Tree Table, are considered exceptional trees.

All inventoried trees were previously assigned an identification (ID) number by the Project Team as shown on the site plan provided. For this reason, on-site trees were not tagged, and the current numbering system was used. Off-site trees were assigned a digital ID letter and were not tagged.

In addition to the ID number, the following attributes were recorded for all inventoried trees:

- **Species Name** (scientific and common).
- **Number of Stems.**
- **Diameter.** The diameter-at-breast-height (DBH) of all regulated trees in the study area was measured at 4.5 feet above the average surface of the ground. The methodology for measuring and calculating the diameter of trees with multiple trunks, major leans, or on steep slopes followed 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 was visually estimated.
- **Canopy Radius.** Canopy radius, also known as crown radius or dripline, was measured horizontally from the center of the trunk to the outermost branch tips. For trees with uneven crowns, the average of two perpendicular radii was recorded.
- **Condition.** A basic visual assessment was used to evaluate the health and condition of trees within the study area in accordance with ISA and CTLA standards. The condition determination was based on current conditions and considered the health, structural integrity, and form of the tree, in addition to the characteristics of each species. Each tree was given an overall condition rating from Excellent to Very Poor as summarized in Table 1.

Tree locations were identified by a professional land surveyor and incorporated onto the site plan prepared by McClellan | Tellone, dated August 20, 2024. The survey and proposed site plan were provided to Facet in PDF format.

Table 1. Tree Condition Ratings (adapted from CTLA 2020).

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 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%

Findings

A total of six trees that meet the City’s definition of a regulated tree were located on-site. All other trees located on the subject property are less than 10-inches DBH and therefore do not meet the definition of a regulated tree. One off-site tree was also inventoried and assessed. Table 2 below includes details of all inventoried trees.

Table 2. Tree Inventory Table.

TREE ID #	TREE NAME	# STEMS	COMB DBH (IN)	HEIGHT (FT)	RADIUS (FT)	CONDITION	SIGNIFICANT	EXCEPTIONAL	REMOVAL	NOTES
100	<i>Sequoiadendron giganteum</i> (Giant sequoia)	1	72.9	75	20	Good	Yes	Yes	No	
101	<i>Cedrus deodara</i> (Deodar cedar)	1	33.5	60	25	Good	Yes	Yes	Yes	
105	<i>Cryptomeria japonica</i> (Japanese cedar)	1	11.7	20	4	Good	Yes	No	No	Previously topped.
109	<i>Thuja plicata</i> (Western red cedar)	1	18.0	40	5	Good	Yes	No	No	Structural roots growing toward and under existing walkway.
110	<i>Prunus laurocerasus</i> (Cherry laurel)	2	12.5	30	10	Good	Yes	No	No	*Listed as a weed of concern by King County and its control is recommended in natural areas.
112	<i>Thuja plicata</i> (Western red cedar)	1	42.0	60	15	Fair	Yes	Yes	No	Two cavities on either side of trunk base. Large lower branch growth with no branches mid-trunk.
A	<i>Alnus rubra</i> (Red alder)	1	20.0	45	12	Good	Yes	No	No	Off-site. Uncorrected lean. Canopy overhangs project area.

Diameter. Regulated on-site trees range in DBH from 11.7 inches to 72.9 inches. The average diameter is 31.8 inches.

Exceptional Trees. Three on-site trees meet the criteria for an Exceptional Tree (Tree #100, a 72.9-inch giant sequoia, Tree #101, a 33.5-inch deodar cedar, and Tree #112, a 42-inch western red cedar).

Height. The estimated height of on-site regulated trees ranges from 20 feet to 75 feet. The average height is 47.5 feet.

Canopy radius. The average canopy radius of all on-site regulated trees ranges from 4 feet to 25 feet, with an average radius of 13.2 feet.

Condition. Of the six regulated on-site trees, all but one were found to be in Good condition with normal vigor, well-developed structure, and no significant damage, defects, or disease. One tree, Tree

#112, was in Fair condition, showing signs of reduced vigor, twig dieback, defoliation, or significant damage or defects.

Regulations

The City of Mercer Island regulates tree activity under MICC 19.10 – Trees. In addition to the requirements of MICC 19.10, the removal or pruning of any tree located within a critical area or critical area buffer shall comply with the requirements of MICC 19.07 – Environment.

