Tree Solutions Inc
Consulting Arborists

No tree will be removed. The project changed from New Construction to Alternation and Addition. Trees, driveway and structure remain the same.

Project No. TS - 9282

Arborist Report

To:	Ken & Phebe Chu
CC:	Ectypos Architecture c/o Lucia Pirzio-Brioli
Site:	4332 W Mercer Way, Mercer Island, WA, 98040
Re:	Tree Inventory and Assessment
Date:	May 9, 2024
Project Arborist:	Connor McDermott ISA Certified Arborist PN- 8704A ISA Qualified Tree Risk Assessor
Reviewed by:	Holly Iosso, Registered Consulting Arborist #567 ISA Certified Arborist PN- 6298A ISA Qualified Tree Risk Assessor
Referenced Documents:	Civil Set Sheets C-1 through C-4 (Nick Bossoff Engineering, 05/07/2024) Proposed Site Plan A1.0 (Ectypos Architecture, 05/11/2024) Critical Areas Map (Altmann Oliver Associates LLC, 03/07/2024)
Attached:	Table of Trees Tree Site Map

Summary

Tree Solutions Inc. inventoried and assessed 18 large (regulated) and exceptional trees on this site. I used the existing tag system on site with corresponding tree numbers.

Of the trees assessed, four met the exceptional tree size thresholds criteria outlined in the Mercer Island City Code (MICC) 19.16.010.

I found two tree groves on-site and 11 additional trees are considered exceptional trees because they are part of the tree groves. Trees that are part of a grove are also considered exceptional trees, unless they meet the definition of a hazardous tree (which these do not).

There were 15 adjacent trees that required documentation for this property. Trees on neighboring properties were documented if they appeared to be regulated or exceptional trees and their driplines extended over the property line. All trees on adjacent properties were estimated from the subject site or public property such as the adjacent right-of-way (ROW). I used a combination of the existing tag numbers and alphabetical tree identifiers for trees off-site.

One tree (Tree 17) is proposed for removal for development and is required to be replaced with 6 replacement trees per MICC 19.10.070.B.

Assignment and Scope of Work

This report outlines the site inspection by Connor McDermott and Josh Urry of Tree Solutions Inc., on February 27, 2024. I was asked to visit the site and provide an arborist report including findings and management recommendations. Lucia Pirzio-Brioli of Ectypos Architecture, the architect for the project, requested these services as part of a site development permit submittal.

Observations and Discussion

Site

This 17,558 square foot site is located on W Mercer Way of Mercer Island within an R-15 single-family zoning. There is currently a single family home with an attached garage on site.

According to the Critical Areas Map (Altmann Oliver Associates LLC, 03/07/2024) there is a steep slope area east of the existing home and a stream and 60 foot stream buffer that runs through the northern third of the site (Figure 1).

Trees

I inventoried and assessed 18 regulated trees on-site. Regulated trees are defined as trees that measure over 10 inches diameter at standard height (DSH) per MICC 19.16.010. Of these trees, 15 trees are regulated as exceptional: four based on individual size thresholds (MICC 19.16.010) and 11 because they were part of a tree grove.

MICC 19.16.010 defines tree groves as eight or more regulated trees with overlapping canopy unless they are regulated as hazard trees. I observed two groves on the property that included trees off-site and in the ROW. The first grove was on the north and western boundary of the property and included trees 1, 18 to 21, 25 to 35, 37 to 40, D and E. The second grove was on the southeastern boundary of the property and included trees 10 to 15, 17, and A. Locations of the tree groves can be found in the attached site map.

The slope on the eastern boundary of the site had extensive invasive ivy (*Hedera spp.*) that was growing at the base and on the trunk of several of the trees. The combination of the ivy and the steep slope limited my assessment. The ivy should be removed so I can reassess the base of trees prior to construction (Photo 1). Once ivy is removed, I recommend establishing erosion control measures such as jute matts, straw waddles, and planting.

Tree 14 is a 31-inch red alder (*Alnus rubra*) tree that I observed to be in poor health and structural condition. The tree has a dead top that extends 25 feet down the trunk and is in decline. It is a poor candidate for retention (Photo 2). I recommend the dead top is removed prior to construction to mitigate risk to any new targets.

Trees 38 to 40 are Douglas-fir (*Pseudotsuga menziesii*) trees that are growing north of the property. I observed the trunks were girdled by a wire at 2 to 3 feet above the base (Photo 3). I recommend removing wires to improve the long-term health function of the trees.

I have included a marked up survey of the site to serve as the site map and attached a table of trees that has detailed information about each tree.

Discussion—Construction Impacts

Proposed Plans

The most recent plans ("Proposed Site Plan" A1.0, Ectypos Architecture, 05/11/2024) propose site redevelopment south of the existing house footprint with a new single family home and an attached garage. Additionally, a catchment wall is proposed on the east side of the new house to protect the structure from potential landslides (Figure 2).

Retention Requirements

According to MICC 19.10.060, R-16 zoned areas a minimum of 30 percent of regulated trees must be retained during development and through a five year rolling period starting when the tree permit is approved. Currently 17 trees, or 94 percent of the regulated trees, are proposed for retention which exceeds the requirement outlined in the code.

Tree Removals

Tree 17 is currently proposed for removal in order to install the proposed catchment wall. Per MICC 19.10.070 the tree is required to be replaced with six replacement trees and meet the standards laid out in MICC 19.10.070.B.

Tree Protection

General

Tree protection must meet the requirements as outlined by MICC 19.10.080 which refers to best management practices (BMP) as published by the International Society of Arboriculture. Code also requires a Tree Protection Plan be developed by a certified arborist.

Development work is restricted within the recommended limits of disturbance (RLOD), defined as eight times DSH or greater, depending on individual tree species and/or condition. All work proposed within the RLOD must be reviewed and approved by the project arborist and the City of Mercer Island. The RLOD for each retained tree is listed in the attached table of trees.

Work that is required within the RLOD of retained trees is subject to alternative methods as outlined in the tree protection specifications in Appendix C and as called out in this report. All groundwork within the RLODs should be monitored by the project arborist to assess root impacts and guide any root cutting as necessary. Tree protection fencing should be placed at the RLOD for each tree and only moved to accommodate required work.

No ground disturbance is allowed within the minimum limits of disturbance (MLOD), defined as five times DSH, or 6 feet from the tree trunk, whichever is greater. Disturbance within the MLOD has high a potential for mechanical damage to structural roots which may destabilize trees.

I recommend the civil plan set is updated to show the location of tree protection fencing at the approved locations for retained trees on and off site.

Demolition of the existing structures and driveway- Trees 1, 38, 39, and 40

The plans propose the removal of the existing home and eastern portion of the driveway north of the existing home. The driveway entrance into the property and west of the home are proposed to be retained throughout construction. The driveway is proposed to be replaced with landscaping, including mitigation planting.

I recommend tree protection is set at the existing hardscape for all trees adjacent to the driveway prior to construction. This includes trees 1, 19, 20, 21, 28, 29, 32, 33, 37, 38, 39, 40. Demolition of the driveway is proposed within the RLOD of trees 1, 38, 39, 40.

Project arborist should be present during driveway demolition to ensure no damage occurs to tree roots. The asphalt should be removed closest to the trees and the machinery should work backwards or south of the trees (Photo 4). No machinery traffic is allowed across exposed soil. No materials may be stored on the uncovered soil once the asphalt is removed.