Tree Removal Associated with a Development Proposal – MICC 19.10.060

Tree retention is required for additions, remodels to an existing single-family dwelling, or a new single-family dwelling with a net lot area of at least 6,000 square feet. A minimum of 30 percent of trees with a diameter of ten inches or greater shall be retained over a rolling five-year period. In addition, the development proposal shall minimize the removal of large trees and maximize on-site retention for exceptional trees, trees that have a greater likelihood of longevity, and trees that are part of a healthy grove. Specifically, MICC 19.10.060.A.3 requires retention of exceptional trees unless the circumstances outlined in MICC 19.10.060.A.3.a-c apply. Given the proposed development, these circumstances are not applicable and all exceptional trees, (Tree #s 100, 101, and 112), must be retained.

Three trees are proposed for removal; however, only one is a regulated tree by definition. Tree #101 is a large deodar cedar with a 33.5-inch DBH and is considered exceptional per the City's exceptional tree table. Should the City allow removal of this tree, approximately 83% of regulated trees on-site would remain. This would comply with the minimum 30 percent retention standard. This report assumes that no other trees have been removed within the past five years.

Tree Replacement – MICC 19.10.070

Pursuant to MICC 19.10.070, replacement tree ratios are based on the diameter of the removed tree. Tree #101 is 33.5 inches in diameter and would therefore require three replacement trees, if allowed to be removed. The project is proposing three Pacific dogwood trees (*Cornus nuttallii*) as replacement trees.

Tree Protection Standards – MICC 19.10.080

Tree protection measures for the remaining regulated trees shall be employed to ensure long-term viability and are discussed below.

Discussion

Effects of Proposed Development

The project proposes to demolish the existing residence and construct a new residence with a larger footprint, as shown in the enclosed site plan. One regulated tree, Tree #101, is proposed for removal. Tree #101 is a large deodar cedar with a 33.5-inch DBH that is located adjacent to the existing residence and driveway. According to the Project Team, this tree will need to be limbed approximately 25 feet up the north side of the trunk in order to construct the proposed residence. The removal of that many limbs combined with the proposed impacts to the CRZ, (discussed below),

may impact the tree such that its long-term viability may be compromised. Given that the tree is considered exceptional, the project design should accommodate its retention.

Tree #101: Should the tree be retained, demolition of the existing residence and excavation for the foundation of the new residence would encroach a portion of the outer critical root zone (CRZ). We recommend exploratory root investigations to guide project design, protection measures during construction, and future maintenance and monitoring needs:

- Exploratory excavation via air spading or hydro spading should be performed by a qualified professional to confirm the presence or absence of structural roots in the location of the proposed foundation prior to excavation activities.
- If structural roots are encountered, the Project Arborist will consult with the project team on whether the proposed excavations will impact the long-term viability of the tree and if alternative designs should be pursued.
- Before construction, tree protection fencing should be installed at the TPZ boundary determined from the exploratory root excavations and approximately four inches of mulch or arborist chips should be placed on the remaining CRZ located outside the fence.

Tree #109: Structural roots associated with Tree #109 were observed near the concrete walkway adjacent to the northeast corner of the existing residence. These roots may extend beneath the walkway. As such, the following practices should be observed:

- Removal of the walkway should be done by hand and no heavy machinery should be used.
- Tree protection fencing shall be installed at a distance of 8 feet from the face of the trunk to the north, south, and west.
- The Project Arborist should be on-site to supervise and consult should roots extend beneath the walkway toward the foundation of the existing residence.

Tree #112: The existing shed located immediately next to Tree #112, an exceptional size western red cedar, is planned to be demolished. Given the proximity of the shed to Tree #112 and the current condition of the tree, protection measures should include the following:

- Prior to construction activities, the remaining CRZ should be protected with tree protection fencing and an application of approximately four inches of mulch or arborist chips.
- A trunk wrap using untreated 2"x4" wood slats should be erected around the trunk of the tree before demolition activities.
- Once the shed is demolished, tree protection fencing shall be installed at a distance of 11 feet from the northwest face of the trunk and 16.5 feet from the west face of the trunk for the remainder of construction.
- The Project Arborist should be on-site for foundation excavations proposed in the outer critical root zone. If structural roots are encountered, the Project Arborist will consult with the

project team on whether the proposed excavations will impact the long-term viability of the tree and if alternative designs should be pursued.

General Tree Protection Recommendations

All retained trees within the vicinity of the proposed project will require protection measures during construction. Trees can be damaged quickly and irreversibly by construction activities, especially by heavy machinery and exposure to chemicals. The following best management practices follow the industry standards for tree protection (ANSI A300 Part 5, 2019) and should be adhered to whenever work is being performed.

Tree Protection Zones and Fencing

The CRZ is the area that contains tree roots critical to the health and stability of the tree. It can be approximated as an area with a radius of one foot for every diameter inch of the trunk. However, topography and site conditions may greatly affect where critical roots are growing. The tree protection zone (TPZ) is the area within the critical root zone in which certain activities are prohibited or restricted to prevent or minimize potential injury to designated trees, especially during construction or development. The TPZ boundary denotes the location of tree protection fencing and should encompass as much of the CRZ as possible. However, the TPZ may be adjusted in size or shape to accommodate the existing infrastructure, planned construction, and specific site conditions, as well as the tree canopy conformation and visible root orientation, species response to construction impacts, size, condition, and maturity.

All construction activities, including staging and driving machinery, should be located outside of the TPZ. Verification of site conditions and long-term health of the tree by an ISA certified arborist may be required for intrusions into the TPZ. The TPZ and other tree protection measures for preserved trees should be shown on the site development plans, including grading and drainage plans and temporary erosion and sediment control (TESC) plans.

Tree Protection Fencing Requirements

- Fencing should be placed at the outer edges of the tree protection zone.
- Fencing should be six feet high and constructed of chain link, wire-mesh, or high-visibility plastic fencing.
- Fencing should include visible warning signs, such as "Tree Protection Area – Keep Out", spaced no further than 15 feet apart.
- Fencing and signage should be installed prior to the start of construction and remain in place for the duration of the project.

Minimize Grade Changes

The grade should not be altered in the TPZ. Most tree roots grow in the top six to 18 inches of soil and are highly susceptible to damage from grade changes. If the grade is lowered, roots critical to health and stability will be removed. If the grade is raised, roots can suffocate from lack of oxygen.

Root pruning

For excavation or construction proposed within the dripline, CRZ, or TPZ, roots must be protected or properly pruned to ensure tree health and stability. Any roots over one inch that are exposed after excavation should be clean cut by hand. All root pruning should be overseen by the Project Arborist or designee.

Maintenance

The impacts of construction are stressful to trees, which may not show the signs of stress for up to five to ten years after being impacted. Applying additional woodchip mulch and providing supplemental irrigation may be necessary to reduce tree stress during construction.

Disclaimer

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 future conditions of the trees. Changes in site conditions, including clearing and grading, will alter the condition of remaining trees in a way that is not predictable.

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.

Matheny, Nelda, and James R Clark. Trees and Development: A Technical Guide to Preservation of Trees During Land Development. International Society of Arboriculture, 1998.

Mercer Island City Code. Chapter 19.10 - TREES | City Code | Mercer Island, WA | Municode Library. Accessed 18 September 2024.

5928 77th AVE SE Stream Delineation and Wetland Assessment Report. March 5, 2024. Facet.

Site Photos (9/17/2024)



Photo 1. Tree #100, facing northwest.



Photo 2. Tree #101, facing north.



Photo 3. Tree #109, facing east.



Photo 4. Roots of Tree #109.



Photo 5. Tree #112, facing east, with existing shed below.

Enclosures: Proposed Site Plan



TREE PROTECTION NOTES

ALL WORK WITHIN DRIFLINE OF TREE 610 & 612 (PER ARBORIST REPORT) TO BE DONE IN COLLABORATION WITH A QUALIFIED ISA CERTIFIED ARBORIST. THE ARBORIST SHOULD BE GIVEN THE DISCRETION TO ADVISE, MONITOR, AND DOCUMENT ALL WORK WITHIN THE DRIFLINE.

ALTERNATIVE EXCAVATION TECHNIQUES SUCH AS PNEUMATIC AIR EXCAVATION SHALL BE EMPLOYED AS DETERMINED BY THE ARBORIST TO RETAIN STRUCTURAL ROOTS NEAR THE LIMITS OF DISTURBANCE.