Once demolition is completed I recommend tree protection fencing for trees 1, 37, 38, 39, and 40 to be set at the new hardscape limits. I recommend a 4-inch layer of arborist woodchip mulch to be spread over the uncovered area immediately. This will both provide a visual indicator of tree protection with the tree protection fencing and help mitigate any health impacts to the trees during demolition.

If machinery access is required within the area following demolition, soil protection measures outlined in Appendix C must be utilized. Any landscaping in the area must be done by hand so damage to structural roots is minimized.

Utilities Plan- Tree 18
The plans propose installation of gas, water, power, and sewer utilities on the south end of the site. Installation of these utilities will require excavation within the RLOD of tree 18. Disturbance will be 13.5 feet from the tree.

Tree protection fencing and limits of disturbance can be set in this location if the following measures are utilized.

- Tree protection fencing is set along the RLOD of trees 18 prior to any construction
- Excavation within the RLOD is monitored by the project arborist, who will assess and document root impacts
- Excavation within the RLOD uses alternative methods such as pneumatic or hydro excavation (Photo 5).

Air excavation should be utilized to the extent feasible but if the utilities are required to be more than 18 inches below the existing grade I recommend hydro excavation is utilized.

Catchment Wall- Trees 10, 11, 12, 13, and 14
The plans propose the installation of a catchment wall on the east side of the property. The limits of disturbance to install the catchment wall are proposed within the RLOD of trees 10, 11, 12, 13, and 14 and within the MLOD of tree 13 (Photo 6).

In discussion with the project team, I understand that the catchment wall is proposed to be constructed with a foundation of 2-inch pin piles with helical anchors. If impacts within the MLOD of tree 13 are limited to pin piles, I believe the wall can be constructed as proposed if the following measures are utilized within the RLOD of trees 10, 11, 12, 13, and 14:

- Tree protection fencing is set along the RLOD of trees 10, 11, 12, and 13 prior to any construction

- When construction of the catchment wall is to begin tree protection can be moved to the location shown on the TESC plan.
- No machinery is allowed within the RLOD of these trees without tree protection.
- Any excavation within the RLOD must be approved and monitored by the project arborist.
- Excavate the location of the pin piles either by hand or air-excavation with the arborist present to assess locations of roots and assess impacts to the trees.

Clearance Pruning
To construct the proposed structures, infrastructure clearance pruning may be required-- particularly for trees on the eastern boundary of the site. Any clearance pruning should be performed by an ISA certified arborist and utilize the most current and applicable ANSI A300 specifications. Tree Solutions Inc can provide pruning specifications for specific trees prior to construction upon request.

Additional tree protection specifications are provided in Appendix C.

Recommendations

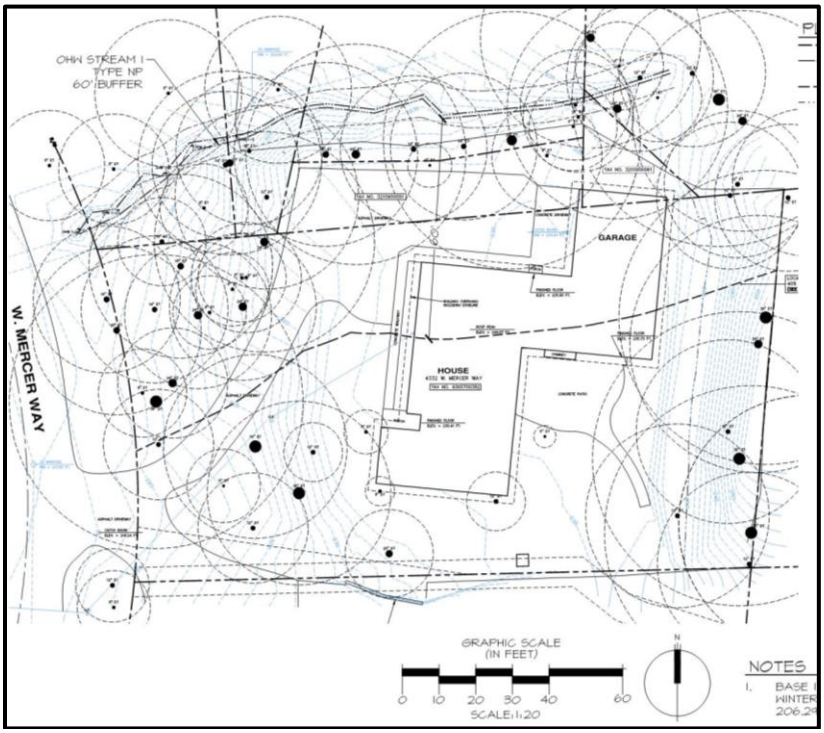
- Remove wires on trees 38, 39, and 40 to improve the long-term health function of the trees.
- Manage tree 14, which is in poor condition, prior to construction to mitigate risk.
- Update site plans to include tree protection measures and include the following per MICC 19.10.090 C:
    - Draw RLOD protection areas around each tree as drawn on Tree Site Plan (attached)
    - Include tree protection fencing consisting of 6-foot-tall chain-link fencing. Fencing should be located at the RLOD unless specified in this report.
        - Trees growing in a group should be protected at the edge of their shared RLOD.
        - Set tree protection at existing hardscape limits where applicable.
    - Add note that states work within the RLOD of existing trees must be monitored by the project arborist.
    - Alternative excavation within the RLOD must be utilized such as a flat fronted bucket excavator, hydro excavation and hand digging.
    - An ‘X’ over tree removals
    - Show replacement tree locations on Landscape Plans
- All tree retention and removal regulations must be followed and are outlined in MICC Chapter 19.10 Trees.
- Ensure tree protection standards comply with MICC 19.10.080.
- All off-site trees must be protected during construction. Follow tree protection specifications located in Appendix C throughout construction.
- All work within RLOD must be monitored by the project arborist and utilize approved methods.
- All pruning should be conducted by an ISA certified arborist following current and applicable ANSI A300 specifications.

- Obtain all necessary permits and approval from the city prior to commencement of site work.

Respectfully submitted,

Connor McDermott,
Consulting Arborist

Appendix A **Site Figures**



Trees, driveway and structure remain the same

Figure 1. Cropped section of Critical Areas Map (Altmann Oliver Associates LLC, 03/07/2024).

No tree will be removed. The project changed from New Construction to Alternation and Addition. This design is no longer applicable.