TREE PROTECTION FENCING IN THE FORM OF 6' CHAINLINK FENCING WILL BE INSTALLED AT THE LIMITS OF DISTURBANCE AND WILL REMAIN FOR THE DURATION OF THE PROJECT.

THE TREE SHALL BE GIVEN SUPPLEMENTAL WATER 3-4 TIMES A MONTH DURING DROUGHT PERIODS (MAY - SEPTEMBER)

THE AREA WITHIN THE TREE PROTECTION FENCING SHALL BE MULCHED WITH 3-4 INCHES OF COARSE WOODY MULCH.

IF EQUIPMENT MUST BE USED IN THE DRIFLINE OF THE TREE, SOIL PROTECTION MEASURES SHALL BE EMPLOYED PER THE ISA BEST MANAGEMENT PRACTICES, AND THIS WORK WILL BE MONITORED. BURLAP TO PREVENT DESICCATION. ALL LARGE EQUIPMENT TO REMAIN OUTSIDE OF CRITICAL TREE ROOT ZONE AT ALL TIMES. CONCRETE TRUCKS TO POUR FOUNDATIONS ADJACENT TO CRITICAL ROOT ZONES AND PROPOSED GRADE BEAM FROM A DISTANCE OF NO LESS THAN 28'-0" FROM THE EXCEPTIONAL TREES.

PILES TO BE DRIVEN BY HANDHELD PILE DRIVER TO AVOID THE USE OF HEAVY EQUIPMENT WITHIN CRITICAL ROOT ZONE.

ANY CLEARANCE PRUNING TO BE DONE ON THIS TREE SHALL BE CONDUCTED BY A QUALIFIED ISA CERTIFIED ARBORIST UNDER THE SUPERVISION OF THE PROJECT ARBORIST.

ARBORIST SHALL BE ON SITE TO MONITOR PLACEMENT OF PILES. PILOT HOLES FOR PILES WILL BE DUG USING PNEUMATIC AIR EXCAVATION TO AVOID STRUCTURAL ROOTS.

TREE ROOTS WERE IDENTIFIED THROUGH AIR EXCAVATION PRIOR TO START OF CONSTRUCTION. REFERENCE ARBORIST MEMORANDUM DATED 08/19/11 PROJECT ARBORIST TO BE ON SITE DURING PLACEMENT OF PILES ADJACENT TO TREE-610 AND TREE-612. PILE LOCATION FLEXIBLE PER STRUCTURAL DRAWINGS.

REFERENCE THE PRUNING SPECIFICATION PROVIDED BY THE LICENSED ARBORIST FOR MAINTENANCE OF EXISTING TREES.