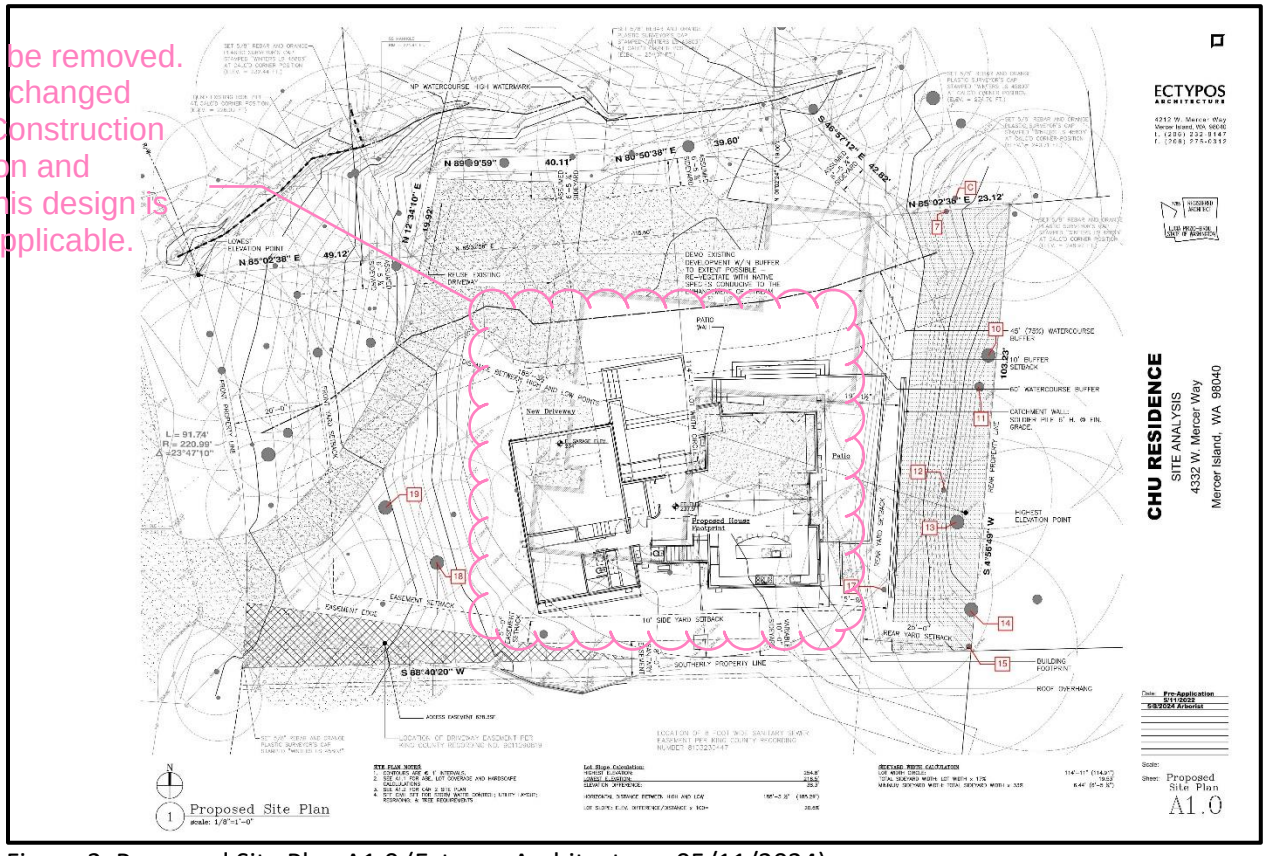


Figure 2. Proposed Site Plan A1.0 (Ectypos Architecture, 05/11/2024).

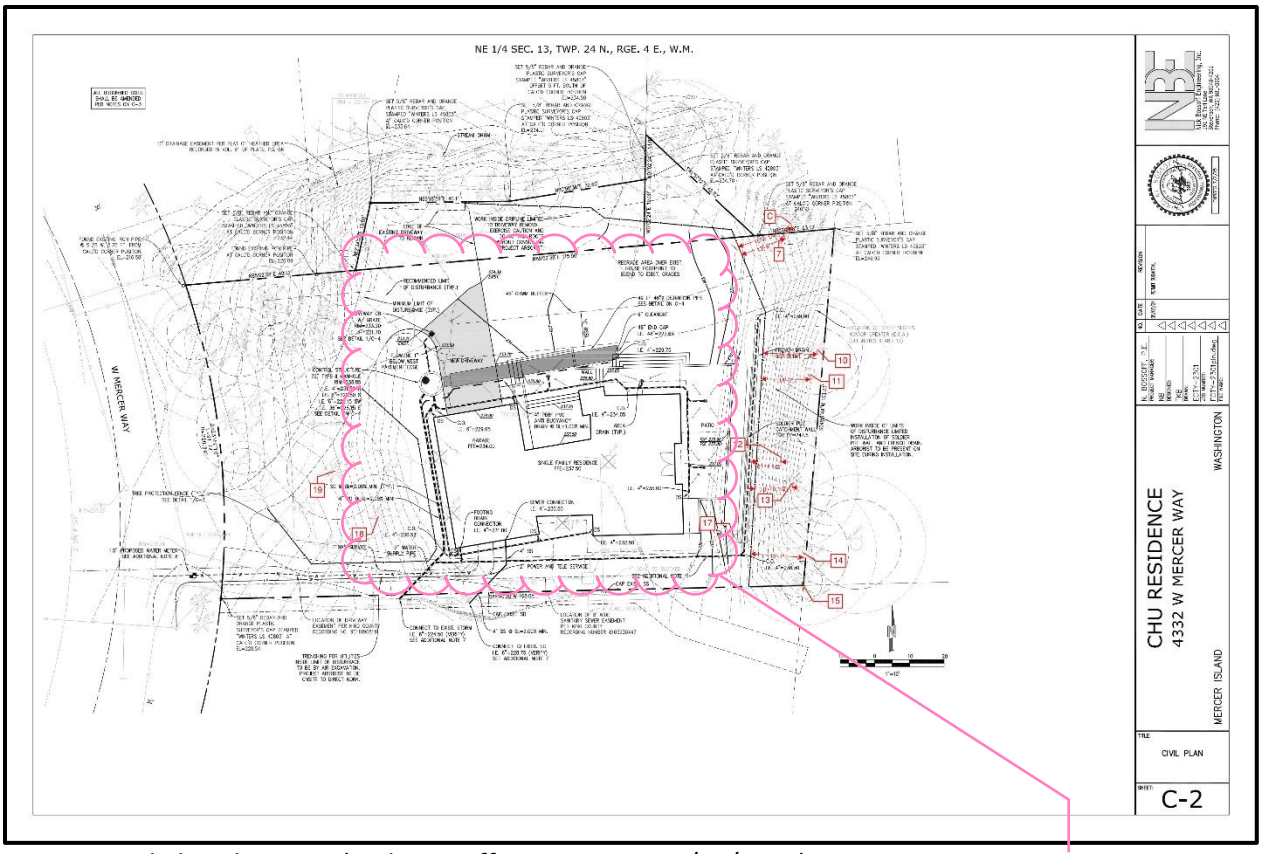


Figure 3.Civil Plan Sheet C-2 (Nick Bossoff Engineering, 05/07/2024)

No tree will be removed. The project changed from New Construction to Alternation and Addition. This design is no longer applicable.

Appendix B **Photographs**

Photo 1. View of the base of trees along the eastern boundary of the site. I observed extensive ivy at the base of these trees and I recommend the ivy is removed prior to construction and for the base of the trees to be reassessed.

Photo 2. Tree 14 indicated above is a red alder in declining condition and is not a good candidate for long term retention. I recommend the tree is reduced to a wildlife snag.

Photo 3. Tree 39 viewed from the south. There is a wire that is girdling the base that I recommend is removed to improve and maintain the long term function of the tree.

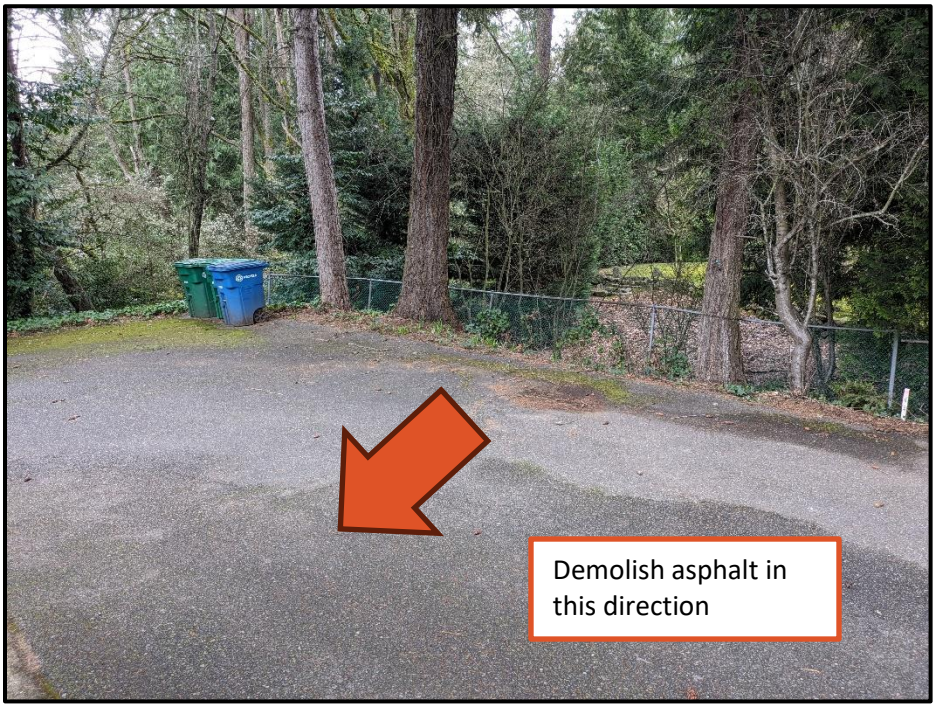


Photo 4. Base of tree 38 viewed from the south. The driveway is proposed for removal in this area. I recommend the asphalt removal begins closest to the tree and moves backwards. Once the pavement is removed no machinery traffic or materials are allowed. I recommend the project arborist is called if any large roots over 2-inches diameter are encountered.

Photo 5. Base of tree 19 viewed from the north. Utilities are proposed within the RLOD of the tree. I recommend excavation within the RLOD occur with either hydro or air excavation.

Photo 6. View of trees 10, 11, 12, 13, 14, and 17 viewed from the west. A catchment wall is proposed within the RLOD of the subject trees and I recommend the footings for the walls are installed by hand or air excavation.

Appendix C **Tree Protection Specifications**

The following is a list of protection measures that must be employed before, during and after construction to ensure the long-term viability of retained trees.

1. **Project Arborist:** The project arborists shall at minimum have an International Society of Arboriculture (ISA) Certification and ISA Tree Risk Assessment Qualification.
2. **Tree Protection Zone (TPZ):** The TPZ is to be set at the Recommended Limits of Disturbance listed in the Table of Trees. In some cases, the TPZ may extend outside tree protection fencing. Work within the TPZ must be approved and monitored by the project arborist.
3. **Tree Protection Fencing:** Tree protection shall consist of 6-foot-tall chain-link fencing installed at the TPZ as approved by the project arborist. Fence posts shall be anchored into the ground or bolted to existing hardscape surfaces.
    a. Where trees are being retained as a group the fencing shall encompass the entire area including all landscape beds or lawn areas associated with the grove.
    b. Per arborist approval, TPZ fencing may be placed at the edge of existing hardscape within the TPZ to allow for staging and traffic.
    c. Where work is planned within the TPZ, install fencing at edge of TPZ and move to limits of disturbance at the time that the work within the TPZ is planned to occur. This ensures that work within the TPZ is completed to specification.
    d. Where trees are protected at the edge of the project boundary, construction limits fencing shall be incorporated as the boundary of tree protection fencing.
4. **Access Beyond Tree Protection Fencing:** The project manager or project arborist shall be present when tree protection areas are accessed.
5. **Tree Protection Signage:** Tree protection signage shall be affixed to fencing every 20 feet. Signage shall be fluorescent, at least 2’ x 2’ in size. Signage will note: “Tree Protection Area – Do Not Enter: Entry into the tree protection area is prohibited unless authorized by the project manager.” Signage shall include the contact information for the project manager and instructions for gaining access to the area.
6. **Filter / Silt Fencing:** Filter / silt fencing within or at the edge of the TPZ of retained trees shall be installed in a manner that does not sever roots. Install so that filter / silt fencing sits on the ground and is weighed in place by sandbags or gravel. Do not trench to insert filter / silt fencing into the ground.
7. **Monitoring:** The project arborist shall monitor all ground disturbance at the edge of or within the TPZ, including where the TPZ extends beyond the tree protection fencing.
8. **Soil Protection:** No parking, foot traffic, materials storage, or dumping (including excavated soils) are allowed within the TPZ. Heavy machinery shall remain outside of the TPZ. Access to the tree protection area will be granted under the supervision of the project arborist. If project arborist allows, heavy machinery can enter the area if soils are protected from the load. Acceptable methods of soil protection include applying 3/4-inch plywood over 6 inches of wood chip mulch or use of AlturnaMats® (or equivalent product approved by the project arborist). Retain existing paved surfaces within or at the edge of the TPZ for as long as possible.
9. **Soil Remediation:** Soil compacted within the TPZ of retained trees shall be remediated using pneumatic air excavation according to a specification produced by the project arborist.
10. **Canopy Protection**: Where fencing is installed at the limits of disturbance within the TPZ, canopy management (pruning or tying back) shall be conducted to ensure that vehicular traffic does not damage canopy parts. Exhaust from machinery shall be located 5 feet outside the dripline of retained trees. No exhaust shall come in contact with foliage for prolonged periods of time.