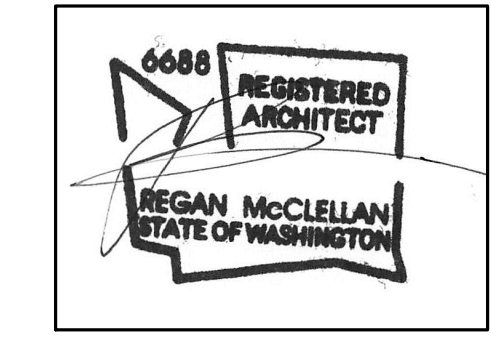
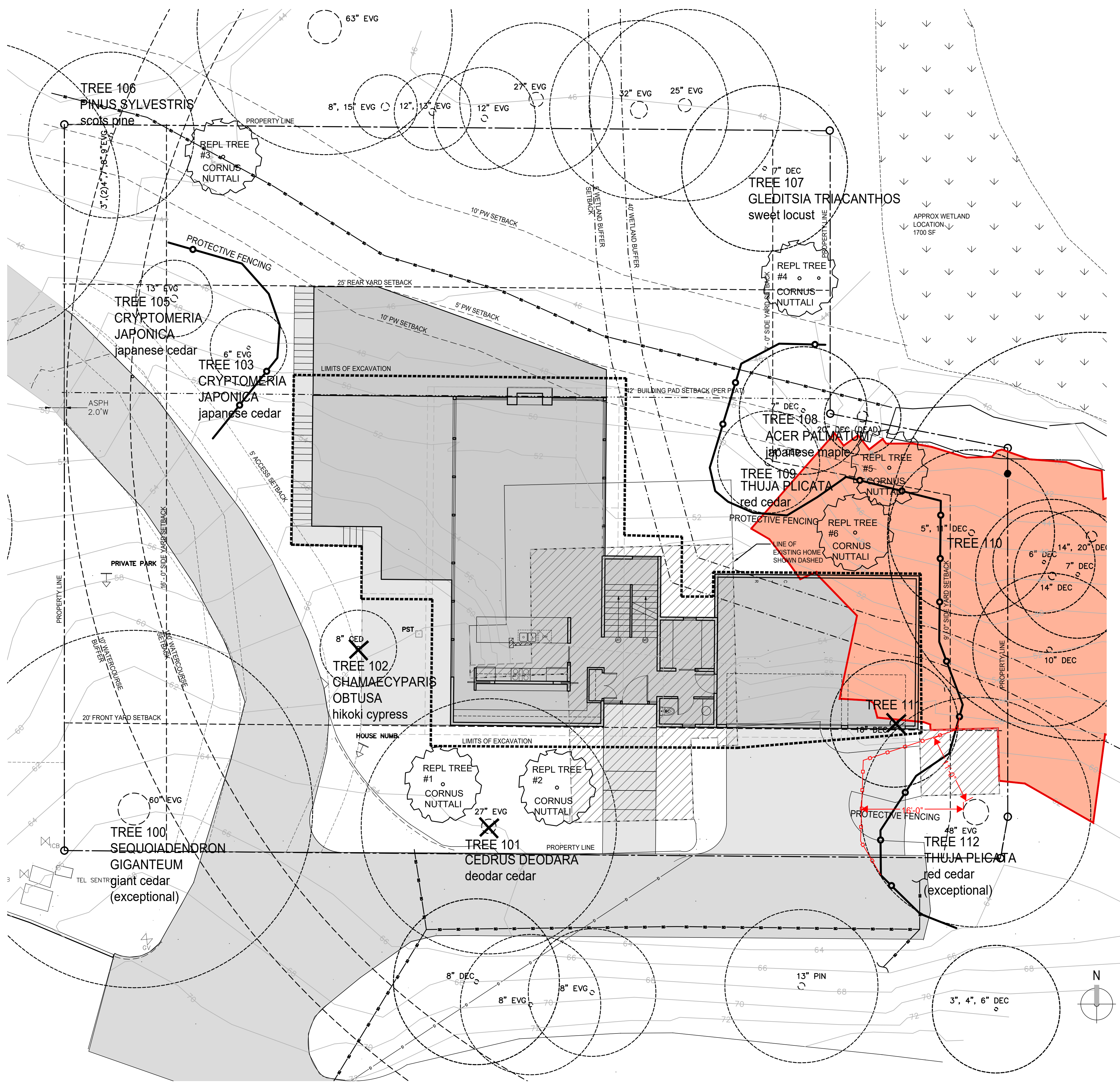
PROJECT:
BAUMAN RESIDENCE
5928 77TH AVE SE
MERCER ISLAND, WA 98040

CLIENT:
KATHRYN & TIMOTHY BAUMAN
5928 77TH AVE SE
MERCER ISLAND, WA 98040

REV	PHASE / ISSUE	DATE
	REASONABLE USE EXCEPTION	2024-08-20

TREE RETENTION SUMMARY TABLE

TREE NUMBER	TRUNK DIA -INCHES	NOTES	# OF REPLACEMENT TREES
100	60	EXCEPTIONAL	
101	27	REMOVE	3
102	8	REMOVE	1
103	6		
104		NOT USED	
105	13		
106	35 (3,4,4,7,8,9)	MULTI TRUNK	
107	7		
108	7		
109	14		
110	16 (5,11)	MULTI-TRUNK	
111	16	REMOVE	2
112	48	EXCEPTIONAL	
265 TOTAL			6 REPLACEMENT TREES
51% REMOVED TOTAL			
19% REMOVED TOTAL			
81% RETAINED TOTAL			



DATE:
AUGUST 20, 2024

SHEET TITLE:

TREE PLAN

SHEET:

1 TREE PLAN
1/8" = 1'-0"

A1.3