11. **Duff/Mulch:** Apply 6 inches of arborist wood chip mulch or hog fuel over bare soil within the TPZ to prevent compaction and evaporation. TPZ shall be free of invasive weeds to facilitate mulch application. Keep mulch 1 foot away from the base of trees and 6 inches from retained understory vegetation. Retain and protect as much of the existing duff and understory vegetation as possible.
12. **Excavation:** Excavation done at the edge of or within the TPZ shall use alternative methods such as pneumatic air excavation or hand digging. If heavy machinery is used, use flat front buckets with the project arborist spotting for roots. When roots are encountered, stop excavation and cleanly sever roots. The project arborist shall monitor all excavation done within the TPZ.
13. **Fill:** Limit fill to 1 foot of uncompacted well-draining soil, within the TPZ of retained trees. In areas where additional fill is required, consult with the project arborist. Fill must be kept at least 1 foot from the trunks of trees.
14. **Root Pruning:** Limit root pruning to the extent possible. All roots shall be pruned with a sharp saw making clean cuts. Do not fracture or break roots with excavation equipment.
15. **Root Moisture:** Root cuts and exposed roots shall be immediately covered with soil, mulch, or clear polyethylene sheeting and kept moist. Water to maintain moist condition until the area is back filled. Do not allow exposed roots to dry out before replacing permanent back fill.
16. **Hardscape Removal:** Retain hardscape surfaces for as long as practical. Remove hardscape in a manner that does not require machinery to traverse newly exposed soil within the TPZ. Where equipment must traverse the newly exposed soil, apply soil protection as described in section 8 of these specifications. Replace fencing at edge of TPZ if soil exposed by hardscape removal will remain for any period of time.
17. **Tree Removal:** All trees to be removed that are located within the TPZ of retained trees shall not be ripped, pulled, or pushed over. The tree should be cut to the base and the stump either left in place or ground out. A flat front bucket can also be used to sever roots around all sides of the stump, or the roots can be exposed using hydro or air excavation and then cut before removing the stump.
18. **Irrigation:** Retained trees with soil disturbance within the TPZ will require supplemental water from June through September. Acceptable methods of irrigation include drip, sprinkler, or watering truck. Trees shall be watered three times per month during this time.
19. **Pruning:** Pruning required for construction and safety clearance shall be done with a pruning specification provided by the project arborist in accordance with American National Standards Institute ANSI-A300 2017 Standard Practices for Pruning. Pruning shall be conducted or monitored by an arborist with an ISA Certification.
20. **Plan Updates:** All plan updates or field modification that result in impacts within the TPZ or change the retained status of trees shall be reviewed by the senior project manager and project arborist prior to conducting the work.
21. **Materials:** Contractor shall have the following materials onsite and available for use during work in the TPZ:
    - **Sharp and clean bypass hand pruners**
    - **Sharp and clean bypass loppers**
    - **Sharp hand-held root saw**
    - **Reciprocating saw with new blades**
    - **Shovels**
    - **Trowels**
    - **Clear polyethylene sheeting**
    - **Burlap**
    - **Water**

Appendix D **Glossary**

DBH or DSH: diameter at breast or standard height; the diameter of the trunk measured 54 inches (4.5 feet) above grade (Council of Tree and Landscape Appraisers 2019)

tree grove: a group of eight or more trees each 10 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. (MICC 19.16.010)

exceptional tree: a tree measuring 36 inches DSH or greater or with a diameter that is equal to or greater than the diameter listed in the Exceptional Tree Table (MICC 19.16.010)

ISA: International Society of Arboriculture

large tree (regulated): A tree measuring 10 inches or greater DSH (MICC 19.16.010)

MLOD (Minimum Limits of Disturbance) Minimum Limits of Disturbance represents a distance five (5) times that of the trunk or 6-feet, whichever is greater, and is the minimum distance from a trunk that a structural root can be cut to maintain tree stability.

RLOD (Recommend Limits of Disturbance): As outlined in ISA Best Management Practices: Managing Trees During Construction, this is calculated as a radial distance 8 times the trunk diameter or greater depending on tree species and/or condition. For the purpose of this report, this represents the critical root zone (CRZ).

Visual Tree Assessment (VTA): method of evaluating structural defects and stability in trees by noting the pattern of growth (Mattheck & Breloer 1994)

Appendix E **References**

Accredited Standards Committee A300 (ASC 300). ANSI A300 (Part 1) Tree, Shrub, and Other Woody Plant Management – Standard Practices (Pruning). Londonderry: Tree Care Industry Association, 2017.

Council of Tree and Landscape Appraisers, Guide for Plant Appraisal, 10th Edition Second Printing. Atlanta, GA: The International Society of Arboriculture (ISA), 2019.

Fite, Kelby and Dr. E. Thomas Smiley. Best Management Practices: Managing Trees During Construction, Second Edition. Champaign, IL: International Society of Arboriculture (ISA), 2016.

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

Mercer Island Municipal Code (MICC) 19.16.010. Definitions

Mercer Island Municipal Code (MICC) 19.10. Trees

Appendix F **Methods**

Measuring

I measured the diameter of each tree at 54 inches above grade, diameter at standard height (DSH). If a tree had multiple stems, I measured each stem individually at standard height and determined a single-stem equivalent diameter by using the method outlined in the Guide for Plant Appraisal, 10th Edition Second Printing published by the Council of Tree and Landscape Appraisers. A tree is regulated based on this single-stem equivalent diameter value. Because this value is calculated in the office following field work, some unregulated trees may be included in our data set. These trees are included in the tree table for informational purposes only and not factored into tree totals discussed in this report.

Tagging

I tagged each tree with a circular aluminum tag at eye level. I assigned each tree a numerical identifier on our map and in our tree table, corresponding to this tree tag. I used alphabetical identifiers for trees off-site.

Evaluating

I evaluated tree health and structure utilizing visual tree assessment (VTA) methods. The basis behind VTA is the identification of symptoms, which the tree produces in reaction to a weak spot or area of mechanical stress. A tree reacts to mechanical and physiological stresses by growing more vigorously to re-enforce weak areas, while depriving less stressed parts. An understanding of the uniform stress allows the arborist to make informed judgments about the condition of a tree.

Rating

When rating tree health, I took into consideration crown indicators such as foliar density, size, color, stem and shoot extensions. When rating tree structure, I evaluated the tree for form and structural defects, including past damage and decay. Tree Solutions has adapted our ratings based on the Purdue University Extension formula values for health condition (*Purdue University Extension bulletin FNR-473-W - Tree Appraisal*). These values are a general representation used to assist arborists in assigning ratings.

Health

Excellent - Perfect specimen with excellent form and vigor, well-balanced crown. Normal to exceeding shoot length on new growth. Leaf size and color normal. Trunk is sound and solid. Root zone undisturbed. No apparent pest problems. Long safe useful life expectancy for the species.

Good - Imperfect canopy density in few parts of the tree, up to 10% of the canopy. Normal to less than ¾ typical growth rate of shoots and minor deficiency in typical leaf development. Few pest issues or damage, and if they exist they are controllable or tree is reacting appropriately. Normal branch and stem development with healthy growth. Safe useful life expectancy typical for the species.

Fair - Crown decline and dieback up to 30% of the canopy. Leaf color is somewhat chlorotic/necrotic with smaller leaves and “off” coloration. Shoot extensions indicate some stunting and stressed growing conditions. Stress cone crop clearly visible. Obvious signs of pest problems contributing to lesser condition, control might be possible. Some decay areas found in main stem and branches. Below average safe useful life expectancy

Poor - Lacking full crown, more than 50% decline and dieback, especially affecting larger branches. Stunting of shoots is 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 and uncontrollable. Extensive decay or hollows in branches and trunk. Short safe useful life expectancy.

Structure

Excellent - 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 - 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 - 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 - 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.

Appendix G **Assumptions & Limiting Conditions**

1 Consultant assumes that the site and its use do not violate, and is in compliance with, all applicable codes, ordinances, statutes or regulations.

2 The consultant may provide a report or recommendation based on published municipal regulations. The consultant assumes that the municipal regulations published on the date of the report are current municipal regulations and assumes no obligation related to unpublished city regulation information.

3 Any report by the consultant and any values expressed therein represent the opinion of the consultant, and the consultant's fee is in no way contingent upon the reporting of a specific value, a stipulated result, the occurrence of a subsequent event, or upon any finding to be reported.

4 All photographs included in this report were taken by Tree Solutions, Inc. during the documented site visit, unless otherwise noted. Sketches, drawings and photographs (included in, and attached to, this report) are intended as visual aids and are not necessarily to scale. They should not be construed as engineering drawings, architectural reports or surveys. The reproduction of any information generated by architects, engineers or other consultants and any sketches, drawings or photographs is for the express purpose of coordination and ease of reference only. Inclusion of such information on any drawings or other documents does not constitute a representation by the consultant as to the sufficiency or accuracy of the information.

5 Unless otherwise agreed, (1) information contained in any report by consultant covers only the items 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, climbing, or coring.

6 These findings are based on the observations and opinions of the authoring arborist, and do not provide guarantees regarding the future performance, health, vigor, structural stability or safety of the plants described and assessed.

7 Measurements are subject to typical margins of error, considering the oval or asymmetrical cross-section of most trunks and canopies.

8 Tree Solutions did not review any reports or perform any tests related to the soil located on the subject property unless outlined in the scope of services. Tree Solutions staff are not and do not claim to be soils experts. An independent inventory and evaluation of the site's soil should be obtained by a qualified professional if an additional understanding of the site's characteristics is needed to make an informed decision.

9 Our assessments are made in conformity with acceptable evaluation/diagnostic reporting techniques and procedures, as recommended by the International Society of Arboriculture.

Table of Trees

4332 W Mercer Way, Mercer Island, WA 98040

Arborist: JU CM
Date of Inventory: 02/27/2024
Table Updated: 05/09/2024

DSH (Diameter at Standard Height) is measured 4.5 feet above grade, or as specified in the Guide for Plant Appraisal, 10th Edition , published by the Council of Tree and Landscape Appraisers.
DSH for multi-stem trees are noted as a single stem equivalent, which is calculated using the method defined in the Guide for Plant Appraisal, 10th Edition .
Letters are used to identify trees on neighboring property with overhanging canopies.
Minimum Limit of Disturbance (MLOD) is defined as 5 times trunk diameter or 6 feet, whichever is greater.
Recommended Limit of Disturbance (RLOD) is 8 times trunk diameter or greater depending on tree species and/or condition.
Dripline is measured from the center of the tree to the outermost extent of the canopy.

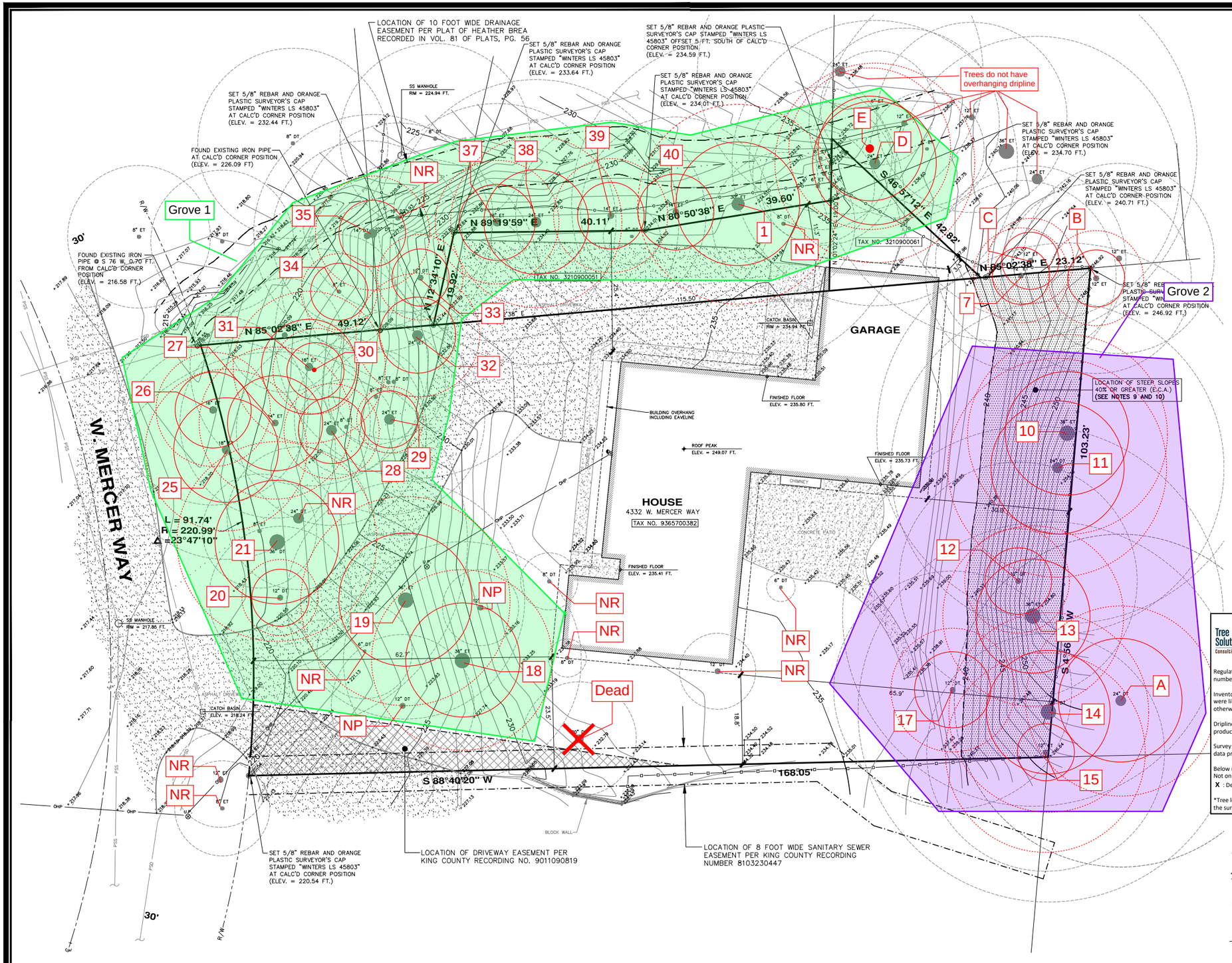
								Dripline Radius (feet)										
Tree ID	**Tree Location**	**Scientific Name**	**Common Name**	**DSH** (inches)	**DSH Multistem**	**Health Condition**	**Structural Condition**	**N**	**E**	**S**	**W**	**Exceptional Threshold**	**Exceptional**	**24-Inch DSH or Greater**	**Exceptional Grove**	**MLOD** (feet)	**RLOD** (feet)	**Proposed Action**	**Notes**
1	Off-site	*Thuja plicata*	*Western redcedar*	31.0		Good	Fair	1.3	13.3	26.8	17.8	*30.0*	Exceptional - Size	Yes	Grove 1	13	21	Retain	Topped at 20 ft with new reiterations above; phototrophic to south; driveway 8.5 ft from base
7	On-site	*Pinus sylvestris*	*Scots pine*	15.0		Fair	Fair	8.6	-	12.6	22.6	*24.0*		-	-	6	10	Retain	Limited live canopy; likely suppressed; ivy at base; phototrophic to west; shared
10	On-site	*Pseudotsuga menziesii*	*Douglas-fir*	32.0		Good	Fair	21.3	22.3	29.3	24.3	*30.0*	Exceptional - Size	Yes	Grove 1	13	21	Retain	Not tagged; growing on top of slope; sheer vertical cut; kink at 40 ft; sap weeping on west side 15 ft above base
11	On-site	*Acer macrophyllum*	*Bigleaf maple*	34.6		Fair	Good	23.4	13.4	22.4	40.4	*30.0*	Exceptional - Size	Yes	Grove 1	14	23	Retain	Not tagged; pruned with stub cuts for clearance; south most stem is likely dead and can be reduced to snag; clearance likely required for wall; remove lowest 3-4 rungs of branches; fill at base
12	On-site	*Acer macrophyllum*	*Bigleaf maple*	17.0		Good	Good	8.7	0.7	24.7	35.7	*30.0*	Exceptional - Grove	-	Grove 1	7	11	Retain	Estimated due to slope and ivy; lower stem pruned for clearance
13	On-site	*Pseudotsuga menziesii*	*Douglas-fir*	29.0		Good	Good	20.2	14.2	22.2	23.2	*30.0*	Exceptional - Grove	Yes	Grove 1	12	19	Retain	Ivy at base; large stems of ivy removed; growing on top of slope; estimated due to slope and ivy
14	On-site	*Alnus rubra*	*Red alder*	31.0		Poor	Poor	16.3	1.3	26.3	37.3	-	Exceptional - Grove	Yes	Grove 1	13	21	Retain	Central trunk long dead; diameter at standard height estimated due to fence; ivy at base; not good long term retention tree
15	On-site	*Thuja plicata*	*Western redcedar*	10.3		Good	Good	9.4	9.4	9.4	9.4	*30.0*	Exceptional - Grove	-	Grove 1	6	7	Retain	Small tree suppressed by adjacent trees
18	On-site	*Pseudotsuga menziesii*	*Douglas-fir*	28.1		Good	Fair	14.2	12.7	9.7	11.2	*30.0*		Yes	Grove 2	12	19	Retain	Limbed up on south east side; mechanical damage on south side; sap weeping from old wounds; 50 percent live crown ratio
19	On-site	*Pseudotsuga menziesii*	*Douglas-fir*	33.6		Good	Good	23.4	22.4	25.4	20.4	*30.0*	Exceptional - Size	Yes	Grove 2	14	22	Retain	Top broken out in past but has new reiterations; limbed up for powerlines; ivy at base
20	On-site	*Prunus cerasifera*	*Flowering plum*	11.4		Good	Fair	9.5	12.5	12.5	10.0	*21.0*	Exceptional - Grove	-	Grove 2	6	8	Retain	Pruned for powerlines; narrow union; stems combined for diameter at standard height due to orientation of stems
21	On-site	*Acer macrophyllum*	*Bigleaf maple*	32.0	29.6, 9.9, 7.1	Fair	Good	20.3	9.3	29.3	43.8	*30.0*	Exceptional - Size	Yes	Grove 2	13	21	Retain	Dieback in upper 3rd of canopy; ivy into crown; ivy limits assessment; pruned for powerlines with heading cuts; poor shoot extension; codominant at base
25	ROW	*Pseudotsuga menziesii*	*Douglas-fir*	25.9		Good	Fair	20.6	16.1	20.1	21.1	*30.0*	Exceptional- Size	Yes	Grove 2	11	17	Retain	Topped at 25 ft; reiterative tops allowed to grow; canopy pruned over road
26	ROW	*Acer macrophyllum*	*Bigleaf maple*	18.5		Good	Good	25.8	0.8	34.8	35.8	*30.0*	Exceptional- Grove	-	Grove 2	8	12	Retain	Phototrophic over road; canopy raised over road; bamboo at base; small cavity at union 8 ft above base
27	On-site	*Pseudotsuga menziesii*	*Douglas-fir*	24.6		Good	Fair	8.0	1.0	7.0	16.0	*30.0*	Exceptional - Grove	Yes	Grove 2	10	16	Retain	Topped or broke top at 35 ft reiteration to west and road; ivy at base

Table of Trees

4332 W Mercer Way, Mercer Island, WA 98040

Arborist: JU CM
Date of Inventory: 02/27/2024
Table Updated: 05/09/2024

Tree ID	Tree Location	Scientific Name	Common Name	DSH (inches)	DSH Multistem	Health Condition	Structural Condition	N	E	S	W	Exceptional Threshold	Exceptional	24-Inch DSH or Greater	Exceptional Grove	MLOD (feet)	RLOD (feet)	Proposed Action	Notes
28	On-site	*Acer macrophyllum*	*Bigleaf maple*	15.6		Poor	Poor	8.7	19.2	8.7	8.7	*30.0*	Exceptional - Grove	-	Grove 2	7	10	Retain	Nearly dead; ivy growing on trunk; poor shoot extension; east stem young and most alive is phototrophic to east
29	On-site	*Thuja plicata*	*Western redcedar*	9.8	7.4, 6.5	Good	Good	12.9	19.4	13.4	8.4	*30.0*	Exceptional - Grove	-	Grove 2	6	7	Retain	Low canopy hangs over driveway; ivy on trunk
30	On-site	*Thuja plicata*	*Western redcedar*	14.0		Poor	Poor	8.6	8.6	8.6	8.6	*30.0*	Exceptional - Grove	-	Grove 2	6	9	Retain	Top is dead; cavity on north side; through crack at base on east side and from root flare
31	On-site	*Pseudotsuga menziesii*	*Douglas-fir*	23.7		Good	Good	18.0	14.0	13.0	15.0	*30.0*	Exceptional - Grove	-	Grove 2	10	16	Retain	Potentially lost top at some point; tree 30 grows out of base of tree
32	On-site	*Pseudotsuga menziesii*	*Douglas-fir*	20.1		Good	Good	13.3	23.3	12.8	12.8	*30.0*	Exceptional - Grove	-	Grove 2	8	13	Retain	On-site; potentially was codominant at 30 ft; now has kink on trunk; low live crown ratio; ivy at base
33	Off-site	*Acer platanoides*	*Norway maple*	12.9	3.3, 6.6, 7.4, 7.6	Fair	Fair	14.5	22.0	18.5	11.5	-	Exceptional-Grove	-	Grove 2	6	9	Retain	Off-site; codominant at base; suppressed with dieback in crown observed; ivy at base
34	Off-site	*Thuja plicata*	*Western redcedar*	12.5		Good	Good	11.0	11.0	11.0	11.0	*30.0*	Exceptional-Grove	-	Grove 2	6	8	Retain	Off-site; small healthy tree
35	Off-site	*Alnus rubra*	*Red alder*	17.9		Good	Fair	7.7	0.7	15.7	34.2	-	Exceptional-Grove	-	Grove 2	7	12	Retain	Off-site; corrected lean to west toward road; cavity at base on south side with reaction wood; partial slope failure
37	Off-site	*Pinus nigra*	*Austrian black pine*	19.1		Good	Good	0.8	3.8	17.3	17.3	*24.0*	Exceptional-Grove	-	Grove 2	8	13	Retain	Offsite; phototrophic lean to west; 50 percent live crown ratio; 2ft from driveway
38	Off-site	*Pseudotsuga menziesii*	*Douglas-fir*	26.5		Excellent	Good	1.1	17.1	20.1	10.1	*30.0*	Exceptional-Size	Yes	Grove 2	11	18	Retain	Offsite; ivy on trunk; driveway cracking below; dominant tree in row
39	Off-site	*Pseudotsuga menziesii*	*Douglas-fir*	17.4		Good	Good	0.7	12.7	18.2	6.7	*30.0*	Exceptional-Grove	-	Grove 2	7	12	Retain	Offsite; stem girdled at 2 ft by wire; ivy on trunk; 5.5 ft from driveway
40	Off-site	*Pseudotsuga menziesii*	*Douglas-fir*	18.1		Good	Good	0.8	10.8	12.3	10.8	*30.0*	Exceptional-Grove	-	Grove 2	8	12	Retain	Offsite; stem girdled by wire at 3 ft; suppressed in row; 6.5 ft from driveway
A	Off-site	*Acer platanoides*	*Norway maple*	30.0		Good	Fair	1.3	1.3	1.3	16.8	-	Exceptional-Size	Yes	Grove 1	13	20	Retain	Offsite tree; managed for end weight
B	Off-site	*Acer macrophyllum*	*Bigleaf maple*	15.0		Good	Good	-	-	-	18.6	*30.0*		-		6	10	Retain	Offsite; no tag; upright canopy; ivy at base; estimated
C	Off-site	*Acer macrophyllum*	*Bigleaf maple*	14.0		Good	Good	-	-	15.6	21.6	*30.0*		-		6	9	Retain	Offsite; no tag; pruned to property line with poor cut; phototrophic to south west; estimated
D	Off-site	*Alnus rubra*	*Red alder*	32.0		Excellent	Good	1.3	19.3	33.3	22.3	-	Exceptional-Size	Yes	Grove 2	13	21	Retain	Offsite; no tag; estimated; growing adjacent to creek; good condition
E	Off-site	*Alnus rubra*	*Red alder*	26.0		Good	Good	1.1	6.1	27.1	25.1	-	Exceptional-Size	Yes	Grove 2	11	17	Retain	Offsite; no tag; estimated; growing north of creek



NOTES

1. THIS SURVEY WAS PERFORMED BY FIELD TRAVERSE USING A 10 SECOND "TOTAL STATION" THEODOLITE SUPPLEMENTED WITH A 100 FT. STEEL TAPE. THIS SURVEY MEETS OR EXCEEDS THE STANDARDS FOR LAND BOUNDARY SURVEYS AS SET FORTH IN WAC CHAPTER 332-130-090.
2. CONTOUR INTERVAL = 1 FT.
3. VERTICAL DATUM = NAVD'88, AS PER DIRECT OBSERVATIONS USING GPS EQUIPMENT ON NOV. 15, 2021.

   HORIZONTAL DATUM = NAD 83/91
4. PARCEL AREA = 18,817 SQ. FT.
5. THIS SURVEY IS RELIANT UPON THE INFORMATION CONTAINED WITHIN CHICAGO TITLE COMPANY TITLE ORDER NO. 0208804-ETU, DATED JULY 01, 2021.
6. UNDERGROUND UTILITY INFORMATION AS SHOWN HEREON IS APPROXIMATE ONLY AND IS BASED UPON TIES TO ABOVE GROUND STRUCTURES.
7. TAX PARCEL NO. 9365700382
8. TREE DIAMETERS AND DRIPLINES DISPLAYED HEREON ARE APPROXIMATE. FOR SPECIFIC GENUS AND DIAMETER, TREES SHOULD BE EVALUATED BY A CERTIFIED ARBORIST.
9. THE AREA OF ON-SITE STEEP SLOPES 40% OR GREATER = 2,004 SQ. FT. OR 10% OF TOTAL PARCEL AREA.
10. THE LOCATION AND AREA OF STEEP SLOPES AS DISPLAYED HEREON ARE APPROXIMATE AND HAVE BEEN DETERMINED TO THE BEST OF OUR ABILITY FROM FIELD DATA COLLECTED BY US DURING THE COURSE OF THIS SURVEY. FINAL DETERMINATION OF THE LOCATION OF STEEP SLOPES, AND ANY ASSOCIATED BUFFERS, IS DEPENDENT UPON REVIEW AND APPROVAL BY THE CITY OF SEATTLE.
11. WE HAVE DETERMINED TO THE BEST OF OUR ABILITY THE OVERHEAD HIGH VOLTAGE POWERLINE WHICH IS CLOSEST TO THE PROJECT SITE AND HAVE DISPLAYED ITS HORIZONTAL AND VERTICAL LOCATION HEREON. HOWEVER, ADDITIONAL OVERHEAD SERVICE LINES MAY EXIST WHICH ARE NOT OBVIOUS TO US BY FIELD OBSERVATION AND POTENTIALLY IMPACT PROJECT DESIGN. THEREFORE, PRIOR TO DESIGN AND CONSTRUCTION WE RECOMMEND THAT SEATTLE CITY LIGHT BE CONSULTED REGARDING THE POSSIBLE EXISTANCE OF ADDITIONAL SERVICE LINES NOT DISPLAYED HEREON WHICH SHOULD BE CONSIDERED FOR PROJECT DESIGN.

Tree Solutions Inc
Consulting Arborists

Arborist: C McDermott & J Urry
206-528-4670

Tree Assessment Date:
02/27/2024

Regulated trees 8-inches diameter or greater on the site are identified with a number. This number corresponds with the metal tree tag unless otherwise noted.

Inventory also includes all regulated off-site trees that had overhanging canopies or that were likely to be impacted by site work. Off-site trees are identified by a letter unless otherwise noted.

Dripline measurements, species, and other tree specifics are listed in the tree table produced by Tree Solutions Inc.

Survey and site plans should be updated to include tree identifiers and accurate dripline data prior to any design related to tree protection.

Below regulated size: NR
Not on survey: NP
X : Dead

*Tree locations added to the survey are approximate and should be confirmed and added to the survey.

: Minimum Limits of Disturbance (MLOD)

: Recommended Limits of Disturbance (RLOD)

LEGEND:

- GAS METER
- ELECTRIC METER
- WATER VALVE
- FIRE HYDRANT
- WATER METER
- MANHOLE COVER
- CATCH BASIN
- GAS VALVE
- POWER POLE
- UTILITY POLE
- ROCKERY
- CONCRETE PAVING
- ASPHALT PAVING
- CHAIN LINK FENCE
- WOODEN FENCE
- OHP — OVERHEAD POWER LINE
- COMM — OVERHEAD COMMUNICATIONS LINE
- TELE — UNDERGROUND COMMUNICATIONS LINE
- P — UNDERGROUND POWER LINE
- G — UNDERGROUND GAS LINE
- W — UNDERGROUND WATER LINE
- SSS — UNDERGROUND SANITARY SIDE SEWER
- X" PSD — X" DIAMETER STORM MAIN
- X" PSS — X" DIAMETER SEWER MAIN
- X" W — X" DIAMETER WATER MAIN

BRANDON E. WINTERS
STATE OF WASHINGTON
45803
REGISTERED
PROFESSIONAL LAND SURVEYOR

DATE: 01/19/2022

TOPOGRAPHIC SURVEY
4332 WEST MERCER WAY
MERCER ISLAND, WASHINGTON

CHADWICK & WINTERS
LAND SURVEYING AND MAPPING
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PHONE: 206.297.0996
FAX: 206.297.0997
WEB: WWW.CHADWICKWINTERS.COM

PROJECT #:	21-7329
DRAWING:	21-7329 TOPO.DWG
CLIENT:	KEN CHU
DATE:	01/19/2022
DRAWN BY:	RCS